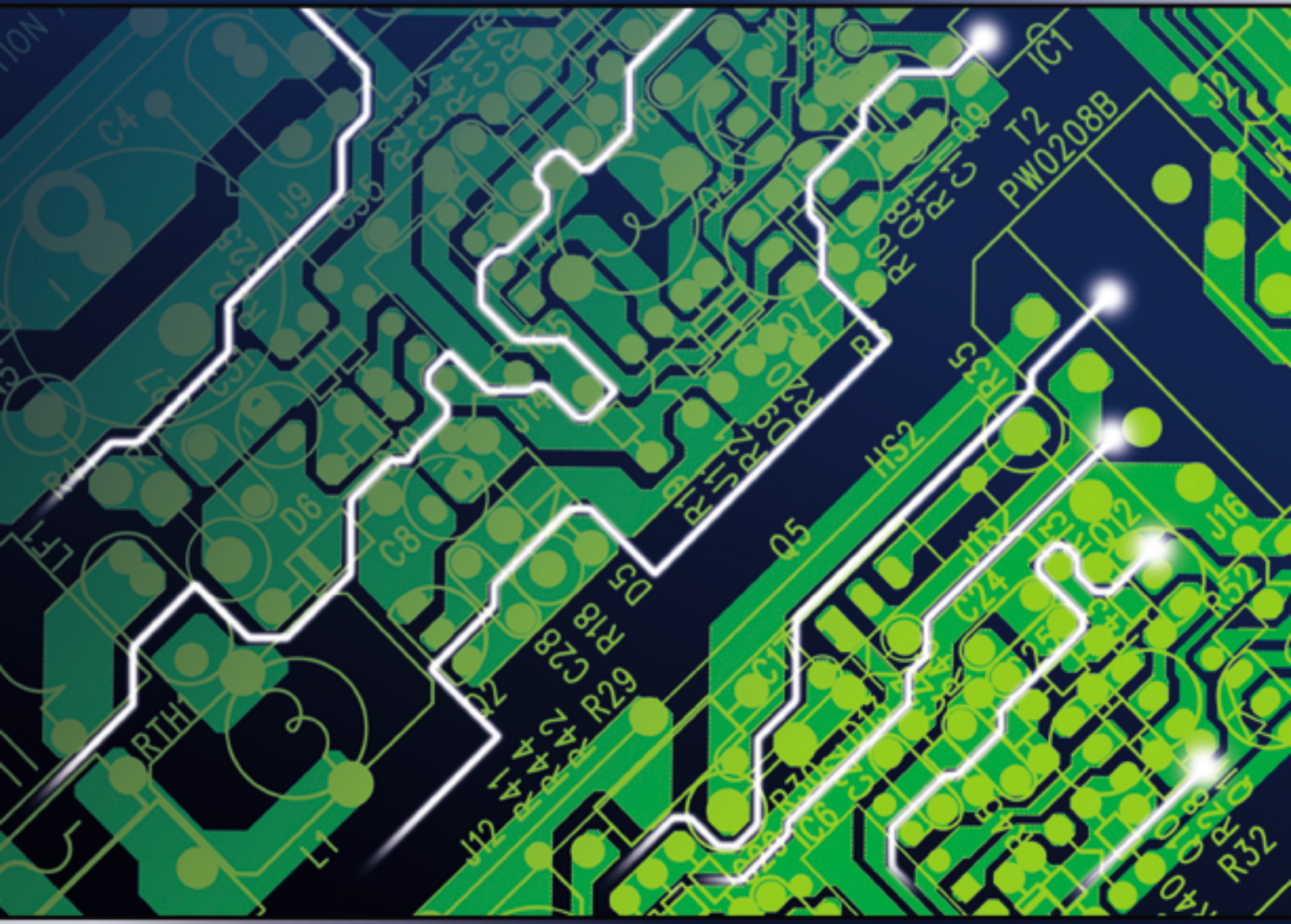
PRODUCT CATALOG



Lambda For Low Cost Of Ownership

2008

LAMBDA

Lambda for Low Cost of Ownership

The choice and application of the power supply is an important one. Working with Lambda can help you save time and money, from design concept to years after your system or product is first installed.

Why Lambda?

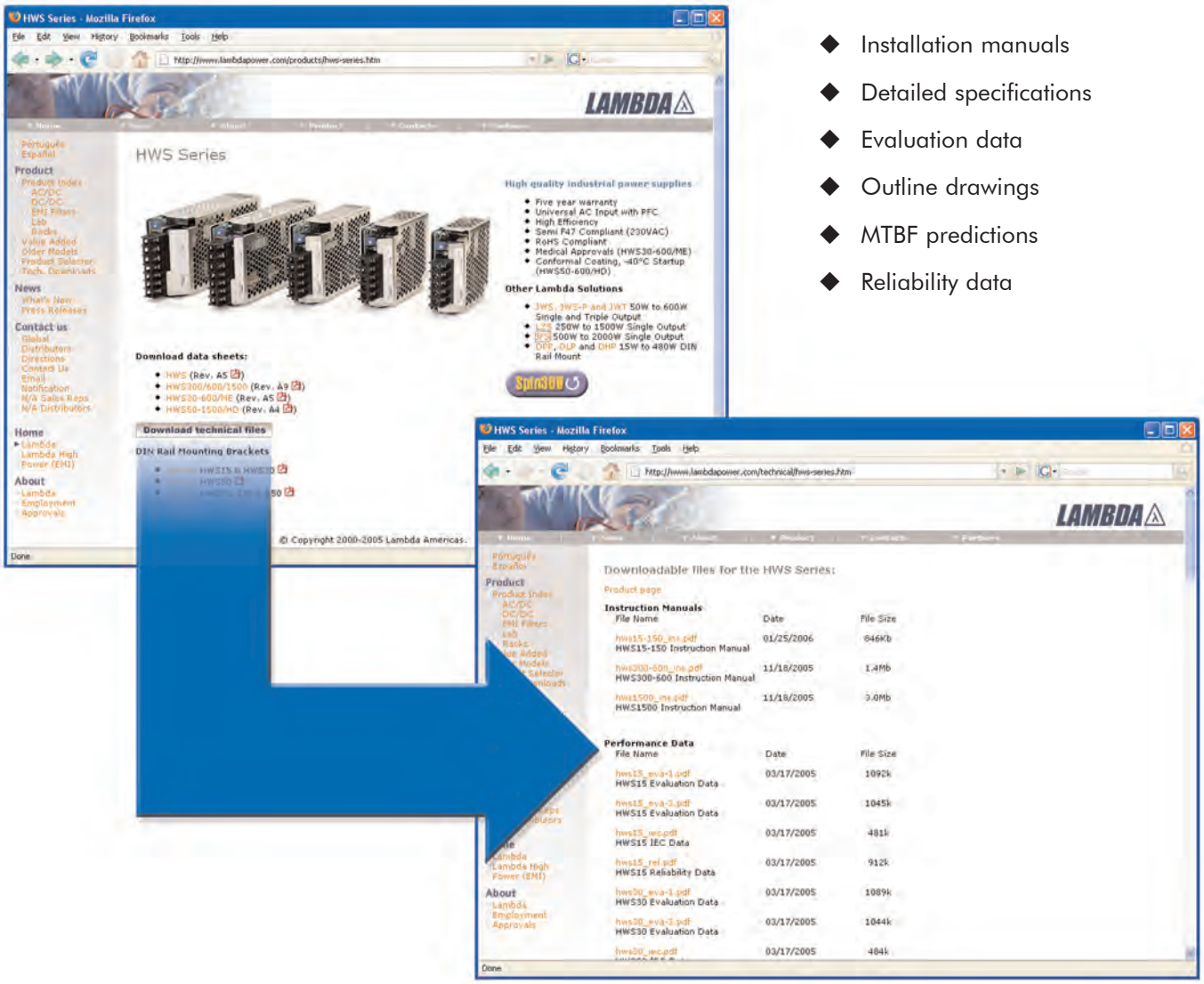
- Over the last 60 years, Lambda has developed a worldwide reputation and heritage for high quality, robust product.
- We at Lambda stand behind our products, with industry leading warranties of up to five years.
- Our research and development budget is one of the largest in the industry helping you design in reliable, cutting edge technology ahead of your competition.
- A broad range of product enables our customers to choose the right model for the application, and assists with their vendor reduction programs.
- Multiple manufacturing and design facilities across the globe. We can provide crucial local support when programs move between Asia, North America and Europe. With those multiple factories we also have proven risk mitigation against natural disasters.
- Our technical support can get your product to market faster. Please see overleaf for more details.

Thank you for your interest in Lambda products.

Table of Contents

Need Technical Information?

The Lambda website (www.lambdapower.com) has a huge library of data:



- Installation manuals
- Detailed specifications
- Evaluation data
- Outline drawings
- MTBF predictions
- Reliability data

Want Engineering Support?

- Please call 1-800-LAMBDA-4 to speak to our inside technical support team, or email lambda.techsupport@lambda.com
- Lambda's Field Application Engineers are available for in-depth advice at your facility. Please contact your local Lambda Salesperson to schedule a visit.

◆ AC-DC Products

DC-DC Products

Filters

Company

Linear	Desktop
Enclosed or L Bracket	Open Frame
PCB Mount	Rack Mount Hot Swap

AC-DC Selector

Applications	# of Outputs	Output Power (W)
		5 · 10 · 15 · 30 · 50 · 100 · 300 · 500 · 1000 · 1500 · 2500
High Reliability Industrial (Five Year Warranty)	Single	NNS; HWS; JWS; LZSa
	Dual	NND
	Triple	JWT
Industrial (Three Year Warranty)	Single & Multiple	HK-A (Single Output, 115VAC input); NV; MTW; Vega; Alpha
Datacom Commercial (One - Two Year Warranty)	Single	KW, KPS, KM; ZWS, ZWSAF, ZWSPAF; VSB, VSC, VSP (115VAC); DT; H; SC, SC120, ZP; SWS; PF & PFE; TL (2U); FPS (1U); TH (1U)
	Multiple	KW, KM; LWD, LWT; H; DT; SC, ZP; ZWD, ZWQ
Programmable	Single	ZUP
DIN Rail Mount	Single	DSP, DPP, DLP-PU*; DLP

* See website

Alpha 1000

1000W Multiple Output Modular Power Supply

- Customized Power Supplies
- Universal AC Input
- Power factor Corrected
- Capable of up to 14 fully regulated and independent outputs
- Output Voltages from 1.8V - 48V
- Low Leakage Options
- Input Transient Protection
- Compact Package
- International Safety Agency Approvals

RoHS

Features and Benefits

Feature	Benefit
◆ PFC compliant to EN61000-3-2	◆ Supports global use
◆ Fast-on Tab Connections	◆ Quick installation
◆ No Minimum Load	◆ Eliminates the need for external components
◆ Wide Range Output Modules	◆ Capable of providing non-standard voltages, eliminates customs

Specifications

ITEMS / MODELS		
AC Input Volt. range & Freq.	-	85-264VAC, 47-63Hz
DC Input Voltage Range	-	120 - 360VDC (800W maximum output to 45C)
Input Current	A	16A maximum
Inrush Current	A	Less than 50A
Leakage Current	-	1.1mA @ 264VAC, 63Hz (see input filter options in detailed product datasheet)
Efficiency	%	75% typical (configuration and input dependent)
Power Factor Correction	-	Compliant to EN61000-3-2 (> 0.99 typical, reduced PFC > 255VAC)
Conducted EMI	-	EN55022 level A
Output Power	W	800W@85VAC (50°C max); 1000W@100VAC (50°C max); 1000W@90VAC (45°C max); 1000W for 30 seconds maximum @ 85VAC followed by 800W for 60 seconds minimum.
Output Load Regulation	-	0.2% maximum.
Output Line Regulation	-	0.5% maximum.
Ripple & Noise	-	2% pk-pk or 100mV (Whichever is greater)
No Load Operation	-	No preload is required on any output module.
Hold Up Time	ms	>15ms
Remote Sense	-	Available on single output modules only, refer to the module table.
Options (see option codes)	-	AC Fail, Global Inhibit, Module Inhibit, 5V@50mA aux., Parallel, Low Leakage.
Operating Temperature	°C	-20°C to +50°C full load, derate each output at 2.5% /°C from 50°C to 65°C.
Thermal Protection	-	Converter protected against over-temperature conditions. Recycle I/P power to restore output.
Storage Temperature	°C	-40°C to +85°C
Temperature Coefficient	-	0.02% per °C
Humidity	% RH	5% - 95% Non-condensing
Altitude	-	3,000m operating
Cooling	-	Internal fan provides forced-air cooling. Airflow intake on I/P end, exhaust on O/P end of unit.
Isolation	-	Input - Output 4.3kVDC, Input - Ground 2.3kVDC, Output - Ground 500VDC
Switching Frequency	-	100kHz on PFC, 200kHz on forward converter.
Vibration	-	1.5G, 10 - 200Hz
Shock	-	3,000 bumps, 10G, 16ms half-sine pulses.
Safety Agency Approvals	-	UL, EN/IEC60950-1, UL, EN/IEC60601-1*, IEC, EN61010-1, CE Mark
Size (WxHxD)	in.	7" x 2.5" x 11"
Warranty	-	Three Years

Notes: Consult datasheet for additional specifications
* Low leakage filter options only.

Alpha 1000

1 Case Codes

Choose the converter which best fits your total power needs:

Code	Wattage	Max Slots	Size (H x W x L)	Input Voltage
CA1000	1000*	7	2.5" x 7" x 11"	85 - 265VAC

* Note: CA1000 derates to 800W for 85–100VAC input with a peak of 1000W for 30 seconds maximum.

2 Output Module Codes

Code	V1 Adjust	V1 Amps	V2 Adjust	V2 Amps	Slot(s)[1]
L	1.8 - 3.2	25	-	-	1
T	1.8 - 3.2	60	-	-	2
Q	2.7 - 3.9	25	-	-	1
R	2.7 - 3.9	60	-	-	2
B	4.5 - 5.5	25	-	-	1
A	4.5 - 5.5	60	-	-	2
BB	4.5 - 6.5	25	-	-	1
AA	4.5 - 6.5	60	-	-	2
S	2.5 - 5.7	85	-	-	2
M	5.0 - 16.0	8	-	-	1
C	5.0 - 16.0	16[3]	-	-	1
F	9.0 - 16.0	33	-	-	2
U	10.0 - 21.0	16	-	-	1
N	18.0 - 29.0	5	-	-	1
D	18.0 - 29.0	8	-	-	1
K	18.0 - 29.0	15	-	-	2
G	17.5 - 29.0	25[3]	-	-	2
J	30.0 - 48.0	10[3]	-	-	2
E	5.0 - 16.0	8[3]	5.0 - 16.0	8[3]	1
P	18.0 - 29.0	5	5.0 - 16.0	8[3]	1
H	18.0 - 32.0	5[3]	18.0 - 32.0	5[3]	1

Notes: 1) The total # of slots must not exceed 7 for CA1000.
2) Slot position may change upon order placement.
3) Module Deratings: C derates linearly to 12A from 12.1V–15V
E & P 8A rating derates to 6A in slots 4 & 5
H derates from 5A to 4A in slots 4 & 5
G derates to 21A above 24.5V
J derates 0.25A/V above 40V

Sample Configurations

	Output 1		Output 2		Output 3		Output 4		Output 5	
	V	A	V	A	V	A	V	A	V	A
CA1000-24G	24	16.5	-	-	-	-	-	-	-	-
CA1000-5APP-5APP *	5	120	-	-	-	-	-	-	-	-
CA1000-5A-12.7C	5	60	12.7	16	-	-	-	-	-	-
CA1000-24G-5/12E	24	25	5	8	12	8	-	-	-	-
CA1000-5A-24G-12C-12C	5	60	24	25	12	16	12	16	-	-
CA1000-5BMF-24D-6/12E	5	25	24	8	6	8	12	8	-	-
CA1000-5B-5CIN-12C-12/12E	5	25	5	16	12	16	12	8	12	8
CA1000-5S-12F-12C-5/24P	5	85	12	33	12	16	5	8	24	5

Note: Total output power must not exceed 1000W converter limits.
* Modules in parallel.

Other Lambda Modular Products

NV	350W to 700W up to 8 outputs
Vega	450W to 900W up to 10 outputs
Alpha1500	1500W up to 16 outputs

3 Option Codes

If required the following options may be added to the configuration by placing the code after the module. (i.e. Inhibiting a 5V @ 25A = 5B + Inhibit code = "5BIN")

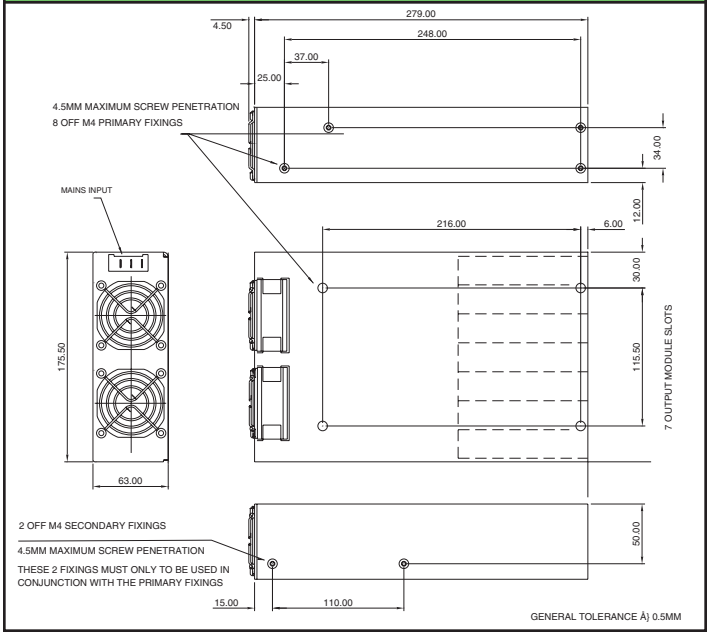
Code	Description	Available On
MF[2]	Mains Fail This option provides an AC fail signal, power supply inhibit, and 5V@50mA auxiliary supply. This is only placed in the first module slot. (TTL compatible reference to 0 volts of Aux. Supply)	All modules except Dual output (E, H, P)
PP	Parallel for Power This option allows 2 adjacent modules to be paralleled together for increased output power. Bus bars provided.	Modules: A, B, C, D, F, G, M, N, Q, R
PA	Parallel for Redundancy This option allows modules to be connected for N+1 redundancy. A DC good signal is also offered (electrically similar to AC fail.) No bus bars provided.	Modules: A, B, C, D, F, G, M, N, Q, R, S
IN[3]	Inhibit Module inhibit and DC good signal. (TTL compatible referenced to (-V) of the module)	Modules A, B, C, D, F, G, J, M, N, Q, R

Low Leakage Options (Max values stated)

	120VAC, 60Hz	240VAC, 60Hz	264VAC, 63Hz[4]	Conducted EMI
LL	88 µA	197µA	233 µA	Curve A
RL	50 µA	112 µA	132 µA	>Curve A
TL	24 µA	53 µA	63 µA	>Curve A

Notes: 1) Only one option per module may be used.
2) Mains Fail: AC Fail "AC On" = ≤ 0.8V, 50mA max.
"AC Off" = open circuit, 50V abs max.
PS Inhibit "PS On" = ≥ 2.0V or open circuit.
"PS Off" = ≤ 0.8V @ 5mA.
(TTL compatible, Referenced to 0 volts of Aux. Supply.)
3) Inhibit: DC Good Electrically similar to AC fail module.
Inhibit Electrically similar to PS inhibit.
4) Type testing result

Outline Drawing



For Additional Information, please visit
www.lambdapower.com/products/alpha-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A5: Jan 2007

Alpha 1500

1500W Multiple Output Modular Power Supply

- Customized Power Supplies
- Power factor Corrected
- Capable of up to 16 fully regulated and independent outputs
- Output Voltages from 1.8V - 48V
- Low Leakage Options
- Input Transient Protection
- Low Profile Package
- International Safety Agency Approvals

RoHS

Alpha Features and Benefits

Feature	Benefit
◆ PFC compliant to EN61000-3-2	◆ Supports global use
◆ Fast-on Tab Connections	◆ Quick installation
◆ No Minimum Load	◆ Eliminates the need for external components
◆ Wide Range Output Modules	◆ Capable of providing non-standard voltages, eliminates customs

Specifications

ITEMS / MODELS		
AC Input Volt. range & Freq.	-	150 - 264VAC, 47 - 63Hz (1500W). See power limitations for lower input ranges.
Input Current	A	16A maximum
Inrush Current	A	Less than 50A
Leakage Current	-	1.1mA @ 264VAC, 63Hz (low leakage current options available)
Efficiency	%	75% typical (configuration and input dependent)
Power Factor Correction	-	Compliant to EN61000-3-2 (> 0.99 typical, reduced PFC > 255VAC)
Conducted EMI	-	EN55022 level A
Output Power	W	800W@85VAC (50°C max); 1000W@100VAC (50°C max); 1000W@90VAC (45°C max); 1500W @ 150VAC (50°C max)
Output Load Regulation	-	2% max. without remote sensing. 0.5% max. remote sense connected
Output Line Regulation	-	0.5% maximum.
Ripple & Noise	-	2% pk-pk or 100mV (Whichever is greater)
No Load Operation	-	No preload is required on any output module
Hold Up Time	ms	>15ms
Remote Sense	-	Available on single output modules only
Options (see option codes)	-	AC Fail, Global Inhibit, Module Inhibit, 5V@50mA aux., Parallel, Low Leakage
Operating Temperature	°C	0°C to +50°C full load, derate each output at 2.5% /°C from 50°C to 65°C
Thermal Protection	-	Converter protected against over-temperature conditions. Recycle I/P power to restore output
Storage Temperature	°C	-40°C to +85°C
Temperature Coefficient	-	0.02% per °C
Humidity	% RH	5% - 95% Non-condensing
Altitude	-	3000m Operating
Cooling	-	Internal fan provides forced-air cooling. Airflow intake on I/P end, exhaust on O/P end of unit.
Isolation	-	Input - Output 4.3kVDC, Input - Ground 2.3kVDC, Output - Ground 500VDC
Switching Frequency	-	100kHz on PFC, 200kHz on forward converter.
Vibration	-	1.5G, 10 - 200Hz
Shock	-	3,000 bumps, 10G, 16ms half-sine pulses.
Safety Agency Approvals	-	UL60950-1, IEC60950-1, CSA22.2 No.60950-1, EN60950-1, IEC61010-1, EN61010-1, CE Mark
Size (WxHxD)	in.	8" x 2.5" x 11"
Weight	lbs.	8 (3.6kg) typical dependent on configuration
Warranty	-	Three Years

Alpha 1500

1 Case Code

Code	Wattage	Max Slots	Size (H x W x L)	Input Voltage*
CA1500	1500	8	2.5" x 8" x 11"	150 - 264VAC

*Input Voltage/Power Limitations

Input Voltage	Intermittent Output Power Rating	Continuous Output Power Rating	Max. Ambient Temperature
85 - 99.9VAC	-	800W	50°C
100 - 149.9VAC	-	1000W	50°C
150 - 164.9VAC	-	1500W	50°C
165 - 179.9VAC	-	1595W	50°C
180 - 264VAC	-	1690W	50°C
90 - 264VAC	-	1000W	45°C
85 - 264VAC	1000W*	-	50°C

*- 1000W for 30 seconds maximum followed by 800W for 60 seconds min.
Note: Ratings are not affected by the use of input or output connector housings

2 Output Module Codes

Code	V1 Adjust	V1 Amps	V2 Adjust	V2 Amps	Slot(s)(1)
L	1.8 - 3.2	25	-	-	1
T	1.8 - 3.2	60	-	-	2
Q	2.7 - 3.9	25	-	-	1
R	2.7 - 3.9	60	-	-	2
B	4.5 - 5.5	25	-	-	1
A	4.5 - 5.5	60	-	-	2
BB	4.5 - 6.5	25	-	-	1
AA	4.5 - 6.5	60	-	-	2
S	2.5 - 5.7	85	-	-	2
M	5.0 - 16.0	8	-	-	1
C	5.0 - 16.0	16	-	-	1
F	9.0 - 16.0	33	-	-	2
U	10.0 - 21.0	16	-	-	1
N	18.0 - 29.0	5	-	-	1
D	18.0 - 29.0	8	-	-	1
K	18.0 - 29.0	15	-	-	2
G	17.5 - 29.0	25	-	-	2
J	30.0 - 48.0	10	-	-	2
E	5.0 - 16.0	8	5.0 - 16.0	8	1
P	18.0 - 29.0	5	5.0 - 16.0	8	1
H	18.0 - 32.0	5	18.0 - 32.0	5	1

Notes: 1) The total # of slots must not exceed 8 for CA1500.
2) Slot position may change upon order placement.

Max. Output Current Limitations

All modules can be used at their full rated current in all slot positions unless otherwise stated below

A module:	Limited to 51A in slot 7/8
B module:	Limited to 20A in slot 8
C module:	Limited to 12A if output exceeds 12V
L module:	Limited to 20A in slot 8
Q module:	Limted to 20A in slot 8
R module:	Limited to 51A in slot 7/8
S module:	Limited to 65A in slot 7/8, 66A in slot 6/7, 80A in slot 5/6, 85A in slot 4/5, 66A in slot 3/4, 68A in slot 2/3, 73A in slot 1/2
T module:	Limited to 51A in slot 7/8

Other Lambda Modular Products

NV	350W to 700W up to 8 outputs
Vega	450W to 900W up to 10 outputs
Alpha1000	1000W up to 14 outputs

For Additional Information, please visit
www.lambdapower.com/products/alpha-series.htm

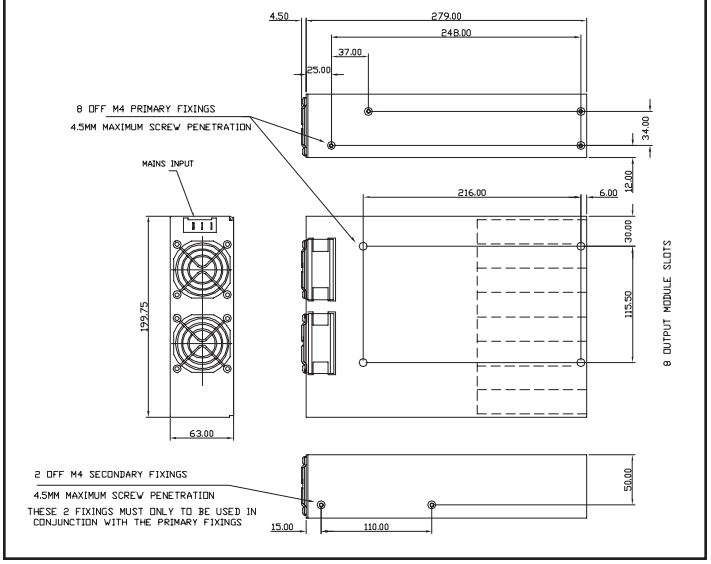
3 Option Codes

If required the following options may be added to the configuration by placing the code after the module. (i.e. Inhibiting a 5V @ 25A = 5B + Inhibit code = "5B_IN")

Code	Description	Available On
MF[2]	Mains Fail This option provides an AC fail signal, power supply inhibit, and 5V@50mA auxiliary supply. This is only placed in the first module slot. (TTL compatible reference to 0 volts of Aux. Supply)	All modules except Dual output (E, H, P)
PP	Parallel for Power This option allows 2 adjacent modules to be paralleled together for increased output power. Bus bars provided.	Modules: A, B, C, D, F, G, M, N, Q, R
PA	Parallel for Redundancy This option allows modules to be connected for N+1 redundancy. A DC good signal is also offered (electrically similar to AC fail.) No bus bars provided.	Modules: A, B, C, D, F, G, M, N, Q, R, S
IN[3]	Inhibit Module inhibit and DC good signal. (TTL compatible referenced to (-V) of the module)	Modules A, B, C, D, F, G, J, M, N, Q, R
	Low Leakage Options	All converters
	Max. Leakage Current / Conducted RFI	
LL	240 µA / Curve A	
RL	100 µA / Above Curve A	
TL	50 µA / Above Curve A	

Notes: 1) Only one option per module may be used.
2) Mains Fail: AC Fail — "AC On" = ≤ 0.8V, 50mA max.; "AC Off" = open circuit, 50V abs max.
PS Inhibit — "PS On" = ≥ 2.0V or open circuit.; "PS Off" = ≤ 0.8V @ 5mA.
(TTL compatible, Referenced to 0 volts of Aux. Supply.)
3) Inhibit: DC Good — Electrically similar to AC fail module.
Inhibit — Electrically similar to PS inhibit.

Outline Drawing



Sample Configurations

Description	O/P 1	O/P 2	O/P 3	O/P 4	O/P 5
CA1500 24G_PP* 24G_PP*	24V 50A	-	-	-	-
CA1500 5S_MF 12F_PP* 12F_PP*	5V 80A	12V 60A	-	-	-
CA1500 LL 5A 28G 36J_IN	5V 60A	28V 25A	36V 10A	-	-
CA1500 5A_PP* 5A_PP* 3.3R 12C 12C	5V 120A	3.3V 60A	12V 16A	12V 16A	-
CA1500 24G_PP* 24D_PP* 3.3S 5S 12/12E	24V 33A	3.3V 85A	5V 66A	12V 8A	12V 8A

Actual part number (format CA1500Hxxxxx) assigned on quotation.
* Outputs paralleled via bus bars. (O/P = Output)

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A3: Dec 2006

DLP Series

75 to 240W, 24V Output DIN Rail Mount Power Supplies

- Low Cost
- 3 Year Warranty
- UL508 Listed, NEC NFPA70 Class 2(1) (/C2 Models)
- Convection Cooled
- Conforms to EN61000-3-2 (PFC)
- Conducted and Radiated EMI, Class B
- Input Transient Protection, IEC61000-4
- Semi F47 Compliant (DLP180 & 240 only)

RoHS

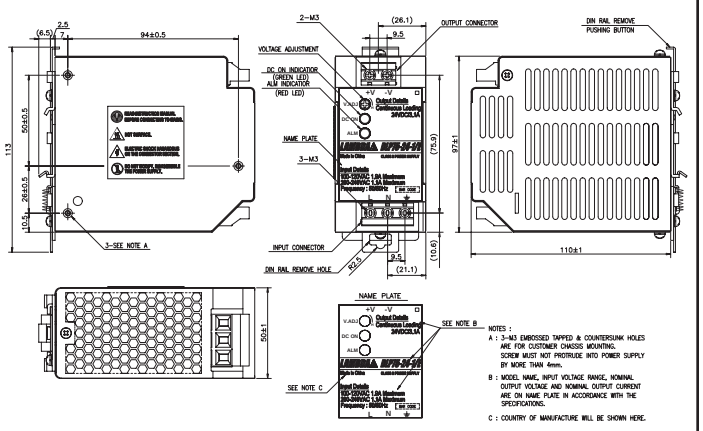
Specifications

ITEMS \ MODELS		DLP75-24-1/E DLP75-24-1/C2EJ	DLP100-24-1/E DLP100-24-1/C2EJ	DLP120-24-1/E	DLP180-24-1/E	DLP240-24-1/E
Output Voltage	V	24	24	24	24	24
Output Current (/C2 models)	A	3.1 (2.5)	4.1 (3.7)	5.0	7.5	10
Output Power (/C2 models)	W	75 (60)	98.4 (88.8)	120	180	240
Output Voltage Adjustment	V	21.6 - 28 (fixed for /C2 models)				
Load Regulation	-	192mV				
Line Regulation	-	120mV				
Ripple/Noise (0-60°C)	mV	240				
AC Input Voltage & Frequency	-	85-132/170-265VAC, 47-63Hz Auto select			85-265VAC (47-63Hz) or 120-370VDC(2)	
Input Current 100/230VAC	A	1.7/0.8	2.3/1.2	2.4/1.3	2.3/1.0	3.0/1.3
/C2	A	1.4/0.7	2.0/1.0		-	
Efficiency 100/230VAC	%	81/83	82/85	83/85	84/87	82/86
Power Factor	-	Meets EN61000-3-2 (DLP180, 240: >0.95)				
Inrush Current(Typ)100/230VAC	A	20/45				
Leakage Current	mA	Less than 0.75mA				
Hold-up Time 100/230VAC	ms	20/30 (Semi F47 Compliance, DLP 180 & 240 only)				
Overcurrent Protection	-	>105%,Fold Back	>105%, Constant Current			
/C2	-	~2.6A	~3.75A	-		
Overvoltage Protection	-	30-35V, latching, cycle AC line to reset (26-30V DLP75-24-1/C2EJ)				
LED Indicators	-	Green LED = DC ok Red LED = overcurrent				
Operating Temperature (3)	-	Convection cooled, -10°C to 60°C, derate linearly to 60% load from 50 to 60°C				
Storage Temperature	-	-30°C~+85°C				
Humidity (Non-Condensing)	%RH	30-90% operating 10-95% non operating				
Withstand Voltage	-	Input - Ground 2kVAC, Input to Output 3kVAC, Output - Ground 500VAC				
Vibration	-	9.8m/s² (1.0G) at DIN rail; (10-55Hz: 9.8m/s² Constant, X,Y, Z each 1 hour)				
Shock	-	196m/s² (20G)				
Safety Agency Approvals	-	UL508, NEC Class 2(1) (/C2 models), UL60950-1, CSA60950-1, EN60950-1, CE, EN50178 Cat III (Pri)				
Conducted EMI	-	FCC-B, EN55011/EN55022-B, VCCI-B; Meets IEC61000-4-1				
Radiated EMI	-	EN55011/EN55022-B, FCC-Class B, VCCI-B				
ESD	-	IEC61000-4-2 ±10kV (Air), ±5kV (Contact)				
Radiated RFI	-	IEC61000-4-3 80-1000MHz,12V/m 80% AM 1kHz				
Fast Transient Burst	-	IEC61000-4-4 2.4kV 5kHz				
Lightning Surge	-	IEC61000-4-5 4.4kV, 1.2x50μs (Common Mode) 2.4kV 1.2x50μs (Normal)				
Conducted RFI	-	IEC61000-4-6 150kHz-80MHz, 12V, 80% AM 1kHz				
Magnetic Field	-	IEC61000-4-8 36A/m				
Voltage Dips	-	IEC61000-4-11 70% 10ms, 40% 100ms, 0% 5s				
Size	mm	50 x 97 x 110	60 x 97 x 110	60 x 97 x 110	80 x 97 x 110	120 x 97 x 110
Weight	g	470	540	540	780	1000
Warranty	-	3 Years				

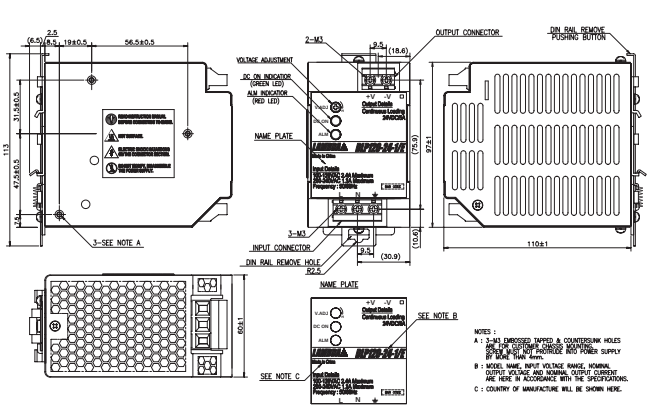
(1) Evaluated to NEC NFPA70 Class 2 output per UL1310
(2) DC input is not safety approved
(3) DLP240-24-1/E, 170-265VAC: -10°C~+70°C, derated linearly to 60% load from 50° to 70°C.
DLP75-24-1/C2EJ: -10°C~+70°C, derated linearly to 75% load from 50° to 60°C.
DLP100-24-1/C2EJ: -10°C~+70°C, derated linearly to 80% load from 50° to 60°C.

DLP Series

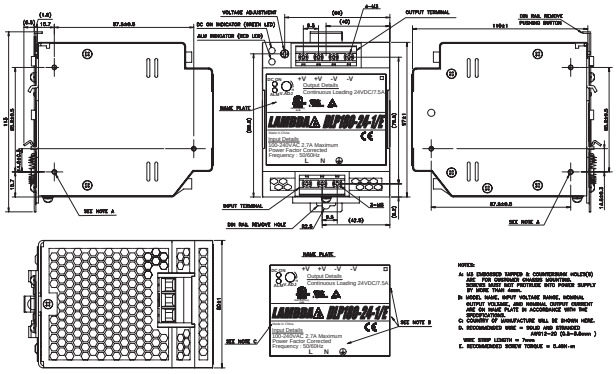
DLP75 Outline



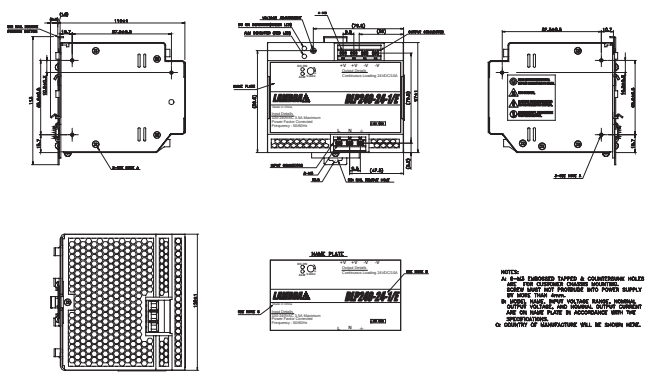
DLP 100/120 Outline



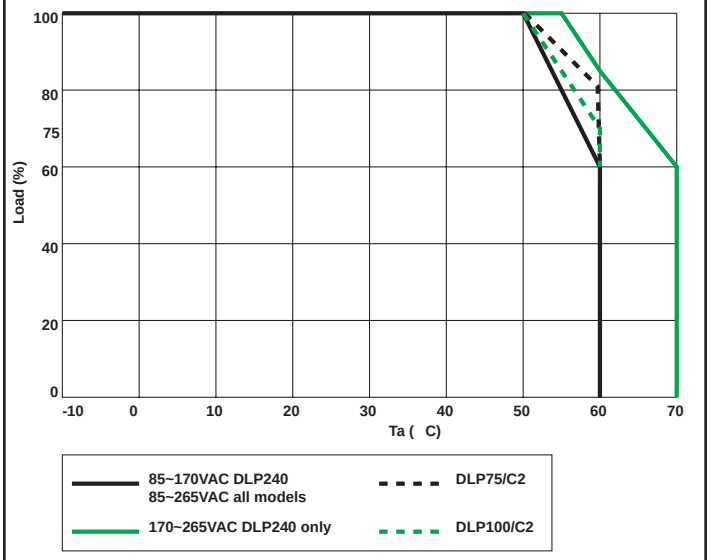
DLP 180 Outline



DLP 240 Outline



Derating Curve



Other Lambda Industrial Products

DPP/DSP	10W to 480W Single Output DIN Rail
HWS	15W to 1500W Single Output

Snap-on Mounting: snap onto DIN Rail TS35/7.5 or TS35/15. (no tools required)

For Additional Information, please visit
www.lambdapower.com/products/dlp-series.htm

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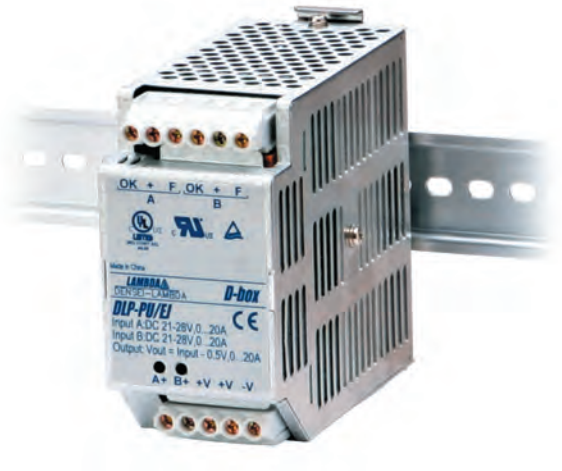
Revision A8: Oct 2007

DLP-PU Series

Power Supply Parallel or Redundancy Module



- OR-ing Diodes Included
- Alarm Signals
- LED Indicators
- DIN Rail Mounting

RoHS

Features and Benefits

Feature	Benefit
◆ Internal ORing Diodes	◆ Allows redundant operating
◆ Can connect two units in parallel	◆ Enables system scalability
◆ Output voltage monitoring (via relays)	◆ Remote alarm notification
◆ DIN Rail Mounting	◆ Easier system integration

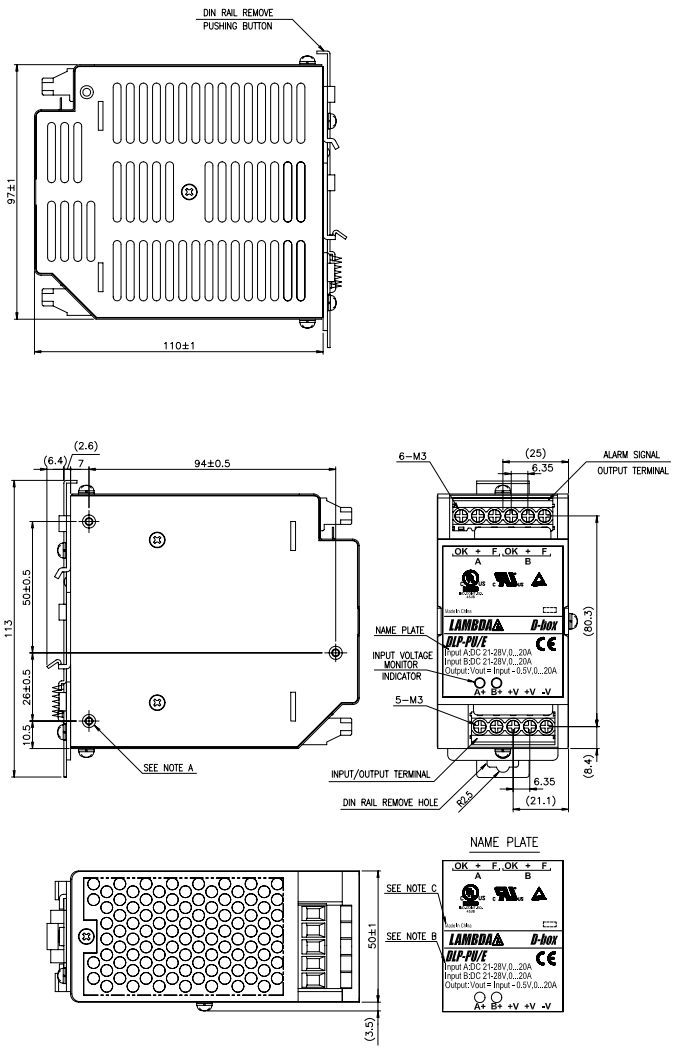
Specifications

ITEMS / MODELS		DLP-PU/E
Input Voltage Range	VDC	21 - 28VDC
Number of inputs	-	Two
Maximum Input Current	A	20A per input
Maximum Output Current	A	20A
Overcurrent protection	-	None
Voltage Drop	VDC	0.5V
Maximum Reverse Voltage	VDC	35VDC
LED Indicators	-	Two green LEDs indicating each input is "good"
Input Voltage Alarm	-	Relay off when input is <19.2V (±1%) or > 30V (±5%). NO and NC contacts
Relay contact rating (max)	-	28VDC, 1A or 120VAC, 0.5A (5mA minimum recommended)
Cooling	-	Convection
Operating Temperature		-10 to +70°C, derate linearly to 60% from 60 to 70°C
Storage Temperature	-	-30 to +90°C
Humidity	-	Operating: 30 - 90%RH, Storage: 10 - 95%RH (non condensing)
Withstand Voltage	-	Input or Output - Chassis, Input or Output - Relay Contacts, Relay Contacts to Chassis; 500VAC for 1 min.
Isolation Resistance	-	Input or Output - Chassis, Input or Output - Relay Contacts, Relay Contacts to Chassis; >10M Ohms at 25°C, 70%RH and 500VDC
Vibration	-	Non operating, mounted on DIN Rail,10-55Hz (sweep for 1 min), 9.8m/s^2 constant X, Y, Z each for 1 hour
Shock	-	196m/s^2
Safety Agency Approval	-	UL60950-1, CSA60950-1, EN60950-1, UL508, CSA22.2 No.14, EN60529 IP20, EN50178 Cat 1
Size	mm/in	50 x 97 x 110mm, 1.97x 3.81 x 4.33"
Weight	g	470g
Warranty	yrs	Three Years

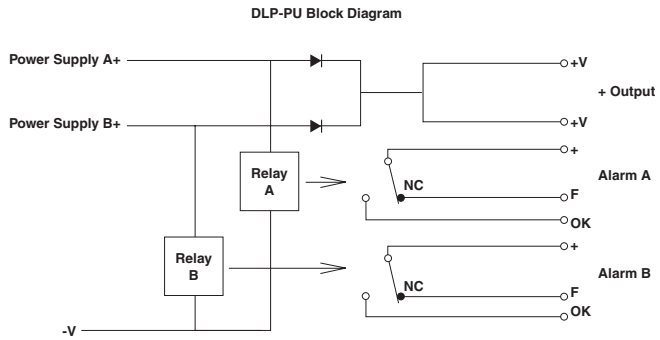
Note:
See Installation Manual for full details, test methods of parameters and application notes

DLP-PU Series

Outline Drawing



Block Diagram



Other Lambda DIN Rail Products

DLP	75W to 240W power supplies
DPP/DSP	10W to 480W low cost power supplies
MC/MZ/MA/MX	6A to 30A single & three phase EMI Filters

Snap-on Mounting: snap onto DIN Rail TS35/7.5 or TS35/15. (no tools required)

For Additional Information, please visit
www.lambdapower.com/products/dlp-series.htm

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Revision A4: Oct 2007

DPP Series

15-100W, 5-48V Output DIN Rail Mount Power Supplies

- Low Cost
- 5V to 48V Outputs
- Universal Input
- Compact Size
- NEC NFPA70 Class 2[2]
- UL508 Listed
- -10 to +71°C Operation
- Convection Cooled

RoHS

Specifications

ITEMS \ MODELS		DPP15	DPP25/30	DPP50	DPP100
AC Input Voltage range	VAC	85 - 264VAC			85 - 132VAC 176 - 264VAC
Input Frequency	Hz	47 - 63Hz			
DC Input Voltage range	-	90 - 375VDC			210 - 375VDC
Inrush Current (115 / 230VAC)	A	<35A	35 / 45A	35 / 50A	35 / 55A
Power Factor	-	Meets EN61000-3-2 Class A			
Input Current (230VAC)	A	0.4	0.72	1.35	2.2
Leakage Current	mA	<0.75mA, 265VAC, 63Hz			
Output Voltage Accuracy	%	±1% (24V outputs preset at 24.5V)			
Line Regulation	%	< 0.5%			
Load Regulation	%	< 0.5%			
Ripple and Noise	mV	50mV			
Overcurrent Protection (Typ)	-	>110% (fold forward type)			
Overvoltage Protection	V	120 - 137.5%, Cycle AC line to reset			
Hold Up Time (115VAC input)	ms	> 20ms			
Parallel switch	-	No			Yes
LED Indicator	-	Green LED = On			
Operating Temperature	-	-10 to +71°C (Derate linearly 5%/°C from 61 to 71°C)			
Storage Temperature	-	-25 to +85°C			
Operating Humidity	-	20 - 90% RH (non condensing)			
Cooling (1)	-	Convection			
Withstand Voltage	-	Input to Output 3kVAC for 1 min.			
Shock	-	Half sine wave, 4G, 22ms, 3 times per face, X, Y, Z			
Vibration	-	10-500Hz (20 min sweep) 0.002G²/Hz, 1 Grms acceleration X, Y, Z, 1 hour			
Isolation Resistance	-	>100M at 25C & 70%RH, Output to Ground 500VDC			
Safety Agency Approvals	-	UL60950-1, UL508, NEC Class 2[2], EN60950-1, CE Mark			
Emissions	-	EN55011, EN55022 Radiated & Conducted, EN61000-6-3			
Immunity	-	EN61000-6-2, EN61000-4-2 Level 4, EN61000-4-3, EN61000-4-6 Level 3, EN61000-4-4 Level 4 (I/P) Level 3 (O/P), EN61000-4-5 Level 4, EN61000-4-8, EN61000-4-11			
Weight (Typ)	g	130	260		390
Size (WxHxD)	in	0.9x2.95x3.81"	1.77x2.95x3.58"		2.86x2.95x3.81"
Case material	-	Plastic			
MTBF (MIL-HDBK-217F, GF25)	Hours	287,000	>288,000	269,000	239,000
Warranty	-	Two years			

(1) Recommend 1" clearance on all sides.
(2) Does not include DPP25-5 & DPP100-24 models. Evaluated to NEC NFPA70 Class 2 output per UL1310.

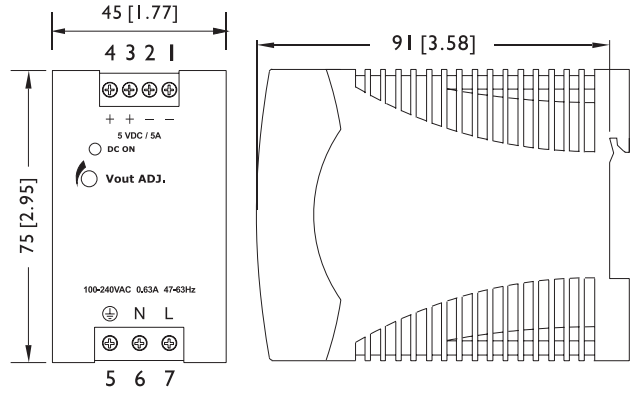
DPP Series

Model Selector

Model	Voltage (V)	Voltage Adjust (V)	Current (A)	Power (W)	Effic. (typ) %
DPP25-5	5	5-6	5	25	78
DPP30-12	12	9.9-12.1	2.5	30	83
DPP50-15	15	11.9-15.1	3.4	50	85
DPP15-24	24	22.5-28.5	0.63	15	81
DPP30-24	24	22.5-28.5	1.3	30	84
DPP50-24	24	22.5-28.5	2.1	50	86
DPP100-24	24	22.5-28.5	4.2	100	87
DPP50-48	48	48-56	1.05	50	87

DPP25-DPP50 Outline

mm [inch]



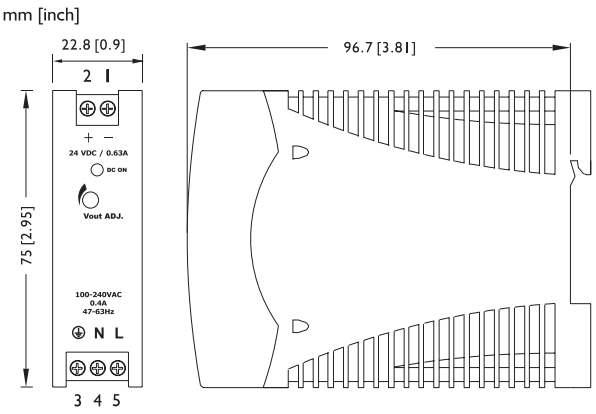
Other Lambda DIN Rail Products

DPP480	480W power supplies
DLP	75W to 240W power supplies
DLP-PU	Redundancy Module (20A)
MC/MZ/MA/MX	6A to 30A single & three phase EMI Filters

For Additional Information, please visit
www.lambdapower.com/products/dpp-series.htm

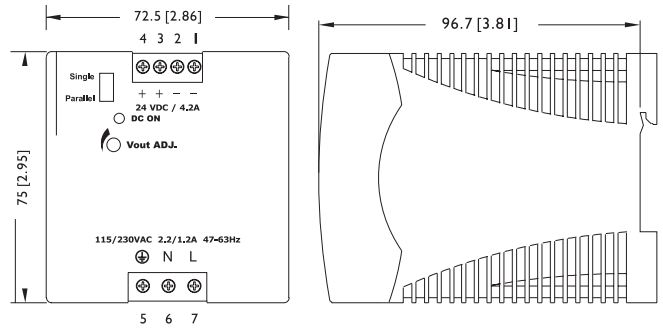
DPP15 Outline

mm [inch]



DPP100 Outline

mm [inch]



Installation:

Snap-on Mounting - snap onto DIN Rail TS35/7.5 or TS35/15. (No tools required)
Cooling - Normal Convection
Clearance - 25mm all sides
Connection - Use solid copper wire 0.5-2.0mm^2 (AWG24-12)

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Revision A7: Nov 2006

DPP480 Series

480W Single Output DIN Rail Mount Power Supplies

RoHS

- Low Cost
- 24V or 48V Outputs
- Wide Range AC Input (single & three phase)
- Active PFC
- Parallel Function Switch
- -25 to +71°C Operation
- Convection Cooled

Specifications

ITEMS / MODELS		DPP480-xx-1	DPP480-xx-3
AC Input Voltage range	VAC	90 - 264VAC, single phase	340 - 575VAC, three phase(1)
Input Frequency	Hz	47 - 63Hz	
DC Input Voltage range	VDC	120 - 370VDC	480 - 820VDC
Inrush Current	A	25 / 50A (115 / 230VAC)	15A (typical)
Power Factor	-	Meets EN61000-3-2 Class A	0.7 at 500VAC
Input Current	A	6.9 / 3.3A (115 / 230VAC)	1.4 / 1.0A (380 / 500VAC)
Output Voltage Accuracy	%	-0, +1% of Nominal	
Line Regulation	%	±0.5%	±1%
Load Regulation	%	±1% (±5% when set in parallel mode)	
Ripple and Noise (20MHz BW)	mV	100mV	
Overcurrent Protection (Typ)	-	110 - 140%	115 - 135% Selectable - hiccup or continuous
Overvoltage Protection	V	See model selector	
Overtemperature Protection	-	-	Yes, auto recovery
Hold Up Time (115VAC input)	ms	> 35ms	20ms
Parallel operation	-	Set in parallel (droop) mode - maximum of 3 DPP480-xx-1 or 2 DPP480-xx-3 units	
LED Indicators	-	Green LED = On, Red LED = DC Output Low	
DC Good Relay (24V model only)	-	0.3A rated normally open relay contacts, closes when output is above 17.6 - 19.4V	
Operating Temperature	°C	-25 to +71°C (Derate linearly 2.5%/°C from 56 to 71°C)	-25 to +71°C (Derate linearly 2.5%/°C from 61 to 71°C)
Storage Temperature	°C	-25 to +85°C	
Operating Humidity	-	20 - 95% RH (non condensing)	
Cooling (1)	-	Convection	
Withstand Voltage	-	Input to Output 3kVAC for 1 min.	
Isolation Resistance	-	>100M at 25°C & 70%RH, Output to Ground 500VDC	
Safety Agency Approvals	-	UL508 Listed, UL60950-1, EN60950-1, CE	
Conducted & Radiated EMI	-	EN55022 class B (24V) class A (48V)	EN55022 class A
Weight (Typ)	g	1800g	1750g
Size (WxHxD)(2)	In	6.89 x 4.92 x 4.57	5.91 x 4.87 x 4.38"
Case material	-	Metal	
Warranty	yrs	Two years	

(1) Under a dropped phase condition, output power is derated to 75% load
(2) Recommend 1" clearance on all sides

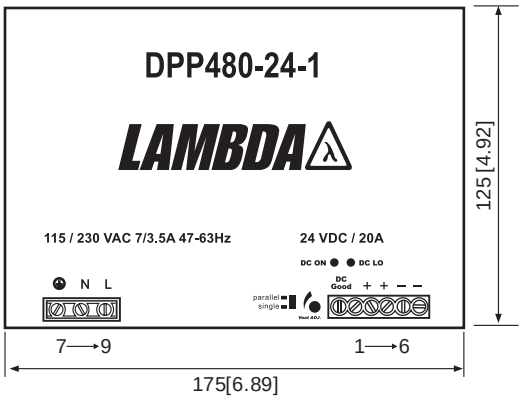
DPP480 Series

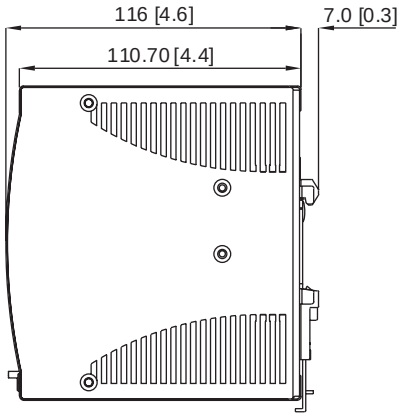
Model Selector

Model	Voltage	Adjust. Range	Output Current	Over-voltage	Eff.
DPP480-24-1	24V	22.5 - 28.5V	20A	30 - 33V	89%
DPP480-48-1	48V	47 - 56V	10A	57 - 63V	90%
DPP480-24-3	24V	22.5 - 28.5V	20A	30 - 33V	90%
DPP480-48-3	48V	47 - 56V	10A	60 - 68V	91%

Outline Drawing (DPP480-24-1)

mm [inch]





Accepts TS35/7.5 or TS35/15 DIN Rails

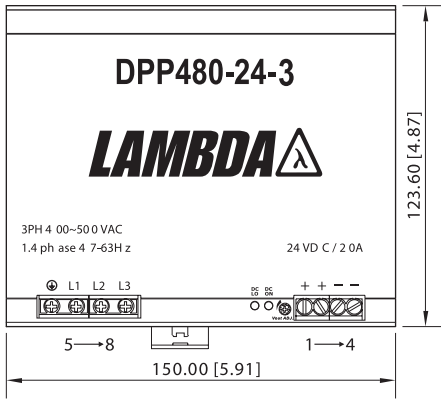
Other Lambda DIN Rail Products

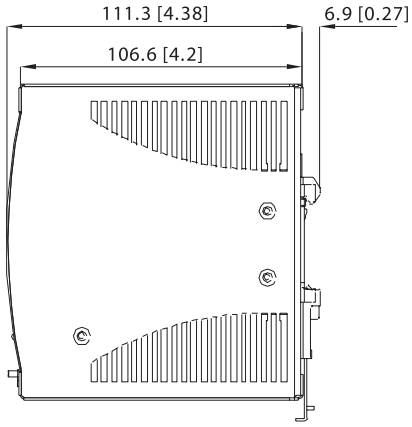
DPP/DSP	10W to 100W, 5V to 48V power supplies
DLP	75W to 240W power supplies
DLP-PU	Redundancy Module (20A)
MC/MZ/MA/MX	6A to 30A single & three phase EMI Filters

For Additional Information, please visit
www.lambdapower.com/products/dpp-series.htm

Outline Drawing (DPP480-24-3)

mm [inch]





Terminal Assignments

#	DPP480-xx-1	DPP480-xx-3
1	DC Good relay	+V
2	DC Good relay	+V
3	+V	-V
4	+V	-V
5	-V	Chassis ground
6	-V	L1
7	Chassis ground	L2
8	N	L3
9	L	DC Good relay
10	No connection	DC Good relay

Snap-on Mounting: snap onto DIN Rail TS35/7.5 or TS35/15. (no tools required)

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Revision A8: Oct 2007

DSP Series

7.5W to 100W Low Profile DIN Rail Mount Power Supplies

RoHS

- Low Profile for Building Automation
- 5V to 24V Outputs
- Wide Range AC Input
- UL1310 Class 2
- Class II Double Insulation
- -25 to +71°C Operation
- Convection Cooled
- DIN Rail or Chassis Mount

Features and Benefits

Feature	Benefit
◆ Low 2.2" Profile	◆ Fits into wall mounted cabinets
◆ Wide Range AC	◆ Global use with no input selector switches
◆ Full Power at 61°C	◆ No derating needed

Specifications

ITEMS \ MODEL		DSP10	DSP30	DSP60	DSP100
AC Input Voltage range	VAC	90 - 264VAC, Class II double insulated (No ground connection required)			
Input Frequency	Hz	47 - 63Hz			
DC Input Voltage range	VDC	120 - 370VDC			
Inrush Current (115 / 230VAC)	A	15 / 30A	25 / 50A	30 / 60A	30 / 60A
Power Factor & Flicker	-	Meets EN61000-3-2, EN61000-3-3			
Output Voltage Accuracy	%	±1% of Nominal			
Line Regulation	%	1%			
Load Regulation	%	1%			
Ripple and Noise (20MHz BW)	mV	50mV			
Overcurrent Protection (Typ)	-	110 - 160%, fold forward under short circuit (DSP100-24/C2 102-108%)			
Overvoltage Protection	V	120 - 145%			
Hold Up Time (115VAC input)	ms	See Model Selector			
LED Indicators	-	Green LED = On, Red LED = DC Output Low			
Operating Temperature	-	-25 to +71°C (Derate linearly 2.5%/°C from 61 to 71°C)			
Temperature Coefficient	%/°C	±0.02%/°C			
Storage Temperature	-	-25 to +85°C			
Operating Humidity	-	20 - 95% RH (non condensing)			
Cooling	-	Convection			
Withstand Voltage	-	Input to Output 3kVAC for 1 min.			
Isolation Resistance	-	>100M at 25C & 70%RH, Output to Ground 500VDC			
Safety Agency Approvals	-	UL1310 Class 2(1), UL508 Listed, UL60950-1, EN60950-1, CE			
Immunity	-	EN61000-4-2, -3, -4, -5, -6, -8 & -11			
Conducted & Radiated EMI	-	DSP10: EN55022 Class B; DSP30-100: EN55022 Class A			
Weight (Typ)	g	60	200	250	320
Size (WxHxD)	in	0.71 x 3.58 x 2.19"	2.09 x 3.58 x 2.19"	2.8 x 3.58 x 2.19"	3.54 x 3.58 x 2.19"
Case material	-	Plastic			
Warranty	yrs	Two years			

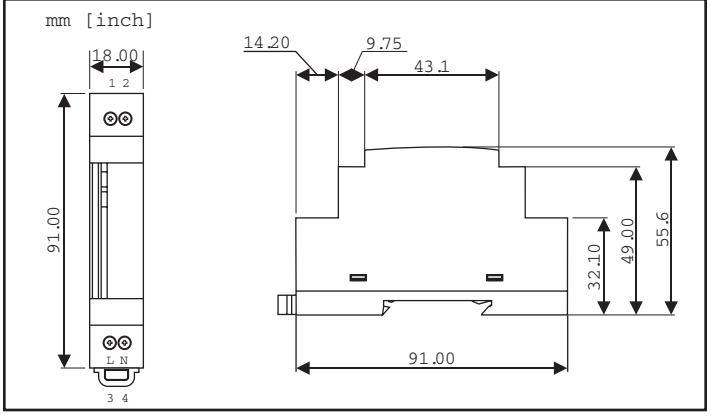
(1) Excludes Models: DSP60-5, DSP60-12, DSP100-12, DSP100-15, DSP100-24)

DSP Series

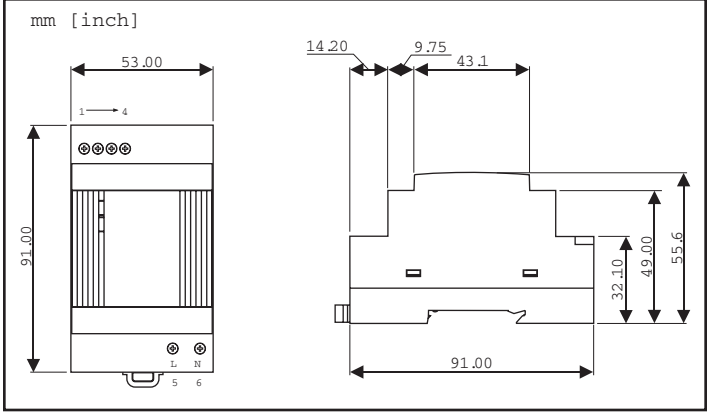
Model Selector

Model	Voltage (V)	Voltage Adjust (V)	Current (A)	Power (W)	Efficiency (Typ %)	Hold Up Time 115VAC in (ms)
DSP10-5	5	None	1.5	7.5	74	10
DSP30-5	5	5 - 5.5	3.0	15.0	74	25
DSP60-5	5	5 - 5.5	7.0	35.0	80	16
DSP10-12	12	None	0.83	10.0	78	10
DSP30-12	12	12 - 14	2.1	25.2	82	25
DSP60-12	12	12 - 14	4.5	54.0	84	16
DSP100-12	12	12 - 14	6.0	72.0	82	16
DSP10-15	15	None	0.67	10.1	78	60
DSP30-15	15	13.5 - 16.5	2.0	30.0	83	25
DSP60-15	15	13.5 - 16.5	4.0	60.0	85	12
DSP100-15	15	13.5 - 16.5	5.0	75.0	85	16
DSP10-24	24	None	0.42	10.1	80	60
DSP30-24	24	24 - 28	1.3	31.2	83	25
DSP60-24	24	24 - 28	2.5	60.0	86	12
DSP100-24/C2	24	20 - 24.2	3.8	91.2	89	10
DSP100-24	24	24 - 28	4.2	100.8	85	10

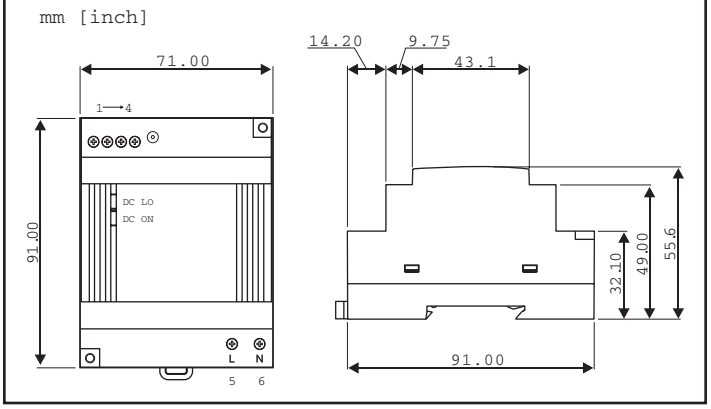
DSP10 Outline Drawing



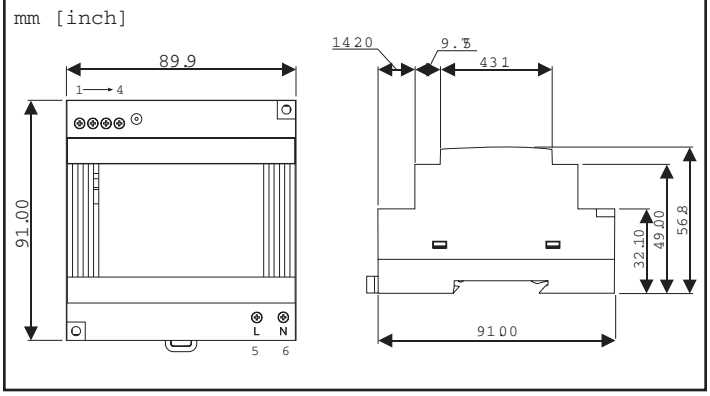
DSP30 Outline Drawing



DSP60 Outline Drawing



DSP100 Outline Drawing



Other Lambda DIN Rail Products

DPP	15W to 480W, 5V to 48V power supplies
DLP	75W to 240W power supplies
DLP-PU	Redundancy Module (20A)
MC/MZ	6A to 30A single & three phase EMI Filters

Snap-on Mounting: snap onto DIN Rail TS35/7.5 or TS35/15. (no tools required)

For Additional Information, please visit www.lambdapower.com/products/dsp-series.htm

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Revision A5: Oct 2007

DT Series

External Power Supplies

- Low Profile Light Weight
- Single and Multiple Outputs
- 2 Wire or 3 Wire Input Versions
- Wide Range Input
- Global Safety Compliance
- Low Conducted EMI

RoHS

Specifications

ITEMS \ MODELS			DT27	DT36PW
Maximum Output Power		W	27W	36W
Number of Outputs		-	2	1
Minimum Load		-	yes	no
Input Voltage Range		-	90~264VAC (47~63Hz)	
Efficiency		-	75% (typical)	
Inrush Current (@120VAC)		A	50A	50A
Size (L x W x H)		mm	106x60x30	106x60x30
Regulation	(1)	-	Line: Typically 1%, Load: Typically 5%	
Ripple/Noise	(1)	-	Typically 1%	
Overcurrent Protection		-	Short Circuit, auto restart	
Overvoltage Protection		-	+5V only	150% max
Hold Up Time (120VAC)		ms	10	10
Operating Temperature		°C	0~40°C	
Storage Temperature		°C	-40~70°C	-40~70°C
EMI		-	FCC Class B, EN55022B, (EN50081-1 DT15W, DT30U)	
Safety	(2)	-	UL1950, CSA 22.2 234, EN60950, (MITI DT15W, DT30U)	
Input Connector		-	IEC320 C7	IEC320 C7
Output Cable		m	1.0	1.0
Output Connector ID x OD	(1)	mm	-	2.1 x 5.5
Center Pin		-	-	Positive
Warranty		yrs	One year	

Specifications

ITEMS \ MODELS			DT45PW	DT60PWxxxP	DT60PW201	DT70PWxxxP	DT100PW
Maximum Output Power		W	45W	60W	60W	70W	100W
Number of Outputs		-	3	1	2	1	1
Minimum Load		-	yes	no	yes	no	no
Input Voltage Range		-	90~264VAC (47~63Hz)				90-132/180-264
Efficiency (typical)		-	75%	75%			
Inrush Current (@115VAC)		A	27A	27A			50A
Size (L x W x H)		mm	130x69x40	130x69x40	154x85x53		185x105x60
Regulation	(1)	-	Line: Typically 1%, Load: Typically 5%				
Ripple/Noise	(1)	-	Typically 1%				
Overcurrent Protection		-	Short Circuit, auto restart				Shutdown
Overvoltage Protection		-	+5V only	150% max	+5V only	+5V only	150% max
Hold Up Time (115VAC)		ms	10				
Operating Temperature		°C	0~40°C				
Storage Temperature		°C	-40~70°C				
EMI		-	FCC Class B, EN55022B				
Safety	(2)	-	UL60950, CSA 22.2 60950, EN60950				
Input Connector		-	IEC320 C13				
Output Cable (minimum)		m	1.0	1.0	1.0	1.0	1.0
Warranty		yrs	One year				

(1) See Lambda website for full specification
(2) CE Mark excludes DT12PW

DT Series

Output Ratings

Model	Max Output (W)	Output	Voltage (V)	Min Load (A)	Max Output (A)	Peak Load (A)
Single Output						
DT36PW050P	20.0	V1	5	0	4	-
DT36PW090P	27.0	V1	9	0	3	-
DT36PW120P	30.0	V1	12	0	2.5	-
DT36PW150P	36.0	V1	15	0	2.4	-
DT36PW180P	36.0	V1	18	0	2	-
DT36PW240P	36.0	V1	24	0	1.5	-
DT60PW090P	40.5	V1	9	0	4.5	-
DT60PW120P	39.6	V1	12	0	3.3	-
DT60PW150P	60.0	V1	15	0	4	-
DT60PW180P	59.4	V1	18	0	3.3	-
DT60PW240P	60.0	V1	24	0	2.5	3
DT70PW050P	40.0	V1	5	0	8	10
DT70PW090P	50.4	V1	9	0	5.6	-
DT70PW120P	50.4	V1	12	0	4.2	-
DT70PW135P	70.0	V1	13.5	0	5.2	-
DT70PW150P	69.0	V1	15	0	4.6	-
DT70PW180P	70.2	V1	18	0	3.9	-
DT70PW240P	69.6	V1	24	0	2.9	-
DT100PW240P	100.0	V1	24	0	4.2	-
DT100PW480P	100.0	V1	48	0	2.1	-
Dual Outputs						
DT27PW201	27.0	V1	5.1	0.5	5	-
		V2	12	0.24	1.5	-
DT60PW201	60.0	V1	5.1	0.5	6	8
		V2	12	0.1	2	3
Triple Outputs						
DT45PW301	45.0	V1	5	0.5	5	-
		V2	12	0.3	1.5	2
		V3	-12	0	0.3	-

Line Cord Accessories

DT27, DT36PW	RLMDT361800	US Plug to IEC320 C7 1.8m long
DT45, DT60, DT70, DT100	RLMDT701800	US Plug to IEC320 C13 1.8m long

For Additional Information, please visit
www.lambdapower.com/products/dt-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision B2: Jan 2007

FPS1000 Series

1000W Front End Power Supplies

- 1U high
- Up to 3000W (3 units) in 19" rack
- Hotswap capable (ORing diodes built in)
- Low Cost
- PoE Option

RoHS

Key Market Segments & Applications

Power for Distributed Power Architecture
Factory Automation
RF Amplifiers

Features and Benefits

Feature	Benefit
◆ 1U high	◆ Utilizes less cabinet space
◆ Hotswap capable	◆ Suitable for N+1 redundancy
◆ High efficiency	◆ Less heat dissipated in system
◆ Full array of signals	◆ Easier system monitoring

Specifications

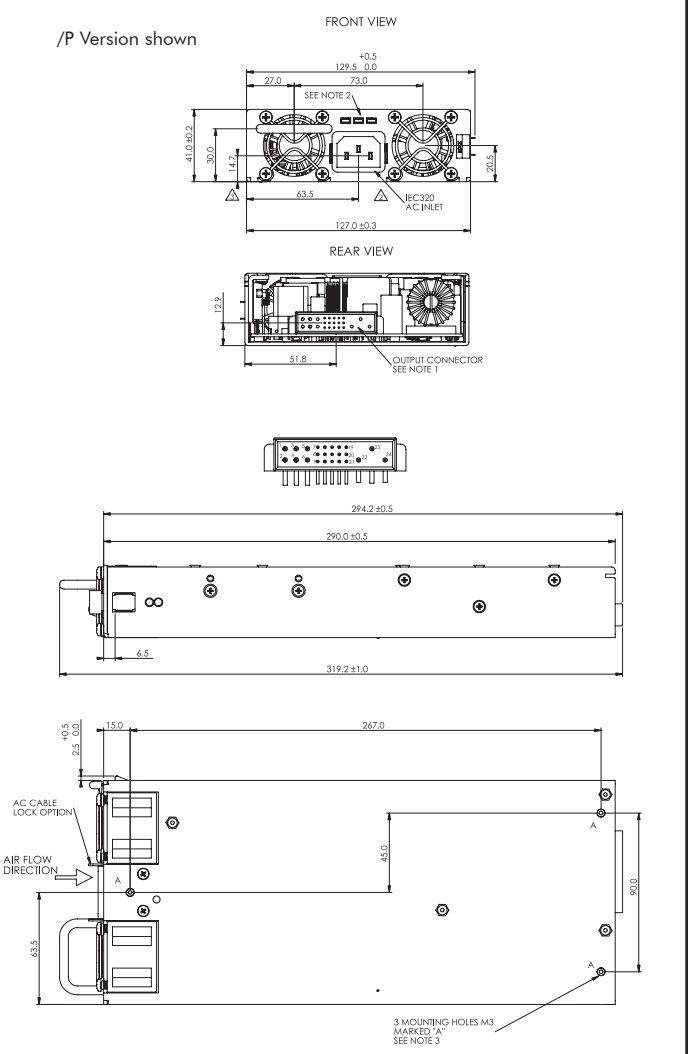
ITEMS / MODELS		12V Nominal	24V Nominal	32V Nominal	48V Nominal
Output Voltage Range (1)	V	10.5 - 13.2V	21.5 - 29V	28.8 - 38.4V	43 - 58V
Output Current	A	72A	40A	31A	21A
Line Regulation	-	<0.4%			
Load Regulation	-	<0.8%			
Output Noise	mV	150mV	200mV	250mV	300mV
Overvoltage Protection	V	14.3 to 15.7V	31 to 34V	41.5V to 45.5V	62 to 66V
Overcurrent Protection	-	105 - 125%, Constant Current type			
Load Sharing	-	Single wire current sharing, up to 8 units			
Remote Sense	-	Compenstates for 1V on each output lead			
I²C Monitoring	-	Optional (Specify /S)			
Signals (opto isolated)	-	DC OK, AC Fail, and Overtemperature warning, high on fail			
Remote On/Off	-	On: 0 - 0.6V or short, Off: 2- 15V or open			
Auxiliary Output	-	11.2-12.5VDC 0.25A			
AC Input	-	85 - 265VAC, 47 - 63Hz[2], 120-360VDC. (Derate 10% < 100VAC)			
Leakage Current	mA	<1.1mA at 230VAC input			
Inrush Current	A	<40A			
Hold up time (100VAC input)	-	20ms typical (800W loading)			
Efficiency (typ) 100/200VAC	-	80 / 83%	83 / 86%	84 / 87%	85 / 88%
Power Factor Correction	-	EN61000-3-2 class A (20-100% load), >0.98 at full load			
Immunity	-	EN61000-4-2, -3, -4, -5, -6, -11			
EMC (conducted and radiated)	-	EN55022, level B, FCC Class B			
Operating Temperature	°C	0 to +70°C, derate 2%/°C from 50 to 60°C, 2.5%/°C from 60 to 70°C			
Storage Temperature	°C	-30 to +85°C			
Withstand Voltage	-	Input to Output 3kVAC, Input to Output 2kVAC, Output to Ground 500VAC for 1 min.			
Cooling	-	Two internal fans, airflow from front to back (variable speed)			
Humidity	-	Operating: 10 - 90% RH, Storage: 10 - 95% RH (non condensing)			
Shock & Vibration	-	Meets ETS 300 019			
Safety Agency	-	UL60950-1, EN60950-1, CE Mark			
Input / Output Connector	-	Positronic PCIB24W9M400A1 (Mating #PCIB24W9F400A1)			
Front panel indicators	-	AC OK, DC OK, DC Fail			
Size (LxWxH)	in	Stand alone: 1.61 x 5 x 11.4"; Rack: 1.72 x 19 x 13.8"			
Weight	g	2,000			
Warranty	yr	Two Years			

(1) Via Trim pin on output connector

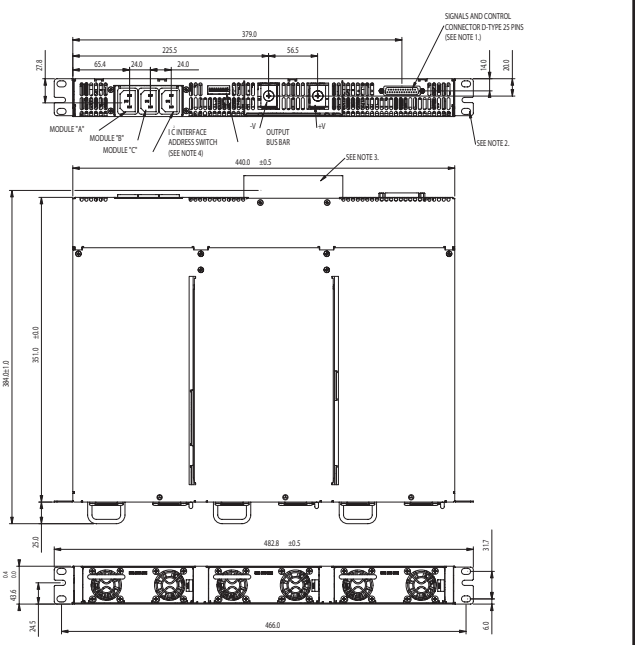
(2) 47-440Hz with reduced PFC (100-265VAC input)

FPS1000 Series

FPS1000 Outline Drawing



FPSS1U Outline Drawing



Model Selector

Front AC Input Configuration	Output Voltage	Output Current	Maximum Power	I²C Interface
FPS100012/P*	12V	72A	864W	No
FPS100012/PS*	12V	72A	864W	Yes
FPS100024/P	24V	40A	960W	No
FPS100024/PS	24V	40A	960W	Yes
FPS100032/P	32V	31A	992W	No
FPS100032/PS	32V	31A	992W	Yes
FPS100048/P	48V	21A	1008W	No
FPS100048/PS	48V	21A	1008W	Yes
FPSS1U/P	Rack (3 slot), contains two blanking panels			
FPST1U/P	Rack with 3 individual outputs (floating)			
Rear AC Input Configuration	**Output Voltage**	**Output Current**	**Maximum Power**	**I²C Interface**
FPS100012*	12V	72A	864W	No
FPS100012/S*	12V	72A	864W	Yes
FPS100024	24V	40A	960W	No
FPS100024/S	24V	40A	960W	Yes
FPS100032	32V	31A	992W	No
FPS100032/S	32V	31A	992W	Yes
FPS100048	48V	21A	1008W	No
FPS100048/S	48V	21A	1008W	Yes
FPSS1U	Rack (3 slot), contains two blanking panels			
FPST1U	Rack with 3 individual outputs (floating)			

Full Systems (3 units + rack)

Front AC Input Configuration	Output Voltage	Output Current	Maximum Power	I²C Interface
FPS300024/P	24V	120A	2880W	No
FPS300024/PS	24V	120A	2880W	Yes
FPS300048/P	48V	63A	3000W	No
FPS300048/PS	48V	63A	3000W	Yes

Front AC Input configuration. Remove /P suffix for Rear AC configuration.

