

# μPA2766T1A

N-channel MOSFET

30 V , 130 A , 0.88 mΩ

R07DS0883EJ0102

Rev.1.02

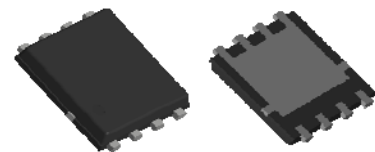
Nov 28, 2012

## Description

The μPA2766T1A is N-channel MOS Field Effect Transistor designed for high current switching application.

## Features

- $V_{DSS} = 30\text{ V}$  ( $T_A = 25^\circ\text{C}$ )
- Low on-state resistance
  - $R_{DS(on)} = 0.88\text{ m}\Omega$  MAX. ( $V_{GS} = 10\text{ V}$ ,  $I_D = 46\text{ A}$ )
  - $R_{DS(on)} = 1.82\text{ m}\Omega$  MAX. ( $V_{GS} = 4.5\text{ V}$ ,  $I_D = 39\text{ A}$ )
- 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
μPA2766T1A-E2-AY <sup>*1</sup>	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) ( $T_C = 25^\circ\text{C}$ )	$I_{D(DC)}$	±130	A
Drain Current (pulse) <sup>*1</sup>	$I_{D(pulse)}$	±312	A
Total Power Dissipation <sup>*2</sup>	$P_{T1}$	1.5	W
Total Power Dissipation (PW = 10 sec) <sup>*2</sup>	$P_{T2}$	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 <sup>*3</sup>	$I_{AS}$	55	A
Single Avalanche Energy <sup>*3</sup>	$E_{AS}$	303	mJ

## Thermal Resistance

Channel to Ambient Thermal Resistance <sup>*2</sup>	$R_{th(ch-A)}$	83.3	°C/W
Channel to Case(Drain) Thermal Resistance	$R_{th(ch-C)}$	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

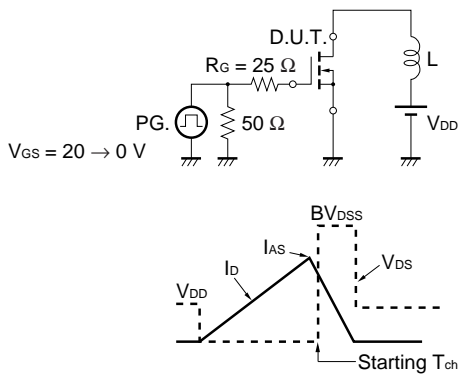
\*3. Starting  $T_{ch} = 25^\circ\text{C}$ ,  $V_{DD} = 15\text{ V}$ ,  $R_G = 25\ \Omega$ ,  $V_{GS} = 20 \rightarrow 0\text{ V}$ ,  $L = 100\ \mu\text{H}$

