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April 1st, 2010
Renesas Electronics Corporation

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

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for new design

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DATA SHEET



MOS FIELD EFFECT TRANSISTOR

μPA2750GR

SWITCHING

N-CHANNEL POWER MOS FET

DESCRIPTION

The μPA2750GR is N-Channel MOS Field Effect Transistor designed for DC/DC converters and power management application of notebook computers.

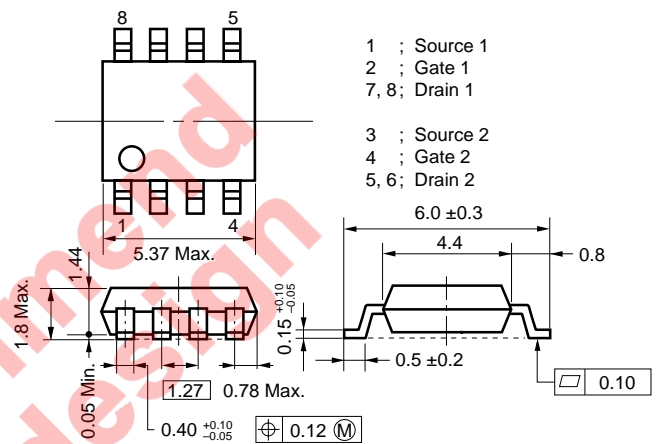
FEATURES

- Dual chip type
- Low on-state resistance
 $R_{DS(on)1} = 15.5 \text{ m}\Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 4.5 \text{ A)}$
 $R_{DS(on)2} = 21.0 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 4.5 \text{ A)}$
 $R_{DS(on)3} = 23.9 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.0 \text{ V, } I_D = 4.5 \text{ A)}$
- Low C_{iss} : $C_{iss} = 1040 \text{ pF TYP. (} V_{DS} = 10 \text{ V, } V_{GS} = 0 \text{ V)}$
- Built-in G-S protection diode
- Small and surface mount package (Power SOP8)

ORDERING INFORMATION

PART NUMBER	PACKAGE
μPA2750GR	Power SOP8

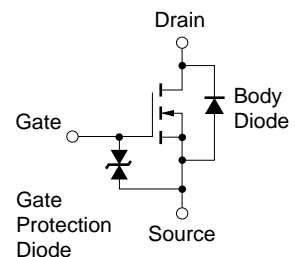
PACKAGE DRAWING (Unit: mm)



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C, All terminals are connected.)

Drain to Source Voltage (V _{GS} = 0 V)	V _{DS}	30	V
Gate to Source Voltage (V _{DS} = 0 V)	V _{GS}	±20	V
Drain Current (DC)	I _{D(DC)}	±9.0	A
Drain Current (pulse) ^{Note1}	I _{D(pulse)}	±36	A
Total Power Dissipation (1 unit) ^{Note2}	P _T	1.7	W
Total Power Dissipation (2 unit) ^{Note2}	P _T	2.0	W
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C
Single Avalanche Current ^{Note3}	I _{AS}	9.0	A
Single Avalanche Energy ^{Note3}	E _{AS}	8.1	mJ

EQUIVALENT CIRCUIT (1/2 circuit)



- Notes**
1. $PW \leq 10 \mu s$, Duty cycle $\leq 1\%$
 2. T_A = 25°C, Mounted on ceramic substrate of 2000 mm² x 2.2 mm
 3. Starting T_{ch} = 25°C, V_{DD} = 15 V, R_G = 25 Ω, V_{GS} = 20 → 0 V

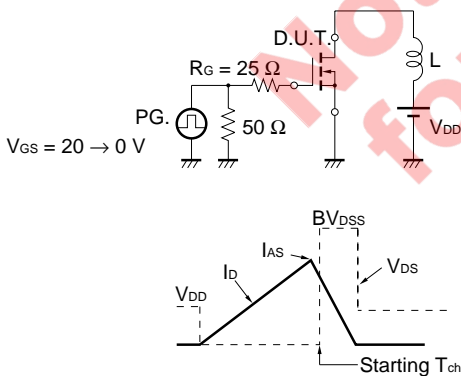
Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