Accessories

Part No.	Description
FPS/Z0008511	Module Mating Connector (Positronic PCIB24W9F400A1/AA-S1031)

Options

Suffix	Description
/POE*	1500VAC Output to Ground Isolation (Output noise 400mV)

* FPS100048 only.

Other Lambda Industrial Products

PX, CC-E, PAQ, PAH, PAF	DC-DC Converters
TL	2U 500 to 2500W Front End AC-DC
TH	1U 750 to 2000W Front End AC-DC

For Additional Information, please visit
www.lambdapower.com/products/fps-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision B4: Oct 2007

H Series

Low Cost Linear Power Supplies

- Low Output Ripple
- Single and Multiple Outputs
- Excellent Line & Load Regulation
- Worldwide Voltage Taps

RoHS

Key Market Segments & Applications

Test & Measurement	Burn-in & Test, Automated Test, Instrumentation, Measurement, Detection
Low noise applications	
Light Industrial	

H Features and Benefits

Feature	Benefit
◆ Industry standard footprint	◆ Availability to second source
◆ Low Output Ripple	◆ Reduced system interference
◆ Tight regulation	◆ Better performance in sensitive equipment
◆ Operation up to 70C Ambients	◆ Easier system integration

Specifications

ITEMS		
AC Input	-	100/120/220/230/240VAC, 47-63Hz (derate by 10% for 50Hz operation)
Efficiency	-	5V: 45%, 12/15V: 55%, 24V: 60%
Transient Response	-	50us for 50% load change
EMI	-	FCC Class B, VDE0871 Level B
Output Adjustment	-	±5% for all outputs (except outputs 2 & 3 on triple output models)
Remote Sense	-	On all single output models, HDC12 & HDC15, and output 1 of triple output models
Line Regulation	-	±0.05% for 10% line change
Load Regulation	-	±0.05% for 50% load change
Ripple and Noise	-	<3mV peak to peak
Overcurrent Protection	-	Foldback with automatic recovery (Contact factory before adjusting)
Overvoltage Protection	-	Standard on 5V outputs set at 6.2V ±0.4V OVP12 module sold separately for other outputs (see model selector)
Cooling	-	Convection or forced air
Operating Temp. Range	-	0 to +70°C, derate 3%/°C above 50°C
Storage Temperature	°C	-55 to +85°C
Temperature coefficient	-	±0.01% per °C
Humidity	-	5 - 95% RH (non condensing)
Leakage Current	uA	<50uA
Vibration	-	MIL-STD-810C, Method 514
Shock	-	MIL-STD-810C, Method 516
Safety Agency Approval	-	UL60950-1, EN60950-1, CE Mark
Size	-	Please see outline drawings
Warranty	-	Two years

Note: See Installation Manual for full details, test methods of parameters and application notes

H Series

Output Ratings

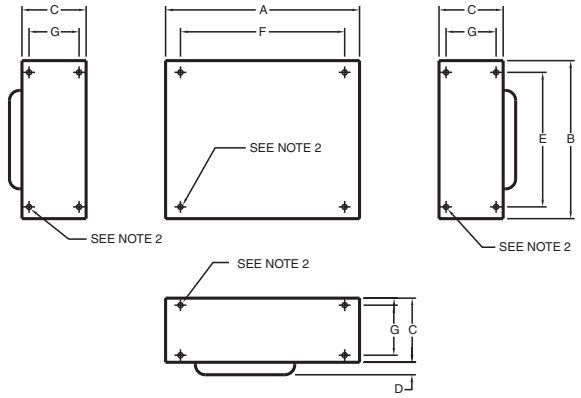
	Model	Output	Output (V)	Max Current (A)	Power (W)
Single Output	HSB5-3-OVP	V1	5	3.0	15.0
	HSC5-6-OVP	V1	5	6.0	30.0
	HSN5-9-OVP	V1	5	9.0	45.0
	HSD5-12-OVP	V1	5	12.0	60.0
	HSB12-1.7	V1	12	1.7	20.4
	HSC12-3.4	V1	12	3.4	40.8
	HSN12-5.1	V1	12	5.1	61.2
	HSB15-1.5	V1	15	1.5	22.5
	HSC15-3	V1	15	3.0	45.0
	HSN15-4.5	V1	15	4.5	67.5
	HSB24-1.2	V1	24	1.2	28.8
	HSC24-2.4	V1	24	2.4	57.6
	HSN24-3.6	V1	24	3.6	86.4
	HSD24-4.8	V1	24	4.8	115.2
	HSB28-1.0	V1	28	1.0	28.0
	HSC28-2.0	V1	28	2.0	56.0
	HSN28-3.0	V1	28	3.0	84.0
	HSD28-4.0	V1	28	4.0	112.0
Dual Output	HDA12-15	V1	+12/15	1.0/0.8	24.0
		V2	-12/15	1.0/0.8	
	HDB12-15	V1	+12/15	1.8/1.5	40.0
		V2	-12/15	1.8/1.5	
	HDC12	V1	12*	3.4	80.0
		V2	12*	3.4	
	HDC15	V1	15*	3.0	80.0
		V2	15*	3.0	
Triple Output	HTC1	V1	5*	3.0	40.0
		V2	+12/15	1.0/0.8	
		V3	-12/15	1.0/0.8	
	HTD1	V1	5*	6.0	70.0
		V2	+12/15	1.7/1.5	
		V3	-12/15	1.7/1.5	
Accessories	OVP12 Adjustable 6.2-34V, 8A continuous, 12A peak				

* Isolated Outputs

Other Lambda Industrial Products

HWS	15 to 1500W single output (switching)
NNS	15 to 90W high reliability
ZWS	5 to 150W single output, universal input (switching)
VSB & VSC	10 to 150W single output, 115VAC input (switching)

H Outline Drawing



DIMENSIONS:

MODEL		A	B	C	D	E	F	G
HSB	A	4.881 (124.0)	3.976 (101.0)	1.614 (41.0)	.314 (8.0)	3.385 (86.0)	4.13 (105.0)	-
HSC	B	4.881 (124.0)	5.629 (143.0)	2.480 (63.0)	.472 (12.0)	4.881 (124.0)	4.13 (105.0)	1.28 (32.5)
HSN	C	4.881 (124.0)	7.007 (178.0)	2.755 (70.0)	.472 (12.0)	6.259 (159.0)	4.13 (105.0)	1.259 (32.0)
HSD	I	4.881 (124.0)	8.818 (224.0)	2.755 (70.0)	.590 (15.0)	7.992 (203.0)	4.13 (105.0)	1.259 (32.0)
HDA	H	4.015 (102.0)	6.496 (165.0)	1.653 (42.0)	.314 (8.0)	5.748 (146.0)	3.38 (86.0)	-
HDB	D	4.881 (124.0)	7.007 (178.0)	2.755 (70.0)	.472 (12.0)	6.259 (159.0)	4.13 (105.0)	1.259 (32.0)
HDC	I	4.881 (124.0)	8.818 (224.0)	2.755 (70.0)	.590 (15.0)	7.992 (203.0)	4.13 (105.0)	1.259 (32.0)
HTC	F	4.015 (102.0)	10.236 (260.0)	2.519 (64.0)	.314 (8.0)	9.251 (235.0)	3.38 (86.0)	1.259 (32.0)
HTD	G	4.881 (124.0)	11.023 (280.0)	2.755 (70.0)	.590 (15.0)	7.480 (190.0)	4.13 (105.0)	1.259 (32.0)

WEIGHT:

MODEL	LBS
HSB	1.98
HSC	3.96
HSN	5.94
HSD	7.48
HDA	1.98
HDB	3.96
HDC	7.48
HTC	5.06
HTD	7.92

NOTE:
1. DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS ( ) ARE IN MM.
2. .188 (4.8) HOLES FOR CUSTOMER MTG.

For Additional Information, please visit
www.lambdapower.com/products/h-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A4: Sep 2007

HK-A Series

Single Output 115VAC Input Industrial Power Supplies

- 3 Year Warranty
- Small size
- Approved to UL & CSA (cUL)
- 85 - 132VAC Input, 47-440Hz
- ±10% output adjustment

RoHS

Key Market Segments & Applications

Factory Automation	Process Control, NC-Machining, Automotive, Packaging Equipment, Materials Handling, Chemical Processing, Robots
Test & Measurement	Burn-in & Test, Automated Test, Instrumentation, Measurement, Detection
Automated Service	Vending Machines, Elevators, Video Gaming, Point of Sale Equipment

HK-A Features and Benefits

Feature	Benefit
◆ 3 Year Warranty	◆ Lower Cost of Ownership
◆ Adjustment potentiometer	◆ Reduces need for non standard models
◆ Low profile	◆ Smaller end system size

Specifications

ITEMS \ MODEL		HK10A	HK15A	HK25A	HK50A	HK100A	HK150A
Input Voltage range	-	85 - 132VAC (47 - 440Hz) or 110 - 175VDC					
Inrush Current (100VAC)	A	20	30	15	30	15	15
Temperature Coefficient (Typ)	-	1% (over operating temperature range)					
Overcurrent Protection	-	>105%					
Overvoltage Protection	%	>115% (Zener clamp)		115 to 135%			
Hold Up Time (Typ at 100VAC)	ms	20					
Remote Sense	-	No				Yes	
LED Indicator	-	Green LED = On					
Operating Temp (no cover) (1)	-	0°C to +60°C, derate linearly to 50% load from 50°C to 60°C					
Operating Temp (w/ cover) (1)	-	0°C to +50°C, derate linearly to 50% load from 40°C to 50°C					
Storage Temperature	-	-30 to +85°C					
Operating Humidity	-	30 - 90% RH (non condensing)					
Storage Humidity	-	10 - 95% RH (non condensing)					
Cooling	-	Convection cooled					
Withstand Voltage	-	I/P to Grnd, I/P to O/P 2kVAC (20mA), O/P to Grnd 500VAC (100mA) for 1 min.					
Isolation Resistance	-	>100M at 25C & 70%RH, Output to Ground 500VDC					
Vibration (non operating)	-	10 - 55Hz (1 minute sweep), 19.6m/s^2 constant X, Y, Z 1 hour					
Shock	-	< 196.1 m/s^2					
Safety Agency Approvals	-	UL60950-1, CSA C22.2 No. 60950-1 (cUL)					
Conducted & Radiated EMI	-	FCC Class B, VCCI-B					
Recommended EMI Filter	-	MAW12R522	MAW120122		MAW120222	MB1200	
Weight (Typ)	g	150	170	230	280	540	650
Size (WxHxD)	mm	See sheet 2					
Warranty	-	Three Years					

(1) Vertical mount as photo, HK100A & HK150A models operate to -10°C
See installation manual for full details, test methods of parameters and application notes

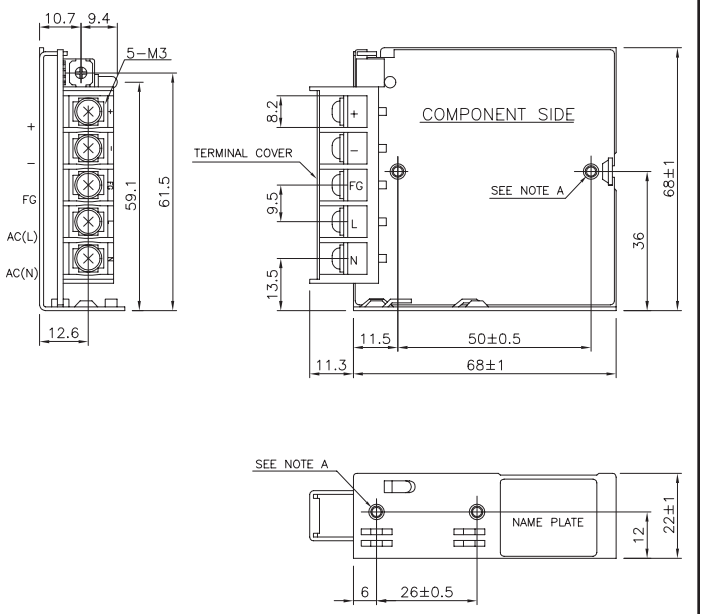
HK-A Series

Model Selector

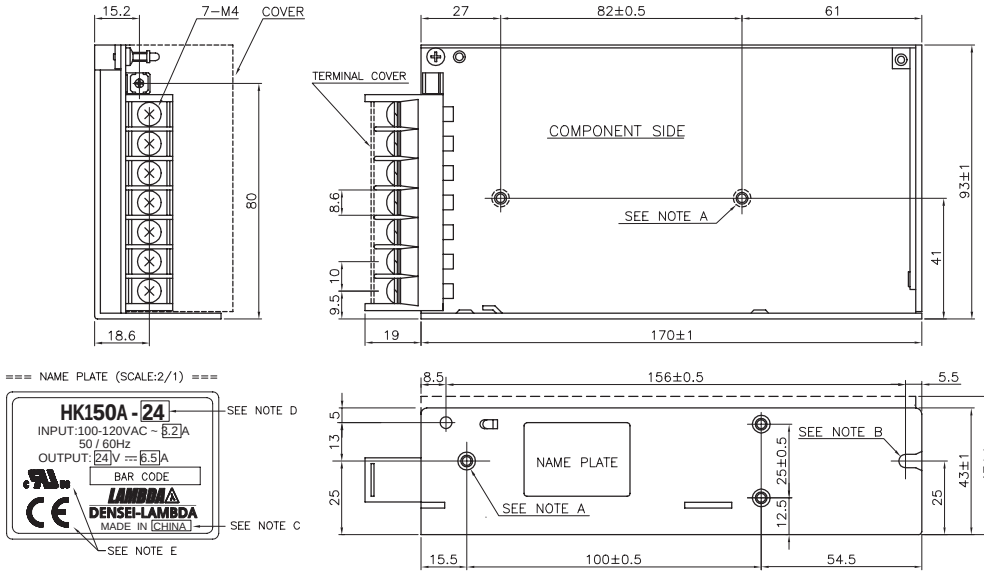
Model	Voltage	Adjust Range	Max Curr.	Load Reg mV	Line Reg mV	Ripple Noise	Eff. (typ)%
HK10A-5/A	5	4.5 - 5.5	2.0	40	20	120	71
HK15A-5/A	5	4.5 - 5.5	3.0	40	20	120	69
HK25A-5/A	5	4.5 - 5.5	5.0	40	20	120	72
HK50A-5/A	5	4.5 - 5.5	10.0	40	20	120	79
HK100A-5/A	5	4.5 - 5.5	20.0	40	20	120	80
HK150A-5/A	5	4.5 - 5.5	30.0	40	20	120	80
HK10A-12/A	12	10.8 - 13.2	0.9	96	48	150	73
HK15A-12/A	12	10.8 - 13.2	1.3	96	48	150	74
HK25A-12/A	12	10.8 - 13.2	2.1	96	48	150	76
HK50A-12/A	12	10.8 - 13.2	4.2	96	48	150	81
HK100A-12/A	12	10.8 - 13.2	8.5	96	48	150	81
HK150A-12/A	12	10.8 - 13.2	12.5	96	48	150	81
HK10A-15/A	15	13.5 - 16.5	0.7	120	60	150	74
HK15A-15/A	15	13.5 - 16.5	1.0	120	60	150	75
HK25A-15/A	15	13.5 - 16.5	1.7	120	60	150	77
HK50A-15/A	15	13.5 - 16.5	3.4	120	60	150	82
HK100A-15/A	15	13.5 - 16.5	7.0	120	60	150	81
HK150A-15/A	15	13.5 - 16.5	10.0	120	60	150	81
HK10A-24/A	24	21.6 - 26.4	0.5	150	96	150	78
HK15A-24/A	24	21.6 - 26.4	0.7	150	96	150	77
HK25A-24/A	24	21.6 - 26.4	1.1	150	96	150	80
HK50A-24/A	24	21.6 - 26.4	2.2	150	96	150	84
HK100A-24/A	24	21.6 - 26.4	4.5	150	96	150	82
HK150A-24/A	24	21.6 - 26.4	6.5	150	96	150	82

Derate to 80% load from 0 to -10°C

HK-10A Outline Drawing



HK-150A Outline Drawing



Model	Dimensions HxLxD
HK10A	2.83 x 2.83 x 1.02
HK15A	2.83 x 3.31 x 1.08
HK25A	2.83 x 3.9 x 1.26
HK50A	2.83 x 4.69 x 1.38
HK100A	3.66 x 5.91 x 1.52
HK150A	3.66 x 6.69 x 1.85

=== NOTE ===

A: M4 TAPPED HOLES FOR CUSTOMER CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 6mm.

B: ø4.5 HOLES(2) FOR CUSTOMER CHASSIS MOUNTING.

C: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.

D: MODEL NAME, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.

E: C-UL-US & CE MARKING (ONLY 3.3V,5V,12V,15V & 24V)

Options

Suffix	Description
Blank	No cover (Special order)
/A	With cover (Standard US stock)
LDIN30	DIN Rail Mounting Bracket (Sold Separately)

Other Lambda Industrial Products

HWS	15W to 1500W Single output 85-265VAC
DLP/DPP	15W to 480W DIN rail mount 85-265VAC
ZWS	5W to 150W pcb style single output 85-265VAC
VSB/VSC	10W to 150W pcb style single output 85-132VAC

For Additional Information, please visit
www.lambdapower.com/products/hka-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A5: Aug 2006

HWS Series

Single Output Industrial Power Supplies

- 5 Year Warranty
- UL508 approved
- SEMI F47 Compliant (high line AC)
- Universal Input (85 - 265VAC)
- High Efficiency

RoHS

Key Market Segments & Applications

Factory Automation	Process Control, NC-Machining, Automotive, Packaging Equipment, Materials Handling, Chemical Processing, Robots
Test & Measurement	Burn-in & Test, Automated Test, Instrumentation, Measurement, Detection
Automated Service	

HWS Features and Benefits

Feature	Benefit
◆ 5 Year Warranty	◆ Lower Cost of Ownership
◆ High Efficiency	◆ Easier System Cooling
◆ Wide Range AC Input	◆ Supports Global Use

Specifications

ITEMS \ MODELS		HWS15	HWS30	HWS50	HWS100	HWS150
Input Voltage range	-	85 - 265VAC (47 - 63Hz) or 120 - 370VDC				
Input Current (Typ) (1)	A	0.4 / 0.2	0.8 / 0.4	0.7 / 0.35	1.3 / 0.65	1.9 / 0.95
Inrush Current (1)	A	14 / 28				
Power Factor	-	Meets EN61000-3-2				
Temperature Coefficient	-	<0.02%/°C				
Overcurrent Protection	-	>104%				
Overvoltage Protection	V	Yes (See page 2)				
Hold Up Time (Typ)	ms	20				
Leakage Current (max)	mA	<0.5mA (Typ 0.3mA at 100VAC, 0.5mA at 230VAC)				
Remote Sense	-	No			Yes	
Indicator	-	Green LED = ON				
Operating Temperature (no cover)	-	-10C to +70C, derate linearly to 20% load from 50°C to 70°C(2)				
Storage Temperature	-	-30 to +85°C				
Humidity (non condensing)	-	Operating: 30 - 90%RH, Non operating 10 - 95%RH				
Cooling	-	Convection				
Withstand Voltage	-	Input to Ground 2kVAC, Input to Output 3kVAC, Output to Ground 500VAC for 1 min.				
Isolation Resistance	-	>100M at 25°C & 70%RH, Output to Ground 500VDC				
Vibration (non operating)	-	10 - 55Hz (1 minute sweep), 19.6m/s² constant X, Y, Z 1 hour				
Shock	-	< 196.1m/s²				
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, EN50178, UL508, CE Mark(3)				
Line Dip	-	Complies with SEMI F47 (200VAC line only)				
Conducted & Radiated	EMI	EN55011 / EN55022-B, FCC-B, VCCI-B				
Recommended EMI Filter	-					
Immunity	-	IEC61000-4-2 (Level 3,2), -3, -4, -5, -6 (Level 3), -8, -11 (Level 4)				
Weight (Typ)	g	180	220	280	450	500
Size (WxHxD)	in	1.04x3.23x3.15	1.04x3.23x3.74	1.04x3.23x4.72	1.1x3.23x6.3	1.46x3.23x6.3
Warranty	-	Five Years				

(1) 100/200VAC
(2) -40°C Start up, see options table
(3) UL60601-1, EN60601-1, see options table

HWS Series

Output Ratings

Model	Voltage	Adjust Range	Max Curr. A	Load Reg mV	Line Reg mV	Ripple Noise mV	Over voltage V	Eff. typ % (1)
HWS15-3/A	3.3V	2.97 - 3.96	3	40	20	120	4.13-4.95	68/71
HWS30-3/A	3.3V	2.97 - 3.96	6	40	20	120	4.13-4.95	70/73
HWS50-3/A	3.3V	2.97 - 3.96	10	40	20	120	4.13-4.95	76/78
HWS100-3/A	3.3V	2.97 - 3.96	20	40	20	120	4.13-4.95	78/81
HWS150-3/A	3.3V	2.97 - 3.96	30	40	20	120	4.13-4.95	78/81
HWS15-5/A	5V	4.0 - 6.0	3	40	20	120	6.25-7.25	77/79
HWS30-5/A	5V	4.0 - 6.0	6	40	20	120	6.25-7.25	77/80
HWS50-5/A	5V	4.0 - 6.0	10	40	20	120	6.25-7.25	82/84
HWS100-5/A	5V	4.0 - 6.0	20	40	20	120	6.25-7.25	83/86
HWS150-5/A	5V	4.0 - 6.0	30	40	20	120	6.25-7.25	83/86
HWS15-12/A	12V	9.6 - 14.4	1.3	96	48	150	15-17.4	80/81
HWS30-12/A	12V	9.6 - 14.4	2.5	96	48	150	15-17.4	81/83
HWS50-12/A	12V	9.6 - 14.4	4.3	96	48	150	15-17.4	81/83
HWS100-12/A	12V	9.6 - 14.4	8.5	96	48	150	15-17.4	83/86
HWS150-12/A	12V	9.6 - 14.4	13	96	48	150	15-17.4	83/86
HWS15-15/A	15V	12.0 - 18.0	1	120	60	150	18.8-21.8	80/81
HWS30-15/A	15V	12.0 - 18.0	2	120	60	150	18.8-21.8	81/83
HWS50-15/A	15V	12.0 - 18.0	3.5	120	60	150	18.8-21.8	81/83
HWS100-15/A	15V	12.0 - 18.0	7	120	60	150	18.8-21.8	83/86
HWS150-15/A	15V	12.0 - 18.0	10	120	60	150	18.8-21.8	83/86
HWS15-24/A	24V	19.2 - 28.8	0.65	192	96	200	30-34.8	82/83
HWS30-24/A	24V	19.2 - 28.8	1.3	192	96	200	30-34.8	83/86
HWS50-24/A	24V	19.2 - 28.8	2.2	192	96	150	30-34.8	82/84
HWS100-24/A	24V	19.2 - 28.8	4.5	192	96	150	30-34.8	84/87
HWS150-24/A	24V	19.2 - 28.8	6.5	192	96	150	30-34.8	85/88
HWS15-48/A	48V	38.4 - 52.8	0.33	384	192	200	55.2-64.8	80/80
HWS30-48/A	48V	38.4 - 52.8	0.65	384	192	200	55.2-64.8	82/83
HWS50-48/A	48V	38.4 - 52.8	1.1	384	192	200	55.2-64.8	83/85
HWS100-48/A	48V	38.4 - 52.8	2.1	384	192	200	55.2-64.8	84/87
HWS150-48/A	48V	38.4 - 52.8	3.3	384	192	200	55.2-64.8	85/88

Options

Suffix	Description
Blank	Screw terminals, no cover
/A	Screw terminals, cover
/R	Remote on/off (50-150W only)
/HD	See HWS50-1500/HD Datasheet for details. -40 to +71(74)°C operation, conformally coated PCBs
/ME	See HWS30-1500/ME Datasheet for details. UL60601-1, EN60601-1 medical approvals

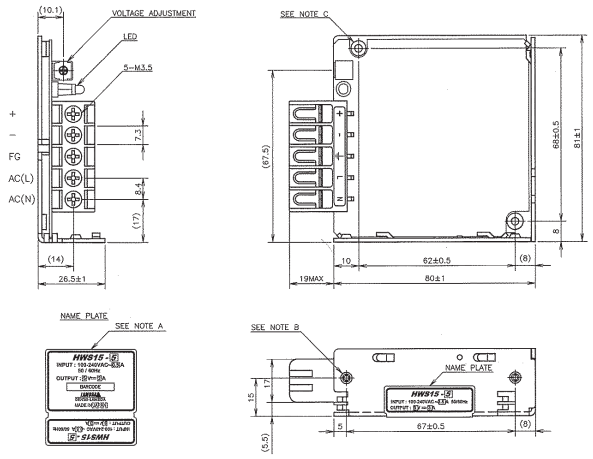
Example: HWS50-24/RA

Other Lambda Industrial Products

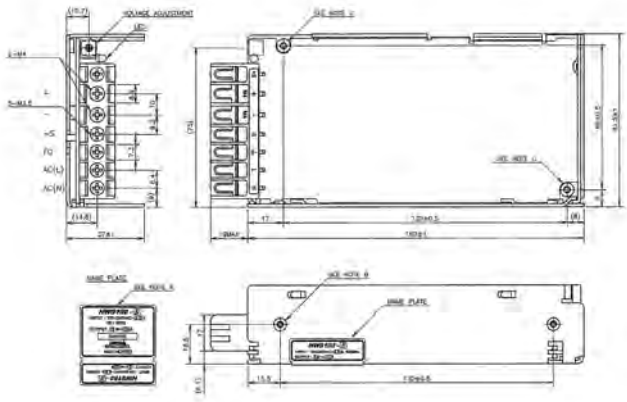
JWS, JWS-P & JWT	50W to 600W Single and triple output
HWS1500	1500W Single output
LZSa	500W to 1500W Single output
DPP, DLP & DSP	10W to 480W DIN Rail Mount

HWS Outline Drawing

HWS15



HWS150



*see website for all outline drawings

For Additional Information, please visit
www.lambdapower.com/products/hws-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A6: Nov 2006

HWS300-1500

Single Output Industrial Power Supplies

- 5 Year Warranty
- UL508 approved
- SEMI F47 Compliant (high line AC)
- Universal Input (85 - 265VAC)
- High Efficiency

RoHS

Key Market Segments & Applications

Factory Automation
Test & Measurement
Automated Service

HWS Features and Benefits

Feature	Benefit
◆ 5 Year Warranty	◆ Lower Cost of Ownership
◆ High Efficiency	◆ Easier System Cooling
◆ Wide Range AC Input	◆ Supports Global Use

Specifications

ITEMS / MODEL			HWS300	HWS600	HWS1000	HWS1500
Input Voltage range (47-63Hz)		-	85 - 265VAC or 120 - 330VDC			85 - 265VAC
Input Current (Typ)	(1)	A	5V: 3.8/1.9; 12-48V: 4.2/2.1	5V: 7.5/3.6; 12-48V: 8.1/3.9	3.3V: 9.6/5.0; 5-60V: 13.5/7.0	19/10
Inrush Current	(1)	A	20 / 40			
Power Factor		-	Meets EN61000-3-2			
Temperature Coefficient		-	<0.02%/°C			
Overcurrent Protection		-	>105% (>101% of peak current for peak current capable models)			
Overvoltage Protection		V	See table on page 2 (Recycle AC or remote on/off to reset)			
Hold Up Time (Typ)		ms	20			
Leakage Curr. (at 240VAC, 60Hz)		mA	<0.75mA		<1.2mA	<1.5mA
Remote Sense		-	Yes			
Indicator		-	Green LED = ON			
Remote on/off		-	Yes (Isolated from output)			
Parallel operation		-	Single wire connection (up to 5 units)			
DC Good		-	Yes			
Remote Adjust (PV)		-	External voltage adjusts output, see options table			
Operating Temperature		-	-10°C to +70°C, derate linearly to 50% load from 50C to 70C (2, 3)			
Storage Temperature		°C	-30 to +85°C			
Humidity (non condensing)		-	Operating: 10 - 90%RH, Non operating 10 - 95%RH			
Cooling		-	Internal fan			
Withstand Voltage	(4)	-	Input to Ground 2.5kVAC, Input to Output 3kVAC, Output to Ground 500VAC for 1 min.			
Isolation Resistance		-	>100M at 25C & 70%RH, Output to Ground 500VDC			
Vibration (non operating)		-	10 - 55Hz (1 minute sweep), 19.6m/s^2 constant X, Y, Z 1 hour			
Shock		-	< 196.1 m/s^2			
Safety Agency Approvals	(5)	-	UL60950-1, CSA60950-1, EN60950-1, EN50178, UL508, CE Mark			
Line Dip		-	Complies with SEMI F47 (200VAC line only)			
Conducted & Radiated EMI		-	EN55011 / EN55022, FCC VCCI (HWS300, 600 & 1000: Class B, HWS1500: Class A)			
Recommended EMI Filter		-	MC1206	MC1210	MC1220	MC1230
Immunity		-	IEC61000-4-2, -3, -4, -6 (Level 3), -5, -8 (Level 4), -11			
Weight (Typ)		g	1,000	1,600	3,200	3,800
Size (WxHxD)		In	2.4 x 3.23 x 6.5"	3.94 x 3.23 x 6.5"	5 x 3.25 x 9.45"	5 x 3.25 x 11"
Warranty		yrs	Five Years			

Notes:
(1) 100/200VAC
(2) HWS start up -20°C. (-40°C see options table)
(3) HWS1000/1500 with 85VAC input: See installation manual
HWS1000: -10 to +71°C. HWS1000-5 derate linearly above 40°C
(4) 2kVAC HWS1000/1500 Input to ground
(5) UL60601-1, EN60601-1, see options.
UL508; HWS300/600 5V, 12V, 24V & 48V models

HWS300-1500

Output Ratings

Model	Voltage V	Adjust Range V(3)	Max Curr. A	Peak Curr. A(2)	Max. Pwr. W	Load Reg mV	Line Reg mV	Ripple Noise mV	Over-voltage V	Eff. typ % (1)
HWS300-3	3.3V	2.64 - 3.96	60	-	198	30	20	120	4.13 - 4.95	74/77
HWS600-3	3.3V	2.64 - 3.96	120	-	396	30	20	120	4.13 - 4.95	75/78
HWS1000-3	3.3V	2.64 - 3.96	200		660	40	20	120	4.13 - 4.62	71/73
HWS300-5	5V	4 - 6	60	-	120	30	20	120	6.25 -7.25	79/82
HWS600-5	5V	4 - 6	120	-	600	30	20	120	6.25 -7.25	80/83
HWS1000-5	5V	4 - 6	200		1000	40	20	120	6.25 - 7	76/78
HWS1000-6	6V	4.8 - 7.2	167		1002	60	36	150	7.5 - 8.4	79/81
HWS1000-7	7.5V	6 - 9V	134	160	1005	60	36	150	9.38 - 10.5	80/82
HWS300-12	12V	9.6 - 14.4	27	-	324	96	48	120	15 - 17.4	80/83
HWS600-12	12V	9.6 - 14.4	53	-	648	96	48	120	15 - 17.4	80/83
HWS1000-12	12V	9.6 - 14.4	88	100	1056	100	48	150	15 - 17.4	83/85
HWS1500-12	12V	9.6 - 14.4	125	-	1500	72	48	150	15 - 17.4	82/85
HWS300-15	15V	12 - 18	22	-	330	120	60	150	18.8 - 21.8	82/85
HWS600-15	15V	12 - 18	43	-	645	120	60	150	18.8 - 21.8	82/85
HWS1000-15	15V	12 - 18	70	80	1050	120	60	150	18.8 - 21.8	83/85
HWS1500-15	15V	12 - 18	100	-	1500	90	60	150	18.7 - 21.8	83/87
HWS300-24	24V	19.2 - 28.8	14	16.5	336	192	96	150	30 - 34.8	82/85
HWS600-24	24V	19.2 - 28.8	27	31	648	192	96	150	30 - 34.8	82/85
HWS1000-24	24V	19.2 - 28.8	44	50	1056	150	96	150	30 - 34.8	85/87
HWS1500-24	24V	19.2 - 28.8	65/70 (1)	105	1560	144	96	200	30 - 34.8	84/88
HWS1000-36	36V	28.8 - 43.2	29.3	33.3	1055	150	144	200	45 - 49.7	85/88
HWS1500-36	36V	28.8 - 43.2	42/46.5 (1)	70	1512	150	144	200	45 - 49.7	84/88
HWS300-48	48V	38.4 - 52.8	7	-	336	384	192	200	55.2 - 64.8	82/85
HWS600-48	48V	38.4 - 52.8	13	-	624	384	192	200	55.2 - 64.8	82/85
HWS1000-48	48V	38.4 - 52.8	22	25	1056	300	192	200	38.4 - 52.8	86/88
HWS1500-48	48V	38.4 - 52.8	32	-	1536	288	192	200	55.2 - 64.8	86/90
HWS1000-60	60V	48 - 66	17.6	20	1056	360	240	400	69 - 75	85/88

Notes
(1) 100/200VAC
(2) 200-265VAC Input, 10s maximum on time with 35% duty cycle
(3) Use program input (PV) to adjust from 20-120% of nominal (20-110% for 48V models)

Options

Suffix	Description
Blank	HWS300-1500 the cover is fitted as standard
/A	Not Applicable HWS300-1500 the cover is fitted as standard
/PV	HWS300, 600 (Standard on HWS1000 & 1500): 1-6V program voltage input to adjust output 20-120% of nominal (20-110% for 48V) (12V-48V models only)
/HD	See HWS50-1500/HD Datasheet for details.-40 to +71(74)°C operation, conformally coated PCBs
/ME	See HWS30-1500/ME Datasheet for details. UL60601-1, EN60601-1 medical approvals

Other Lambda Industrial Products

HWS	15W to 150W single output
LZSa	500W to 1500W Single output
SWS	50W to 1000W, low cost
DPP, DLP & DSP	10W to 480W DIN Rail Mount

For Additional Information, please visit
www.lambdapower.com/products/hws-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision B5: Sep 2007

LAMBDA HWS50-1500/HD

Single Output Industrial Power Supplies

- 5 Year Warranty
- -10 to +71°C Operation (-40°C start up)
- Universal Input (85 - 265VAC)
- Conformally coated pcbs
- RoHS Compliant design

RoHS

Key Market Segments & Applications

Factory Automation
LED Displays
Test & Measurement

HWS Features and Benefits

Feature	Benefit
◆ 5 Year Warranty	◆ Lower Cost of Ownership
◆ Conformally coated pcbs	◆ Operation in harsh environments
◆ Wide range AC Input	◆ Supports global use

Specifications

ITEMS / MODELS			HWS50	HWS100	HWS150	HWS300	HWS600	HWS1500
Input Voltage range (47-63Hz)		-	85 - 265VAC or 120 - 370VDC			85 - 265VAC or 120 - 330VDC		85 - 265VAC
Input Current (Typ)	(1)	A	0.7 / 0.35	1.3 / 0.65	1.9 / 0.95	4.1 / 2.1	8.1 / 3.9	19 / 10
Inrush Current	(1)	A	14 / 28			20 / 40		
Power Factor		-	Meets EN61000-3-2					
Temperature Coefficient		-	<0.02%/°C					
Overcurrent Protection		-	>104%					
Overvoltage Protection		V	Yes (See table on page 2)					
Hold Up Time (Typ)		ms	20					
Leakage Current (60Hz)		mA	<0.5mA			<0.75mA		≤1.5mA
Remote Sense		-	No	Yes				
Indicator		-	Green LED = ON					
Remote On/Off		-	No			Yes (Isolated from output)		
Parallel operation		-	No			Single wire connection (5 units max)		
DC Good		-	No			Yes		
Operating Temperature and Derating (operation to +74°C - contact factory)			HWS50-150: -10°C to +71°C, (-10 ~+50°C: 100%, +60°C: 60%, +71°C: 20%) HWS300-1500: -10°C to +71°C, (-10 ~+50°C: 100%, derate linearly to 50% load from +50 to +71°C) Guaranteed start up at -40°C (see specification sheets on website for details and derating)					
Storage Temperature			-40 to +85°C					
Humidity (non condensing)			Operating: 30 - 90%RH (10 -90% on HWS300-1500), Non operating 10 - 95%RH					
Cooling		-	Convection			Internal fan		
Withstand Voltage	(2)	-	Input to Ground 2kVAC, Input to Output 3kVAC, Output to Ground 500VAC for 1 min.					
Isolation Resistance		-	>100MΩ at 25°C & 70%RH, Output to Ground 500VDC, >10M Output to remote on/off 100VDC					
Vibration (non operating)		-	MIL-STD-810F 514.5 Category 4, 10 (HWS1500 Cat 4, figure 514.5C-1)					
Shock (in packaging)		-	MIL-STD-810F 516.5 Category I, VI (HWS1500 <196.1m/s^2)					
Safety Agency Approvals		-	UL60950-1, CSA60950-1, EN60950-1, EN50178, CE Mark					
Line Dip		-	Complies with SEMI F47 (200VAC line only)					
Conducted & Radiated EMI		-	EN55011 / EN55022-B, FCC-B, VCCI-B (HWS1500 Class A)					
Immunity			IEC61000-4-2 (Level 2,3), -3, -4, -6, (Level 3), -5, -8 (Level 4), -11					
Weight (Typ)		g	280	450	500	1000	1600	3800
Size (WxHxD)		in	1.04x3.23x4.72	1.1x3.23x6.3	1.46x3.23x6.3	2.4x3.23x6.5	3.94x3.23x6.5	5x3.25x11
Warranty		yr	Five Years					

(1) 100/200VAC input
(2) HWS300-600 2.5kVAC Input to ground

HWS50-1500/HD

Output Ratings

Model	Voltage	Adjust Range	Min Curr(A)[3]	Max Curr(A)[4]	Max Power(W)	Load Reg(mV)	Line Reg(mV)	Ripple Noise(mV)	Overvoltage (V)	Efficiency (typ)%[1]
HWS50-3/HD	3.3V	2.97 - 3.96	0.1	10	33	40	20	120	4.13-4.95	76/78
HWS100-3/HD	3.3V	2.97 - 3.96	0.2	20	66	40	20	120	4.13-4.95	78/81
HWS150-3/HD	3.3V	2.97 - 3.96	0.3	30	99	40	20	120	4.13-4.95	78/81
HWS300-3/HD	3.3V	2.64 - 3.96	0.0	60	198	30	20	120	4.13-4.95	74/77
HWS600-3/HD	3.3V	2.64 - 3.96	0.0	120	396	30	20	120	4.13-4.95	75/78
HWS50-5/HD	5V	4.0 - 6.0	0.1	10	50	40	20	120	6.25-7.25	82/84
HWS100-5/HD	5V	4.0 - 6.0	0.2	20	100	40	20	120	6.25-7.25	83/86
HWS150-5/HD	5V	4.0 - 6.0	0.3	30	150	40	20	120	6.25-7.25	83/86
HWS300-5/HD	5V	4.0 - 6.0	0.0	60	300	30	20	120	6.25-7.25	79/82
HWS600-5/HD	5V	4.0 - 6.0	0.0	120	600	30	20	120	6.25-7.25	80/83
HWS50-12/HD	12V	9.6 - 14.4	0.04	4.3	51.6	96	48	150	15-17.4	81/83
HWS100-12/HD	12V	9.6 - 14.4	0.09	8.5	102	96	48	150	15-17.4	83/86
HWS150-12/HD	12V	9.6 - 14.4	0.1	13	156	96	48	150	15-17.4	83/86
HWS300-12/HD	12V	9.6 - 14.4	0.0	27	324	72	48	150	15-17.4	80/83
HWS600-12/HD	12V	9.6 - 14.4	0.0	53	636	72	48	150	15-17.4	80/83
HWS1500-12/HD	12V	9.6 - 14.4	0.0	125	1500	72	48	150	15-17.4	82/85
HWS50-15/HD	15V	12.0 - 18.0	0.04	3.5	52.5	120	60	150	18.8-21.8	81/83
HWS100-15/HD	15V	12.0 - 18.0	0.07	7	105	120	60	150	18.8-21.8	83/86
HWS150-15/HD	15V	12.0 - 18.0	0.1	10	150	120	60	150	18.8-21.8	83/86
HWS300-15/HD	15V	12.0 - 18.0	0.0	22	330	90	60	150	18.8-21.8	80/83
HWS600-15/HD	15V	12.0 - 18.0	0.0	43	645	90	60	150	18.8-21.8	81/84
HWS1500-15/HD	15V	12.0 - 18.0	0.0	100	1500	90	60	150	18.7-21.8	83/87
HWS50-24/HD	24V	19.2 - 28.8	0.02	2.2	52.8	192	96	150	30-34.8	82/84
HWS100-24/HD	24V	19.2 - 28.8	0.05	4.5	108	192	96	150	30-34.8	84/87
HWS150-24/HD	24V	19.2 - 28.8	0.07	6.5	156	192	96	150	30-34.8	85/88
HWS300-24/HD	24V	19.2 - 28.8	0.0	14 (16.5 pk)	336	144	96	150	30-34.8	82/85
HWS600-24/HD	24V	19.2 - 28.8	0.0	27 (31 pk)	648	144	96	150	30-34.8	82/85
HWS1500-24/HD	24V	19.2 - 28.8	0.0	65/70 (-/105pk)[1]	1560/1680[1]	144	96	200	30-34.8	84/88
HWS1500-36/HD	36V	28.8 - 43.2	0.0	42/46.5 (-/70pk)[1]	1512/1674[1]	150	144	200	45-49.7	84/88
HWS50-48/HD	48V	38.4 - 52.8	0.01	1.1	52.8	384	192	200	55.2-64.8	83/85
HWS100-48/HD	48V	38.4 - 52.8	0.02	2.1	100.8	384	192	200	55.2-64.8	84/87
HWS150-48/HD	48V	38.4 - 52.8	0.03	3.3	158.4	384	192	200	55.2-64.8	85/88
HWS300-48/HD	48V	38.4 - 52.8	0.0	7	336	288	192	350	55.2-64.8	82/85
HWS600-48/HD	48V	38.4 - 52.8	0.0	13	624	288	192	350	55.2-64.8	83/86
HWS1500-48/HD	48V	38.4 - 52.8	0.0	32	1536	288	192	200	55.2-64.8	86/90

(3) Minimum load for maximum stability at -40°C start up
(4) Peak load for 10s maximum on time, 35% duty cycle

Options

Suffix	Description
Blank	No Cover (HWS50-150 Only) HWS300-1500 the cover is fitted as standard
/A	The cover option for HWS50-150 is NOT available on /HD series HWS300-1500 the cover is fitted as standard

Other Lambda Industrial Products

LZS, LZSa	250W to 1500W Single output
DPP, DLP, DSP	10W to 480W DIN Rail Mount

For Additional Information, please visit
www.lambdapower.com/products/hws-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A6: Sep 2007

LAMBDA HWS30-1500/ME

Single Output Medical Power Supplies

- 5 Year Warranty
- Medical Approvals[2]
- Universal Input (85 - 265VAC)
- High Efficiency
- Broad 30W to 1500W product range

RoHS

HWS Features and Benefits

Feature	Benefit
◆ 5 Year Warranty	◆ Lower Cost of Ownership
◆ Medical Approvals	◆ Reduces system approval times
◆ Wide range AC Input	◆ Supports global use

Specifications

ITEMS / MODELS			HWS30 HWS50	HWS100 HWS150	HWS300	HWS600	HWS1500
Input Voltage range (47-63Hz)	(2)	-	85 - 265VAC or 120 - 370VDC		85 - 265VAC or 120 - 330VDC		85 - 265VAC
Input Current (Typ)	(1)	A	0.8 / 0.4 0.7 / 0.35	1.3 / 0.65 1.9 / 0.95	4.1 / 2.1	8.1 / 3.9	19 / 10
Inrush Current	(1)	A	14 / 28		20 / 40		
Power Factor / Flicker		-	Meets EN61000-3-2, EN61000-3-3				
Temperature Coefficient		-	<0.02%/°C				
Overcurrent Protection		-	>104%				
Overvoltage Protection		V	Yes (See table on page 2)				
Hold Up Time (Typ)		ms	20				
Leakage Current (60Hz)		mA	<0.5mA				
Remote Sense		-	No	Yes			
Indicator		-	Green LED = ON				
Remote On/Off		-	No		Yes (Isolated from output)		
Parallel operation		-	No		Single wire connection (5 units max)		
DC Good		-	No		Yes		
Voltage Programming		-	No				Yes
Operating Temperature & Derating		-	HWS30-150: -10°C to +70°C, (-10 - +50°C: 100%, +60°C: 60%, +70°C: 20%) HWS300-1500: -10°C to +70°C, (-10 - +50°C: 100%, derate linearly to 50% load from +50 to +70°C)				
Storage Temperature		-	-30 to +85°C				
Humidity (non condensing)		-	Operating: 30 - 90%RH (10 -90% on HWS300-1500), Non operating 10 - 95%RH				
Cooling		-	Convection		Internal fan		
Withstand Voltage	(3)	-	I/P to Grnd 2kVAC, I/P to O/P 3kVAC, O/P to Grnd 500VAC, O/P to Remote On/Off 100VAC for 1 min.				
Isolation Resistance		-	>100M at 25C & 70%RH, Output to Ground 500VDC, >10M Output to remote on/off 100VDC				
Vibration (non operating)		-	10 - 55Hz (1 min sweep), 19.6m/s² constant, X, Y, Z axis, one hour each				
Shock (in packaging)		-	< 196.1m/s²				
Safety Agency Approvals	(2)	-	UL60601-1, EN60601, CSA-C22.2 No601.1-M90 (C-UL) (basic insulation), CE Mark				
Line Dip		-	Complies with SEMI F47 (200VAC line only)				
Conducted & Radiated EMI		-	EN55011 / EN55022-B, FCC-B, VCCI-B (HWS600 & 1500 Class A)				
Immunity		-	IEC61000-4-2 (Level 2,3), -3, -4, -6, (Level 3), -5 (Level 3,4), -8 (Level 4), -11				
Weight (Typ)		g	220 280	450 500	1000	1600	3800
Size (WxHxD)		In	1.04x3.23x3.74 1.04x3.23x4.72	1.1x3.23x6.3 1.46x3.23x6.3	2.4x3.23x6.5	3.94x3.23x6.5	4.98x3.23x11.02
Warranty		yrs	Five Years				

(1) 100/200VAC input
(2) See conditions of accep[tability and clause 19.5DV.2 of UL60601 for equipment in proximity of patient
(3) HWS300-600 2.5kVAC Input to ground

HWS30-1500/ME

Output Ratings

Model	Voltage	Adjust Range	Max Curr(A)[4]	Max Power(W)	Load Reg(mV)	Line Reg(mV)	Ripple Noise(mV)	Overvoltage (V)	Efficiency (typ)%[1]
HWS30-5/ME	5V	4.0 - 6.0	6	30	40	20	120	6.25-7.25	77/80
HWS50-5/ME	5V	4.0 - 6.0	10	50	40	20	120	6.25-7.25	82/84
HWS100-5/ME	5V	4.0 - 6.0	20	100	40	20	120	6.25-7.25	83/86
HWS150-5/ME	5V	4.0 - 6.0	30	150	40	20	120	6.25-7.25	83/86
HWS30-12/ME	12V	9.6 - 14.4	2.5	30	96	48	150	15-17.4	81/83
HWS50-12/ME	12V	9.6 - 14.4	4.3	51.6	96	48	150	15-17.4	81/83
HWS100-12/ME	12V	9.6 - 14.4	8.5	102	96	48	150	15-17.4	83/86
HWS150-12/ME	12V	9.6 - 14.4	13	156	96	48	150	15-17.4	83/86
HWS300-12/ME	12V	9.6 - 14.4	27	324	72	48	150	15-17.4	80/83
HWS30-15/ME	15V	12.0 - 18.0	2	30	120	60	150	18.8-21.8	81/83
HWS50-15/ME	15V	12.0 - 18.0	3.5	52.5	120	60	150	18.8-21.8	81/83
HWS100-15/ME	15V	12.0 - 18.0	7	105	120	60	150	18.8-21.8	83/86
HWS150-15/ME	15V	12.0 - 18.0	10	150	120	60	150	18.8-21.8	83/86
HWS300-15/ME[5]	15V	12.0 - 18.0	22	330	90	60	150	18.8-21.8	82/85
HWS30-24/ME	24V	19.2 - 28.8	1.3	31.2	192	96	200	30-34.8	83/86
HWS50-24/ME	24V	19.2 - 28.8	2.2	52.8	192	96	150	30-34.8	82/84
HWS100-24/ME	24V	19.2 - 28.8	4.5	108	192	96	150	30-34.8	84/87
HWS150-24/ME	24V	19.2 - 28.8	6.5	156	192	96	150	30-34.8	85/88
HWS300-24/ME	24V	19.2 - 28.8	14 (16.5 pk)	336	144	96	150	30-34.8	82/85
HWS600-24/ME	24V	19.2 - 28.8	27 (31 pk)	648	144	96	150	30-34.8	82/85
HWS1500-24/ME	24V	19.2 - 28.8, 4.8 - 28.8[7]	65 (105 pk)[6]	1560(2520 pk)[6]	144	96	200	30-34.8	84/88
HWS1500-36/ME	36V	28.8 - 43.2, 7.2 - 43.2[7]	42 (70 pk)[6]	1512(2520 pk)[6]	150	144	200	34-49.7	84/88
HWS30-48/ME	48V	38.4 - 52.8	0.65	31.2	384	192	200	55.2-64.8	82/83
HWS50-48/ME	48V	38.4 - 52.8	1.1	52.8	384	192	200	55.2-64.8	83/85
HWS100-48/ME	48V	38.4 - 52.8	2.1	100.8	384	192	200	55.2-64.8	84/87
HWS150-48/ME	48V	38.4 - 52.8	3.3	158.4	384	192	200	55.2-64.8	85/88
HWS300-48/ME[5]	48V	38.4 - 52.8	7	336	288	192	350	55.2-64.8	82/85
HWS1500-48/ME	48V	38.4 - 52.8, 9.6 - 52.8[7]	32	1536	288	192	200	55.2-64.8	86/90

Options

Suffix	Description
Blank	No Cover (HWS30-150/ME Only) HWS300-1500/ME the cover is always fitted
/A	Not applicable. The cover option for the HWS30-150/ME is NOT available. HWS300-1500/ME the cover is always fitted

(4) Peak load for 10s maximum on time, 35% duty cycle
(5) Safety agency in progress - contact factory for status.
(6) 200-265AC Input
(7) Using voltage programming input - see installation manual for details

Other Lambda Medical Products

NV Series	175 to 700W single & multiple output
Vega Series	450 to 900W single & multiple output
Alpha Series	1000W single and multiple output

For Additional Information, please visit
www.lambdapower.com/products/hws-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A7: Aug 2007

HWS1800T

1800W 3ph Industrial Power Supplies

- 5 Year Warranty
- Three Phase Input (170 - 265VAC)
- High Efficiency
- SEMI F47 Compliant

RoHS

Key Market Segments & Applications

Factory Automation
Test & Measurement
Semiconductor Fabrication

Features and Benefits

Feature	Benefit
◆ 5 Year Warranty	◆ Lower Cost of Ownership
◆ High Efficiency	◆ Easier System Cooling
◆ Compact Size	◆ Less space used in system

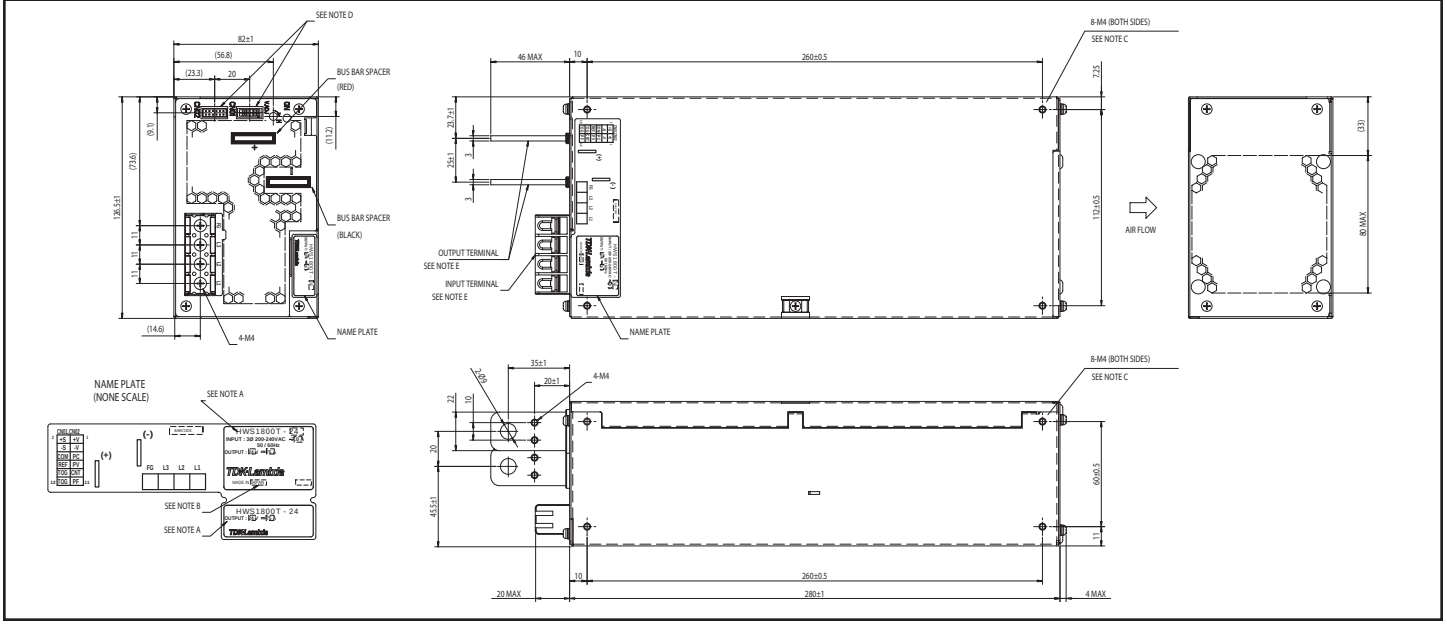
Specifications

ITEMS / MODEL		HWS1800
Input Voltage range (1)	-	Three phase 170 - 265VAC (47 - 63Hz)
Input Current (Typical)	A	12V & 15V: 6A, 24 to 60V: 7A
Inrush Current (200VAC)	A	40A
Power Factor	-	Meets EN61000-3-2
Temperature Coefficient	-	<0.02%/°C
Overcurrent Protection	-	>105% of peak current rating
Overvoltage Protection	V	See table on page 2. Cycle input to reset or use remote on/off function
Hold Up Time (Typ)	ms	12V & 15V: 20ms, 24 to 60V: 18ms at 200VAC
Leakage Current (max)	mA	<2.6mA at 240VAC
Remote Sense	-	Yes
Indicator	-	Green LED = ON
Remote on/off	-	Yes
Parallel operation	-	Single wire connection
DC Good	-	Yes
Remote Adjust (PV)	-	External voltage adjusts output voltage. See Instruction Manual
Operating Temperature	-	-10°C to +70°C, derate linearly to 50% load from 50°C to 70°C, -20°C start up
Storage Temperature	-	-30 to +85°C
Humidity (non condensing)	-	Operating: 10 - 90%RH, Non operating 10 - 95%RH
Cooling	-	Internal fan
Withstand Voltage	-	I/P to Grnd 2kVAC, I/P to O/P 3kVAC, O/P to Grnd 500VAC, O/P to CNT 100VAC for 1 min
Isolation Resistance	-	>100M at 25C & 70%RH, Output to Ground 500VDC
Vibration (non operating)	-	10 - 55Hz (1 minute sweep), 19.6m/s^2 constant X, Y, Z 1 hour
Shock (In package)	-	< 196.1 m/s^2
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, EN50178
Line Dip	-	Complies with SEMI F47
Conducted & Radiated EMI	-	EN55011 / EN55022-A, FCC-A, VCCI-A
Immunity	-	IEC61000-4-2, -3, -4, -5, -6, -8
Weight (Typ)	g	3800
Size (WxHxD)	in	4.98 x 3.23 x 11"
Warranty	yrs	Five Years

Notes:
(1) Derate by 20% below 180VAC input

HWS1800T

Outline Drawing



Output Ratings

Model	Voltage V	Adjust Range V	Max Curr. A	Peak Curr. A(2)	Max Power W	Peak Power W²	Load Reg mV	Line Reg mV(3)	Ripple Noise mV	Overvoltage V	Efficiency (typ) %
HWS1800T-12	12	9.6 - 14.4	125	150	1500	1800	72	48	200	15 - 17.4	84
HWS1800T-15	15	12 - 18	100	120	1500	1800	90	60	200	18.7 - 21.8	84
HWS1800T-24	24	19.2 - 28.8	75	105	1800	2520	144	96	250	30 - 34.8	88
HWS1800T-36	36	28.8 - 43.2	50	70	1800	2520	216	144	250	45 - 49.7	88
HWS1800T-48	48	38.4 - 52.8	37.5	52.5	1800	2520	288	192	300	55.2 - 64.8	90
HWS1800T-60	60	48 - 60	30	42	1800	2520	360	240	400	63 - 75	90

Notes

(2) 10s maximum on time with 35% duty cycle
(3) 180 - 265VAC

Other Lambda Industrial Products

HWS	15W to 1500W single output, single phase
LZSa	500W to 1500W single output
SWS	50W to 1000W, low cost
DPP, DLP & DSP	10W to 480W DIN Rail mount

For Additional Information, please visit
www.lambdapower.com/products/hws-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A1: Jun 2007

LAMBDA

JWS Series

Single Output Industrial Power Supplies

- 5 Year Warranty
- Power factor Corrected
- Approved to VDE0160 Machinery Directive
- Universal Input (85 - 265VAC)

RoHS

Key Market Segments & Applications

Factory Automation	Process Control, NC-Machining, Automotive, Packaging Equipment, Materials Handling, Chemical Processing, Robots
Test & Measurement	Burn-in & Test, Automated Test, Instrumentation, Measurement, Detection

JWS Features and Benefits

Feature	Benefit
◆ VDE0160 Approved	◆ No additional Approvals Needed
◆ 5 Year Warranty	◆ Lower Cost of Ownership
◆ Power Factor Corrected	◆ Supports Global Use
◆ Level B EMI	◆ Assists System Compliance

Specifications

ITEMS \ MODEL		JWS50	JWS75	JWS100	JWS150	JWS300	JWS600
Input Voltage range	-	85 - 265VAC (47 - 63Hz) or 120 - 330VDC					
Inrush Current (100 / 200VAC)	A	14 / 28			25 / 50	20 / 40	
Power Factor	-	Meets EN61000-3-2					
Temperature Coefficient	-	<0.02%/°C					
Overcurrent Protection	-	>105%					
Overvoltage Protection	V	Yes					
Hold Up Time (Typ)	ms	20					
Leakage Current (max)	mA	0.75					
Remote Sense	-	No		Yes			
Remote On / Off	-	Specify as Option /R				Standard	
AC Power Fail	-	Not Available				Standard	
Parallel Connection	-	Not Available				Standard	
Operating Temp. (open frame)	-	-10°C~+60°C, derate linearly to 60% load from 50°C~60°C					
Operating Temp. (with cover)	-	-10°C~+50°C, derate linearly to 60% load from 40°C~50°C (JWS50-150)					
		-10°C~+65°C, derate linearly to 55% load from 50°C~65°C (JWS300-600)					
Storage Temperature	-	-30 to +85°C					
Operating Humidity (*1)	-	30 - 90% RH				10 - 90% RH	
Storage Humidity (*1)	-	10 - 95% RH					
Cooling	-	JWS50 - JWS150 Convection, JWS300 & JWS600 Internal fan					
Withstand Voltage	-	Input to Ground 2kVAC (20mA), Input to Output 3kVAC (20mA),					
	-	Output to Ground 500VAC (100mA) for 1 min.					
Isolation Resistance	-	>100M at 25°C & 70%RH, Output to Ground 500VDC					
Vibration (non operating)	-	10 - 55Hz (1 minute sweep), 19.6m/s² constant X, Y, Z 1 hour					
Shock	-	< 196.1 m/s²					
Safety Agency Approvals	-	UL60950-1, CSA C22.2 No. 60950-1, EN60950-1, VDE0160, CE Mark, Built to meet DENTORI					
Conducted & Radiated EMI	-	EN55011 / EN55022-B, FCC Class B, VCCI-B					
Recommended EMI Filter	-	MAW1202-22			MAW1203-22	MB1210	MB1216
Weight (Typ)	g	350	450	650	850	1900	3000
Size (WxHxD)	mm	See side 2					
Warranty	-	Five Years					

*1 non condensing

JWS Series

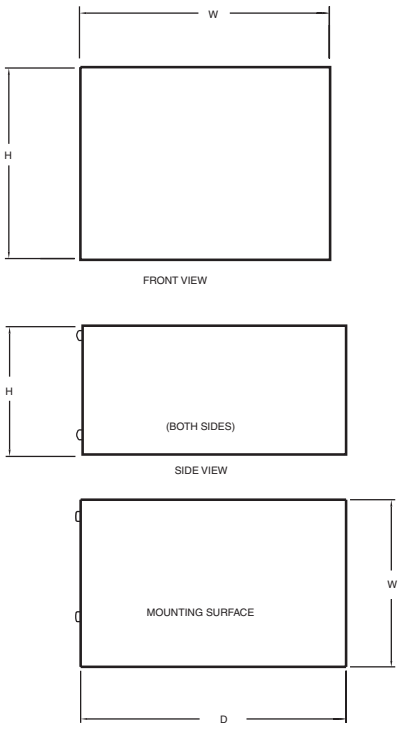
Output Ratings

Model	Voltage	Adjust Range	Max Curr.	Load Reg mV	Line Reg mV	Ripple Noise	Eff. (typ)%
JWS300-2	2.0V	1.8 - 2.4	60	20	20	120	60
JWS600-2	2.0V	1.8 - 2.4	120	30	20	120	61
JWS50-3/A	3.3V	2.85 - 3.63	10	40	20	120	65
JWS75-3/A	3.3V	2.85 - 3.63	15	40	20	120	67
JWS100-3/A	3.3V	2.85 - 3.63	20	40	20	120	67
JWS150-3/A	3.3V	2.85 - 3.63	30	40	20	120	67
JWS300-3	3.3V	2.97 - 3.96	60	20	20	120	68
JWS600-3	3.3V	2.97 - 3.96	120	30	20	120	70
JWS50-5/A	5.0V	4.5 - 5.5	10	40	20	120	74
JWS75-5/A	5.0V	4.5 - 5.5	15	40	20	120	74
JWS100-5/A	5.0V	4.5 - 5.5	20	40	20	120	75
JWS150-5/A	5.0V	4.5 - 5.5	30	40	20	120	75
JWS300-5	5.0V	4.5 - 6.0	60	20	20	120	74
JWS600-5	5.0V	4.5 - 6.0	120	30	20	120	75
JWS100-6/A	6.0V	5.4 - 6.6	16.7	48	24	120	75
JWS300-6	6.0V	5.4 - 7.2	50	36	24	150	74
JWS600-6	6.0V	5.4 - 7.2	100	36	24	120	75
JWS600-8	8.0V	7.2 - 9.6	68	48	32	150	77
JWS50-9/A	9.0V	8.1 - 9.9	5.6	76	36	150	74
JWS100-9/A	9.0V	8.1 - 9.9	11.2	72	36	150	75
JWS300-9	9.0V	8.1 - 10.8	34	54	36	150	76
JWS600-9	9.0V	8.1 - 10.8	68	54	36	150	77
JWS50-12/A	12.0V	10.8 - 13.2	4.3	96	48	150	76
JWS75-12/A	12.0V	10.8 - 13.2	6.3	96	48	150	76
JWS100-12A	12.0V	10.8 - 13.2	8.5	96	48	150	76
JWS150-12/A	12.0V	10.8 - 13.2	13	96	48	150	77
JWS300-12	12.0V	10.8 - 14.4	27	48	48	150	76
JWS600-12	12.0V	10.8 - 14.4	53	72	48	150	80
JWS50-15/A	15.0V	13.5 - 16.5	3.5	120	60	150	77
JWS75-15/A	15.0V	13.5 - 16.5	5	120	60	150	77
JWS100-15/A	15.0V	13.5 - 16.5	7	120	60	150	77
JWS150-15/A	15.0V	13.5 - 16.5	10	120	60	150	78
JWS300-15	15.0V	13.5 - 18.0	22	60	60	150	77
JWS600-15	15.0V	13.5 - 18.0	43	90	60	150	81
JWS50-24/A	24.0V	21.6 - 26.4	2.2	150	96	150	79
JWS75-24/A	24.0V	21.6 - 26.4	3.2	150	96	150	79
JWS100-24/A	24.0V	21.6 - 26.4	4.5	150	96	150	79
JWS150-24/A	24.0V	21.6 - 26.4	6.5	150	96	150	80
JWS300-24	24.0V	21.6 - 28.8	14	144	96	150	80
JWS600-24	24.0V	21.6 - 28.8	27	144	96	150	82
JWS50-28/A	28.0V	25.2 - 30.8	2	160	112	150	79
JWS100-28/A	28.0V	25.2 - 30.8	3.6	160	112	150	79
JWS150-28/A	28.0V	25.2 - 30.8	5.5	160	112	150	80
JWS300-28	28.0V	25.2 - 33.6	12	168	112	150	80
JWS600-28	28.0V	25.2 - 33.6	23	168	112	150	82
JWS50-48/A	48.0V	43.2 - 52.8	1.1	240	192	200	79
JWS75-48/A	48.0V	43.2 - 52.8	1.6	240	192	200	79
JWS100-48/A	48.0V	43.2 - 52.8	2.1	240	192	200	79
JWS150-48/A	48.0V	43.2 - 52.8	3.3	240	192	200	80
JWS300-48	48.0V	43.2 - 52.8	6.5	288	192	350	80
JWS600-48	48.0V	43.2 - 52.8	13	288	192	350	83

Other Lambda Industrial Products

HWS	15W to 1500W Single output
JWS-P & JWT	70W to 480W Single and triple output
LZSa	500 to 1500W Single output
DLP/DSP/DPP	10 to 480W DIN Rail Mount

JWS Outline Drawing



See website for detailed drawing.

Dimensions Table

	Height (H)	Width (W)	Depth (D)
JWS50	1.45″	3.35″	6.25″
JWS75	1.65″	3.62″	6.88″
JWS100	1.97″	3.62″	7.40″
JWS150	2.56″	3.62″	7.80″
JWS300	3.62″	4.72″	7.48″
JWS600	3.62″	6.29″	7.90″

Options

Suffix	Description
Blank	Screw terminals, no cover (JWS50 - JWS150)
/A*	Screw terminals, cover (JWS50 - JWS150)
/B	Molex terminals, no cover (JWS50 & JWS75)
/C	Molex terminals, cover (JWS50 & JWS75)
/R	Remote On / Off (JWS50 - JWS150)
Example	JWS50-5/RA
Note:	* Standard US stock item.

For Additional Information, please visit
www.lambdapower.com/products/jws-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A5: Nov 2006

LAMBDA

JWT Series

Triple Output Industrial Power Supplies

- 5 Year Warranty
- Power factor Corrected
- Approved to VDE0160 Machinery Directive
- Universal Input (85 - 265VAC)

RoHS

Key Market Segments & Applications

Factory Automation	Process Control, NC-Machining, Automotive, Packaging Equipment, Materials Handling, Chemical Processing, Robots
Test & Measurement	Burn-in & Test, Automated Test, Instrumentation, Measurement, Detection

JWT Features and Benefits

Feature	Benefit
◆ VDE0160 Approved	◆ No additional Approvals Needed
◆ 5 Year Warranty	◆ Lower Cost of Ownership
◆ Power Factor Corrected	◆ Supports Global Use
◆ Level B EMI	◆ Assists System Compliance

Specifications

ITEMS \ MODEL		JWT75	JWT100
Max Output Power	W	75	100
Efficiency (Typ)	%	72	
Input Voltage range	-	85 - 265VAC (47 - 63Hz) or 120 - 330VDC	
Input Current Typ	A	1.2 / 0.6	1.4 / 0.7
Inrush Current	A	14A at 100VAC, 28A at 200VAC input	
Power Factor	-	Meets EN61000-3-2	
Output Voltage Accuracy	-	V1 variable, V2 & V3 +/-5%	
Temperature Coefficient	-	V1 & V2 <0.02%/°C, V3 <0.03%/°C	
Overcurrent Protection	-	>105%	
Overvoltage Protection	V	Main output only: 5.7 - 7V	
Hold Up Time (Typ)	ms	20	
Leakage Current	-	0.75mA Max, 0.44mA typical at 230VAC	
Operating Temperature	-	-10°C to +65°C, derate linearly to 50% load from 50°C to 65°C -10°C to +50°C, derate linearly to 60% load from 40°C to 50°C with cover	
Storage Temperature	-	-30 to +85°C	
Humidity	-	30 - 90% RH (operating), 10 - 95% RH (non operating)	
Cooling	-	Convection	
Withstand Voltage	-	Input to Ground 2kVAC (20mA), Input to Output 3kVAC (20mA), Output to Ground 500VAC (100mA) for 1 min.	
Isolation Resistance	-	>100M at 25°C & 70%RH, Output to Ground 500VDC	
Vibration (non operating)	-	10 - 55Hz (1 minute sweep), 2G constant X, Y, Z 1 hour	
Shock	-	<20G	
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, VDE0160, CE Mark, Built to meet DENTORI	
Conducted & Radiated EMI	-	EN55011 / EN55022-B, FCC Class B, VCCI-B	
Recommended EMI Filter	-	MAW1202-22	
Weight (Typ)	g	600	720
Size (WxHxD)	mm	42 x 92 x 188	48 x 92 x 203
Warranty	-	Five Years	

JWT Series

Model Selector

Model	Output	Voltage	Adjust. Range	Min Current (A)	Max Current (A)	Load Reg (mV)	Line Reg (mV)	Ripple Noise (mV)
JWT75-522/A	V1	+5V	5 - 5.25	0.8	8	40	20	120
	V2	+12V	-	0	4	100	48	150
	V3	-12V	-	0	0.5	150	48	150
JWT75-5FF/A	V1	+5V	5 - 5.25	0.8	8	40	20	120
	V2	+15V	-	0	3.2	120	60	150
	V3	-15V	-	0	0.5	150	60	150
JWT75-525/A	V1	+5V	5 - 5.25	0.8	8	40	20	120
	V2	+12V	-	0	4	100	48	150
	V3	-5V	-	0	0.5	100	20	150
JWT100-522/A	V1	+5V	5 - 5.25	1.3	13	40	20	120
	V2	+12V	-	0	5.5	100	48	150
	V3	-12V	-	0	1	150	48	150
JWT100-5FF/A	V1	+5V	5 - 5.25	1.3	13	40	20	120
	V2	+15V	-	0	4.5	120	60	150
	V3	-15V	-	0	1	150	60	150
JWT100-525/A	V1	+5V	5 - 5.25	1.3	13	40	20	120
	V2	+12V	-	0	5.5	100	48	150
	V3	-5V	-	0	1	100	20	150

Dimensions Table

	Height (H)	Width (W)	Depth (D)
JWT75	1.65	3.62	7.40
JWT100	1.89	3.62	7.99

Options

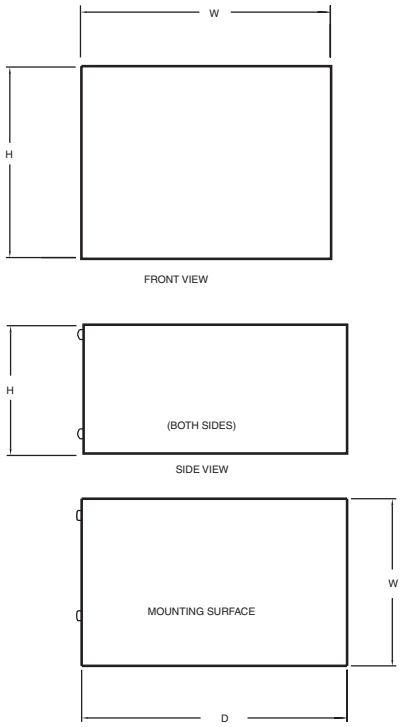
Suffix	Description
Blank	Screw terminals, no cover
/A	Screw terminals, cover (Standard US stock item)
/B	Molex terminals, no cover
/C	Molex terminals, cover
/R	Remote On / Off
Example	JWT75-525/RC

Other Lambda Industrial Products

HWS	15 to 1500W Single output
JWS, JWS-P	50W to 600W Single output
DLP/DSP/DPP	10 to 480W DIN Rail Single Output
NV175	175W Triple & Quad 3" x 5"

For Additional Information, please visit
www.lambdapower.com/products/jws-series.htm

JWS Outline Drawing



See website for detailed drawing.