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

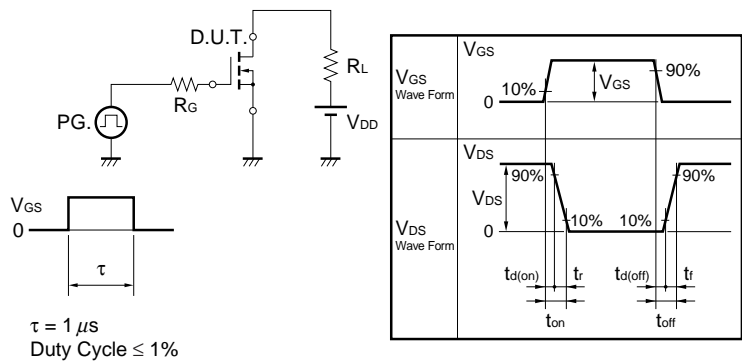
Item	Symbol	MIN.	TYP.	MAX.	Unit	Test Conditions
Zero Gate Voltage Drain Current	I <sub>DSS</sub>			10	μA	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V
Gate Leakage Current	I <sub>GSS</sub>			±100	nA	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> = 0 V
Gate Cut-off Voltage	V <sub>GS(off)</sub>	1.0		2.5	V	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1 mA
Forward Transfer Admittance *1	y <sub>fs</sub>	35			S	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 39 A
Drain to Source On-state Resistance *1	R <sub>DS(on)1</sub>		0.72	0.88	mΩ	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 46 A
	R <sub>DS(on)2</sub>		1.3	1.82	mΩ	V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 39 A
Input Capacitance	C <sub>iss</sub>		10850		pF	V <sub>DS</sub> = 10 V,
Output Capacitance	C <sub>oss</sub>		4010		pF	V <sub>GS</sub> = 0 V,
Reverse Transfer Capacitance	C <sub>rss</sub>		3340		pF	f = 1 MHz
Turn-on Delay Time	t <sub>d(on)</sub>		50		ns	V <sub>DD</sub> = 15 V, I <sub>D</sub> = 39 A,
Rise Time	t <sub>r</sub>		160		ns	V <sub>GS</sub> = 10 V,
Turn-off Delay Time	t <sub>d(off)</sub>		380		ns	R <sub>G</sub> = 10 Ω
Fall Time	t <sub>f</sub>		365		ns	
Total Gate Charge	Q <sub>G</sub>		257		nC	V <sub>DD</sub> = 15 V,
Gate to Source Charge	Q <sub>GS</sub>		33		nC	V <sub>GS</sub> = 10 V,
Gate to Drain Charge	Q <sub>GD</sub>		103		nC	I <sub>D</sub> = 78 A
Body Diode Forward Voltage *1	V <sub>F(S-D)</sub>		0.80	1.5	V	I <sub>F</sub> = 46A, V <sub>GS</sub> = 0 V
Reverse Recovery Time	t <sub>rr</sub>		215		ns	I <sub>F</sub> = 50 A, V <sub>GS</sub> = 0 V,
Reverse Recovery Charge	Q <sub>rr</sub>		415		nC	di/dt = 100 A/μs

Note: \*1. Pulsed

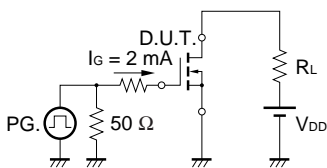
**TEST CIRCUIT 1 AVALANCHE CAPABILITY**



**TEST CIRCUIT 2 SWITCHING TIME**

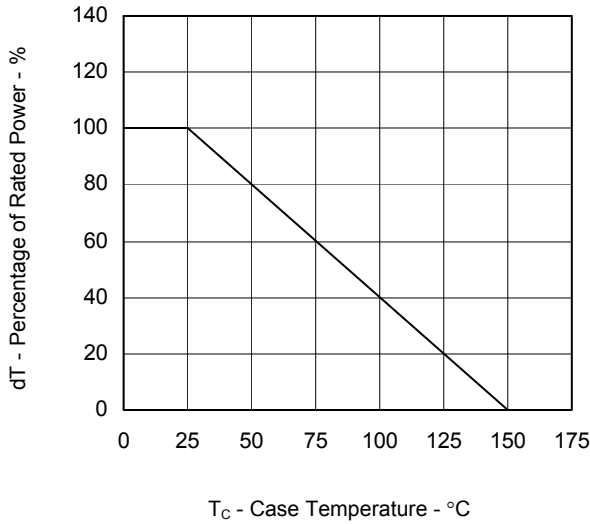


**TEST CIRCUIT 3 GATE CHARGE**

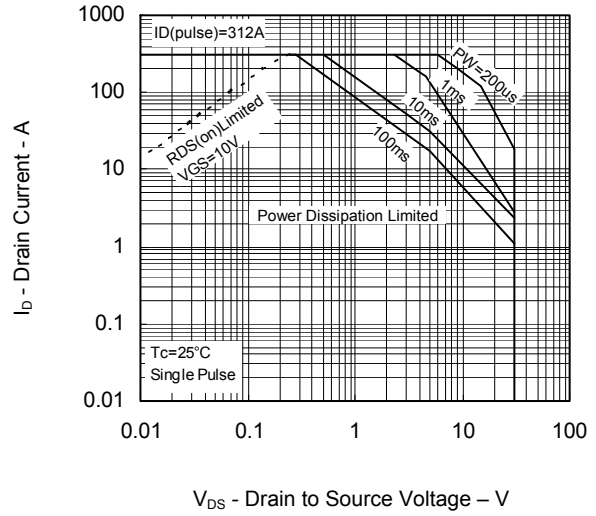


TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)

