

# μPA2739T1A

P-channel MOSFET

-30 V, -85 A, 2.8 mΩ

R07DS0885EJ0102

Rev.1.02

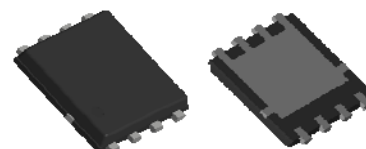
Nov 28, 2012

## Description

The μPA2739T1A is P-channel MOS Field Effect Transistors designed for high current switching applications.

## Features

- $V_{DSS} = -30\text{ V}$  ( $T_A = 25^\circ\text{C}$ )
- Low on-state resistance
  - $R_{DS(on)} = 2.8\text{ m}\Omega$  MAX. ( $V_{GS} = -10\text{ V}$ ,  $I_D = -46\text{ A}$ )
  - $R_{DS(on)} = 5.7\text{ m}\Omega$  MAX. ( $V_{GS} = -4.5\text{ V}$ ,  $I_D = -23\text{ A}$ )
- 4.5 V Gate-drive available
- Thin type surface mount package with heat spreader
- Halogen free



8-pin HVSON(6051)

## Ordering Information

Part No.	LEAD PLATING	PACKING	Package
μPA2739T1A-E2-AY*1	Pure Sn	Tape 3000 p/reel	8-pin HVSON(6051) 0.1 g TYP.

Note: \*1. Pb-free (This product does not contain Pb in external electrode.)

## Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ )

Item	Symbol	Ratings	Unit
Drain to Source Voltage ( $V_{GS} = 0\text{ V}$ )	$V_{DSS}$	-30	V
Gate to Source Voltage ( $V_{DS} = 0\text{ V}$ )	$V_{GSS}$	±20	V
Drain Current (DC) ( $T_C = 25^\circ\text{C}$ )	$I_{D(DC)}$	±85	A
Drain Current (pulse) *1	$I_{D(pulse)}$	±180	A
Total Power Dissipation *2	$P_{T1}$	1.5	W
Total Power Dissipation (PW = 10 sec) *2	$P_{T2}$	4.6	W
Total Power Dissipation ( $T_C = 25^\circ\text{C}$ )	$P_{T3}$	83	W
Channel Temperature	$T_{ch}$	150	°C
Storage Temperature	$T_{stg}$	-55 to +150	°C
Single Avalanche Current *3	$I_{AS}$	-40	A
Single Avalanche Energy *3	$E_{AS}$	160	mJ

## Thermal Resistance

Channel to Ambient Thermal Resistance *2	$R_{th(ch-A)}$	83.3	°C/W
Channel to Ambient Thermal Resistance *2	$R_{th(ch-C)}$	1.5	°C/W

Notes: \*1.  $PW \leq 10\ \mu\text{s}$ , Duty Cycle  $\leq 1\%$

\*2. Mounted on a glass epoxy board of 25.4 mm x 25.4 mm x 0.8 mm

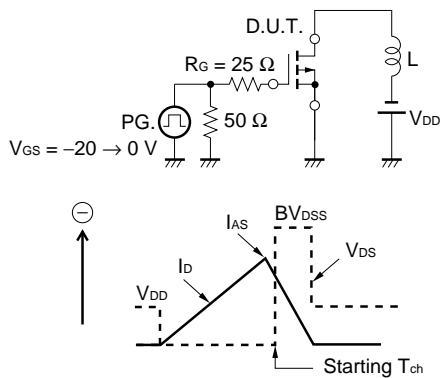
\*3. Starting  $T_{ch} = 25^\circ\text{C}$ ,  $V_{DD} = -15\text{ V}$ ,  $R_G = 25\ \Omega$ ,  $V_{GS} = -20 \rightarrow 0\text{ V}$ ,  $L = 100\ \mu\text{H}$

