

μPA3753GR

DUAL N-channel MOSFET
60V, 5A, 56mΩ

R07DS1322EJ0100
Rev.1.00
Jan 25, 2016

Description

The μPA3753GR is Dual N-channel MOS Field Effect Transistors designed for switching application.

Features

- Dual chip type
- Low on-state resistance
 - $R_{DS(on)} = 56 \text{ m}\Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 2.5 \text{ A)}$
 - $R_{DS(on)} = 72 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 2.5 \text{ A)}$
- Low gate charge
 - $Q_G = 13.4 \text{ nC TYP. (} V_{GS} = 10 \text{ V)}$
- Small and surface mount package (SOP-8)



SOP-8

Ordering Information

Part No.	Lead Plating	Packing	Package
μPA3753GR-E1-AX ^{*1}	Ni / Pd / Au	Tape 2500 p/reel	SOP-8 0.085 g TYP.
μPA3753GR-E2-AX ^{*1}			

Note: ^{*1}. Pb-Free (This product does not contain Pb in the external electrode and other parts.)
"E1", "E2" indicates the unit orientation.

Absolute Maximum Ratings (T_A = 25°C)

Item	Symbol	Ratings	Unit
Drain to Source Voltage (V _{GS} = 0 V)	V _{DSS}	60	V
Gate to Source Voltage (V _{DS} = 0 V)	V _{GSS}	±20	V
Drain Current (DC)	I _{D(DC)}	±5.0	A
Drain Current (pulse) ^{*1}	I _{D(pulse)}	±20	A
Total Power Dissipation (1unit) ^{*2}	P _{T1}	0.85	W
Total Power Dissipation (2units) ^{*2}	P _{T2}	1.12	W
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{STG}	−55 to +150	°C
Single Avalanche Current ^{*3}	I _{AS}	5.0	A
Single Avalanche Energy ^{*3}	E _{AS}	2.5	mJ

Notes: ^{*1}. PW ≤ 10 μs, Duty Cycle ≤ 1%

^{*2}. Mounted on glass epoxy board of 25.4 mm x 25.4 mm x 0.8 mm

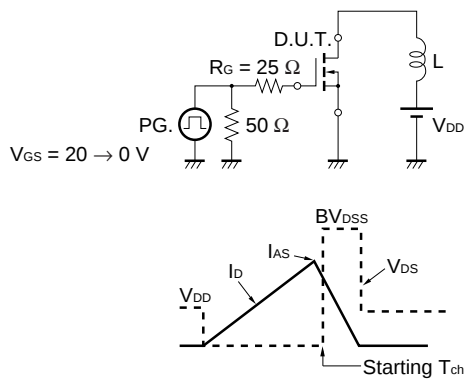
^{*3}. Starting T_{ch} = 25°C, V_{DD} = 30 V, R_G = 25 Ω, V_{GS} = 20 → 0 V, L = 100 μH

Electrical Characteristics (T_A = 25°C)