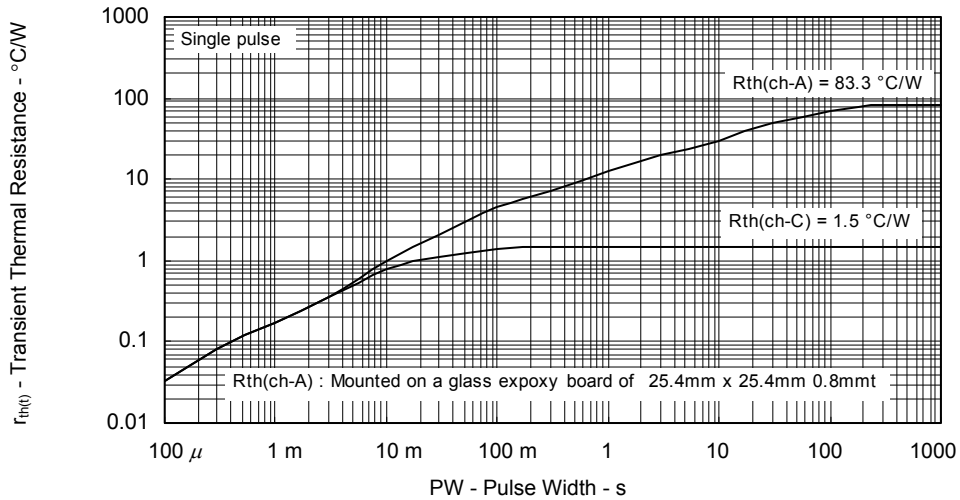
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



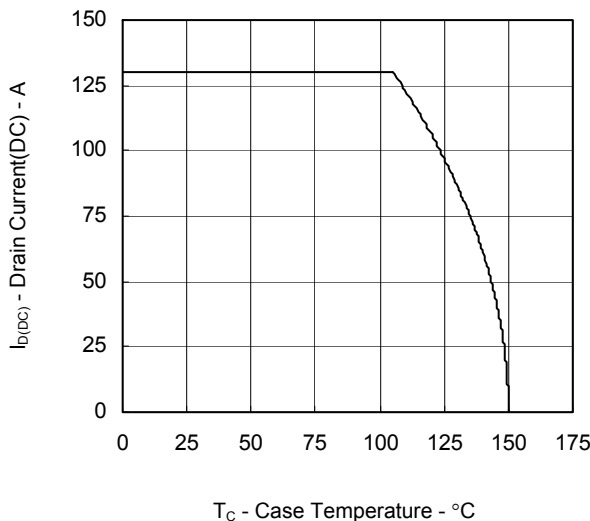
FORWARD BIAS SAFE OPERATING AREA



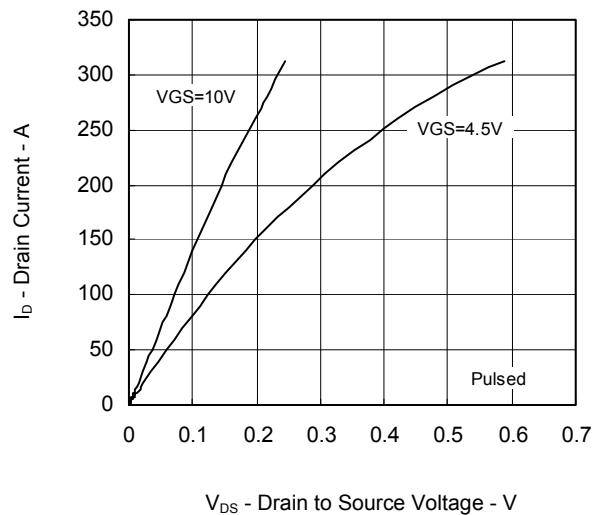
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