**Electrical Characteristics (T<sub>A</sub> = 25°C)**

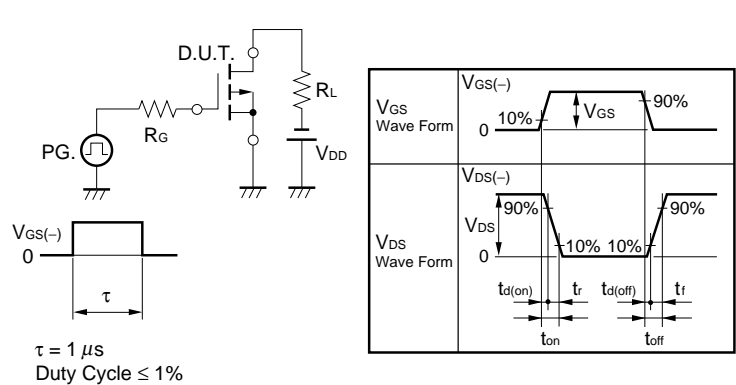
Item	Symbol	MIN.	TYP.	MAX.	Unit	Test Conditions
Zero Gate Voltage Drain Current	I <sub>DS</sub>			-1	μA	V <sub>DS</sub> = -30 V, V <sub>GS</sub> = 0 V
Gate Leakage Current	I <sub>GSS</sub>			±100	nA	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> = 0 V
Gate Cut-off Voltage	V <sub>GS(off)</sub>	-1.0		-2.5	V	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -1 mA
Forward Transfer Admittance *1	y <sub>fs</sub>	26			S	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -23 A
Drain to Source On-state Resistance *1	R <sub>DS(on)1</sub>		2.2	2.8	mΩ	V <sub>GS</sub> = -10 V, I <sub>D</sub> = -46 A
	R <sub>DS(on)2</sub>		3.8	5.7	mΩ	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -23 A
Input Capacitance	C <sub>iss</sub>		6050		pF	V <sub>DS</sub> = -10 V, V <sub>GS</sub> = 0 V, f = 1 MHz
Output Capacitance	C <sub>oss</sub>		3000		pF	
Reverse Transfer Capacitance	C <sub>rss</sub>		2420		pF	
Turn-on Delay Time	t <sub>d(on)</sub>		27		ns	V <sub>DD</sub> = -15 V, I <sub>D</sub> = -23 A, V <sub>GS</sub> = -10 V, R <sub>G</sub> = 10 Ω
Rise Time	t <sub>r</sub>		140		ns	
Turn-off Delay Time	t <sub>d(off)</sub>		310		ns	
Fall Time	t <sub>f</sub>		490		ns	
Total Gate Charge	Q <sub>G</sub>		153		nC	V <sub>DD</sub> = -15 V, V <sub>GS</sub> = -10 V, I <sub>D</sub> = -23 A
Gate to Source Charge	Q <sub>GS</sub>		17		nC	
Gate to Drain Charge	Q <sub>GD</sub>		70		nC	
Body Diode Forward Voltage *1	V <sub>F(S-D)</sub>		0.85	1.2	V	I <sub>F</sub> = 46 A, V <sub>GS</sub> = 0 V
Reverse Recovery Time	t <sub>rr</sub>		450		ns	I <sub>F</sub> = 50 A, V <sub>GS</sub> = 0 V, di/dt = 100 A/μs
Reverse Recovery Charge	Q <sub>rr</sub>		1200		nC	

