

To our customers,

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## Old Company Name in Catalogs and Other Documents

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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# MOS FIELD EFFECT TRANSISTOR

# $\mu$ PA2550

## DUAL P-CHANNEL MOSFET FOR SWITCHING

### DESCRIPTION

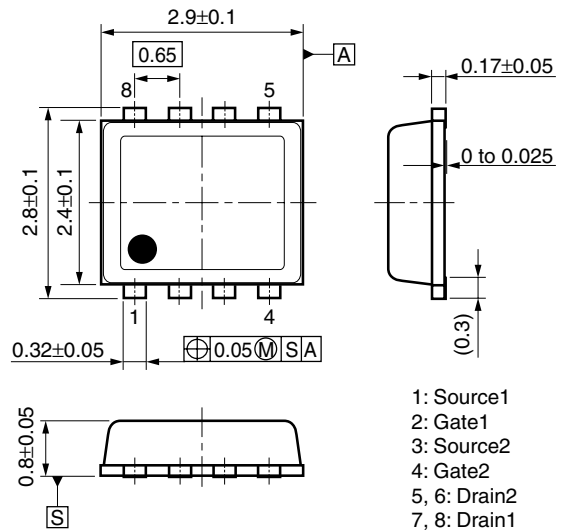
The  $\mu$ PA2550 is dual P-channel MOSFETs designed for power management applications of portable equipments, such as load switch.

Dual P-channel MOSFETs are assembled in one package, to contribute minimize the equipments.

### FEATURES

- 1.8 V drive available
- Low on-state resistance
  - $R_{DS(on)1} = 40 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -2.5 \text{ A)}$
  - $R_{DS(on)2} = 60 \text{ m}\Omega \text{ MAX. (} V_{GS} = -2.5 \text{ V, } I_D = -2.5 \text{ A)}$
  - $R_{DS(on)3} = 93 \text{ m}\Omega \text{ MAX. (} V_{GS} = -1.8 \text{ V, } I_D = -2.5 \text{ A)}$
- Built-in gate protection diode
- Small and surface mount package (8-pin VSO (2429))

### PACKAGE DRAWING (Unit: mm)



### ORDERING INFORMATION

PART NUMBER	LEAD PLATING	PACKING	PACKAGE
$\mu$ PA2550T1H-T1-AT <sup>Note</sup>	Pure Sn	8 mm embossed taping	8-pin VSO (2429)
$\mu$ PA2550T1H-T2-AT <sup>Note</sup>		3000 p/reel	

**Note** Pb-free (This product does not contain Pb in the external electrode and other parts.)

**Marking:** 2550

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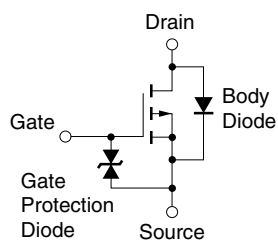
**ABSOLUTE MAXIMUM RATINGS (TA = 25°C)**

Drain to Source Voltage (VGS = 0 V)	V <sub>DSS</sub>	-12	V
Gate to Source Voltage (VDS = 0 V)	V <sub>GSS</sub>	±8	V
Drain Current (DC)	I <sub>D(DC)</sub>	±5.0	A
Drain Current (pulse) <sup>Note1</sup>	I <sub>D(pulse)</sub>	±20	A
Total Power Dissipation (1 unit, 5 s) <sup>Note2</sup>	P <sub>T1</sub>	1.5	W
Total Power Dissipation (2 units, 5 s) <sup>Note2</sup>	P <sub>T2</sub>	2.2	W
Channel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