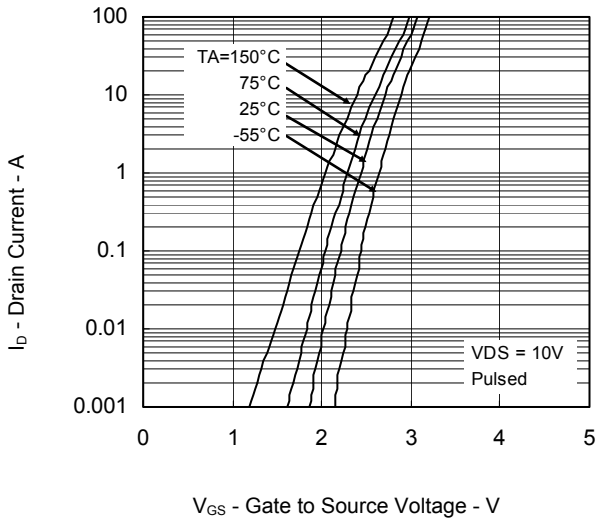
DRAIN CURRENT(DC) vs. CASE TEMPERATURE



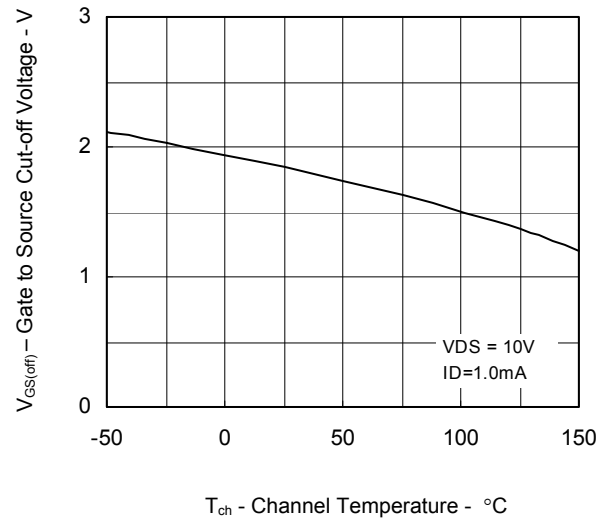
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