Note: \*1. Pulsed

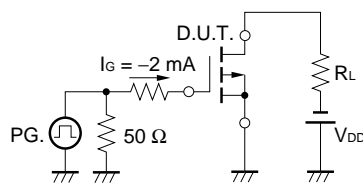
**TEST CIRCUIT 1 AVALANCHE CAPABILITY**



**TEST CIRCUIT 2 SWITCHING TIME**

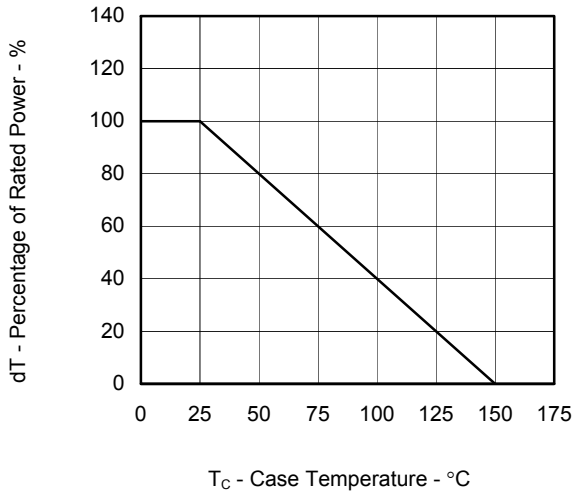


**TEST CIRCUIT 3 GATE CHARGE**

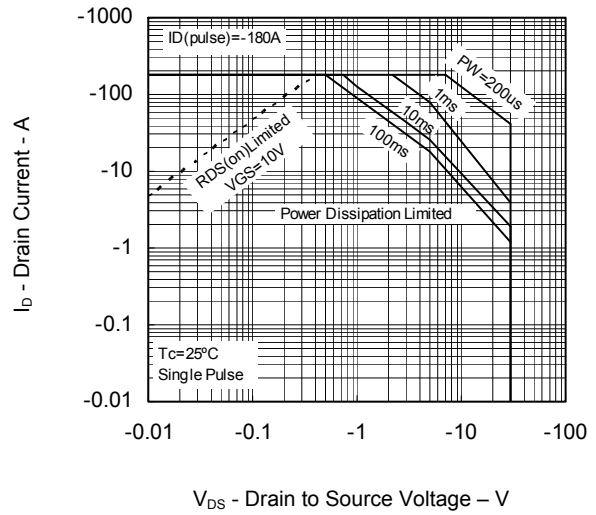


TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

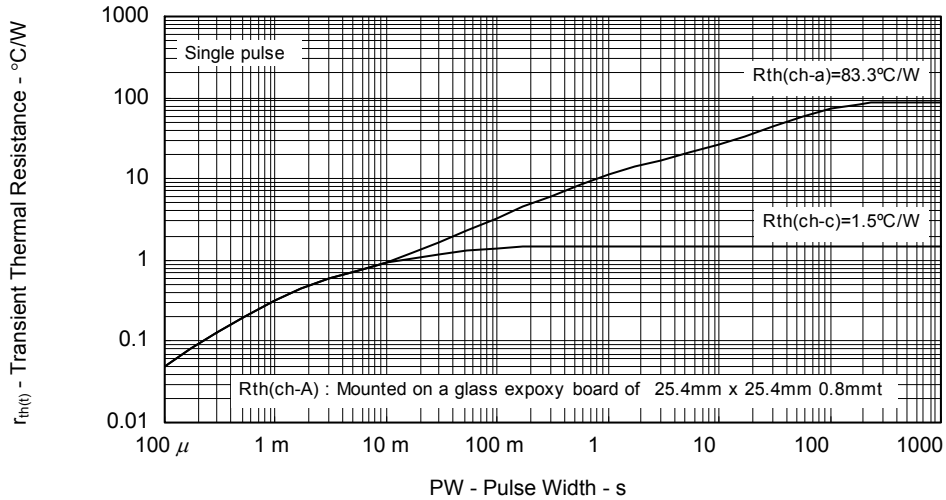
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