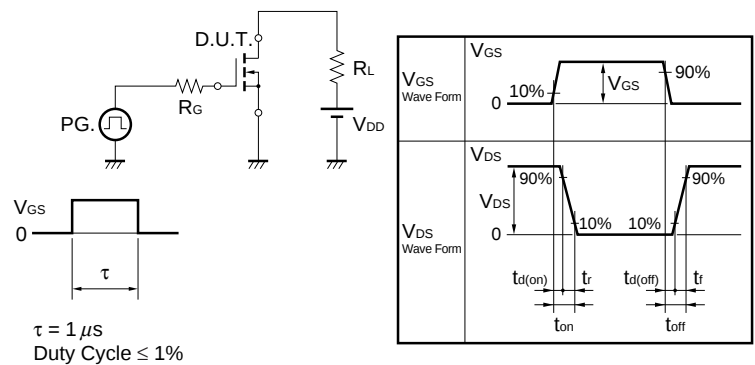
Item	Symbol	MIN.	TYP.	MAX.	Unit	Test Conditions
Zero Gate Voltage Drain Current	I _{DSS}			1.0	μA	V _{DS} = 60 V, V _{GS} = 0 V
Gate Leakage Current	I _{GSS}			±100	nA	V _{GS} = ±20 V, V _{DS} = 0 V
Gate Cut-off Voltage	V _{GS(off)}	1.5		2.5	V	V _{DS} = 10 V, I _D = 1 mA
Forward Transfer Admittance *1	y _{fs}	2.5			S	V _{DS} = 10 V, I _D = 2.5 A
Drain to Source On-state Resistance *1	R _{DS(on)1}		44	56	mΩ	V _{GS} = 10 V, I _D = 2.5 A
	R _{DS(on)2}		49	72	mΩ	V _{GS} = 4.5V, I _D = 2.5 A
Input Capacitance	C _{iss}		640		pF	V _{DS} = 10 V,
Output Capacitance	C _{oss}		72		pF	V _{GS} = 0 V,
Reverse Transfer Capacitance	C _{rss}		32		pF	f = 1.0 MHz
Turn-on Delay Time	t _{d(on)}		8.5		ns	I _D = 2.5 A, V _{DD} = 30 V, V _{GS} = 10 V, R _G = 10 Ω
Rise Time	t _r		3.7		ns	
Turn-off Delay Time	t _{d(off)}		30		ns	
Fall Time	t _f		5.1		ns	
Total Gate Charge	Q _G		13.4		nC	V _{GS} = 10 V, I _D = 5 A , V _{DD} = 48 V
Gate to Source Charge	Q _{GS}		1.6		nC	
Gate to Drain Charge	Q _{GD}		3.1		nC	
Body Diode Forward Voltage *1	V _{F(S-D)}			1.2	V	I _F = 5.0 A, V _{GS} = 0 V
Reverse Recovery Time	t _{rr}		22		ns	I _F = 5.0 A, V _{GS} = 0 V, di/dt = 100 A/μs
Reverse Recovery Charge	Q _{rr}		36		nC	

Note: *1. Pulsed

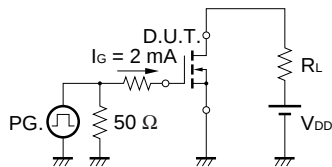
TEST CIRCUIT 1 AVALANCHE CAPABILITY



TEST CIRCUIT 2 SWITCHING TIME

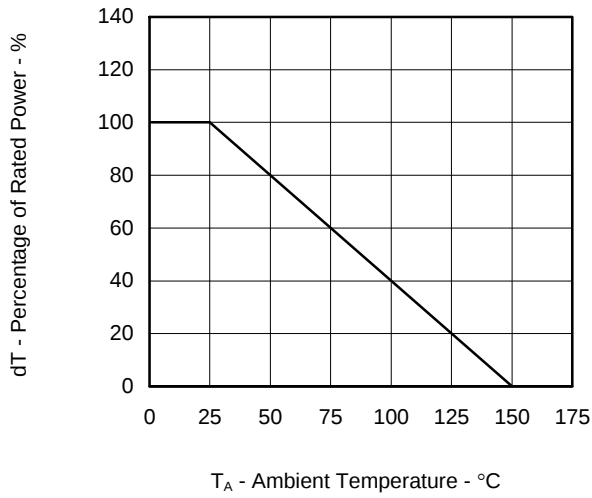


TEST CIRCUIT 3 GATE CHARGE

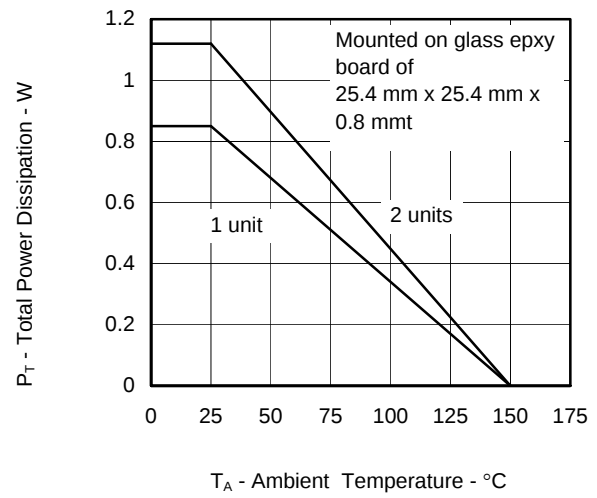


Typical Characteristics ($T_A = 25^\circ\text{C}$)