**Notes 1.** PW ≤ 10 μs, Duty Cycle ≤ 1%

**2.** Mounted on FR-4 board of 25.4 mm x 25.4 mm x 0.8 mm

**EQUIVALENT CIRCUIT (1/2)**



**Remark** The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

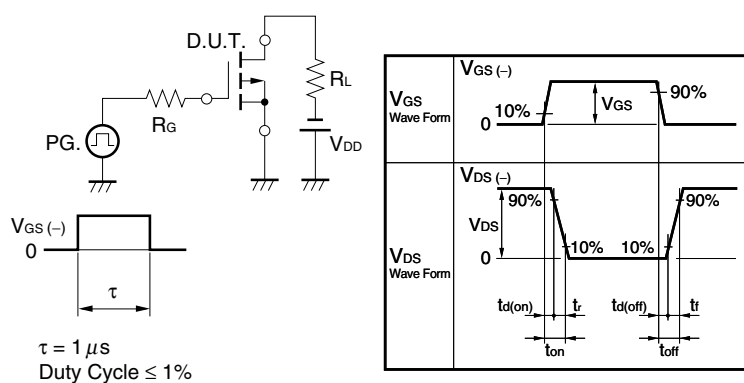
**Caution** This product is electrostatic-sensitive device due to low ESD capability and should be handled with caution for electrostatic discharge.

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

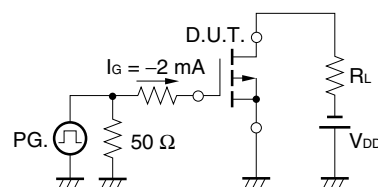
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -12 V, V <sub>GS</sub> = 0 V			-1	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±8 V, V <sub>DS</sub> = 0 V			±10	μA
Gate to Source Cut-off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -1 mA	-0.4	-0.7	-1.0	V
Forward Transfer Admittance <sup>Note</sup>	y <sub>fs</sub>	V <sub>DS</sub> = -10 V, I <sub>D</sub> = -2.5 A	3.5			S
Drain to Source On-state Resistance <sup>Note</sup>	R <sub>DS(on)1</sub>	V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -2.5 A		29	40	mΩ
	R <sub>DS(on)2</sub>	V <sub>GS</sub> = -2.5 V, I <sub>D</sub> = -2.5 A		37	60	mΩ
	R <sub>DS(on)3</sub>	V <sub>GS</sub> = -1.8 V, I <sub>D</sub> = -2.5 A		53	93	mΩ
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -10 V,		930		pF
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> = 0 V,		200		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	f = 1.0 MHz		170		pF
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = -6 V, I <sub>D</sub> = -2.5 A,		11		ns
Rise Time	t <sub>r</sub>	V <sub>GS</sub> = -4 V,		3.3		ns
Turn-off Delay Time	t <sub>d(off)</sub>	R <sub>G</sub> = 6 Ω		70		ns
Fall Time	t <sub>f</sub>			46		ns
Total Gate Charge	Q <sub>G</sub>	V <sub>DD</sub> = -6 V, V <sub>GS</sub> = -4 V, I <sub>D</sub> = -5 A		8.7		nC
Body Diode Forward Voltage <sup>Note</sup>	V <sub>F(S-D)</sub>	I <sub>F</sub> = -5 A, V <sub>GS</sub> = 0 V		0.9		V