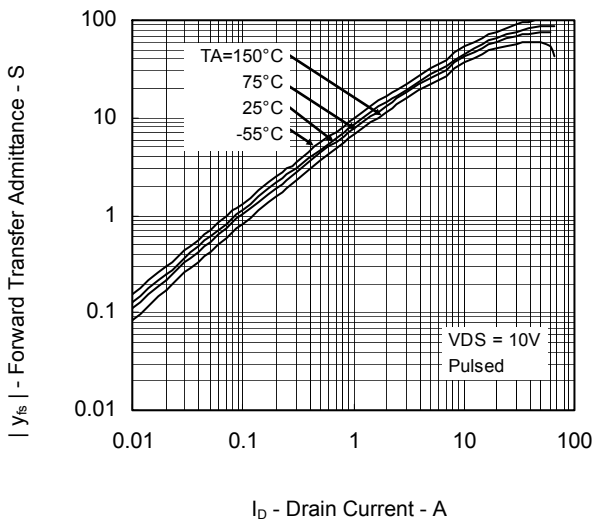
**FORWARD TRANSFER CHARACTERISTICS**



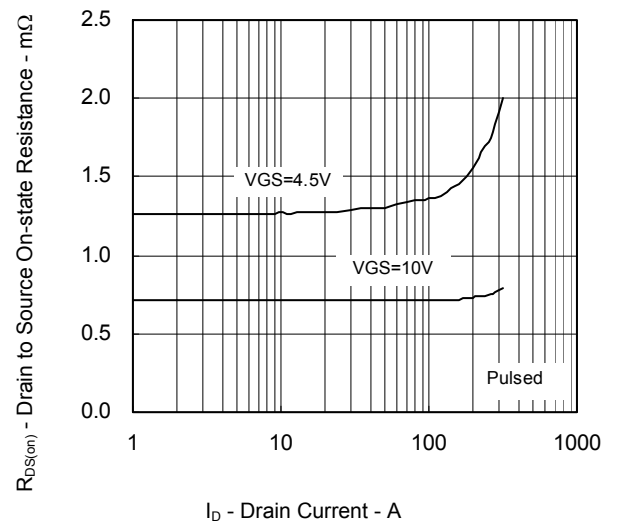
**GATE TO SOURCE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE**



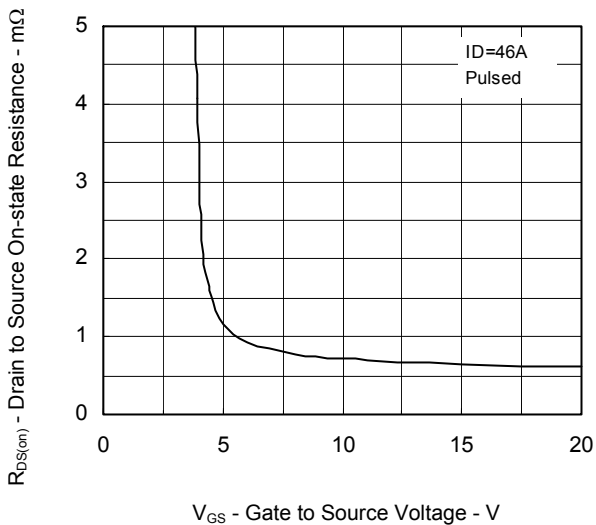
**FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT**



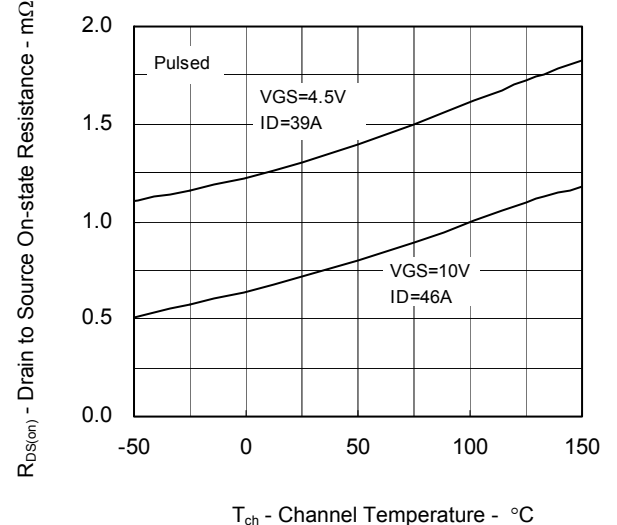
**DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT**



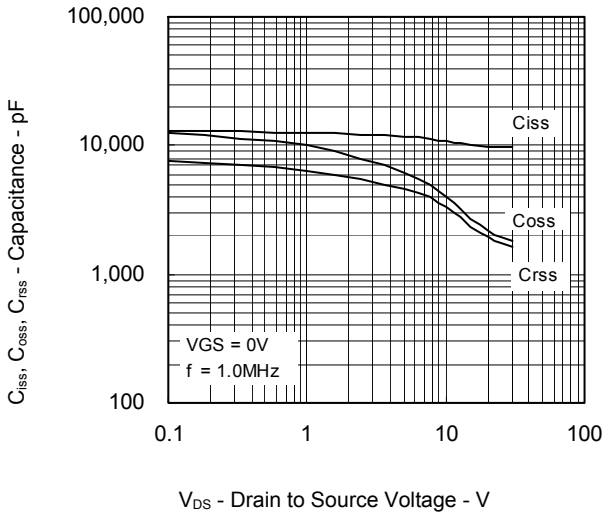
**DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE**