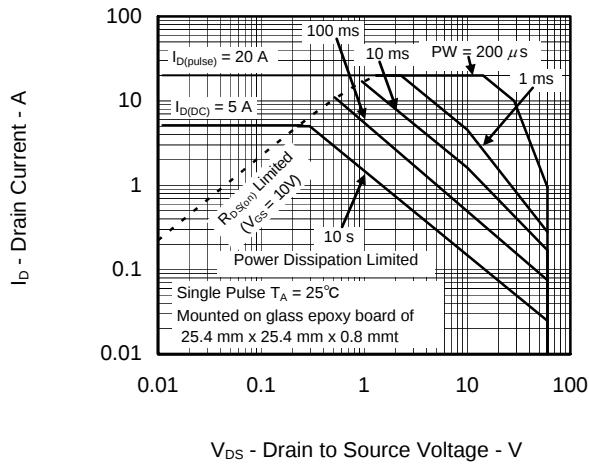
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



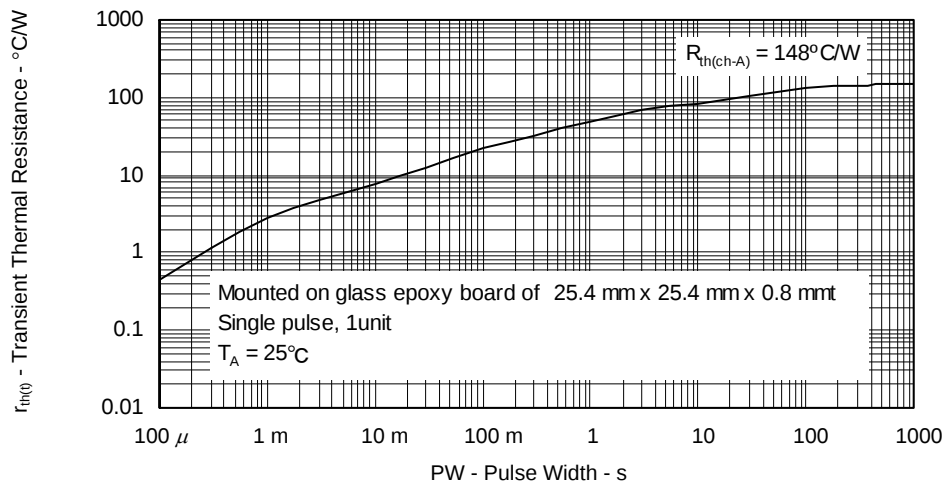
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



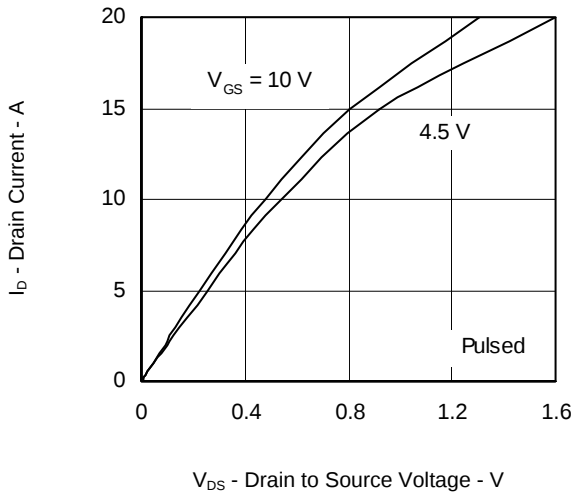
FORWARD BIAS SAFE OPERATING AREA



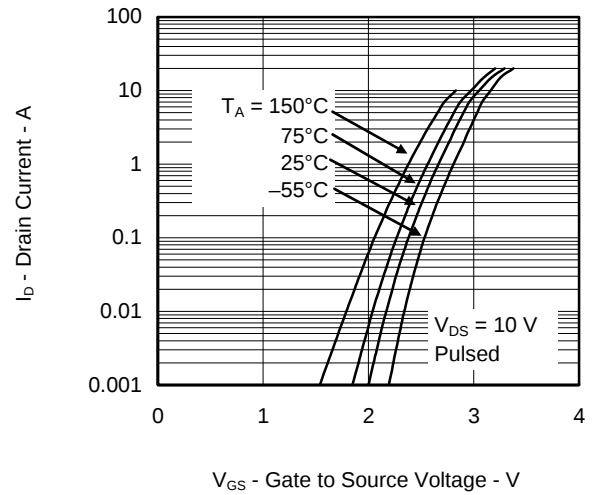
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