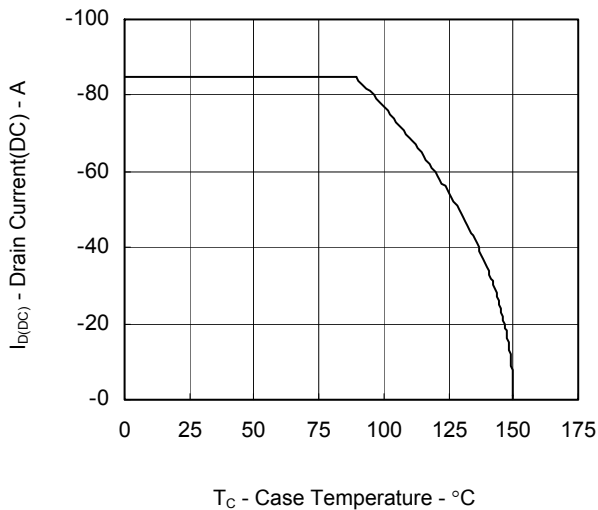
FORWARD BIAS SAFE OPERATING AREA



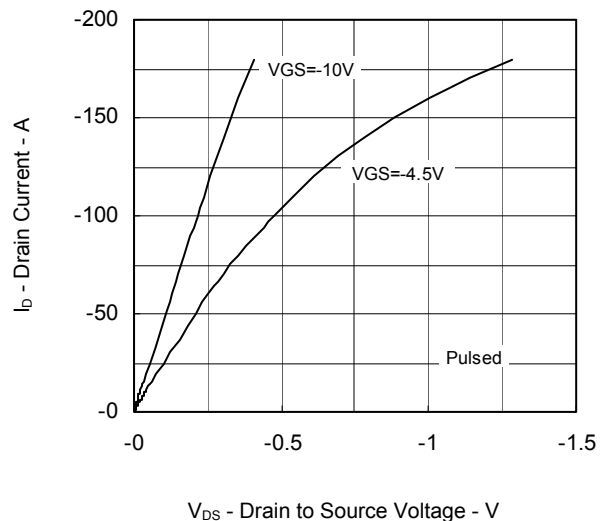
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



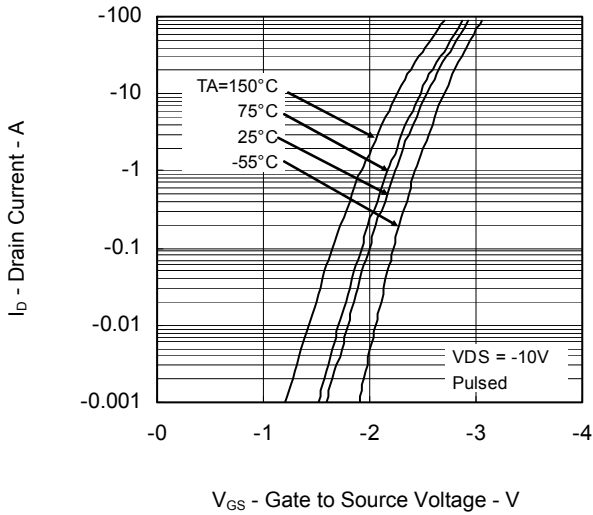
DRAIN CURRENT(DC) vs. CASE TEMPERATURE



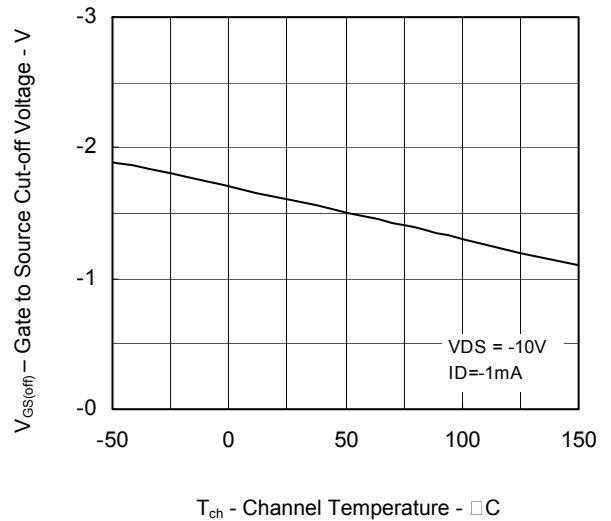
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