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A4: Nov 2006

KM Series

15-40W Medical AC-DC PCB-Mount Power Supplies

- Small size and lightweight
- PC Board Mountable
- Wide Range Input
- Medical Safety Certifications (4kVAC Input - Output)
- Class II (No ground needed)

RoHS

Features and Benefits

Feature	Benefit
Small size	Minimizes pcb space
Wide input range	Global use with no manual intervention
High efficiency	Lower heat dissipated in system

Specifications

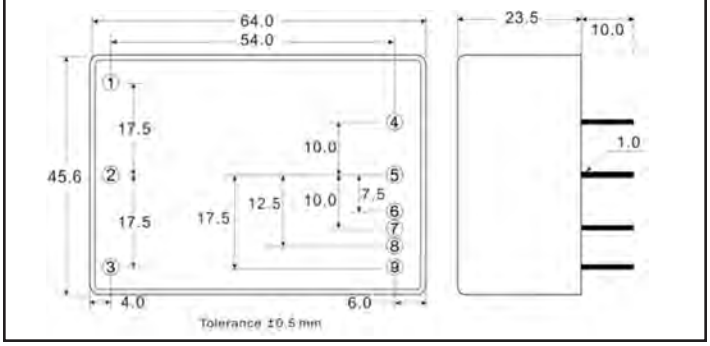
ITEMS / MODELS		KMS15	KMD15	KMT15	KMS40	KMD40	KMT40
Input Voltage Range	-	90-264VAC 47-440Hz or 100-375VDC					
Inrush Current Limiting	A	10 / 20A, cold start, 25°C ambient (115 / 230VAC)					
Input Current (115 / 230VAC)	mA	220 / 118mA			860 / 460mA		
Recommended External Fuse	-	2A slow blow type			3.15A slow blow type		
Temperature Coefficient	-	±0.01%/°C					
Ripple and Noise (pk-pk)	mV	50mV or 1%, whichever is greater					
Overcurrent Protection	-	> 105%, hiccup mode, automatic recovery					
Overvoltage Protection	%	Yes, Zener diode clamp					
Hold-up Time (typical)	ms	20ms			18ms		
Leakage Current (115 / 230VAC)	-	0.1 / 0.2mA			0.1 / 0.2mA		
Operating Temperature	-	-25°C to 70°C, derate linearly to 50% load from 50°C to 70°C. Max case temperature 95°C					
Storage Temperature	-	-40°C to 100°C					
Humidity	%RH	20% to 95% RH (non-condensing)					
Cooling	-	Convection, over temperature protected ~100°C case temperature)					
Withstand Voltage	VAC	Input to output: 4kVAC					
Immunity	-	EN60601-1-2					
Safety Agency Certification	-	UL60601-1, IEC60601-1, CE Mark					
Conducted EMI	-	EN55011 Class B			EN55011 Class A		
Switching Frequency	kHz	132kHz					
Weight	g	120			280		
Size (LxWxH)	in	2.52 x 1.79 x 0.92"			3.5 x 2.5 x 1.06"		
Mounting & Case	-	PC board mountable. Plastic resin fiberglass case (UL 94V-0)					
MTBF	hrs	200,000 to 400,000 hours, model dependant					
Warranty	yrs	2 years					

KM Series

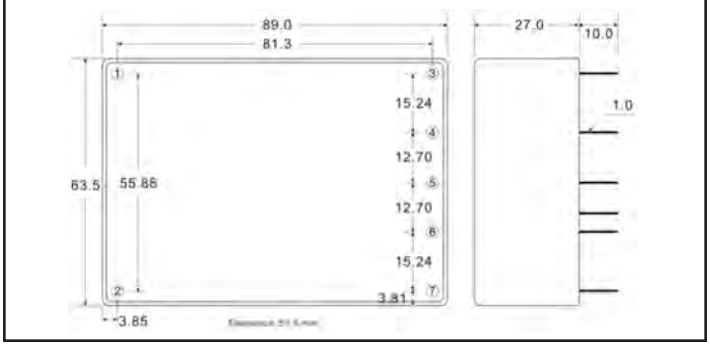
Output Ratings

Model		Output Voltage (V)	Minimum Current (A)	Maximum Current (A)	Power (W)	Output Set Accuracy (%)	Line Regulation (%)	Load Regulation (1) (%)	Cross Regulation	Efficiency (%)
Single Output										
KMS15-3P3	V1	3.3V	0A	3.00A	9.9W	±2%	0.5%	1%	-	74%
KMS40-3P3	V1	3.3V	80mA	8.00A	26.4W	±2%	0.5%	1%	-	75%
KMS15-5	V1	5V	0A	3.00A	15W	±2%	0.5%	1%	-	78%
KMS40-5	V1	5V	80mA	8.00A	40W	±2%	0.5%	1%	-	79%
KMS15-9	V1	9V	0A	1.67A	15W	±2%	0.5%	1%	-	79%
KMS40-9	V1	9V	44mA	4.44A	40W	±2%	0.5%	1%	-	82%
KMS15-12	V1	12V	0A	1.25A	15W	±2%	0.5%	1%	-	81%
KMS40-12	V1	12V	33mA	3.33A	40W	±2%	0.5%	1%	-	83%
KMS15-15	V1	15V	0A	1.00A	15W	±2%	0.5%	1%	-	81%
KMS40-15	V1	15V	26.7mA	2.67A	40W	±2%	0.5%	1%	-	83%
KMS15-24	V1	24V	0A	0.62A	15W	±2%	0.5%	1%	-	83%
KMS40-24	V1	24V	16.7mA	1.67A	40W	±2%	0.5%	1%	-	83%
Dual Output										
KMD15-55	V1	+5V	150mA	1.5A	15W	±2%	0.5%	1%	5%	78%
	V2	-5V	150mA	1.5A		±2%	0.5%	1%	5%	
KMD40-55	V1	+5V	400mA	4A	40W	±2%	0.5%	1%	5%	79%
	V2	-5V	400mA	4A		±2%	0.5%	1%	5%	
KMD40-512	V1	5V(2)	1250mA	5A	40W	±3%	0.5%	2%	1%	80%
	V2	12V(2)	312mA	1.25A		±5%	5.0%	6%	7%	
KMD40-524	V1	5V(2)	1250mA	5A	40W	±3%	0.5%	2%	1%	80%
	V2	24V(2)	156mA	0.625A		±5%	5.0%	6%	7%	
KMD15-1212	V1	+12V	62.5mA	0.625A	15W	±2%	0.5%	1%	3%	80%
	V2	-12V	62.5mA	0.625A		±2%	0.5%	1%	3%	
KMD40-1212	V1	+12V	166mA	1.66A	40W	±2%	0.5%	1%	5%	83%
	V2	-12V	166mA	1.66A		±2%	0.5%	1%	5%	
KMD15-1515	V1	+15V	50mA	0.5A	15W	±2%	0.5%	1%	3%	81%
	V2	-15V	50mA	0.5A		±2%	0.5%	1%	3%	
KMD40-1515	V1	+15V	133mA	1.33A	40W	±2%	0.5%	1%	5%	81%
	V2	-15V	133mA	1.33A		±2%	0.5%	1%	5%	
Triple Output										
KMT15-51212	V1	5V(3)	500mA	2A	15W	±2%	0.5%	1%	1%	78%
	V2	+12V	50mA	0.2A		±3%	2.0%	5%	5%	
	V3	-12V	50mA	0.2A		±3%	2.0%	5%	5%	
KMT40-51212	V1	5V(3)	1250mA	5A	40W	±3%	0.5%	3%	3%	80%
	V2	+12V	150mA	0.6A		±5%	5.0%	7%	7%	
	V3	-12V	150mA	0.6A		±5%	5.0%	7%	7%	
KMT15-51515	V1	5V(3)	500mA	2A	15W	±2%	0.5%	1%	1%	78%
	V2	+15V	37.5mA	0.15A		±3%	2.0%	5%	5%	
	V3	-15V	37.5mA	0.15A		±3%	2.0%	5%	5%	
KMT40-51515	V1	5V(3)	1250mA	5A	40W	±3%	0.5%	3%	3%	80%
	V2	+15V	125mA	0.5A		±5%	5.0%	7%	7%	
	V3	-15V	125mA	0.5A		±5%	5.0%	7%	7%	

KM15 Outline Drawings



KM40 Outline Drawings



(1) Symmetrical loading, from minimum to maximum load
(2) Output V1 is isolated from output V2
(3) Output V1 is isolated from outputs V2 & V3

For Additional Information, please visit
www.lambdapower.com/products/km-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A1: Sept 2007

KPS Series

5 to 15W AC-DC Board Mount Power Supplies

- Small Size and lightweight
- PC board Mountable
- Low Cost
- Universal Input Voltage
- UL Class II Approved

RoHS

Key Market Segments & Applications

Factory Automation
Printers and motor drives
Kiosks

Features and Benefits

Feature	Benefit
◆ Small size	◆ Minimizes pcb space
◆ Wide input range	◆ Global use with no manual intervention
◆ No external components needed	◆ Easy to use
◆ Class II UL approved	◆ No ground connection needed

Specifications

ITEMS / MODEL		KPS-5	KPS-10	KPS-15
Input Voltage range		85 - 264VAC (47 - 440Hz) or 110 - 370VDC		
Inrush Current (115 / 230VAC)	A	20/40		
Input Current (115/230VAC)	A	0.13 / 0.07	0.27 / 0.13	0.4 / 0.2
Temperature Coefficient		±0.05%/°C		
Voltage Accuracy		±1%		
Minimum Load	A	None		
Load Regulation		±1% (10% to 100% load)		
Line Regulation (1)		±0.5%		
Ripple & Noise (2)	mV	1% or 50mV whichever is greater		
Short Circuit Protection	-	Continuous - hiccup mode		
Overvoltage Protection	V	130-150%		
Hold Up Time (Typ@115VAC)	ms	8	16	16
LED Indicator		Green LED = OK		
Operating Temperature		0 to +70°C, derate linearly to 25% load from 40°C to 70°C		
Storage Temperature		-20 to +85°C		
Humidity (non condensing)		10 - 95% RH		
Cooling		Convection		
Withstand Voltage		Input to Output 3kVAC		
Vibration (non operating)		23.52m/s² (10 - 55Hz: constant sweep 1 min X, Y, Z for 1 hour)		
Shock		< 196.1 m/s² (20G)		
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, Class II, CE Mark		
Conducted & Radiated EMI		EN55022-B, FCC Class B		
Immunity		EN61000-4 -2, -3, -4, -5, -6		
Weight (Typ)	g (oz)	29g (1oz)	60g (2oz)	80g (2.8oz)
Size (WxLxH; H above pcb)	in.	1.38 x 2.17 x 0.79	1.77 x 2.56 x 0.91	1.89 x 2.75 x 0.91
Warranty		One Year		

Notes:
(1) KPS-5 Measured from 100 - 240VAC
(2) Measured with 0.1uF ceramic & 10uF electrolytic at 20MHz BW

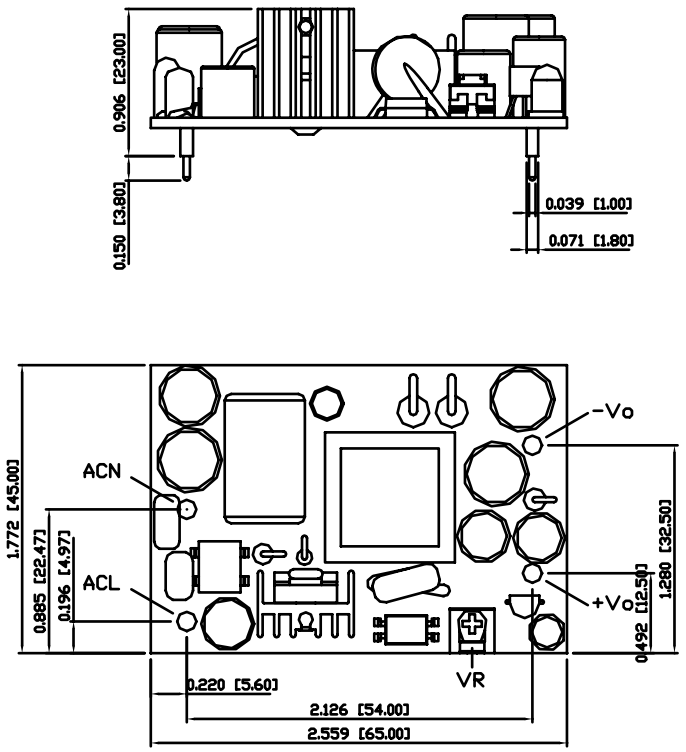
KPS Series

Model Selector (other voltages available)

Model	Output Voltage (V)	Maximum Output (A)	Peak Load (A)(3)	Output Pwr (W)	Effic (%)
KPS5-3R3	3.3	1.25	-	4.1	70
KPS5-5	5.0	1.00	-	5.0	70
KPS5-12	12.0	0.42	-	5.0	70
KPS5-15	15.0	0.33	-	5.0	70
KPS5-24	24.0	0.23	-	5.5	77
KPS10-3R3	3.3	2.50	3.80	8.3	65
KPS10-5	5.0	2.00	2.80	10.0	70
KPS10-12	12.0	0.84	1.20	10.1	75
KPS10-15	15.0	0.67	1.00	10.1	75
KPS10-24	24.0	0.42	0.65	10.1	78
KPS15-3R3	3.3	3.00	4.50	9.9	70
KPS15-5	5.0	3.00	4.50	15.0	73
KPS15-12	12.0	1.25	1.80	15.0	80
KPS15-15	15.0	1.00	1.50	15.0	80
KPS15-24	24.0	0.63	0.95	15.1	82

(3) Average not to exceed max power, <30s,10%, duty cycle

KPS10 Outline Drawing

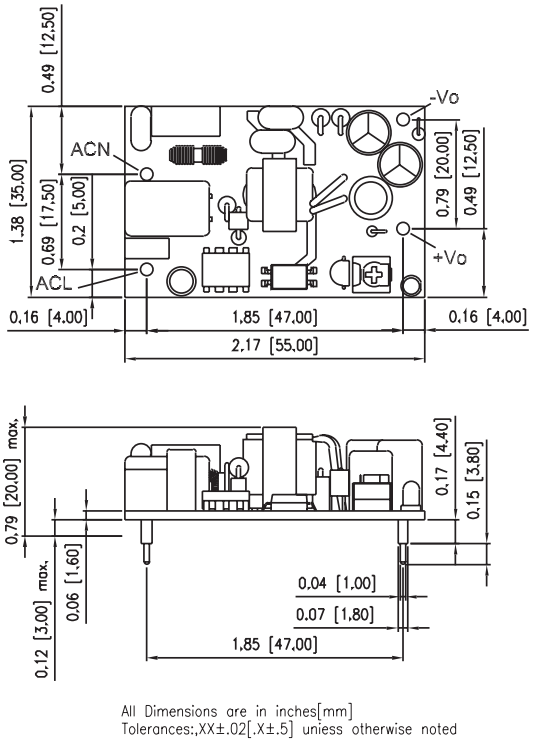


Other Lambda Industrial Products

ZP	40W & 60W, 2x4" footprint
NV175	175W, 3x5", 1-5 outputs
ZWS	5 to 240W, single output

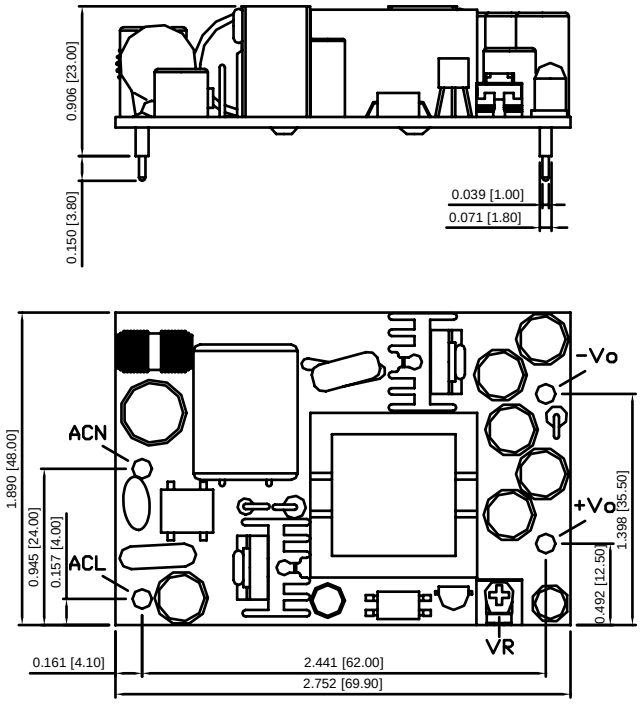
For Additional Information, please visit
www.lambdapower.com/products/kps-series.htm

KPS5 Outline Drawing



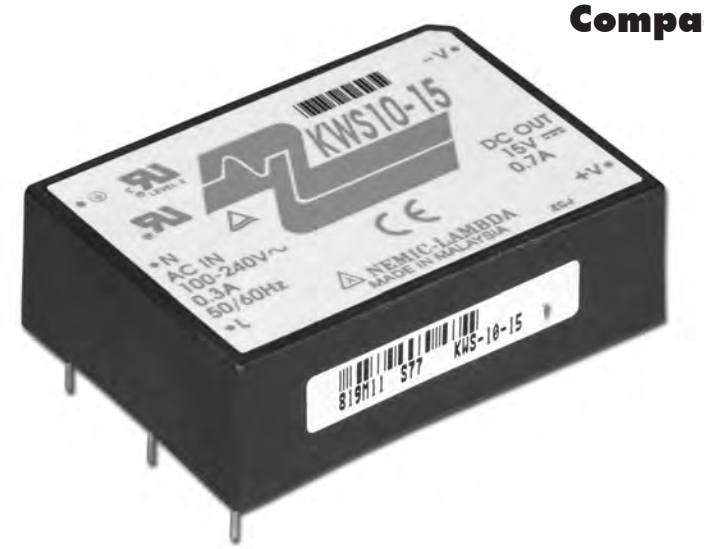
All Dimensions are in inches[mm]
Tolerances:.XX±.02[.X±.5] unless otherwise noted

KPS15 Outline Drawing



KW Series

Compact AC-DC PCB-Mount Power Supplies



- Small size and lightweight
- PC Board Mountable
- -10 to +70 °C Continuous Operation
- 85 - 265VAC Wide Range Input
- World-wide Agency Approvals
  UL, CSA, TUV and CE Mark
- Convection Cooled
- Low Noise Conducted EMI Class B

RoHS

KW Features and Benefits

Feature	Benefit
◆ Small size	◆ Minimizes pcb space
◆ Wide input range	◆ Global use with no manual intervention
◆ No external components needed	◆ Easy to use

Specifications

ITEMS \ MODEL		5V	12V	15V	±12V	±15V
AC Input		85-265VAC 47-440Hz				
DC Input	VDC	110-340VDC				
Efficiency (typical)	%	73	76	76	73	73
Inrush Current Limiting (1)	A	5 & 10W: 15/30A, 15W: 20/40A				
Conducted EMI	-	FCC20780 class B, VDE0871 Class B, VCCI-2 (with external cap).				
Output Voltage Accuracy	%	± 5% (fixed)				
Line Regulation	%	0.4%				
Load Regulation	%	0.8%				
Ripple and Noise (pk-pk)	mV	120	150			
Hold-up Time (typical)	ms	17ms				
Overvoltage Protection (typical)	%	~110% (zener clamp)				
Overload Protection	-	~125% (avoid prolonged operation in overload)				
Cooling	-	Convection				
Operating Temperature	-	-10°C to 70°C, derate linearly to 25% load from 50°C to 70°C				
Humidity	%RH	20% to 90% RH (non-condensing)				
Isolation	VAC	Input to output: 3kVAC; Input to Case: 2kVAC; Output to Case: 500VAC				
Mounting	-	PC board mountable				
Safety Agency Approval	-	UL60950-1; CSA 22.2 No. 60950-1-03; EN60950-1 & CE Mark (LVD)				
Weight	g	5W: 75, 10W: 100, 15W: 150				
Warranty	-	1 year				

(1) 100/200VAC @ 25°C

KW Series

Output Ratings

Model	Voltage (V)	Power (W)	Current (A)
Single Output			
KWS5-5	5V	5	1.00
KWS10-5	5V	10	2.00
KWS15-5	5V	15	3.00
KWS5-12	12V	5	0.45
KWS10-12	12V	10	0.90
KWS15-12	12V	15	1.30
KWS5-15	15V	5	0.35
KWS10-15	15V	10	0.70
KWS15-15	15V	15	1.00
Dual Output			
KWD5-1212	±12V	5	±0.22
KWD10-1212	±12V	10	±0.45
KWD15-1212	±12V	15	±0.65
KWD5-1515	±15V	5	±0.18
KWD10-1515	±15V	10	±0.36
KWD15-1515	±15V	15	±0.52

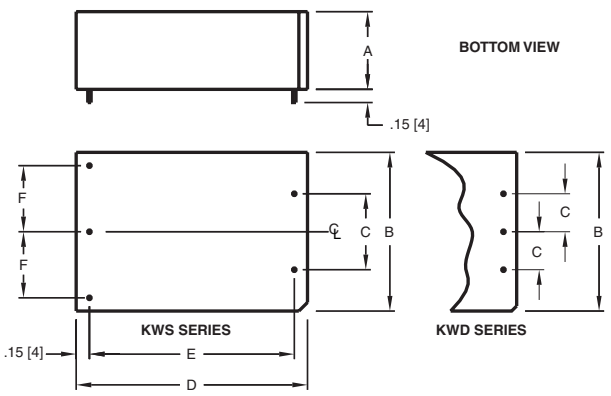
PIN Out Table

PIN	Function
FG	Case (Frame Ground)
AC(N)	AC Neutral
AC(L)	AC Line
-V	Negative Voltage Out
+V	Positive Voltage Out
COM	Output common

Other Lambda Industrial Products

KPSa	5 to 15W Open frame PCB mount single output
HWS	15 to 1500W Single output
ZWS	5 to 240W Single output, universal input
SC	30 to 120W Single, dual, triple & quad output

KW Outline Drawing



DIMENSIONS:

MODEL	A	B	C	D	E	F
KWS5	.807 (20.5)	1.77 (45.0)	.787 (20.0)	2.16 (55.0)	1.850 (47.0)	.688 (17.5)
KWS10	.807 (20.5)	1.77 (45.0)	.787 (20.0)	2.52 (64.0)	2.125 (54.0)	.688 (17.5)
KWS15	.925 (23.5)	1.889 (48.0)	.905 (23.0)	2.75 (70.0)	2.440 (62.0)	.787 (20.0)
KWD5	.807 (20.5)	1.77 (45.0)	.393 (10.0)	2.16 (55.0)	1.850 (47.0)	.688 (17.5)
KWD10	.807 (20.5)	1.77 (45.0)	.393 (10.0)	2.52 (64.0)	2.125 (54.0)	.688 (17.5)
KWD15	.925 (23.5)	1.889 (48.0)	.453 (11.5)	2.75 (70.0)	2.440 (62.0)	.787 (20.0)

WEIGHT:

MODEL	GRAMS
KWS5	75
KWS10	100
KWS15	150
KWD5	75
KWD10	100
KWD15	150

NOTE:
1. DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS ( ) ARE IN MM.
2. PIN: 5x .039 (1.0).

KWD5/KWD10/KWD15
KWS5/KWS10/KWS15

For Additional Information, please visit
www.lambdapower.com/products/kw-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A2: Nov 2006

LW Series

Low Profile Dual & Triple Output

- 26mm height
- Outputs 2 and 3 isolated from output 1
- Universal Input (85 - 265VAC)

* RoHS

Key Market Segments & Applications

Factory Automation	Process Control, NC-Machining, Automotive, Packaging Equipment, Materials Handling, Chemical Processing, Robots
Test & Measurement	Burn-in & Test, Automated Test, Instrumentation, Measurement, Detection
Automated Service	Vending Machines, Elevators, Video Gaming, Point of Sale Equipment

LW Features and Benefits

Feature	Benefit
◆ Low Profile	◆ Assists System Integration
◆ Isolated 2nd and 3rd outputs	◆ Enable series operation for higher voltages
◆ Wattbox design on LWT	◆ Power trading between outputs

Specifications

ITEMS \ MODEL		LWD15	LWD30	LWD50	LWT15H	LWT30H	LWT50H
Max Output Power (typ)	W	15	30	50	17	30	50
Efficiency (Typ)	%	64	70	75	72	73	72
AC Input Voltage range	-	85 - 265VAC (47 - 440Hz)					
DC Input Voltage range	-	110 - 350VDC			110 - 330VDC		
Input Current Typ (100/200VAC)	A	0.4/0.2	0.72/0.36	1.0/0.5	0.4/0.22	0.7/0.42	1.2/0/7
Inrush Current (110/200VAC)	A	17/34	14/28	14/28	14/28	16/32	16/32
Output 1 Voltage Adjustment	-	5V: 5 to 5.25V, 12V: 12 to 12.6V, 15V: 15V to 15.75V					
Output Voltage Accuracy	-	Output 2 ±5%			Output 2 & 3 ±5%		
Temperature Coefficient	-	Output 1 < 1%, Output 2 or 3, <2% at 0 - 60°C					
Line Regulation	-	1%					
Load Regulation	-	2%					
Ripple & Noise	-	5V:100mV, 12V & 15V: 150mV, 24V: 200mV			Output 1: 100mV, Outputs 2 & 3: 150mV		
Overcurrent Protection	-	>105%					
Overvoltage Protection	V	Main output only: 5.75 - 6.75V, manual reset					
Hold Up Time (Typ at 100VAC)	ms	20					
Series Operation	-	Possible					
Operating Temperature	-	LWD: 0°C to +60°C, derate as follows: 40°C: 100%, 50°C: 60%, 60°C: 40%					
		LWT: 0°C to +60°C, derate as follows: 40°C: 100%, 50°C: 80%, 60°C: 60%					
Storage Temperature	°C	-30 to +85°C					
Operating Humidity	-	30 - 90% RH (Non condensing)					
Storage Humidity	-	10 - 95% RH (Non condensing)					
Cooling	-	Convection					
Withstand Voltage	-	Input to Gnd, Input to Output 2kVAC (20mA)			Input to Gnd 2kVAC Input to Output 3kVAC (20mA)		
Isolation Resistance	-	>100M at 25C & 70%RH, Output to Ground 500VDC					
Vibration (non operating)	-	19.6m/s²			10-55Hz(1 min) <19.6m/s² (1 hr)		
Shock		196.1m/s²					
Safety Agency Approvals (1)	-	UL60950-1, CSA60950-1, EN60950-1, CE LVD			UL60950-1, CSA60950-1, EN60950-1, CE LVD		
Conducted EMI	-	FCC Class A			VDE Class B, FCC Class B		
Weight (Typ)	g	180	250	400	220	300	400
Size (WxHxD)	mm	Please refer to outline drawings					
Warranty	-	One Year					

(1) LWD Series approved as ELV

* LWT models only

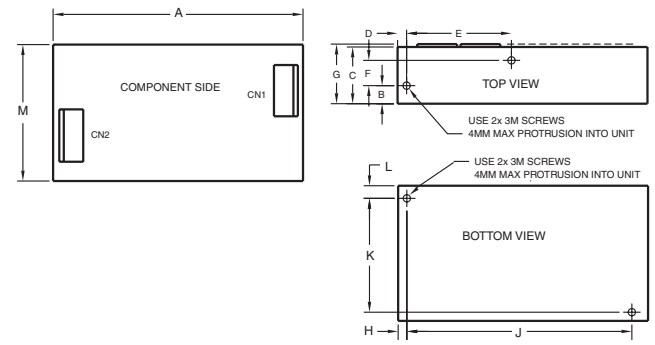
Note: See Installation Manual for full details, test methods of parameters and application notes

LW Series

Output Ratings

Model	Output	Voltage	Min Current	Max Current
LWD15-0512	V1	5V	0.0	1.5
	V2	12V	0.0	0.6
LWD15-0524	V1	5V	0.0	1.5
	V2	24V	0.0	0.3
LWD15-1212	V1	12V	0.0	0.6
	V2	12V	0.0	0.6
LWD15-1224	V1	12V	0.0	0.6
	V2	24V	0.0	0.3
LWD15-1515	V1	15V	0.0	0.5
	V2	15V	0.0	0.5
LWD30-0512	V1	5V	0.0	3.0
	V2	12V	0.0	1.2
LWD30-0524	V1	5V	0.0	3.0
	V2	24V	0.0	0.6
LWD30-1212	V1	12V	0.0	1.2
	V2	12V	0.0	1.2
LWD30-1224	V1	12V	0.0	1.2
	V2	24V	0.0	0.6
LWD30-1515	V1	15V	0.0	1.0
	V2	15V	0.0	1.0
LWD50-0512	V1	5V	1.0	5.0
	V2	12V	0.0	2.0
LWD50-1212	V1	12V	0.4	2.0
	V2	12V	0.0	2.0
LWD50-1515	V1	15V	0.3	1.6
	V2	15V	0.0	1.6
LWT15H-522	V1	5V	0.5	3.0
	V2	+12V	0.0	0.6
	V3	-12V	0.0	0.4
LWT15H-5FF	V1	5V	0.5	3.0
	V2	+15V	0.0	0.6
	V3	-15V	0.0	0.4
LWT15H-525	V1	5V	0.5	3.0
	V2	+12V	0.0	0.6
	V3	-5V	0.0	0.4
LWT30H-522	V1	5V	0.7	5.0
	V2	+12V	0.0	1.2
	V3	-12V	0.0	0.6
LWT30H-5FF	V1	5V	0.7	5.0
	V2	+15V	0.0	1.2
	V3	-15V	0.0	0.6
LWT30H-525	V1	5V	0.7	5.0
	V2	+12V	0.0	1.2
	V3	-5V	0.0	0.6
LWT50H-522	V1	5V	1.0	8.0
	V2	+12V	0.0	1.5
	V3	-12V	0.0	1.0
LWT50H-5FF	V1	5V	1.0	8.0
	V2	+15V	0.0	1.5
	V3	-15V	0.0	1.0
LWT50H-525	V1	5V	1.0	8.0
	V2	+12V	0.0	1.5
	V3	-5V	0.0	1.0

LW Outline Drawing



DIMENSIONS:

MODEL	A	B	C	D	E	F	G	H	J	K	L	M
LWT-15	5.03 (128.0)	.31 (7.9)	.98 (25.0)	.15 (3.8)	1.811 (46.0)	.433 (11.0)	1.02 (26.0)	.15 (3.8)	3.897 (99.0)	1.988 (50.5)	.21 (5.5)	2.36 (59.9)
LWT-30	6.29 (160.0)	.47 (12.0)	.98 (25.0)	1.77 (45.0)	3.937 (99.9)	.314 (8.0)	1.02 (26.0)	.66 (17.0)	5.433 (138.0)	.905 (23.0)	1.69 (43.0)	2.75 (70.0)
LWT-50	6.29 (159.7)	.35 (8.8)	1.02 (26.0)	.39 (10.0)	4.625 (117.5)	.433 (11.0)	-	1.67 (42.4)	3.602 (91.5)	3.228 (82.0)	.31 (7.8)	3.82 (97.0)
LWD-15	4.32 (109.7)	.31 (7.9)	.98 (25.0)	.15 (3.8)	1.812 (46.0)	.437 (11.0)	1.03 (26.1)	.15 (3.8)	3.890 (98.8)	1.988 (50.5)	.21 (5.3)	2.36 (59.9)
LWD-30	5.75 (146.0)	.48 (12.1)	.98 (25.0)	1.37 (34.9)	3.937 (99.9)	.312 (7.9)	1.03 (26.1)	.28 (7.1)	5.437 (138.0)	.906 (23.0)	1.29 (32.7)	2.36 (59.9)
LWD-50	6.29 (159.7)	.35 (8.8)	.98 (25.0)	.39 (9.9)	4.625 (117.4)	.437 (11.0)	1.03 (26.1)	1.67 (42.4)	5.437 (138.0)	3.234 (82.1)	.31 (7.8)	3.81 (96.7)

WEIGHT:

MODEL	LBS
LWT-15	.50
LWT-30	.70
LWT-50	1.00
LWD-15	.50
LWD-30	.70
LWD-50	1.00

1. DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS IN ( ) ARE IN MM.
2. 4x M3 TAPPED HOLES FOR CUSTOMER MTG.
   SCREWS MUST NOT PROTRUDE INTO P.S. BY MORE THAN .15 (4) MAX.

LWT/LWD

Other Lambda Industrial Products

HWS	15W-1500W Single output
ZWQ	80W-170W Quad output
ZP	40W-60W Single, dual & triple output
SC40 & SC60	40W-80W Single & triple output, low cost

For Additional Information, please visit
www.lambdapower.com/products/lw-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A7: Feb 2007

LZSa Series

Single Output Industrial Power Supplies

- 5 Year Warranty
- -40°C to +71°C Operation
- MIL-STD-810E Vibration / Shock
- Input transient protected
- UL508, SEMIF47, Factory Mutual (Class 1, Division 2)

RoHS

Key Market Segments & Applications

Factory Automation
Process & Controls
Harsh Environments

Features and Benefits

Feature	Benefit
◆ Rugged mechanical design	◆ High reliability in harsh conditions
◆ Superior thermal design	◆ Longer life even at 71°C operation
◆ Wide range adjustment of output	◆ Reduces need for custom outputs
◆ Input voltage transient protected	◆ Reduced system filtering

Specifications

ITEMS / MODELS		LZSa500	LZSa1000	LZSa1500
Input Voltage (47-440Hz)*	-	85 - 265VAC (1500W: see output rating below 180VAC),100-400VDC		
Inrush Current (110 / 220VAC)	A	20 / 40A	40 / 80A	
Power Factor	-	EN61000-3-2 Class A		
Efficiency (typical)	%	84%		
Ripple & Noise	-	75mV Pk-Pk	75mV Pk-Pk	75mV Pk-Pk
Line Regulation	%	0.1%		
Load Regulation	%	0.1%		
Transient Response	-	±1% deviation, recovering to ±0.2% in <1.25ms (25% load change)		
Overcurrent Protection	-	110 - 130%		
Overvoltage Protection	V	User adjustable from front panel		
Thermal Protection	-	Internal thermostat. Recycle AC to reset		
Hold Up Time at 110VAC	ms	20ms Hold Up, 20ms Ride Through		
Remote Sense	-	Compensates for a total of 1V cable drop		
Remote Adjust	-	Using front panel potentiometer, Resistance (1k/V), or Voltage (1V/V)		
Remote On / Off	-	TTL compatible, active high		
Signals	-	Optocoupled transistor for AC Fail, DC Good, Inverter OK. 200kHz sync signal (Ref-sense)		
Indicators	-	Green LED indicates output good, red LED indicates overvoltage or over temperature		
Parallel Connection	-	Single wire current share		
Operating Temperature	°C	-40°~+71°C, derate linearly to 60% load from 60°C~70°C (20 min warm up period needed for <-30°C)		
Storage Temperature	°C	-40° to +85°C		
Temperature Coefficient	-	0.01%/°C		
Humidity (non condensing)	%RH	10 - 90%RH		
Cooling	-	Internal fan		
Withstand Voltage	-	Input - Ground 2,121VDC, Input - Output 4,242VDC, Output - Ground 500VDC		
Vibration	-	MIL-STD-810E, Method 516.4 Proc. I, II, IV, VI		
Shock	-	MIL-STD-810E, Method 514.4, Category 1, 9		
Safety Agency Approvals	-	UL60950-1, UL508, EN60950-1, FM 3600, 3611, 3810, & CE Mark. SEMIF47(>100VAC)		
Leakage current	uA	<500uA at 265VAC, 60Hz		
Emissions	-	EN55022/EN55011 Class B, EN61000-3-3		
Immunity	-	EN61000-4-2, -3, -4, -5, -6, -8, -11. IEEE C62.41 (6kV/30 Ohm, Criteria A)		
Altitude	m	3,000m operating, 12,000m non operating		
Weight	lbs	6.5	8.1	
Size (WxHxD)(w/o bus bars)	ins	4.25 x 4.75 x 10.25	5.62 x 4.75 x 10.5	
Warranty	yrs	Five Years		

Notes: (Consult Installation Manual for detailed specifications, test methods and application notes) * Reduced power factor above 63Hz

LZSa Series

Output Ratings

Model	Nominal Voltage (V)	Adjustment Range (V)	Maximum Current (A)	Maximum Power (W)
LZSa500-3	24	18 - 29.4	21	504
LZSa1000-2	12	10 - 15.75	84	1008
LZSa1000-3	24	18 - 29.4	42	1008
LZSa1500-3	24	18 - 29.4	63	1512[1]

Note (1) 1512W @ 180-265VAC
1200W @ 120VAC
1104W @ 100VAC
1008W @ 85VAC

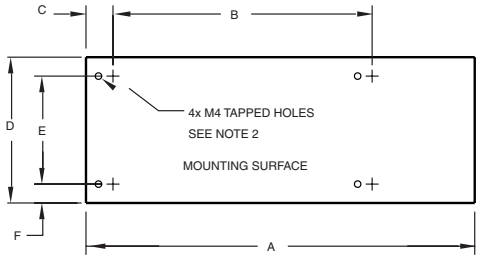
Other Lambda Industrial Products

HWS	15W to 1500W Single Output
DLP, DPP	15W to 480W Single Output

For Additional Information, please visit
www.lambdapower.com/products/lzs-series.htm

Outline Drawings

SIDE VIEW



BOTTOM VIEW

DIMENSIONS:

MODEL	A	B	C	D	E	F
LZSa500	10.25 (260.3)	6.500 (165.1)	.62 (15.8)	4.25 (107.9)	3.000 (76.2)	.62 (15.8)
LZSa1000/1500	10.50 (266.7)	8.500 (215.9)	.75 (19.0)	5.62 (142.8)	3.500 (88.9)	1.06 (26.9)

NOTE:
1. DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS ( ) ARE IN MM.
2. 4 x M4 TAPPED HOLES FOR CUSTOMER MTG. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN .25 (6.3).
3. CUSTOMER MUST PROVIDE CLEARANCE AROUND VENT HOLES TO ALLOW FOR AIR FLOW.

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A5: Jul 2007

MTW Series

15W to 60W Low Profile Triple Output Power Supplies

Manufactured by TDK
TDK-Lambda is a collaborative product brand between TDK and the Lambda group.

- 26mm height
- 3 year Warranty
- Peak Load capable
- Light weight
- Output 1 isolated from outputs 2 & 3

RoHS

Key Market Segments & Applications

Factory Automation	Test & Measurement
Automated Service	Portable Equipment

Features & Benefits

Feature	Benefit
Low Profile	Assists System Integration
Three Year Warranty	Low Cost of Ownership
Output 1 is isolated from outputs 2 & 3	Outputs V2 & V3 can be connected in series

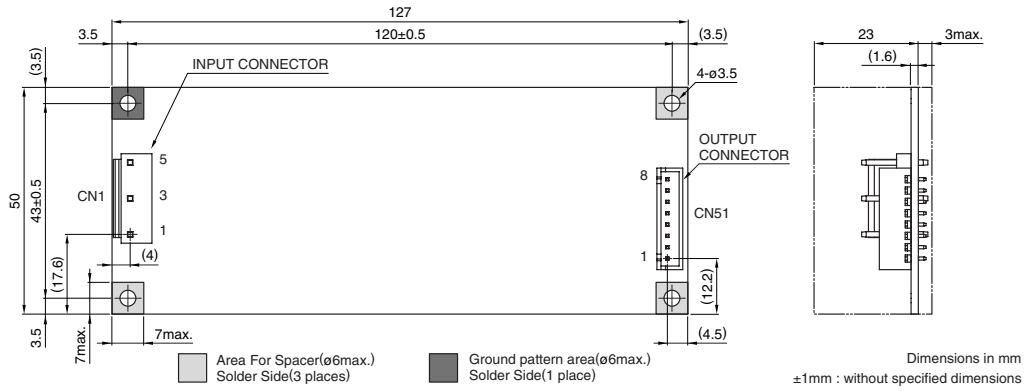
Specifications

ITEMS \ MODELS		MTW15-51212 MTW15-51515	MTW30-51212 MTW30-51515	MTW60-51212 MTW60-51515
Input Voltage Range	V	85 - 265VAC (47 - 440Hz)		
Input Current Typ (1)	A	0.42 / 0.25	0.8 / 0.4	1.4 / 0.8
Inrush Current (1)	A	25 / 50	20 / 40	20 / 40
Leakage Current (240VAC, 60Hz)	mA	0.75mA Max		
Max Output Power	W	16 17.5	30 33	60 62.5
Efficiency (Typ)	%	71	76	76
Hold Up Time (1)	ms	20 / 150	20 / 140	10 / 20
Output Voltage Adjustment	-	Fixed		
Overcurrent Protection	-	Yes, automatic recovery. Hiccup style on MTW30 & 60		
Overvoltage Protection	V	V1: Zener Clamp	V1: Zener Clamp	V1 & V2: Zener Clamp
Operating Temperature	-	-20°C start up. -10 to +60°C, derating linearily to 70% load above 50°C		
Storage Temperature	-	-30 to +75°C		
Humidity (Non condensing)	-	10 - 90%RH (Operating & storage) at 35°C		
Cooling	-	Convection		
Withstand Voltage	-	Input to ground 2kVAC, Input to output 3kVAC, Output to ground 500VAC		
Vibration (non operating)	-	5 - 10Hz: 10mm amplitude, 10 - 200Hz: 2G (19.6m/s^2)10m sweep time, 3 axis, 1 hour each		
Shock	-	Acceleration: 60G (588m/s^2) Half sine wave, 6 - 16ms pulse duration, 3x each direction		
Safety Agency Approvals	-	UL60950-1, CSA C22.2 No 60950-1 (C-UL), EN60950-1		
Immunity	-	EN61000-4-2 (Lv 4), -3, -4 (Lv 3), -5 (Lv 4), -6 (Lv 3), -8 (Lv 4), -11		
Conducted EMI	-	FCC-Class B, EN55011-B, EN55022-B		
Weight (Typ)	g	150	210	330
Size (WxHxL)	mm	50 x 26 x 127	65 x 26 x 140	83 x 26 x 185
Warranty	yrs	Three Years		

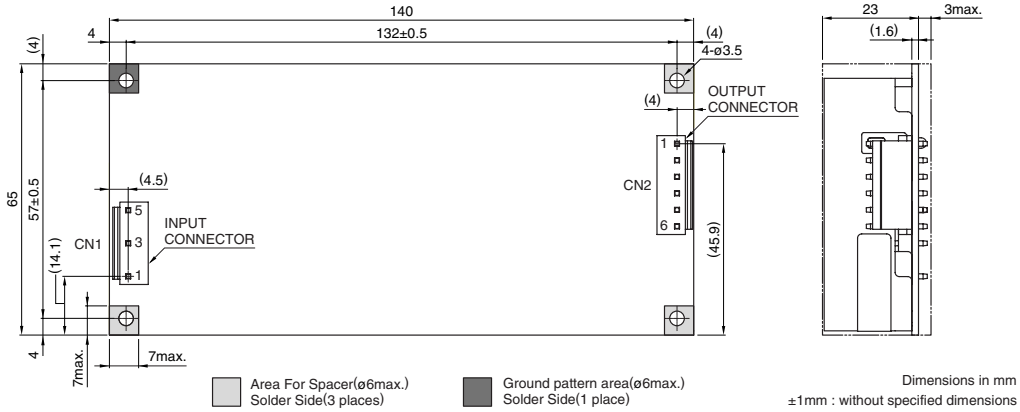
Notes:
(1) 100/240VAC
(2) Output V1 is isolated from outputs V2 & V3

MTW Series

Outline Drawing (MTW15)



Outline Drawing (MTW30)



Model Selector

Model	Output	Voltage (V)	Regulation	Minimum Current (A)	Maximum Current (A)	Peak Current (A)	Ripple & Noise (mV)
MTW15-51212	V1	5V	4.75 - 5.25V	0	2.0	3.0	120
	V2	12V	11.4 - 12.6V	0	0.3	0.6	150
	V3	-12V	11.4 - 12.6V	0	0.2	0.3	150
MTW15-51515	V1	5V	4.75 - 5.25V	0	2.0	3.0	120
	V2	15V	14.4 - 15.6V	0	0.3	0.6	150
	V3	-15V	14.4 - 15.6V	0	0.2	0.3	150
MTW30-51212	V1	5V	4.9 - 5.3V	0	3	4.5	120
	V2	12V	11.4 - 12.6V	0	1.2	2.0	150
	V3	-12V	11.4 - 12.6V	0	0.3	0.45	150
MTW30-51515	V1	5V	4.9 - 5.3V	0	3	4.5	120
	V2	15V	14.25 - 15.75V	0	0.8	2.0	150
	V3	-15V	14.25 - 15.75V	0	0.3	0.45	150
MTW60-51212	V1	5V	4.9 - 5.3V	0	5.0	7.0	120
	V2	12V	11.4 - 12.6V	0	2.5	3.5	150
	V3	-12V	11.4 - 12.6V	0	0.5	0.7	150
MTW60-51515	V1	5V	4.9 - 5.3V	0	5.0	7.0	120
	V2	15V	14.25 - 15.75V	0	2.0	3.5	150
	V3	-15V	14.25 - 15.75V	0	0.5	0.7	150

Mating Connectors

	Model	Input	Output
Connectors JST	MTW15	B3P5-VH-B	B8B-XH-2
	MTW30	B3P5-VH-B	B6P-VH-B
	MTW60	B3P5-VH-B	B8P-VH-B

Other Lambda Industrial Products

ZWS	5 to 240W Single output
SC40 & SC60	50 to 80W 3x5" footprint
ZP	40 to 60W, 2x4" footprint

For Additional Information, please visit
www.lambdapower.com/products/mtw-series.htm

NN Series

High Reliability 15 to 90W Linear Power Supplies

- Single and Dual Outputs
- Excellent Line & Load Regulation
- Remote Programming and Current Share (NNS)
- Front Panel Voltage Taps
- Thermal Protection
- Five Year Warranty

RoHS

Key Market Segments & Applications

Test and Measurement
Low noise applications
Industrial

NN Features and Benefits

Feature	Benefit
◆ Five Year Warranty	◆ Lower Cost of Ownership
◆ Low Output Ripple	◆ Reduced system interference
◆ Fully Featured	◆ Greater System Flexibility
◆ Operation from -20 to +71C Ambient	◆ Easier system integration

Specifications

ITEMS / MODELS		NNS15	NNS30	NNS50	NND15	NND30
AC Input	VAC	85~115, 98~132, 170~230, 195~265VAC (Front panel selectable)				
Input Frequency	Hz	47~440Hz				
EMI	-	FCC Class B, VDE0871 Level B				
Output Adjustment	-	±10%				
Remote Sense	-	Yes	Yes	Yes	None	
Remote Programming	-	1000 Ohm/Volt			None	
Parallel Operation	-	Via PC Terminal			None	
Output Indicator	-	LED = On				
Line Regulation	%	0.01%				
Load Regulation	%	0.03%				
Cross Regulation	%	Not applicable			0.03%	
Ripple and Noise	mV	1mV rms, 3mV peak to peak				
Overcurrent Protection	%	105 to 130%				
Overvoltage Protection	VDC	5V: 6 ~ 7.2V, 12V: 14.5 ~ 17.2V, 15V: 18.1 ~ 21.5V, 24V: 29 ~ 34.3V				
Cooling	-	Convection				
Operating Temp. Range	°C	-20°C: 60%, 0 to 50°C: 100%, 60°C: 60%, 71°C: 40%				
Storage Temperature	°C	-40 to +85°C				
Temperature coefficient	%	±0.02% per °C				
Humidity (non condensing)	%RH	Operating: 20 - 95% RH, Non operating: 10 - 95% RH				
Vibration	-	10-55Hz Amplitude (sweep for 1 min), <2G X, Y, Z 1 hour each				
Shock (in package)	-	<20G				
Safety Agency Approval	-	UL60950-1, CSA60950-1, EN60950-1, CE Mark				
Withstand Voltage	-	Input to Output: 3.75kVAC, Input to Chassis: 2.5kVAC for 1 minute				
Isolation Resistance	-	>100M at 500VDC @ 25C & 70%RH for 1 minute				
Weight	g	1750	2930	4200	1750	2750
Size WxHxD	mm	60x124x124	80x124x178	97x113x200	60x113.5x150	80x113.5x164
Warranty	y	Five years				

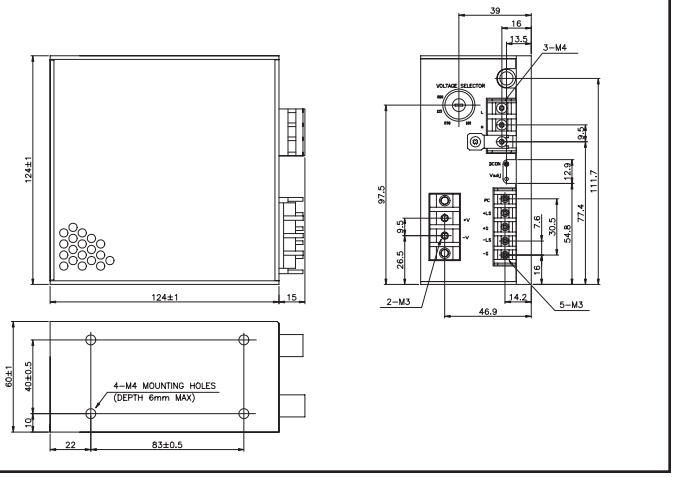
Note: See Installation Manual for full details, test methods of parameters and application notes

NN Series

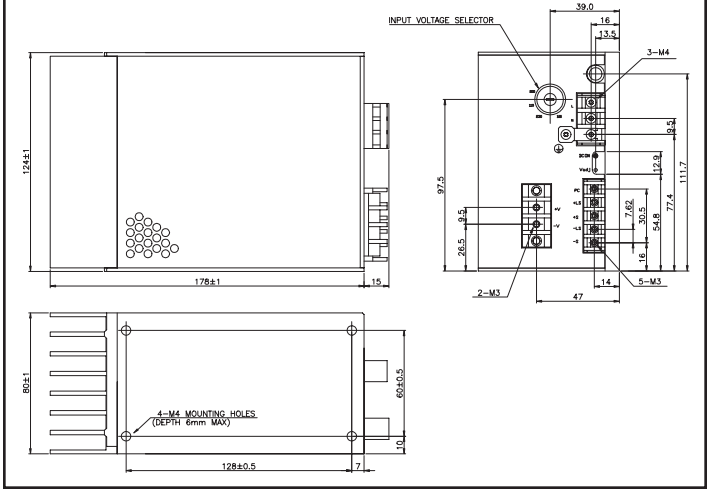
Model Selector

	Model	O/P	O/P(V)	Max Cur.(A)	Max Pwr(W)	Eff. (%)
Single Output	NNS155	V1	5	3.0	15.0	35
	NNS305	V1	5	6.0	30.0	35
	NNS505	V1	5	10.0	50.0	42
	NNS1512	V1	12	1.7	20.4	45
	NNS3012	V1	12	4.0	48.0	45
	NNS5012	V1	12	6.5	78.0	51
	NNS1515	V1	15	1.4	21.0	46
	NNS3015	V1	15	3.4	51.0	46
	NNS5015	V1	15	5.5	82.5	53
	NNS1524	V1	24	0.9	21.6	50
	NNS3024	V1	24	2.3	55.2	50
	NNS5024	V1	24	3.8	91.2	56
Dual Output	NND15-1212	V1	+12	0.75	18.0	45
		V2	-12	0.75		
	NND30-1212	V1	+12	1.6	38.4	45
		V2	-12	1.6		
	NND15-1515	V1	+15	0.6	18.0	45
		V2	-15	0.6		
	NND30-1515	V1	+15	1.3	39.0	45
		V2	-15	1.3		

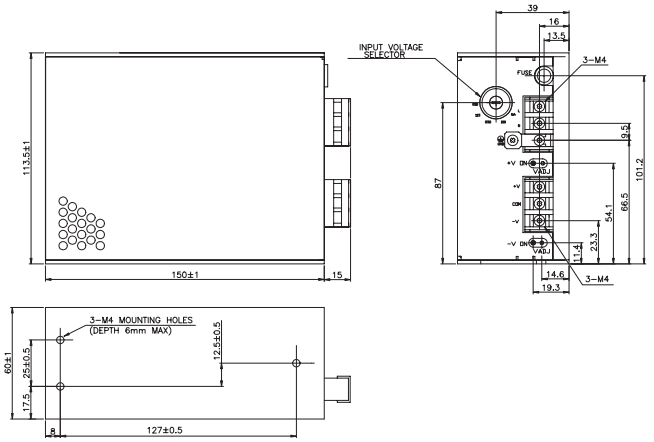
NNS15 Outline Drawing



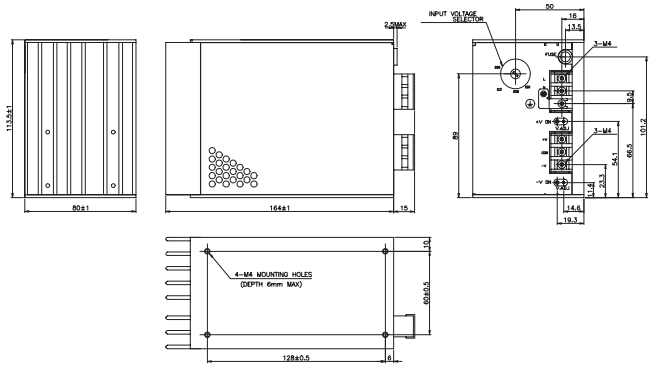
NNS30 Outline Drawing



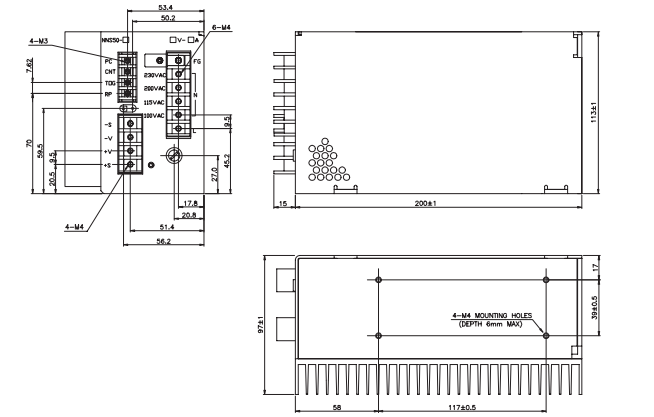
NND15 Outline Drawing



NND30 Outline Drawing



NNS50 Outline Drawing



Other Lambda Industrial Products

H	15-115W low cost linear, single to triple output
HWS	15 to 1500W Single output, universal input switching
ZWS	5 to150W single output, universal input (switching)
VSB & VSC	10 to150W single output, 115VAC input (switching)

For Additional Information, please visit
www.lambdapower.com/products/nn-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A4: Sep 2007

NV175 Series

3" x 5" 175-200W Power Supplies

- 1-5 Outputs
- Up to 90% Efficient
- Active Power Factor Correction
- Universal Input (90 - 264VAC)
- No Minimum Loads
- Medical Approvals (Basic Insulation Input-Output)

RoHS

Key Market Segments & Applications

Broadcast	Test & Measurement
Medical	Industrial Computing and Routers

Features and Benefits

Feature	Benefit
◆ High Efficiency	◆ Less heat dissipated in system
◆ Low Profile	◆ Fits in 1U enclosures
◆ Power Factor Corrected	◆ Supports Global Use
◆ No Minimum Loads	◆ Ease of Use

Specifications

ITEMS / MODEL		NV175
Input Voltage range	-	90 - 264VAC (47 - 63Hz, 440Hz with reduced PFC)
Inrush Current	A	<40A at 25°C and 264VAC input, Cold Start
Power Factor Harmonics	-	EN61000-3-2 Compliant (0.97 typical)
Regulation Total	-	1%; Including Line (for 90-264VAC input change), Load (for 0-100% load change) and Cross (for 0-100% load change on any other output) regulation
Ripple & Noise	mV	1% or 50mV (Which ever is greater)
Efficiency	-	Up to 90%, configuration dependant
Minimum Load	A	None
Overcurrent Protection	-	>105%
Overvoltage Protection	V	CH1 & CH2, 120-130%, Cycle AC line to reset
Overtemperature Protection	-	Yes
Hold Up Time (Typ)	ms	>16ms at 90VAC Input
Leakage Current (max)	µA	123µA 120VAC 60Hz, 257µA 240VAC 60Hz, <300µA 264VAC 63Hz (Type Test results)
Remote Sense	-	On Outputs CH1 & CH2, 0.5V compensation maximum
DC Good	-	CH1 Only, High on Fail (90% of nominal ±5%)
Remote On/Off (Specify N option)	-	TTL logic level high (or open circuit on -N3 option) will inhibit all outputs (except Standby)
Operating Temperature (1)(7)	-	0 to +70°C. Derate linearily to 50% load from 50°C to 70°C
Storage Temperature	-	-40 to +85°C
Humidity (non condensing)	-	5 - 95% RH
Cooling	-	Forced air, 2m/s from input to output
Isolation (4)	-	Input to Ground 2.3kVDC, Input to Output 4.3kVDC, Output to Ground 200VDC
Vibration (non operating)	-	Conforms to MIL-STD-810E, Method 516.5, Pro I, IV, VI; EN60068-2-6, IEC68-2-6
Shock	-	Conforms to MIL-STD-810E/F, Method 514.4, Pro I, Cat 1,9; EN60068-2-27, EN60068-2-47, IEC68-2-47, IEC68-2-47, JIS C0041-1987
Safety Agency Approvals	-	UL60950-1, CSA22.2 No 60950-1, EN60950-1, IEC60950-1, CE for LVD, IEC60601-1, EN60601-1, EN61010-1, IEC61010-1
Immunity	-	EN61000-6-2:2001, EN61000-4-2, -3, -4, -5, -6, -8, -11
Conducted Emissions and Flicker	-	EN55022 Class B (per CISPR.22), EN61000-3-3
Radiated Emissions (2)	-	EN55022 Class A (per CISPR.22)
Weight (Typ)	g	250g
Size (without cover) (3)	in	3" x 5" x 1.25"; N option version 3.7" x 5" x 1.25"
Warranty	yrs	Three Years

(1) -20°C cold start
(2) See application note for Class B
See NV175-M for reinforced medical insulation
(3) Including underside component leads
(4) Input-Output: Reinforced IEC60950-1, Basic IEC 60601-1.

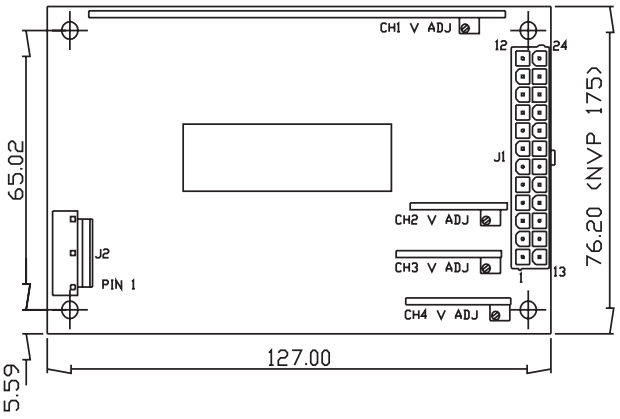
NV175 Series

Stocked Models Quick Selector

Model	CH1 (5)	CH2 (5)	CH3	CH4	CH5 Stand By (6)	Global Option Type
NV1-1T000	12V/15A	-	-	-	-	-
NV1-1G000	24V/7.5A	-	-	-	-	-
NV1-453TT	+5V/25A	+3.3V/15A	+12V/5A	-12V/1A	-	-
NV1-453FF	+5V/25A	+3.3V/15A	+15V/5A	-15V/1A	-	-
NV1-4G5TT	+24V/7.5A	+5V/8A	+12V/5A	-12V/1A	-	-
NV1-4G5FF	+24V/7.5A	+5V/8A	+15V/5A	-15V/1A	-	-
NV1-453TT-N3	+5V/25A	+3.3V/15A	+12V/5A	-12V/1A	5V/2A	N3 (ATX)
NV1-453FF-N3	+5V/25A	+3.3V/15A	+15V/5A	-15V/1A	5V/2A	N3 (ATX)
NV1-4G5TT-N3	+24V/7.5A	+5V/8A	+12V/5A	-12V/1A	5V/2A	N3 (ATX)
NV1-4G5FF-N3	+24V/7.5A	+5V/8A	+15V/5A	-15V/1A	5V/2A	N3 (ATX)

Notes:
(5) Maximum combined current from CH1 + CH2 = 25A
5V CH1 models are limited to 175W max. All others 180W, 200Wpk 5 mins
(6) CH5 is always on regardless of inhbit status. Peak rated at 2.5A, floating output
(7) Convection cooled maximum ratings: CH1: 55W, Ch2: 8.25W, Ch3: 9W, CH4: 3W, 75.25W total. 0°C - 40°C temperature range
(8) 12 - 12.5V if 24V CH3 is fitted.
(9) 14.5 - 15.5V if 24V CH3 is fitted.
(10) 24 - 24.5V if 5V CH2 is fitted.
24 - 26V if 24V CH3 is fitted

Outline Drawing



See the website for detailed datasheet and outline drawing.

Built to Order Model Selector

CH1	CH1(5) Code	Adjust. Range	CH2(5)	CH2 Code	Adjust. Range	CH3	CH3 Code	Adjust. Range	CH4	CH4 Code	Adjust. Range
+5V / 25A	5	5 - 5.5V	+1.8V / 15A	1	0.9 - 3.3V				-12V / 1A	T	Fixed
			+2.7V / 15A	2	2.5 - 3.3V				-15V / 1A	F	Fixed
			+3.3V / 15A	3	2.5 - 3.3V				-3.3V / 2A	3H	Fixed
			No output	0	-				-5V / 2A	5H	Fixed
						+12V / 5A	T	12 - 15V	-12V / 2A	TH	Fixed
						+15V / 5A	F	12 - 15V	-15V / 2A	FH	Fixed
						+24V / 2.5A	G	18 - 24V	Fan Supply only	0H	Fixed
+12V / 15A	T	12 - 15V (7)	+5V / 10A	5	3.3 - 5.5V	No output	0	-	No output	0	
+15V / 12A	F	12 - 15V (8)	No output	0	-						
									Add "P" to code for positive polarity output	Add "P" to code for positive polarity output	
+24V / 7.5A	G	24 - 28V (9)	+5V / 8A	5	3.3 - 5.5V						
			No output	0	-						

How to Create a Model Number

NV1-	Enter number of outputs	CH1 Code	CH2 Code	CH3 Code	CH4 Code	Global Option	Case Option

No Option	Blank	Blank	No Case
AC Fail, Remote On/Off, 5V/2A Standby, CH1 DC Good	N	U	U Chassis
AC Fail, Remote On/Off, 13.5V/1A Standby, CH1 DC Good	N2	C	U Chassis with Cover
ATX AC Fail+Remote On/Off, 5V/2A Standby, CH1 DC Good	N3	F	U Chassis, Cover and Fan*
ATX AC Fail+Remote On/Off, 12V/1A Standby, CH1 DC Good	N4	I	U Chassis, Cover and Fan* and IEC inlet

* A high output CH4 (3H, 5H, TH, FH) or fan supply 0H must be selected to provide fan option.

Example

NV1 3 G 5 0 3HP N C

Description: Triple output, 24V/7.5A, 5V/8A, 3.3V/2A, Global option N, U Chassis with cover.

Mating Parts (Molex)

CONN	Housing	Pins
J1	39-01-2245	44476-3112
J2	09-50-8051	08-52-0113

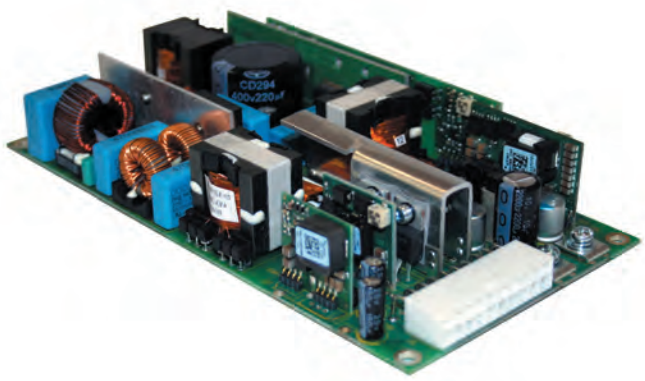
Other Lambda Industrial Products

NV350	350W 1U Modular Power Supply 1-6 outputs
SC40/60	40 to 80W single, dual & triple 3x5 footprint
ZWS/ZWSPAF	5 to 240W single output power supplies

For Additional Information, please visit
www.lambdapower.com/products/nv-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision B8: Aug 2007

NV300 Series



3.75" x 7.25" 300W Power Supplies

- Up to 90% Efficient
- Active Power Factor Correction
- Universal Input (90 - 265VAC)
- Up to 5 Outputs (including standby)
- No Minimum Loads

RoHS

Key Market Segments & Applications

Industrial Computing and Routers	Broadcast
Test & Measurement	Medical

Features and Benefits

Feature	Benefit
◆ High Efficiency	◆ Less heat dissipated in system
◆ Low Profile	◆ Fits in 1U enclosures
◆ No Minimum Loads	◆ Ease of Use

Specifications

ITEMS / MODEL		NV300
Input Voltage range	-	90 - 264VAC (45-63Hz, 440Hz with reduced PFC)120 - 350VDC
Inrush Current	A	<15A at 25C and 264VAC input, Cold Start
Power Factor Harmonics	-	EN61000-3-2 Class A Compliant, 0.97 typical
Total Regulation	-	CH1-3: 1.5%, CH4: 2.5%
Ripple & Noise	mV	1% or 50mV (whichever is the greater)
Efficiency	-	Up to 90%, configuration dependant
Minimum Load	A	None
Overcurrent Protection	-	Yes
Overvoltage Protection	V	Yes, see application notes for details
Overtemperature Protection	-	Yes
Hold Up Time (Typ)	ms	>16ms at 90VAC Input
Leakage Current (max)	µA	123µA 120VAC, 60Hz; 257µA 240VAC 60Hz, <300µA 264VAC, 63Hz (Type Test result)
Remote Sense	-	On Outputs CH1 & CH2, 0.5V Maximum compensation
DC Good	-	Logic low signal indicates CH1 is within regulation
Remote On//Off	-	TTL logic level high (or open) will inhibit all outputs (except standby)
Operating Temperature	-	0 to +70°C. Derate linearily to 50% load from 50°C to 70°C(1)
Storage Temperature	-	-40 to +85°C
Humidity (non condensing)	-	5 - 95% RH
Cooling	-	Forced air 2m/s from input to output unless internal, temperature controlled, fan is specified
Isolation	-	Input to Ground 2.25kVDC, Input to Output 4.3kVDC, Output to Ground 200VDC
Vibration (non operating)	-	Conforms to MIL-STD-810E, Method 516.5, Pro I, IV, VI; EN60068-2-6; IEC68-2-6
Shock	-	Conforms to MIL-STD-810E/F, Method 514.4, Pro I, Cat 1,9; EN60068-2-27, -2-47, IEC68-2-27, -2-47, JIS C0041-1987
Safety Agency Approvals	-	UL, CSA, EN and IEC60950-1; EN and IEC61010-1; UL, EN and IEC60601-1; CE for LVD (Contact factory for agency status)
Immunity	-	EN50082-2: EN61000-4-2, -3, -4, -5, -6, -8, -11, -14
Conducted Emissions and Flicker		EN55011, EN55022 Class B (per CISPR.11/22), EN61000-3-3
Radiated Emissions	-	EN55011, EN55022 Class B (per CISPR.11/22)
Weight (Typ)	g	470
Size (pcb version) (2)	in	3.75 x 7.25 x 1.34 (4.72 x 7.25 x 1.34 for N option version)
Warranty	yr	Three Years

Notes:
(1) -20oC cold start
(2) Including underside component leads

NV300 Series

Stocked Models Quick Selector

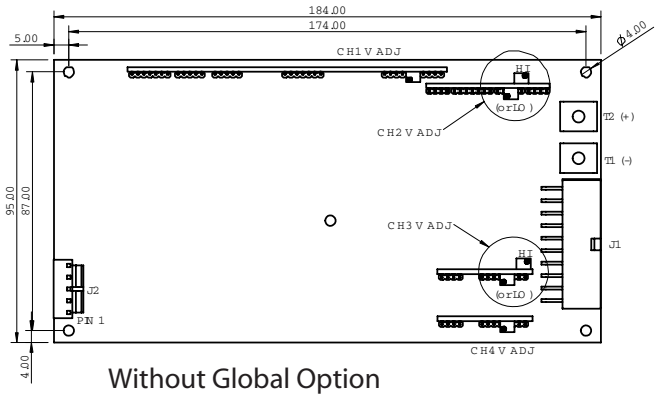
Model	CH1 (4)	CH2 (4)	CH3	CH4	CH5 Stand By (3)	Global Option Type
NVA3-350TT	+5V/40A	-	+12V/5A	-12V/1A	-	-
NVA3-350FF	+5V/40A	-	+15V/5A	-15V/1A	-	-
NVA3-453TT	+5V/40A	+3.3V/15A	+12V/5A	-12V/1A	-	-
NVA3-453FF	+5V/40A	+3.3V/15A	+15V/5A	-15V/1A	-	-
NVA3-350TT-N3	+5V/40A	-	+12V/5A	-12V/1A	+5V/2A	ATX (-N3)
NVA3-350FF-N3	+5V/40A	-	+15V/5A	-15V/1A	+5V/2A	ATX (-N3)
NVA3-453TT-N3	+5V/40A	+3.3V/15A	+12V/5A	-12V/1A	+5V/2A	ATX (-N3)
NVA3-453FF-N3	+5V/40A	+3.3V/15A	+15V/5A	-15V/1A	+5V/2A	ATX (-N3)

Notes:
(3) CH5 is a standby Voltage (always On)

Other Lambda Industrial Products

NV175, 350, 700	175W to 700W 1U power supplies
HWS	15 to 1500W single output power supplies

Outline Drawing



Without Global Option

See the website for detailed datasheet and outline drawing.

Built to Order Model Selector

CH1	CH1 Code	Adjust. Range(5)	CH2	CH2 Code	Adjust. Range	CH3	CH3 Code	Adjust. Range	CH4(2)	CH4 Code(2)	Adjust. Range
+5V / 40A(1)	5	5 - 5.5V	+1.8V / 15A	1	0.9 - 3.8V	+12V / 5A(4)	T	12 - 15V	-3.3V / 2A(3)	3H	Fixed
			+2.7V / 15A	2	2.5 - 3.8V	+12V / 8A(6)	TH	12 - 15V	-5V / 2A(3)	5H	Fixed
			+3.3V / 15A	3	2.5 - 3.8V	+15V / 4A(4)	F	12 - 15V	-12V / 1A	T	Fixed
			+2.7V / 24A	2H	2.5 - 3.8V	+15V / 6.4A(6)	FH	12 - 15V	-12V / 2A(3)	TH	Fixed
			+3.3V / 24A	3H	2.5 - 3.8V	+24V / 2.5A	G	18 - 24V	-15V / 1A	F	Fixed
			Omit	0	-	Omit	0	-	-15V / 2A(3)	FH	Fixed
									Fan supply only	0H	-
									Omit	0	-

How to Create a Model Number

NVA3-	Enter number of outputs	CH1 Code	CH2 Code	CH3 Code	CH4 Code	Global Option	Case Option

Other output voltages are available, contact factory.

	Global Option	Case Option
No option	Blank	Blank
AC Fail, CH1 DC Good, Remote On/Off, +5V / 2A standby	-N3	U
AC Fail, CH1 DC Good, Remote On/Off, +12V / 1A standby	-N4	C
		F
		I

No case	
U Chassis	
U Chassis with Cover	
End fan, U chassis & cover(7)	
IEC input, end fan, U chassis & cover(7)	

Note:
(1) Maximum combined current from CHs 1 & 2 = 40A
(2) Add 'P' suffix to code for positive output (ex. 3HP)
(3) 1.5A maximum if used with "-F" option
(4) 60W maximum output power
(5) Maximum output voltage (includes remote sense)
(6) 96W maximum output power
(7) CH4 code of 3H, 5H, TH, FH or 0H must be used

Example

NVA3-353G0H-N3F

Description: Triple output, 5V/40A, 3.3V/15A, 24V/2.5A, Global Option (N3), cover & fan (F).

For Additional Information, please visit
www.lambdapower.com/products/nv-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A1: Jan 2007

LAMBDA NV350/700 Series

350W to 960W Modular Power Supplies

RoHS

- 1U Form Factor
- Up to 90% Efficient
- Active Power Factor Correction
- Universal Input (90 - 264VAC)
- Up to 8 Outputs (6 for the NV350)
- No Minimum Loads
- Medical Approvals

Features and Benefits

Feature	Benefit
◆ High Efficiency	◆ Less heat dissipated in system
◆ Low Profile	◆ Fits in 1U enclosures
◆ Power Factor Corrected	◆ Supports Global Use
◆ No Minimum Loads	◆ Ease of Use

Specifications

ITEMS \ MODELS		NV350	NV700
Input Voltage range	VAC	90 - 264VAC (47 - 63Hz, 440Hz with reduced PFC)	
Inrush Current (25°C, Cold Start)	A	<15	<40
Power Factor Harmonics	-	EN61000-3-2 Compliant	
Line Regulation	-	< 0.1% for 90-264VAC input change	
Load Regulation (0-100% change)	-	B, BH Modules: < 1%, DB modules output 2: <2%, DA Modules: <3%	
Cross Regulation	-	< 0.1% for 100% load change on any output, (DA module CH1<0.2%, CH2<3%)	
Ripple & Noise	mV	1% or 50mV, whichever is greater	
Efficiency	-	Up to 90%, configuration dependant	
Minimum Load	A	None	
Overcurrent Protection	-	110 - 150%, hiccup mode (Primary limited)	
Overvoltage Protection	V	Yes	
Overtemperature Protection	-	Yes, recycle AC to reset	
Hold Up Time (Typ at 90VAC Input)	ms	>16ms (12ms for NV700 with >700W output power)	
Leakage Current (1)	µA	130µA 120VAC, 60Hz, 260µA 240VAC 60Hz	
Remote Sense	-	On B, BH and output 1 of DB Modules	
Module Good	-	Open collector, on indicates output is good (N/A on DA modules)	
Module Inhibit	-	TTL logic level high inhibits the module (both outputs on DB outputs)(2)	
AC Fail (Specify as option)	-	High on fail	
Operating Temperature	-	0 to +70°C. Derate linearily to 50% load from 50°C to 70°C(3)	
Storage Temperature	-	-40 to +85°C	
Humidity (non condensing)	-	5 - 95% RH	
Cooling	-	Internal fan or 1m/s with system supplied air (NV3 only)	
Isolation	-	Input to Ground 2.3kVDC, Input to Output 4.3kVDC, Output to ground 200VDC	
Vibration (non operating)	-	2G, 10-500Hz (sweep & endurance at resonance) in all 3 planes	
Shock	-	30G per IEC68-2-27	
Safety Agency Approvals	-	UL, CSA, EN, IEC60950-1, CE for LVD, EN, IEC60601-1, UL, EN, IEC 61010-1	
Immunity	-	EN50082-2: EN61000-4-2, -3, -4, -5, -6, -8, -11	
Conducted Emissions and Flicker	-	EN55011, EN55022 Class B (per CISPR.22), EN61000-3-3	
Radiated Emissions	-	EN55011, EN55022 Class B (per CISPR.22)(4)	
Weight (Typ)	g	800	1160
Size	in	1.6 x 3.75 x 10.8"	1.6 x 4.92 x 10.8
Warranty	yr	Three Years	

Notes:

(1) Worse case: <300µA 264VAC, 63Hz (normal condition, <500µA single fault condition)
(2) Output 2 remote on/off inhibits just Output 2 of DB module
(3) -20°C cold start, derate from 45C for NV7 when input voltage < 100VAC
(4) See application note for Class B

NV350/700 Series

1. Configuration Guide

You can create your own NV350 or NV700 configuration online at www.nv-power.com. This method checks your configuration and offers the optimum solution. Alternatively, you can do this manually by using the guide below. Calculate total output power to ensure power requirements within 350W or 960W, then select required Cooling, Connection and Controls/Signals from the following tables:

		A	B	C	D
		NV3	S	S	S	EN5V

Output Power	NV3	350W (250W with reverse air)
	NV7	960W (700W <150VAC input)
Cooling	S	Standard air - forward
	R	Reverse air[4]
	C	Customer air - no fan[1]
Input Connection	S	Screw
	I	IEC320[2]
Primary Option[3]	ES5V	AC good, PSU enable, 5V/2A standby
	ES12V	AC good, PSU enable, 12V/1A standby
	IS5V	AC good, PSU inhibit, 5V/2A standby
	IS12V	AC good, PSU inhibit, 12V/1A standby
	EN5V	AC good, PSU enable, 5V/2A standby, global module good
	EN12V	AC good, PSU enable, 12V/1A standby, global module good
	IN5V	AC good, PSU inhibit, 5V/2A standby, global module good
	IN12V	AC good, PSU inhibit, 12V/1A standby, global module good

1 - Thermocoupled sample recommended to ensure adequate cooling - consult sales
2 - Not with customer air cooling
3 - The Primary Option uses 1 slot
4 - Not with NV7

2. Output Section

Select Output Modules from the Module Tables below ensuring that no more that 6 slots (NV-350) or 8 slots (NV-700) in total are used.

Example - if you require 5.2V 40A :-
a) Select B as closest match for voltage & current and prefix with voltage eg 5.2B
b) Repeat for other outputs.