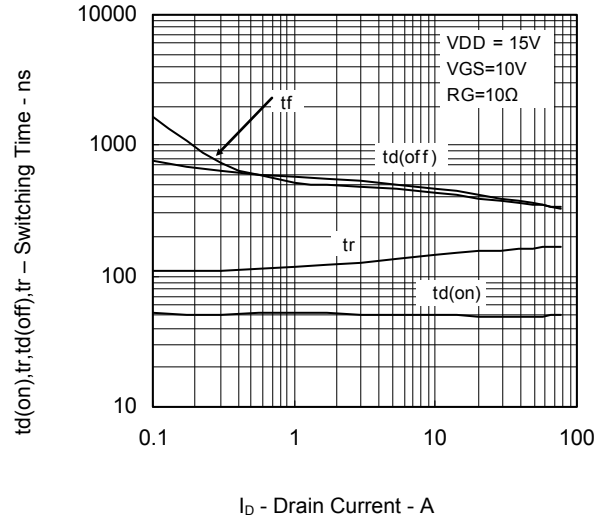
**DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE**



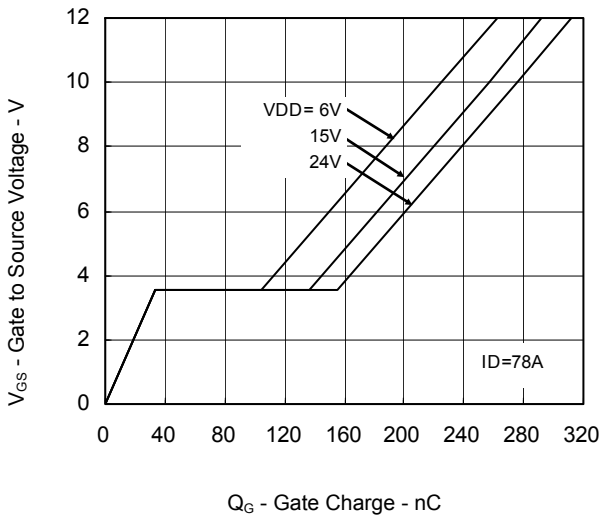
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