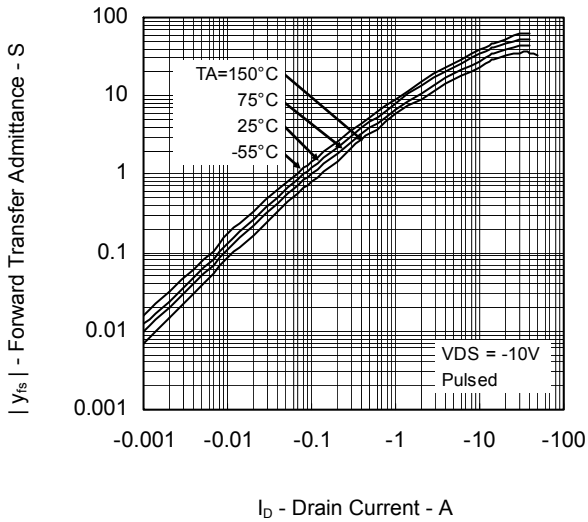
FORWARD TRANSFER CHARACTERISTICS



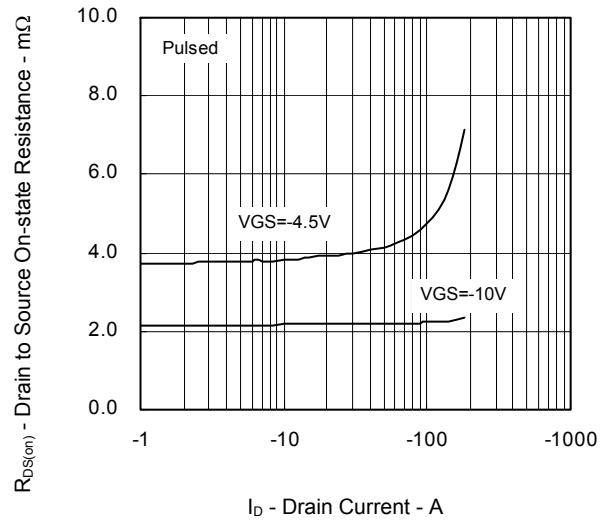
GATE TO SOURCE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



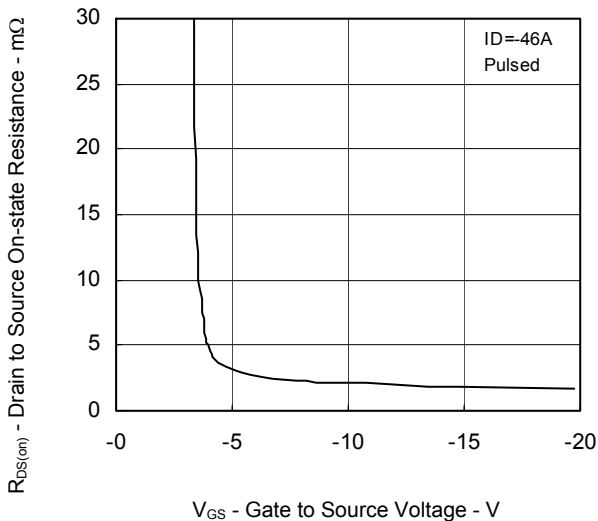
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



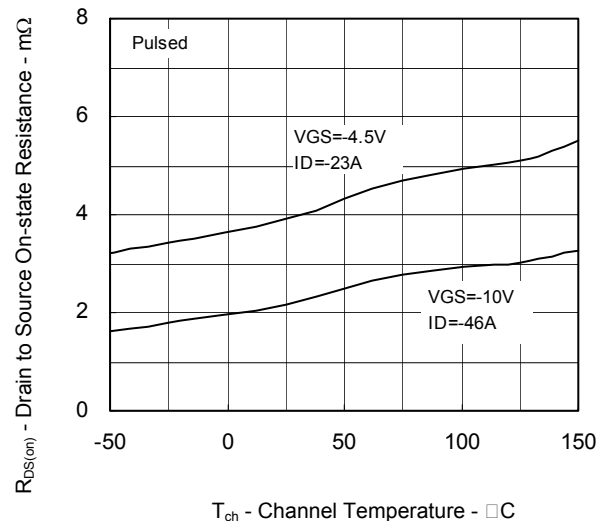
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



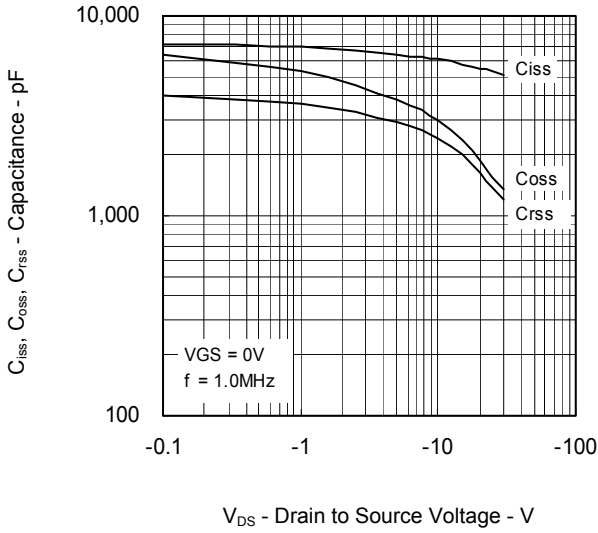
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