This will create a complete product description eg **NV3SSSES5V 5.2B 12/15DB** which represents a three output NV350 with Forward air cooling, Screw input terminals, 300µA Leakage, ac good, PSU enable and 5V/2A aux supply

Output 1 = 5.2V / 40A
Output 2 = 12V / 13A with screw terminals
Output 3 = 15V / 4A with screw terminals
Max 350W continuous output power

Contact Lambda to validate configuration or visit the NV webpage to validate part number. (www.nv-power.com)

Single Output Modules (2 Slots each)

Voltage Range	Current	Module Code
3.2 - 3.6V	40A	B
4.75 - 5.5V	40A(1)	B
12 - 15.5V	20A(2)	BH
24 - 28V	10A(3)	BH

Dual Output Module (Common 0V) (1 Slot)

Module Code = DA

Output 1	Output 2
+12V 3A	-12V 1A

(1) NV3: 5.2-5.5V, derate linearly from 40A to 36A
NV7: 5-5.5V, derate linearly from 40A to 36A
(2) NV3: 13.2-15.5V, derate linearly from 20A to 16.5A
NV7: 12.5-15.5V, derate linearly from 20A to 15.5A
(3) NV3: 25.7-28V, derate linearly from 10A to 8.5A
NV7: 24-28V, derate linearly from 10A to 8.5A
(4) 12.5-15.5V, derate linearly from 13A to 10A
(5) 25-28V, derate linearly from 7A to 6A

Dual Output Modules (2 Slots each)

Module Code = DB

Output 1		Output 2		
Voltage Range	Current	Voltage Range	Current	Max Power
3.2 - 3.6V	25A	3.3 - 5.5V	10A	55W
		7 - 15V	5A	60W
		24 - 32V	2A	50W
4.75 - 5.5V	25A	3.3 - 5.5V	10A	55W
		7 - 15V	5A	60W
		24 - 32V	2A	50W
12 - 15.5V	13A[4]	3.3 - 5.5V	10A	55W
		7 - 15V	5A	60W
		24 - 32V	2A	50W
24 - 28V	7A[5]	3.3 - 5.5V	10A	55W
		7 - 15V	5A	60W
		24 - 32V	2A	50W

For Additional Information, please visit
www.lambdapower.com/products/nv-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A7: Jan 2007

LAMBDA PFE300-700 Series

300 to 714W Full Brick AC-DC Power Supply

- Low profile, small size
- 100°C baseplate temperature
- High power density
- High Efficiency

RoHS

Features and Benefits

Feature	Benefit
◆ Low profile	◆ Assists system integration
◆ High Efficiency	◆ Easier to cool
◆ Power Factor Corrected (PFC)	◆ Supports Global Use
◆ Operation up to 100°C baseplate	◆ Operates in harsh environments

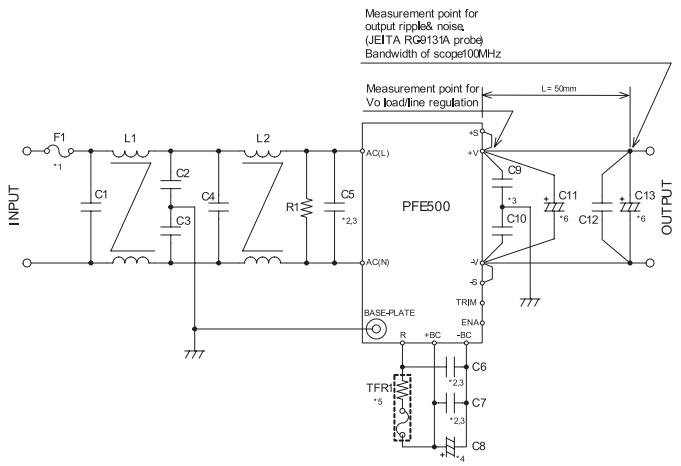
Specifications

ITEMS \ MODEL		PFE300-12 PFE500-12	PFE300-28 PFE500-28	PFE300-48 PFE500-48	PFE700-48
AC Input	VAC	85 to 265VAC, 47-63Hz			
Input Current (100/220VAC)	A	4.0 / 2.0 5.0 / 3.0	4.0 / 2.0 6.2 / 3.2	4.0 / 2.0 6.2 / 3.2	8.8 / 4.4
Inrush Current (100/200VAC)(1)	A	20 / 40 peak			
Power Factor		0.95 minimum			
Output Voltage (Nominal)	VDC	12V	28V	48V	51V
Output Voltage Setpoint Accuracy	-	±2%			±1V
Output Current	A	25 33	10.8 18	6.3 10.5	14
Output Power	W	300 396	302 504	302 504	714
Output Voltage adjustment	VDC	9.6 - 14.4V	22.4 - 33.6V	38.4 - 57.6V	Fixed
Ripple and Noise (1)	mV	120	280	480	4000
Line regulation	mV	48	56	96	-
Load regulation	mV	48	56	96	-
Total Regulation	V	-	-	-	50 - 57
Over Current Protection	%	105 - 140% (Automatic Recovery)			
Over Voltage Protection	-	125 - 145%			60 - 69.6V
Parallel Operation	-	Requires external circuitry			Yes
Power On Signal (ENA)	-	Open collector (10mA sink current). Low (on) when output is present			
Efficiency (200VAC typ)	%	83	86	86	89
Operating Baseplate Temperature	°C	-40 to +100°C (2) -40 to +85°C (2)	-40 to +100°C (2)		See derating curves
Storage Temperature	°C	-40 to +100°C			
Humidity (non condensing)	-	Operating: 20 - 95%RH, Non Operating: 10 - 95%RH			
Cooling	-	Conduction			
Withstand Voltage	-	Input to Output 3kVAC, Input to Baseplate 2.5kVAC, Output to Baseplate 1.5kVDC			
Isolation Resistance	-	Output to baseplate: 100M Ohm at 500VDC, 25oC ambient, 70%RH			
Vibration (non operating)	-	10-55Hz (1 min sweep), constant amplitude 0.825mm (max 49m/s^2), X, Y, Z 1 hour each			
Shock	-	196.1m/s^2			
Safety Agency Approvals		UL60950-1, CSA60950-1 (cUL), EN60950-1, CE mark (LVD)			
Weight	g	250			
Size (WxHxD)	mm(in)	61 x 12.7 x 116.8mm (2.4 x 0.5 x 4.6)			
Warranty	yrs	2 years			

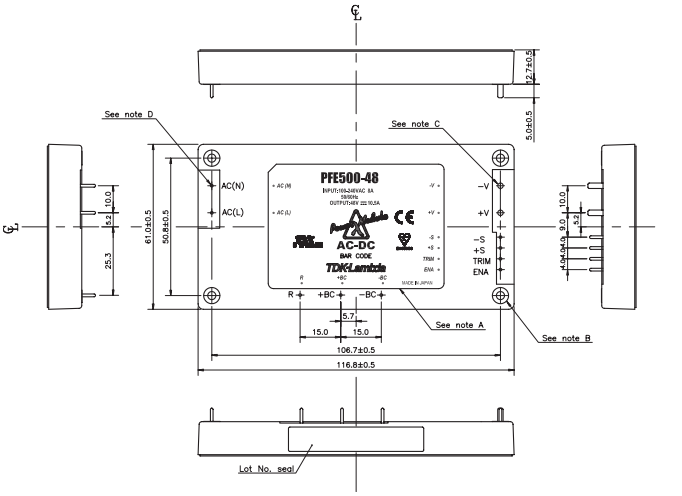
Notes: (Consult Installation Manual for detailed specifications, test methods and application notes)
1) External components are required, consult Application Notes
2) Full load, no derating required

LAMBDA PFE300-700 Series

PFE500 Basic connection



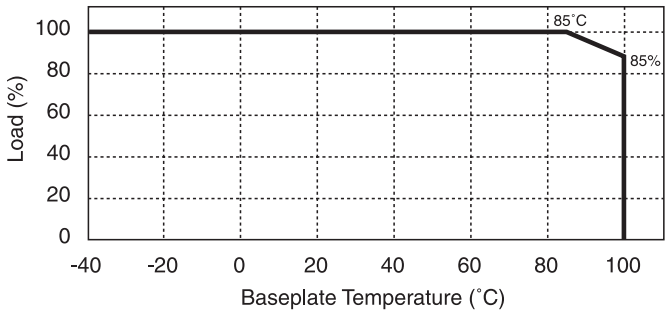
Outline Drawing

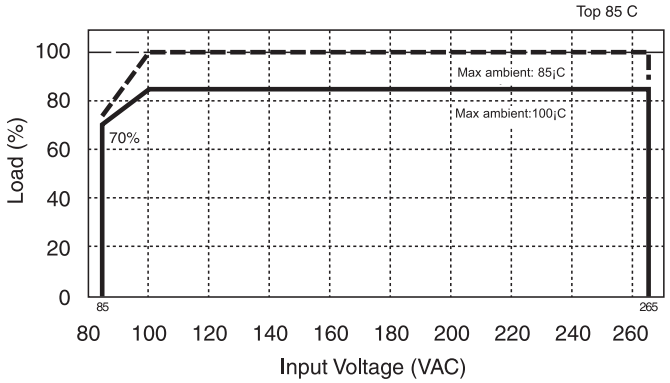


Heatsink Table

Heatsink	Size (mm)	Thermal Resistance
HAF-10L	116.8 x 25.4 x 61	2.2°C/W
HAF-15L	116.8 x 38.1 x 61	1.9°C/W
HAF-15T	116.8 x 38.1 x 61	1.5°C/W

Derating Curve PFE700-48





Other Lambda Products

PAE, PAH, PAF	50 to 600W DC-DC converters
CC-E, PX	1.5 to 40W DC-DC converters

For Additional Information, please visit
www.lambdapower.com/products/pfe-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A8: Oct 2007

PR & PF Series

Rectifier & Power Factor Correction Modules

* RoHS

- Suitable for use in Custom Power Supplies
- Provides high voltage DC to Lambda's PH and PAF Power Modules
- Parallel operation on PF Series
- 0.5" profile

PR & PF Features & Benefits

Feature	Benefit
Low profile	Assists system integration
Parallel operation	For higher power or N+1 operation
Power Factor Corrected (PF)	Supports Global Use
Operation up to 85°C	Operates in harsh environments

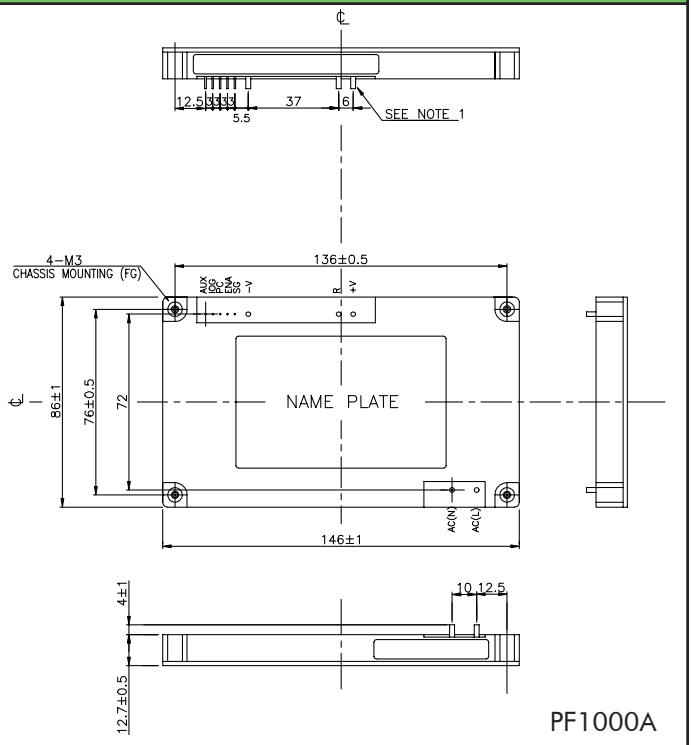
Specifications

Items	-	PR500-280	PF500A-360	PF1000A-360
AC Input Voltage range & Frequency	VAC	85-132/170-265 selectable	85-265 wide range	
Input Frequency	-	47 - 440Hz	47 - 63Hz	
Output Voltage	VDC	230 - 370	360	
Output Power at 100/200VAC	W	500/750W	504/756W	1008/1512W
Load Regulation	-	Unregulated	10V	
Line Regulation	-	Unregulated	5V typical	
Inrush Current	A	External pins provided connection for in rush resistor		
Efficiency (typ) at full load	%	95% (200VAC)	90% (100VAC), 95% (200VAC)	
Power Factor	-	-	Meets EN61000-3-2 (0.95 typical)	
Overcurrent Protection	-	-	Converter shutdown	
Overvoltage Protection	V	-	390 - 400VDC, manual reset	
Thermal Shutdown	-	-	Shuts down Inverter, manual reset	
AC Fail Signal	-	Yes	-	
Inverter Good Signal	-	-	Yes, when inverter is operating correctly	
Enable Signal	-	Signal provided to enable "PH" DC-DC converters		
Parallel Connection	-	-	Single wire current share	
Auxiliary Output Voltage	-	-	Yes - see installation manual	
Operating Baseplate Temperature	°C	-20 to +85°C (no derating)		
Storage Temperature	°C	-40 to +85		
Cooling	-	Conduction (see installation manuals for heatsinks)		
Withstand Voltage	-	Input - Ground 3kVAC for 1 min		
Safety Agency Approvals	-	UL60950-1, CSA22.2 No.60950-1, EN60950-1, & CE Mark		
Weight	g	140	130	200
Size (WxHxD)	mm	See output line drawings		
Warranty	-	Two Years		

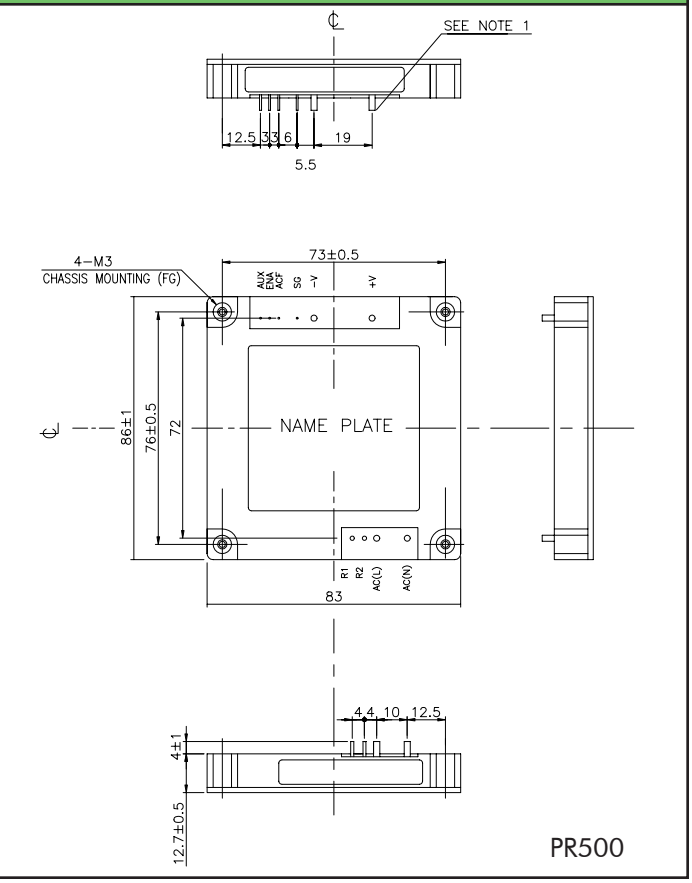
Notes: (Consult Installation Manual for detailed specifications, test methods and application notes)
* PF Modules only. Doesn't include PR500

PR & PF Series

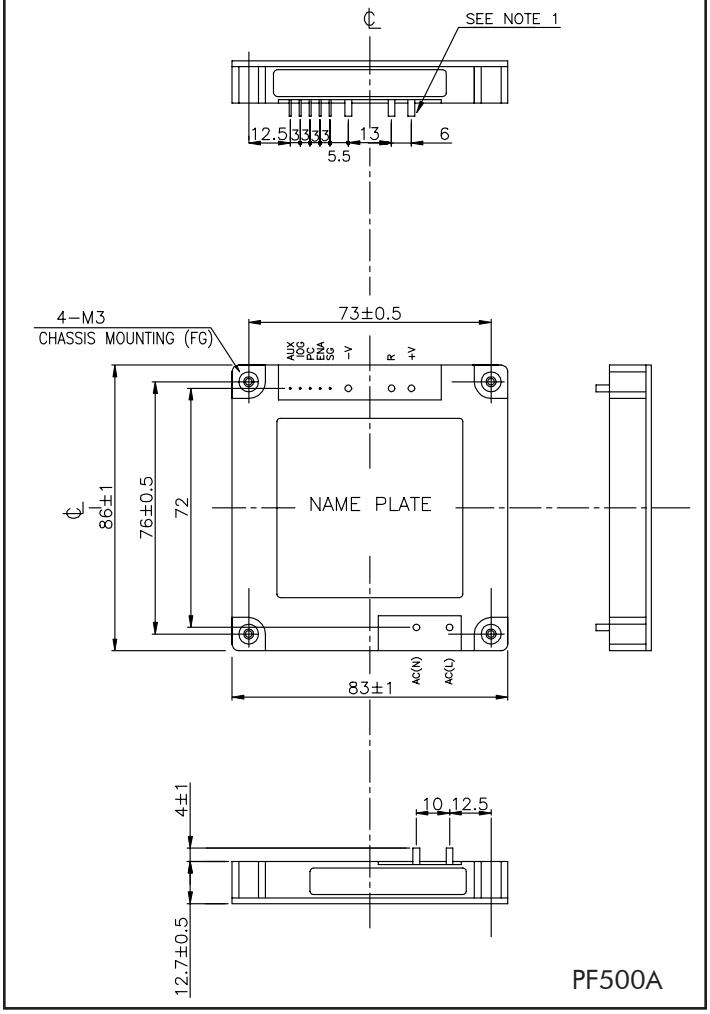
Outline Drawing



Outline Drawing



Outline Drawing



Other Lambda Industrial Products

PFE	400 to 700W Full brick AC-DC power module
PH F	50 to 300W Full function power modules
PH S	50 to 600W Simple function power modules
PAF	400 to 600W Full brick power module

For Additional Information, please visit
www.lambdapower.com/products/pf-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A3: Dec 2006

SC40/60 Series

3 x 5" 40W to 80W AC-DC Power Supplies

RoHS

- Low Cost
- Single and Multiple Outputs
- Wide Range AC Input
- Low profile
- Global Safety Agency Compliance
- Meets EN61000-4 (-2 to -6)

Key Market Segments & Applications

Computer Peripherals
Datacom
Point of Sale
Test and Measurement

SC40/60 Features and Benefits

Feature	Benefit
◆ Industry standard footprint	◆ Availability to second source
◆ Broad product range	◆ Optimization of power supply to system
◆ Meets EN61000-4 immunity	◆ Greater reliability

Specifications

ITEMS / MODELS		SCS40	SCD40	SCT4x	SCT401	SCS60	SCD60	SCT6x	SCT601
Output Power Convection	W	40	40			60			50
Output Power Forced Air	W	55	55			80			68
Main Output Adjustment	V	-5, +10% O/P 1 only			±5%	-5, +10%			±5%
Line and Load Regulation (1)	%	Output 1: ±2%, Output 2: ±5% (±7% on 24V models), Output 3: ±5%							
Hold Up Time (typical)	ms	20			16	20			13
Size (2)	in	3 x 5 x 1"				3 x 5 x 1.34"			
AC Input	-	85-265 VAC, 47-63 Hz							
Efficiency	%	Typically 70% full load at nominal AC Line							
Inrush Current Limiting	A	36A typical @230VAC cold start							
Surge Immunity	-	EN61000-4 (-2 through -6) level 3							
EMI	-	FCC Class B, EN55022 B							
Cross Regulation	%	± 2% on output 1, ±5% on outputs 2 & 3 (multiple outputs only)							
Ripple and Noise	%	1% peak to peak							
Overcurrent Protection	-	Short circuit protection, automatic recovery							
Overvoltage Protection	-	Output 1 only, <135%							
Cooling	-	When specified with forced air cooling, flow is 300 LFM (1.5m/s)							
Operating Temp. Range (3)	-	0 to +70°C (Derate linearly to 50% load from 50-70°C)							
Storage Temperature	-	-20 to +85°C							
Safety Agency Approval	-	UL60950-1, CSA60950-1, IEC/EN60950-1, CE Mark							
Warranty	-	1 year							

(1) SCT401 & SCT601 Outputs 1 & 2: ±2.5%

(2) Height is specified as maximum component height
Note: See Installation Manual for full details, test methods of parameters and application notes

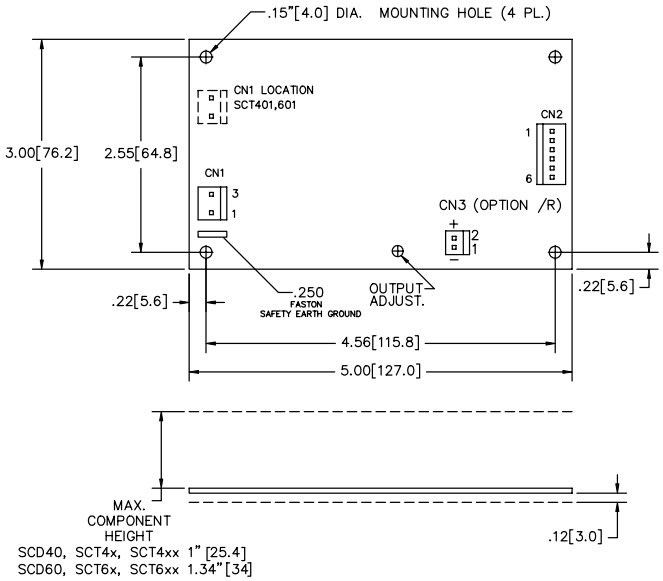
(3) -40°C startup, contact factory for details.

SC40/60 Series

SC Model Selector

	Model		O/P (V)	Min Load(A)	Convec. (A)	Forced Air(A)	Peak Load(A)**
Single Output	SCS403	V1	3.3	-	8.0	11.0	12.0
	SCS405	V1	5.0	-	8.0	11.0	12.0
	SCS4012	V1	12.0	-	3.3	4.5	5.0
	SCS4015	V1	15.0	-	2.6	3.6	4.0
	SCS4024	V1	24.0	-	1.6	2.3	2.5
	SCS4028	V1	28.0	-	1.4	2.0	2.2
	SCS4048	V1	48.0	-	0.9	1.2	1.3
	SCS603	V1	3.3	-	12.0	16.0	18.0
	SCS605	V1	5.0	-	12.0	16.0	18.0
	SCS6012	V1	12.0	-	5.0	6.7	7.5
	SCS6015	V1	15.0	-	4.0	5.3	6.0
	SCS6024	V1	24.0	-	2.5	3.3	3.8
	SCS6028	V1	28.0	-	2.1	2.9	3.2
	SCS6048	V1	48.0	-	1.3	1.7	1.9
Dual Output	SCD401212	V1	12.0	0.1	1.8	2.5	-
		V2	-12.0	0.1	1.5	2.0	-
	SCD401515	V1	15.0	0.1	1.5	2.0	-
		V2	-15.0	0.1	1.2	1.6	-
	SCD601212	V1	12.0	0.2	2.75	3.7	-
		V2	-12.0	0.2	2.25	3.0	-
	SCD601515	V1	15.0	0.2	2.2	2.9	-
		V2	-15.0	0.2	1.8	2.4	-
Triple Output	SCT42	V1	5.0	0.4	4.0	5.0	7.0
		V2	12.0	0.2	2.0	2.5	4.0
		V3	-12.0	-	0.5	0.7	1.0
	SCT43	V1	5.0	0.5	5.0	6.0	7.0
		V2	12.0	-	0.5	0.7	1.0
		V3	-12.0	-	0.5	0.7	1.0
	SCT44	V1	5.0	0.4	4.0	5.0	7.0
		V2	12.0	0.2	2.0	2.5	4.0
		V3	-5.0	-	0.5	0.7	1.0
	SCT45	V1	5.0	0.4	4.0	5.0	7.0
		V2	15.0	0.2	2.0	2.5	3.0
		V3	-15.0	-	0.5	0.7	1.0
	SCT46	V1	5.0	0.4	4.0	5.0	6.0
		V2	24.0	0.1	1.0	1.5	2.0
		V3	-12.0	-	0.5	0.7	1.0
	SCT47	V1	5.0	0.4	4.0	5.0	6.0
		V2	24.0	0.2	1.0	1.5	2.0
		V3	12.0	-	0.5	0.7	1.0
	SCT48	V1	5.0	0.4	4.0	5.0	6.0
		V2	24.0	0.1	1.0	1.5	2.0
		V3	-5.0	-	0.5	0.7	1.0
	SCT401	V1	3.3	0.4	4.0	5.0	7.0
		V2	5.0	-	2.0	2.5	4.0
		V3*	±12.0	-	0.5	0.7	1.0
	SCT62	V1	5.0	0.7	7.0	8.0	10.0
		V2	12.0	0.3	3.0	3.5	6.0
		V3	-12.0	-	0.7	1.0	1.5
	SCT63	V1	5.0	0.7	7.0	8.0	10.0
		V2	15.0	0.3	2.8	3.3	4.0
		V3	-15.0	-	0.7	1.0	1.5
	SCT64	V1	5.0	0.7	7.0	8.0	10.0
		V2	12.0	0.3	3.0	3.5	6.0
		V3	-5.0	-	0.7	1.0	1.5
	SCT65	V1	5.0	0.7	7.0	8.0	10.0
		V2	24.0	0.1	1.5	2.0	3.0
		V3	12.0	-	0.7	1.0	1.5
	SCT66	V1	5.0	0.7	7.0	8.0	10.0
		V2	24.0	0.1	1.5	2.0	3.0
		V3	-12.0	-	0.7	1.0	1.5
	SCT67	V1	5.0	0.7	7.0	8.0	10.0
		V2	24.0	0.1	1.5	2.0	3.0
		V3	-5.0	-	0.7	1.0	1.5
	SCT68	V1	5.0	0.7	7.0	8.0	10.0
		V2	15.0	0.1	3.0	3.5	3.0
		V3	12.0	-	0.92	1.0	1.5
	SCT601	V1	3.3	0.7	7.0	8.0	9.5
		V2	5.0	0.3	3.0	3.5	3.5
		V3*	±12.0	-	1.0	2.0	2.0

SC Outline Drawing



NOTES:
1. DIMENSIONS SHOWN IN INCH [mm]
2. TOLERANCE .02 [0.5] MAXIMUM
3. MATING CONNECTORS:

CN1	MOLEX	09-50-8031
CN2	MOLEX	09-50-8061
CN2	MOLEX	09-50-8071 (SCT401/601)
CN1, 2 PINS	MOLEX	08-52-0113
CN3	MOLEX	22-01-3027
CN3	PINS MOLEX	08-50-0114

Model Selector Notes:
* V3 output floating on SCT401 & SCT601
** <30s, 10% duty cycle, average power must not exceed maximum ratings

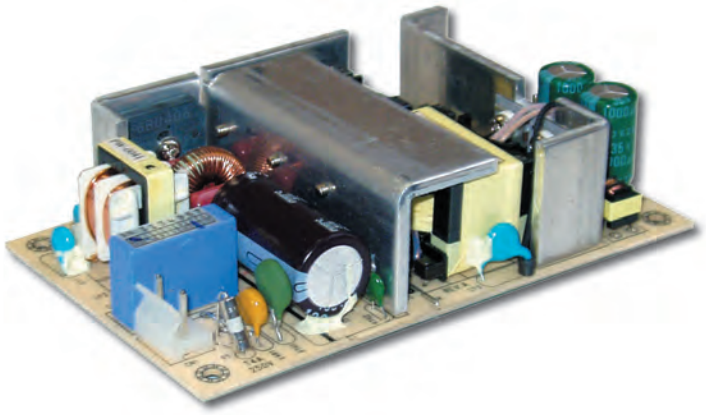
Other Lambda DC-DC Products

ZP	40 to 60W single & multiple output 2" x 4"
NV175	175W 3" x 5", 1-5 outputs
ZWS	5 to 240W single output, universal input
VSB, VSC, VSP	10 to 150W single output, 115VAC input

For Additional Information, please visit
www.lambdapower.com/products/sc-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A5: Dec 2006

LAMBDA SCS120PW Series



3 x 5" 120W Single Output Power Supplies

RoHS

- Low Profile
- Convection cooled
- Wide Range AC Input with PFC
- Global Safety Agency Compliance

Key Market Segments & Applications

Computer Peripherals
Datacom
Point of Sale
Test and Measurement

Features and Benefits

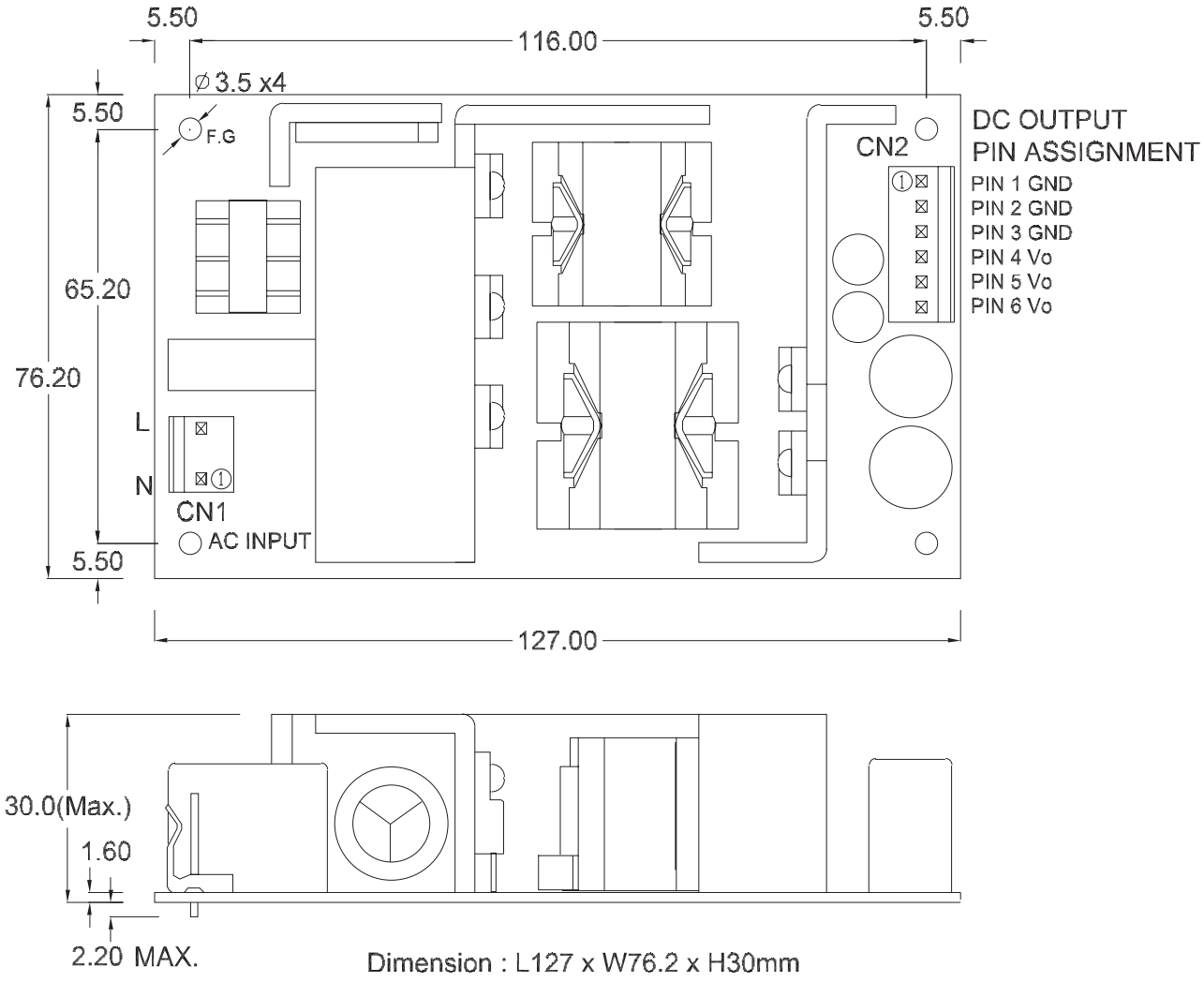
Feature	Benefit
◆ Industry standard footprint	◆ Availability to second source
◆ Power factor Correction	◆ Worldwide usage
◆ Convection Cooled	◆ Easier system integration
◆ Low profile	◆ Suitable for 1U enclosures

Specifications

ITEMS / MODELS		SCS120PW12	SCS120PW15	SCS120PW18	SCS120PW19	SCS120PW24
Output Voltage (Fixed)	V	12V	15V	18V	19V	24V
Output Current	A	10A	8A	6.67A	6.32A	5A
Output Power	W	120W				
Line & Load Regulation	%	±3%				
Ripple & Noise	%	1%				
Hold Up Time (typical)	ms	16ms (Full load at 115VAC input)				
Overcurrent Protection	%	105 - 120%				
Overvoltage Protection	%	110 - 130%, cycle AC line to reset				
Input Voltage Range	-	90-264 VAC, 47-63 Hz (440Hz with reduced PFC)				
AC Input Current	A	2.5A Max				
Harmonic Correction (PFC)	-	Meets EN61000-3-2 (typically >0.9)				
Efficiency	%	Typically 85% full load at nominal AC Line				
Inrush Current Limiting	A	<50A peak @ 230VAC cold start				
Surge Immunity	-	EN61000-4 (-2 through -5)				
EMI	-	FCC Class B, EN55022 B				
Cooling	-	Convection				
Operating Temperature	°C	0 to +40°C, derate linearly to 50% load from 40°C to 60°C				
Temperature Coefficient	%/°C	±0.05%/°C				
Storage Temperature	°C	-10 to +70°C				
Humidity (non-condensing)	-	20-90%RH operating, 20-95%RH non-operating				
Shock	-	< 196.1m/s² (20G)				
Vibration	-	10Hz-55Hz amplitude (sweep 1 min), <2G X, Y, Z axis for 1 hour each				
Altitude	m	3000m operating, 5000m storage				
Safety Agency Approval	-	UL60950-1, CSA60950-1, EN60950-1, CE Mark (LVD)				
Size W x L x H	In	3 x 5 x 1.27"				
Weight	g	300				
Warranty	yrs	1 year				

SCS120PW Series

Outline Drawing



Other Lambda Industrial Products

NV175	3" x 5" 175W single to quad outputs
SC40/60	3" x 5" 40 - 80W single to quad outputs
ZPS/ZPT	2" x 4" 40 - 60W single triple outputs
ZWS	5 to 240W single output
VSB & VSC	10 to 150W single output, 115VAC input

Mating Connectors

Mating	Molex Connector	Molex Pins
CN1	09-50-8031	08-52-0113
CN2	09-50-8061	08-52-0113

For Additional Information, please visit
www.lambdapower.com/products/sc-120.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A7: Sep 2007

SWS Series

Single Output General Purpose Power Supplies

- Low Cost
- Power Factor Correction to EN61000-3-2
- Universal Input (85 - 265VAC)
- Input Transient Protected IEC61000-4
- Enclosed

RoHS

Key Market Segments & Applications

Factory Automation	Process Control, NC-Machining, Automotive, Packaging Equipment, Materials Handling, Chemical Processing, Robots
Test & Measurement	Burn-in & Test, Automated, Detection Test, Instrumentation, Measurement
Automated Service	Vending Machines, Elevators, Video Gaming, Point of Sale Equipment

SWS Features and Benefits

Feature	Benefit
◆ Meets IEC61000-4	◆ Greater reliability
◆ Global safety Approvals	◆ Supports Global Use
◆ Power Factor Corrected	◆ Supports Global Use
◆ Level B EMI	◆ Assists System Compliance

Specifications

ITEMS / MODEL		SWS50	SWS75	SWS100	SWS150
Input Voltage range (1)	-	85 - 265VAC (47 - 63Hz) or 120 - 370VDC			
Inrush Current (115/230VAC)	A	20/40		16/32	
Power Factor	-	Meets EN61000-3-2			
Input Current (115/230VAC)	A	1.2/0.6	1.6/0.8	1.2/0.6	1.8/0.9
Temperature Coefficient	-	<0.02%/°C			
Total Regulation	-	<5%			
Overcurrent Protection	-	>105%, Constant Current Style			
Overvoltage Protection	V	115 -135%, Cycle AC line to reset			
Hold Up Time (Typ)	ms	20ms at 115VAC			
Leakage Current Max.	mA	1mA (0.6mA typ@230VAC)		0.75mA (0.5mA typ@230VAC)	
Remote Sense	-	Not Available			
LED Indicator	-	Green LED = On			
Operating Temperature	-	-10 to +70°C (See table for derating - model specific)			
Storage Temperature	-	-30 to +85°C			
Operating Humidity (2)	-	30 - 90% RH			
Storage Humidity (2)	-	10 - 95% RH			
Cooling		Convection			
Withstand Voltage	-	Input to Ground 2kVAC, Input to Output 3kVAC, Output to Ground 500VAC for 1 min.			
Isolation Resistance	-	>100M at 25C & 70%RH, Output to Ground 500VDC			
Vibration (non operating)	-	19.6m/s^2(10 - 55Hz (constant sweep 1 min) X, Y, Z for 1 hour)			
Shock	-	< 196.1 m/s^2 (20G)			
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, CE Mark, EN50178			
Conducted & Radiated EMI	-	EN55011 / EN55022-B, FCC Class B, VCCI-B			
Recommended EMI Filter	-	MAW1202-22	MAW1203-22	MAW1202-22	MAW1203-22
Immunity	-	EN61000-4-2,-3,-4,-5,-6,-8,-11			
Weight (Typ)	g	400	480	600	750
Size (WxHxD)	in	3.62 x 1.46 x 6.26	3.7 x 1.69 x 6.69	3.78 x 1.77 x 7.4	3.9 x 2 x 7.8
Warranty	-	Two Years			

(1) Derate to 85% load below 100VAC input (2) non condensing

SWS Series

Model Selector

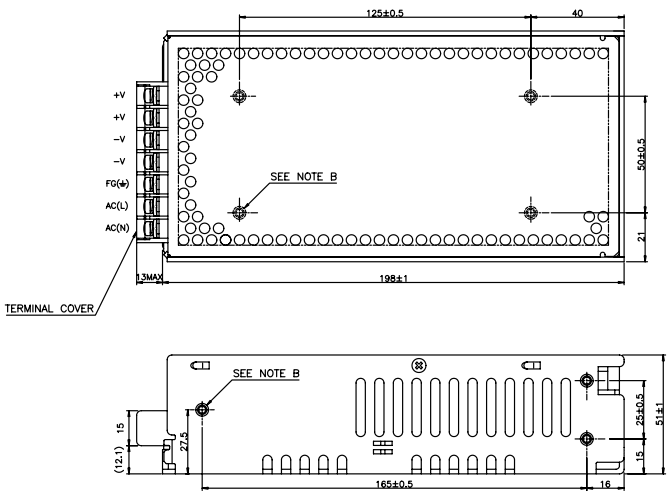
Model	Voltage	Adjust Range	Max Curr.	Load Reg mV	Line Reg mV	Ripple Noise	Eff. (typ)%
SWS50-3	3.3V	3-3.6V	10	40	20	80	73/70
SWS75-3	3.3V	3-3.6V	15	40	20	80	72/68
SWS100-3	3.3V	3-3.6V	20	40	20	100	69/70
SWS150-3	3.3V	3-3.6V	30	40	20	100	70/72
SWS50-5	5V	4.5-5.5V	10	50	20	80	77/75
SWS75-5	5V	4.5-5.5V	15	50	20	80	77/74
SWS100-5	5V	4.5-5.5V	20	40	20	100	75/77
SWS150-5	5V	4.5-5.5V	30	40	20	100	76/78
SWS50-12	12V	10.8-13.2V	4.3	96	48	80	82/79
SWS75-12	12V	10.8-13.2V	6.3	96	48	80	83/81
SWS100-12	12V	10.8-13.2V	8.5	96	48	100	79/81
SWS150-12	12V	10.8-13.2V	12.5	96	48	100	79/82
SWS50-15	15V	13.5-16.5V	3.5	120	60	100	84/80
SWS75-15	15V	13.5-16.5V	5	120	60	100	85/82
SWS100-15	15V	13.5-16.5V	6.7	120	60	100	81/83
SWS150-15	15V	13.5-16.5V	10	120	60	100	81/83
SWS150-18	18V	16.2-19.8V	8.4	144	72	120	82/84
SWS50-24	24V	21.6-26.4V	2.1	144	96	100	84/80
SWS75-24	24V	21.6-26.4V	3.2	144	96	100	85/82
SWS100-24	24V	21.6-26.4V	4.3	144	96	150	82/84
SWS150-24	24V	21.6-26.4V	6.3	144	96	150	82/85
SWS150-28	28V	25.2-30.8V	5.4	168	112	180	82/85

Veritcal Mount Convection	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C
SWS50	100%	100%	100%	100%	100%	100%	93%	85%
SWS75 (3.3-5V)	100%	100%	100%	100%	93%	85%	73%	60%
SWS75 (12V-24V)	100%	100%	100%	100%	100%	93%	85%	60%
SWS100	100%	100%	100%	100%	100%	87%	73%	60%
SWS150 (3.3-5V)	100%	95%	90%	85%	73%	60%	-	-
SWS150 (12V-24V)	100%	100%	100%	100%	100%	100%	80%	60%

1.2m/s Forced Air	50°C	55°C	60°C	65°C	70°C
SWS75	100%	100%	90%	80%	70%
SWS100	100%	100%	90%	80%	70%
SWS150	100%	100%	90%	80%	70%

Derate to 80% load from 0 to -10°C

SWS150 Outline Drawing

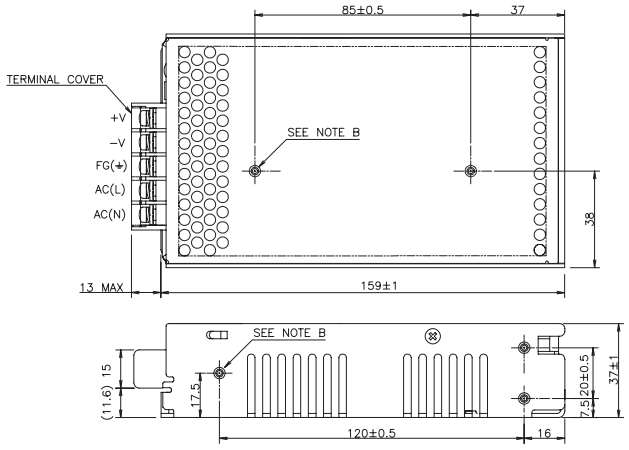


Other Lambda Industrial Products

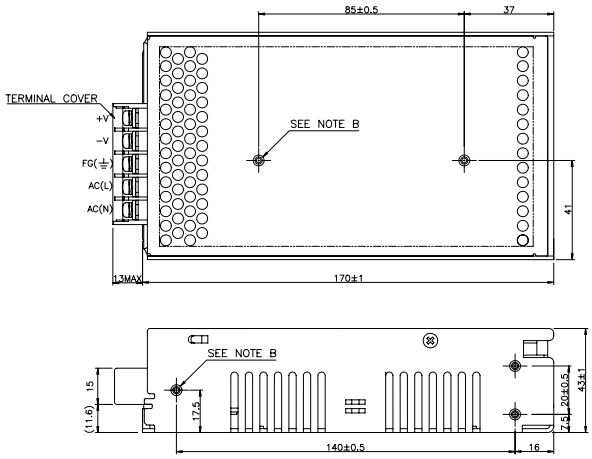
HWS	15W to 1500W Single Output
ZWS	5W to 480W Open Frame
SWS300/600	300W to 600W (Higher Power)

For Additional Information, please visit
www.lambdapower.com/products/sws-series.htm

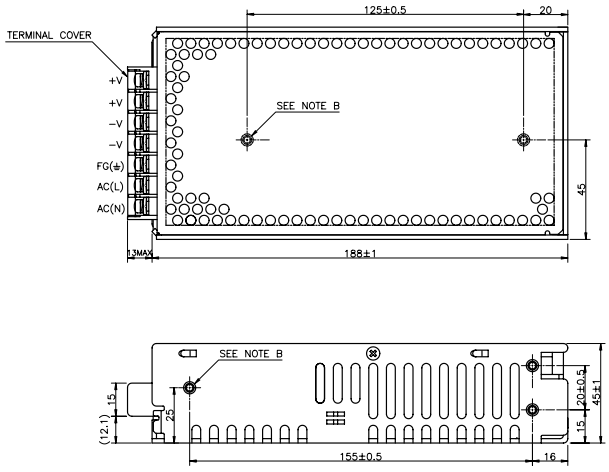
SWS50 Outline Drawing



SWS75 Outline Drawing



SWS100 Outline Drawing



Options

Suffix	Descriptor
/CO2	Double sided conformal coating

LAMBDA SWS300/600 Series

Single Output General Purpose Power Supplies

- Low Cost
- Active Power Factor Correction
- Universal Input (85 - 265VAC)
- Input Transient Protected IEC61000-4
- SEMI F47 Certified (208VAC Input)

RoHS

Key Market Segments & Applications

Factory Automation	Process Control, NC-Machining, Automotive, Packaging Equipment, Materials Handling, Chemical Processing, Robots
Test & Measurement	Burn-in & Test, Automated, Detection Test, Instrumentation, Measurement
Automated Service	Vending Machines, Elevators, Video Gaming, Point of Sale Equipment

SWS Features and Benefits

Feature	Benefit
◆ Meets IEC61000-4	◆ Greater reliability
◆ Global safety Approvals	◆ Supports Global Use
◆ Power Factor Corrected	◆ Supports Global Use
◆ Level B EMI	◆ Assists System Compliance

Specifications

ITEMS / MODEL		SWS300	SWS600
Input Voltage range (1)	-	85 - 265VAC (47 - 63Hz) or 120 - 370VDC	
Inrush Current (115 / 230VAC)	A	20 / 40 at 25°C, cold start	
Power Factor	-	Meets EN61000-3-2	
Input Current (100/200VAC)	A	3.6 / 1.8A	7.2 / 3.6A
Temperature Coefficient	-	<0.02%/°C	
Overcurrent Protection	--	>105%, Constant current style	
Overvoltage Protection	V	3.3V: 4.1-5.3V, 5V: 6.25-7.5V, 12V: 13.8-16.8V	
		15V: 19.3-24.2V, 24V: 30-34.8V, 36V: 41.4-50.4V, 48V: 60-69.6V	
Overtemperature Protection	-	Yes, cycle AC to reset	
Hold Up Time (Typ)	ms	20ms at 115/230VAC	
Leakage Current (max)	mA	SWS300: 0.75mA , SWS600: 1.5mA	
Remote Sense	-	None	Yes
Parallel Connection	-	None	Yes
Remote On/Off	-	None	Yes, >4.5V to shutdown
Power Fail Signal	-	None	Yes, open collector output
LED Indicator	-	Green LED = On	
Operating Temperature	-	-10 to +65°C (See table for derating - model specific)	
Storage Temperature	°C	-30 to +85°C	
Humidity (non-condensing)	-	30 - 90% RH operating, 10 - 95%RH non operating	
Cooling	-	Internal fan	
Withstand Voltage	-	I/P to Grnd 2kVAC, I/P to O/P 3kVAC, O/P to Grnd 500VAC, O/P to CNT 100VAC for 1 min	
Isolation Resistance	-	>100M at 25C & 70%RH, Output to Ground 500VDC	
Vibration (non operating)	-	10 - 55Hz (sweep for 1 min)19.6m/s^2 constant X, Y, Z 1 hour each plane)	
Immunity	-	EN61000-4-2, -3, -4, -5, -6, -8, -11	
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, EN50178, CE Mark, SEMI F47 (208VAC)	
Conducted & Radiated EMI	-	EN55011 / EN55022-B, FCC Class B	
Recommended EMI Filter	-	MC1206	MC1210
Weight (Typ)	g	950	2000
Size (WxHxD)	in	2.05 x 4.01 x 7.8"	3.62 x 4.72 x 7.48"
Warranty	yrs	Two Years	

Notes: (1) Derate linearly to 80% load from 115VAC to 85VAC input (derate to 90% load for SWS600-5, no derating SWS300, 600-3)

LAMBDA SWS300/600 Series

Model Selector

Model	Voltage	Adjust Range	Max Curr. (A)	Load Reg (mV)	Line Reg (mV)	Ripple Noise (mV)	Eff.(3) (typ)%
SWS300-3	3.3V	2.97-3.96V	55	40	20	120	67/70
SWS300-5	5V	4.5-6V	55	40	20	120	75/78
SWS300-12	12V	9.6-13.2V	26	96	48	120	77/80
SWS300-15	15V	13.2-18.6V	21	120	48	120	79/83
SWS300-24	24V	20-28.8V	13	120	48	150	80/84
SWS300-36	36V	28.8-40V	8.7	180	72	200	82/85
SWS300-48	48V	40-57.6V	6.7	240	96	240	82/85
SWS600-3	3.3V	2.97-3.96V	100 (2)	40	20	100	69/71
SWS600-5	5V	4.5-6V	100 (2)	40	20	100	74/77
SWS600-12	12V	9.6-13.2V	50	96	48	120	78/81
SWS600-15	15V	13.2-18.6V	40	120	48	120	80/83
SWS600-24	24V	20-28.8V	25	120	48	150	81/84
SWS600-36	36V	28.8-40V	16.7	180	72	200	81/85
SWS600-48	48V	40-57.6V	12.5	240	96	240	82/85

Notes:
(2) Peak rating of 120A for 10s
(3) 115/230VAC

Derating

Model	50°C	55°C	60°C	65°C
SWS300	100%	91.6%	83.3%	50%
SWS600	100%	85%	70%	55%

Additional derating required when operating SWS600 with side ventilation holes blocked - see installation manual.

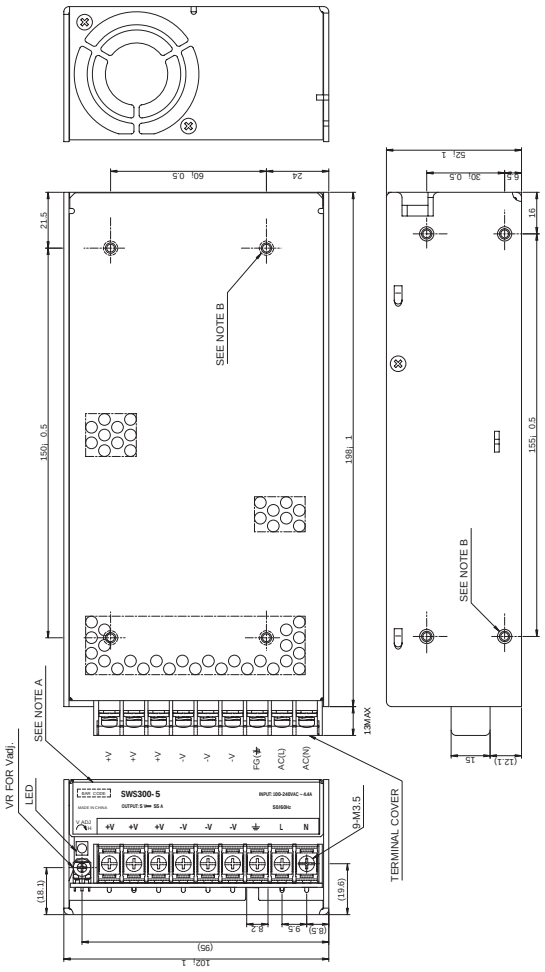
Options

Suffix	Descriptor
/CO2	Double sided conformal coating

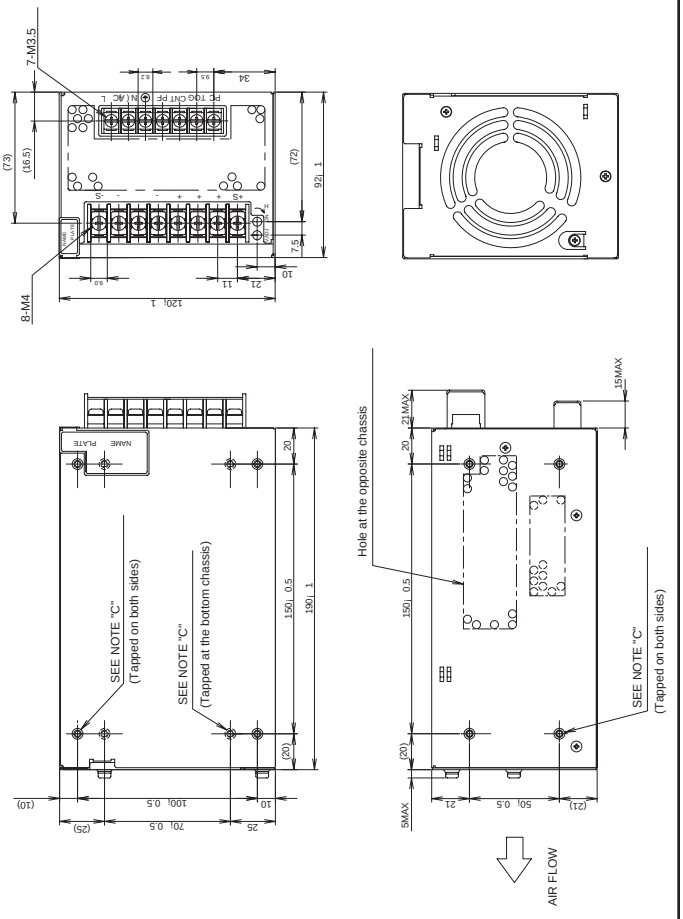
Other Lambda Industrial Products

HWS	15-1500W Single Output, High Reliability
SWS	50-150W Single Output
ZWS	5-240W PCB style Single Output

SWS300 Outline Drawing



SWS600 Outline Drawing



For Additional Information, please visit
www.lambdapower.com/products/sws-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A7: Sep 2007

LAMBDA

SWS600/1000L

Single Output Low Profile Power Supplies

- Low Cost
- Low Profile
- Active Power Factor Correction
- Universal Input (85 - 265VAC)
- Input Transient Protected IEC61000-4
- Low Acoustical noise
- Medical Approvals (SWS1000L)

RoHS

Key Market Segments & Applications

LED Signs	Test & Measurement
Automated Service	

Features and Benefits

Feature	Benefit
◆ Global safety Approvals	◆ Supports Global Use
◆ Power Factor Corrected	◆ Supports Global Use
◆ Variable speed fan	◆ Greater reliability & lower acoustical noise

Specifications

ITEMS \ MODEL		SWS600L	SWS1000L (Preliminary)
Input Voltage range	-	85 - 265VAC (47 - 63Hz) or 120 - 350VDC	
Inrush Current (115 / 230VAC)	A	20 / 40	
Power Factor	-	Meets EN61000-3-2 Class A	
Input Current (100/200VAC)	A	7.1 / 3.6	12 / 6
Temperature Coefficient	-	<0.02%/°C	
Overcurrent Protection	-	>105%, Constant current style	
Overvoltage Protection	V	125% -145%	
Overtemperature Protection	-	Yes, cycle AC or Remote On/Off to reset	
Hold Up Time (Typ)	ms	20ms at 115/230VAC	
Leakage Current (max)	mA	<0.75mA	<0.3mA
Remote Sense	-	Yes	
Parallel Connection	-	Yes	
Remote On/Off (CNT)	-	Yes	
Voltage Programming (1)	-	Yes, 1-6V adjusts output from 20 - 120% of nominal	
DC Good & Fan Fail Signal	-	Yes, open collector output	
Auxiliary Output	-	12V 0.1A	
LED Indicator	-	Green LED = On	
Operating Temperature	-	-40°C start up. -20 to 74°C, derating linearly to 50% load above 50°C	
Storage Temperature	-	-40 to +85°C	-30 to +85°C
Humidity (non condensing)	-	20 - 90% RH operating, 10 - 95%RH non operating	
Cooling	-	Variable speed internal fan	
Withstand Voltage(One minute)	-	Input to Ground 2kVAC, Input to Output 3kVAC, Output to Ground 500VAC, Output to CNT 100VAC	Input to Ground 2.6kVAC, Input to Output 4kVAC, Output to Ground 600VAC, Output to CNT 120VAC
Isolation Resistance	-	>50M at 25C & 70%RH, Output to Ground 500VDC	
Vibration (non operating)	-	MIL-STD-810F 514.5 Cat. 4,10	
Shock (in packaging)	-	MIL-STD-810F 516.5 Procedure I, VI	
Immunity	-	EN61000-4-2, -3, -4, -5, -6, -8, -11	
Safety Agency Approvals	-	UL, CSA, EN60950-1, UL60601-1 (1000W only), IEC61010-1 (600W only), EN50178, CE Mark	
Conducted & Radiated EMI	-	EN55011 / EN55022-B, FCC Class B	
Weight (Typ)	g	1600	2200
Size (WxHxD)	in	2.4 x 4.72 x 7.48"	2.4 x 5.91 x 9.45"
Warranty	yrs	Three Years	

Notes: (1) Not available on 3.3V & 5V SWS1000L models

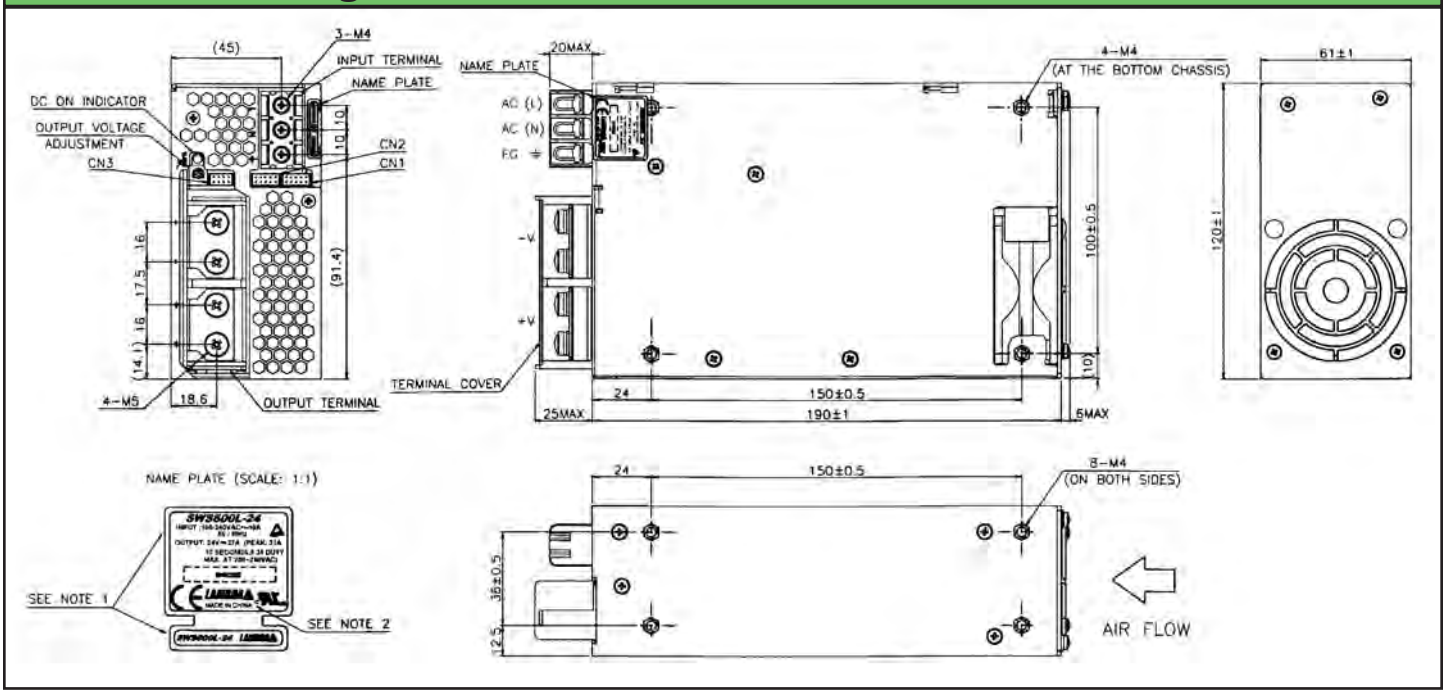
SWS600/1000L

Model Selector

Model	Voltage	Adjust Range	Max Curr. (A)	Max Pwr (W)	Load Reg (mV)	Line Reg (mV)	Ripple Noise (mV)	Eff.(2) (typ)%
SWS600L-3	3V	2.64 - 3.96V	120	396W	30	20	120	70 / 72
SWS600L-5	5V	4 - 6V	120A	600W	30	20	120	75 / 77
SWS1000L-5	5V	4 - 6V	200A	1000W	30	20	120	79 / 81
SWS600L-12	12V	9.6 - 14.4V	53A	636W	72	48	150	79 / 82
SWS1000L-12	12V	9.6 - 14.4V	88A	1056W	72	48	150	82 / 84
SWS600L-15	15V	12 - 19.5V	43A	645W	90	60	150	79 / 82
SWS600L-24	24V	19.2 - 28.8V	27A (31A)3	648W (744W)	144	96	150	81 / 84
SWS1000L-24	24V	19.2 - 28.8V	44A	1056W	144	96	150	84 / 86
SWS600L-36	36V	28.8 - 43.2V	18A	648W	216	144	200	82 / 84
SWS1000L-36	36V	28.8 - 43.2V	29A	1044W	216	144	200	84 / 86
SWS600L-48	48V	38.4 - 56V	13A	624W	288	192	200	81 / 83
SWS1000L-48	48V	38.4 - 57.6V	22A	1056W	288	192	200	84 / 86
SWS600L-60	60V	48 - 66V	10A	600W	360	240	200	81 / 84

Notes: Preliminary models shaded in green
(2) 115 / 230VAC (3) Peak current and power possible at 170-26VAC input, 10s max, 35% duty cycle

Outline Drawing



Other Lambda Industrial Products

SWS	50 - 300W Single Output
HWS	15 - 1800W Single output, high reliability
ZWS	5 - 240W pcb style single, output
DLP, DPP, DSP	10 - 480W DIN Rail mount

For Additional Information, please visit
www.lambdapower.com/products/sws-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A1: Aug 2007

TH Series

1200 to 2500W Front End Power Supplies

- 1U High
- Up to 10,000W in 19" Rack
- Hot Swap Capable
- High Efficiency

RoHS

Key Market Segments & Applications

Power for distributed Power Architecture
Factory Automation

Features and Benefits

Feature	Benefit
◆ 1U high	◆ Utilizes less cabinet space
◆ Hotswap capable	◆ Suitable for N+1 redundancy
◆ High efficiency	◆ Higher density
◆ Full array of signals	◆ Easier system monitoring

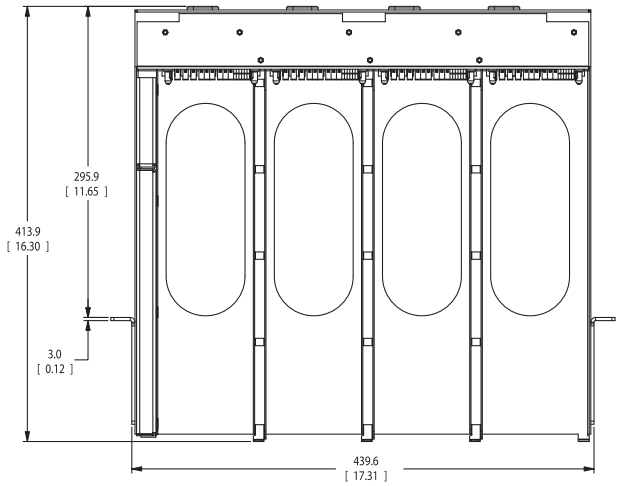
Specifications

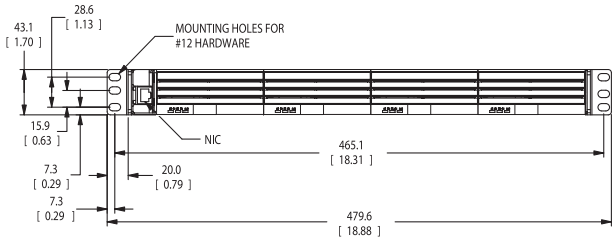
ITEMS / MODEL			TH120012[5]	TH120024	TH120048	TH200048	TH250048[5]
Nominal Voltage		V	12	24	48	48	48
Output Voltage Range		VDC	10.5-14	21-28	42-56	42-56	42-56
Total Regulation		%	±1%				
Output Current		A(max)	100	50	25	40	50
Current limit	(1)	A	120	60	30	48	60
Short Circuit Current		%	150	75	37	60	75
Output Noise		mV	250mV peak to peak (10kHz to 20MHz)				
Output Rise Time		ms	100-400 ms				
Dynamic Response		%	3% in 10ms for a 10-100% load change				
Overvoltage Protection	(1)	VDC	13-15	27-30	50-60	50-60	50-60
Load Sharing		%	±5%				
I²C Programing		-	Set output Volt, Monitors AC present, Converter OK, Thermal Profile, Fan fail				
Signals (opto isolated)	(4)	-	AC Fail, Module Alarm, Temp Alarm				
Remote On/Off		V	Shuts down outputs by applying 3.3 to 5V				
Auxiliary Output	(3)	-	12V@100mA				
AC Input		VAC	90-264	90-264	90-264	180-264	180-264
Input Frequency		Hz	47-63				
Power Factor		-	0.99 typ. @ 230VAC, full load, meets EN61000-3-2				
Inrush Current	(2)	A	30 Amps peak				
Efficiency (at full load)		%	88	90	92	93	93
Immunity		-	EN61000-4-2,-3,-4,-5,-6,-8,-11				
EMC (conducted and radiated)		-	EN55022, Level B, FCC Class B				
Operating Temperature		°C	-40 to 70, derate linearly to 60% load above 50°C				
Storage Temperature		°C	-40 to 85				
Humidity		%	5 to 95 (non-condensing)				
Altitude		ft	-200 to 8000				
Shock		G	IEC68-2-27, Mil-STD-810E, 20G				
Vibration		Hz	IEC68-2-64 (random) 20-2000Hz, 30 minutes				
Safety Agency			UL60950, CSA 22.2 No. 60950-00, EN60950, CE Mark				
Size (L x W x H)		in.	14.25 x 4.00 x 1.69 (stand alone), 16.30 x 17.31 x 1.7 (THR4 Rack)				
Weight		lbs	Power Module 6lbs, Rack 9lbs				
Warranty		-	2 Years				

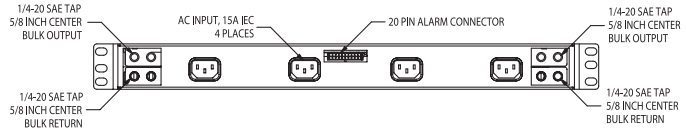
1 Adjustable via i²C or through Lambda Network Interface Card
2 Excludes Xcaps in the EMC input filter
3 Output operates independent of main DC output and is referenced to (-)Vout
4 All three signals share a common return - logic ground
5 Use rack model THR400

TH Series

THR4 Rack Outline Drawing

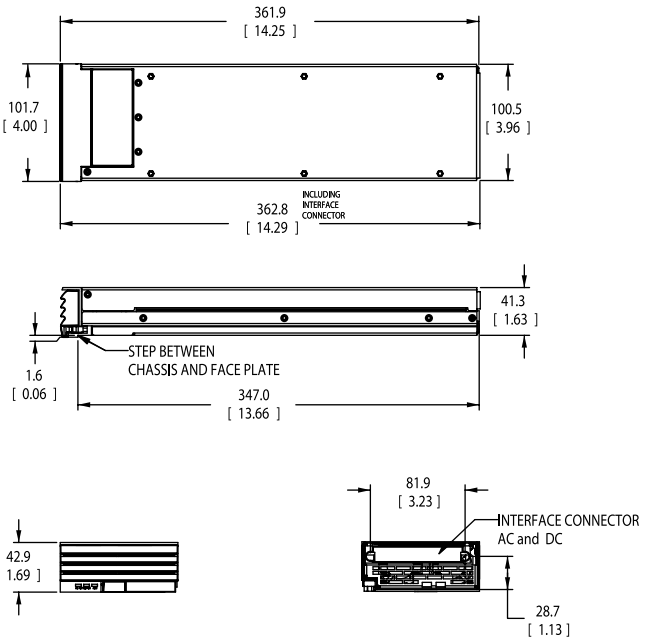






* THR400 - AC input via two terminal blocks.

TH Module Outline Drawing



Models

Model	Output Voltage	Output Current	Maximum Power
TH120012[5]	12V	100A	1200W
TH120024	24V	50A	1250W
TH120048	48V	25A	1250W
TH200036	36V	40A	1440W
TH200048	48V	40A	2000W
TH250048[5]	48V	50A	2500W
THR4	19" Rack holds up to 4 TH Modules; 200A maximum output current.		
THR400	19" Rack holds up to 4 TH modules; 400A maximum output current. Screw terminal input connection.		
THRBP	Blanking panel for one module slot.		
THR4NIC	Network interface card for 48V systems.		
THR4NIC12	Network interface card for 12V systems.		
THR4NIC24	Network interface card for 24V systems.		
TLCK-232	RS232 Communications kit.		
TLKRC01	Signal cable		

Alarm Connector

Mating Housing	Molex MicroFit 43025-2000
Mating Terminal	Molex MicroFit 43030-0002

Other Lambda Industrial Products

PX, CC-E, PAQ, PAH, PAF	DC-DC Converters
TL	2U 500-2500W Front End
FPS1000	1U 1kW to 3kW Low Cost Front End

For Additional Information, please visit
www.lambdapower.com/products/th-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision B2: Oct 2007

TL Series

500 to 2500W Front End Power Supplies

- 2U high
- Up to 12,500W in 19" rack
- Hotswap capable
- >90% efficiency
- Full power at 65°C ambient

RoHS

Key Market Segments & Applications

Power for Distributed Power Architecture
Factory Automation

TL Features and Benefits

Feature	Benefit
◆ 2U high	◆ Utilizes less cabinet space
◆ Hotswap capable	◆ Suitable for N+1 redundancy
◆ High efficiency	◆ Higher density
◆ Full array of signals	◆ Easier system monitoring

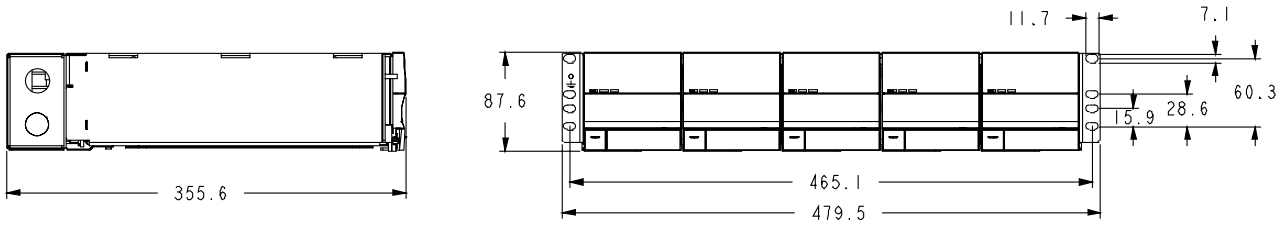
Specifications

ITEMS / MODEL			12V Nominal (Factory Set)	24V Nominal (Factory Set)	48V Nominal (Factory Set)
Output Voltage Range	(1)	VDC	10.5-14V	21 - 28V	42 - 56V
Total Regulation		%	±1		
Current limit		%	105 to 120%, Factory Programmable		
Short Circuit Current		%	150% maximum, Factory Programmable		
Output Noise		mV	480mV maximum, peak to peak (10Hz to 20MHz)		
Output Rise Time		-	100 - 400ms		
Dynamic Response		-	3% in 10ms for a 10 - 100% load change		
Overvoltage Protection	(4)	VDC	13.5 to 15V	27 to 30V	54 to 60V
Load sharing		-	±10%		
Remote Sense		-	Compensates for 1V total cable drop (stand alone unit only)		
I2C programming	(1)	-	Set Output Volt., Monitors AC Present, Converter OK, Thermal profile, Fan fail		
Signals (opto isolated)	(2)	-	Converter OK, AC Present, and Over-temperature alarms. Active Low on Fail		
Remote On/Off	(3)	-	Shuts down output(s) by applying 5V		
Margining		-	Applying 0-5V raises output voltage 0-10V		
Auxiliary Output		-	12V 0.1A bias voltage		
AC Input		-	TL500-1000: 90~264VAC, 95VAC start up; TL1500-2500: 180~264VAC, 185VAC start up		
Power Factor		-	0.99 Typical meets EN61000-3-2		
Inrush Current		A	<40A		
Leakage Current		mA	<3.2mA		
Efficiency (typical)		%	92%		
Immunity		-	EN61000-4-2, -3, -4, -5, -6, -8		
EMC (conducted and radiated)		-	EN55022, level B, FCC Class B		
Operating Temperature		-	-40°C to +65°C, short duration at 75°C, no derating (TL250048: -40°C to 65°C)		
Storage Temperature		-	-40 to +85°C		
Humidity		-	5 - 95% RH non condensing		
Altitude		-	-200 to 8000 feet, derate max. ambient 2°C/1000 feet		
Shock		-	IEC68-2-27, MIL STD 810E, 20G		
Vibration		-	IEC68-2-64 (random) 20 - 200Hz, 30 minutes		
Safety Agency		-	UL60950, CSA 22.2 No. 60950-00, EN60950, CE Mark		
Size (L x W x H)		-	11.12" x 3.41" x 3.45" (stand alone), 14" x 18.9" (incl. ears) x 3.45" (TLR5 rack)		
Weight		lbs	Stand alone unit: 5.6lbs, Rack: 9.5lbs		
Warranty		-	Two Years		

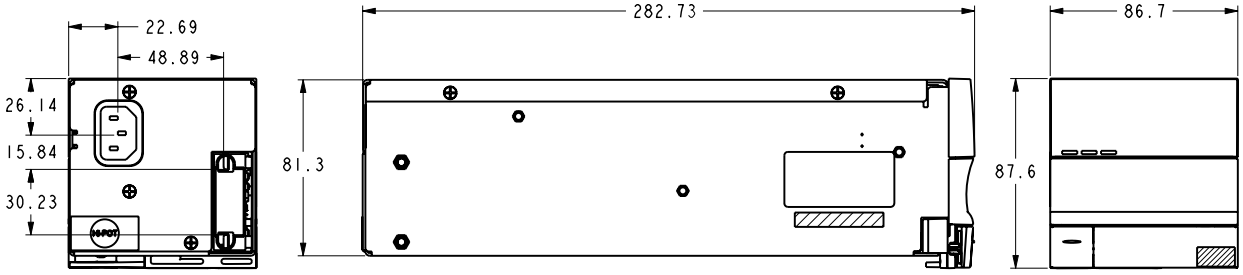
(1) Contact Factory for application
(2) All three signals share a common return - Logic GND
(3) Either stand alone unit or entire rack
(4) Factory Programmable

TL Series

TL Rack Outline Drawing



TL Module Outline Drawing



Other Lambda Industrial Products

FPS	1U 1kW to 3kW Front end
PX, CC-E, PAQ, PAH, PAF	DC-DC Converters
HWS, JFS, LZS, LZSa	15W to 2000W Single output

For Additional Information, please visit
www.lambdapower.com/products/tl-series.htm

Models

Model	Output Voltage	Output Current	Maximum Power
TL50012	12V	40A	500W
TL75012	12V	60A	750W
TL50024	24V	20A	500W
TL100024	24V	40A	1000W
TL150024	24V	55A	1500W
TL50048	48V	10A	500W
TL100048	48V	20A	1000W
TL150048	48V	30A	1500W
TL200048	48V	40A	2000W
TL250048	48V	50A	2500W
TLR5	19" Rack, holds up to 5 TL Modules		
TLRBP	Blanking Panel for One Module Slot		
TLRC01	Signal Cable		
TLCK232	RS232 Communications Kit		
TLHB19*	Angled Baffle Kit (for horizontal air flow)		

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision B3: Oct 2007

Vega Series

450 to 900W Multiple Output Modular Power Supply

RoHS

- 1-10 Wide Range Outputs With Adjustment
- Forward/Reverse/Low Noise/System Air Cooling
- Output Voltages From 0.5V - 62V
- 48VDC Input Option
- Medical Approval Options
- MIL-STD-810 Shock and Vibration

Vega Features and Benefits

Feature	Benefit
◆ PFC compliant to EN61000-3-2	◆ Supports global use
◆ Wide Range Output Adjustment	◆ Capable of providing non-standard voltages, eliminating the need for custom models
◆ Safety Agency Approvals EN, cULus, BSI, CE	◆ Supports worldwide use, lowers risk to end user
◆ Flexibility with option choices	◆ Custom solutions available off the shelf

Specifications

ITEMS \ MODELS		VEGA 450	VEGA 650	VEGA 900
Input Voltage Range (47-440Hz with reduced PFC)	-	90 -264VAC 47-63Hz[1] or 34-75VDC	90-264VAC 47-63Hz[1]	150-264VAC 47-63Hz
Input Current (Typ. at 90VAC)	A	7.7A	11A	9.2A at 150VAC
Efficiency (Typ.)	%	75% at 230VAC (or 48VDC) and full load, configuration dependent		
Nominal Output Voltages	VDC	0.5 - 62 (See configuration guide)		
Output Voltage Adjustment	-	Wide range, via potentiometer or remote adjust pin, module dependent		
Minimum Load	A	0A		
Max Output Power	W	450[2]	650	900
Max Ripple & Noise (pk-pk)	mV	<1% (or 50mV which ever is greater) using EIAJ test method & 20MHz bandwidth		
Regulation (load, line, cross)	%	Less than 0.5%		
Hold Up Time	ms	16ms min at 90VAC (150VAC for 900W, 10ms for 450WDC input)		
Over Voltage Protection	%	120 - 150% (See website for more details)		
Overload/Short Circuit	%	105-125%, constant current characteristic, 150% max short circuit current.		
Remote ON/OFF Control	-	A TTL compatible signal will turn ON/OFF all output modules (optional)		
Remote Sense	V	Compensates for total of 0.75V total line drop (optional on dual output modules)		
Isolation (3)	-	Input-Output 4.3kVDC[3]; Input-Ground 2.3kVDC; Output-Ground 200VDC		
Conducted EMI	-	EN55022 Class B, (as per CISPR .22), Class A for 48V input		
Radiated EMI	-	EN55022 Class B, (as per CISPR .22)		
Operating Temperature	°C	0°C to 50°C, derate ea. output @ 2.5%/°C from 50°C to 65°C.[4] Consult factory for 70°C operation. -20°C startup requires a 30 min. warm-up period.		
Cooling	-	Forced Air Cooled		
Dynamic Load Response	- -	<6% or 300mV of set voltage for 50% load change (above 25% load), recovery to within 1% of nominal within 500 µs		
Regulatory Agency Compliance (601-1 not available on 48V input)	-	UL, CSA, EN, IEC60950-1, EN61010-1, UL, EN, IEC60601-1, CE Mark for LVD		
Vibration	G	MIL-STD-810E, Method 514.4,Pro I, Cat 1, 9 2G, 10-200Hz sweep for 1hr to search for resonant. 6G random, 6-Axis to IEC68-2-64		
Shock	G	MIL-STD-810F, Method 516.5, Pro I, IV, VI; 20G per IEC68-2-27		
Switching Frequency	kHz	200		
Weight (Typ.)	lbs	3.0 lbs. + 0.25 lbs. / used slot; maximum # of slots =5		
Size (L×W×H)	in(mm)	10.6" x 5" x 2.5" (268.4mm x 127mm x 63.5mm)		
Warranty	-	3 Years		

Consult datasheet and application notes for detailed specifications and test methods.
(1) Will operate with 130-330VDC (2) DC Input <44V input 370W (3) 4kVAC Type tested (non-production test) Refer to CB Report (4) 450WDC 1.5%/°C

Vega Series

Configuring Guide

Choose your options for boxes A through E. Select output voltage, single or dual output module code from the tables below, and options (if required) A maximum of 5 module slots may be used. List actual output voltages required to have them pre-set by the factory.

V [A] [B] [C] [D] [E] Choose the following power supply options.

Primary Options
(Leave empty if not required)

F	AC Fail, Global/fan Inhibit, 5V/100mA standby
FV	AC Fail, Global/fan Inhibit, 5V/300mA standby
xFW[5]	AC Fail, Global/fan Inhibit, 5-15V/1A standby
E	AC Fail, Global/fan Enable, 5V/100mA standby
EV	AC Fail, Global/fan Enable, 5V/300mA standby
xEW[5]	AC Fail, Global/fan Enable, 5-15V/1A standby

(5) Specify value of x from 5-15V. (Increase leakage current by 90µA.)