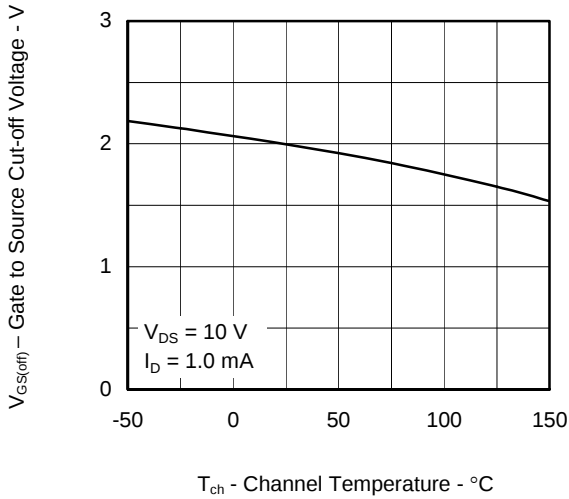
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



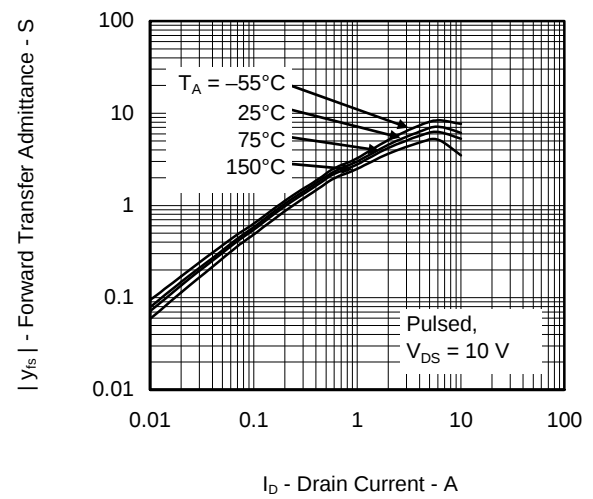
FORWARD TRANSFER CHARACTERISTICS



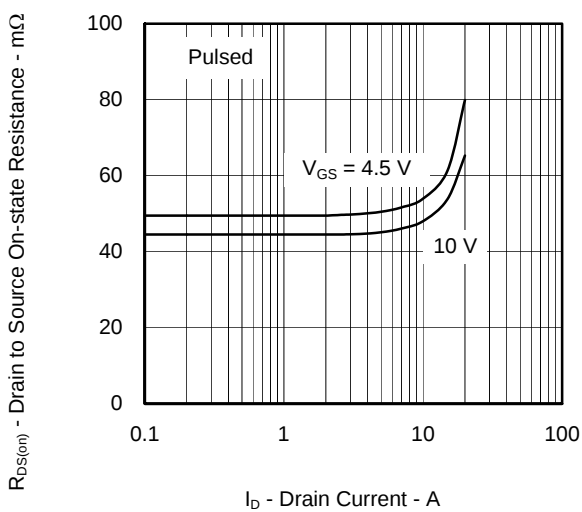
GATE TO SOURCE CUT-OFF VOLTAGE vs.
CHANNEL TEMPERATURE



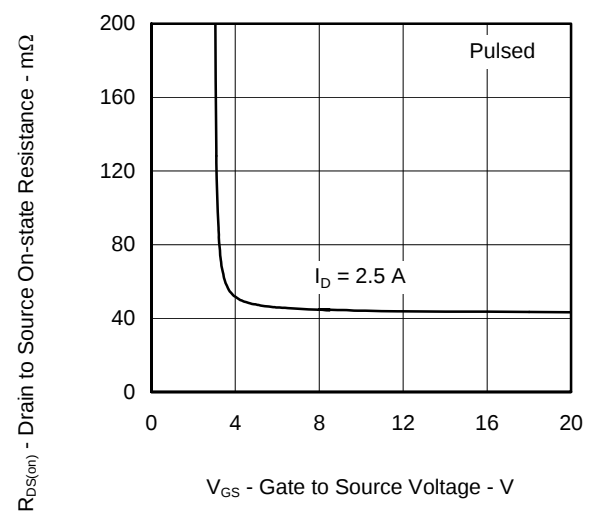
FORWARD TRANSFER ADMITTANCE vs. DRAIN
CURRENT