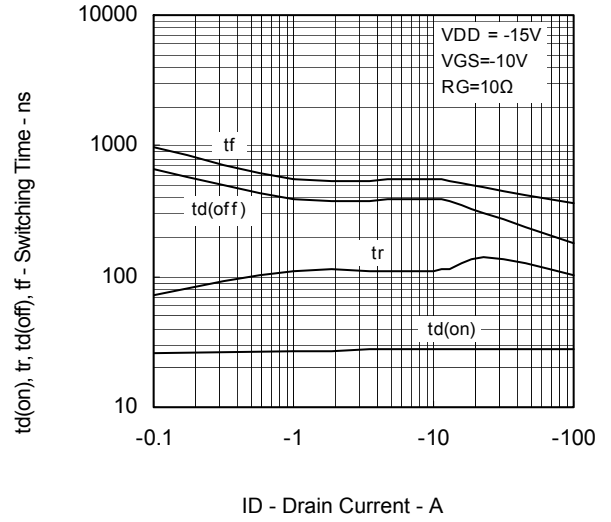
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



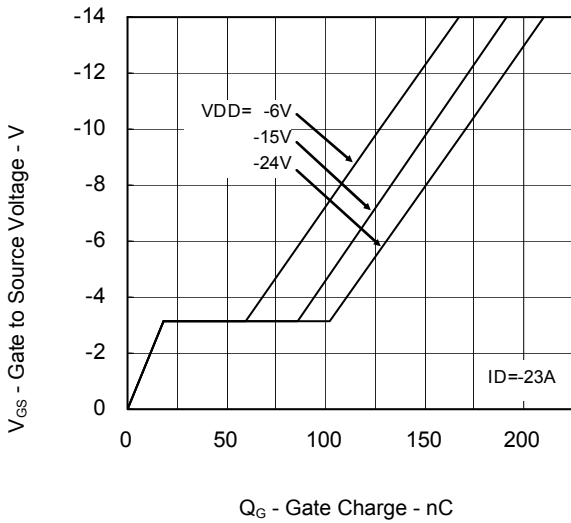
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