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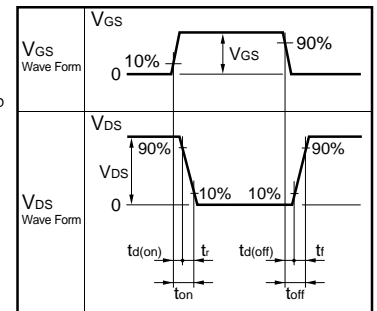
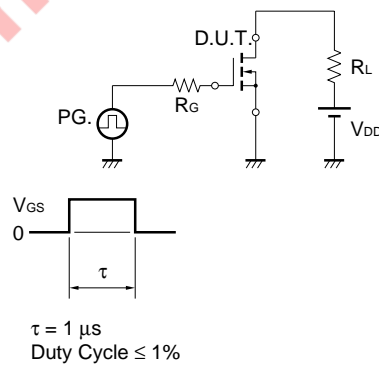
ELECTRICAL CHARACTERISTICS (T_A = 25°C, All terminals are connected.)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V			10	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V			±10	μA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 mA	1.5	2.0	2.5	V
Forward Transfer Admittance	y _{fs}	V _{DS} = 10 V, I _D = 4.5 A	5	11		S
Drain to Source On-state Resistance	R _{DS(on)1}	V _{GS} = 10 V, I _D = 4.5 A		12.5	15.5	mΩ
	R _{DS(on)2}	V _{GS} = 4.5 V, I _D = 4.5 A		16.0	21.0	mΩ
	R _{DS(on)3}	V _{GS} = 4.0 V, I _D = 4.5 A		17.9	23.9	mΩ
Input Capacitance	C _{iss}	V _{DS} = 10 V		1040		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		390		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		130		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = 15 V, I _D = 4.5 A		13		ns
Rise Time	t _r	V _{GS} = 10 V		10		ns
Turn-off Delay Time	t _{d(off)}	R _G = 10 Ω		43		ns
Fall Time	t _f			9		ns
Total Gate Charge	Q _G	V _{DD} = 24 V		21		nC
Gate to Source Charge	Q _{GS}	V _{GS} = 10 V		3.3		nC
Gate to Drain Charge	Q _{GD}	I _D = 9.0 A		5.1		nC
Body Diode Forward Voltage	V _{F(S-D)}	I _F = 9.0 A, V _{GS} = 0 V		0.84		V
Reverse Recovery Time	t _{rr}	I _F = 9.0 A, V _{GS} = 0 V		34		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 100 A/μs		34		nC