Input Filter Choice*

	120VAC, 60Hz	240VAC, 60Hz	264VAC, 63Hz(9)
S	564µA	1270µA	1.5mA
M	244µA	550µA	650µA
L	109µA	246µA	290µA
R	66µA	148µA	175µA
T	23µA	51µA	60µA

Input Connection

F	Fast on terminals (6)
S	Screw terminals
I	Switched IEC 320 Connector (6)

Cooling

F	Standard forward air fan
Q	Quiet fan, forward air (7)
R	Standard reverse air fan
P	Quiet fan, reverse air (6) (7)
C**	Customer air (30 CFM req'd)

Output Power

0	450W DC Input
4	450W
6	650W
9	900W

* Max Leakage calculated at 264VAC, 63Hz. Note: Contact Lambda Technical Support for non-standard leakage options emissions compliance.
** Thermocoupled evaluation unit recommended. Consult sales office.
(6) Not available on 900W Model (7) Not available on 450WDC Model
(8) Only available on 900W Model (9) Type testing result

Call 1-800-LAMBDA-4 for additional technical support or visit www.lambdapower.com/products/vega-series.htm

Single Output Module Selection †

Output Options
(Leave empty if not required)
Inhibit, module good, and current share: N

Output Connection
Fast on terminals: F
Screw terminals: S

Vout | Module | Conn. | Opt.

Example
12B3SN: 12V @ 12A single output module, screw terminal outputs, inhibit option

† Remote sense is standard on single output modules, optional on duals

Dual Output Module Selection

V1 / V2 | Module | Conn. | Opt.

Output Connection
Fast on terminals: F
Screw terminals: S

Output Options
Inhibit, module good, and remote sense: N
Remote sense: R
(Leave empty if not required)

Example
3.3/12H1L/3FR: 3.3V @ 12A and 12V @ 6A output, fast on output terminals and remote sense option.

Full Description Example:

V4FSSFV 5L1S 3.3E1SN 15/15H3/3SR

450W power supply with standard forward air fan, screw terminal input connections, 1.5mA leakage input filter, AC fail with Global/fan inhibit & 5V @ 300mA aux. supply option with the following outputs:

5V @ 35A	Screw terminal connections with remote sense standard
3.3V @ 60A	Screw terminal connection with output inhibit, module good, and current share options, remote sense standard
15V @ 10A	Screw terminal connection with remote sense option (1st half of dual)
15V @ 6A	Screw terminal connection with remote sense option (2nd half of dual)

Note the module descriptions are to be used as listed in the module tables.

Vega Output Modules

Module	V Range	Amp	Slots	Module	V Range	Amp	Slots
Single Output							
B1L	1.8-3.8V	20A	1	E4	14-19.9V	30A	2
C1	1.8-4.1V	35A	1	E3H	14-15V	36A	2
C1Y	1.8-4.1V	40A	1	C4	16.2-21.5V	14A	1
D1L	1.8-3.8V	50A	1.5	CC3	18.2-32.4V	18A	2
E1	1.8-3.8V	60A	2	E5L	20-24V	27A	2
F1[6]	1.8-3.8V	80A	2	B5	21.6-31V	6A	1
Z2	1.8-3.8V	95A	3	C5	21.6-31V	10A	1
Z3	1.8-3.8V	114A	4	D5	21-28V	15A	1.5
B1H	3.9-5.5V	20A	1	E5H	24-28V	25A	2
L1	4.2-5.5V	35A	1	Z19[8]	24-28V	36A	3.5
D2	3.8-9V	45A	1.5	HH5/3	25.3-44.2V	5A	1
D1H	3.9-5.5V	50A	1.5	DD4	28-43V	18A	3
E2	3.8-8V	60A	2	EE4[8]	28-38	22.5	4
Z18	4.2-5.5V	66A	2	HH5/4	32.5-53V	4.5A	1
F2[6]	3.8-8V	75A	2	BB4	32.6-43V	10A	2
Z4	3.9-5.5V	95A	3	EE5L[8]	40-48	18	4
Z6	3.9-5.5V	104A	3.5	C5B4	43-48V	10A	2
B2	5-9V	25A	1	EE5H[8]	48-56	18	4
B3	9.1-16.2V	12A	1	CC5	48.1-62V	10A	2
C3	9.1-16.2V	18A	1	DD5	42-56V	15A	3
D3	8-16.5V	24A	1.5				
E3L	8-13.9V	40A	2	**Wide Range Programmable***			
Z7	8-16.5V	45A	3	W2[6]	1-7.5V	30A	1
EE2	7.6-16V	45A	4	W5	0.5-32V	8.5A	1
D4	14-21.5V	18A	1.5	* Refer to Vega Datasheet			

Vega Output Modules

Module	V1 Min - V1 Max	V1 Amp	V2 Min - V2 Max	V2 Amp	Slots
Dual Output					
H1L/1L	1.8V - 3.8V	12A	1.8V - 3.8V	8A	1
H1L/1H	1.8V - 3.8V	12A	3.9V - 5.5V	8A	1
H1L/2	1.8V - 3.8V	12A	5.6V - 9V	6A	1
H1L/3	1.8V - 3.8V	12A	9.1V - 16.2V	6A	1
H1L/4	1.8V - 3.8V	12A	16.3V - 25V	4.5A	1
H1H/1L	3.9V - 5.5V	12A	1.8V - 3.8V	8A	1
H1H/1H	3.9V - 5.5V	12A	3.9V - 5.5V	8A	1
H1H/2	3.9V - 5.5V	12A	5.6V - 9V	6A	1
H1H/3	3.9V - 5.5V	12A	9.1V - 16.2V	6A	1
H1H/4	3.9V - 5.5V	12A	16.3V - 25V	4.5A	1
H2/1L	5.6V - 9V	10A	1.8V - 3.8V	8A	1
H2/1H	5.6V - 9V	10A	3.9V - 5.5V	8A	1
H2/2	5.6V - 9V	10A	5.6V - 9V	6A	1
H2/3	5.6V - 9V	10A	9.1V - 16.2V	6A	1
H2/4	5.6V - 9V	10A	16.3V - 25V	4.5A	1
H3/1L	9.1V - 16.2V	10A	1.8V - 3.8V	8A	1
H3/1H	9.1V - 16.2V	10A	3.9V - 5.5V	8A	1
H3/2	9.1V - 16.2V	10A	5.6V - 9V	6A	1
H3/3	9.1V - 16.2V	10A	9.1V - 16.2V	6A	1
H3/4	9.1V - 16.2V	10A	16.3V - 25V	4.5A	1
H5/1L	16.2V - 28V	5A	1.8V - 3.8V	8A	1
H5/1H	16.2V - 28V	5A	3.9V - 5.5V	8A	1
H5/2	16.2V - 28V	5A	5.6V - 9V	6A	1
H5/3	16.2V - 28V	5A	9.1V - 16.2V	6A	1
H5/4	16.2V - 28V	5A	16.3V - 25V	4.5A	1

LAMBDA

Vega-Lite

550 to 900W Multiple Output Modular Power Supply

RoHS

- Suitable for higher volume applications
- 1-10 Wide Range Outputs With Adjustment
- Output Voltages From 1.8 - 56V
- Medical Approval Options
- MIL-STD-810 Shock and Vibration

Vega Features and Benefits

Feature	Benefit
◆ PFC compliant to EN61000-3-2	◆ Supports global use
◆ Wide Range Output Adjustment	◆ Capable of providing non-standard voltages, eliminating the need for custom models
◆ Safety Agency Approvals EN, cULus, BSI, CE	◆ Supports worldwide use, lowers risk to end user
◆ Flexibility with option choices	◆ Custom solutions available off the shelf

Specifications

ITEMS / MODELS			VEGA Lite 550	VEGA Lite 750
Input Voltage Range	(1)	-	85-264VAC 47-63Hz(2)	85-264VAC 47-63Hz(2)
Efficiency (Typ.)		%	75% at 230VAC and full load, configuration dependent	
Nominal Output Voltages		VDC	1.8 - 56V (See page 2)	
Output Voltage Adjustment		-	Wide range, via potentiometer or remote adjust pin, module dependent	
Minimum Load		A	0A	
Max Output Power	(3)	W	700 (3)	900 (3)
Max Ripple & Noise (pk-pk)		mV	<1% (or 50mV which ever is greater) using EIAJ test method & 20MHz bandwidth	
Regulation (load, line, cross)		%	Less than 0.5%	
Hold Up Time		ms	16ms min at 100VAC and full load	
Over Voltage Protection		%	120% - 150% (See website for more details)	
Overload/Short Circuit		%	105-125%, constant current characteristic, 150% max short circuit current	
Remote ON/OFF Control		-	A TTL compatible signal will turn ON/OFF all output modules (optional)	
Remote Sense		V	Compensates for total of 0.75 volts total line drop (optional on dual output modules)	
Isolation	(4)	-	Input-Output 4.3kVDC[4]; Input-Ground 2.3kVDC; Output-Ground 200VDC	
Conducted EMI		-	EN55022 Class B, (as per CISPR .22)	
Radiated EMI		-	EN55022 Class B, (as per CISPR .22)	
Operating Temperature		°C	0°C to 50°C, derate ea. output @ 2.5%/°C from 50°C to 65°C. Consult factory for 70°C operation. -20°C startup requires a 30 min. warm-up period.	
Cooling		-	Internal fan	
Dynamic Load Response		- -	<6% or 300mV of set voltage for 50% load change (above 25% load), recovery to within 1% of nominal within 500 microseconds.	
Regulatory Agency Compliance		-	UL, CSA, EN, IEC 60950-1, EN61010-1, UL2601-1, EN, IEC6060-1, CE Mark for LVD	
Vibration		G	MIL-STD-810E, Method 514.4,Pro I, Cat 1, 9 2G, 10-200Hz sweep for 1hr to search for resonant. 6G random, 6-Axis to IEC68-2-64	
Shock		G	MIL-STD-810F, Method 516.5, Pro I, IV, VI; 20G per IEC68-2-27	
Switching Frequency		kHz	200	
Weight (Typ.)		lbs	3.0 lbs. + 0.25 lbs. / used slot; maximum # of slots =5	
Size (L×W×H)		in(mm)	10.6" x 5" x 2.5" (268.4mm x 127mm x 63.5mm)	
Warranty		-	3 Years	

Consult datasheet and application notes for detailed specifications and test methods.

(1) 440Hz with reduced PFC, consult factory

(2) Will operate with 130-330VDC

(3) See input derating curves

(4) 4kVAC type tested (non-production test). Refer to CB report

Vega-Lite

Configuring Guide

Choose your options for boxes A through C. Select output voltage, single or dual output module code from the tables below, and options (if required) A maximum of 5 module slots may be used. List actual output voltages required to have them pre-set by the factory.

V [A] [F] [S] [B] [C] Choose the following power supply options.

Primary Options
(Leave empty if not required)

F	AC Fail, Global/fan Inhibit, 5V/100mA standby
E	AC Fail, Global/fan Enable, 5V/100mA standby

Input Filter Choice*

	120VAC, 60Hz	240VAC, 60Hz	264VAC, 63Hz(5)
S	564µA	1270µA	1.5mA
L	109µA	246µA	290µA

Output Power

5	550W
7	750W

* Max Leakage calculated at 264VAC, 63Hz. Note: Contact Lambda Technical Support for non-standard leakage options emissions compliance.
(5) Type testing result

Vega Output Modules

Module	V Range	Amp	Slots	Module	V Range	Amp	Slots
Single Output							
C1S	1.8-3.4V	35A	1	D4S	14-18V	18A	1.5
D1LS	1.8-3.4V	50A	1.5	E4S	14-19V	30A	2
E1S	1.8-3.4V	60A	2	C4S	16.3-18V	14A	1
L1S	4.2-5.1V	35A	1	C5S	21.6-30V	10A	1
D2S	3.8-7.5V	45A	1.5	D5S	21-28V	15A	1.5
D1HS	3.9-5.1V	50A	1.5	E5HS	24-28V	25A	2
E2S	3.8-7.5V	60A	2	HH5/4S	32.5-48V	4.5A	1
B2S	5-8V	25A	1	BB4S	32.6-40V	10A	2
C3S	9.1-15V	18A	1	C5B4S	43-48V	10A	2
D3S	8-15V	24A	1.5	DD5S	42-56V	15A	3
E3LS	8-12.5V	40A	2				

Vega Output Modules

Module	V1 Min - V1 Max	V1 Amp	V2 Min - V2 Max	V2 Amp	Slots
Dual Output					
H1H/1LS	3.9V - 5.1V	12A	1.8V - 3.4V	8A	1
H1H/3S	3.9V - 5.1V	12A	9.1V - 15.5V	6A	1
H3/1HS	9.1V - 15.5V	10A	3.9V - 5.1V	8A	1
H3/3S	9.1V - 15.5V	10A	9.1V - 15.5V	6A	1
H5/1HS	16.2V - 28V	5A	3.9V - 5.1V	8A	1
H5/3S	16.2V - 28V	5A	9.1V - 15.5V	6A	1
H5/4S	16.2V - 28V	5A	16.3V - 24V	4.5A	1

Call 1-800-LAMBDA-4 for additional technical support or visit www.lambdapower.com/products/vega-series.htm

Single Output Module Selection †

Output Options
(Leave empty if not required)

Inhibit, module good, and current share	N

Vout [ ] Module [ ] [S] Opt. [ ]

Example
12C3SN: 12V @ 18A single output module, with inhibit, module good, and current share option.
† Remote sense is standard on single output modules, optional on duals.

Dual Output Module Selection

V1 [ ] / V2 [ ] Module [ ] [S] Opt. [ ]

Output Options
(Leave empty if not required)

Inhibit, module good, and remote sense	N

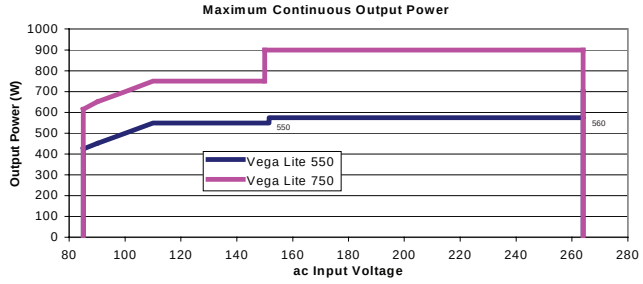
Example
12/12H3/3SN: 12V @ 10A and 12V @ 6A, dual output module with inhibit, module good, and remote sense option.

Full Description Example:

V5FSSF 5L1SN 12/12H3/3S 24C5S

550W power supply with standard forward air fan, screw terminal input connections, 1.5mA leakage input filter, AC fail with Global/fan inhibit & 5V @ 100mA aux. supply option with the following outputs:
5V @ 35A With O/P inhibit, module good & current share options
12V @ 10A
12V @ 6A
24V @ 10A
Note the module descriptions are to be used as listed in the module tables.

Derating Curve



LAMBDA VSB/VSC/VSP Series

Single Output Low Cost, 115VAC Input

- Input transient protected
- 2 year warranty
- High quality design
- 200% Peak Power Version (VSP)

RoHS

Key Market Segments & Applications

Factory Automation	Process Control, NC-Machining, Automotive, Packaging Equipment, Materials Handling, Chemical Processing, Robots
Test & Measurement	Burn-in & Test, Automated Test, Instrumentation, Measurement, Detection
Light Industrial	Gaming, Vending, Printers

VSB/VSC Features and Benefits

Feature	Benefit
◆ 2 Year Warranty	◆ Lower Cost of Ownership
◆ Broad product range	◆ Optimization of power supply to system
◆ Peak Power capability	◆ Can drive high current start up devices

Specifications

ITEMS / MODELS		VS10C	VS15C	VS30C	VS50B VS50P	VS75B VS75P	VS100B VS100P	VS150B VS150P
AC Input Voltage range	-	85-132VAC (47-440Hz)						
DC Input Voltage range	VDC	110 - 175VDC						
Inrush Current (100VAC) (1)	A	25	30	25	30	30	20	20
Temperature Coefficient	-	<0.02%/°C						
Overcurrent Protection (2)	-	~105%			VSB:~125%; VSP: >102% of Peak			
Overvoltage Protection	V	~115% Diode Clamp			~115 - 135% Manual Reset			
Hold Up Time (Typ) at 100VAC	ms	20			17			
Remote Sense	-	None						
Operating Temperature (3)	-	-10°C to +60°C, derate linearly to 70% load from 50°C to 60°C						
Storage Temperature	-	-30 to +85°C						
Humidity (non condensing)	-	Storage 10-95% RH, Operating 30-90% RH						
Cooling (4)	-	Convection						Forced
Withstand Voltage	-	Input to Ground 2kVAC (20mA), Input to Output 2kVAC (20mA), Output to Ground 500VAC (100mA) for 1 min.						
Isolation Resistance	-	>100M at 25°C & 70%RH, Output to Ground 500VDC						
Vibration (non operating)	-	10 - 55Hz (1 minute sweep), 19.6m/s^2 constant X, Y, Z 1 hour						
Shock	-	< 196.1 m/s^2						
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1						
Conducted & Radiated EMI	-	FCC Class B, VCCI-B						
Recommended EMI Filter	-	MAW12R5-22	MAW1201-22		MAW1202-22	MAW1203-22	MAW1205-22	
Weight (Typ) (VSP)	g	65	80	150	200	350 (280)	420 (350)	550 (480)
Size (WxHxD)	mm	See Outline Drawings						
Warranty	-	2 years						

Notes:
(1) 25°C ambient (cold start)
(2) Avoid prolonged operartion in overload
(3) VS50B24 -10°C to +60°C, derate linearly to 62% load from 40°C to 60°C, VS50P derate to 60% at 60°C
(4) 0.7m/s forced air required, consult installation manual for derating with convection cooling

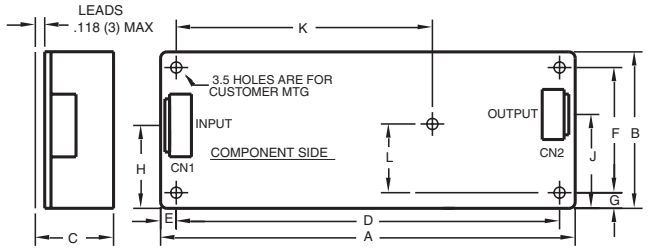
LAMBDA VSB/VSC/VSP Series

Output Ratings

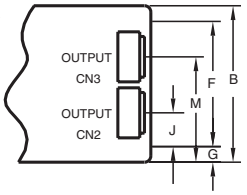
Model	Voltage	Adjust Range V	Max Curr. A	Peak Curr. A	Load Reg mV	Line Reg mV	Ripple Noise mV	Eff. %
VS10C-3	3.3V	2.97-3.63	2	-	40	20	120	62
VS15C-3	3.3V	2.97-3.63	3	-	40	20	120	62
VS30C-3	3.3V	2.97-3.63	6	-	40	20	120	69
VS50B-3	3.3V	2.97-3.63	10	12	40	20	120	73
VS75B-3	3.3V	2.97-3.63	15	18	40	20	120	72
VS100B-3	3.3V	2.97-3.63	20	24	40	20	120	72
VS150B-3	3.3V	2.97-3.63	30	36	40	20	120	72
VS10C-5	5V	4.5-5.5	2	-	40	20	120	71
VS15C-5	5V	4.5-5.5	3	-	40	20	120	72
VS30C-5	5V	4.5-5.5	6	-	40	20	120	75
VS50B-5	5V	4.5-5.5	10	12	40	20	120	78
VS75B-5	5V	4.5-5.5	15	18	40	20	120	79
VS100B-5	5V	4.5-5.5	20	24	40	20	120	79
VS150B-5	5V	4.5-5.5	30	36	40	20	120	78
VS10C-12	12V	10.8-13.2	0.9	-	96	48	150	75
VS15C-12	12V	10.8-13.2	1.3	-	96	48	150	75
VS30C-12	12V	10.8-13.2	2.5	-	96	48	150	80
VS50B-12	12V	10.8-13.2	4.3	5.16	96	48	150	79
VS75B-12	12V	10.8-13.2	6.3	7.56	96	48	150	80
VS100B-12	12V	10.8-13.2	8.5	10.2	96	48	150	80
VS150B-12	12V	10.8-13.2	12.5	15	96	48	150	80
VS10C-15	15V	13.5-16.5	0.7	-	120	60	150	75
VS15C-15	15V	13.5-16.5	1	-	120	60	150	75
VS30C-15	15V	13.5-16.5	2	-	120	60	150	81
VS50B-15	15V	13.5-16.5	3.5	4.2	120	60	150	80
VS75B-15	15V	13.5-16.5	5	6.0	120	60	150	80
VS100B-15	15V	13.5-16.5	7	8.4	120	60	150	80
VS150B-15	15V	13.5-16.5	10	12	120	60	150	80
VS10C-24	24V	21.6-26.4	0.5	-	240	96	200	78
VS15C-24	24V	21.6-26.4	0.7	-	240	96	200	78
VS30C-24	24V	21.6-26.4	1.3	-	150	96	200	82
VS50B-24	24V	21.6-26.4	2.5	3.0	150	96	200	80
VS50P-24	24V	21.6-26.4	2.5	4.2	150	96	180	83
VS75B-24	24V	21.6-26.4	3.2	3.84	150	96	200	81
VS75P-24	24V	21.6-26.4	3.2	7.0	150	96	180	83
VS100B-24	24V	21.6-26.4	4.3	5.16	150	96	200	81
VS100P-24	24V	21.6-26.4	4.3	10	150	96	180	85
VS150B-24	24V	21.6-26.4	6.3	7.56	150	96	200	80
VS150P-24	24V	21.6-26.4	6.3	12	150	96	180	86
VS30C-36	36V	32.4-39.6	0.9	-	240	144	300	80
VS75B-36	36V	32.4-39.6	2.1	2.52	240	144	300	81
VS100B-36	36V	32.4-39.6	3	3.6	240	144	300	81
VS150B-36	36V	32.4-39.6	4.2	5.04	240	144	300	80
VS30C-48	48V	43.2-52.8	0.7	-	480	192	400	80
VS75B-48	48V	43.2-52.8	1.6	1.92	300	192	400	81
VS100B-48	48V	43.2-52.8	2.2	2.64	200	192	400	81
VS150B-48	48V	43.2-52.8	3.2	3.84	300	192	400	81

Peak Current Note: For 10s maximum, 35% duty cycle, average power not to exceed maximum ratings. See installation manual.

VSB/VSC Outline Drawing



NOTE: TOP LEFT AND BOTTOM RIGHT MOUNTING HOLES ARE NOT PRESENT ON VS10 MODELS



DIMENSIONS: WEIGHT:

MODEL	A	B	C	D	E	F	G	H	J	K	L	M	
VS10	3.70 (94)	1.93 (49)	.67 (17)	3.425 (87)	.138 (3.5)	1.654 (42)	.138 (3.5)	1.02 (26)	.85 (21.5)	-	-	-	.17 LBS
VS15	4.53 (115)	1.97 (50)	.67 (17)	4.252 (108)	.138 (3.5)	1.693 (43)	.138 (3.5)	1.22 (31)	1.39 (35.25)	-	-	-	.22 LBS
VS30	5.22 (132.5)	1.97 (50)	.98 (25)	4.823 (122.5)	.197 (5)	1.576 (40)	.197 (5)	1.02 (26)	1.18 (30)	-	-	-	.29 LBS
VS50	7.68 (195)	1.97 (50)	.98 (25)	7.283 (185)	.197 (5)	1.576 (40)	.197 (5)	1.10 (28)	.67 (17)	-	-	-	.44 LBS
VS75	8.74 (222.0)	1.97 (50)	1.26 (32)	8.346 (212)	.197 (5)	1.576 (40)	.197 (5)	.85 (21.5)	1.06 (27)	5.335 (135.5)	1.280 (32.5)	-	.77 LBS
VS100	8.74 (222.0)	2.44 (62)	1.26 (32)	8.346 (212)	.197 (5)	2.047 (52)	.197 (5)	.98 (25)	1.22 (31)	4.705 (119.5)	1.673 (42.5)	-	.92 LBS
VS150	8.74 (222.0)	2.95 (75)	1.42 (36)	8.346 (212)	.197 (5)	2.560 (65)	.197 (5)	1.81 (46)	.85 (21.7)	4.961 (126)	2.165 (55)	1.91 (48.5)	1.21 LBS

NOTE:
1. DIMENSIONS ARE IN INCHES EXCEPT DIMENSIONS ( ) ARE IN MM.

Other Lambda Industrial Products

HWS	15W to 1500W Single output
ZWS, ZWD, ZWQ	5W to 240W Universal input
SC, SCS120	30W to 120W Single, dual & triple output
ZP	40W to 60W Single & multiple output

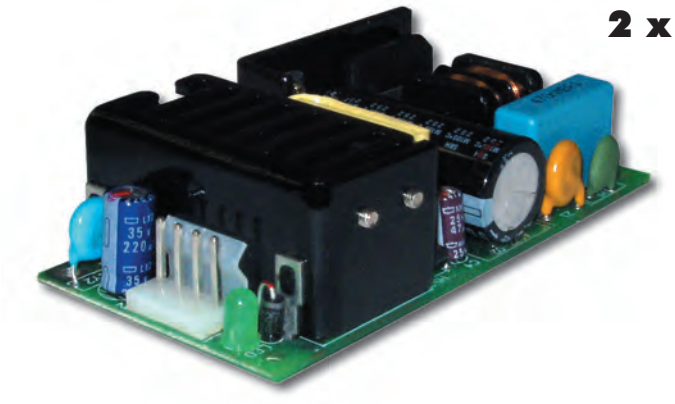
For Additional Information, please visit
www.lambdapower.com/products/vsb-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A5: Dec 2006

ZP40/60 Series

2 x 4" 40W to 60W AC-DC Power Supplies



- Single and Multiple Outputs
- Wide Range AC Input
- Low profile, Industry Standard Footprint
- Global Safety Agency Compliance
- EN61000-4 Immunity

RoHS

Key Market Segments & Applications

Computer Peripherals
Datacom
Point of Sale
Test and Measurement

Features and Benefits

Feature	Benefit
◆ Industry standard footprint	◆ Availability to second source
◆ Up to 88% efficiency	◆ Less system heating
◆ Broad product range	◆ Optimization of power supply to system
◆ Meets EN61000-4 immunity	◆ Greater reliability

Specifications

ITEMS / MODEL			ZPS40	ZPS60	ZPD40	ZPT40
Input Voltage range		-	90 - 264VAC (47 - 440Hz) or 120 - 370VDC			
Inrush Current (132/265VAC)		A	25 / 50 (cold start)			
Input Current (115/230VAC)		A	1.6 / 1.0			
Temperature Coefficient		-	±0.05%/°C			
Voltage Accuracy		-	±1%		V1: ±3%, V2: ±4%, V3: ±3%	
Minimum Load		A	None		V1: 0.4A, V2: 0.2A	
Load Regulation	(1)	-	±1%		V1: ±3%, V2: ±5%, V3: ±1%	
Line Regulation	(2)	-	±0.5%		V1: ±1%, V2: ±2%, V3: ±1%	
Ripple & Noise	(3)(4)	mV	1% or 50mV whichever is greater			
Short Circuit Protection		-	Continuous - hiccup mode			
Overvoltage Protection		V	Typically 110-130% of nominal			
Hold Up Time (Typ)		ms	8ms at 115VAC input			
LED Indicator		-	Green LED = OK		None	
Operating Temperature	(5)		0 to +70°C, derate linearly to 50% load from 50°C to 70°C			
Storage Temperature		-	-20 to +85°C			
Humidity (non condensing)		-	10 - 95% RH			
Cooling		-	Convection			
Withstand Voltage			Input to Ground 1.5kVAC, Input to Output 3kVAC, Output to Ground 500VAC for 1 min.			
Isolation Resistance			>100M at 25C & 70%RH, Output to Ground 500VDC			
Vibration (non operating)			23.52m/s^2 (10 - 55Hz: constant sweep 1 min X, Y, Z for 1 hour)			
Shock		-	< 196.1 m/s^2 (20G)			
Safety Agency Approvals		-	UL60950, CSA60950, EN60950, CE Mark (LVD)			
Conducted & Radiated EMI		-	EN55022-B, FCC Class B			
Immunity		-	EN61000-4-2,-3,-4,-6,-8			
Weight (Typ)		g (oz)	170g (6oz)			
Size (WxLxH)		in	2 x 4 x 1.2 (including underside components)			
Warranty		-	One Year			

Notes:
(1) ZPD, ZPT for a 60% to 100% or 100% to 60% change in load
(2) ZPT40-3512N V2: ±3%, ZPS/ZPD40: 100-240VAC
(3) Measured with 0.1uF ceramic & 10uF electrolytic at 20MHz BW
(4) ZPT40-3512N, V1 & V2 100mV
(5) ZPS40 (3.3V to 9V models), ZPS60 (3.3V to 12V models) derate linearly to 25% load from 40°C to 70°C

ZP40/60 Series

Model Selector

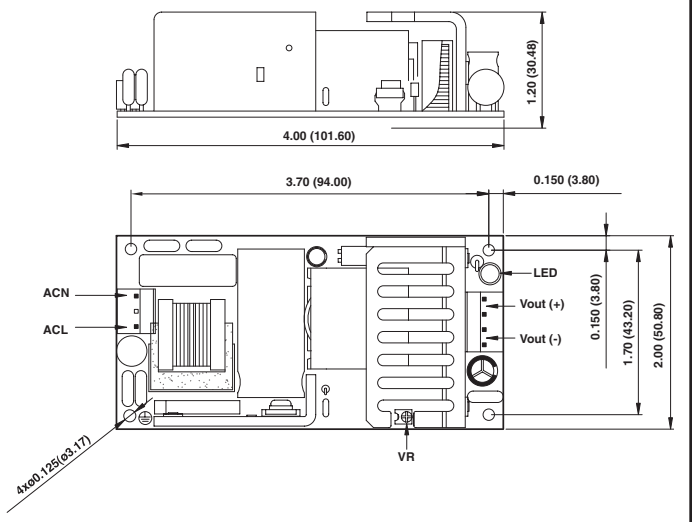
	Model		O/P(V)	Max. O/P(A)	Peak (A)(6)	Output Pwr(W)	Eff. (%)
Single Output	ZPS40-3R3	V1	3.3	6.0	7.2	20.0	74
	ZPS60-3R3	V1	3.3	8.0	8.5	26.0	74
	ZPS40-5	V1	5.0	6.0	7.2	30.0	78
	ZPS60-5	V1	5.0	8.0	9.0	40.0	78
	ZPS40-9	V1	9.0	4.45	5.34	40.0	82
	ZPS60-9	V1	9.0	6.67	8.0	60.0	82
	ZPS40-12	V1	12.0	3.34	4.0	40.0	84
	ZPS60-12	V1	12.0	5.0	6.0	60.0	84
	ZPS40-15	V1	15.0	2.67	3.2	40.0	85
	ZPS60-15	V1	15.0	4.0	4.8	60.0	85
	ZPS40-24	V1	24.0	1.67	2.0	40.0	86
	ZPS60-24	V1	24.0	2.5	3.0	60.0	86
	ZPS40-30	V1	30.0	1.33	1.6	40.0	86
	ZPS60-30	V1	30.0	2.0	2.4	60.0	86
	ZPS40-36	V1	36.0	1.11	1.33	40.0	87
	ZPS60-36	V1	36.0	1.67	2.0	60.0	87
	ZPS40-48	V1	48.0	0.834	1.0	40.0	88
	ZPS60-48	V1	48.0	1.25	1.5	60.0	88
Dual	ZPD40-512	V1	+5.0	3.2	5.0	40.0(7)	77
		V2	+12.0	2.0	2.5		
	ZPD40-524	V1	+5.0	3.2	5.0	40.0(7)	78
		V2	+24.0	1.0	1.5		
Triple Output	ZPT40-5125N	V1	+5.0	3.2	5.0	40.5(7)	75
		V2	+12.0	2.0	2.5		
		V3	-5.0	0.3	0.5		
	ZPT40-51212N	V1	+5.0	3.2	5.0	42.6(7)	75
		V2	+12.0	2.0	2.5		
		V3	-12.0	0.3	0.5		
	ZPT40-51515N	V1	+5.0	3.2	5.0	42.0(7)	75
		V2	+15.0	1.5	2.3		
		V3	-15.0	0.3	0.5		
	ZPT40-52412N	V1	+5.0	3.2	5.0	42.6(7)	75
		V2	+24.0	1.0	1.5		
		V3	-12.0	0.3	0.5		
	ZPT40-5245N	V1	+5.0	3.2	5.0	40.5(7)	75
		V2	+24.0	1.0	1.5		
		V3	-5.0	0.3	0.5		
	ZPT40-52412P	V1	+5.0	3.2	5.0	42.6(7)	75
		V2	+24.0	1.0	1.5		
		V3	+12.0	0.3	0.5		
	ZPT40-3512N	V1	+3.3	5.0	7.0	30.0	70
		V2	+5.0	2.0	3.5		
		V3	-12.0	0.3	0.5		

Pin Connection (ZPD/ZPT)

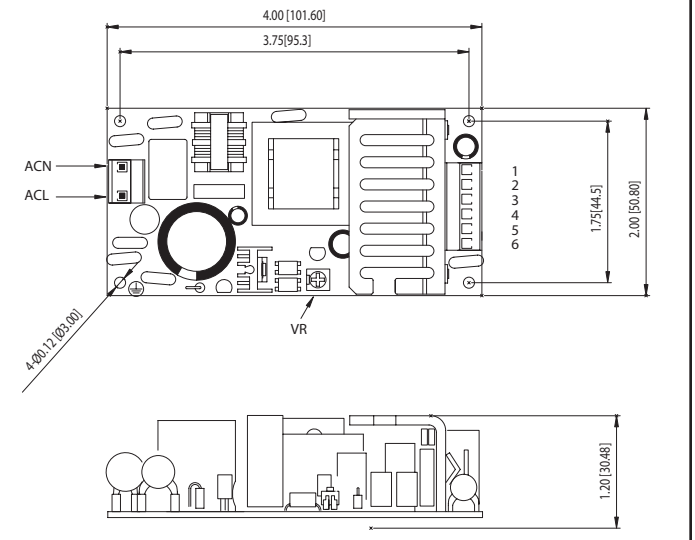
PIN	Function	PIN	Function
1	V2	2	V1
3	V1	4	COM
5	COM	6	V3

Note:
(6) Average not to exceed max power, <30s, 10% duty cycle
(7) 50W with 30CFM forced air cooling, derate linearly to 35W from 50°C to 70°C

ZPS Outline Drawing



ZPD/ZPT Outline Drawing



Other Lambda Industrial Products

SC40/60	40 to 80W, 3x5", 1 - 3 outputs
NV175	175W, 3x5", 1-5 outputs
ZWS	5 to 240W, single output

For Additional Information, please visit
www.lambdapower.com/products/zp-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A2: May 2007

ZUP Series

Zero up programmable power supplies

- Constant Voltage / Constant Current
- Last Setting Memory
- Digital Meters
- Built-in RS232 & RS485 Interface w/ GPIB optional
- Bench or Rack Mount
- Embedded Microprocessor Controller
- Voltage up to 120V, Current up to 132A

RoHS

Specifications

ITEMS \ MODELS	Cond.	ZUP6	ZUP10	ZUP20	ZUP36	ZUP60	ZUP80	ZUP120
Load Regulation	CV	2mV + 0.005% over 0 - 100% load change						
Line Regulation	CV	1mV + 0.005% over 85 - 132 or 170 - 265VAC line change						
Recovery Time (1)	CV	1ms	0.5ms	0.2ms				
Temperature Coefficient	CV	30ppm/°C following 30 minute warm up						
Temperature Drift(2)	CV	0.01% + 2mV change in output						
Up programming response time	CV	50 - 60ms					80ms	120ms
Down prog. resp. time (CV)	Full	50ms (70ms ZUP60-14)						
Down prog. resp. time (CV)	Zero	250ms	350ms	400ms	500ms	750ms	600ms	800ms
Load Regulation	CC	0.01% + 5mA on 200W and 400W models, 0.07% + 10mA on 800W models						
Line Regulation	CC	0.01% + 2mA on 200W and 400W models, 0.01% + 5mA on 800W models						
Temperature Coefficient	CC	100ppm/°C from rated current after 30 minute warm up time						
Temperature Drift(2)	CC	0.02% + 5mA, 200W and 400W models, 0.05% + 10mA 800W models						
Prog Voltage resolution	-	Better than 0.028% of rated voltage						
Prog Voltage accuracy	-	.02%+5mV	.02%+8mV	.02%+12mV	.02%+20mV	.02%+35mV	.02%+50mV	.02%+70mV
Prog Current resolution	-	Better than 0.03% of rated voltage						
Prog Current accuracy	-	0.4% + 40mA						
Overvoltage Shutdown	V	0 - 7.5	0 - 13	0 - 24	0 - 40	0 - 66	0 - 88	0 - 132
Thermal Protection	-	Over temperature protected						
Display - Voltage	-	3 digits (6, 20, 36, 60, 80V models), 3.5 digits (10, 120V models). Accuracy 0.2% ± 2 digits						
Display - Current	-	3 digits, (3.5 digits 132A model). Accuracy 0.5% ± 3 digits						
Display - Status	-	CV / CC, Alarm, Foldback, Local/Remote, On/Off						
Remote On/Off	-	TTL signal or dry contact relay						
Output Good	-	Open Collector						
Voltage & Current Programming	-	By either Voltage (0-4V) or Resistance (0-4k)						
Remote Sense	-	Up to 0.5V compensation per output cable						
Communication Interface	-	RS232 & RS485 standard, IEEE488 optional						
Series & Parallel Operation	-	Series: Up to two units; Parallel: Up to five units in master-slave configuration						
AC Input Voltage range	-	85-265VAC (47-63Hz)						
Inrush Current (100/200VAC) (3)	-	15/30A, 200W models, 15A, 400W models, 30A, 800W models						
Hold Up Time (Typ) at 100VAC	ms	20						
Power Factor Correction	-	Complies with EN61000-3 Class A (0.99 typ)						
Temperature Range	-	Operating: 0 - 50°C; Storage: -20 to +70°C						
Humidity (non condensing)	-	Operating: 30 - 90% RH, Storage 10 - 95%RH						
Cooling	-	Internal fan						
Withstand Voltage	-	Input to Ground 2kVAC, Input to Output 3kVAC, Output to Ground 500VAC for 1 min.						
Isolation Resistance	-	>100M at 25°C & 70%RH						
Vibration & Shock (non-op.)	-	Vibration:10-55Hz(1 min.) 2G constant X, Y, Z, when correctly mounted; Shock: <20G						
Safety Agency Approvals	-	UL3111-1, EN61010-1, CE Mark						
Conducted & Radiated EMI	-	EN55022-B conducted, A radiated, FCC Class B conducted,						
		A radiated, VCCI-2 conducted, -1 radiated						
Warranty	-	Three Years						

Notes:
(1) Recovery to within +/-50mV after load change of 50-100%
(2) Over 8 hour period following 30 minute warm up time
(3) 25°C ambient (cold start)

ZUP Series

Model Selector

Model	Voltage Adjust Range	Current Adjust Range	Max Power	Ripple 5Hz-1MHz mV	Noise 20MHz BW mV	Ripple 5Hz-1MHz mA	Efficiency % (100/200VAC)	Weight kg
ZUP6-33/U	0-6V	0-33	198	5	50	50	69 / 72	2.9
ZUP6-66/U	0-6V	0-66	396	5	50	100	74 / 77	3.2
ZUP6-132/U	0-6V	0-132	792	8	100	200	74 / 77	5.8
ZUP10-20/U	0-10	0-20	200	5	50	25	73 / 77	2.9
ZUP10-40/U	0-10	0-40	400	5	50	50	79 / 82	3.2
ZUP10-80/U	0-10	0-80	800	8	90	100	77 / 81	5.8
ZUP20-10/U	0-20	0-10	200	5	50	15	74 / 78	2.9
ZUP20-20/U	0-20	0-20	400	5	50	30	79 / 83	3.2
ZUP20-40/U	0-20	0-40	800	5	80	60	79 / 82	5.8
ZUP36-6/U	0-36	0-6	216	5	50	7.5	76 / 80	2.9
ZUP36-12/U	0-36	0-12	432	5	50	15	80 / 84	3.2
ZUP36-24/U	0-36	0-24	864	5	70	30	80 / 84	5.8
ZUP60-3.5/U	0-60	0-3.5	210	5	50	5	75 / 79	2.9
ZUP60-7/U	0-60	0-7	420	5	50	10	80 / 84	3.2
ZUP60-14/U	0-60	0-14	840	5	60	20	80 / 84	5.8
ZUP80-2.5/U	0-80	0-2.5	200	30	80	5	77 / 82	2.9
ZUP80-5/U	0-80	0-5	400	30	80	10	83 / 87	3.2
ZUP120-1.8/U	0-120	0-1.8	216	30	80	5	77 / 82	2.9
ZUP120-3.6/U	0-120	0-3.6	432	30	80	10	83 / 87	3.2

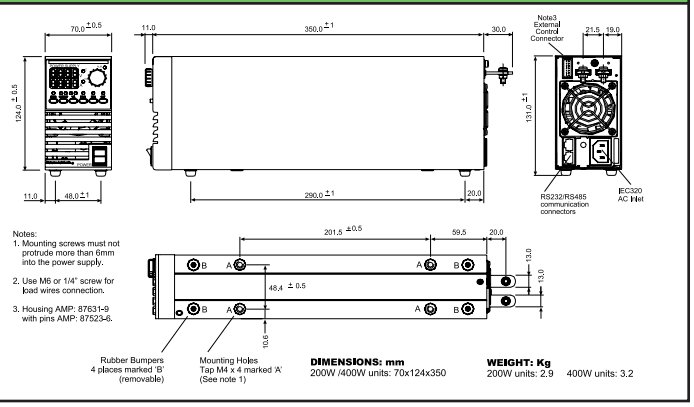
Options & Accessories

Option	Model Suffix	Part Number
Front panel terminals (20A max)[5]	/L[4]	ZUP200/400/L[4]
Front panel terminals (20A max)[6]	/L[4]	ZUP800/L[4]
IEC320 cable USA plug	/U	ZUP/U
Serial link cable RJ-45	/W	ZUP/W
GPIB Controller		GP485*
Dual Unit Assembly (accepts 200W or 400W models)		NL200*
19" 3U rack (accepts up to 6 200/400W models)		NL100*
Blanking panels for NL100 (19 in. rack)		NL101*
RS232 Communications Cable DB-9		ZUP/NC401
RS232 Communications Cable DB-25		ZUP/NC403
RS485 Communications Cable DB-9		ZUP/NC402
RS485 Communications Cable DB-25		ZUP/NC404
User Manual		NL102

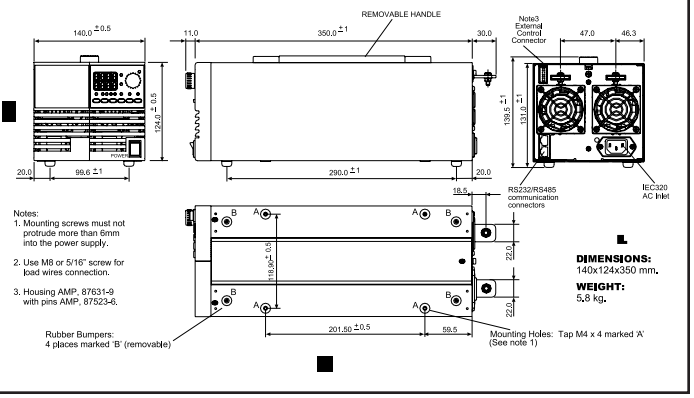
* (See website for more details)
[4] Not available with ZUP80 or ZUP120 models.
[5] 200W and 400W models
[6] 800W models

For Additional Information, please visit
www.lambdapower.com/products/zup.htm

Outline Drawing 200/400W



Outline Drawing 800W



3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A4: Jan 2006

LAMBDA ZWD-PAF Series

100W to 440W Dual Output Power Supplies

- Universal Input (85 - 265VAC)
- Power factor Corrected
- 200% Peak Power capability on 24V output
- Individual output adjustment
- 2 year warranty

RoHS

Key Market Segments & Applications

Factory Automation
Printers and motor drives
Kiosks

Features and Benefits

Feature	Benefit
◆ Input Transient Protected	◆ Withstands harsh environments
◆ Power Factor Corrected	◆ Supports Global Use
◆ 200% Peak Power capability	◆ Can drive high current start up or pulse loads

Specifications

ITEMS \ MODEL			ZWD100PAF-0524	ZWD150PAF-0524	ZWD225PAF-0524
Input Voltage		-	85-265VAC (47-63Hz), 120-370VDC		
Input Current	(1)	A	1.3 / 0.65	1.9 / 0.97	2.81 / 1.43
Inrush Current	(1)(2)	A	15 / 30		
Power Factor		-	0.99 at 100VAC, 0.95 at 200VAC, Meets EN61000-3-2		
Leakage Current		mA	0.75mA max		
Temperature Coefficient		-	<0.02%/°C		
Overcurrent Protection	(3)	-	5V output: >105%, 24V output: >205%		
Overvoltage Protection	(4)	V	120- 145%		
Hold Up Time (Typ)	(1)	ms	5V output: 40ms, 24V output: 20ms		
Efficiency	(2)	%	79 / 81	80 / 82	81 / 83
Remote On/Off		-	On 24V output only, remove jumper to shutdown		
Line Regulation		mV	5V output: 20mV, 24V output: 96mV		
Load Regulation		mV	5V output: 40mV, 24V output: 150mV		
Ripple & Noise		mV	5V output: 120mV, 24V output: 100W, 150mV; 150/225W, 240mV		
Operating Temperature		-	(Open frame or L bracket) -10°C to +70°C, derate linearly to 0% load from 50°C to 70°C		
Operating Temperature		-	(With /A cover option) -10°C to +60°C, derate linearly to 0% load from 40°C to 60°C		
Storage Temperature		-	-30 to +85°C		
Humidity (non condensing)		-	Operating: 20 - 90%RH, Non-operating: 10 - 95% RH		
Cooling		-	Convection cooled		
Withstand Voltage		-	I/P to Gnd 2kVAC (20mA), I/P to O/P 3kVAC (20mA), O/P to Gnd 500VAC (100mA) for 1 min.		
Isolation Resistance		-	>100M at 25°C & 70%RH, Output to Ground 500VDC		
Vibration (non operating)		-	10 - 55Hz (1 minute sweep), 19.6m/s^2 constant X, Y, Z 1 hour		
Shock		-	< 196.1 m/s^2		
Safety Agency Approvals		-	UL60950-1, CSA60950-1, EN60950-1, EN50178, CE Mark		
Conducted & Radiated EMI		-	EN55022-B, FCC Class B, VCCI-B		
Recommended EMI Filter		-	MAW1203-22	MAW1205-22	MAW1205-22
Immunity		-	EN61000-4-2, -3, -4, -5, -6, -8, -11		
Weight (Typ)		g	460 (780 with cover)	530 (885 with cover)	670 (1065 with cover)
Size (WxHxD)		in	2.95 x 8.74 x 1.38	3.35 x 8.74 x 1.57	3.74 x 8.74 x 1.77
Warranty		yrs	Two Years		

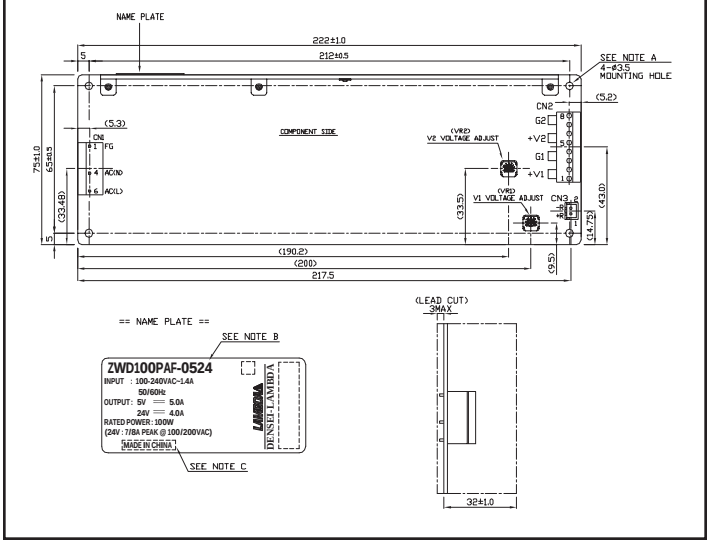
Notes: See installation manual for full specification.
(1) 100/200VAC
(2) 25°C ambient (cold start)
(3) Avoid prolonged operation in overload
(4) OVP on 24V output will shutdown 24V output only

ZWD-PAF Series

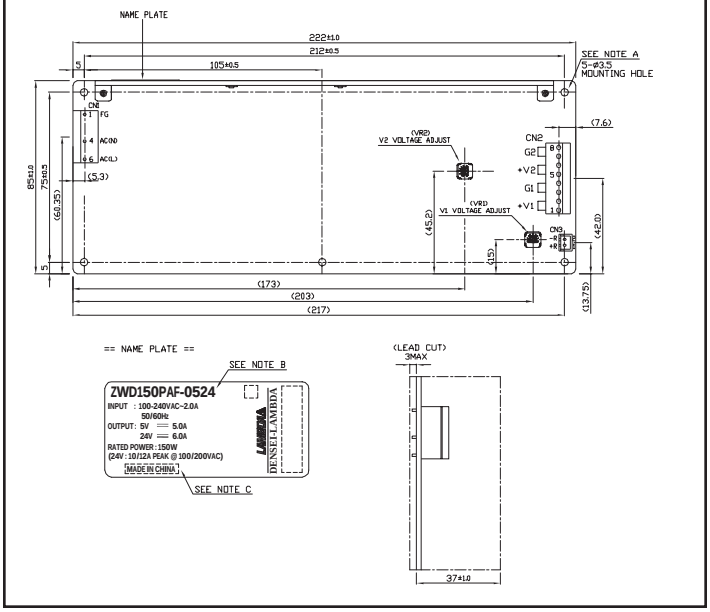
Model Selector

Model	Output Voltage	Output Voltage Accuracy	Output Adjust Range	Max Current	Peak[1,5] Current	Peak[1,5] Power	Max Average Power	Total[1,5] Peak Power
ZWD100PAF-0524	5V	4.9 - 5.1V	4.5 - 5.5V	5A	-	-	100W	172 / 196W
	24V	23.52 - 24.48V	22.8 - 27.6V	4A	7 / 8A	168 / 192W		
ZWD150PAF-0524	5V	4.9 - 5.1V	4.5 - 5.5V	5A	-	-	150W	246 / 294W
	24V	23.52 - 24.48V	22.8 - 27.6V	6A	10 / 12A	240 / 288W		
ZWD225PAF-0524	5V	4.9 - 5.1V	4.5 - 5.5V	5A	-	-	225W	344 / 440W
	24V	23.52 - 24.48V	22.8 - 27.6V	9A	14 / 18A	336 / 432W		

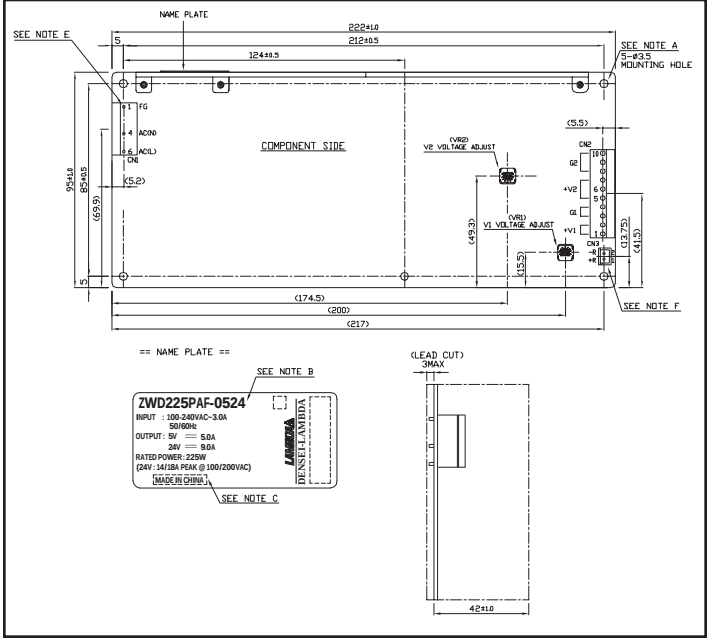
ZWD100 Outline Drawing



ZWD150 Outline Drawing



ZWD225 Outline Drawing



Options

Suffix	Description
blank	Molex Input & Output Connector
/L	L Bracket
/A	Cover & L Bracket
/J	JST Input & Output Connector
/T	Vertical Mount Screw Terminals

Prefered option combination: blank, /L, /TL, or /TA
Example: ZWD100PAF-0524/TA

Other Lambda Industrial Products

ZWS, ZWSPAF	5-480W Single output, 115/230VAC input
HWS	15-1500W Single output
SWS	50-600W Single output low cost
VSB, VSC, VSP	10-288W Single output 115VAC input

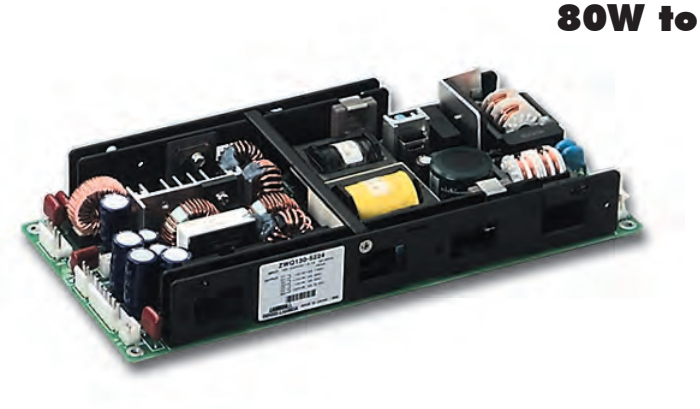
For Additional Information, please visit
www.lambdapower.com/products/zwd-paf-series.htm

Notes:
(5) ZWS100PAF: For <10s max, duty cycle ≤0.35
ZWS150PAF: Up to 10A peak, <10s max, duty cycle ≤0.35; from 10-12A, <5s, duty cycle ≤0.2
ZWS225PAF: Up to 14A peak, <10s max, duty cycle ≤0.35; from 14-18A, <5s, duty cycle ≤0.2

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A3: Dec 2006

ZWQ Series

80W to 170W Quad Output Power Supplies



- Universal Input (85 - 265VAC)
- Power Factor Corrected
- Floating Adjustable Fourth Output
- Low Profile <1U High

RoHS

Key Market Segments & Applications

Factory Automation
Test & Measurement
Light Industrial Equipment

Features and Benefits

Feature	Benefit
◆ Low Profile	◆ Fits in 1U Enclosures
◆ Adjustable Main and Fourth Output	◆ System Optimization
◆ Power Factor Corrected	◆ Supports Global Use
◆ Floating Fourth Output	◆ Can Use as Positive or Negative Output

Specifications

Items \ Models			ZWQ80 -5222	ZWQ80 -5223	ZWQ80 -5224	ZWQ80 -5225	ZWQ130 -5222	ZWQ130 -5223	ZWQ130 -5224	ZWQ130 -5225
Input Voltage		-	85-265VAC (47-63Hz), 120-370VDC							
Input Current	(1)	A	1.6 / 0.8				2.6 / 1.3			
Inrush Current	(1)	A	14/28							
Power Factor		-	Meets EN61000-3-2							
Temperature Coefficient		-	<0.02%/°C							
Max Output Power (convection)		W	80				130			
Max Output Power (forced air)		W	104	88.7	104	104	170	149.6	170	170
Overpower Protection	(2)	W	>109	>93	>109	>109	>173	>152	>173	>173
Minimum Load		A	V1: 0.9A Conv, 1.4A Forced Air				V1: 1.5A Conv, 2.1A Forced Air			
Output Voltage Accuracy		%	±5% for outputs V2 and V3							
Efficiency (Typ)		%	72							
Hold Up Time	(1)	ms	20							
Leakage Current		-	0.75mA max, 0.2mA (Typ) at 100VAC / 0.44mA(Typ) at 230VAC							
Remote On / Off		-	See installation manual (Not available with /A cover option)							
Oper Temp (convection cooled)		-	-10°C to 60°C, derate linearly to 50% load from 40°C to 60°C. (3)							
Oper Temp (forced air cooled)		-	-10°C to 70°C, derate linearly to 50% load from 50°C to 70°C. (>30cfm airflow)(3)							
Storage Temperature		-	-30° to +85°C							
Humidity (non condensing)		-	Operating: 30 - 90% RH; Non-operating 10-95% RH							
Withstand Voltage			I/P~Grnd 2kVAC (20mA), I/P~O/P 3kVAC (20mA), O/P~Grnd 500VAC (100mA) for 1 min.							
Isolation Resistance		-	>100M at 25°C & 70%RH, Output to Ground 500VDC							
Vibration (non operating)		-	10 - 55Hz (1 minute sweep), 19.6m/s² constant X, Y, Z 1 hour							
Shock		-	< 196.1 m/s²							
Safety Agency Approvals		-	UL60950-1, CSA60950-1, EN60950-1, CE Mark, EN50178							
Conducted & Radiated EMI		-	EN55011, EN55022-B, FCC Class B, VCCI-B							
Immunity		-	EN61000-4-2,-3,-4,-5,-6,-8,-11							
Weight (Typ)		g	550				730			
Size (W x H x D)		mm	93.5 x 35 x 210 (refer to outline drawing)				106 x 35 x 225 (refer to outline drawing)			
Warranty		yrs	One Year							

(1) 100/200VAC
(2) Avoid prolong operation in overload
(3) /A version - additional derating, see installation manual

ZWQ Series

Model Selector

Model	Output	Voltage (V)	Voltage Adjust Range (V)	Convect. (A)	Peak or Forced Air (A)(4)	Max Load Reg (mV)	Max Line Reg (mV)	Ripple Noise (mV)	OVP (V)(5)
ZWQ80-5222	V1	5	5.0-5.25	8.0	10.0	100	20	120	5.7-7.0
	V2	+12/15*	+12/+15	2.0	2.5	300	48	150	16.5-22.5
	V3	-12/15*	-12/-15	2.0	2.5	300	48	150	16.5-22.5
	V4	12	11.4-12.6	3.0	4.0	300	48	150	13.8-16.2
ZWQ80-5223	V1	5	5.0-5.25	8.0	10.0	100	20	120	5.7-7.0
	V2	+12/15*	+12/+15	2.0	2.5	300	48	150	16.5-22.5
	V3	-12/15*	-12/-15	2.0	2.5	300	48	150	16.5-22.5
	V4	3.3	2.0-3.63	7.0	9.0	100	20	120	3.79-4.95
ZWQ80-5224	V1	5	5.0-5.25	8.0	10.0	100	20	120	5.7-7.0
	V2	+12/15*	+12/+15	2.0	2.5	300	48	150	16.5-22.5
	V3	-12/15*	-12/-15	2.0	2.5	300	48	150	16.5-22.5
	V4	24	22.8-25.2	1.5	2.0	400	96	200	27.6-32.4
ZWQ80-5225	V1	5	5.0-5.25	8.0	10.0	100	20	120	5.7-7.0
	V2	+12/15*	+12/+15	2.0	2.5	300	48	150	16.5-22.5
	V3	-12/15*	-12/-15	2.0	2.5	300	48	150	16.5-22.5
	V4	5	2.0-5.25	7.0	9.0	100	20	120	5.7-7.0
ZWQ130-5222	V1	5	5.0-5.25	15.0	19.0	100	20	120	5.7-7.0
	V2	+12/15*	+12/+15	4.0	5.0	300	48	150	16.5-22.5
	V3	-12/15*	-12/-15	4.0	5.0	300	48	150	16.5-22.5
	V4	12	11.4-12.6	4.0	5.0	300	48	150	11.4-12.6
ZWQ130-5223	V1	5	5.0-5.25	15.0	19.0	100	20	120	5.7-7.0
	V2	+12/15*	+12/+15	4.0	5.0	300	48	150	16.5-22.5
	V3	-12/15*	-12/-15	4.0	5.0	300	48	150	16.5-22.5
	V4	3.3	2.0-3.63	10.0	12.0	100	20	120	3.79-4.95
ZWQ130-5224	V1	5	5.0-5.25	15.0	19.0	100	20	120	5.7-7.0
	V2	+12/15*	+12/+15	4.0	5.0	300	48	150	16.5-22.5
	V3	-12/15*	-12/-15	4.0	5.0	300	48	150	16.5-22.5
	V4	24	22.8-25.2	2.0	2.5	400	96	200	27.6-32.4
ZWQ130-5225	V1	5	5.0-5.25	15.0	19.0	100	20	120	5.7-7.0
	V2	+12/15*	+12/+15	4.0	5.0	300	48	150	16.5-22.5
	V3	-12/15*	-12/-15	4.0	5.0	300	48	150	16.5-22.5
	V4	5	2.0-5.25	10.0	12.0	100	20	120	5.7-7.0

* User selectable via connector or PCB. Outputs are floating from V1 & V4. Can be connected in series for 24/30V.

Other Lambda Industrial Products

ZWS/ZWD	5W to 480W Single and dual output
SC	30W to 120W Single, dual, & triple output
NV	175 to 700W Single and multiple output
HWS	15 to 1500W Single output

Options

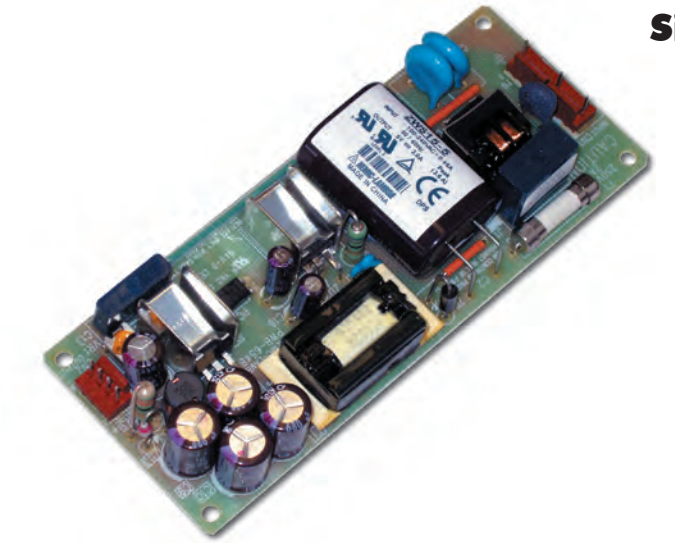
Suffix	Description
blank	No cover or L Bracket
/L	L Bracket
/A	Cover and L Bracket

4 The peak current draw must not exceed a 10 sec. duration with a duty cycle of 35%.
5 An overvoltage condition on any output will shut down all outputs, the power supply must be re-set by cycling the AC input.

For Additional Information, please visit
www.lambdapower.com/products/zwq-series.htm

ZWS Series

Single Output Low Cost, Worldwide Use



- Universal Input (85 - 265VAC)
- Power factor Corrected (>50W)
- Input transient protected
- 2 year warranty
- High quality design
- Peak Power capability

RoHS

Key Market Segments & Applications

Factory Automation	Process Control, NC-Machining, Automotive, Packaging Equipment, Materials Handling, Chemical Processing, Robots
Test & Measurement	Burn-in & Test, Automated Test, Instrumentation, Measurement, Detection
Light Industrial	Gaming, Vending, Printers

ZWS Features and Benefits

Feature	Benefit
◆ Input Transient Protected	◆ Withstands harsh environments
◆ 2 Year Warranty	◆ Lower Cost of Ownership
◆ Power Factor Corrected	◆ Supports Global Use
◆ Peak Power capability	◆ Can drive high current start up devices

Specifications

ITEMS \ MODELS		ZWS5 ZWS10	ZWS15 ZWS30	ZWS50
AC Input Voltage range	-	85-265VAC (47-440Hz)		
DC Input Voltage range	-	110 - 330VDC		
Inrush Current (100/200VAC) (1)	A	15 / 30		
Power Factor (Passive)	-	None		
Temperature Coefficient	-	<0.02%/°C		
Overcurrent Protection (2)	-	~125%		
Overvoltage Protection	V	~140% diode clamp		~115 - 130%, manual reset
Hold Up Time (Typ) @ 100VAC	ms	17		
Remote Sense	-	None		
Operating Temperature	-	(open frame) -10°C~+60°C, derate linearly to 70% load from 50°C~60°C		
Operating Temperature	-	(with cover) Additional derating applies, please consult Installation Manual		
Storage Temperature	-	-30 to +85°C		
Humidity (non condensing)	-	10 - 95% RH		
Cooling	-	Convection		
Withstand Voltage	-	Input to Ground 2kVAC (20mA), Input to Output 3kVAC (20mA), Output to Ground 500VAC (100mA) for 1 min.		
Isolation Resistance	-	>100M at 25C & 70%RH, Output to Ground 500VDC		
Vibration (non operating)	-	10 - 55Hz (1 minute sweep), 19.6m/s² constant X, Y, Z 1 hour		
Shock	-	< 196.1 m/s²		
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, CE Mark		
Conducted & Radiated	EM	EN55022-B, FCC Class B, VCCI-B		
Recommended EMI Filter	-	MAW12R5-22	MAW1201-22 MAW1202-22	MAW1202-22
Weight (Typ)	g	120/120	140/270	370
Size (WxHxD)	mm	See Outline Drawings		
Warranty	-	2 years		

Notes:
(1) 25C ambient (cold start)
(2) Avoid prolonged operartion in overload

ZWS Series

Output Ratings

Model	Voltage	Adjust Range	Max Curr. A	Peak Curr. A	Load Reg mV	Line Reg mV	Ripple Noise mV	Eff. %
ZWS5-3	3.3V	2.97-3.63	1	1.2	40	20	120	62
ZWS10-3	3.3V	2.97-3.63	2	2.4	40	20	120	62
ZWS15-3	3.3V	2.97-3.63	3	3.6	40	20	120	63
ZWS30-3	3.3V	2.97-3.63	6	7.2	40	20	120	70
ZWS50-3	3.3V	2.97-3.63	10	12	40	20	120	73
ZWS5-5	5V	4.5-5.5	1	1.2	40	20	120	67
ZWS10-5	5V	4.5-5.5	2	2.4	40	20	120	70
ZWS15-5	5V	4.5-5.5	3	3.6	40	20	120	71
ZWS30-5	5V	4.5-5.5	6	7.2	40	20	120	75
ZWS50-5	5V	4.5-5.5	10	12	40	20	120	77
ZWS5-12	12V	10.8-13.2	0.42	0.51	96	48	150	68
ZWS10-12	12V	10.8-13.2	0.85	1.02	96	48	150	70
ZWS15-12	12V	10.8-13.2	1.25	1.5	96	48	150	71
ZWS30-12	12V	10.8-13.2	2.5	3	96	48	150	77
ZWS50-12	12V	10.8-13.2	4.3	5.16	96	48	150	80
ZWS5-15	15V	13.5-16.5	0.34	0.41	120	60	150	68
ZWS10-15	15V	13.5-16.5	0.7	0.84	120	60	150	71
ZWS15-15	15V	13.5-16.5	1	1.2	120	60	150	71
ZWS30-15	15V	13.5-16.5	2	2.4	120	60	150	77
ZWS50-15	15V	13.5-16.5	3.5	4.2	120	60	150	81
ZWS5-24	24V	21.6-26.4	0.22	0.27	150	96	200	70
ZWS10-24	24V	21.6-26.4	0.45	0.54	150	96	200	71
ZWS15-24	24V	21.6-26.4	0.65	0.78	150	96	200	71
ZWS30-24	24V	21.6-26.4	1.3	1.56	150	96	200	78
ZWS50-24	24V	21.6-26.4	2.1	2.52	150	96	200	82
ZWS30-36	36V	32.4-39.6	0.9	1.08	240	144	300	78
ZWS50-36	36V	32.4-39.6	1.4	1.68	240	144	300	82
ZWS30-48	48V	43.2-52.8	0.7	0.84	300	192	400	78
ZWS50-48	48V	43.2-52.8	1.1	1.32	300	192	400	82

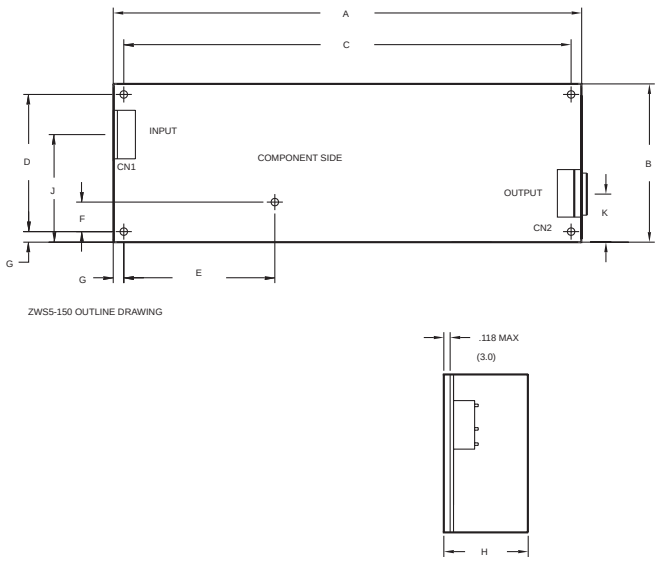
Note for Peak Current: For 10s maximum, 35% duty cycle, average power not to exceed maximum ratings.

Options

Suffix	Description
-	Molex Terminals
/A	Cover option
/J	JST Connectors*
/JA	JST Connectors & Cover

Note: * Recommended for new designs

ZWS Outline Drawing



DIMENSIONS:

MODEL	A	B	C	D	E	F	G	H	J	K	L
ZWS5	3.86 (98.0)	1.77 (44.9)	3.580 (90.9)	1.500 (38.1)	-	-	.14 (3.5)	.83 (21.0)	1.05 (26.6)	.54 (13.7)	-
ZWS10	4.14 (105.1)	1.97 (50.0)	3.860 (98.0)	1.690 (42.9)	-	-	.14 (3.5)	.83 (21.0)	.99 (25.1)	.67 (18.4)	-
ZWS15	4.93 (125.2)	1.97 (50.0)	4.650 (118.1)	1.690 (42.9)	-	-	.14 (3.5)	.83 (21.0)	1.04 (25.0)	.57 (14.4)	-
ZWS30	5.24 (133.0)	2.17 (55.1)	4.850 (123.1)	1.770 (45.0)	-	-	.20 (5.0)	1.02 (25.9)	.20 (31.0)	1.16 (40.2)	-
ZWS50	7.68 (195.0)	2.17 (55.1)	7.290 (185.1)	1.770 (45.0)	-	-	.20 (5.0)	1.02 (25.9)	1.32 (33.5)	.72 (18.2)	-

Other Lambda Industrial Products

ZWS-AF	50W to 150W Active PFC
ZWD/ZWQ	100W to 440W Single & multiple output
VSB/VSC	5W to 150W Single output 115VAC input
SC	30W to 120W Single, dual, & triple output
HWS	15W to 1500W Single output enclosed

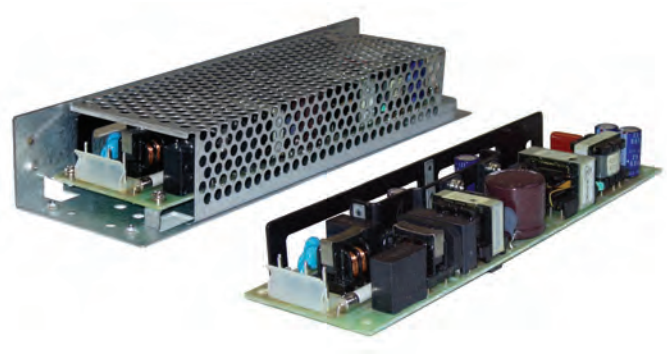
For Additional Information, please visit
www.lambdapower.com/products/zws-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A5: Dec 2006

ZWS-AF Series

50W to 150W Single Output Low Cost, Worldwide Use



- Universal Input (85 - 265VAC)
- Power factor Corrected
- Input transient protected
- 2 year warranty
- High quality design
- Peak Power capability

RoHS

Key Market Segments & Applications

Factory Automation	Process Control, NC-Machining, Automotive, Packaging Equipment, Materials Handling, Chemical Processing, Robots
Test & Measurement	Burn-in & Test, Automated Test, Instrumentation, Measurement
Light Industrial	Gaming, Vending, Printers

ZWS Features and Benefits

Feature	Benefit
◆ Input Transient Protected	◆ Withstands harsh environments
◆ 2 Year Warranty	◆ Lower Cost of Ownership
◆ Power Factor Corrected	◆ Supports Global Use
◆ Peak Power capability	◆ Can drive high current start up devices

Specifications

ITEMS / MODELS			ZWS50AF	ZWS75AF	ZWS100AF	ZWS150AF
AC Input Voltage range		VAC	85-265VAC (47-63Hz)			
DC Input Voltage range		VDC	120-370VDC			
Input Current (Typ)	(1)	A	0.8/0.4	1.2/0.6	1.4/0.7	2.0/1.0
Inrush Current		A	14/28 25°C Ambient, Cold Start			
Power Factor	(1)	-	Meets EN61000-3-2 (0.99/0.95)			
Maximum Ripple and Noise		mV	3.3 & 5V: 120mV; 12 to 24V: 150mV; 36 & 48V: 200mV			
Temperature Coefficient		-	<0.02%/°C			
Overcurrent Protection	(4)	-	>105% of Peak Current Capability			
Hold Up Time (Typ)	(1)	ms	20ms			
Leakage Current		-	0.5mA max 0.1mA (Typ) at 100VAC 0.16mA (Typ) at 230VAC			
Remote On / Off		-	See installation manual (Not available with /A cover option)			
Operating Temperature		-	Convection cooling - See table on page 2			
		-	0.7m/s air -10°C to +70°C, derate linearly to 70% load from 60°C to 70°C (2)			
Storage Temperature		-	-30° to +85°C			
Humidity (non condensing)		-	Operating: 30 - 90% RH, storage 10-95% RH			
Withstand Voltage		-	I/P~Grnd 2kVAC (20mA), I/P~O/P 3kVAC (20mA), O/P~Grnd 500VAC (100mA) for 1 min.			
Isolation Resistance		-	>100M at 25C & 70%RH, Output to Ground 500VDC			
Vibration (non operating)		-	10 - 55Hz (1 minute sweep), 19.6m/s² constant X, Y, Z 1 hour			
Shock		-	< 196.1 m/s²			
Safety Agency Approvals		-	UL60950-1, CSA60950-1, EN60950-1, EN50178, CE Mark			
Conducted & Radiated EMI		-	designed to meet EN55011, EN55022-B, FCC Class B, VCCI-B			
Immunity		-	designed to meet EN61000-4-2,-3,-4,-5,-6,-8,-11			
Weight (Typ)		g	210	290	380	500
Size (W x H x D)		mm	55 x 26 x 195	55 x 32 x 222	62 x 35 x 222	75 x 40 x 222
Warranty		yrs	Two Years			

Notes:
(1) 100/200VAC
(2) ZWS150AF -10 to 60°C, derate linearly to 70% load from 50°C to 60°C
(3) The peak current draw must not exceed a 10 second duration with a duty cycle of 35%
(4) Constant current limit with automatic recovery. Do not operate in a over-load or shorted output condition for more than 30 seconds.
(5) An overvoltage condition on the output will shut down the power supply. The power supply must be re-set by cycling the AC input.