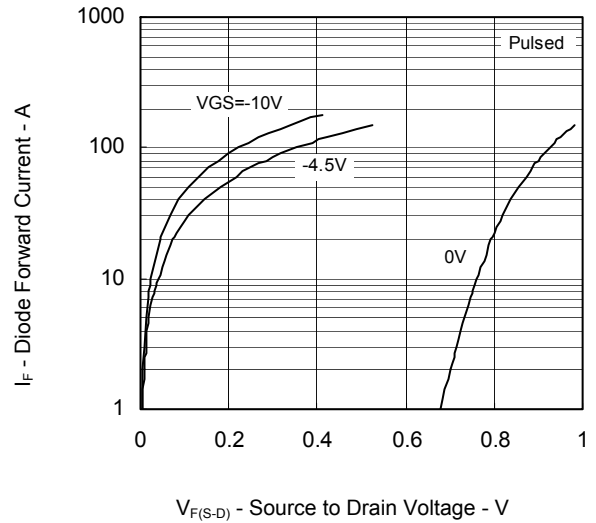
SWITCHING CHARACTERISTICS



DYNAMIC INPUT CHARACTERISTICS

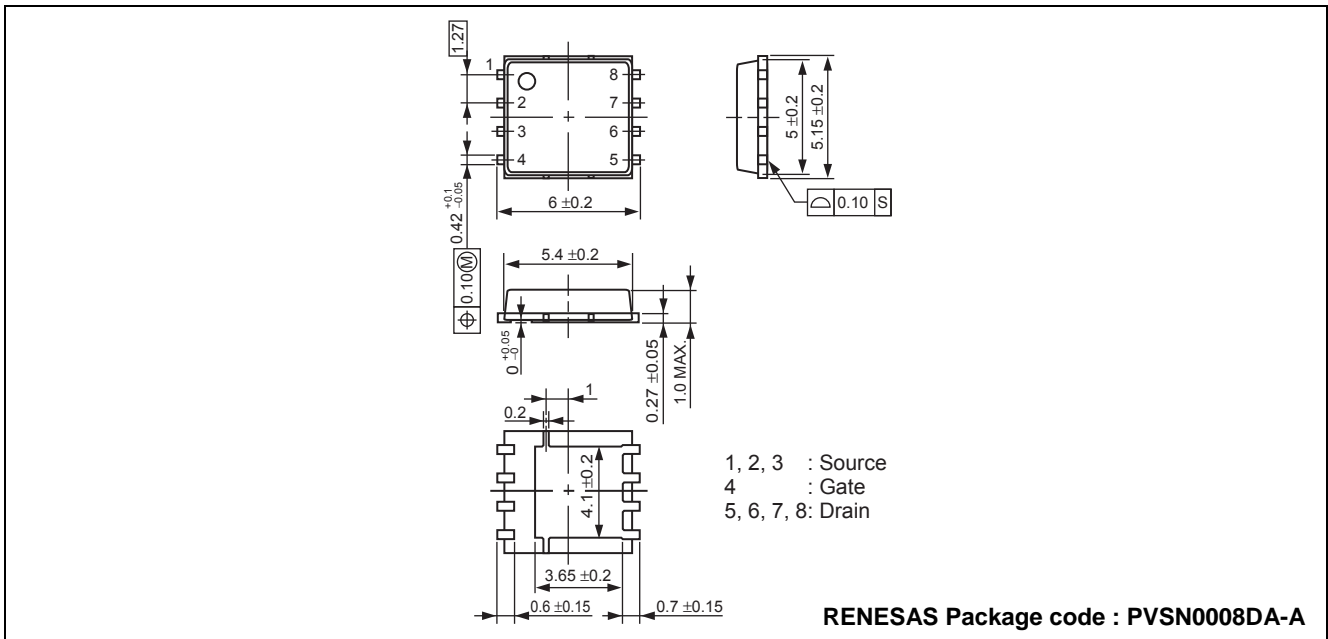


SOURCE TO DRAIN DIODE FORWARD VOLTAGE

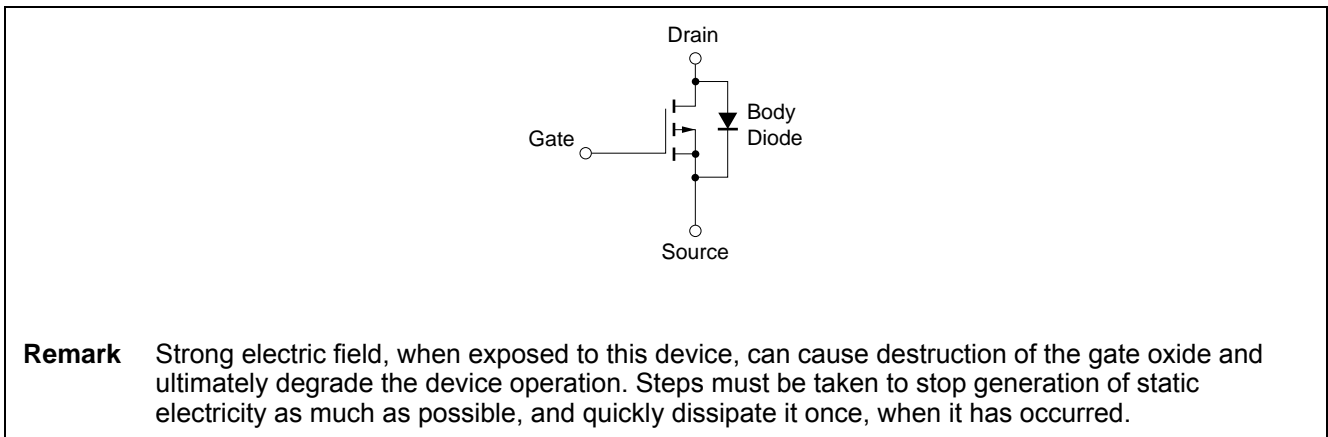


### Package Drawings (Unit: mm)

#### 8-pin HVSON (6051)



### Equivalent Circuit



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