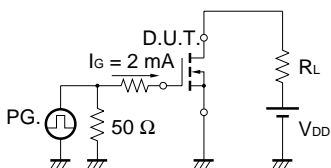
TEST CIRCUIT 1 AVALANCHE CAPABILITY



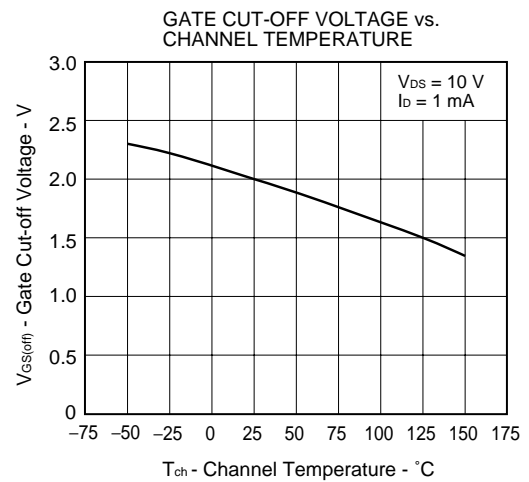
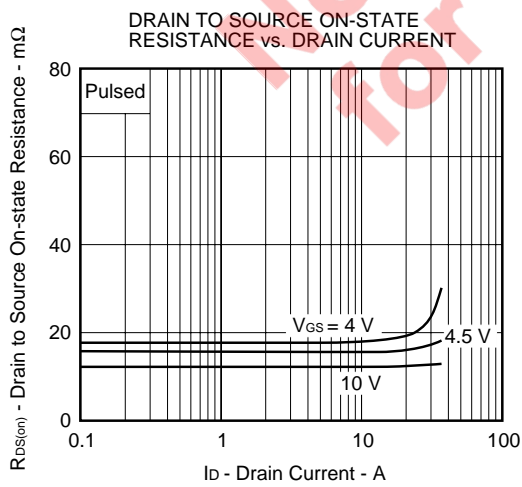
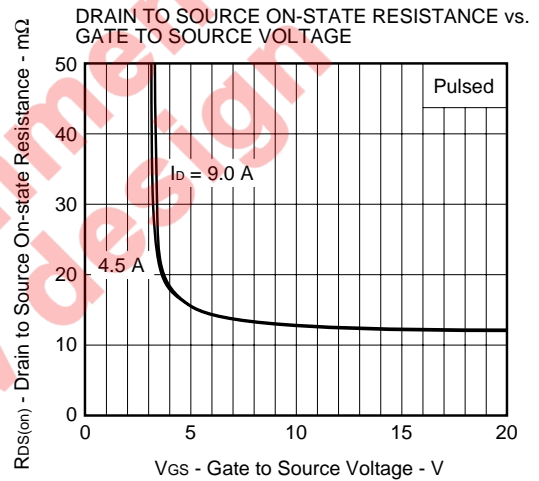
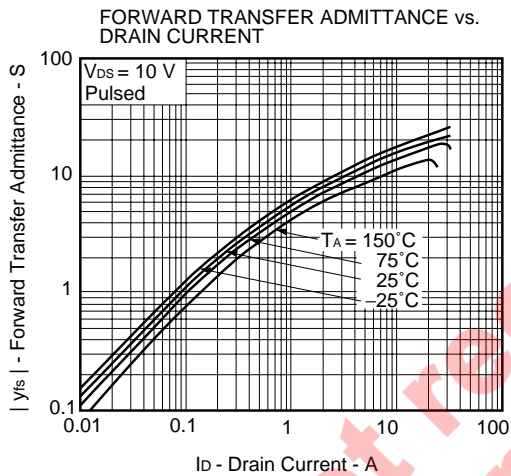
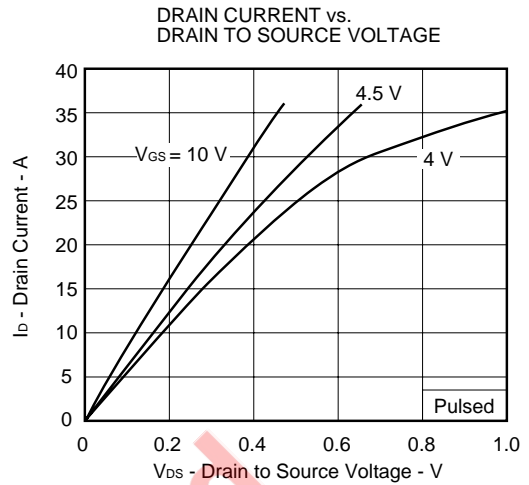
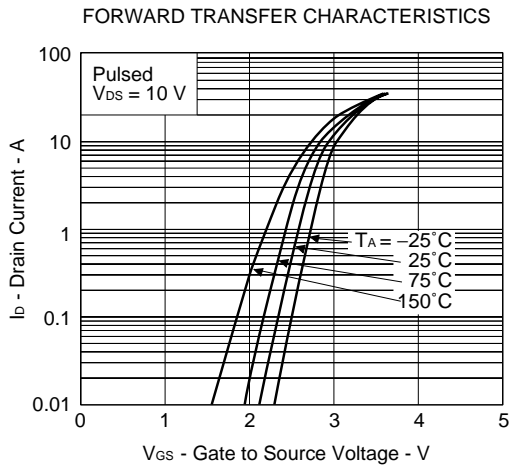
TEST CIRCUIT 2 SWITCHING TIME