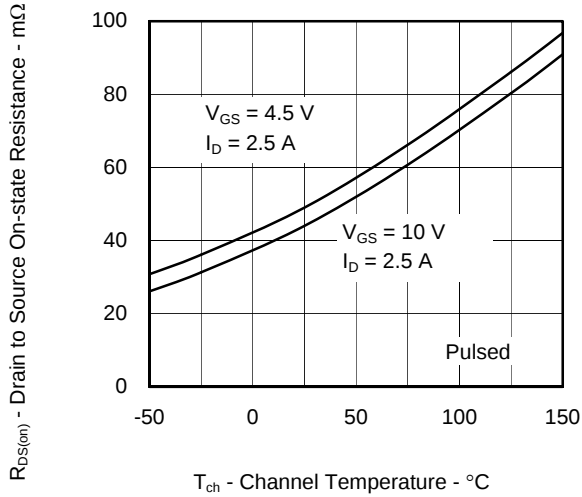
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



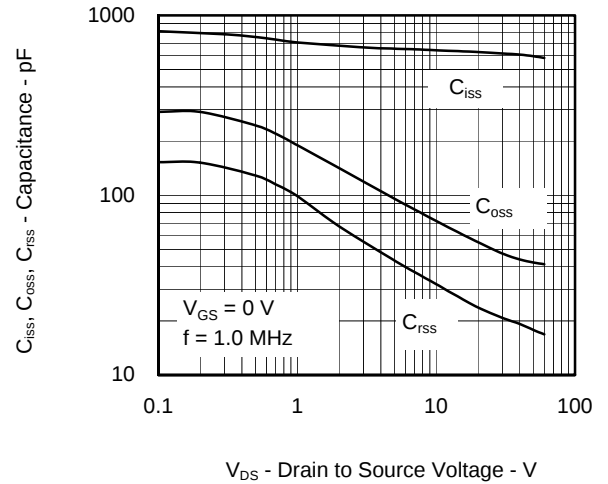
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



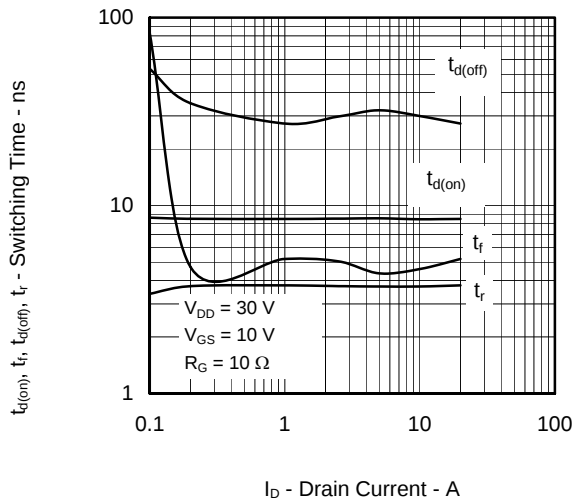
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



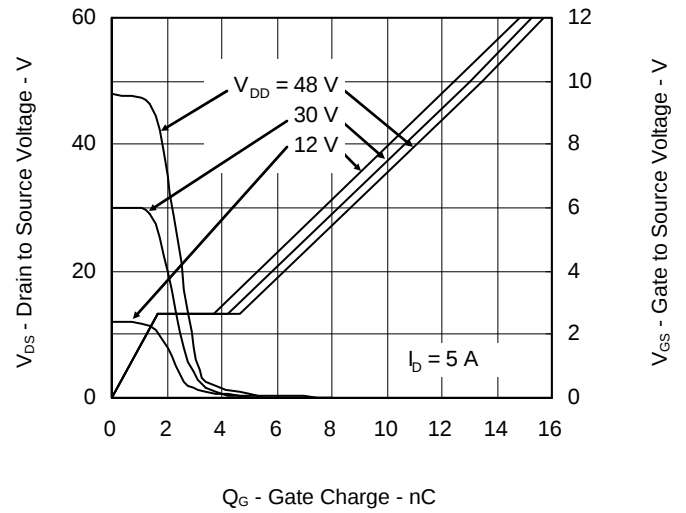
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