ZWS-AF Series

Output Ratings

Model	Voltage	Output Adjust Range (V)	Max Curr. (A)	Max Peak Curr. (A)[3]	Max Output Power (W)	Peak Output Power[3] (W)	Eff. (%)	Max Load Reg.(mV)	Max Line Reg.(mV)	OVP (V)[5]
ZWS75AF3	3.3V	2.85-3.63	15.0	-	49.5	-	67	40	20	3.79-4.95
ZWS100AF3	3.3V	2.85-3.63	20.0	-	66.0	-	69	40	20	3.79-4.95
ZWS150AF3	3.3V	2.97-3.63	30.0	-	99.0	-	74	40	20	3.79-4.95
ZWS50AF5	5V	4.5-5.5	10.0	-	50.0	-	75	40	20	5.75-7.0
ZWS75AF5	5V	4.5-5.5	15.0	-	75.0	-	75	40	20	5.75-7.0
ZWS100AF5	5V	4.5-5.5	20.0	-	100.0	-	75	40	20	5.75-7.0
ZWS150AF5	5V	4.5-5.5	30.0	-	150.0	-	77	40	20	5.75-7.0
ZWS50AF12	12V	10.8-13.2	4.3	5.2	51.6	62.4	78	96	48	13.8-16.2
ZWS75AF12	12V	10.8-13.2	6.3	7.5	75.6	90.0	78	96	48	13.8-16.2
ZWS100AF12	12V	10.8-13.2	8.5	10.0	102.0	120.0	79	96	48	13.8-16.2
ZWS150AF12	12V	10.8-13.2	12.5	15.0	150.0	180.0	79	96	48	13.8-16.2
ZWS50AF15	15V	13.5-16.5	3.5	4.2	52.5	63.0	79	120	60	17.3-20.3
ZWS75AF15	15V	13.5-16.5	5.0	6.0	75.0	90.0	79	120	60	17.3-20.3
ZWS100AF15	15V	13.5-16.5	6.7	8.0	100.5	120.0	79	120	60	17.3-20.3
ZWS150AF15	15V	13.5-16.5	10.0	12.0	150.0	180.0	81	120	60	17.3-20.3
ZWS50AF24	24V	21.6-26.4	2.1	2.6	50.4	62.4	81	150	96	27.6-32.4
ZWS75AF24	24V	21.6-26.4	3.2	3.8	76.8	91.2	82	150	96	27.6-32.4
ZWS100AF24	24V	21.6-26.4	4.3	5.0	103.2	120.0	81	150	96	27.6-32.4
ZWS150AF24	24V	21.6-26.4	6.3	7.5	151.2	180.0	82	150	96	27.6-32.4
ZWS75AF36	36V	32.4-39.6	2.1	2.5	75.6	90.0	82	200	144	41.4-48.6
ZWS100AF36	36V	32.4-39.6	2.8	3.4	100.8	122.4	82	200	144	41.4-48.6
ZWS150AF36	36V	32.4-39.6	4.2	5.0	151.2	180.0	82	200	144	41.4-48.6
ZWS75AF48	48V	43.2-52.8	1.6	1.9	76.8	91.2	82	240	192	55.2-64.8
ZWS100AF48	48V	43.2-52.8	2.1	2.5	100.8	120.0	82	240	192	55.2-64.8
ZWS150AF48	48V	43.2-52.8	3.2	3.8	153.6	182.4	82	240	192	55.2-64.8

Other Lambda Industrial Products

VSB/VSC	5W-150W Single output 115VAC input
SC	30W-120W Single, dual & triple output
HWS	15W-1500W Single output
ZWSPAF	150W-480W Peak power, single output
ZWD, ZWQ	100W-440W Dual and quad output

For Additional Information, please visit
www.lambdapower.com/products/zws-series.htm

Derating - Convection Cooling

Model	40°C	45°C	50°C	55°C	60°C
ZWS50AF	100%	100%	100%	85%	70%
ZWS75AF	100%	100%	100%	85%	70%
ZWS100AF	100%	100%	100%	80%	60%
ZWS150AF	100%	87%	75%	62%	50%

Options

Suffix	Description
-	Molex Input & Output Connectors
/A	With cover & L Bracket
/J	JST Input & Output Connectors*
/JA	JST Connectors & Cover

* Recommended for new designs

ZWS-PAF Series

150W to 480W Single Output Power Supplies

- Universal Input (85 - 265VAC)
- Power factor Corrected
- 200% Peak Power capability
- 2 year warranty
- Less than 0.5mA earth leakage current

RoHS

Key Market Segments & Applications

Factory Automation
Test & Measurement
Light Industrial Equipment

Features and Benefits

Feature	Benefit
◆ Input Transient Protected	◆ Withstands harsh environments
◆ Power Factor Corrected	◆ Supports Global Use
◆ 200% Peak Power capability	◆ Can drive high current start up or pulse loads

Specifications

ITEMS / MODELS			ZWS150PAF	ZWS240PAF
Input Voltage			85-265VAC (47-63Hz), 120-370VDC	
Input Current (Forced air)	(1)	A	2.8/1.4	4.0/2.0
Inrush Current	(1,2)	A	14 / 28	
Power Factor			0.99 at 100VAC, 0.95 at 200VAC, Meets EN61000-3-2	
Leakage Current		mA	0.5mA Max. Typically 0.1mA (100VAC), 0.22mA (230VAC)	
Temperature Coefficient			<0.02%/°C	
Overcurrent Protection	(3)	-	>102% of peak current capability	
Overvoltage Protection		V	24V: 30-35V, 36V: 43.2-50.4, 48V: 55.2-64.8V	
Hold Up Time (Typ) at 100VAC		ms	20 (16ms at forced air power ratings)	
Efficiency		%	82	
Remote On/Off			See installation manual (Not available with /A cover option)	
Line Regulation		%	0.4%	
Load Regulation		%	0.8%	
Ripple & Noise		%	1%	
Operating Temperature	(4)		(Open frame or L bracket) -10°C to +70°C, derate linearly to 70% load from 60°C to 70°C	
Operating Temperature	(4)		(With /A cover option) -10°C to +60°C, derate linearly to 70% load from 50°C to 60°C	
Storage Temperature			-30 to +85°C	
Humidity (non condensing)			Operating: 30 - 90% RH, Operating: 10 - 95% RH	
Cooling			Convection or Forced Air Cooled (1.5m/s)	
Withstand Voltage			Input to Ground 2kVAC (20mA), Input to Output 3kVAC (20mA), Output to Ground 500VAC (100mA) for 1 min.	
Isolation Resistance			>100M at 25C & 70% RH, Output to Ground 500VDC	
Vibration (non operating)			10 - 55Hz (1 minute sweep), 19.6m/s^2 constant X, Y, Z 1 hour	
Shock			< 196.1 m/s^2	
Safety Agency Approvals			UL60950-1, CSA60950-1, EN60950-1, EN50178, CE Mark	
Conducted & Radiated EMI			EN55022/EN55022-B, FCC Class B, VCCI-B	
Recommended EMI Filter			MAW1205-22	
Immunity			EN61000-4-2, -3, -4, -5, -6, -8, -11	
Weight (Typ)		g	500g (800g with cover)	750g (1100g with cover)
Size (WxHxD)		mm	See Outline Drawings	
Warranty		yrs	Two Years	

Notes:
(1) 100/200VAC
(2) 25°C ambient (cold start)
(3) Avoid prolonged operartion in overload
(4) With 0.7m/s airflow. See derating table for convection cooling

ZWS-PAF Series

Model Selector

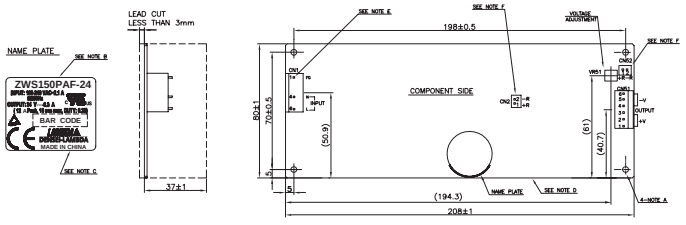
Model	Voltage	Adjust Range	Max Current Convection	Max Power Convection	Max Current Forced Air(6)	Max Power Forced Air(6)	Peak Current(5)	Peak Power(5)
ZWS150PAF24	24V	21.6 - 28.8V	6.3A	151.2W	8.4A	201.6W	12A	288W
ZWS150PAF36	36V	32.4 - 41.4V	4.2A	151.2W	5.6A	201.6W	8A	288W
ZWS150PAF48	48V	43.2 - 52.8V	3.1A	148.8W	4.3A	206.4W	6A	288W
ZWS240PAF24	24V	21.6 - 28.8V	10A	240W	12.5A	300W	20A	480W
ZWS240PAF36	36V	32.4 - 41.4V	6.7A	241.2W	8.4A	302.4W	13.3A	478.8W
ZWS240PAF48	48V	43.2 - 52.8V	5A	240W	6.3A	302.4W	10A	480W

Note 5: For 10s maximum, 35% duty cycle, average power not to exceed maximum ratings
Note 6: With 1.5m/s forced air

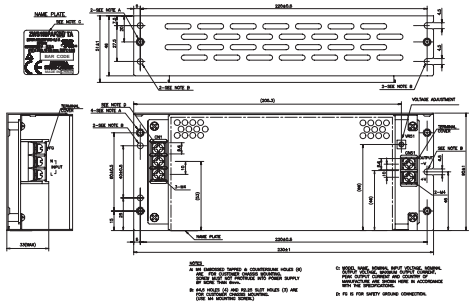
Model Derating for Conducted Cooling

Model	25°C	30°C	35°C	40°C	45°C	50°C	55°C	60°C
ZWS150PAF**	100%	100%	100%	100%	100%	100%	85%	70%
ZWS150PAF**/A	100%	100%	90%	80%	72.5%	65%	-	-
ZWS240PAF**	100%	100%	100%	100%	100%	86.7%	73.3%	60%
ZWS240PAF**/A	100%	90%	80%	70%	60%	50.0%	-	-

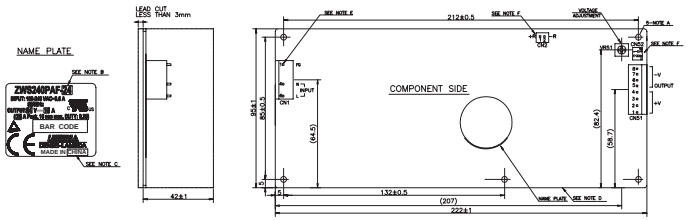
ZWS150PAF Outline Drawing



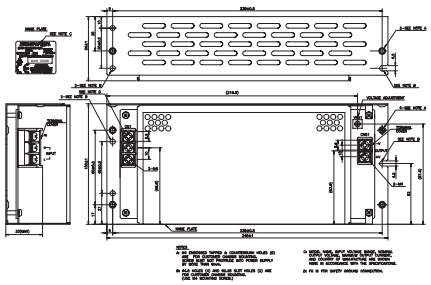
ZWS150PAF/TL Outline Drawing



ZWS240PAF Outline Drawing



ZWS240PAF/TL Outline Drawing



Options

Suffix	Option
Blank	Molex Input & Output Connectors
/L	L Bracket
/A	Cover and L Bracket
/J	JST Input & Output Connectors
/T	Vertical Mount Screw Terminals
/S	Horizontal Mount Screw Terminals

Preferred option combinations: Blank, /L, /TL or /TA.
Example: ZWS240PAF24/TA

Other Lambda Industrial Products

VSB/VSC	10W to 150W Single output 115VAC input
ZWS	5W to 150W Single output, 115/230VAC input
SC	30W to 120W Single, dual & triple output
HWS	15W to 1500W Single output, enclosed

For Additional Information, please visit
www.lambdapower.com/products/zws-series.htm

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AC-DC Products

◆ DC-DC Products

Filters

Company

Enclosed or L Bracket
PCB Mount
Non Isolated

DC-DC Selector

Nominal Input Voltage	# of Outputs	Output Power (W) 3 10 30 50 100 150 300 600
5V	Single	CC-E
		iAC, iBA, PL*
	Dual	CC-E
12V	Single	CC-E
		iA, iBC, PL*
		PXD,PXE,PXF
	Dual	CC-E
		PXD,PXE,PXF
	Triple	PXF
24V	Single	CC-E
		PXD,PXE,PXF
		PH-F
		PH-S
		iQ, PAH300
		PAF
	Dual	CC-E
		PXD,PXE,PXF
		iQA, PAH75D*
	Triple	PXF
48V	Single	CC-E
		PXD,PXE,PXF
		iSA, PAE*, iE, iP
		iQ, PAQ*
		PH-F
		PH-S
		iH, PAH
		PAF
	Dual	CC-E
		PXD,PXE,PXF
		PAQ*
		PAH75D*
	Triple	PXF
	Multiple	Vega*
82-185VDC	Single	PH-F
		PH-S
200-400VDC	Single	PH-F
		PH-S
		PAF

* See website

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CC-E Series

Ultra Compact, 1.5W to 25W Single and Dual DC-DC Converters

Manufactured by TDK
TDK-Lambda is a collaborative product brand between TDK and the Lambda group.

- Compact Footprint / Low Profile
- Through Hole or SMT Versions
- 5V, 12V, 24V & 48V Inputs
- 3.3 to 30V[1] Single, ±12 to 15V Dual Outputs
- Output Voltage Adjustment
- Input - Output Isolation
- RoHS Compliant
- 5 Year Warranty

RoHS

Key Market Segments & Applications

Telecommunications
Datacom
Instrumentation

Features & Benefits

Feature	Benefit
Compact	Less pcb area used
Self contained	Requires no external components
Multiple Input Voltage configurations	Easier system configuration
Open frame (no potting)	Lighter in weight, suitable for surface mount (R version)

Specifications

Nominal Output Voltage	V	3.3V	5V	12/15V	±12/15 (24/30)[1]
DC Input	V	5V: 4.5-9.0V, 12V: 9-18V, 24V: 18-36V, 48V: 36-76V			
Efficiency	%	71 to 90% model dependant			
Output Voltage Tolerance	%	1.5-10W: ±3%, 15-25W: ±5%			±5%
Output Adjustment (via trim pin)	V	3.15-3.6V	4.75-6.0V	11.4-15V	22.8 - 30V
Line Regulation	mV	20 (40 CC15; 30 CC25)		40	80
Load Regulation	mV	40 (120 CC15; 200 CC25)		100	600[2]
Temperature Coefficient	%	<± 0.02%/°C			
Preload	-	No preload required			
Output Ripple (typ./max.BW 50MHz)	mV	40/120		30/120	
Overcurrent Protection	-	Output current limiting with automatic recovery, shutdown CC15, 25 type			
Overvoltage Protection	-	No			
Remote On/ Off	-	CC1R5, 3, 6, & 10: RC terminal open, output is OFF; RC terminal to -Vin (0-0.4V), output is ON CC15 & CC25: RC terminal open, output is ON; RC terminal to +Vin, output is OFF			
Operating Temp.- Convection	°C	-40 to 85°C, derates linearly to 40% load from 50°C to 85°C			
Operating Temp.- Forced Air	°C	-40°C to 85°C with 1m/s air full load			
Storage Temperature	°C	-40°C to 85°C			
Humidity (non Condensing)	-	95% RH max.(maximum wet-bulb temperature: 38°C)			
Isolation Voltage	-	500VAC 1 min. Input to output, input to case, output to case			
Isolation Resistance	-	Input to output, input to case, output to case: 50M ohm min. (500VDC)			
Shock	m/s^2	980m/s^2 (100G) 6ms (6 directions, each 3 times)			
Vibration (non Operating)	-	10 to 55Hz (sweep for 15min) 1.52mm constant, 3 directions X, Y, Z each 2 hours			
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1			
Weight	g	CC1R5: 3.2, CC3: 4.5, CC6: 5.8, CC10:10.0, CC15: 12.5, CC25: 20.0			
Size (L x W x H) (DIP Through Hole and SMD package) (SIP Through Hole only)	in	CC1R5: 0.650 x 0.654 x 0.335; CC3: 0.900 x 0.654 x 0.335; CC6: 0.900 x 0.831 x 0.335 CC10: 1.400 x 0.890 x 0.335; CC15: 1.500 x 1.264 x 0.295; CC25: 1.701 x 1.768 x 0.295 CC3 (SIP): 1.09 x 0.362 x 0.705			
Warranty	-	5 years			

1. For 24V/30V output - connnect across +Vout & -Vout and leave "common out" pin not connected
2. Based upon equal load current from both outputs
3. For 15V output connect trim to -Vout
4. See Installation Manual for full specifications, test methods of parameters and application notes

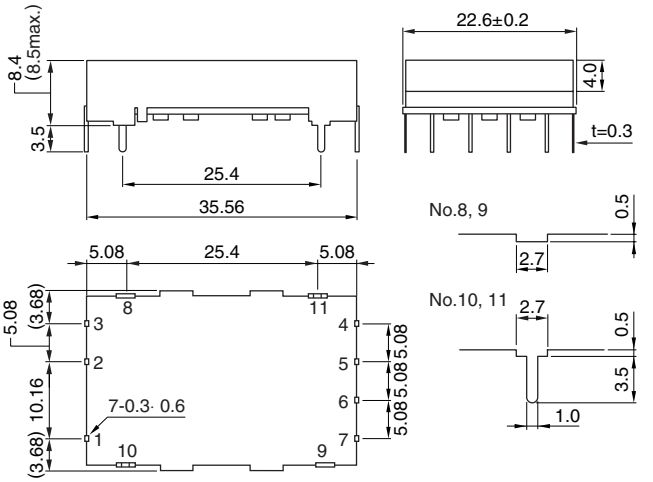
CC-E Series

Model Selector

Output Voltage (V)	Output Current (A)	Output Power (W)	5V Input	12V Input	24V Input	48V Input
Single Outputs						
3.3	0.4	1.5	CC1R5-0503SF-E	CC1R5-1203SF-E	CC1R5-2403SF-E	CC1R5-4803SF-E
3.3	0.8	3	CC3-0503SF-E	CC3-1203SF-E	CC3-2403SF-E	CC3-4803SF-E
3.3	1.2	6	CC6-0503SF-E	CC6-1203SF-E	CC6-2403SF-E	CC6-4803SF-E
3.3	2.5	10	CC10-0503SF-E	CC10-1203SF-E	CC10-2403SF-E	CC10-4803SF-E
3.3	4.5	15	-	-	CC15-2403SF-E	-
3.3	7.5	25	-	-	CC25-2403SF-E	-
5	0.3	1.5	CC1R5-0505SF-E	CC1R5-1205SF-E	CC1R5-2405SF-E	CC1R5-4805SF-E
5	0.6	3	CC3-0505SF-E	CC3-1205SF-E	CC3-2405SF-E	CC3-4805SF-E
5	1.0	5	CC6-0505SF-E	-	-	-
5	1.2	6	-	CC6-1205SF-E	CC6-2405SF-E	CC6-4805SF-E
5	2.0	10	CC10-0505SF-E	CC10-1205SF-E	CC10-2405SF-E	CC10-4805SF-E
5	3.0	15	-	-	CC15-2405SF-E	-
5	5.0	25	-	-	CC25-2405SF-E	-
12(15)	0.125(0.1)	1.5	CC1R5-0512SF-E	CC1R5-1212SF-E	CC1R5-2412SF-E	CC1R5-4812SF-E
12(15)	0.25(0.2)	3	CC3-0512SF-E	CC3-1212SF-E	CC3-2412SF-E	CC3-4812SF-E
12(15)	0.5(0.4)	6	CC6-0512SF-E	CC6-1212SF-E	CC6-2412SF-E	CC6-4812SF-E
12(15)	0.8(0.64)	10	CC10-0512SF-E	-	-	-
12(15)	1.0(0.8)	10	-	CC10-1212SF-E	CC10-2412SF-E	CC10-4812SF-E
Dual Outputs						
±12 (15)[3]	0.06(0.05)	1.5	CC1R5-0512DF-E	CC1R5-1212DF-E	CC1R5-2412DF-E	CC1R5-4812DF-E
±12 (15)[3]	0.125(0.1)	3	CC3-0512DF-E	CC3-1212DF-E	CC3-2412DF-E	CC3-4812DF-E
±12 (15)[3]	0.25(0.2)	6	CC6-0512DF-E	CC6-1212DF-E	CC6-2412DF-E	CC6-4812DF-E
±12 (15)[3]	0.4(0.32)	10	CC10-0512DF-E	-	-	-
±12 (15)[3]	0.45(0.36)	10	-	CC10-1212DF-E	CC10-2412DF-E	CC10-4812DF-E

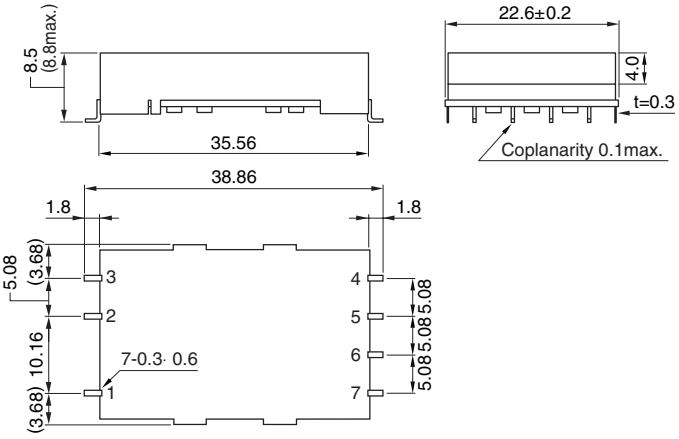
Outline Drawing

CC10- F-E (DIP TYPE)



Outline Drawing

CC10- R-E (SMD TYPE)



Options

Version	Description
F-E	Through hole mounting (DIP pkg)
R-E	Surface mount (DIP pkg)
S-E	Through hole mounting (SIP pkg - CC3)

Other Lambda Industrial Products

PX	10 - 40W 12, 24, 48V DC-DC converters
PAQ, PAH, PAF	50 -700W quarter, half & full bricks

Pinout (CC1R5, 3, 6, and 10)

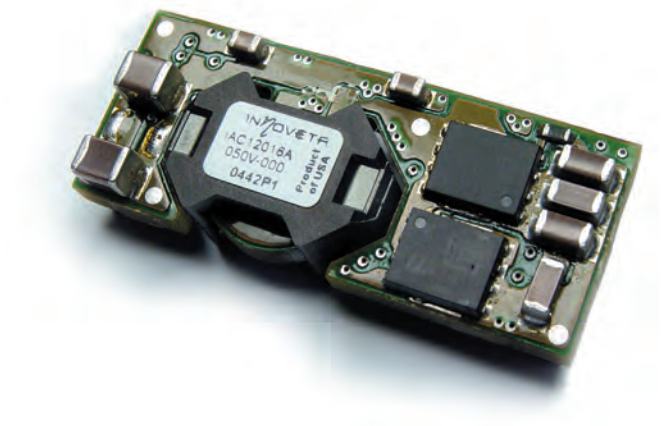
Pin	Single	Dual
1	+Vin	+Vin
2	RC	RC
3	-Vin	-Vin
4	NC	Common out
5	-Vout	-Vout
6	TRM	TRM
7	+Vout	+Vout

For CC15 and 25 see Installation Manual online

For Additional Information, please visit
www.lambdapower.com/products/cc-series.htm

iAA/iAC Series

15 - 16A Point of Load Converter



- Standard Industry Footprint
- 3.0-5.5V and 6.0-14.0V Inputs
- 0.8-5.0V Nominal Outputs
- Surface Mount
- Low 8.5mm Profile
- Non Isolated Output

RoHS

Features and Benefits

Feature	Benefit
◆ High operating efficiency (up to 95%)	◆ Reduced system heating
◆ Constant switching frequency	◆ Easier system filtering
◆ Starts with pre-biased output	◆ Supports complex digital systems

Specifications

ITEMS \ MODEL		iAA05015A008V	iAA05015A025V	iAA05015A033V	iAC12016A008V
Nominal Output Voltage	VDC	0.75-3.63	2.5	3.3	0.8 - 5.0
Input Voltage Range	VDC	3.0-5.5[2]	3.0-5.5	4.5-5.5	6.0[1]-14 or 9.6-14
Input Current (max)	A	16			18
Output Voltage Tolerance	VDC	±3.3% Vo, set	2.413 - 2.588	3.19 - 3.41	-2.5 to +3.5% Vo, set
Ripple & Noise (max)(pk to pk) (3)	mV	75			100
Line Regulation (max)	mV	5			10
Load Regulation (max)	mV	10			15
Overload Protection	%	Inception - 175-235% of rated output; Short circuit - auto recovery			
Overvoltage Protection	-	N/A			
Remote Sense	-	Yes			
Remote On / Off	-	Positive or Negative Logic available, see Feature Set			
Sequencing	-	Not Available			See Feature Set
Temperature (operating)	°C	-40 to 125			
Temperature (storage)	°C	-55 to 125			
Humidity (operating)	-	20-95% RH Non condensing			
Humidity (storage)	-	Per IPC / JEDEC J-STD-020, for MSL-1[4] (<30C/85%RH) in original packaging			
Cooling	-	Convection or forced air			
Isolation Voltage	-	N/A			
Vibration (non operating)	-	5 to 50Hz @ 0.5g (4.9m/s²), and 50 to 500Hz @ 1.5g (14.7m/s²) per Bellcore TR-EOP-000063-5.4.4			
Shock	-	196.1m/s²			
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950)			
Weight (max)	g	12			
Size	mm	33 x 13.5 x 8.5			
Warranty	-	3 Years			

Notes: See website for detailed specifications
(1) 8.3 - 14.0V when output is >3.63V
(2) 4.5 - 5.5V when output is ≥3.0V
(3) Measured across one 0.1µF ceramic capacitor and one 47µF ceramic capacitor; BW = 20MHz
(4) iAC MSL-2

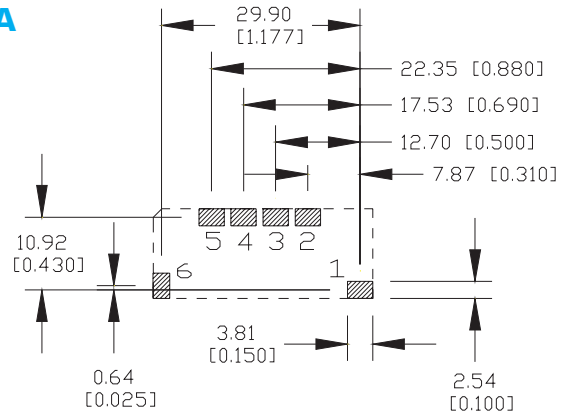
iAA/iAC Series

Model Selector

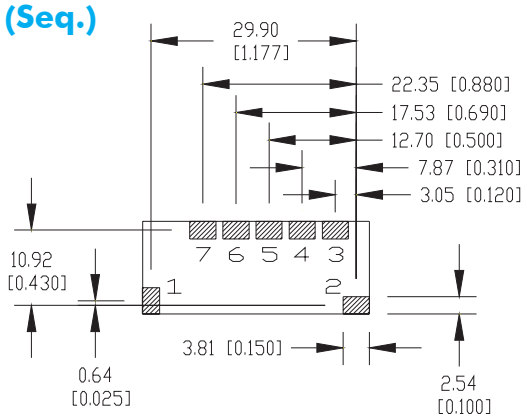
Model	Output Voltage (V)	Output Adjust (V)	Output Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iAA05015A008V-001-R	0.75 - 3.63	0.75 - 3.63	15	49.5	94.5
iAA05015A025V-001-R	2.5	2.25 - 2.75	15	37.5	93
iAA05015A033V-001-R	3.3	2.97 - 3.63	15	49.5	95
iAC12016A008V-001-R	0.8 - 5.0	0.8 - 5.0	16	80	94 @ 5V

Recommended Footprint (Top View)

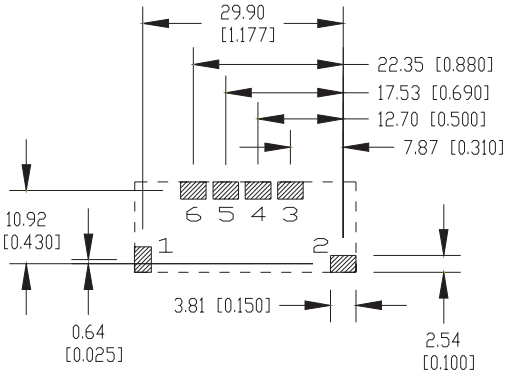
iAA



iAC (Seq.)



iAC (No Seq.)



Feature Set

	Feature Set	Pos. Logic On / Off	Neg. Logic On / Off	Input Voltage	Sequencing
iAA	00	X			
	01*		X		
iAC	00	X		6.0 - 14.0	X
	01*		X	6.0 - 14.0	X
	02	X		6.0 - 14.0	
	03		X	6.0 - 14.0	
	04	X		9.6 - 14.0	X
	05		X	9.6 - 14.0	X
	06	X		9.6 - 14.0	
	07		X	9.6 - 14.0	

* Preferred feature set

Model Number Example: iAC12016A008V-0**01**-R

Pinout

PIN	Function iAA	iAC(Seq)	iAC(No Seq)
1	Vin	On/Off	On/Off
2	Gnd	Vin	Vin
3	Vout	Seq	Gnd
4	Trim	Gnd	Vout
5	Sense	Vout	Trim
6	On/Off	Trim	Sense
7	-	Sense	-

Other Lambda DC-DC Products

CC-E	1.5-12W, 1 to 2 Outputs, 5 to 48VDC Input
PX	10-40W, 1 to 3 Outputs, 12 to 48VDC Input
iPB	15-35W, 1.5-5V Output, 36-75VDC Input, Pico Brick
iSA	30-78W, 1.2-12V Output, 36-75VDC Input, Sixteenth Bricks
iEA	30-78W, 1.2-28V Output, 36-75VDC Input, Eighth Brick DC-DC
PAE50/100	36-100W.1.9-5V Output, 36-75VDC Input. Eighth Brick DC-DC
iEB	150W, 12V O/P, 42-56V Input, Eighth Brick Interm. Bus DC-DC
iQD	300W, 12V O/P, 42-53VDC Input, Quarter Brick Intermediate Bus DC-DC
iQB, iQM, iQN, iQP	30-300W, 1.2-12V Output, 24 to 48VDC Input, Quarter Brick DC-DC
PAH300/350	300-350W, 12-28V Output, 36-75VDC Input, Half Brick DC-DC
PAF	400-700W, 1.8-48V O/P, 24-400VDC Input, Full Brick DC-DC
FPS	1kW to 3kW, 24-48V Output, AC-DC Front Ends
iBC, PL	Non Isolated DC-DC Converters

For Additional Information, please visit
www.lambdapower.com/products/iaa-series.htm

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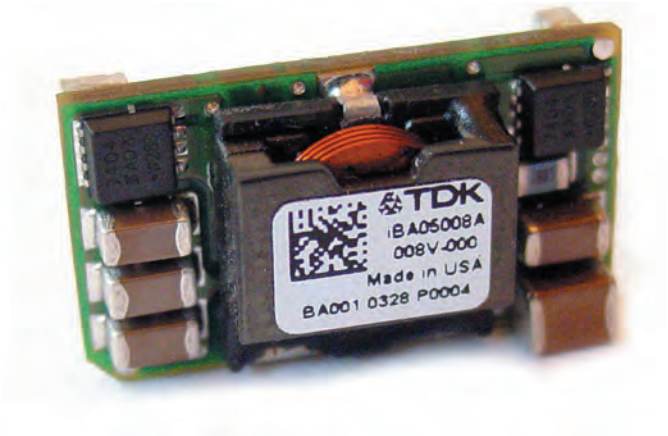
Revision A3: June 2007

iBA/iBC Series



7 - 8A Point of Load Converter

RoHS

- Standard Industry Footprint
- 3.0-5.5V and 6.0-14.0V Input
- 0.8-5.0V Nominal Output
- Surface Mount
- Low 8.38mm Profile
- Non Isolated Output

Features and Benefits

Feature	Benefit
◆ High operating efficiency (up to 95%)	◆ Reduced system heating
◆ Constant switching frequency	◆ Easier system filtering
◆ Starts with pre-biased output	◆ Supports complex digital systems

Specifications

ITEMS \ MODEL		iBA05008A008V	iBC12007A008V
Nominal Output Voltage	VDC	0.75 - 3.63	0.8 - 5.0
Input Voltage Range	VDC	3.0 - 5.5(2)	6.0(1) - 14 or 9.6 - 14
Input Current (max)	A	8.5	
Output Voltage Tolerance	VDC	N/A	
Ripple & Noise (max)(pk to pk) (3)	mV	75	100
Line Regulation (max)	mV	5	20
Load Regulation (max)	mV	10	30
Overload Protection	%	Inception- 185-215% of rated output; Short circuit - auto recovery	
Overvoltage Protection	-	N/A	
Remote Sense	-	No	
Remote On / Off	-	Positive or Negative Logic available, see Feature Set	
Sequencing	-	No	Yes
Temperature (operating)	°C	-40 to 125	
Temperature (storage)	°C	-55 to 125	
Humidity (operating)	-	20-95% RH Non condensing	
Humidity (storage)	-	Per IPC / JEDEC J-STD-020, for MSL-1[4] (<30C/85%RH) in original packaging	
Cooling	-	Convection or forced air	
Isolation Voltage	VDC	none	
Vibration (non operating)	-	5 to 50Hz @ 0.5g (4.9m/s^2), and 50 to 500Hz @ 1.5g (14.7m/s^2) per Bellcore TR-EOP-000063-5.4.4	
Shock	-	196.1m/s^2	
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950)	
Weight (max)	g	7	
Size	mm	20.3 x 11.4 x 8.38	27.9 x 11.4 x 8.38
Warranty	-	3 Years	

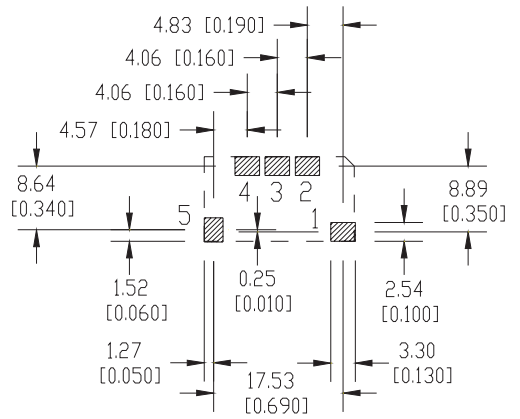
Notes: See website for detailed specifications
(1) 8.3-14V when output is >3.63V
(2) 4.5 - 5.5V when output is ≥3.0V
(3) Measured across one 0.1µF ceramic capacitor and one 47µF ceramic capacitor; BW = 20MHz
(4) iBC MSL-2

iBA/iBC Series

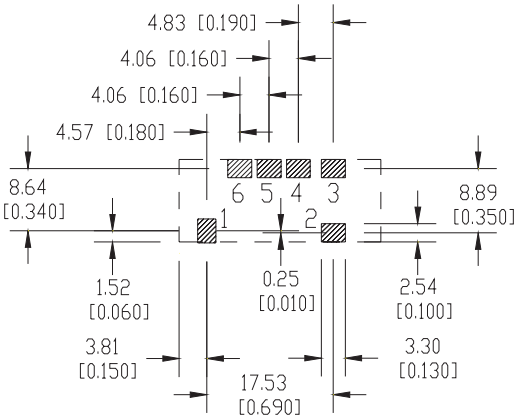
Model Selector

Model	Output Voltage	Output Adjust	Output Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iBA05008A008V-001-R	0.75 - 3.63	0.75 - 3.63	8	26.4	94 @ 3.3V
iBC12007A008V-001-R	0.8 - 5.0	0.8 - 5.0	7	35	93 @ 5.0V

Recommended Footprint (Top View)



iBA



iBC

Feature Set

	Feature Set	Pos. Logic On / Off	Neg. Logic On / Off	Sequencing	(6-14V) Input Rng.	(9.6-14) Input Rng.
iBA	00	X				
	01		X			
iBC	00	X		X	X	
	01*		X	X	X	
	02	X			X	
	03		X		X	
	04	X		X		X
	05		X	X		X
	06	X				X
	07		X			X

* Preferred feature set

Model Number Example: iBC12007A008V-0**01**-R

Pinout

PIN	Function iBA	Function iBC
1	Vin	On/Off
2	Gnd	Vin
3	Trim	Seq
4	Vout	Gnd
5	On/Off	Trim
6	-	Vout

For Additional Information, please visit
www.lambdapower.com/products/iba-series.htm

Other Lambda DC-DC Products

CC-E	1.5-12W, 1 to 2 Outputs, 5 to 48VDC Input
PX	10-40W, 1 to 3 Outputs, 12 to 48VDC Input
iPB	15-35W, 1.5-5V Output, 36-75VDC Input, Pico Brick
iSA	30-78W, 1.2-12V Output, 36-75VDC Input, Sixteenth Bricks
iEA	30-78W, 1.2-28V Output, 36-75VDC Input, Eighth Brick DC-DC
PAE50/100	36-100W.1.9-5V Output, 36-75VDC Input. Eighth Brick DC-DC
iEB	150W, 12V Output, 42-56V Input, Eighth Brick Intermediate Bus DC-DC
iQD	300W, 12V Output, 42-53VDC Input, Quarter Brick Intermediate Bus DC-DC
iQB, iQM, iQN, iQP	30-300W, 1.2-12V Output, 24 to 48VDC Input, Quarter Brick DC-DC
PAH300/350	300-350W, 12 to 28V Output, 36-75VDC Input, Half Brick DC-DC
PAF	400-700W, 1.8 to 48V output, 24 to 400VDC Input, Full Brick DC-DC
FPS	1kW to 3kW, 24 to 48V Output, AC-DC Front Ends
iAA, PL	Non Isolated DC-DC Converters

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Revision A3: June 2007

iEA Series

30 - 78W Eighth Brick DC-DC Converters

- Standard Eighth Brick Footprint
- 36-75VDC Input
- 1.2V 25A - 12V 6.5A Nominal Output
- Through Hole Mounting
- Low 8.8mm Profile
- 1500VDC Basic Isolation

RoHS

Features and Benefits

Feature	Benefit
◆ High operating efficiency (up to 91%)	◆ Reduced system heating
◆ Constant switching frequency	◆ Easier system filtering
◆ Open frame design	◆ Better thermal performance

Specifications

ITEMS \ MODEL		iEA480						
Nominal Output Voltage	VDC	1.2	1.5	1.8	2.5	3.3	5	12
Input Voltage Range	VDC	36-75						
Input Current (max)	A	4						
Output Voltage Tolerance	VDC	1.16 -1.24	1.45 -1.55	1.74 -1.86	2.42 -2.58	3.20 - 3.40	4.85 - 5.15	11.58 - 12.42
Ripple & Noise (max)(pk to pk) (1)	mV	100					125	200
Line Regulation (max)	mV	5				7	10	24
Load Regulation (max)	mV	7				8	10	24
Overload Protection (typ)	A	33	35	35	31	29	20	8.5
Overvoltage Protection	%	Inception- 122-146% Vo,nom typical						
Remote Sense	-	Yes						
Remote On / Off	-	Positive or Negative Logic, see Feature Set						
Temperature (operating)	°C	-40 to 125						
Temperature (storage)	°C	-55 to 125						
Humidity (operating)	-	20-95% RH Non condensing						
Humidity (storage)	-	10-95% RH Non condensing						
Cooling	-	Convection or forced air						
Isolation Voltage	VDC	1500						
Vibration (non operating)	-	5 to 50Hz @ 0.5g (4.9m/s^2), and 50 to 500Hz @ 1.5g (14.7m/s^2) per Bellcore TR-EOP-000063-5.4.4						
Shock	-	196.1m/s^2						
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950), CE Mark (LVD)						
Weight (max)	g	30.4						
Size	mm	58.4 x 22.9 x 8.8						
Warranty	-	3 Years						

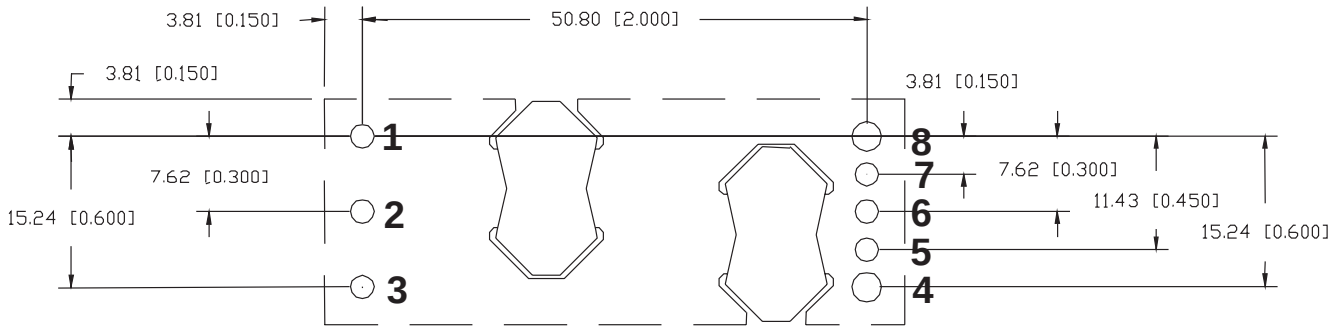
Notes: See website for detailed specifications
(1) Measured across one 1.0 µF ceramic capacitor and one 10µF tantalum capacitor; BW = 20MHz

iEA Series

Model Selector

Model	Voltage (V)	Adjust Range (V)	Max. Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iEA48025A012V-001-R	1.2	1.08 to 1.32	25	30	78
iEA48025A015V-001-R	1.5	1.35 to 1.65	25	37.5	81
iEA48025A018V-001-R	1.8	1.62 to 1.98	25	45	83
iEA48025A025V-001-R	2.5	2.25 to 2.75	25	62.5	86
iEA48020A033V-001-R	3.3	2.97 to 3.63	20	66	90
iEA48015A050V-001-R	5	4.5 to 5.5	15	75	90
iEA48007A120V-001-R	12	10.8 to 13.2	6.5	78	91

Recommended Footprint (Top View)



Feature Set

Feature Set	Pos. Logic On / Off	Neg. Logic On / Off	0.110" Pin Len.	0.200 Pin Len.	0.145" Pin Len.	Latching OVP
00	X				X	
01*		X			X	
02	X		X			
03		X	X			
04	X			X		
05		X		X		
11		X			X	X
15		X		X		X

* Preferred feature set

Model Number Example: iEA48020A033V-0**01**-R

Pinout

PIN	Function
1	Vin (+)
2	On / Off
3	Vin (-)
4	Vout (-)
5	Sense (-)
6	Trim
7	Sense (+)
8	Vout (+)

For Additional Information, please visit
www.lambdapower.com/products/iea-series.htm

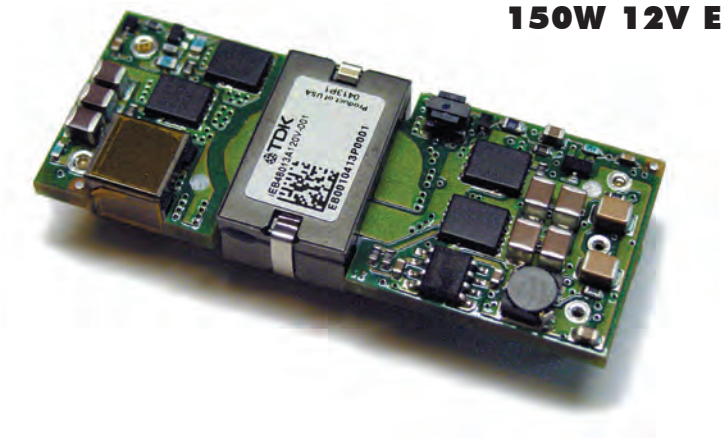
Other Lambda DC-DC Products

CC-E	1.5-12W, 1 to 2 Outputs, 5 to 48VDC Input
PX	10-40W, 1 to 3 Outputs, 12 to 48VDC Input
iPB	15-35W, 1.5-5V Output, 36-75VDC Input, Pico Brick
iSA	30-78W, 1.2-12V Output, 36-75VDC Input, Sixteenth Bricks
PAE50/100	36-100W.1.9-5V Output, 36-75VDC Input. Eighth Brick DC-DC
iEB	150W, 12V Output, 42-56V Input, Eighth Brick Intermediate Bus DC-DC
iQD	300W, 12V Output, 42-53VDC Input, Quarter Brick Intermediate Bus DC-DC
iQB, iQM, iQN, iQP	30-300W, 1.2-12V Output, 24 to 48VDC Input, Quarter Brick DC-DC
PAH300/350	300-350W, 12 to 28V Output, 36-75VDC Input, Half Brick DC-DC
PAF	400-700W, 1.8 to 48V output, 24 to 400VDC Input, Full Brick DC-DC
FPS	1kW to 3kW, 24 to 48V Output, AC-DC Front Ends
iAA, iBC, PL	Non Isolated DC-DC Converters

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A2: May 2007

iEB Series

150W 12V Eighth Brick Intermediate Bus Converter



- Standard Eighth Brick Footprint
- 42-56VDC Input
- 12V 13.5A Nominal Output
- Through Hole Mounting
- Low 8.5mm Profile
- 2250VDC Basic Isolation

RoHS

Features and Benefits

Feature	Benefit
◆ High operating efficiency (94%)	◆ Reduced system heating
◆ Constant switching frequency	◆ Easier system filtering
◆ Nominal 12V output	◆ Ideal for non-isolated point of load converters

Specifications

ITEMS \ MODEL		iEB48013A120V
Nominal Output Voltage	VDC	12
Input Voltage Range	VDC	42 - 56
Input Current (max)	A	6
Output Voltage Tolerance	VDC	8.9 to 14.4V
Ripple & Noise (max)(pk to pk) (1)	mV	200
Line Regulation (typ)	mV	3500
Load Regulation (typ)	mV	750
Overload Protection (typ)	A	Overcurrent threshold 20A, short circuit 6A - auto recovery
Remote Sense	-	no
Remote On / Off	-	Positive or Negative Logic, see Feature Set
Temperature (operating)	°C	-40 to 120
Temperature (storage)	°C	-55 to 125
Humidity (non-condensing)	-	20-95% RH Non-condensing
Humidity (storage)	-	10-95% RH Non-condensing
Cooling	-	Convection or forced air
I/O Isolation Voltage	VDC	2250VDC (Basic isolation)
Vibration (non-operating)	-	5 to 50Hz@0.5g (4.9m/s^2), and 50 to 500Hz@1.5g (14.7m/s^2) per Bellcore TR-EOP-000063-5.4.4
Shock	-	196.1m/s^2
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950), CE Mark (LVD)
Weight (max)	g	27
Size	mm	58.42 x 22.86 x 8.5
Warranty	-	3 Years

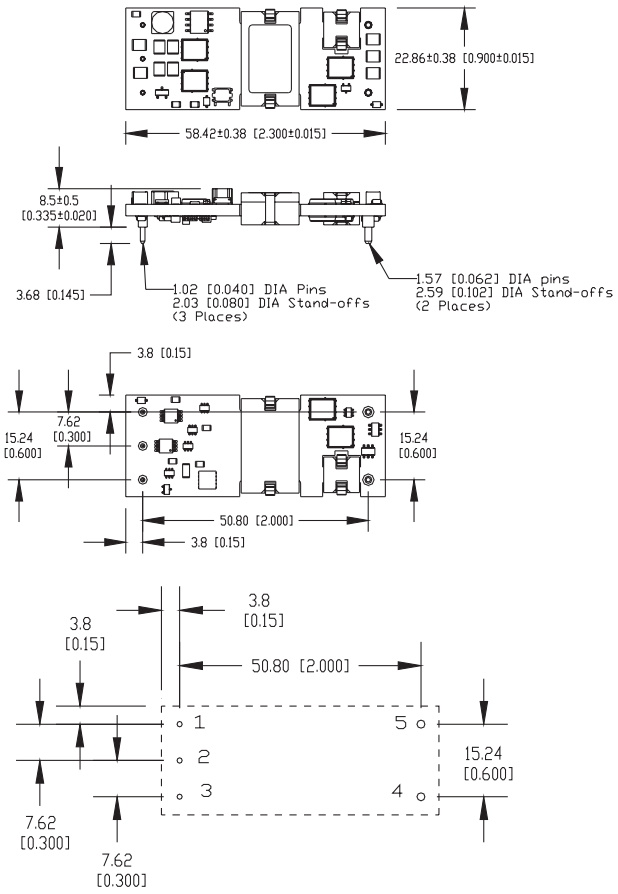
Notes: See website for detailed specifications
(1) Measured across one 0.1µF, and 2x22µF ceramic capacitors; BW = 20MHz

iEB Series

Model Selector

Model	Voltage (V)	Adjust Range (V)	Max. Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iEB48013A120V-001-R	12	-	13.5	150	94

Outline Drawing



Feature Set

Feature Set	Positive Logic On / Off	Negative Logic On / Off	0.110" Pin Len.	0.145" Pin Len.	0.200" Pin Len.
00	X			X	
01*		X		X	
02	X		X		
03		X	X		
04	X				X
05		X			X

* Preferred feature set

Model Number Example: iEB48013A120V-0**05**-R

PIN Assignments

PIN	Function
1	Vin (+)
2	On / Off
3	Vin (-)
4	Vout (-)
5	Vout (+)

For Additional Information, please visit
www.lambdapower.com/products/ieb-series.htm

Other Lambda DC-DC Products

CC-E	1.5-12W, 1 to 2 Outputs, 5 to 48VDC Input
PX	10-40W, 1 to 3 Outputs, 12 to 48VDC Input
iPB	15-35W, 1.5-5V Output, 36-75VDC Input, Pico Brick
iSA	30-78W, 1.2-12V Output, 36-75VDC Input, Sixteenth Bricks
iEA	30-78W, 1.2-28V Output, 36-75VDC Input, Eighth Brick DC-DC
PAE50/100	36-100W.1.9-5V Output, 36-75VDC Input. Eighth Brick DC-DC
iQD	300W, 12V Output, 42-53VDC Input, Quarter Brick Intermediate Bus DC-DC
iQB, iQM, iQN, iQP	30-300W, 1.2-12V Output, 24 to 48VDC Input, Quarter Brick DC-DC
PAH300/350	300-350W, 12 to 28V Output, 36-75VDC Input, Half Brick DC-DC
PAF	400-700W, 1.8 to 48V Output, 24 to 400VDC Input, Full Brick DC-DC
FPS	1kW to 3kW, 24 to 48V Output, AC-DC Front Ends
iAA, iBC, PL	Non Isolated DC-DC Converters

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A3: May 2007

iHA Series

72 - 448W Half Brick Converter

- Standard Half Brick Footprint
- 36-75VDC Input
- 1.2V 60A - 28V 16A Nominal Outputs
- Through Hole Mounting
- Low 12.7mm Profile
- 1500VDC Basic Isolation

RoHS

Features and Benefits

Feature	Benefit
◆ High operating efficiency (up to 93.5%)	◆ Reduced system heating
◆ Constant switching frequency	◆ Easier system filtering
◆ Baseplate	◆ Allows for improved thermal management with optional heatsink

Specifications

ITEMS \ MODEL		iHA48								
Nominal Output Voltage	VDC	1.2	1.5	1.8	2.5	3.3	5	12	24	28
Input Voltage Range	VDC	36 - 75 (28V/16A: 40 - 60)								
Input Current (max)	A	2.6 - 12.8 Amps model dependent								
Output Voltage Tolerance	VDC	1.16 -1.24	1.46 -1.55	1.75 -1.85	2.43-2.58	3.20 -3.40	4.84-5.15	11.64-12.36	23.28 - 24.72	27.16-28.84
Ripple & Noise (max)(pk to pk) (1)	mV	60	60	80	75	55	70	100	600	675
Line Regulation (max)	mV	2	2	4	5	6	8	15	25	30
Load Regulation (max)	mV	6			8	10	10	25	50	50
Overload Protection (typ)	%	Inception- 113-156% of rated output; Short circuit auto recovery								
Overvoltage Protection (typ)	VDC	1.5	1.8	2.2	3.0	4.0	6.0	14.5	29.0	33.0
Remote Sense	-	Yes								
Remote On / Off	-	Positive or Negative Logic available, see Feature Set								
Temperature (operating)	°C	-40 to 115 for Vo ≤ 5.0V; -40 to 110 for Vo ≥ 12V								
Temperature (storage)	°C	-55 to 125								
Humidity (operating)	-	20-95% RH Non condensing								
Humidity (storage)	-	10-95% RH Non condensing								
Cooling	-	Convection or forced air								
Isolation Voltage	VDC	1500V Input to output & baseplate, 500V Output to baseplate								
Vibration (non operating)	-	5 to 50Hz @ 0.5g (4.9m/s^2), and 50 to 500Hz @ 1.5g (14.7m/s^2) per Bellcore TR-EOP-000063-5.4.4								
Shock	-	196.1m/s^2								
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950), CE Mark (LVD)								
Weight (max)	g	85								
Size	mm	57.9 x 61.0 x 12.7								
Warranty	-	3 years								

Notes: See website for detailed specifications

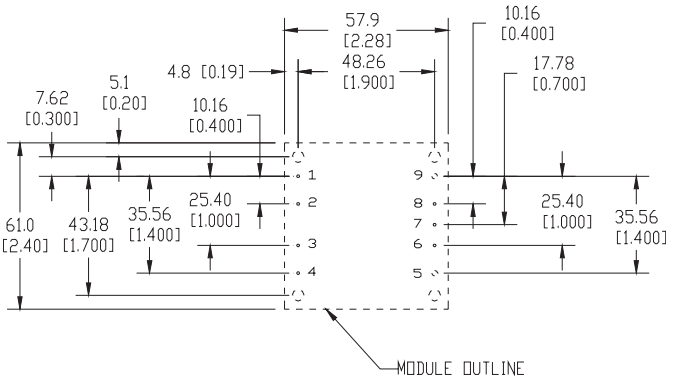
(1) Measured across 47µF +1µF +0.1µF ceramic caps for 1.2-5Vo, across 1µF +0.1µF ceramic caps +10µF Tan cap for 12Vo, across 200µF Al electrolytic +10µF +1µF +0.1µF ceramic caps for 24-28Vo; BW = 20MHz

iHA Series

Model Selector

Model	Voltage (V)	Adjust Range (V)	Max. Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iHA48060A012V-001-R	1.2	0.65 - 1.32	60.0	72	83.0
iHA48060A015V-001-R	1.5	0.81 - 1.65	60.0	90	86.0
iHA48060A018V-001-R	1.8	0.97 - 1.98	60.0	108	86.5
iHA48060A025V-001-R	2.5	1.35 - 2.75	60.0	150	88.5
iHA48040A033V-001-R	3.3	1.78 - 3.63	40.0	132	91.5
iHA48060A033V-001-R	3.3	1.78 - 3.63	60.0	198	90.0
iHA48040A050V-001-R	5.0	2.7 - 5.5	40.0	200	91.0
iHA48025A120V-001-R	12	6.48 - 13.2	25.0	300	91.5
iHA48013A240V-001-R	24	13 - 26.4	12.5	300	91.0
iHA48011A280V-001-R	28	15.12 - 30.8	11.0	308	91.0
iHA48016A280V-001-R	28	14 - 30.8	16.0	448	93.5

Recommended Footprint (Top View)



For Additional Information, please visit
www.lambdapower.com/products/iha-series.htm

Feature Set

Feature Set	On / Off Logic	Omit Pin 3	Output OVP	Pin Length
00	Positive	No	Latching	0.145
01*	Negative	No	Latching	0.145
02	Positive	Yes	Auto-Recovery	0.145
03	Negative	Yes	Auto-Recovery	0.145
04	Positive	No	Latching	0.110
05	Negative	No	Latching	0.110
06	Positive	Yes	Auto-Recovery	0.110
07	Negative	Yes	Auto-Recovery	0.110

* Preferred feature set

Model Number Example: iHA48040A050V-0**01**-R

Pinout

PIN	Function	PIN	Function
1	Vin (+)	2	On / Off
3	Case (Omit opt.)	4	Vin (-)
5	Vout (-)	6	Sense (-)
7	Trim	8	Sense (+)
9	Vout (+)		

Other Lambda DC-DC Products

CC-E	1.5-12W, 1 to 2 Outputs, 5 to 48VDC Input
PX	10-40W, 1 to 3 Outputs, 12 to 48VDC Input
iPB	15-35W, 1.5-5V Output, 36-75VDC Input, Pico Brick
iSA	30-78W, 1.2-12V Output, 36-75VDC Input, Sixteenth Bricks
iEA	30-78W, 1.2-28V Output, 36-75VDC Input, Eighth Brick DC-DC
PAE50/100	36-100W.1.9-5V Output, 36-75VDC Input. Eighth Brick DC-DC
iEB	150W, 12V Output, 42-56V Input, Eighth Brick Intermediate Bus DC-DC
iQD	300W, 12V Output, 42-53VDC Input, Quarter Brick Intermediate Bus DC-DC
iQB, iQM, iQN, iQP	30-300W, 1.2-12V Output, 24 to 48VDC Input, Quarter Brick DC-DC
PAH300/350	300-350W, 12 to 28V Output, 36-75VDC Input, Half Brick DC-DC
PAF	400-700W, 1.8 to 48V output, 24 to 400VDC Input, Full Brick DC-DC
FPS	1kW to 3kW, 24 to 48V Output, AC-DC Front Ends
iAA, iBC, PL	Non Isolated DC-DC Converters

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Revision A2: May 2007

iPB Series

15 - 45W Pico Brick Converter

- Compact 30.5 x 29.3 x 8.1 mm
- 36-75VDC Input
- 1.5V 10A - 18V 2.5A Nominal Outputs
- Surface Mount
- Low 8.81mm Profile
- 1500VDC Basic Isolation

RoHS

Features and Benefits

Feature	Benefit
◆ High operating efficiency (up to 89%)	◆ Reduced system heating
◆ Constant switching frequency	◆ Easier system filtering
◆ 33% smaller than eighth brick	◆ Optimization of board space

Specifications

ITEMS / MODEL		iPB480							
Nominal Output Voltage	VDC	1.5	1.8	2.5	3.3	5	12	15	18
Input Voltage Range	VDC	36 - 75							
Input Current (max)	A	2.0 - 2.2 Amps model dependent							
Output Voltage Tolerance	VDC	1.45-1.55	1.74-1.86	2.41-2.58	3.19-3.41	4.8-5.2	11.52-12.48	14.4-15.6	17.1-18.9
Ripple & Noise (max)(pk to pk) (1)	mV	100				125		100	
Line Regulation (max)	mV	5			6	8	24	30	36
Load Regulation (max)	mV	10			12	15	96	120	144
Overload Protection (typ)	%	Inception- 120-150% of rated output; Short circuit - auto recovery							
Overvoltage Protection (typ)	VDC	1.8	2.2	3.0	4.0	10	19	19	27
Remote Sense	-	No							
Remote On / Off	-	Yes (Negative Logic)							
Temperature (operating)	°C	-40 to 115					-40 to 125		
Temperature (storage)	°C	-55 to 125							
Humidity (operating)	-	20-95% RH Non condensing							
Humidity (storage)	-	Per IPC / JEDEC J-STD-020, for MSL-1 (<30C/85%RH) in original packaging							
Cooling	-	Convection or forced air							
Isolation Voltage	VDC	1500							
Vibration (non operating)	-	5 to 50Hz @ 0.5g (4.9m/s^2), and 50 to 500Hz @ 1.5g (14.7m/s^2) per Bellcore TR-EOP-000063-5.4.4							
Shock	-	196.1m/s^2							
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950), CE Mark (LVD)							
Weight (max)	g	18							
Size	mm	30.5 x 29.3 x 8.81							
Warranty	-	3 years							

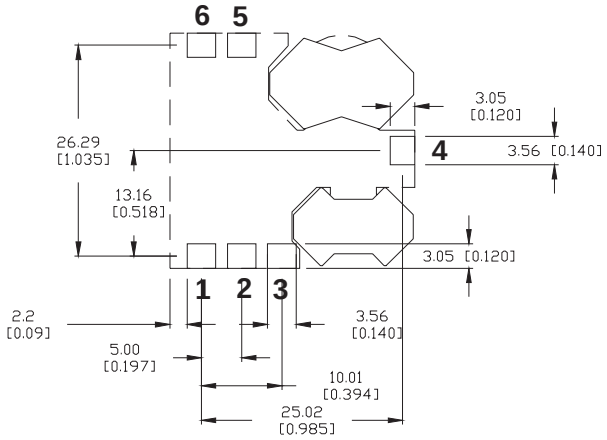
Notes: See website for detailed specifications
(1) Measured across one 3.3µF ceramic capacitor and one 10µF Tan capacitor; BW = 20MHz

iPB Series

Model Selector

Model	Voltage (V)	Adjust Range (V)	Max. Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iPB48010A015V-001-R	1.5	1.43 - 1.65	10	15	79
iPB48010A018V-001-R	1.8	1.62 - 1.98	10	18	82
iPB48010A025V-001-R	2.5	2.25 - 2.75	10	25	86
iPB48010A033V-001-R	3.3	2.97 - 3.46	10	33	88
iPB48007A050V-001-R	5	4.5 - 5.5	7	35	89
iPB48004A120V-001-R	12	10.8 - 13.2	3.5	42	85
iPB48003A150V-001-R	15	13.5 - 16.5	2.75	41	87
iPB48003A180V-001-R	18	16.2 - 19.8	2.5	45	88

Recommended Footprint (Top View)



Pinout

PIN	Function
1	Vout (+)
2	Vout (-)
3	Vout Trim
4	On / Off
5	Vin (-)
6	Vin (+)

For Additional Information, please visit
www.lambdapower.com/products/ipb-series.htm

Other Lambda DC-DC Products

CC-E	1.5-12W, 1 to 2 Outputs, 5 to 48VDC Input
PX	10-40W, 1 to 3 Outputs, 12 to 48VDC Input
iSA	30-78W, 1.2-12V Output, 36-75VDC Input, Sixteenth Bricks
iEA	30-78W, 1.2-28V Output, 36-75VDC Input, Eighth Brick DC-DC
PAE50/100	36-100W.1.9-5V Output, 36-75VDC Input. Eighth Brick DC-DC
iEB	150W, 12V Output, 42-56V Input, Eighth Brick Intermediate Bus DC-DC
iQD	300W, 12V Output, 42-53VDC Input, Quarter Brick Intermediate Bus DC-DC
iQB, iQM, iQN, iQP	30-300W, 1.2-12V Output, 24 to 48VDC Input, Quarter Brick DC-DC
PAH300/350	300-350W, 12 to 28V Output, 36-75VDC Input, Half Brick DC-DC
PAF	400-700W, 1.8 to 48V output, 24 to 400VDC Input, Full Brick DC-DC
FPS	1kW to 3kW, 24 to 48V Output, AC-DC Front Ends
iAA, iBC, PL	Non Isolated DC-DC Converters

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Revision A2: May 2007

iQA Series

67.5 - 75W Dual Output Quarter Brick Converter

- Standard Quarter Brick Footprint
- 36-75VDC Input
- 2.5/1.8V 24A - 5.0/3.3V 15A Nominal Outputs
- Through Hole Mounting
- Low 12.7mm Profile
- 1500VDC Basic Isolation

RoHS

Features and Benefits

Feature	Benefit
◆ Independent output trim	◆ Reduces need for custom models
◆ Constant switching frequency	◆ Easier system filtering
◆ Baseplate	◆ Allows for improved thermal management with optional heatsink

Specifications

ITEMS / MODEL		iQA48		
Nominal Output Voltage	VDC	3.3 / 1.8	3.3 / 2.5	5.0 / 3.3
Input Voltage Range	VDC	36 - 75		
Input Current (max)	A	3		
Output Voltage Tolerance	VDC	3.20 - 3.40	3.20 - 3.40	4.85 - 5.15
		1.74 - 1.86	2.42 - 2.58	3.20 - 3.40
Ripple & Noise (max) (pk to pk)	mV	80 / 70	80 / 70	40 / 40
Line Regulation (max)	mV	5	5	2
Load Regulation (max)	mV	15		5
Overload Protection (typ)	%	Inception - 120% of rated output; Short circuit - auto recovery hiccup		
Overvoltage Protection	-	Yes		
Remote Sense	-	N/A		
Remote On / Off	-	Positive or Negative Logic available, see Feature Set		
Temperature (operating)	°C	-40 to 105		-40 to 110
Temperature (storage)	°C	-55 to 125		
Humidity (operating)	-	20-95% RH Non condensing		
Humidity (storage)	-	10-95% RH Non condensing		
Cooling	-	Convection or forced air		
Isolation Voltage	VDC	1500V Input to output & baseplate, 500V Output to baseplate		
Vibration (non operating)	-	5 to 50Hz @ 0.5g (4.9m/s^2), and 50 to 500Hz @ 1.5g (14.7m/s^2) per Bellcore TR-EOP-000063-5.4.4		
Shock	-	196.1m/s^2		
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950), CE Mark (LVD)		
Weight (max)	g	47		
Size	mm	58.4 x 38.1 x 12.7		
Warranty	-	3 Years		

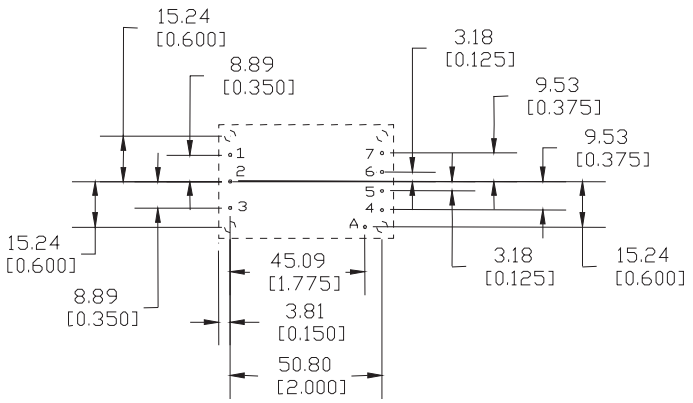
Notes: See website for detailed specifications

iQA Series

Model Selector

Model	Voltage (V)	Adjust Range (V)	Max. Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iQA48024A033M-103-R	3.3 / 1.8	N/A	15/15 (24 total)	67.5	85
iQA48024A033M-001-R	3.3 / 2.5	1.5-3.63 / 1.0-3.3	15/15 (24 total)	72	85
iQA48015A050M-001-R	5.0 / 3.3	1.5-5.5	15/15 (15 total)	75	87

Recommended Footprint (Top View)



For Additional Information, please visit
www.lambdapower.com/products/iqa-series.htm

Feature Set

Feature Set	Logic On / Off	Pin Length	Trim
00	Positive	0.145"	Dual independent pins
01*	Negative	0.145"	Dual independent pins
02	Positive	0.145"	Single tracking pin
03	Negative	0.145"	Single tracking pin
04	Positive	0.110"	Dual independent pins
05	Negative	0.110"	Dual independent pins
06	Positive	0.110"	Single tracking pin
07	Negative	0.110"	Single tracking pin

* Preferred feature set

Model Number Example: iQA48015A050M-0**01**-R

Pinout

PIN	Function
1	Vin (+)
2	On / Off
3	Vin (-)
4	Vo2 (+)
5	Output RTN
6	Vo1 Trim (optional: single tracking trim pin)
7	Vo1 (+)
A	Vo2 Trim (optional: omit for single trim pin option)

Other Lambda DC-DC Products

CC-E	1.5-12W, 1 to 2 Outputs, 5 to 48VDC Input
PX	10-40W, 1 to 3 Outputs, 12 to 48VDC Input
iPB	15-35W, 1.5-5V Output, 36-75VDC Input, Pico Brick
iSA	30-78W, 1.2-12V Output, 36-75VDC Input, Sixteenth Bricks
iEA	30-78W, 1.2-28V Output, 36-75VDC Input, Eighth Brick DC-DC
PAE50/100	36-100W.1.9-5V Output, 36-75VDC Input. Eighth Brick DC-DC
iEB	150W, 12V Output, 42-56V Input, Eighth Brick Intermediate Bus DC-DC
iQD	300W, 12V Output, 42-53VDC Input, Quarter Brick Intermediate Bus DC-DC
iQB, iQM, iQN, iQP	30-300W, 1.2-12V Output, 24 to 48VDC Input, Quarter Brick DC-DC
PAH300/350	300-350W, 12 to 28V Output, 36-75VDC Input, Half Brick DC-DC
PAF	400-700W, 1.8 to 48V output, 24 to 400VDC Input, Full Brick DC-DC
FPS	1kW to 3kW, 24 to 48V Output, AC-DC Front Ends
iAA, iBC, PL	Non Isolated DC-DC Converters

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Revision A1: Jan 2007

iQB Series

25 - 150W Quarter Brick Converter

RoHS

- Standard Quarter Brick Footprint
- 18-36, 36-75VDC Inputs
- 1.2V 25A, 12V 12.5A Nominal Outputs
- Through Hole Mounting
- Low 8.81mm Profile
- 1500VDC Basic Isolation

Features and Benefits

Feature	Benefit
◆ High operating efficiency (up to 92%)	◆ Reduced system heating
◆ Constant switching frequency	◆ Easier system filtering
◆ Low component count	◆ Higher reliability

Specifications

ITEMS \ MODEL		iQB						
Nominal Output Voltage	VDC	1.2	1.5	1.8	2.5	3.3	5	12
Input Voltage Range	VDC	36-75				18-36,36-75	36-75	
Input Current (max)	A	2 - 6.5 Amps model dependent						
Output Voltage Tolerance	VDC	1.16 - 1.24	1.45 - 1.55	1.74 - 1.86	2.42- 2.58	3.20 - 3.40	4.85 - 5.15	11.58 - 12.42
Ripple & Noise (max)(pk to pk) (1)	mV	75	100				125	150-250
Line Regulation (max)	mV	5					10	24
Load Regulation (max)	mV	7					10	24
Overload Protection (typ)	%	Inception- 120-153% of output rating; Short circuit auto recovery						
Overvoltage Protection	VDC	1.41 to 1.8	1.7 to 2.3	2.15 to 2.58	2.7 to 3.5	3.75 to 4.4	5.7 to 6.7	13.6 to 16
Remote Sense	-	Yes						
Remote On / Off	-	Positive or Negative Logic available, see Feature Set						
Temperature (operating)	°C	-40 to 120 (115°C for 24V input model)						-40 to 115
Temperature (storage)	°C	-55 to 125						
Humidity (operating)	-	20-95% RH Non condensing						
Humidity (storage)	-	10-95% RH Non condensing						
Cooling	-	Convection or forced air						
Isolation Voltage	VDC	1500						
Vibration (non operating)	-	5 to 50Hz @ 0.5g (4.9m/s2), and 50 to 500Hz @ 1.5g (14.7m/s^2) per Bellcore TR-EOP-000063-5.4.4						
Shock	-	196.1m/s^2						
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950), CE Mark (LVD)						
Weight (max)	g	39						
Size	mm	57.9 x 36.8 x 8.81 (10.11 for 12V 8.3A model)						
Warranty	-	3 Years						

Notes: See website for detailed specifications
(1) Measured across one 1µF ceramic capacitor and one 10µF Tan capacitor; BW = 20MHz

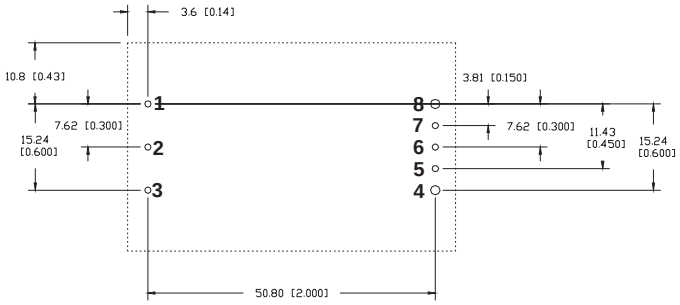
iQB Series

Model Selector

Model	Voltage (V)	Adjust Range (V)	Max. Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iQB48025A012V-001-R	1.2	1.08 to 1.32	25	30	78
iQB48025A015V-001-R	1.5	1.35 to 1.65	25	37.5	82
iQB48015A018V-001-R	1.8	1.62 to 1.98	15	27	85
iQB48025A018V-001-R	1.8	1.62 to 1.98	25	45	84
iQB48010A025V-001-R	2.5	2.25 to 2.75	10	25	87
iQB48020A025V-001-R	2.5	2.25 to 2.75	20	50	86
iQB48025A025V-001-R	2.5	2.25 to 2.75	25	62.5	85
iQB48010A033V-001-R	3.3	2.97 to 3.63	10	33	90
iQB24015A033V-001-R*	3.3	2.97 to 3.63	15	49.5	89
IQB48020A033V-001-R	3.3	2.97 to 3.63	20	66	89
iQB48025A033V-001-R	3.3	2.97 to 3.63	25	82.5	88
iQB48008A050V-001-R	5	4.5 to 5.5	8	40	90
iQB48015A050V-001-R	5	4.5 to 5.5	15	75	90
iQB48004A120V-001-R	12	9.6 to 13.2	4.17	50	91
iQB48008A120V-001-R	12	9.6 to 13.2	8.33	100	90
iQB48012A120V-001-R	12	9.6 to 13.2	12.5	150	92

* 24V Nominal Input

Recommended Footprint (Top View)



For Additional Information, please visit
www.lambdapower.com/products/iqb-series.htm

Feature Set

Feature Set	On / Off Logic	Pin Length
00	Positive	0.145"
01*	Negative	0.145"
02	Positive	0.110"
03	Negative	0.110"
04	Positive	0.200
05	Negative	0.200

* Preferred feature set

Model Number Example: iQB48015A050V-0**01**-R

Pinout

PIN	Function	PIN	Function
1	Vin (+)	2	On / Off
3	Vin (-)	4	Vout (-)
5	Sense (-)	6	Trim
7	Sense (+)	8	Vout (+)

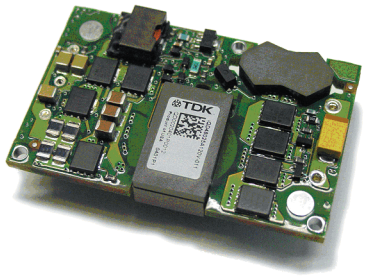
Other Lambda DC-DC Products

CC-E	1.5-12W, 1 to 2 Outputs, 5 to 48VDC Input
PX	10-40W, 1 to 3 Outputs, 12 to 48VDC Input
iPB	15-35W, 1.5-5V Output, 36-75VDC Input, Pico Brick
iSA	30-78W, 1.2-12V Output, 36-75VDC Input, Sixteenth Bricks
iEA	30-78W, 1.2-28V Output, 36-75VDC Input, Eighth Brick DC-DC
PAE50/100	36-100W.1.9-5V Output, 36-75VDC Input. Eighth Brick DC-DC
iEB	150W, 12V Output, 42-56V Input, Eighth Brick Intermediate Bus DC-DC
iQD	300W, 12V Output, 42-53VDC Input, Quarter Brick Intermediate Bus DC-DC
iQM, iQN, iQP	30-300W, 1.2-12V Output, 24 to 48VDC Input, Quarter Brick DC-DC
PAH300/350	300-350W, 12 to 28V Output, 36-75VDC Input, Half Brick DC-DC
PAF	400-700W, 1.8 to 48V output, 24 to 400VDC Input, Full Brick DC-DC
FPS	1kW to 3kW, 24 to 48V Output, AC-DC Front Ends
iAA, iBC, PL	Non Isolated DC-DC Converters

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A2: May 2007

iQD Series

300W 12V Quarter Brick Intermediate Bus Converter



- Standard Quarter Brick Footprint
- 42-53VDC Input
- 12V 27A Nominal Outputs
- Through Hole Mounting
- Low 9.65mm Profile
- 2250VDC Basic Isolation

RoHS

Features and Benefits

Feature	Benefit
◆ High operating efficiency (95%)	◆ Reduced system heating
◆ Constant switching frequency	◆ Easier system filtering
◆ Nominal 12V output	◆ Ideal for non isolated point of load converters

Specifications

ITEMS / MODEL		iQD48025A120V
Nominal Output Voltage	VDC	12
Input Voltage Range	VDC	42 - 53
Input Current (max)	A	10
Output Voltage Tolerance	VDC	8.9 - 13.6
Ripple & Noise (max)(pk to pk) (1)	mV	200
Line Regulation (typ)	mV	2700
Load Regulation (typ)	mV	800
Overload Protection (typ)	A	Overcurrent threshold 36A; Short circuit 8A - auto recovery
Overvoltage Protection	-	N/A
Remote Sense	-	No
Remote On / Off	-	Positive or Negative Logic, see Feature Set
Temperature (operating)	°C	-40 to 120
Temperature (storage)	°C	-55 to 125
Humidity (operating)	-	20-95% RH Non condensing
Humidity (storage)	-	10-95% RH Non condensing
Cooling	-	Convection or forced air
I/O Isolation Voltage	VDC	2250
Vibration (non operating)	-	5 to 50Hz @ 0.5g (4.9m/s^2), and 50 to 500Hz @ 1.5g (14.7m/s^2) per Bellcore TR-EOP-000063-5.4.4
Shock	-	196.1m/s^2
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950), CE Mark (LVD)
Weight (max)	g	47
Size	mm	57.91 x 36.83 x 9.65
Warranty	-	3 Years

Note: See website for detailed specifications

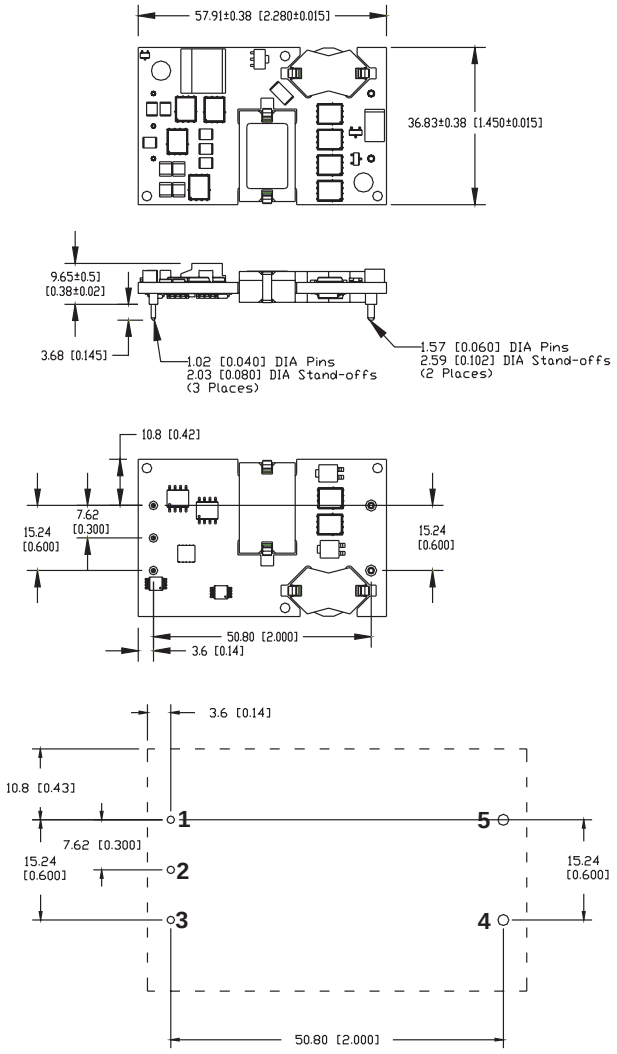
(1) Measured across one 22µF ceramic capacitor; BW = 20MHz

iQD Series

Model Selector

Model	Voltage (V)	Adjust Range (V)	Max. Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iQD48025A120V-001-R	12	N/A	27	300	95

Outline Drawing



Feature Set

Feature Set	Positive Logic On / Off	Negative Logic On / Off	0.200" Pin Len.	0.145" Pin Len.	0.180" Pin Len.
00	X			X	
01*		X		X	
04	X		X		
05		X	X		
07		X			X

* Preferred feature set

Model Number Example: iQD48025A120V-0**01**-R

Pinout

PIN	Function
1	Vin (+)
2	On / Off
3	Vin (-)
4	Vout (-)
5	Vout (+)

For Additional Information, please visit
www.lambdapower.com/products/iqd-series.htm