Note Pulsed

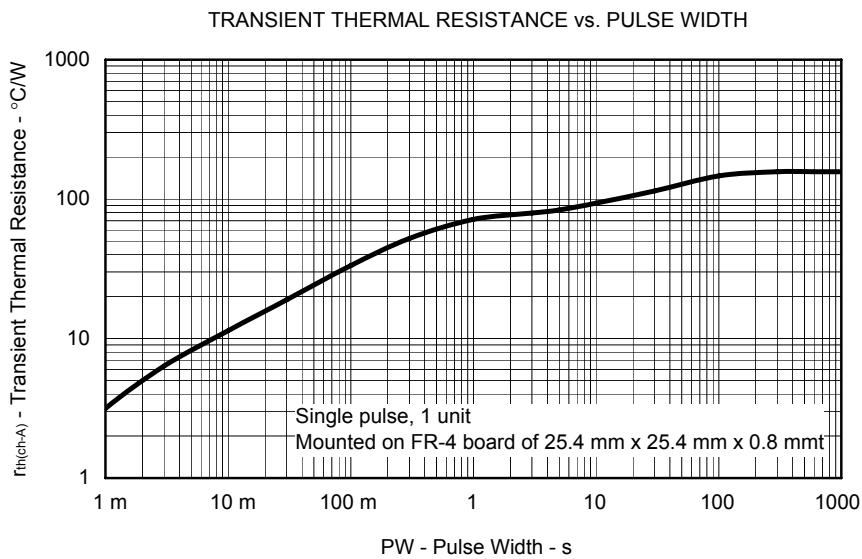
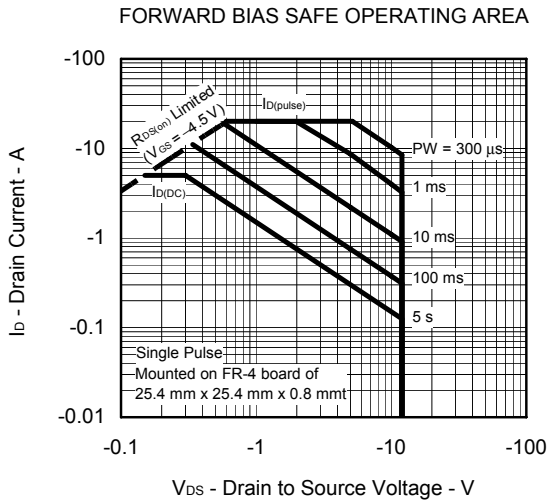
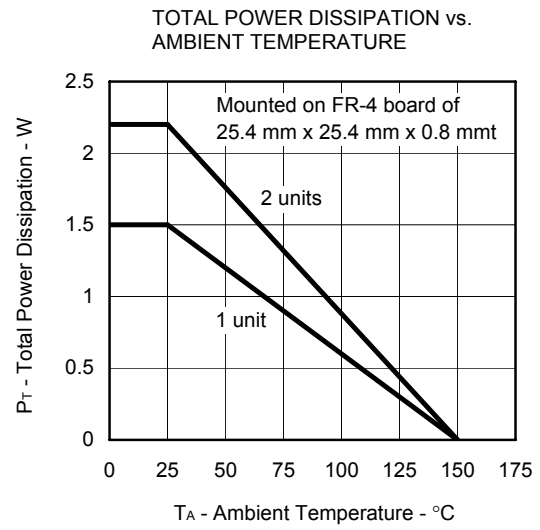
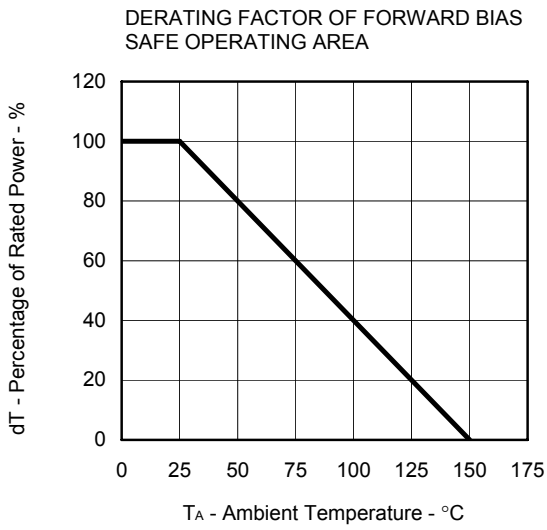
TEST CIRCUIT 1 SWITCHING TIME



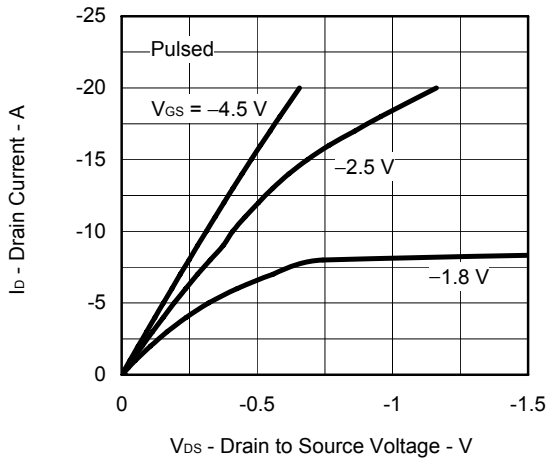
TEST CIRCUIT 2 GATE CHARGE



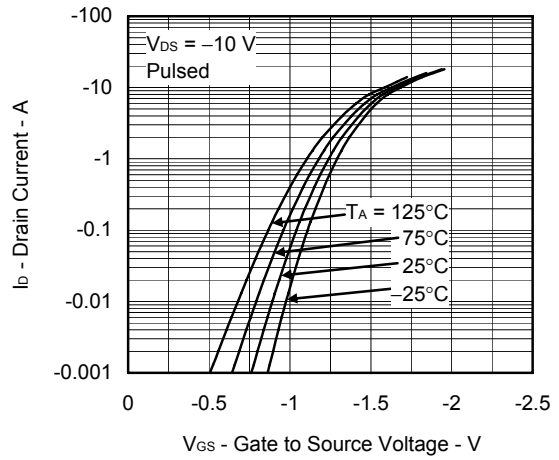
TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)