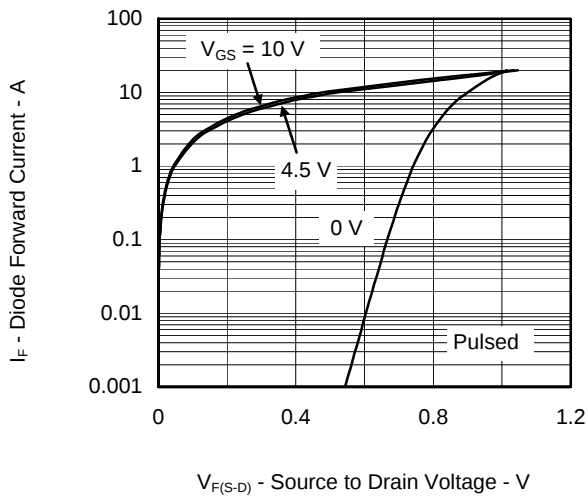
SWITCHING CHARACTERISTICS



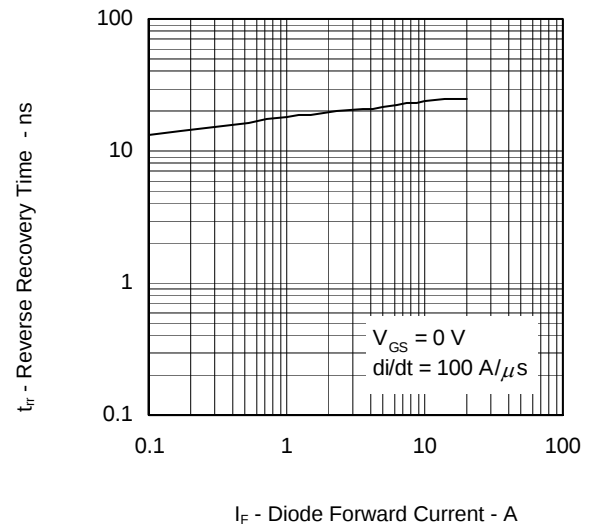
DYNAMIC INPUT/OUTPUT CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE

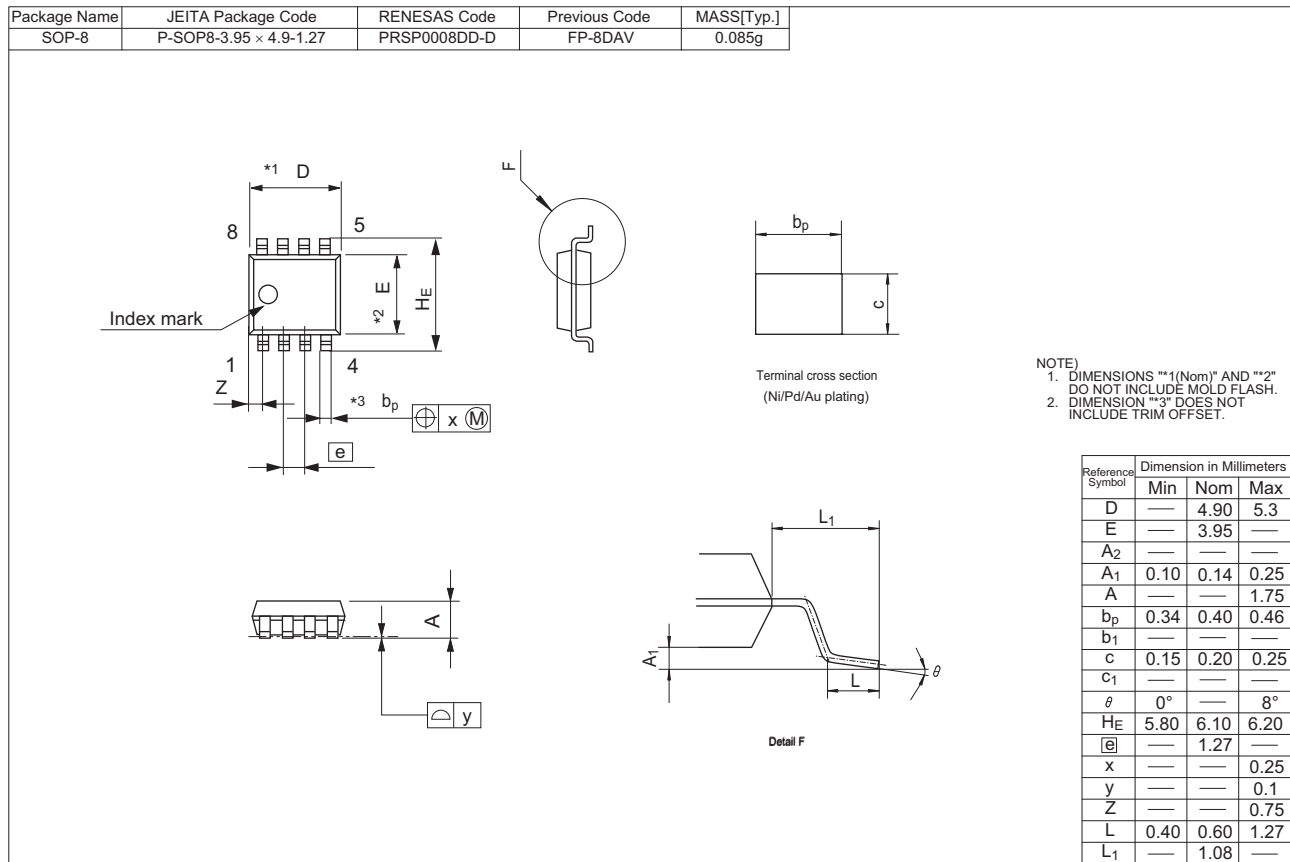


REVERSE RECOVERY TIME vs DIODE FORWARD CURRENT

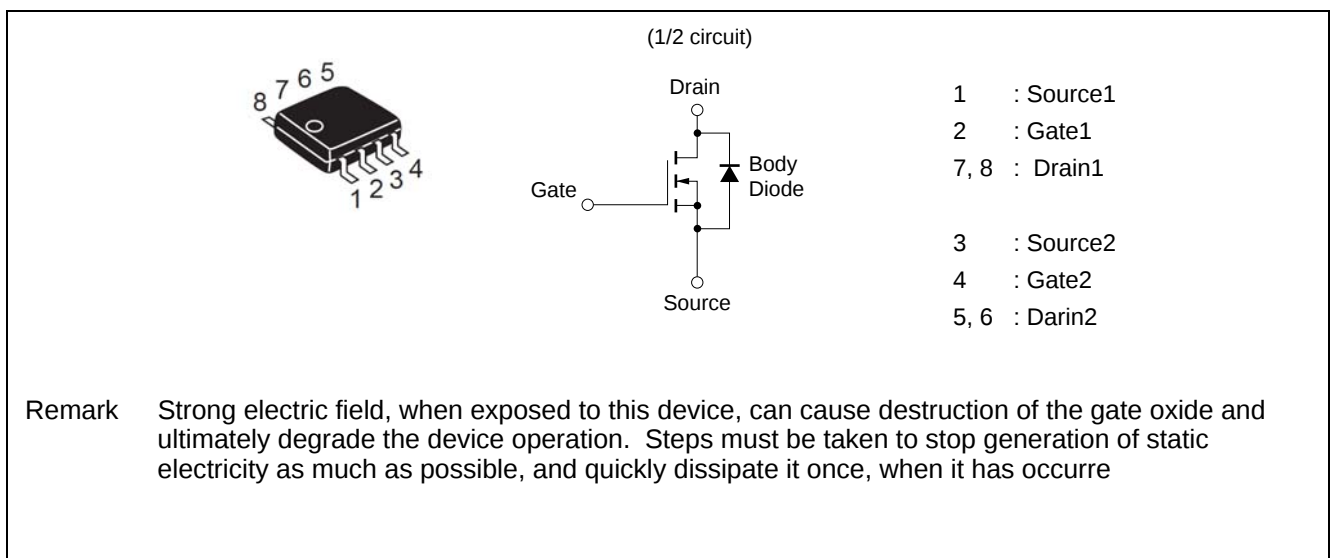


Package Drawings (Unit: mm)

SOP-8



Equivalent Circuit



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