Other Lambda DC-DC Products

CC-E	1.5-12W, 1 to 2 Outputs, 5 to 48VDC Input
PX	10-40W, 1 to 3 Outputs, 12 to 48VDC Input
iPB	15-35W, 1.5-5V Output, 36-75VDC Input, Pico Brick
iSA	30-78W, 1.2-12V Output, 36-75VDC Input, Sixteenth Bricks
iEA	30-78W, 1.2-28V Output, 36-75VDC Input, Eighth Brick DC-DC
PAE50/100	36-100W.1.9-5V Output, 36-75VDC Input. Eighth Brick DC-DC
iEB	150W, 12V Output, 42-56V Input, Eighth Brick Intermediate Bus DC-DC
iQB, iQM, iQN, iQP	30-300W, 1.2-12V Output, 24 to 48VDC Input, Quarter Brick DC-DC
PAH300/350	300-350W, 12 to 28V Output, 36-75VDC Input, Half Brick DC-DC
PAF	400-700W, 1.8 to 48V output, 24 to 400VDC Input, Full Brick DC-DC
FPS	1kW to 3kW, 24 to 48V Output, AC-DC Front Ends
iAA, iBC, PL	Non Isolated DC-DC Converters

iQE Series

96 - 120W, 24V Input Quarter Brick Converter

- Standard Quarter Brick Footprint
- 18-36VDC Input
- 3.3V 30A - 15V 7A Nominal Outputs
- Through Hole Mounting
- Low 10.41mm Profile
- 1500VDC Basic Isolation

RoHS

Features and Benefits

Feature	Benefit
◆ High operating efficiency (>90%)	◆ Reduced system heating
◆ Constant switching frequency	◆ Easier system filtering
◆ Low component count	◆ Higher reliability

Specifications

ITEMS \ MODEL		iQE24				
Nominal Output Voltage	VDC	3.3	5	8	12	15
Input Voltage Range	VDC	18-36				
Input Current (max)	A	10				
Output Voltage Tolerance	VDC	3.2 - 3.4	4.85 - 5.15	7.76 - 8.24	11.58 - 12.42	14.48 - 15.52
Ripple & Noise (max)(pk to pk) (1)	mV	150	150	150	150	150
Line Regulation (max)	mV	10	15	25	30	30
Load Regulation (max)	mV	10	30	25	30	30
Overload Protection (typ)	%	Inception- 133-158% of rated output; Short circuit - auto recovery				
Overvoltage Protection	VDC	3.8 - 4.6	5.7 - 6.7	8.9 - 11	13.6 - 16.5	16.7 - 21
Remote Sense	-	Yes				
Remote On / Off	-	Positive or Negative Logic available, see Feature Set				
Temperature (operating)	°C	-40 to 125				
Temperature (storage)	°C	-55 to 125				
Humidity (operating)	-	20-95% RH Non condensing				
Humidity (storage)	-	10-95% RH Non condensing				
Cooling	-	Convection or forced air				
Isolation Voltage	VDC	1500				
Vibration (non operating)	-	5 to 50Hz @ 0.5g (4.9m/s^2), and 50 to 500Hz @ 1.5g (14.7m/s^2) per Bellcore TR-EOP-000063-5.4.4				
Shock	-	196.1m/s^2				
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950)				
Weight (max)	g	50				
Size	mm	57.9 x 36.8 x 10.41				
Warranty	-	3 Years				

Notes: See website for detailed specifications
(1) Measured across one 22µF and one 0.1µF ceramic capacitor; BW = 20MHz

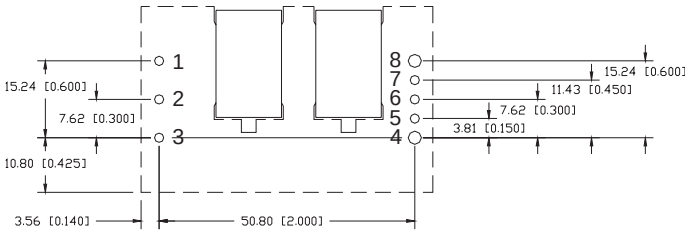
LAMBDA

iQE Series

Model Selector

Model	Voltage (V)	Adjust Range (V)	Max. Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iQE24030A033V-001-R	3.3	2.97 - 3.63	30	99	90.5
iQE24024A050V-001-R	5	4.5 - 5.5	24	120	90
iQE24012A080V-001-R	8	7.2 - 8.8	12	96	92
iQE24009A120V-001-R	12	10.8 - 13.2	8.75	105	88
iQE24007A150V-001-R	15	13.5 - 16.5	7	105	90

Recommended Footprint (Top View)



Feature Set

Feature Set	Positive Logic On / Off	Negative Logic On / Off	0.110" Pin Len.	0.180" Pin Len.	0.145" Pin Len.
00	X				X
01		X			X
02	X		X		
03		X	X		
06	X			X	
07*		X		X	

* Preferred feature set

Model Number Example: iQE24030A033V-0**07**-R

Other Lambda DC-DC Products

CC-E	1.5-12W, 1 to 2 Outputs, 5 to 48VDC Input
PX	10-40W, 1 to 3 Outputs, 12 to 48VDC Input
iPB	15-35W, 1.5-5V Output, 36-75VDC Input, Pico Brick
iSA	30-78W, 1.2-12V Output, 36-75VDC Input, Sixteenth Bricks
iEA	30-78W, 1.2-28V Output, 36-75VDC Input, Eighth Brick DC-DC
PAE50/100	36-100W.1.9-5V Output, 36-75VDC Input. Eighth Brick DC-DC
iEB	150W, 12V Output, 42-56V Input, Eighth Brick Intermediate Bus DC-DC
iQD	300W, 12V Output, 42-53VDC Input, Quarter Brick Intermediate Bus DC-DC
iQB, iQM, iQN, iQP	30-300W, 1.2-12V Output, 24 to 48VDC Input, Quarter Brick DC-DC
PAH300/350	300-350W, 12 to 28V Output, 36-75VDC Input, Half Brick DC-DC
PAF	400-700W, 1.8 to 48V output, 24 to 400VDC Input, Full Brick DC-DC
FPS	1kW to 3kW, 24 to 48V Output, AC-DC Front Ends
iAA, iBC, PL	Non Isolated DC-DC Converters

For Additional Information, please visit
www.lambdapower.com/products/iqe-series.htm

Pinout

PIN	Function
1	Vin (+)
2	On / Off
3	Vin (-)
4	Vout (-)
5	Sense (-)
6	Trim
7	Sense (+)
8	Vout (+)

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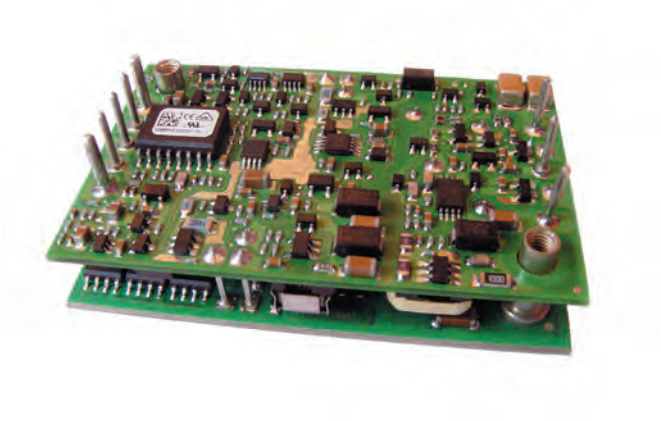
Revision A2: May 2007

LAMBDA iQM/iQN/iQP Series



72 - 300W Quarter Brick Converter

RoHS

- Standard Quarter Brick Footprint
- 36-75VDC Input
- 1.2V 100A - 35V 6A Nominal Outputs
- Through Hole Mounting
- Low 12.7mm Profile
- 1500VDC Basic Isolation

Features and Benefits

Feature	Benefit
◆ High operating efficiency (up to 92%)	◆ Reduced system heating
◆ Constant switching frequency	◆ Easier system filtering
◆ Baseplate	◆ Allows for improved thermal management with optional heatsink

Specifications

ITEMS \ MODEL		iQM (iQP)								
Nominal Output Voltage	VDC	1.2	1.5	1.8	2.5	3.3	5	12	28	35
Input Voltage Range	VDC	36 - 75								
Input Current (max)	A	2.8 - 10.5 Amps model dependent								
Output Voltage Tolerance	VDC	1.16 - 1.24	1.45 - 1.55	1.74 - 1.86	2.42 - 2.58	3.20 - 3.40	4.85 - 5.15	11.6 - 12.4	27.44 - 28.56	34.48 - 35.53
Ripple & Noise (max)(pk to pk)	mV	80[1](50[5])	90[1](100[5])	90[1](80[5])	95[1](75[5])	100[1](80[5])	100[1]	120[2](200[5])	200[3]	250[4]
Line Regulation (max)	mV	5				6.6	8 (10)	24	56	100
Load Regulation (max)	mV	5	7	6	5	6.6	10	24	N/A	N/A
Overload Protection (typ)	%	Inception- 108-117% of rated output; Short circuit auto recovery								
Overvoltage Protection	VDC	1.5	1.83	2.25	3.1	4.1	6.1	14.5	33.6	39.7
Remote Sense	-	Yes								
Remote On / Off	-	Positive or Negative Logic available, see Feature Set								
Temperature (operating)	°C	-40-120(121)			-40-117(121)		-40-115(119)	-40-117(116)	40-115	-40-119
Temperature (storage)	°C	-55 to 125								
Humidity (operating)	-	20-95% RH Non condensing								
Humidity (storage)	-	10-95% RH Non condensing								
Cooling	-	Convection or forced air								
Isolation Voltage	VDC	1500V Input to output & base plate, 500V Output to base plate								
Vibration (non operating)	-	5 to 50Hz @ 0.5g (4.9m/s^2), and 50 to 500Hz @ 1.5g (14.7m/s^2) per Bellcore TR-EOP-000063-5.4.4								
Shock	-	196.1m/s^2								
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950), CE Mark (LVD)								
Weight (max)	g	60								
Size	mm	57.9 x 36.8 x 12.7								
Warranty	-	3 years								

Notes: See website for detailed specifications
(1) Measured across 47µF +1µF +0.1µF ceramic caps
(2) Measured across 47µF +1µF +0.1µF ceramic caps + 470µF Al electrolytic
(3) Measured across 40µF +1µF +0.1µF ceramic caps +2X220µF Al electrolytic
(4) Measured across 47µF +1µF +0.1µF ceramic caps + 68µF Al electrolytic
(5) Measured across 47µF +1µF +0.1µF ceramic caps + 1000µF Al electrolytic

LAMBDA iQM/iQN/iQP Series

Model Selector

Model	Voltage (V)	Adjust Range (V)	Max. Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iQM48060A012V-001-R	1.2	0.96 - 1.32	60	72	80.5
iQP48100A012V-001-R	1.2	0.96 - 1.32	100	120	80
iQM48060A015V-001-R	1.5	1.2 - 1.65	60	90	83.5
iQP48090A015V-001-R	1.5	1.2 - 1.65	90	135	84
iQM48060A018V-001-R	1.8	1.44 - 1.98	60	108	85
iQP48085A018V-001-R	1.8	1.44 - 1.98	85	153	86.5
iQM48050A025V-001-R	2.5	2.0 - 2.75	50	125	88.5
iQM48060A025V-001-R	2.5	2.0 - 2.75	60	150	87.5
IQP48080A025V-001-R	2.5	2.0 - 2.75	80	200	89
iQM48035A033V-001-R	3.3	2.64 - 3.63	35	115.5	91.8
iQM48050A033V-001-R	3.3	2.64 - 3.63	50	165	90.5
iQP48070A033V-001-R	3.3	2.64 - 3.63	70	231	91.5
iQM48033A050V-001-R	5	4.0 - 5.5	33	165	91
iQP48050A050V-001-R	5	4.0 - 5.5	50	250	91.5
iQM48017A120V-001-R	12	9.6 - 13.2	17	204	90.5
IQP48021A120V-001-R	12	9.6 - 13.2	21	252	92
iQP48025A120V-001-R	12	9.6 - 13.2	25	300	91.5
iQN48007A280V-001-R	28	16.8 - 30.8	7	196	92
iQN48006A350V-001-R	35	17 - 35	6	210	90

Pinout

PIN	Function (iQM, iQN)	Function (iQP)
1	Vin (+)	Vin (+)
2	On / Off	On / Off
3	Vin (-)	Vin (-)
4	Vout (-)	Vout (-)
5	Sense (-)	Vout (-)
6	Trim	Sense (-)
7	Sense (+)	Trim
8	Vout (+)	Sense (+)
9	no pin	Vout (+)
10	no pin	Vout (+)

For Additional Information, please visit
www.lambdapower.com/products/iqm-iqn-series.htm

Feature Set

Feature Set	On / Off Logic	OVP	Pin Length
00	Positive	Latch	0.145
01*	Negative	Latch	0.145
02	Positive	Latch	0.110
03	Negative	Latch	0.110
04	Positive	Latch	0.200
05**	Negative	Latch	0.200
06	Positive	Non-Latch	0.145
07	Negative	Non-Latch	0.145
08	Positive	Latch	0.180
09	Negative	Latch	0.180

* Preferred feature set for iQM/iQN
** Prefered feature set for iQP
Model Number Example: iQM48050A033V-0**01**-R
Model Number Example: iQP48050A05V-0**05**-R

Other Lambda DC-DC Products

CC-E	1.5-12W, 1 to 2 Outputs, 5 to 48VDC Input
PX	10-40W, 1 to 3 Outputs, 12 to 48VDC Input
iPB	15-35W, 1.5-5V Output, 36-75VDC Input, Pico Brick
iSA	30-78W, 1.2-12V Output, 36-75VDC Input, Sixteenth Bricks
iEA	30-78W, 1.2-28V Output, 36-75VDC Input, Eighth Brick DC-DC
PAE50/100	36-100W.1.9-5V Output, 36-75VDC Input. Eighth Brick DC-DC
iEB	150W, 12V Output, 42-56V Input, Eighth Brick Intermediate Bus DC-DC
iQD	300W, 12V Output, 42-53VDC Input, Quarter Brick Intermediate Bus DC-DC
iQB	100W, 1.2-12V Output, 24 to 48VDC Input, Quarter Brick DC-DC
PAH300/350	300-350W, 12 to 28V Output, 36-75VDC Input, Half Brick DC-DC
PAF	400-700W, 1.8 to 48V output, 24 to 400VDC Input, Full Brick DC-DC
FPS	1kW to 3kW, 24 to 48V Output, AC-DC Front Ends
iAA, iBC, PL	Non Isolated DC-DC Converters

LAMBDA

iSA Series

36 - 82.5W Sixteenth Brick Converter

RoHS

- Standard Sixteenth Brick Footprint (DOSA)
- 36 - 75VDC Input
- 1.2V 30A - 12V 6.5A Nominal Outputs
- Through Hole Mounting
- Low 12.7mm Profile
- 1500VDC Basic Isolation

Features and Benefits

Feature	Benefit
◆ High operating efficiency (up to 90%)	◆ Reduced system heating
◆ Constant switching frequency	◆ Easier system filtering
◆ 44% smaller than eighth bricks	◆ Optimization of board space

Specifications

ITEMS \ MODEL		iSA480						
Nominal Output Voltage	VDC	1.2	1.5	1.8	2.5	3.3	5	12
Input Voltage Range	VDC	36 to 75						
Input Current (max)	A	4						
Output Voltage Tolerance	VDC	1.164-1.236	1.45-1.55	1.74-1.86	2.42-2.58	3.20-3.40	4.85-5.15	11.58-12.42
Ripple & Noise (max)(pk to pk)	mV	75			100			200
Line Regulation (max)	mV	7			7		10	24
Load Regulation (max)	mV	8			8		10	24
Overload Protection	%	Inception- 130-147% of rated output; Short circuit auto recovery						
Overvoltage Protection	VDC	1.5-2.0	1.7-2.3	2.1-2.6	2.7-3.5	3.75-4.65	5.7-6.7	13.6-15.7
Remote Sense	-	Yes						
Remote On / Off	-	Positive and Negative Logic available, see Feature Set						
Temperature (operating)	°C	-40 to 125						
Temperature (storage)	°C	-55 to 125						
Humidity (operating)	-	20-95% RH Non condensing						
Humidity (storage)	-	10-95% RH Non condensing						
Cooling	-	Convection or forced air						
I/O Isolation Voltage	VDC	1500						
Vibration (non operating)	-	5 to 50Hz @ 0.5g (4.9m/s^2), and 50 to 500Hz @ 1.5g (14.7m/s^2) per Bellcore TR-EOP-000063-5.4.4						
Shock	-	196.1m/s^2						
Safety Agency Approvals	-	UL60950 (US and Canada), VDE0805 (IEC60950), CB scheme (IEC60950), CE Mark (LVD)						
Weight (max)	g	30.4						
Size	mm	33 x 22.9 x 12.7						
Warranty	-	3 Years						

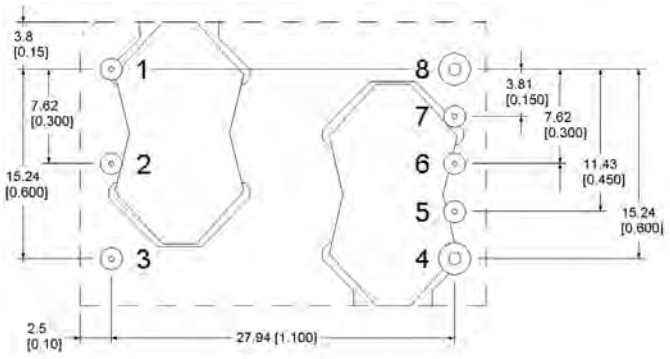
Notes: See website for detailed specifications

iSA Series

Model Selector

Model	Voltage (V)	Adjust Range (V)	Max. Curr. (A)	Max. Output Power (W)	Efficiency at Full Load (%)
iSA48030A012V-001-R	1.2	1.08 to 1.32	30	36	75
iSA48030A015V-001-R	1.5	1.35 to 1.65	30	45	79
iSA48030A018V-001-R	1.8	1.62 to 1.98	30	54	82
iSA48025A025V-001-R	2.5	2.25 to 2.75	25	62.5	85
iSA48025A033V-001-R	3.3	2.97 to 3.63	25	82.5	88
iSA48015A050V-001-R	5	4.5 to 5.5	15	75	90
iSA48007A120V-001-R	12	10.8 to 13.2	6.5	78	90

Recommended Footprint (Top View)



Feature Set

Feature Set	Pos. Logic On / Off	Neg. Logic On / Off	0.110" Pin Len.	0.180" Pin Len.	0.145" Pin Len.	Latching OVP
00	X				X	
01*		X			X	
02	X		X			
03		X	X			
06	X			X		
07		X		X		
11		X			X	X
17		X		X		X

* Preferred feature set

Model Number Example: iSA48025A033V-0**01**-R

Other Lambda DC-DC Products

CC-E	1.5-12W, 1 to 2 Outputs, 5 to 48VDC Input
PX	10-40W, 1 to 3 Outputs, 12 to 48VDC Input
iPB	15-35W, 1.5-5V Output, 36-75VDC Input, Pico Brick
iEA	30-78W, 1.2-28V Output, 36-75VDC Input, Eighth Brick DC-DC
PAE50/100	36-100W.1.9-5V Output, 36-75VDC Input. Eighth Brick DC-DC
iEB	150W, 12V Output, 42-56V Input, Eighth Brick Intermediate Bus DC-DC
iQD	300W, 12V Output, 42-53VDC Input, Quarter Brick Intermediate Bus DC-DC
iQB, iQM, iQN, iQP	30-300W, 1.2-12V Output, 24 to 48VDC Input, Quarter Brick DC-DC
PAH300/350	300-350W, 12 to 28V Output, 36-75VDC Input, Half Brick DC-DC
PAF	400-700W, 1.8 to 48V output, 24 to 400VDC Input, Full Brick DC-DC
FPS	1kW to 3kW, 24 to 48V Output, AC-DC Front Ends
iAA, iBC, PL	Non Isolated DC-DC Converters

Pinout

PIN	Function
1	Vin (+)
2	On / Off
3	Vin (-)
4	Vout (-)
5	Sense (-)
6	Trim
7	Sense (+)
8	Vout (+)

For Additional Information, please visit
www.lambdapower.com/products/isa-series.htm

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Revision A2: June 2007

PAF500F Series

24V & 48V Input Full brick DC-DC Converters

- 12V output for driving non-isolated converters
- Safety Approved
- Up to 80A output current (48V models)
- Full power at 100°C baseplate
- Opto Isolated Remote On / Off
- Wide Adjustable Output Range

RoHS

Key Market Segments & Applications

Central Office:	ATM, Sonet, DSL, ISDN, Frame relay
Broadband:	Switching Equipment, Routers
Wireless/Cellular:	Micro Cells (larger in size/10 sq. mi.) Pico Cells (smaller in size/1 to 2 sq. mi.)
Remote Electronics:	Fixed Local Loop, Fiber Optic Transmission, Microwave Transmission, Wireless Local Loop
Customer Premise:	PBX, PABX, Datacomm, Voice Systems, Video Conferencing

PAF Features and Benefits

Feature	Benefit
◆ Wide adjustment range	◆ Reduces need for custom modules
◆ Parallel Pin	◆ Modules can be connected together for higher current
◆ ASIC Design	◆ Reduced component count, increased MTBF
◆ No potting materials	◆ Lower weight

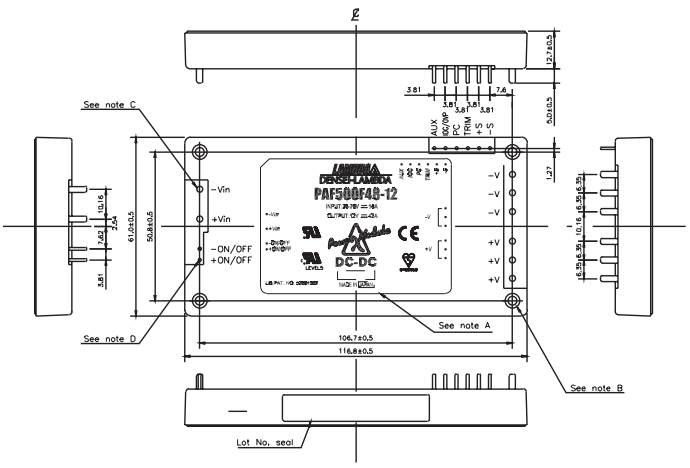
Specifications

ITEMS \ MODEL		PAF500F48-3.3	PAF500F48-5	PAF500F24-12 PAF500F48-12	PAF500F24-28 PAF500F48-28
Nominal Output Voltage	VDC	3.3	5	12	28
Output Current (Max)	A	80	80	42	18
Max Output Power	W	264	400	504	504
Efficiency (Typ)	%	78	83	89	90
Input Voltage range	VDC	36-76		19-36 or 36-76	18-36 or 36-76
Input Current (Typ) (24V/48V)	A	7.3	10.4	24 / 12.2	23.8 / 12.1
Output Voltage Accuracy	%	±1			
Output Voltage Adjustment	VDC	2 - 4	3 - 6	7.2 - 13.2	16.8 - 30.8
Max Ripple & Noise	mV	100	100	200	280
Max Line Regulation	mV	10	10	24	56
Max Load Regulation	mV	10	10	24	56
Overcurrent Protection	%	105 - 140%			
Overvoltage Protection	%	130-160	125-145	115-135	115-135
Signals & Control	-	Remote sense, remote On/Off, Parallel Pin, DC Good (12, 28V models), Adjustable OVP (3.3, 5V models), 7-10V Auxiliary voltage			
Operating Temperature	-	-40°C to +100°C baseplate			
Cooling	-	Conduction (See Installation Manual for heatsink selection)			
Isolation Voltage	VDC	Input - Baseplate 1500V, Input - Output 1500V, Output-Baseplate 500V			
Shock	-	196.1m/s^2			
Vibration		Non Operating, 10-55Hz (sweep for 1 min.)			
Amplitude		0.825mm constant (Max 49m/s^2) X, Y, Z 1 hour each			
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, CE LVD			
Weight (Typ)	g	250			
Size (WxHxD)	in(mm)	2.4x0.5x4.6 (61x12.7x116.8) See outline drawing			
Warranty	-	2 years			

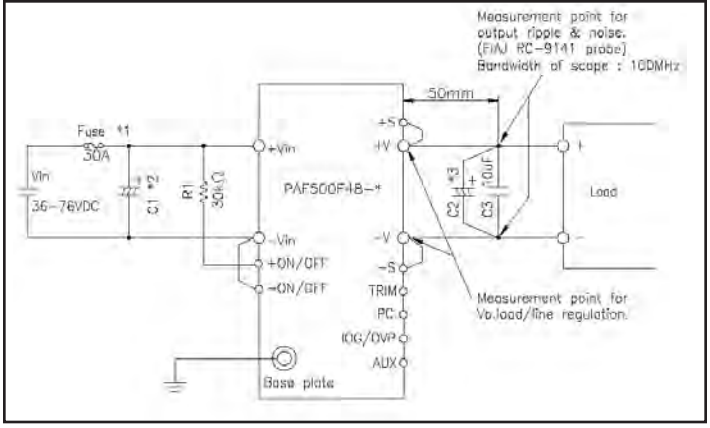
Note: See Installation Manual for full details, test methods of parameters and application notes.

PAF500F Series

Outline Drawing



Connection Example



Heatsink Table

Heatsink	Size (mm)	Thermal Resistance
HAF-10L	116.8 x 25.4 x 61	2.2°C/W
HAF-15L	116.8 x 38.1 x 61	1.9°C/W
HAF-15T	116.8 x 38.1 x 61	1.5°C/W

Pinout

Pin Description	Function
-Vin	Negative Input Terminal
+Vin	Positive Input Terminal
- ON/OFF	Remote On/Off negative terminal
+ON/OFF	Remote On/Off positive terminal
+V	Positive Output Terminal
-V	Negative Output Terminal
AUX	7-10V Aux voltage
IOG/OVP	DC Good / OVP adjustment
PC	Parallel control connection
TRIM	Output adjustment Trim pin
+S	Positive Remote sense
-S	Negative Remore sense

Other Lambda DC-DC Products

PAF	Full Brick 400-700W DC-DC
PAH	Half brick DC-DC
PAQ	Quarter brick DC-DC
PX	10-40W, 12-48V DC-DC

Options

Suffix	Description
Blank	
/T	No thread in mounting holes.

For Additional Information, please visit
www.lambdapower.com/products/paf-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A3: Oct 2007

PAF600F Series

24V & 48V Input Full brick DC-DC Converters

- 12V output for driving non-isolated converters
- Safety Approved
- Full power at 100°C baseplate
- Opto Isolated Remote On / Off
- Wide Adjustable Output Range

RoHS

Key Market Segments & Applications

Central Office:	ATM, Sonet, DSL, ISDN, Frame Relay
Broadband:	Switching Equipment, Routers
Wireless/Cellular:	Micro Cells (larger in size/10 sq. mi.) Pico Cells (smaller in size/1 to 2 sq. mi.)
Remote Electronics:	Fixed Local Loop, Fiber Optic Transmission, Microwave Transmission, Wireless Local Loop
Base Station Power Amplifiers	

PAF Features and Benefits

Feature	Benefit
◆ Wide Adjustment Range	◆ Reduces need for custom modules
◆ Parallel Pin	◆ Modules can be connected together for higher current
◆ ASIC Design	◆ Reduced component count, increased MTBF
◆ 24V & 48V Inputs	◆ Suitable for remote & central office applications

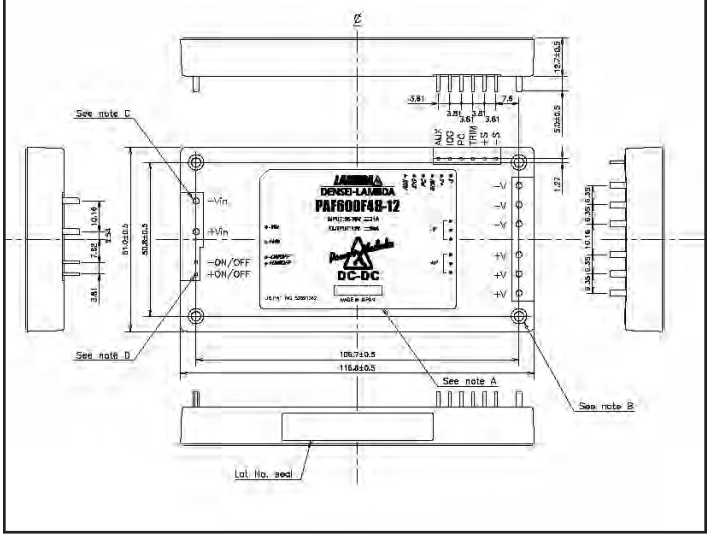
Specifications

ITEMS \ MODEL		PAF600F24-12 PAF600F48-12	PAF600F24-28 PAF600F48-28
Nominal Output Voltage	VDC	12	28
Output Current (Max)	A	50	21.5
Output Power (Max)	W	600	602
Efficiency (Typ)	%	89 to 90%	
Input Voltage Range	VDC	20-36 / 36-76	19-36 / 36-76
Input Current (Typ) 24/48V input	A	28.9 / 14.2	28.9 / 14.1
Output Voltage Accuracy	%	±1	
Output Voltage Adjustment	VDC	7.2 - 13.2	16.8 - 30.8
Ripple & Noise (Max)	mV	200	280
Line Regulation (Max)	mV	24	56
Load Regulation (Max)	mV	24	56
Temperature Coefficient	-	0.02%/°C	
Overcurrent Protection	%	105 - 140%	
Overvoltage Protection	%	115-135%	
Signals & Control	-	Remote sense, remote On/Off, Parallel Pin, DC Good, 7-10V Auxiliary voltage	
Operating Temperature	-	-40°C to +100°C baseplate	
Humidity (operating)	-	30-95% RH Non condensing	
Humidity (storage)	-	10-95% RH Non condensing	
Cooling	-	Conduction (See Installation Manual for heatsink selection)	
Isolation Voltage	VDC	Input - Baseplate 1500V, Input - Output 1500V, Output-Baseplate 500V (for 1 min.)	
Shock	-	196.1m/s^2	
Vibration	-	Non Operating, 10-55Hz (sweep for 1 min.)	
		Amplitude 0.825mm constant (Max 49 m/s^2) X,Y,Z 1 hour each	
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, CE LVD (48V model only)	
Weight (Typ)	g	250	
Size (WxHxD)	in(mm)	2.4 x 0.5 x 4.6 (61 x 12.7 x 116.8) See outline drawing	
Warranty	-	2 years	

Note: See Installation Manual for full details, test methods of parameters and application notes.

PAF600F Series

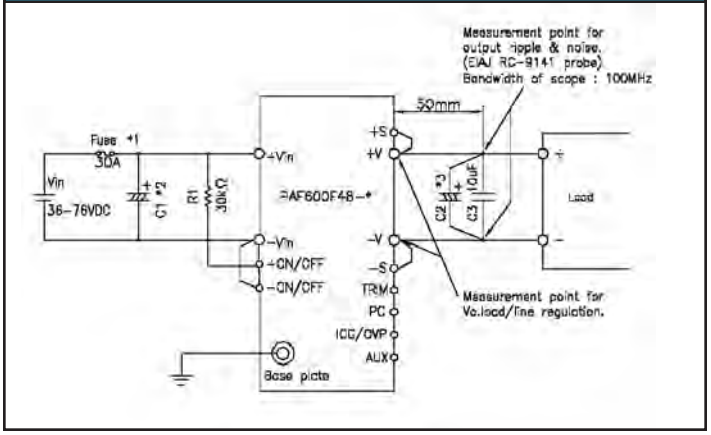
PAF Outline Drawing



Other Lambda DC-DC Products

PAF	Full brick 400-700W DC-DC
PAH	Half brick DC-DC
PAQ	Quarter brick DC-DC
PX	10-40W, 12-48V DC-DC

Connection Example



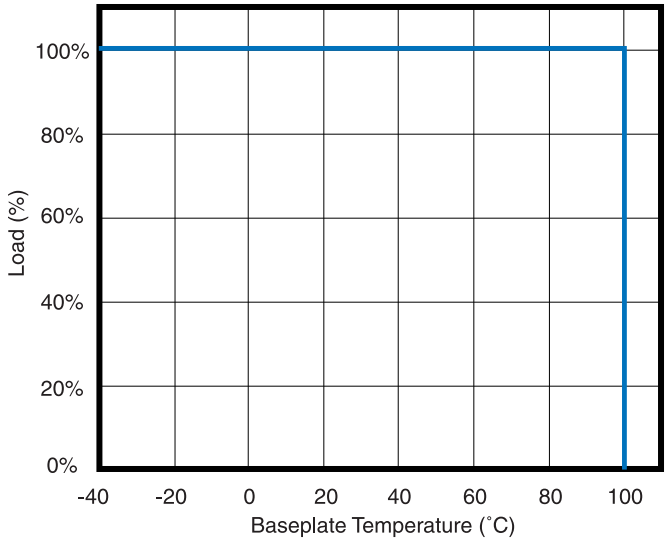
Heatsink Table

Heatsink	Size (mm)	Thermal Resistance
HAF-10L	116.8 x 25.4 x 61	2.2°C/W
HAF-15L	116.8 x 38.1 x 61	1.9°C/W
HAF-15T	116.8 x 38.1 x 61	1.5°C/W

Pinout

Pin Description	Function
-Vin	Negative Input Terminal
+Vin	Positive Input Terminal
- ON/OFF	Remote On/Off Negative Terminal
+ON/OFF	Remote On/Off Positive Terminal
+V	Positive Output Terminal
-V	Negative Output Terminal
AUX	7-10V Aux Voltage
IOG	DC Good
PC	Parallel Control Connection
TRIM	Output Adjustment Trim Pin
+S	Positive Remote Sense
-S	Negative Remote Sense

Derating Curve



Options

Suffix	Description
Blank	
/T	No thread in mounting holes.

For Additional Information, please visit
www.lambdapower.com/products/paf-series.htm

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Revision A5: Oct 2007

PAF-F280 Series

200V to 400VDC Input Full brick DC-DC Converters

- Output Voltages from 7.2V to 57V
- 450W to 600W Output Power
- Current Share
- Operation to 100°C Baseplate
- Wide Adjustable Output Range

RoHS

Key Market Segments & Applications

Servers & Rail Systems
High End Computers
Custom Power Supplies

PAF Features and Benefits

Feature	Benefit
◆ Wide Adjustment Range	◆ Reduces need for custom modules
◆ Parallel Pin	◆ Modules can be connected together for higher current
◆ High Efficiency - up to 91%	◆ Reduced heat losses

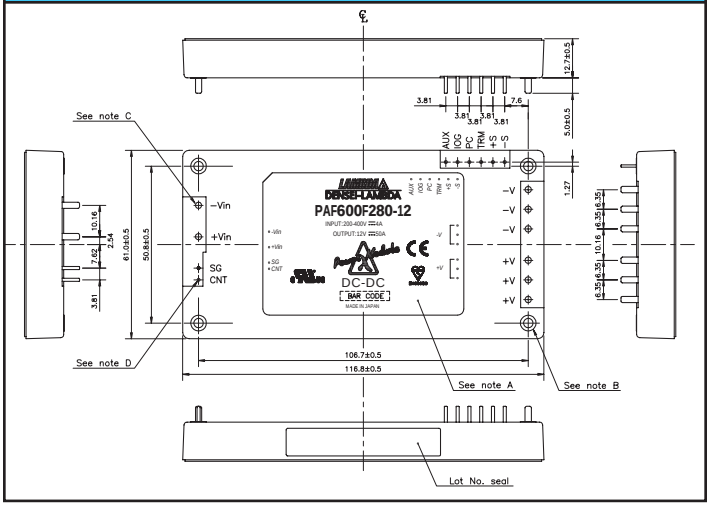
Specifications

ITEMS \ MODEL			PAF450F280-12 PAF600F280-12	PAF450F280-24 PAF600F280-24	PAF450F280-28 PAF600F280-28	PAF450F280-48 PAF600F280-48
Nominal Output Voltage		VDC	12	24	28	48
Output Current (Max)	450W	A	38	19	16.5	9.5
	600W		50	25	21.5	12.5
Max Output Power	450W	W	456	456	462	456
	600W		600	600	602	600
Efficiency (Typ)		%	89-90	91	91	91
Input Voltage Range		VDC	200-400VDC			
Output Voltage Accuracy		%	±1			
Output Voltage Adjustment		VDC	7.2 - 14.4	14.4 - 28.8	16.8 - 33.6	28.8 - 57.6
Max Ripple & Noise		mV	120	240	280	480
Max Line Regulation		mV	48	56	56	96
Max Load Regulation		mV	48	56	56	96
Temperature Coefficient		°C	0.02%/°C			
Overcurrent Protection		%	105 - 140%			
Overvoltage Protection		%	125 - 145%			
Signals & Control		-	Remote Sense, Remote On/Off, Parallel Pin, Inverter Good, 11-14V Auxiliary voltage			
Baseplate Temperature		-	-40°C to +100°C Baseplate: (See derating chart)			
Humidity (non condensing)		-	5 - 95% RH Operating, 5 - 95% RH Non Operating			
Cooling		-	Conduction (See Installation Manual for heatsink selection)			
Isolation Voltage		-	Input to Baseplate: 2500VAC (20mA); Input to Output 3000VAC for 1 min.; Output to Baseplate: 500VDC for 1 min			
Shock		-	196.1m/s^2			
Vibration		-	Non Operating, 10-55Hz (sweep for 1 min.) Amplitude 0.825mm constant (Max 49 m/s^2) X,Y,Z 1 hour each			
Safety Agency Approvals		-	UL60950-1, CSA60950-1, EN60950-1, CE LVD			
Weight (Typ)		g	200			
Size (WxHxD)		mm	2.4 x 0.5 x 4.6 (61 x 12.7 x 116.8) See outline drawing			
Warranty		yr	2 years			

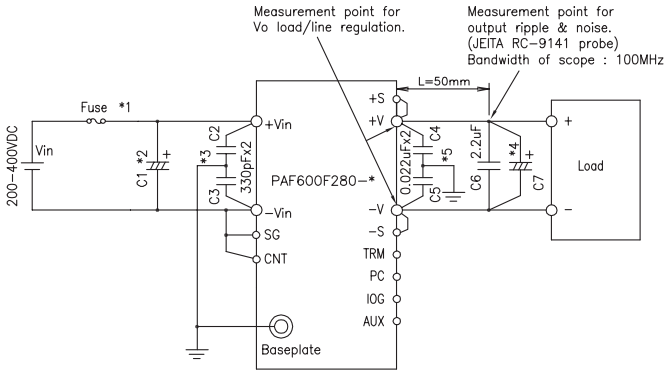
Note: See Installation Manual for full details, test methods of parameters and application notes.

PAF-F280 Series

PAF Outline Drawing



Connection Example



Pinout

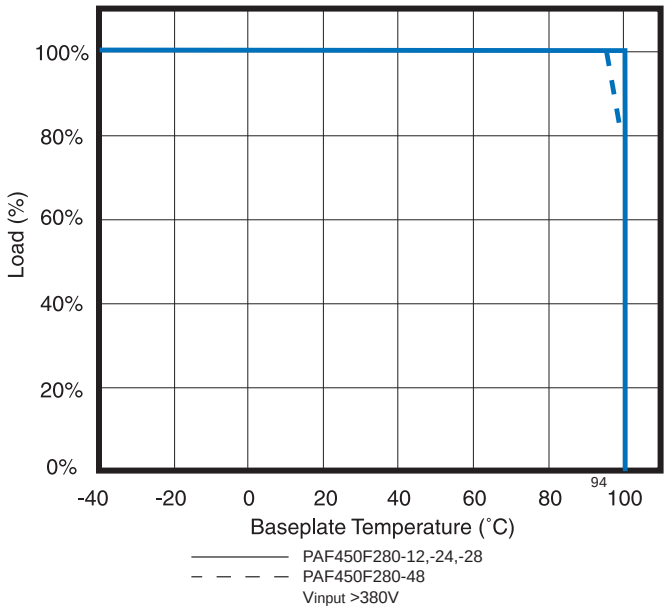
Pin Description	Function
-Vin	Negative Input Terminal
+Vin	Positive Input Terminal
CNT	Remote On/Off
+V	Positive Output Terminal
-V	Negative Output Terminal
AUX	11-14V Aux Voltage
PC	Parallel Control Connection
TRIM	Output Adjustment Trim Pin
+S	Positive Remote Sense
-S	Negative Remote Sense
SG	Remote ON/OFF Return

Other Lambda DC-DC Products

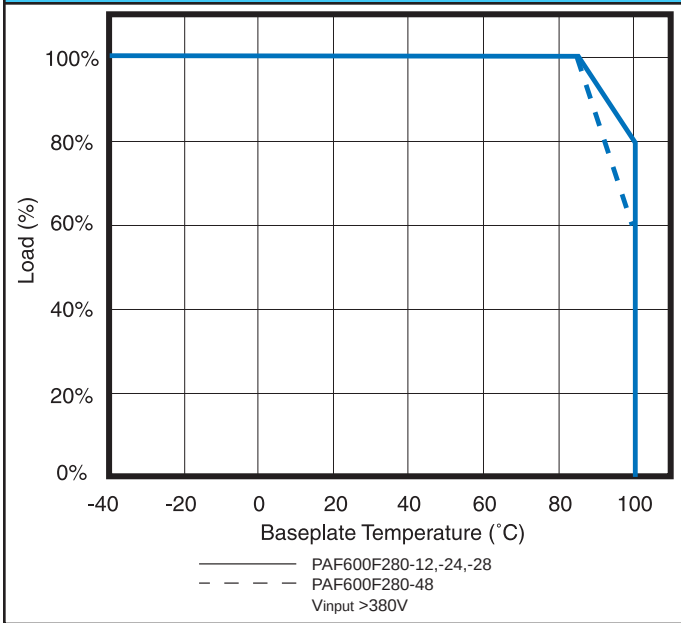
PAF	400-700W Full brick DC-DC
PAH350	350W Half Brick 24 & 48V Input
PH-F	Full function 200-400V Input DC-DC
PH-S	Simple function 200-400V Input DC-DC
PF	Power factor AC - 380VDC Front End
PFE	400-700W, AC-DC Power module

For Additional Information, please visit
www.lambdapower.com/products/paf400-series.htm

Derating Curve PAF450F280



Derating Curve PAF600F280



Options

Suffix	Description
Blank	M3 tapped mounting inserts (4)
/T	3.3mm non-threaded inserts (4)

Heatsink Table

Heatsink	Size (mm)	Thermal Resistance
HAF-10L	116.8 x 25.4 x 61	2.2°C/W
HAF-15L	116.8 x 38.1 x 61	1.9°C/W
HAF-15T	116.8 x 38.1 x 61	1.5°C/W

PAF700F Series

48V Input Full brick DC-DC Converters

- 12V output for driving non-isolated converters
- Safety Approved
- Full power at 85°C baseplate, operation to 100°C
- Opto Isolated Remote On / Off
- Wide Adjustable Output Range

RoHS

Key Market Segments & Applications

Central Office:	ATM, Sonet, DSL, ISDN, Frame Relay
Broadband:	Switching Equipment, Routers
Wireless/Cellular:	Micro Cells (larger in size/10 sq. mi.) Pico Cells (smaller in size/1 to 2 sq. mi.)
Remote Electronics:	Fixed Local Loop, Fiber Optic Transmission, Microwave Transmission, Wireless Local Loop
Base Station Power Amplifiers	

PAF Features and Benefits

Feature	Benefit
◆ Wide Adjustment Range	◆ Reduces need for custom modules
◆ Parallel Pin	◆ Modules can be connected together for higher current
◆ ASIC Design	◆ Reduced component count, increased MTBF

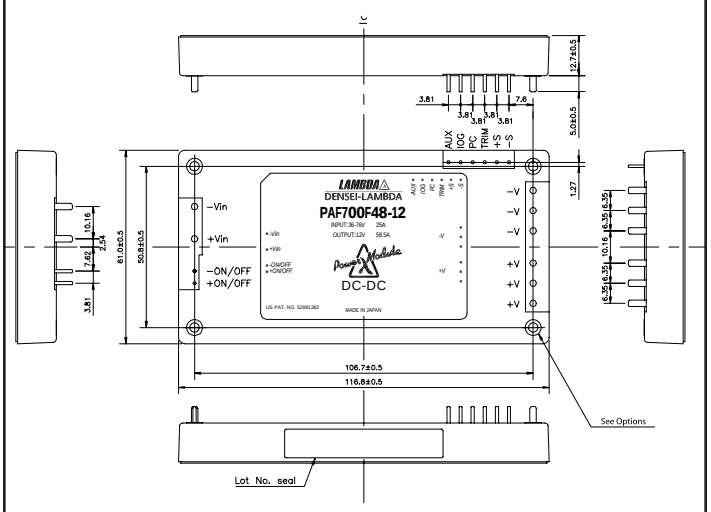
Specifications

ITEMS / MODEL		PAF700F48-12	PAF700F48-28
Nominal Output Voltage	VDC	12	28
Output Current (Max)	A	58.5	25
Output Power (Max)	W	702	700
Efficiency (Typ)	%	90 to 91%	
Input Voltage Range	VDC	36-76	
Input Current (Typ)	A	16.5	16.4
Output Voltage Accuracy	%	±1	
Output Voltage Adjustment	VDC	7.2 - 13.8	16.8 - 32.2
Ripple & Noise (Max)	mV	200	280
Line Regulation (Max)	mV	24	56
Load Regulation (Max)	mV	24	56
Temperature Coefficient	-	0.02%/°C	
Overcurrent Protection	%	105 - 140%	
Overvoltage Protection	%	120 - 135%	
Signals & Control	-	Remote sense, remote On/Off, Parallel Pin, DC Good, 7-10V Auxiliary voltage	
Operating Temperature	-	-40°C to +100°C baseplate	
Humidity (operating)	-	20-95% RH Non condensing	
Humidity (storage)	-	10-95% RH Non condensing	
Cooling	-	Conduction (See Installation Manual for heatsink selection)	
Isolation Voltage	VDC	Input - Baseplate 1500V, Input - Output 1500V, Output-Baseplate 500V (for 1 min.)	
Shock	-	196.1m/s^2	
Vibration	-	Non Operating, 10-55Hz (sweep for 1 min.)	
		Amplitude 0.825mm constant (Max 49 m/s^2) X,Y,Z 1 hour each	
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, CE LVD	
Weight (Typ)	g	200	
Size (WxHxD)	in(mm)	2.4 x 0.5 x 4.6 (61 x 12.7 x 116.8) See outline drawing	
Warranty	-	2 years	

Note: See Installation Manual for full details, test methods of parameters and application notes.

PAF700F Series

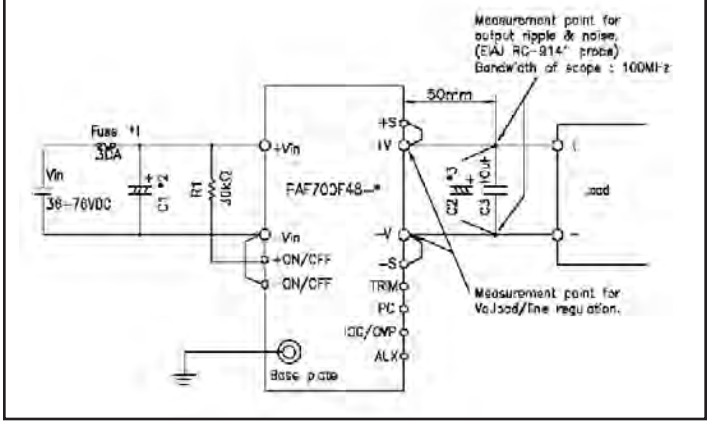
PAF Outline Drawing



Other Lambda DC-DC Products

PAF	Full Brick 400-700W DC-DC
PAH	Half brick DC-DC
PAQ	Quarter brick DC-DC
PX	10-40W, 12-48V DC-DC

Connection Example



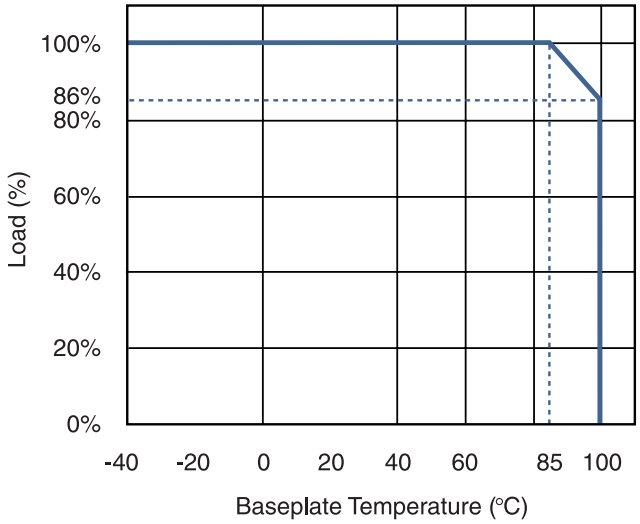
Heatsink Table

Heatsink	Size (mm)	Thermal Resistance
HAF-10L	116.8 x 25.4 x 61	2.2°C/W
HAF-15L	116.8 x 38.1 x 61	1.9°C/W
HAF-15T	116.8 x 38.1 x 61	1.5°C/W

Pinout

PIN	Description	Function
	-Vin	Negative Input Terminal
	+Vin	Positive Input Terminal
	- ON/OFF	Remote On/Off Negative Terminal
	+ON/OFF	Remote On/Off Positive Terminal
	+V	Positive Output Terminal
	-V	Negative Output Terminal
	AUX	7-10V Aux Voltage
	IOG	DC Good
	PC	Parallel Control Connection
	TRIM	Output Adjustment Trim Pin
	+S	Positive Remote Sense
	-S	Negative Remote Sense

Derating Curve



Options

Suffix	Description
Blank	M3 tapped inserts (4)
/T	3.3mm non-threaded inserts (4)

For Additional Information, please visit
www.lambdapower.com/products/paf700-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A3: Oct 2007

PAH Series

50W to 200W 48V Input Half brick DC-DC Converters

- Industry Standard Footprint & Pinouts
- 12V output for driving non-isolated converters
- Safety Approved
- Full power at 100°C baseplate
- Wide Adjustable Output Range

RoHS

Key Market Segments & Applications

Central Office:	ATM, Sonet, DSL, ISDN, Frame relay
Broadband:	Switching Equipment, Routers
Wireless/Cellular:	Micro Cells (larger in size/10 sq. mi.) Pico Cells (smaller in size/1 to 2 sq. mi.)
Remote Electronics:	Fixed Local Loop, Fiber Optic Transmission, Microwave Transmission, Wireless Local Loop
Customer Premise:	PBX, PABX, Datacomm, Voice Systems, Video Conferencing

PAH Features and Benefits

Feature	Benefit
◆ Wide adjustment range	◆ Reduces need for custom modules
◆ Zero Pre-load	◆ Eliminates heat dissipation in system
◆ ASIC Design	◆ Reduced component count, increased MTBF
◆ No potting materials	◆ Lower weight

Specifications

ITEMS \ MODELS		2.5V	3.3V	5V	12V	15V	24V	28V	48V
Efficiency (Typ)	%	75-76	79-80	83-84	85-86		86-88		88
Input Voltage range	VDC	36-76							
Output Voltage Accuracy	%	±1.6							
Max Ripple & Noise	mV	150			200		280		250
Max Line Regulation	mV	10			24	30	48	56	96
Max Load Regulation	mV	10			24	30	48	56	96
Overcurrent Protection	A	105 - 150% automatic recovery							
Overvoltage Protection (1)	%	120-160	120-140	125-145					135-155
Remote Sense	-	Yes							
Remote On/Off	-	Standard; Low = ON, Open = OFF /P option; Low = OFF, Open = ON)							
Operating Temperature	-	-40°C to +100°C baseplate							
Overtemperature	-	Shutdown between 105 - 130°C, Auto restart							
Cooling	-	Conduction (See Installation Manual for heatsink selection)							
Isolation Voltage	V	Input - Baseplate 1500VAC, Input - Output 1500VAC, Output-Baseplate 500VDC							
Shock	-	196.1m/s^2							
Vibration	-	Non Operating, 10-55Hz (sweep for 1 min.)							
Amplitude	-	0.825mm constant (Max 49 m/s^2) X,Y,Z 1 hour each							
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, CE LVD							
Weight (Typ)	g	80							
Size (WxHxD)	in(mm)	2.28x0.5x2.4 (57.9x12.7x61) See outline drawing							
Warranty	-	2 Years							

(1) See options table.
General: See Installation Manual for full details, test methods of parameters and application notes

PAH Series

Model Selector

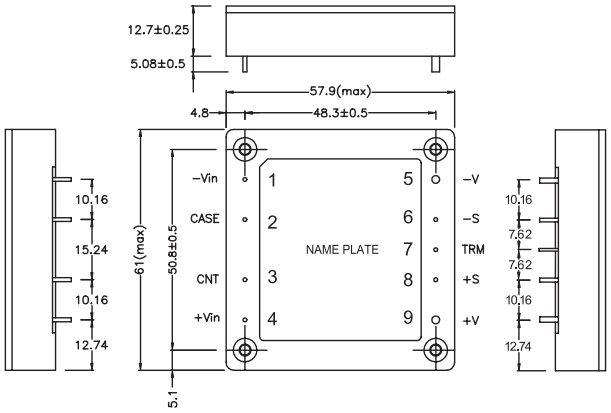
Model Name	Output Voltage	Adjustment	Output Current	Maximum Power
PAH50S48-2.5	2.5	2.25 - 2.75	11.70	29.3
PAH75S48-2.5	2.5	2.25 - 2.75	17.50	43.8
PAH100S48-2.5	2.5	2.25 - 2.75	23.40	58.5
PAH150S48-2.5	2.5	2.25 - 2.75	35.00	87.5
PAH50S48-3.3	3.3	2.97 - 3.63	11.70	38.6
PAH75S48-3.3	3.3	2.97 - 3.63	17.50	57.8
PAH100S48-3.3	3.3	2.97 - 3.63	23.40	77.2
PAH150S48-3.3	3.3	2.97 - 3.63	35.00	115.5
PAH50S48-5	5.0	3.0 - 5.75	10.00	50.0
PAH75S48-5	5.0	3.0 - 5.75	15.00	75.0
PAH100S48-5	5.0	3.0 - 5.75	20.00	100.0
PAH150S48-5	5.0	3.0 - 5.75	30.00	150.0
PAH50S48-12	12.0	7.2 - 13.2	4.20	50.4
PAH75S48-12	12.0	7.2 - 13.2	6.30	75.6
PAH100S48-12	12.0	7.2 - 13.2	8.40	100.8
PAH150S48-12	12.0	7.2 - 13.2	12.50	150.0
PAH200S48-12	12.0	7.2 - 13.2	16.70	200.4
PAH50S48-15	15.0	9.0 - 16.5	3.40	51.0
PAH75S48-15	15.0	9.0 - 16.5	5.00	75.0
PAH100S48-15	15.0	9.0 - 16.5	6.70	100.5
PAH150S48-15	15.0	9.0 - 16.5	10.00	150.0
PAH200S48-15	15.0	9.0 - 16.5	13.40	201.0
PAH50S48-24	24.0	14.4 - 26.4	2.10	50.4
PAH75S48-24	24.0	14.4 - 26.4	3.20	76.8
PAH100S48-24	24.0	14.4 - 26.4	4.20	100.8
PAH150S48-24	24.0	14.4 - 26.4	6.30	151.2
PAH200S48-24	24.0	14.4 - 26.4	8.40	201.6
PAH50S48-28	28.0	16.8 - 30.8	1.80	50.4
PAH75S48-28	28.0	16.8 - 30.8	2.70	75.6
PAH100S48-28	28.0	16.8 - 30.8	3.60	100.8
PAH150S48-28	28.0	16.8 - 30.8	5.40	151.2
PAH200S48-28	28.0	16.8 - 30.8	7.20	201.6
PAH150S48-48	48.0	38.4 - 57.6	3.20	153.6

Options

Suffix	ON/OFF Control	Overvoltage
-	Negative	Manual Reset
/P	Positive	Manual Reset
/V*	Negative	Auto Reset
/PV	Positive	Auto Reset

* Standard US Stock Item.

Outline Drawing



Pinout

Pin Description	Function
-Vin	Negative Input Terminal
+Vin	Positive Input Terminal
Case	Baseplate Terminal
CNT	On / Off Control terminal
+V	Positive Output Terminal
-V	Negative Output Terminal
TRIM	Output adjustment Trim pin
+S	Positive Remote sense
-S	Negative Remote sense

Other Lambda DC-DC Products

PAF	400-700W Full Brick DC-DC
PAH75D	Dual output Half Bricks
PAH200H	High Efficiency Half Brick
PAQ	Quarter brick DC-DC
CC-E	1.5 to 25W, 5-48V Input DC-DC
PX	10-40W, 12-48VDC Input DC-DC converters

For Additional Information, please visit
www.lambdapower.com/products/pah-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A4: Dec 2006

LAMBDA PAH300-450 Series

300W to 450W Half Brick Converters

- Standard Half Brick Footprint
- 18-36 or 36-76VDC Inputs
- 12V 29A - 48V 9.4A Nominal Outputs
- Through Hole Mounting
- Low 12.7mm Profile

RoHS

Key Market Segments & Applications

Base Station Power Amplifiers
Bus converters for Distributed Power Architectures

PAH Features and Benefits

Feature	Benefit
◆ High operating efficiencies (up to 92%)	◆ Reduced system heating, smaller size
◆ Constant switching frequency	◆ Easier system filtering
◆ Baseplate cooling	◆ Allows improved thermal management with optional heatsink

Specifications

ITEM / MODELS		PAH300S, 350S, 450S (see model selector)		
Nominal Output Voltage	VDC	12V	28V	48V
Input Voltage range	VDC	18-36 or 36-76		
Input Current (Max)	A	6.8-17.4A (model dependant)		
Output Voltage Adjustment	VDC	7.2 - 13.2	16.8 - 33	28.8 - 57.6 (5)
Ripple & Noise (max) (pk to pk)	mV	200	280(1)	480
Line Regulation (max)	mV	24	56	96
Load Regulation (max)	mV	24	56	96
Overload Protection	%	105 - 140%, constant current with auto recovery		
Overvoltage Protection (3)	%	115-135%	125-140%(2)	125-145% (6)
Remote Sense	-	Yes		
Remote On / Off (See options)	-	Standard; Low = ON, Open = OFF /P option; Low = OFF, Open = ON		
Temperature (operating)	°C	-40°C to +100°C baseplate, full power(4)		
Temperature (storage)	°C	-40°C to +100°C		
Temperature Coefficient	-	0.02%/°C		
Humidity (operating)	-	5-95% RH Non condensing		
Humidity (storage)	-	5-95% RH Non condensing		
Cooling	-	Conduction (See Installation Manual for heatsink selection)		
Isolation Voltage	VDC	1500VDC Input to output & baseplate, 500VDC Output to baseplate		
Vibration	-	Non Operating, 10-55Hz (sweep for 1 min.)		
Amplitude	-	0.825mm constant (Max 49 m/s^2) X,Y,Z 1 hour each		
Shock	-	196.1m/s^2		
Safety Agency Approvals	-	UL60950-1, CSA60950-1, EN60950-1, CE LVD (48V input models only)		
Weight (Typ)	g	110		
Size (WxHxD)	in(mm)	2.4x0.5x2.28 (61x12.7x57.9) See outline drawing		
Warranty	yrs	2 Years		

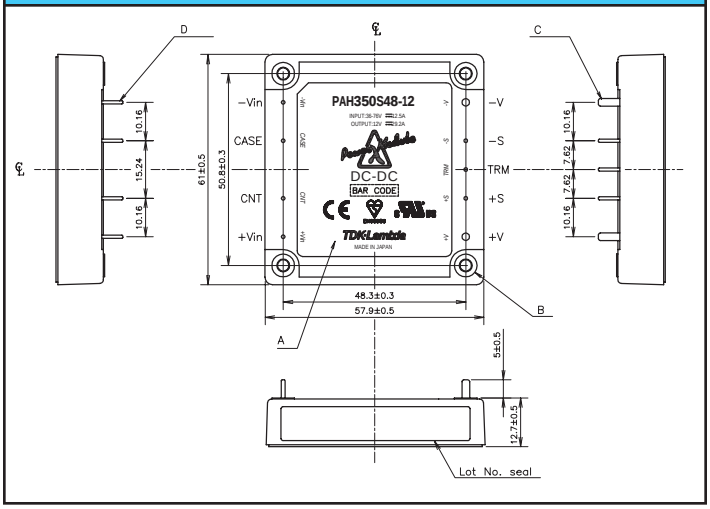
Note: See Installation Manual for full details, test methods of parameters and application notes
(1) 240mV for PAH300
(2) 125-145% for PAH450S48-28
(3) Manual reset
(4) PAH350S24-28 & -48: derate linearly to 85% load from 90°C to 100°C
(5) 28.8-52.8 PAH350S28-48
(6) 115-140% PAH350S28-48

LAMBDA PAH300-450 Series

Model Selector

Model	Input Voltage (V)	Output Voltage (V)	Max. Curr. (A)	Max. Output Power (W)	Efficiency Typ. (%)
PAH300S24-12	18 - 36	12	25	300	87
PAH300S48-12	36 - 76	12	25	300	90
PAH350S48-12	36 - 76	12	29.2	350	89
PAH300S24-28	18 - 36	28	11	308	88
PAH350S24-28	18 - 36	28	12.5	350	88
PAH350S24-48	18 - 36	48	7.3	350	87
PAH300S48-28	36 - 76	28	11	308	90
PAH350S48-28	36 - 76	28	12.5	350	89
PAH450S48-28	36 - 76	28	16	448	92
PAH450S48-48	36 - 76	48	9.4	451	92

Outline Drawing



For Additional Information, please visit
www.lambdapower.com/products/pah300-series.htm

Pinout

Pin Description	Function
-Vin	Negative Input Terminal
+Vin	Positive Input Terminal
CNT	On / Off Control terminal
+V	Positive Output Terminal
-V	Negative Output Terminal
TRIM	Output adjustment Trim pin
+S	Positive Remote sense
-S	Negative Remote sense

Options

Suffix	Description
-	M3 Tapped inserts for mounting
/T	M3 clearance inserts for mounting
/P	Positive logic remote On/Off (Not on PAH450S)

Other Lambda DC-DC Products

PAF	400-700W Full brick DC-DC
PAH	Other half brick DC-DC converters
PAQ	Quarter brick DC-DC converters
PAE	Eighth brick DC-DC converters
PX	10-48W, 12-48V DC-DC
iA,iB	Non isolated DC-DC

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4
Revision A2: Dec 2007

PH-F Series

Full function, 50 to 300W DC-DC converters

RoHS

- High Density
- Wide Range Input
- Wide output adjustment capability
- Remote On/Off
- Fixed Switching Frequency
- International Safety Approvals
- Parallel Operation

Key Market Segments & Applications

Telecom
Custom Power Supplies
N+1 redundant systems
Scalable systems
Point of Load

PH Features and Benefits

Feature	Benefit
◆ Low component count	◆ High reliability demonstrated 5 million hours MTBF
◆ Wide output adjustment	◆ Avoids the need for custom modules
◆ Signals to support N+1 redundancy	◆ Ease of use in redundant configurations
◆ Variety of input voltages	◆ Systems can operate from different input voltages

Specifications

ITEMS		2V	3.3V	5V	12V	15V	24V	28V
Input range	VDC	24V nom: 18-36, 48V nom: 36-76V, 110V nom: 82-185V, 280V nom: 200-400V						
Output Voltage Adj. Range	VDC	1.6~2.4	2.64~3.96	2~6	4.8~14.4	6~18	9.6~28.8	11.2~33.6
Line Regulation	-	0.4% or 20mV (whichever is greater) over entire input range with constant load						
Load Regulation	-	0.8% or 40mV (whichever is greater) from no load to full load with constant input line						
Ripple and Noise	pk-pk	100mV			150mV		240mV	280mV
Series Operation	-	Possible - Refer to installation manual						
Over Voltage Protection	-	150 - 180%		125 - 145%				
Overload Protection	-	Approximately 105 - 140%, automatic recovery						
Remote On/Off	-	Low = ON, Open = OFF						
Remote Sensing	-	Yes						
Parallel operation	-	Using current share pin (PC). Will share within 5%, see app. notes for connection details						
Inverter Good signal	-	Signal available for status of inverter						
Auxiliary Bias Supply	-	8V 10mA auxiliary voltage to supply power to interface circuits (AUX pin)						
Thermal Protection	-	Internal sensing, self resetting						
Cooling	-	Conduction or forced air. See application notes for cooling and heatsink selection						
Operating Temperature Range	-	Baseplate temperature -20°C to +85°C. -40°C start up possible - consult factory						
Storage Temperature	-	-40°C to +85°C						
Temperature Coefficient	-	0.02%/°C						
Isolation	-	Input to output: 3000VAC, Input to Baseplate: 2500VAC(1)						
Isolation Resistance	-	Output to Baseplate -100MOhm at 500VDC and 70%RH						
Safety Agency Approval	-	UL60950-1, CSA60950-1, EN60950-1 and CE Mark.						
Warranty	-	Two years						

Note: See Installation Manual for full details, test methods of parameters and application notes
(1) 24V input models input to output: 2kVAC; input to baseplate: 2kVAC

PH-F Series

Model Selector

Nominal Output Voltage (V)	Output Current (A)	Output Power (W)	24V input	48V input	110V input	280V input
2.0	15.0	30	-	PH75F48-2	PH75F110-2	PH75F280-2
2.0	20.0	40	PH100F24-2	-	-	-
2.0	30.0	60	-	PH150F48-2	PH150F110-2	PH150F280-2
2.0	60.0	120	-	PH300F48-2	PH300F110-2	PH300F280-2
3.3	15.0	45	-	PH75F48-3	PH75F110-3	PH75F280-3
3.3	20.0	60	PH100F24-3	-	-	-
3.3	30.0	90	-	PH150F48-3	PH150F110-3	PH150F280-3
3.3	60.0	180	-	PH300F48-3	PH300F110-3	PH300F280-3
5.0	15.0	75	-	PH75F48-5	PH75F110-5	PH75F280-5
5.0	20.0	100	PH100F24-5	-	-	-
5.0	30.0	150	-	PH150F48-5	PH150F110-5	PH150F280-5
5.0	60.0	300	-	PH300F48-5	PH300F110-5	PH300F280-5
12.0	6.3	75	-	PH75F48-12	PH75F110-12	PH75F280-12
12.0	8.4	100	PH100F24-12	-	-	-
12.0	12.5	150	-	PH150F48-12	PH150F110-12	PH150F280-12
12.0	20.0	240	PH300F24-12	-	-	-
12.0	25.0	300	-	PH300F48-12	PH300F110-12	PH300F280-12
15.0	5.0	75	-	PH75F48-15	PH75F110-15	PH75F280-15
15.0	6.7	100	PH100F24-15	-	-	-
15.0	10.0	150	-	PH150F48-15	PH150F110-15	PH150F280-15
15.0	20.0	300	-	PH300F48-15	PH300F110-15	PH300F280-15
24.0	3.2	75	-	PH75F48-24	PH75F110-24	PH75F280-24
24.0	4.2	100	PH100F24-24	-	-	-
24.0	6.3	150	-	PH150F48-24	PH150F110-24	PH150F280-24
24.0	12.6	300		PH300F48-24	PH300F110-24	PH300F280-24
28.0	2.7	50	-	PH75F48-28	PH75F110-28	PH75F280-28
28.0	3.6	100	PH100F24-28	-	-	-
28.0	5.4	150	-	PH150F48-28	PH150F110-28	PH150F280-28
28.0	10.8	300	PH300F24-28	PH300F48-28	PH300F110-28	PH300F280-28

Pinout

Pin Description	Function
-Vin	Negative Input Terminal
+Vin	Positive Input Terminal
+S	Positive Remote sense
-S	Negative Remote sense
+V	Positive Output Terminal
-V	Negative Output Terminal
AUX	Bias voltage output (secondary reference)
IOG	DC Good
TRIM	Output adjustment trim pin
CNT	On/Off Control Terminal
SG	Signal (CNT RTN)
PC	Parallel control connection

Other Lambda DC-DC Products

PH Simple Func.	50 - 300W, lower cost version of PH
PAQ, PAH, PAF	50 - 700W quarter, half & full bricks
PX	10-40W, 12-48V input, DC-DC
CC-E	1.5-25W, 5-48V input, DC-DC

For Additional Information, please visit
www.lambdapower.com/products/ph-series-ff.htm

PH-S Series

Simple function, 50 to 600W DC-DC converters

- High Density
- Wide Range Input
- Output adjustment Capability
- Remote On/Off
- Fixed Switching Frequency
- International Safety Approvals

RoHS

Key Market Segments & Applications

Telecom
Custom Power Supplies
Point of Load

PH Features and Benefits

Feature	Benefit
◆ High density	◆ Smaller package size
◆ Low component count	◆ High reliability Demonstrated 5 million hours MTBF
◆ Fixed operating frequency	◆ Easier system filtering
◆ Variety of input voltages	◆ Systems can operate from different input voltages

Specifications

ITEMS		3.3V	5V	12V	15V	24V	28V	48V
Input range	VDC	24V nom: 18-36, 48V nom: 36-76V, 110V nom: 82-185V, 280V nom: 200-400V						
Output Voltage Adj. Range	VDC	2.97~3.63	4.5~5.5	10.8~13.2	13.5~16.5	21.6~26.4	25.2~30.8	43.2~52.8
Line Regulation		0.4% or 20mV (whichever is greater) over entire input range with constant load						
Load Regulation		0.8% or 40mV (whichever is greater) from no load to full load with constant input line						
Ripple and Noise	pk-pk	100mV		150mV		240mV	280mV	480mV
Series Operation	-	Possible - Refer to installation manual						
Over Voltage Protection	-	150 - 180%	125 - 145%					
Overload Protection	-	Approximately 105 - 140%, automatic recovery						
Remote On/Off	-	Low = ON, Open = OFF						
Remote Sensing	-	PH100S, PH150S, PH300S, PH600S models						
Parallel operation	-	PH300S & PH600S only: Requires external circuitry						
Inverter Good signal	-	PH300S & PH600S only: Signal available for status of inverter						
Thermal Protection	-	Internal sensing, self resetting						
Cooling	-	Conduction or forced air. See application notes for cooling and heatsink selection						
Operating Temperature Range	- -	Baseplate temperature -20°C to +85°C (100°C on PH300 & PH600). -40°C start up possible - consult factory						
Storage Temperature	-	-40°C to +85°C (+100°C on PH300 & PH600)						
Temperature Coefficient	-	0.02%/°C						
Isolation	-	Input to output: 3000VAC, Input to Baseplate: 2500VAC(1)						
Isolation Resistance	-	Output to Baseplate -100MOhm at 500VDC and 70%RH						
Safety Agency Approval	-	UL60950-1, CSA60950-1, EN60950-1 and CE Mark.						
Warranty	-	Two years						

Note: See Installation Manual for full details, test methods of parameters and application notes
(1) PH300S48 models: Input to output 1.5kVAC, input to baseplate 1.5kVAC

LAMBDA

PH-S Series

Model Selector

Nominal Output Voltage (V)	Output Current (A)	Output Power (W)	24V input	48V input	110V input	280V input
3.3	10.0	33.0	-	PH50S48-3.3	-	PH50S280-3.3
3.3	15.0	49.5	-	PH75S48-3.3	-	PH75S280-3.3
3.3	20.0	66.0	-	PH100S48-3.3	-	PH100S280-3.3
3.3	30.0	99.0	-	PH150S48-3.3	-	PH150S280-3.3
3.3	50.0	165.0	-	PH300S48-3.3	-	PH300S280-3.3
3.3	100.0	330.0	-	-	-	PH600S280-3.3
5.0	10.0	50.0	PH50S24-5	PH50S48-5	PH50S110-5	PH50S280-5
5.0	15.0	75.0	-	PH75S48-5	PH75S110-5	PH75S280-5
5.0	20.0	100.0	-	PH100S48-5	-	PH100S280-5
5.0	30.0	150.0	-	PH150S48-5	PH150S110-5	PH150S280-5
5.0	50.0	250.0	-	PH300S48-5	-	PH300S280-5
5.0	100.0	500.0	-	-	-	PH600S280-5
12.0	4.2	50.0	PH50S24-12	PH50S48-12	PH50S110-12	PH50S280-12
12.0	6.3	75.0	-	PH75S48-12	PH75S110-12	PH75S280-12
12.0	8.4	100.0	-	PH100S48-12	-	PH100S280-12
12.0	12.5	150.0	-	PH150S48-12	PH150S110-12	PH150S280-12
12.0	25.0	300.0	-	PH300S48-12	-	PH300S280-12
12.0	50.0	600.0	-	-	-	PH600S280-12
15.0	3.4	50.0	PH50S24-15	PH50S48-15	PH50S110-15	PH50S280-15
15.0	5.0	75.0	-	PH75S48-15	PH75110-15	PH75S280-15
15.0	6.7	100.0	-	PH100S48-15	-	PH100S280-15
15.0	10.0	150.0	-	PH150S48-15	PH150S110-15	PH150S280-15
15.0	20.0	300.0	-	PH300S48-15	-	PH300S280-15
15.0	40.0	600.0	-	-	-	PH600S280-15
24.0	2.1	50.0	PH50S24-24	PH50S48-24	PH50S110-24	PH50S280-24
24.0	3.2	75.0	-	PH75S48-24	PH75S110-24	PH75S280-24
24.0	4.2	100.0	-	PH100S48-24	-	PH100S280-24
24.0	6.3	150.0	-	PH150S48-24	PH150S110-24	PH150S280-24
24.0	12.5	300.0	-	PH300S48-24	-	PH300S280-24
24.0	25.0	600.0	-	-	-	PH600S280-24
28.0	1.8	50.0	PH50S24-28	PH50S48-28	PH50S110-28	PH50S280-28
28.0	2.7	75.0	-	PH75S48-28	PH75S110-28	PH75S280-28
28.0	3.6	100.0	-	PH100S48-28	-	PH100S280-28
28.0	5.4	150.0	-	PH150S48-28	PH150S110-28	PH150S280-28
28.0	10.8	302.0	-	PH300S48-28	-	PH300S280-28
28.0	21.5	602.0	-	-	-	PH600S280-28
48.0	6.3	302.0	-	PH300S48-48	-	PH300S280-48
48.0	12.5	600.0	-	-	-	PH600S280-48

Pinout

Pin Description	Function
-Vin	Negative Input Terminal
+Vin	Positive Input Terminal
+S	Positive Remote sense
-S	Negative Remote sense
+V	Positive Output Terminal
-V	Negative Output Terminal
IOG	Inverter Good Signal
TRIM	Output adjustment trim pin
CNT	On/Off Control Terminal
CS	Current Monitor Signal

Other Lambda DC-DC Products

PH Full Function	50 - 300W, full function versions of PH
PAQ, PAH, PAF	50 - 700W quarter, half & full bricks
PX	10-40W, 12-48V input, DC-DC
CC-E	1.5-25W, 5-48V input, DC-DC

For Additional Information, please visit
www.lambdapower.com/products/ph-series-sf.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A7: Feb 2007

PXD Series

Single and Dual Output 10 to 20W DC-DC Converters

- Industry Standard 2" x 1" Footprint
- Six Sided Shielding
- Agency Approved
- 12V, 24V and 48V Inputs

RoHS

Key Market Segments & Applications

Telecom, Datacom, Point of Load

Features & Benefits

Feature	Benefit
◆ UL, CSA, EN, CE approvals	◆ Easier system approvals
◆ Wide range input	◆ Less parts to inventory
◆ Six sided shielding	◆ Reduced radiated noise

Specifications

ITEMS		PXD10	PXD15	PXD20
Max Output Power		10W	15W	20W
Voltage Accuracy		±2%	±1%	±1%
Voltage Adjustment (Single Output Only)		None	None	±10%
Minimum Load, each output	(1)	10%	10%	Single 0%; Dual 10%
Line Regulation		±1%	±1%	±0.2%
Load Regulation (10% to 100%)		Single Output: ±1% Dual Output: ±2%	Single Output: ±1% Dual Output: ±2%	±0.5%
Cross Regulation (25% to 100%)			±5%	
Ripple and Noise		Single 50mV, Dual 75mV		Single 75mV, Dual 100mV
Start up time		20ms		10ms
Remote on/off	(3)	Positive Logic: ON: Open or 3.5-12V, OFF Short or <1.2V Negative Logic: ON: Short or <1.2V, OFF: Open or 3.5-12V		
Temperature Coefficient		<±0.02%/°C		
Operating Temperature		See derating curves		
Maximum Case Temperature		100°C		
Storage Temperature		-55 to 105°C		
Thermal Shock		MIL-STD-810D		
Relative Humidity		5 to 95% (non condensing)		
Transient Response (25% step load chg.)		500us recovery	500us recovery	300us recovery
Overvoltage Protection (Zener clamp)		1.5-3.3V: 3.9V, 5V: 6.2V, 12V: 15V, 15V: 18V		
Overcurrent & Short Circuit Protection		Typically at 150%, hiccup with self recovery		
Input Surge Voltage (Max. for 100ms)		12V input: 36V, 24V input: 50V, 48V input: 100V		
Reflected input ripple (peak to peak)	(2)	30mA	20mA	20mA
Isolation Voltage		1600VDC minimum		
Isolation Resistance		10^9 Ohms minimum		
Isolation Capacitance (max)		300pF		1000pF
Typical Switching Frequency (Fixed)		300kHz	Single: 500kHz Dual: 300kHz	500kHz
MTBF (BELLCORE TR-NWT-000332)		1,976,000 hours	2,041,000 hours	1,791,000 hours
Vibration		10 - 55Hz, 2G, 30 minutes each X, Y, Z axis		
Conducted and Radiated Emissions		EN55022 Level A		
Immunity		EN61000-4-2, -3, -4, -5, -6 Pref Criteria 2		
Safety Agency Approval		IEC60950-1, UL60950-1, EN60950-1, CE Mark (48V input only)		
Size (L x W x H)		2x1x0.4"		
Weight		0.95 oz (27g)		
Warranty		One Year		

Notes:
(1) To meet regulation & noise specifications. Operation at zero load will not damage the device
(2) 12uH source impedance in series with + input
(3) Positive logic standard on 20W (see options table). Input current 2.5mA

* See website for detailed specifications

PXD Series

Model Selector

Output Volt (V)	Output Curr (A)	Output Power (W)	Input Volt (V)	Model	Eff.(%)
3.3	2.0	6.6	9 - 18VDC	PXD10-12S3P3	80
3.3	2.0	6.6	18 - 36VDC	PXD10-24S3P3	80
3.3	2.0	6.6	36 - 75VDC	PXD10-48S3P3	79
3.3	5.0	16.5	9 - 18VDC	PXD20-12S3P3	84
3.3	5.0	16.5	18 - 36VDC	PXD20-24S3P3	86
3.3	5.0	16.5	36 - 75VDC	PXD20-48S3P3	87
5	2.0	10	9 - 36VDC	PXD10-24WS05	80
5	2.0	10	18 - 75VDC	PXD10-48WS05	80
5	4.0	20	9 - 18VDC	PXD20-12S05	87
5	4.0	20	18 - 36VDC	PXD20-24S05	89
5	4.0	20	36 - 75VDC	PXD20-48S05	89
12	0.83	10	9 - 36VDC	PXD10-24WS12	82
12	0.83	10	18 - 75VDC	PXD10-48WS12	84
12	1.67	20	9 - 18VDC	PXD20-12S12	85
12	1.67	20	18 - 36VDC	PXD20-24S12	87
12	1.67	20	36 - 75VDC	PXD20-48S12	88
15	0.67	10	9 - 36VDC	PXD10-24WS15	80
15	0.67	10	18 - 75VDC	PXD10-48WS15	84
15	1.33	20	9 - 18VDC	PXD20-12S15	85
15	1.33	20	18 - 36VDC	PXD20-24S15	87
15	1.33	20	36 - 75VDC	PXD20-48S15	87
Dual Outputs					
±5	±1.5	15	9 - 18VDC	PXD15-12D05	83
±5	±1.5	15	18 - 36VDC	PXD15-24D05	84
±5	±1.5	15	36 - 75VDC	PXD15-48D05	85
±12	±0.416	10	9 - 36VDC	PXD10-24WD12	80
±12	±0.416	10	18 - 75VDC	PXD10-48WD12	78
±12	±0.833	20	9 - 18VDC	PXD20-12D12	86
±12	±0.833	20	18 - 36VDC	PXD20-24D12	87
±12	±0.833	20	36 - 75VDC	PXD20-48D12	88
±15	±0.333	10	9 - 36VDC	PXD10-24WD15	80
±15	±0.333	10	18 - 75VDC	PXD10-48WD15	81
±15	±0.667	20	9 - 18VDC	PXD20-12D15	86
±15	±0.667	20	18 - 36VDC	PXD20-24D15	87
±15	±0.667	20	36 - 75VDC	PXD20-48D15	87

Pinout

PIN#	PXD10/PXD15 Single	PXD10/PXD15 Dual	PXD20 Single	PXD20 Dual
1	+Vin			
2	-Vin			
3	+Vout			
4	No Pin	Com	Trim	Com
5	-Vout			
6	Remote On/Off*		Remote On/Off	

* optional, see table below. If not requested, Pin is not fitted.