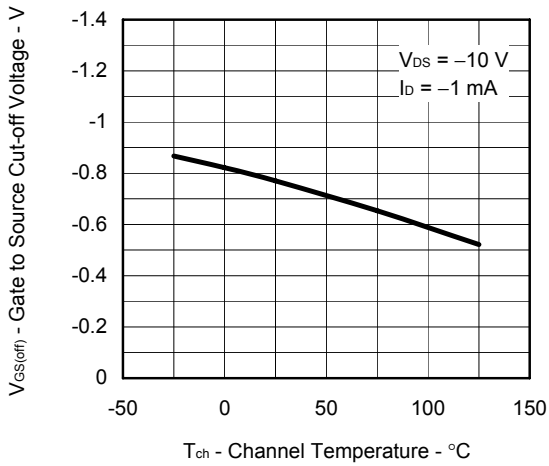
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



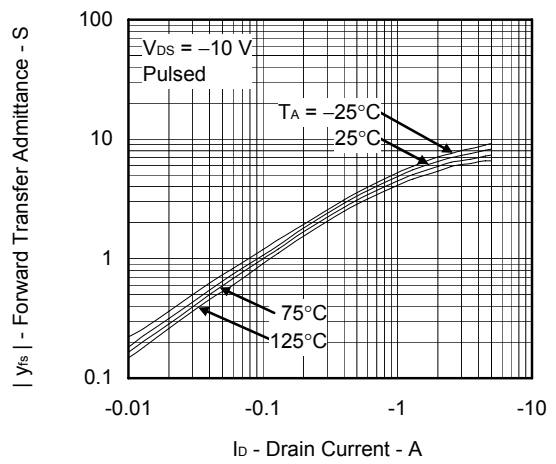
FORWARD TRANSFER CHARACTERISTICS



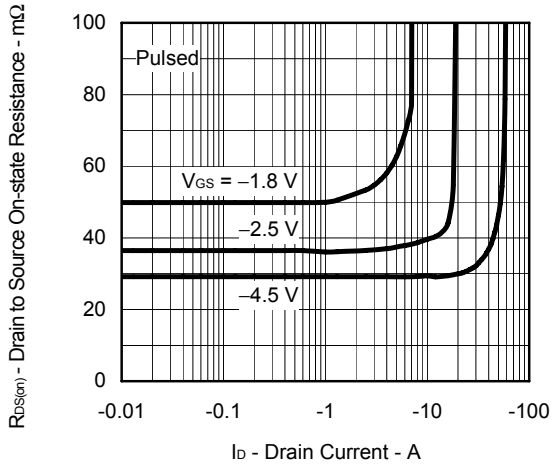
GATE TO SOURCE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



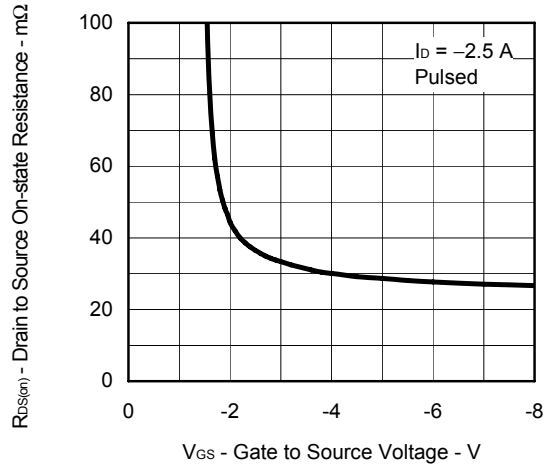
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