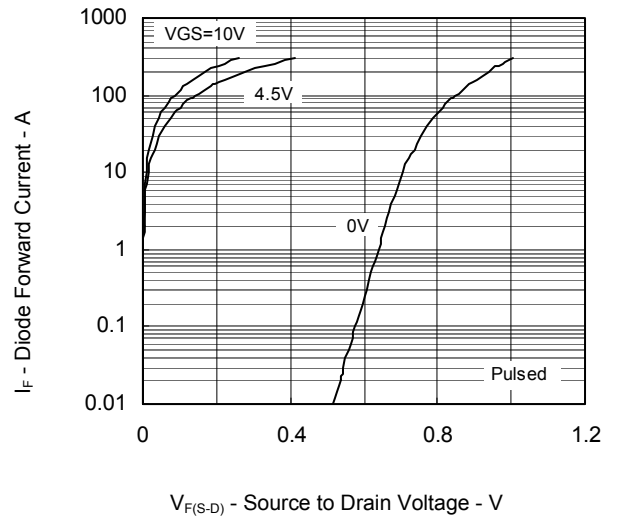
SWITCHING CHARACTERISTICS



DYNAMIC INPUT CHARACTERISTICS

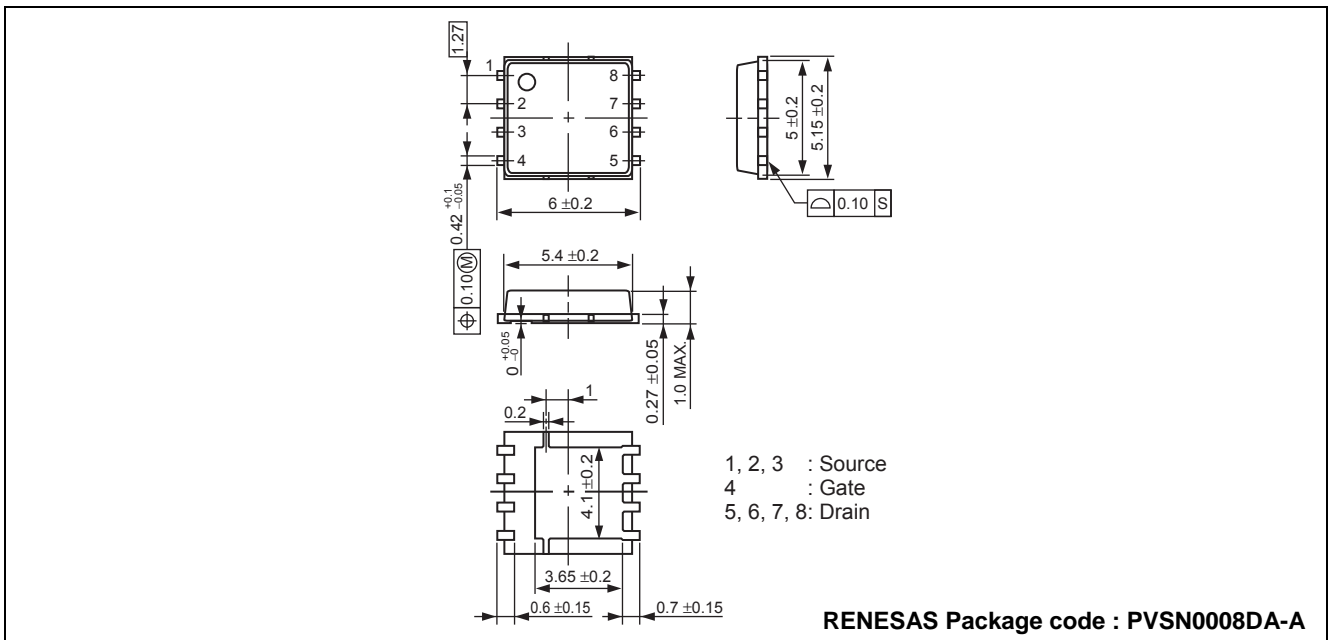


SOURCE TO DRAIN DIODE FORWARD VOLTAGE

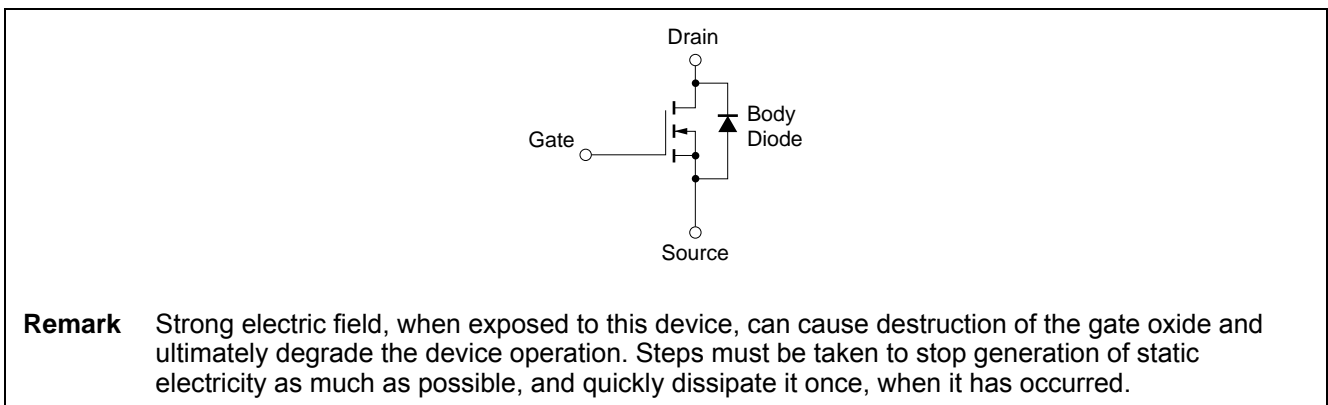


### Package Drawings (Unit: mm)

#### 8pin-HVSON(6051)



### Equivalent Circuit



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