Remote On/Off Option

Suffix	Function	
-P*	Positive Logic	(* Included in PXD20 models)
-N	Negative Logic	

Example: PXD1548S12-N

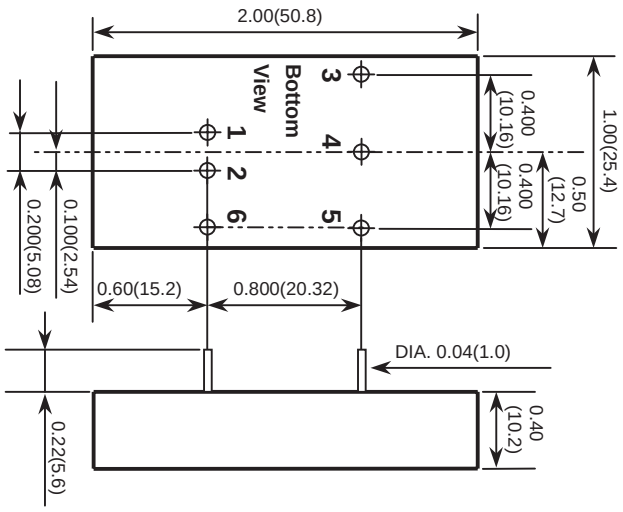
Heat Sink (0.22" high)

7G0020A (includes thermal adhesive pad)

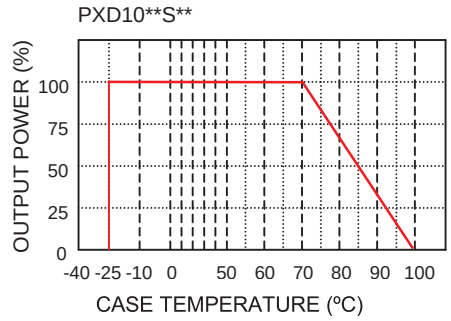
Other Lambda Industrial Products

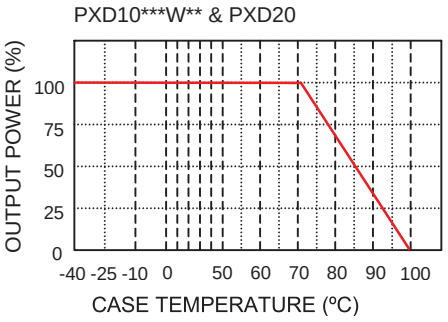
CC-E	1.5-25W, 5 to 48VDC input
PAQ,PAH,PAF	50-700W quarter, half & full bricks

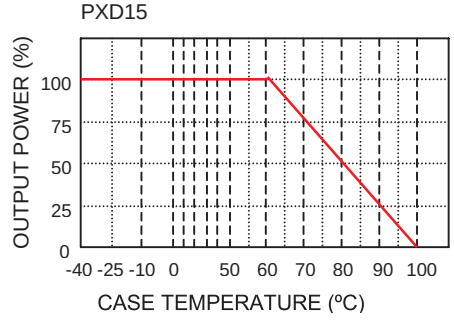
Outline Drawing



Derating Curves







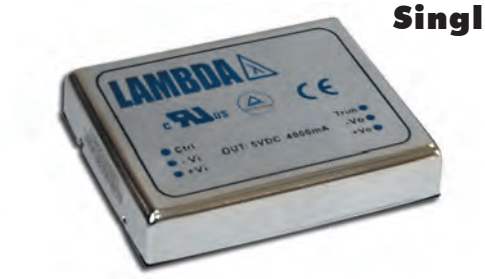
For Additional Information, please visit www.lambdapower.com/products/px-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A7: Sep 2007

PXE Series

Single and Dual Output 20W to 30W DC-DC Converters



- Industry Standard 2" x 1.6" Footprint
- Six Sided Shielding
- Agency Approved
- 12V, 24V and 48V Inputs

RoHS

Key Market Segments & Applications

Telecom, Datacom, Point of Load

Features & Benefits

Feature	Benefit
◆ UL, CSA, EN, CE approvals	◆ Easier system approvals
◆ Wide range input	◆ Less parts to inventory
◆ Six sided shielding	◆ Reduced radiated noise

Specifications

ITEMS		PXE20	PXE30
Max Output Power		20W	30W
Voltage Accuracy		±2%	±1%
Voltage Adjustment		±10%	
Minimum Load, each output	(1)	10%	10%
Line Regulation		±0.2% for single, ±0.5% for dual	
Load Regulation (25% to 100%)		Single ±0.5%, Dual ±3%	Single ±0.5%, Dual ±1%
Cross Regulation (25% to 100%)		Dual ±5%	
Ripple and Noise (P-P)		Single: 75mV; Dual: 100mV	
Start up time		20ms typ.	25ms typ.
Remote on/off	(3)	Positive Logic: ON: Open or 3.5-12V, OFF Short or <1.2V	
Temperature Coefficient		<±0.02%/°C	
Operating Temperature		-40 to +100°C, see derating curve	
Maximum Case Temperature		100°C (Over temperature protection at 115°C - PXE30 model)	
Storage Temperature		-55 to 105°C	
Thermal Shock		MIL-STD-810D	
Relative Humidity (non condensing)		5 to 95%	
Transient Response (25% step load change)		500us recovery	300us recovery
Overvoltage Protection (Zener clamp)		3.3V: 3.9V, 5V: 6.2V, 12V: 15V, 15V: 18V	
Overcurrent and Short Circuit Protection		Typically at 150%, hiccup with self recovery	
Input Surge Voltage (Maximum for 100ms)		12V input: 36V, 24V input: 50V, 48V input: 100V	
Reflected input ripple (peak to peak)	(2)	25mA	30mA
Isolation Voltage		1600VDC minimum (Input-Output, Input-Case)	
Isolation Resistance		10^9 Ohms minimum	
Isolation Capacitance (max)		300pF	1000pF
Typical Switching Frequency (Fixed)		300kHz	
MTBF (BELLCORE TR-NWT-000332)		1,976,000 hours	1,535,000 hours
Vibration		10 - 55Hz, 2G, 30 minutes each X, Y, Z axis	
Conducted and Radiated Emissions		EN55022 Level A	
Immunity		EN61000-4-2, -3, -4, -5, -6 Pref Criteria 2	
Safety Agency Approval		IEC60950-1, UL60950-1, EN60950-1, CE Mark (48V input only)	
Size (L x W x H)		2 x 1.6 x 0.4"	
Weight		1.69 oz (48g)	
Warranty		One Year	

Notes:
(1) To meet regulation & noise specifications. Operation at zero load will not damage the device
(2) 12uH source impedance in series with + input
(3) Max sink current 20mA (PXE20), 2.5mA (PXE30); The on/off pin is referenced to the negative input

PXE Series

Model Selector

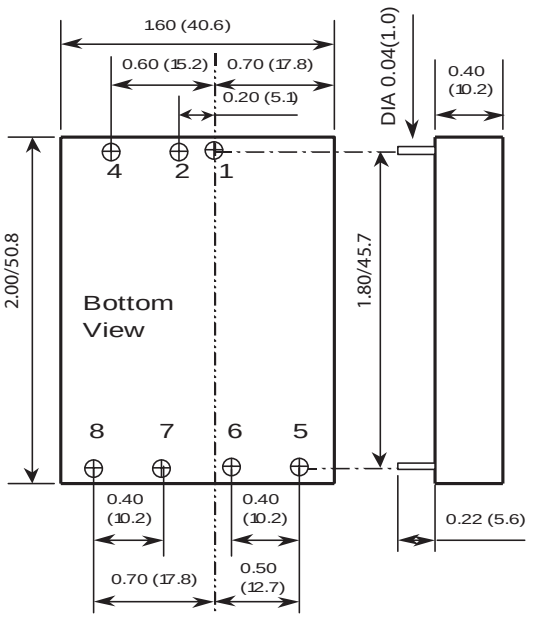
Output Volt (V)	Output Curr (A)	Output Power (W)	Input Volt (VDC)	Model	Eff.(%)
Single Outputs					
3.3	6.0	18	9 - 18	PXE30-12S3P3	85
3.3	6.0	20	10 - 40	PXE30-24WS3P3	87
3.3	6.0	18	18 - 36	PXE30-24S3P3	86
3.3	6.0	20	18 - 75	PXE30-48WS3P3	87
3.3	6.0	18	36 - 75	PXE30-48S3P3	87
5	4.0	20	9 - 36	PXE20-24WS05	79
5	4.0	20	18 - 75	PXE20-48WS05	80
5	6.0	30	9 - 18	PXE30-12S05	87
5	6.0	30	10 - 40	PXE30-24WS05	87
5	6.0	30	18 - 36	PXE30-24S05	88
5	6.0	30	18 - 75	PXE30-48WS05	88
5	6.0	30	36 - 75	PXE30-48S05	89
12	1.67	20	9 - 36	PXE20-24WS12	81
12	1.67	20	18 - 75	PXE20-48WS12	81
12	2.5	30	9 - 18	PXE30-12S12	88
12	2.5	30	10 -40	PXE30-24WS12	87
12	2.5	30	18 - 36	PXE30-24S12	89
12	2.5	30	18 - 75	PXE30-48WS12	87
12	2.5	30	36 - 75	PXE30-48S12	90
15	1.33	20	9 - 36	PXE20-24WS15	81
15	1.33	20	18 - 75	PXE20-48WS15	81
15	2.0	30	9 - 18	PXE30-12S15	88
15	2.0	30	10 - 40	PXE30-24WS15	88
15	2.0	30	18 - 36	PXE30-24S15	89
15	2.0	30	18 - 75	PXE30-48WS15	88
15	2.0	30	36 - 75	PXE30-48S15	90
Dual Outputs					
±5	±2.0	20	9 - 36	PXE20-24WD05	79
±5	±2.0	20	18 - 75	PXE20-48WD05	79
±12	±0.833	20	9 - 36	PXE20-24WD12	81
±12	±0.833	20	18 - 75	PXE20-48WD12	83
±12	±1.25	30	9 - 18	PXE30-12D12	87
±12	±1.25	30	18 - 36	PXE30-24D12	88
±12	±1.25	30	36 - 75	PXE30-48D12	88
±15	±0.666	20	9 - 36	PXE20-24WD15	82
±15	±0.666	20	18 - 75	PXE20-48WD15	84
±15	±1.0	30	9 - 18	PXE30-12D15	87
±15	±1.0	30	18 - 36	PXE30-24D15	88
±15	±1.0	30	36 - 75	PXE30-48D15	88

Pinout

PIN #	Function: Single Output	Function: Dual Output
1	+ Input	+ Input
2	- Input	- Input
4	Remote on/off	Remote on/off
5	No Pin	+ Output
6	+ Output	Common
7	- Output	- Output
8	Trim	Trim

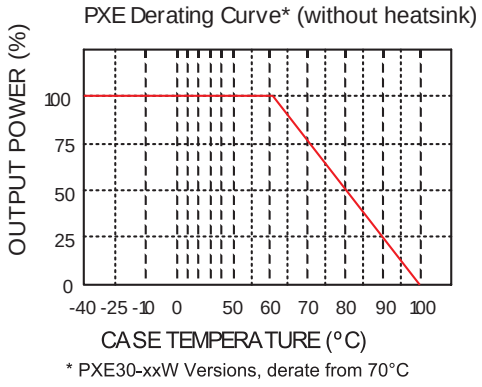
For Additional Information, please visit
www.lambdapower.com/products/px-series.htm

Outline Drawing



1. All dimensions in Inches (mm)
2. Pin pitch tolerance –0.014(0.35)

Derating Curve



* PXE30-xxW Versions, derate from 70°C

Heat Sink (0.22" high)

7G0011A (includes thermal adhesive pad)

Other Lambda Industrial Products

CC-E	1.5-25W, 5 to 48VDC input
PAQ, PAH, PAF	50 - 700W quarter, half & full bricks

PXF Series

Single, Dual, Triple Output 40W DC-DC Converters

- Industry Standard 2" x 2" Footprint
- Six Sided Shielding
- Agency Approved
- 12, 24V, and 48V Inputs

RoHS

Key Market Segments & Applications

Telecom, Datacom, Point of Load

Features & Benefits

Feature	Benefit
◆ UL, CSA, EN, CE approvals	◆ Easier system approvals
◆ Wide range input	◆ Less parts to inventory
◆ Six sided shielding	◆ Reduced radiated noise

Specifications

ITEMS	
Max Output Power	40W
Voltage Accuracy (Full Load, Nom. Vin)	Single, / Dual ±1%, Triple Main ±1%, Triple Auxiliary ±5%
Voltage Adjustment (Single Output Only) (1)	±10%
Minimum Load, each output (2)	Single Output 0%, Dual and Triple 10% of full load
Line Regulation	Single / Dual ±0.5%, Triple (main) ±1%, Triple (auxiliary) ±5%
Load Regulation (10% to 100%) (3)	Single ±0.5%, Dual ±1%, Triple (main) ±2%, Triple (auxiliary) ±5%
Cross Regulation (25% to 100%) (4)	Triple (main) ±1%, Dual/Triple (auxiliary) ±5%
Start up time	25ms typ.
Remote on/off (referenced to negative input)	Positive Logic: ON: Open or 3.0-12V, OFF Short or <1.2V
Temperature Coefficient	<±0.02%/°C
Operating Temperature	See derating curves
Maximum Case Temperature	100°C
Storage Temperature	-55 to 105°C
Thermal Shock	MIL-STD-810D
Relative Humidity (non condensing)	5 to 95%
Transient Response (25% step load change)	300us recovery
Overvoltage Protection (Zener clamp)	3.3V: 3.9V, 5V: 6.2V, 12V: 15V, 15V: 18V, 24V: 30V
Overcurrent and Short Circuit Protection	Typically at 150%, hiccup with self recovery
Input Surge Voltage (Maximum for 100ms)	12V input: 36V, 24V input: 50V, 48V input: 100V
Reflected input ripple (peak to peak) (6)	40mA
Isolation Voltage	1600VDC minimum
Isolation Resistance	10^9 Ohms minimum
Isolation Capacitance (max)	1000pF
Switching Frequency (Fixed)	300kHz (typ.)
MTBF (BELLCORE TR-NWT-000332)	1,398,000 hours
Vibration	10 - 55Hz, 2G, 30 minutes each X, Y, Z axis
Conducted and Radiated Emissions	EN55022 Level A
Immunity	EN61000-4-2, -3, -4, -5, -6 Pref Criteria 2
Safety Agency Approval	IEC60950-1, UL60950-1, EN60950-1, CE Mark (48V input only)
Size (L x W x H)	2 x 2 x 0.4"
Weight	2.11 oz (60g)
Warranty	One Year

(1) Maximum output deviation is 10% inclusive of remote sense and trim. If remote sense is not being used, the +Sense and - Sense should be connected to their corresponding outputs; + output, -output.
(2) Dual and Triple output models require a minimum load of 10% on the output to maintain specified regulation. No load operation will not damage the device.
(3) Load regulation for triple output: Main output:10-100%, with 10-100% balanced load on auxiliaries. Auxiliary outputs: 10% to 100% balanced on all outputs.
(4) Cross regulation for dual output: asymmetrical load 25% / 100% full load. Cross regulation for triple output: Main output 100% load, auxiliary 100%, other auxiliary 25% to 100%. Auxiliary outputs: main output 100% load, auxiliary 100%, other auxiliary 25% to 100% or main output 25%, auxiliary 25%, other auxiliary 25% to 100%.
(5) An external filter capacitor is required for normal operation. The capacitor should be capable of handling a 1A ripple current for 48V and 24V models.
(6) Simulated Source impedence of 12uH placed in series with + input.

PXF Series

Model Selector

Output Volt(V)	Output Curr(A)	Input Volt(VDC)	Model	Ripple/Noise (mV)	Eff.(%)	Max Load Cap(uF)
Single Outputs						
3.3	8	9 - 18	PXF40-12S3P3	50	84	21000
3.3	8	18 - 36	PXF40-24S3P3	50	87	21000
3.3	8	36 - 75	PXF40-48S3P3	50	88	21000
5	8	9 - 18	PXF40-12S05	50	86	13600
5	8	18 - 36	PXF40-24S05	50	89	13600
5	8	36 - 75	PXF40-48S05	50	90	13600
12	3.333	9 - 18	PXF40-12S12	75	86	2360
12	3.333	18 - 36	PXF40-24S12	75	88	2360
12	3.333	36 - 75	PXF40-48S12	75	89	2360
15	2.666	9 - 18	PXF40-12S15	75	87	1510
15	2.666	18 - 36	PXF40-24S15	75	89	1510
15	2.666	36 - 75	PXF40-48S15	75	89	1510
Dual Outputs						
±12	±1.80	9 - 18	PXF40-12D12	120	85	±1200
±12	±1.80	18 - 36	PXF40-24D12	120	87	±1200
±12	±1.80	36 - 75	PXF40-48D12	120	87	±1200
±15	±1.40	9 - 18	PXF40-12D15	150	85	±750
±15	±1.40	18 - 36	PXF40-24D15	150	87	±750
±15	±1.40	36 - 75	PXF40-48D15	150	87	±750
±24	±1.0	18-36	PXF40-24D24*	150	87	±300
Triple Outputs						
3.3,±12	6.0,±0.40	9 - 18	PXF40-12T3312	50/75	83	13000,±330
3.3,±12	6.0,±0.40	18 - 36	PXF40-24T3312	50/75	85	13000,±330
3.3,±12	6.0,±0.40	36 - 75	PXF40-48T3312	50/75	86	13000,±330
5,±12	6.0,±0.40	9 - 18	PXF40-12T0512	50/75	85	6800,±330
5,±12	6.0,±0.40	18 - 36	PXF40-24T0512	50/75	87	6800,±330
5,±12	6.0,±0.40	36 - 75	PXF40-48T0512	50/75	88	6800,±330

* Contact factory for safety agency status.

Pinout

PIN#	Function: Single Output	Dual Output	Triple Output
1	+ Input	+ Input	+ Input
2	- Input	- Input	- Input
3	Remote on/off	Remote on/off	Remote on/off
4	No Pin	No Pin	+ Aux
5	- Sense (Note 1)	+ VO	Common
6	+ Sense (Note 1)	Common	-Aux
7	+ Output	Common	+ Output
8	- Output	- VO	- Output (Com)
9	Trim	Trim	N/C

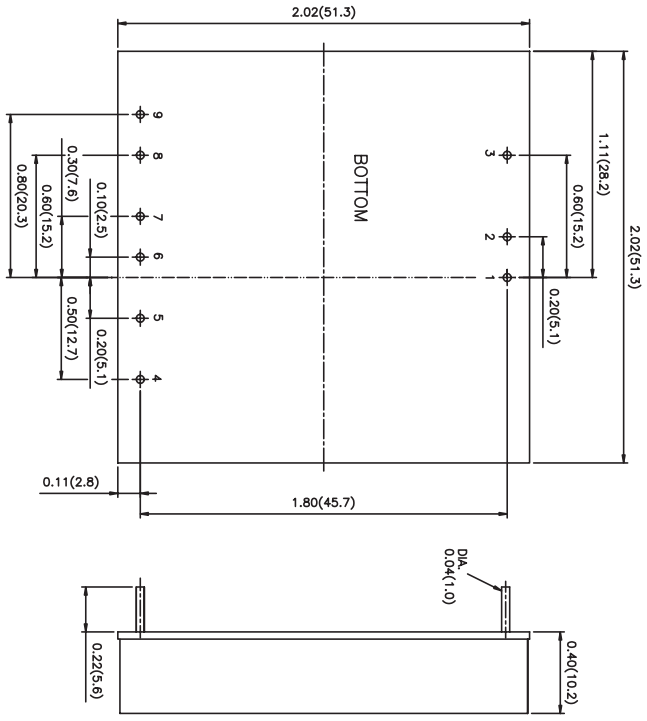
Heat Sink (0.22" high)

7G0026A (includes thermal adhesive pad)

Other Lambda Industrial Products

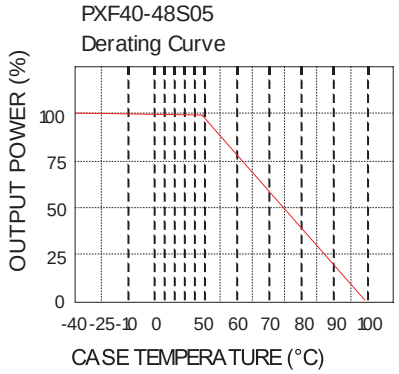
CC-E	1.5-25W, 5 to 48VDC input
PAQ, PAH, PAF	50 - 700W quarter, half & full bricks

Outline Drawing



ALL DIMENSIONS IN INCHES(mm)
PIN PITCH TOLERANCE ±0.014(0.35)
Tolerance : x.xx±0.02(x.x±0.5)
x.xxx±0.01(x.xx±0.25)

Derating Curves



For Additional Information, please visit
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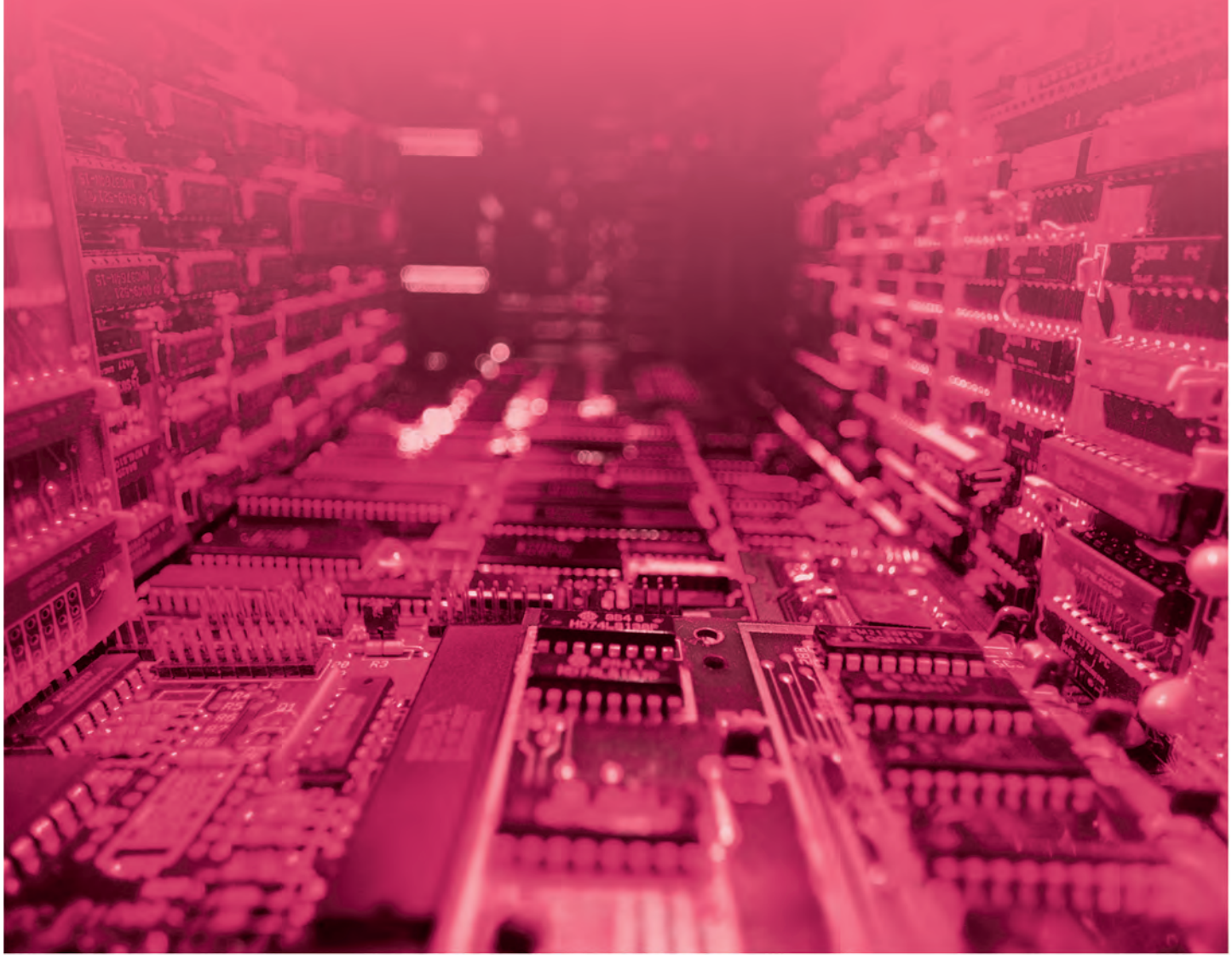
Revision A5: Nov 2006

AC-DC Products

DC-DC Products

◆ Filters

Company



Screw or Wire Termination
DIN Rail Mount

Filter Selector

Maximum Input Voltage	# of Phases	Current (A)
		1 · 6 · 10 · 15 · 30 · 50 · 150
250VAC	Single	MAW
		MA, MC, MX, MZ12
		MA, MC, MX, MZ12
		MB
		MXB - High Performance
	Three	MX13
500VAC	Three	MC13
72VDC	N/A	PAN
		MBS

MA/MX12 Series

6A to 30A, 250VAC EMI Filters

RoHS

Features

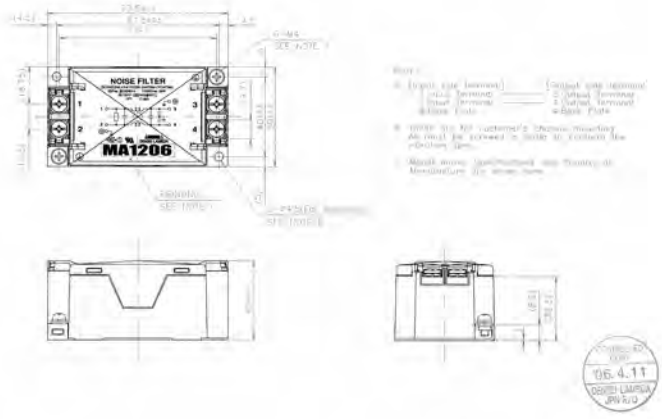
- Easy Connection and Installation
- Captive screws accepting ring tag terminals
- Chassis or DIN Rail mount
- Safety Agency Approved, RoHS Compliant
- MA series (single stage) Low frequency attentuation
- MX series (two stage) Wide band attentuation

Specifications

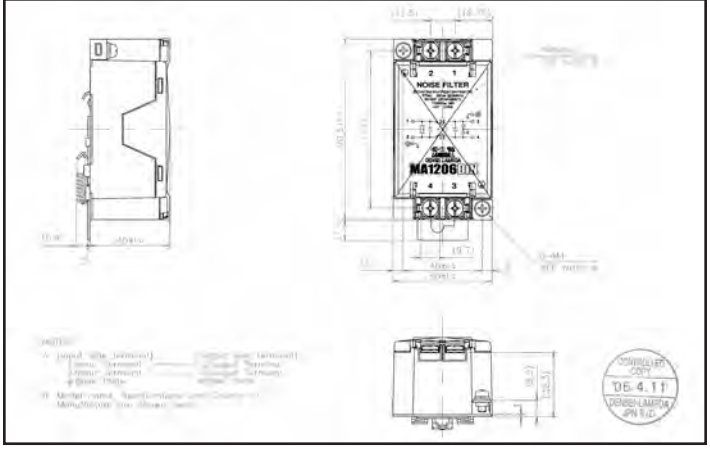
ITEMS \ MODELS		MA1206 MX1206	MA1210 MX1210	MA1216 MX1216	MA1220 MX1220	MA1230 MX1230
Rated Current		6A	10A	16A	20A	30A
Rated Voltage	V	250VAC or VDC				
Test Voltage (For 1 min.)	V	Terminals to Case: 2500VAC at 25C, 70% RH				
Isolation Resistance	MΩ	100MΩ minimum at 70% RH (terminals to case, 500VDC)				
Leakage Current	mA	1mA max at 250VAC 60Hz				
DC Resistance (both lines) MA/MX	mΩ	120/130	50/65	20/20	14/14	6/7
Temperature Rise	°C	30°C Maximum				
Operating Temperature	°C	-40 to +85°C (see derating curve)				
Storage Temperature	°C	-40 to +85				
Operating Humidity	-	30 to 95% RH (non condensing)				
Storage Humidity	-	10 to 95% RH (non condensing)				
Vibration (non operating)	-	10-55-10Hz sweep for 1 min. Amplitude 1.5mm constant (max 88.3m/s², X, Y, Z 2 hours each)				
Safety Standards	-	Approved by UL1283, CSA Std C22.2 No.8 (CUL)(1), EN60939 (SEMKO)				
Size WxLxH	mm	50 x 90.5 x 40 (50 x 101.5 x 46.4 with DIN Rail mounting clip)				
Weight (Typ)	g	280 (290 for DIN Rail mount versions)				
Warranty	-	1 Year				

(1) MX12 only

MA Outline Drawing



MA DIN Outline Drawing

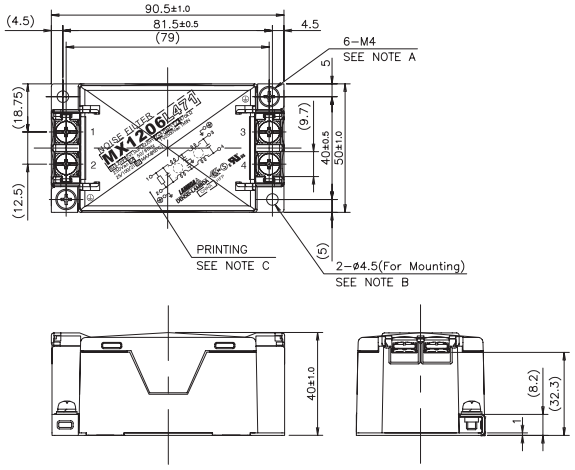


MA/MX12 Series

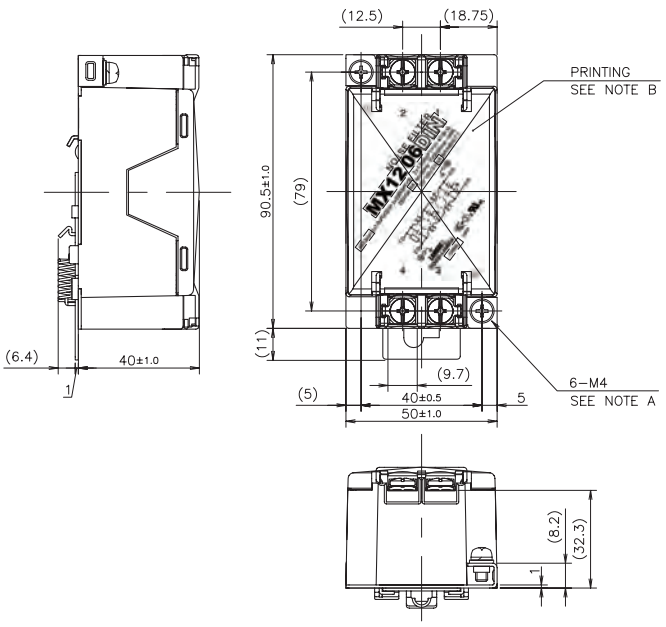
Model Selector

Model	Current Rating	Leakage Current (250VAC 60Hz)	Attenuation Characteristic	Mounting
MA1206	6A		Low Frequency (150 - 500kHz)	Chassis
MA1206DIN	6A		Low Frequency (150 - 500kHz)	DIN Rail
MX1206	6A		Wide band (150kHz - 30MHz)	Chassis
MX1206DIN	6A		Wide band (150kHz - 30MHz)	DIN Rail
MA1210	10A		Low Frequency (150 - 500kHz)	Chassis
MA1210DIN	10A		Low Frequency (150 - 500kHz)	DIN Rail
MX1210	10A		Wide band (150kHz - 30MHz)	Chassis
MX1210DIN	10A		Wide band (150kHz - 30MHz)	DIN Rail
MA1216	16A		Low Frequency (150 - 500kHz)	Chassis
MA1216DIN	16A		Low Frequency (150 - 500kHz)	DIN Rail
MX1216	16A		Wide band (150kHz - 30MHz)	Chassis
MX1216DIN	16A		Wide band (150kHz - 30MHz)	DIN Rail
MA1220	20A		Low Frequency (150 - 500kHz)	Chassis
MA1220DIN	20A		Low Frequency (150 - 500kHz)	DIN Rail
MX1220	20A		Wide band (150kHz - 30MHz)	Chassis
MX1220DIN	20A		Wide band (150kHz - 30MHz)	DIN Rail
MA1230	30A		Low Frequency (150 - 500kHz)	Chassis
MA1230DIN	30A		Low Frequency (150 - 500kHz)	DIN Rail
MX1230	30A		Wide band (150kHz - 30MHz)	Chassis
MX1230DIN	30A		Wide band (150kHz - 30MHz)	DIN Rail

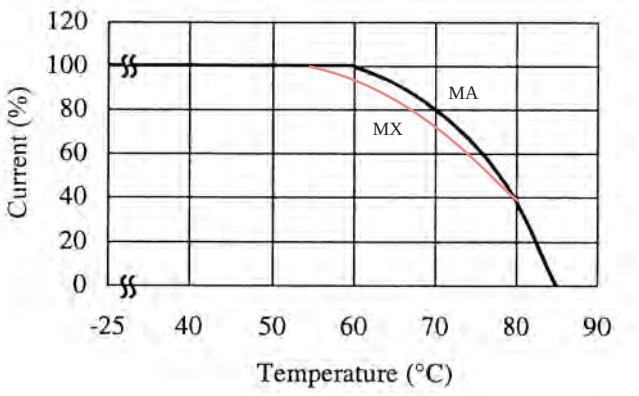
MX Outline Drawing



MX DIN Outline Drawing



Derating



Other Lambda Filter Solutions

MAW	0.5 - 5A, 250VAC filters (wire ended)
MC13	6 - 30A, 500VAC 3 phase filters
MX13	30 - 150A, 3 phase filters
MBS	30 & 50A, 75VDC filters
PAN	20A, 75VDC filters (pcb mount)

For Additional Information, please visit
www.lambdapower.com/products/ma-mx12-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A2: June 2006

MAW Series

0.5A to 5A, 250VAC EMI Filters

RoHS

Features

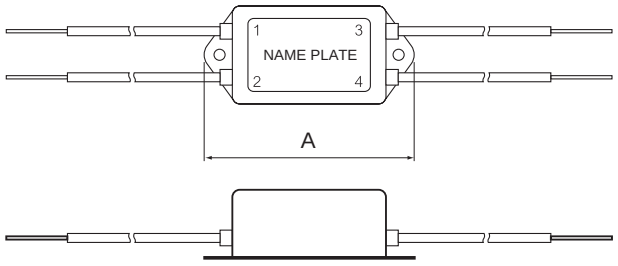
- Shielded Metal Case
- Attenuates High Voltage Pulses

Specifications

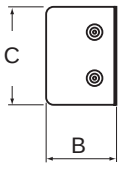
ITEMS \ MODELS		MAW12R522	MAW120122	MAW120222	MAW120322	MAW120522
Rated Voltage (AC,DC)	V	250V				
Rated Current (AC,DC)	A	0.5	1.0	2.0	3.0	5.0
Test Voltage (terminal to case, AC 1 min.)	V	2500V				
Isolation Resistance (terminal to case, 500VDC)	Ω	100MΩ min.				
Leakage Current	-	125V, 60Hz, 0.5mA max.; 250V, 60Hz, 1.0mA max				
DC Resistance	Ω	5 max.	1.5 max.	0.6 max.	0.3 max.	0.2 max.
Temperature Rise	°C	30°C max.				
Operating Temperature (1)	°C	-25 to +85°C				
Operating Humidity	%	30% to 95% RH (non-condensing)				
Storage Temperature	°C	-40 to +85°C				
Storage Humidity	%	10% to 95% RH (non-condensing)				
Vibration	-	Sweep:10-55-10Hz (1min.), Amplitude 1.5mm X, Y, and Z axes, 2 hours each				
Safety Standard	-	UL1283, CSA C22.2 No.8 (C-UL), EN133200 (VDE)				

Notes:
(1) Value at Ta ≤ 55°C. Refer to the derating curve at Ta > 55°C.

Outline Drawing



Lead length 300mm
(stripped 20mm)



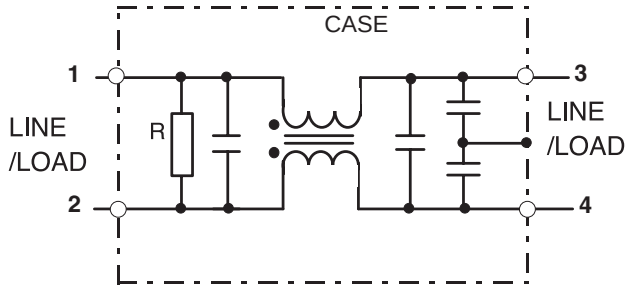
Ø3.6mm mounting holes

Dimensions

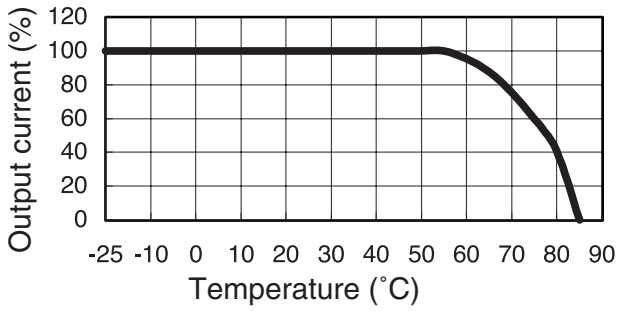
Model	L x H x W (mm) A	B	C	Weight (g)
MAW12R522	68	23	32	95
MAW120122	68	23	32	95
MAW120222	68	23	32	95
MAW120322	74	30	38	160
MAW120522	74	30	38	160

MAW Series

Circuit

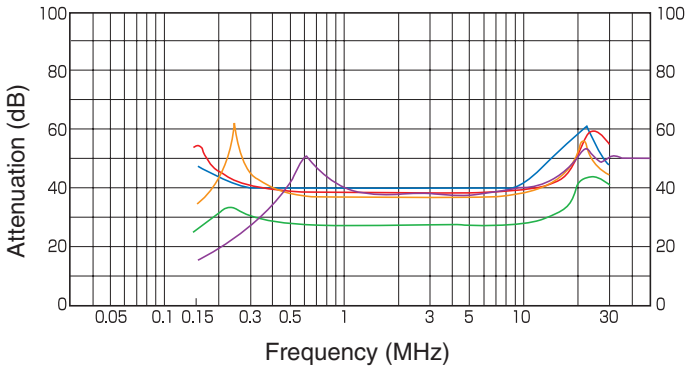


Derating



Typ. Insertion Loss, Symmetrical

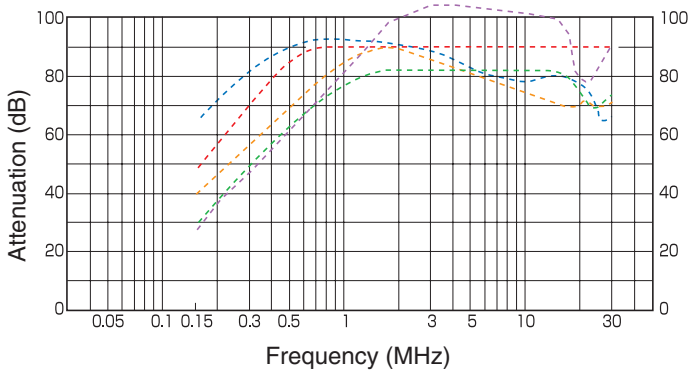
MAW12R5 22 MAW1201 22 MAW1202 22



MAW1203 22 MAW1205 22

Typ. Insertion Loss, Asymmetrical

MAW12R5 22 MAW1201 22 MAW1202 22



MAW1203 22 MAW1205 22

For Additional Information, please visit www.lambdapower.com/products/maw-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A1: July 2003

MB Series

6A to 36A, 250VAC EMI Filters

RoHS

Features

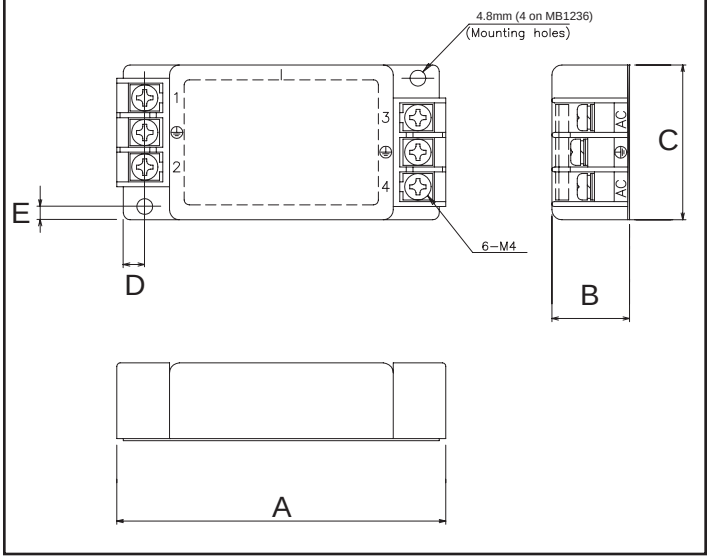
- High Attenuation Wide Band Two Stage Filter
- Screw Terminals with Cover
- Low Profile, Metal Case

Specifications

ITEMS / MODELS		MB1206	MB1210	MB1216	MB1220	MB1236
Rated Voltage (AC,DC)	V	250V				
Rated Current (AC,DC) (1)	A	6	10	16	20	36
Test Voltage (terminal to case, AC 1 min.)	V	2500V (20mA) at 25°C, 70% RH				
Isolation Resistance (terminal to case, 500VDC)	Ω	100M Ohms min. at 25°C, 70% RH				
Leakage Current	-	125V, 60Hz =0.5mA max.; 250V, 60Hz =1mA max.				
DC Resistance	mΩ	140	50	34	20	9
Temperature Rise	°C	40°C max.				
Operating Temperature (1)	°C	-25 to +85°C				
Operating Humidity	%	30% to 95% RH (non-condensing)				
Storage Temperature	°C	-40 to +85°C				
Storage Humidity	%	10% to 95% RH (non-condensing)				
Vibration	-	Sweep:10-55-10Hz (1min.), Amplitude 1.5mm X, Y, and Z axes, 2 hours each				
Safety Standard	-	UL1283, CSA C22.2 No.8 (C-UL), VDE0565 Teil3, Teil3A2, and EN133200 (VDE)				

Notes:
(1) Value at Ta ≤ 35°C. Refer to the derating curve at Ta > 35°C.

Outline Drawing

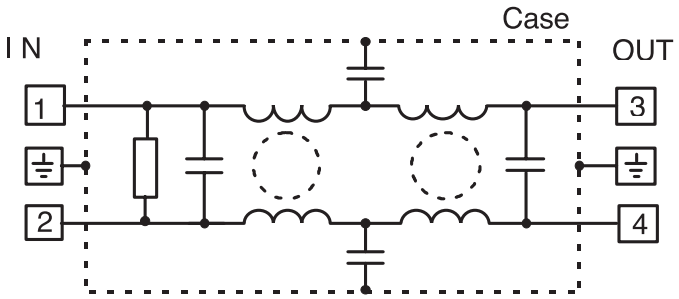


Dimensions

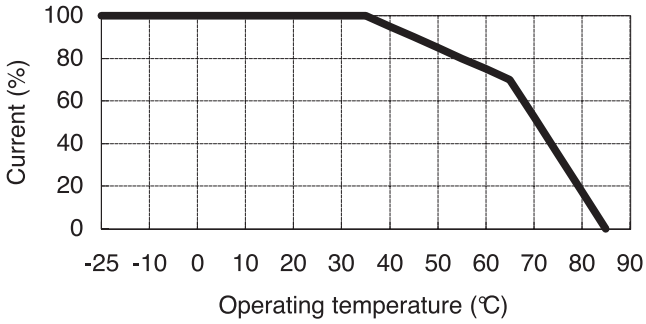
Model	A	B	C	D	E	Weight (g)
MB1206	100	23.6	47	6.5	4	190
MB1210	107	26	47	6.5	4	220
MB1216	117	30	47	6.5	4	310
MB1220	151	35	52	6.5	4	530
MB1236	151	35	67	7.5	6.5	660

MB Series

Circuit

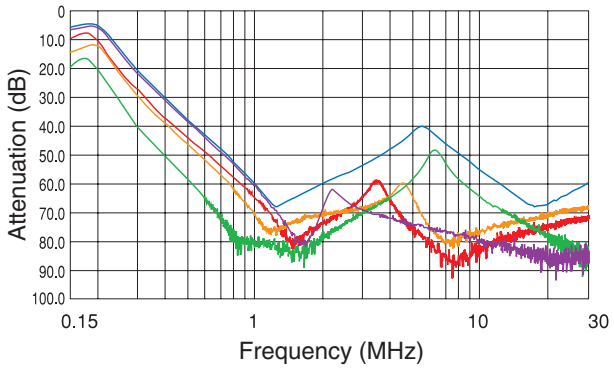


Derating



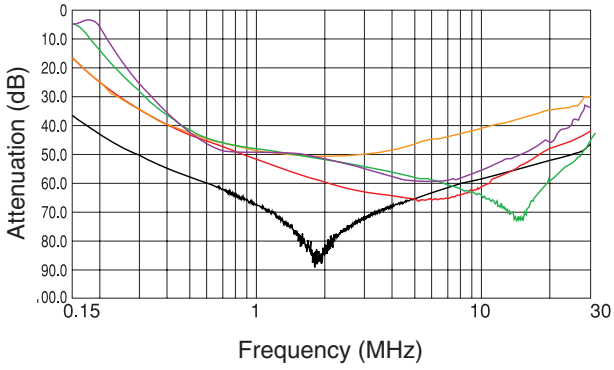
Typ. Insertion Loss, Symmetrical

MB1206 MB1210 MB1216 MB1220 MB1236



Typ. Insertion Loss, Asymmetrical

MB1206 MB1210 MB1216 MB1220 MB1236



For Additional Information, please visit www.lambdapower.com/products/mb-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A1: July 2003

MBS48 Series

30A and 50A, 48VDC EMI Filters

RoHS

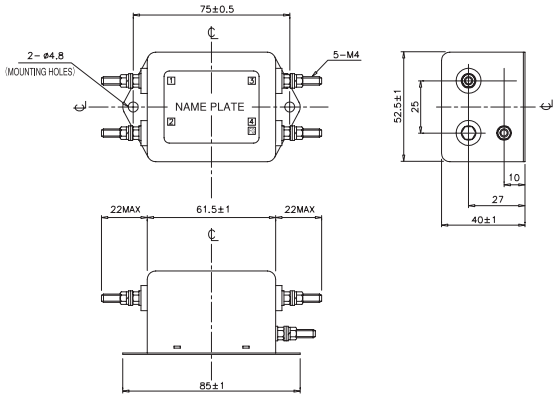
Features

- High Attenuation
- Stud Terminal Connection
- Compact Size

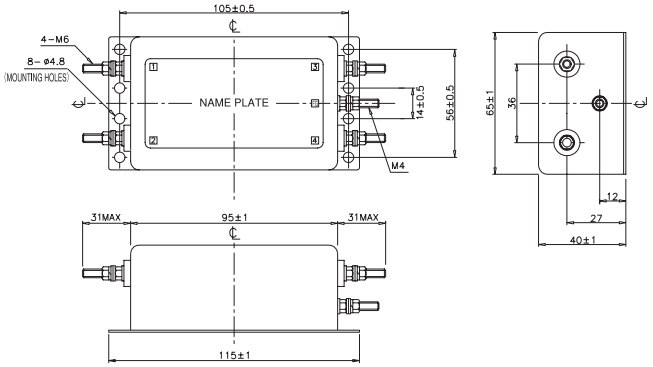
Specifications

ITEMS / MODELS		MBS4830	MBS4850
Rated Voltage	VDC	48VDC (72VDC Max)	
Rated Current	A	30A, 45A peak surge for 1 min	50A, 75A peak surge for 1 min
Test Voltage (For 1 min.)	V	Terminals to Case: 700VDC (20mA) at 25°C, 70% RH Between terminals 100VDC (20mA) at 25°C, 70% RH	
Isolation Resistance	MΩ	500MΩ minimum at 25°C, 70% RH	
Leakage Current	mA	Not Applicable	
DC Resistance	mΩ	8	4
Temperature Rise	°C	35	30
Operating Temperature	°C	-25° to +85°C (see derating curve)	
Storage Temperature	°C	-40° to +85°	
Operating Humidity	-	30 to 95% RH (non condensing)	
Storage Humidity	-	10 to 95% RH (non condensing)	
Vibration	-	10-55-10Hz, Amplitude 1.5mm (1 minute), X, Y, Z (2 hour each)	
Weight (Typ)	g	310	650
Warranty	-	1 Year	

MBS4830 Outline Drawing

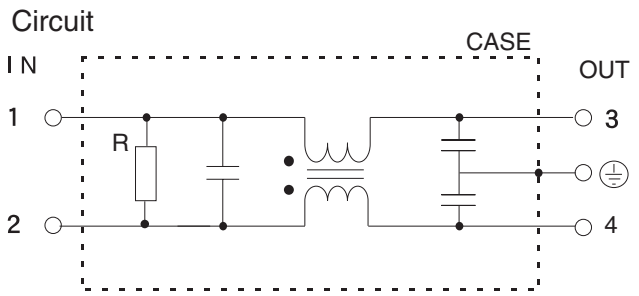


MBS4850 Outline Drawing

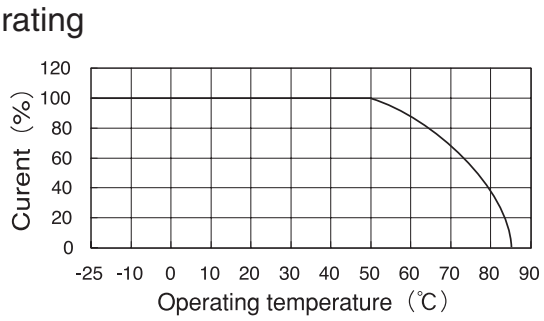


MBS48 Series

Circuit



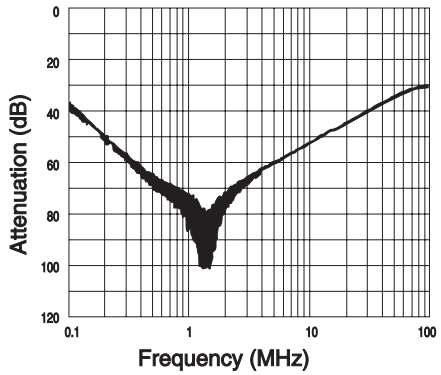
Derating



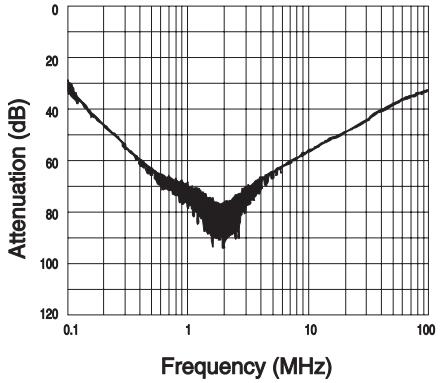
Typ. Insertion Loss, Symmetrical

(1) Asymmetrical

MBS4830

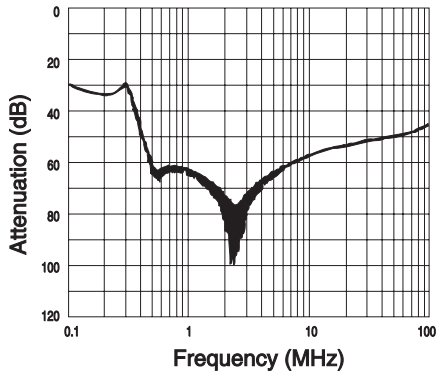


MBS4850

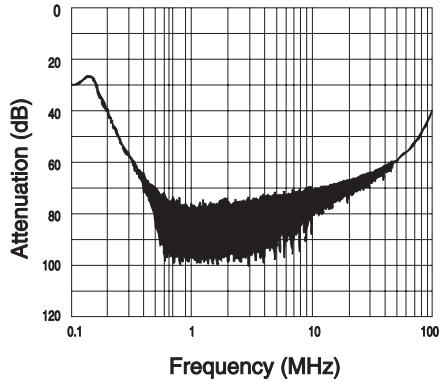


(2) Symmetrical

MBS4830



MBS4850



For Additional Information, please visit www.lambdapower.com/products/mbs-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A1: December 2003

MC13 Series

6A to 30A, 500VAC 3 Phase EMI Filters

RoHS

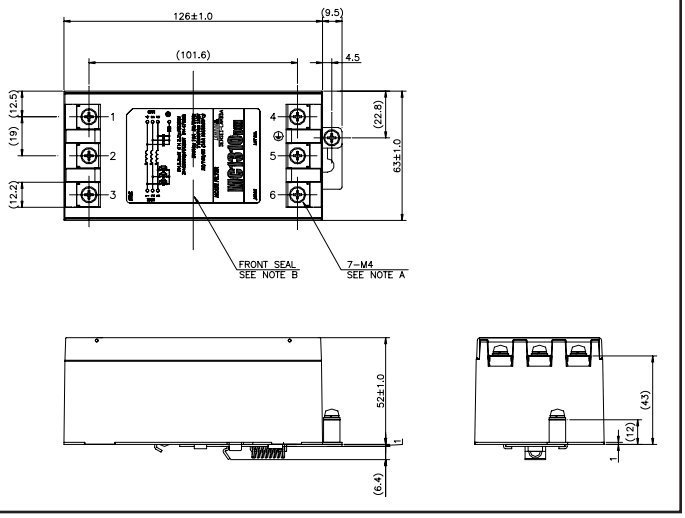
Features

- Industry Standard Size
- DIN Rail Mountable

Specifications

ITEMS \ MODELS		MC1306DIN	MC1310DIN	MC1320DIN	MC1330DIN
Rated Voltage (AC)	V	500 (50/60Hz) Three Phase			
Rated Current (AC) (1)	A	6	10	20	30
Test Voltage (terminal to baseplate, AC 1 min.)	V	2000 (100mA) @ 25°C, 70%RH			
Isolation Resistance (terminal to baseplate, 500VDC)	MΩ	100MΩ min. @ 25°C, 70%RH			
Leakage Current (500V, 60Hz)	mA	5.0 max			
DC Resistance (three lines)	MΩ	90 max	68 max	23 max	11 max
Temperature Rise	°C	30 max			
Operating Temperature	°C	-25 to +85°C			
Operating Humidity	%	30% to 95% RH (non-condensing)			
Storage Temperature	°C	-40 to +85°C			
Storage Humidity	%	10% to 95% RH (non-condensing)			
Vibration	-	10~55Hz, (Sweep for 1 min) 9.8m/s², X, Y, Z axes, 1 hour each			
Safety Standard	-	Approved to UL1283, CSA std.C22.2No.8(CUL), EN133200(VDE)			
Size	mm	135.5 (L) x 59.4 (H) x 63 (W)			
Weight (Typ.)	g	600			

Outline Drawing

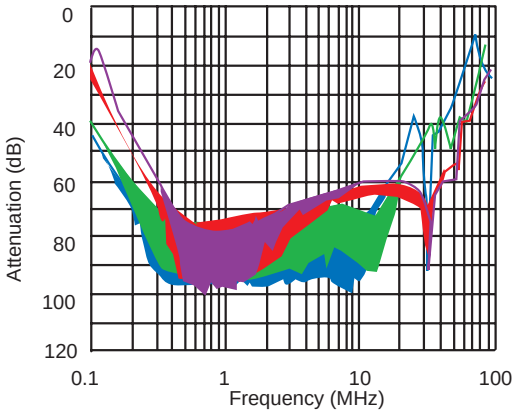


Note (1) Value for Ta < 50°C.
For Ta > 50°C derate according to the derating curve.

MC13 Series

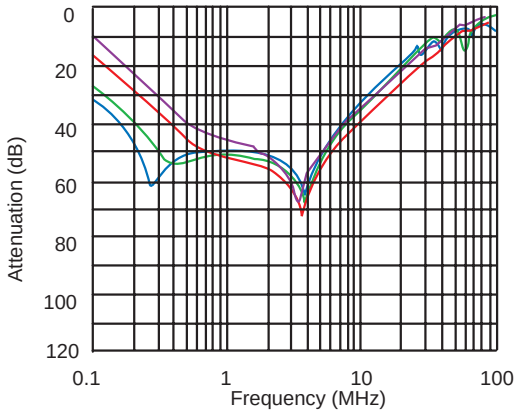
Typ. Attenuation, Symmetrical

MC1306 MC1310 MC1320 MC1330

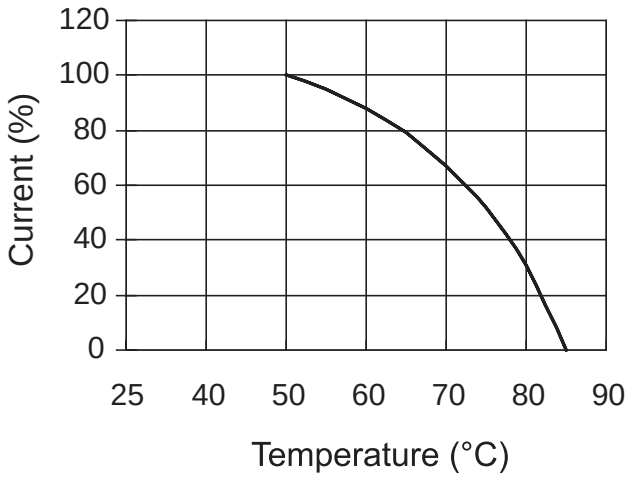


Typ. Attenuation, Asymmetrical

MC1306 MC1310 MC1320 MC1330



Derating



For Additional Information, please visit
www.lambdapower.com/products/mc13-series.htm

3055 Del Sol Blvd • San Diego, CA 92154 • 1-800-LAMBDA-4

Revision A1: October 2003

MXB Series

6A to 30A, 250VAC EMI Filters

RoHS

Features

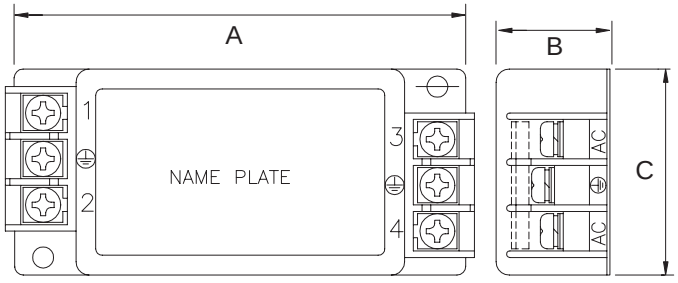
- Two Stage for High Attenuation
- Screw Terminals with Cover
- Improved Performance over MB Series

Specifications

ITEMS \ MODELS		MXB1206-33	MXB1210-33	MXB1220-33	MXB1230-33
Rated Voltage (AC,DC)	V	250V			
Rated Current (AC,DC) (1)	A	6	10	20	30
Test Voltage (terminal to case, AC 1 min.)	V	2500V (20mA) at 25°C, 70% RH			
Isolation Resistance (terminal to case, 500VDC)	Ω	100MΩ min. at 25°C, 70% RH			
Leakage Current	-	125V, 60Hz, 0.5mA max.; 250V, 60Hz, 1.0mA max.			
DC Resistance	mΩ	300 max.	100 max.	20 max.	10 max.
Temperature Rise	°C	35°C max.		40°C max.	
Operating Temperature (1)	°C	-25 to +85°C			
Operating Humidity	%	30% to 90% RH (non-condensing)			
Storage Temperature	°C	-30 to +85°C			
Storage Humidity	%	10% to 95% RH (non-condensing)			
Vibration	-	Sweep:10-55-10Hz (1min.), Amplitude 1.5mm X, Y, and Z axes, 2 hours each			
Safety Standard	-	Approved by UL1283, CSA C22.2 No.8 (C-UL), EN133200 (VDE0565)			

Notes:
(1) Value at Ta ≤ 50°C. Refer to the derating curve at Ta > 50°C.
(2) Value at Ta ≤ 45°C. Refer to the derating curve at Ta > 45°C.
(3) See Derating Curve.

Outline Drawing



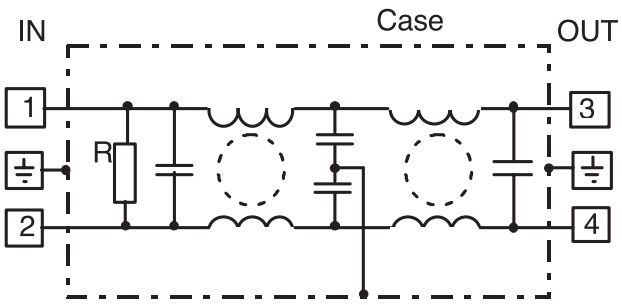
Notes:
Mounting holes Ø4.8mm (Two on MXB1206-1220, Four on MXB1230)

Dimensions

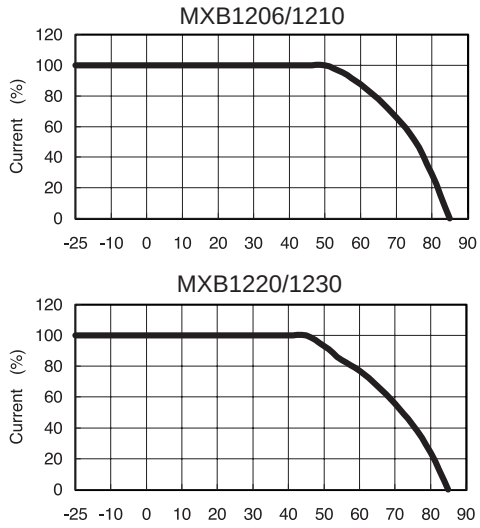
Model	L x H x W (mm) A	B	C	Weight (g)
MXB1206-33	111	26	47	220
MXB1210-33	121	30	47	310
MXB1220-33	151	35	52	530
MXB1230-33	151	35	67	660

MXB Series

Circuit

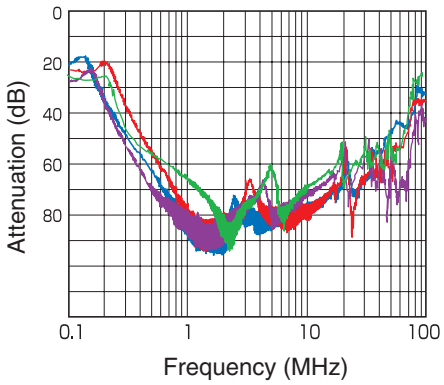


Derating



Typ. Insertion Loss, Symmetrical

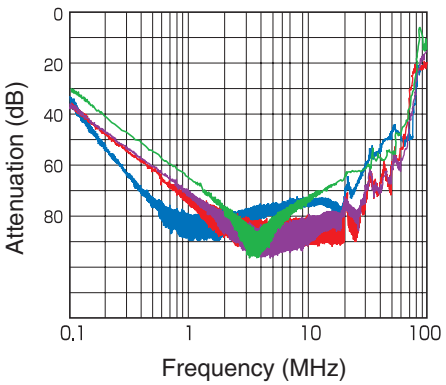
MXB1206-33 **MXB1210-33**



MXB1220-33 **MXB1230-33**

Typ. Insertion Loss, Asymmetrical

MXB1206-33 **MXB1210-33**



MXB1220-33 **MXB1230-33**

For Additional Information, please visit www.lambdapower.com/products/mxb-series.htm

PAN Series

20A, 48VDC pcb mount EMI Filter

RoHS

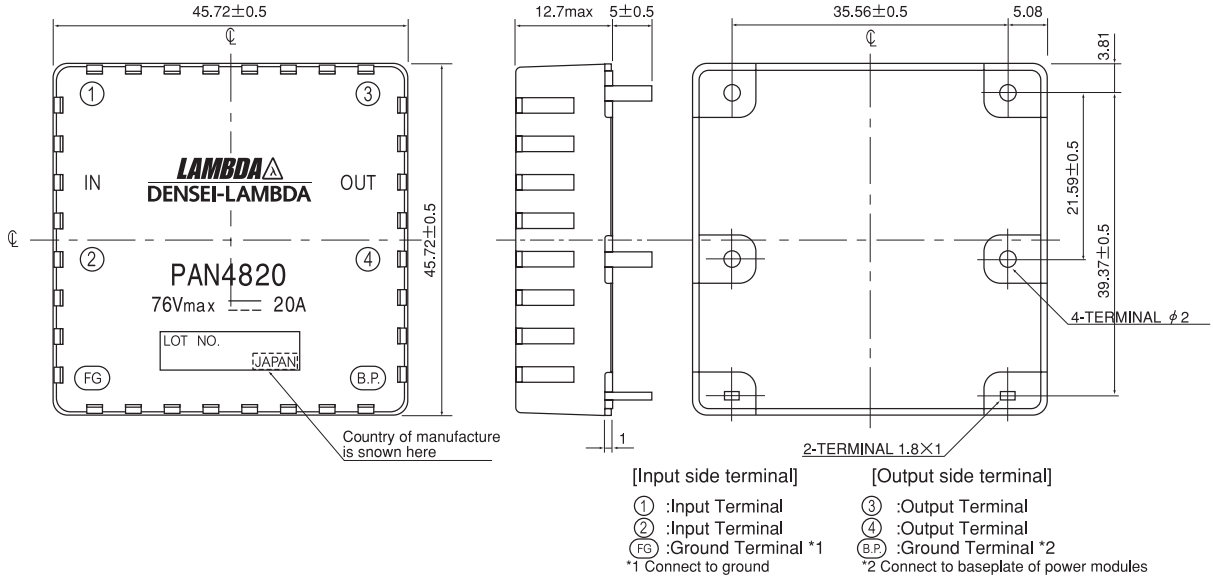
Features

- Compact Size
- PCB Mount
- Conforms to UL1950, CSA950, EN60950
- Suitable for use with Lambda's PAF Series

Specifications

ITEMS \ MODELS		PAN4820
Rated Voltage	VDC	76VDC Max
Rated Current	A	20A
Test Voltage (For 1 min.)	V	Terminals to Case: 1500VDC; Between terminals: 100VDC
Isolation Resistance	MΩ	100MΩ minimum (terminals to case, 500VDC)
Leakage Current	mA	Not Applicable
DC Resistance	mΩ	6
Operating Temperature	°C	-40 to +100 (see derating curve)
Storage Temperature	°C	-40 to +100
Operating Humidity	-	30 to 95% RH (non condensing)
Storage Humidity	-	10 to 95% RH (non condensing)
Vibration	-	10-55Hz sweep for 1 minute Amplitude 0.825mm (max 49m/s², X, Y, Z (1 hour each)
Safety Standards	-	Conforms to UL60950, CSA60950, EN60950
Weight (Typ)	g	45
Warranty	-	1 Year

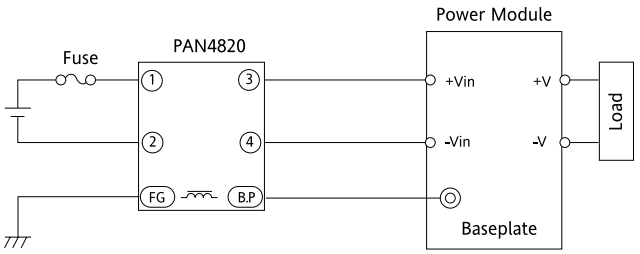
Outline Drawing



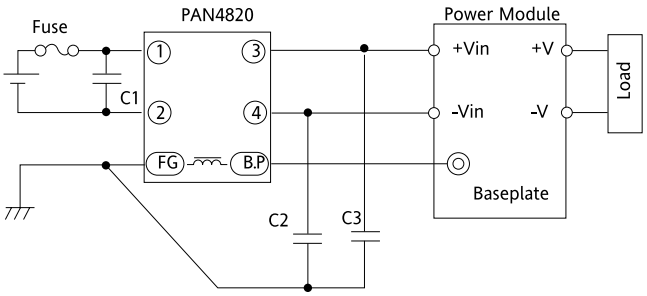
PAN Series

Circuit Connection 1

◆ Conform to EN55011/55022, VCCI Class A

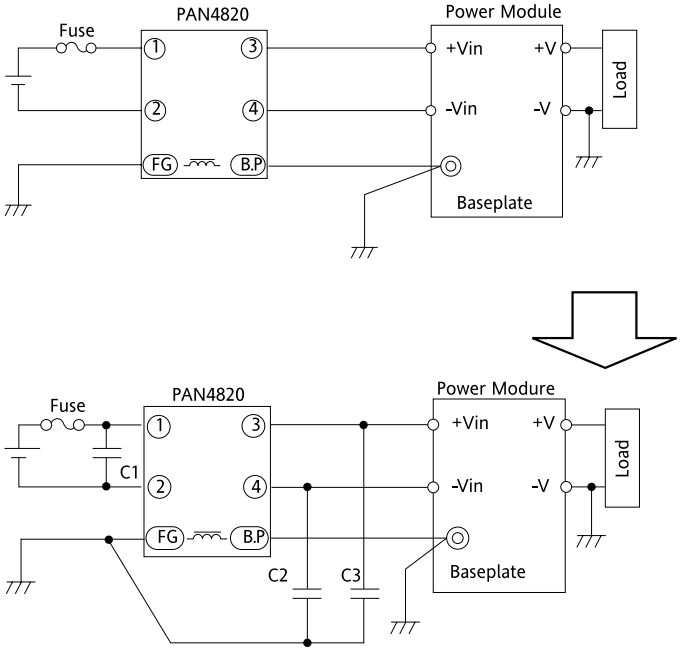


◆ Conform to EN55011/55022, VCCI Class B



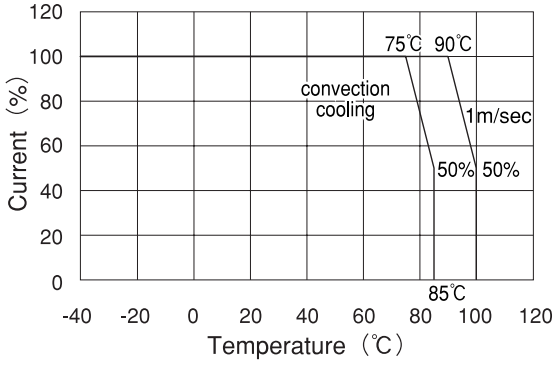
Recommended Values C1μF22Ceramic Capacitor)
C2,3: 0μ47Film or Ceramic Capacitor)

Circuit Connection 2



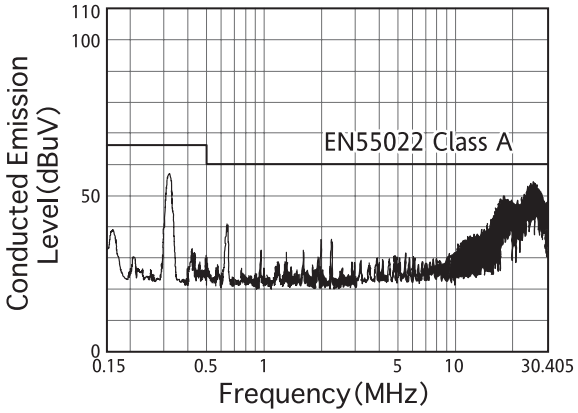
Recommended Values C1μF22Ceramic Capacitor)
C2,3: 0μ47Film or Ceramic Capacitor

Derating

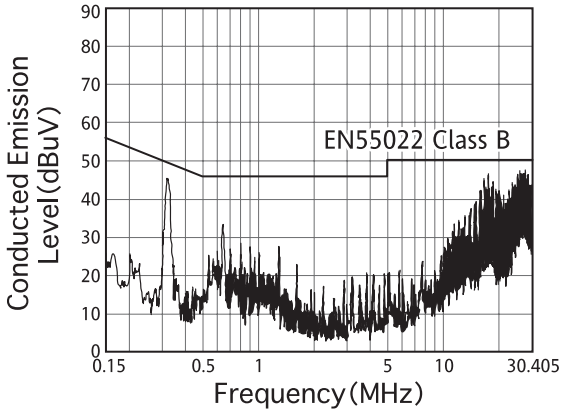


Attenuation

●CLASS-A Application
PAN4820＋PAF500F



●CLASS-B Application
PAN4820＋adding external components
(Capacitor: Net 3)＋PAF500F



For Additional Information, please visit
www.lambdapower.com/products/pan-series.htm

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Revision A2: Nov 2006

AC-DC Products

DC-DC Products

Filters

◆ Company

About Lambda

Lambda is a world class leader in the design, manufacture and marketing of power supplies to the Industrial, Telecom, Datacom, Medical and Test and Measurement sectors. Founded in 1948 we have developed a worldwide reputation and heritage for high quality, robust power supplies.

One thing has remained consistent over the last half century though, the need for change.

- As our Customer's product requirements become more diverse, we responded by broadening our product range from low cost 5W open frame **AC-DC** power supplies to 22,500W hot swap units.
- We developed a large **DC-DC converter** portfolio to power many applications in the recent growth of communications, and we continue to launch leading edge products to support that market.
- The need for fast customization has been met by our **New York Custom Product Solutions** Engineering Team. A wide variety of products can be developed, ranging from simple modifications, value added solutions, or complete 'ground up' custom products.

- Not all of our Customer needs are product based though. **Financial stability** and the resources to continue to invest even in down markets, play a key factor in partner selection. Backed by the resources of a multi billion dollar company*, we have increased our R&D and capital expenditures to offer our customers the latest in leading edge technologies.
- The end products that use Lambda power supplies are often designed on one continent and built in another. We can truly provide that **global support** with nine manufacturing sites, eight R&D facilities, sales and service offices across the world, and our authorized distribution network.
- The desire for **information** - 24/7. Our web site has a huge library of data, from legacy products that were designed decades ago to the latest generation products.
- As we launch new products, our printed catalog quickly becomes outdated. We encourage you to **check** for updates through our website www.lambdapower.com

Thank you for requesting our catalog,
we welcome your feedback.

* Lambda is a unit of TDK Corporation (NYSE:TDK), a global electronics company, headquartered in Tokyo.

LAMBDA Global Facilities

Ilfracombe Plant (U.K.)

Manufacturing and R&D
Modular (Vega, Alpha, Sirius) & DC-DC power supplies

Nagaoka (Japan)

Manufacturing & R&D
AC-DC, DC-DC & custom power supplies

Senai Plant (Malaysia)

Manufacturing
AC-DC, DC-DC power modules & custom products

Wuxi Plant (China)

Manufacturing and R&D
AC-DC Converters, filters & custom products

Kuantan Plant (Malaysia)

Manufacturing
AC-DC Converters & custom products

Karmiel Plant (Israel)

Manufacturing
Manufacturing & R&D

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