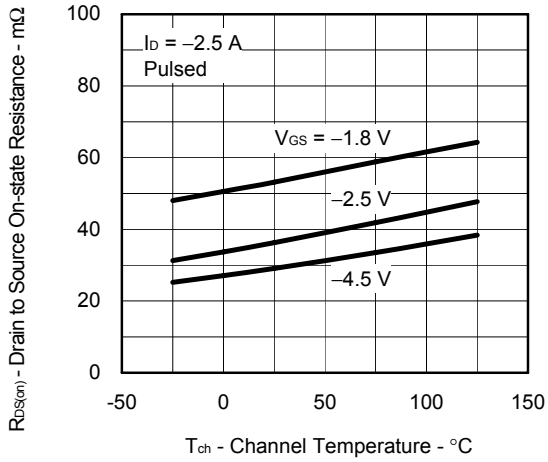
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



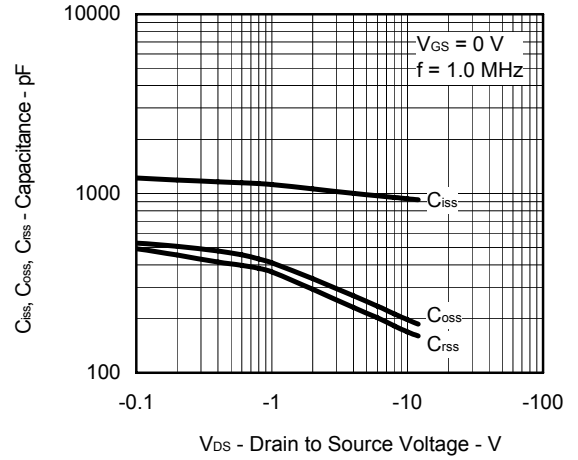
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



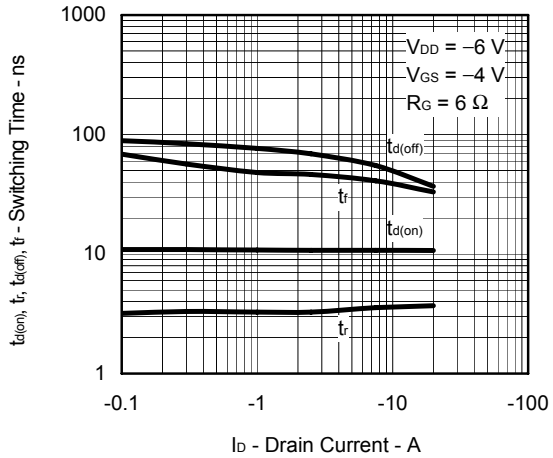
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



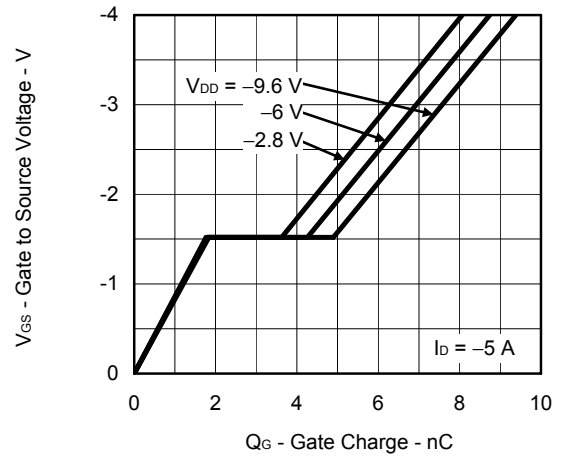
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



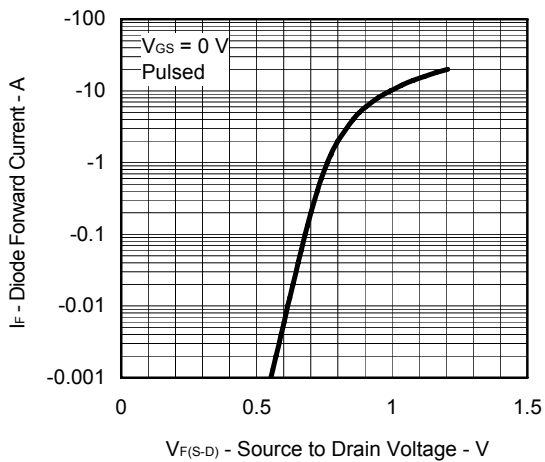
SWITCHING CHARACTERISTICS



DYNAMIC INPUT CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE





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