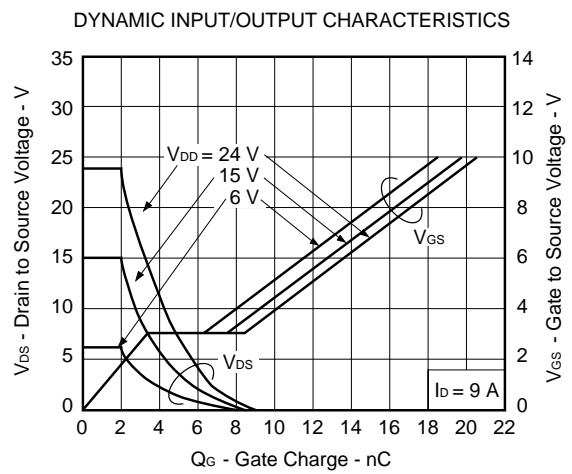
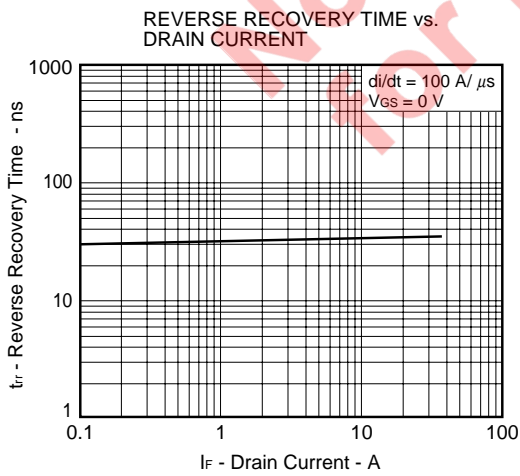
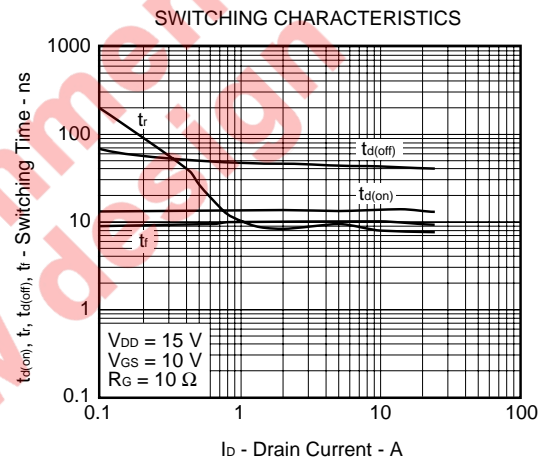
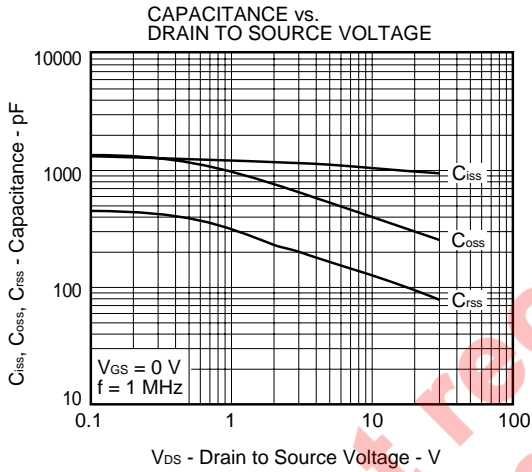
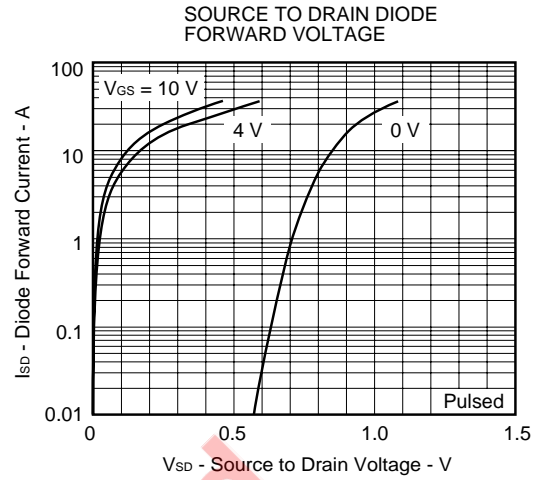
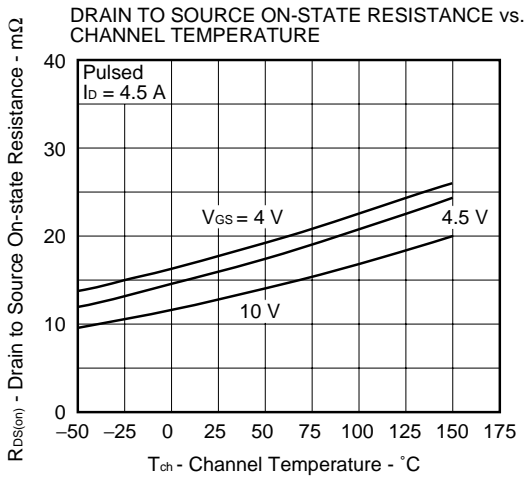


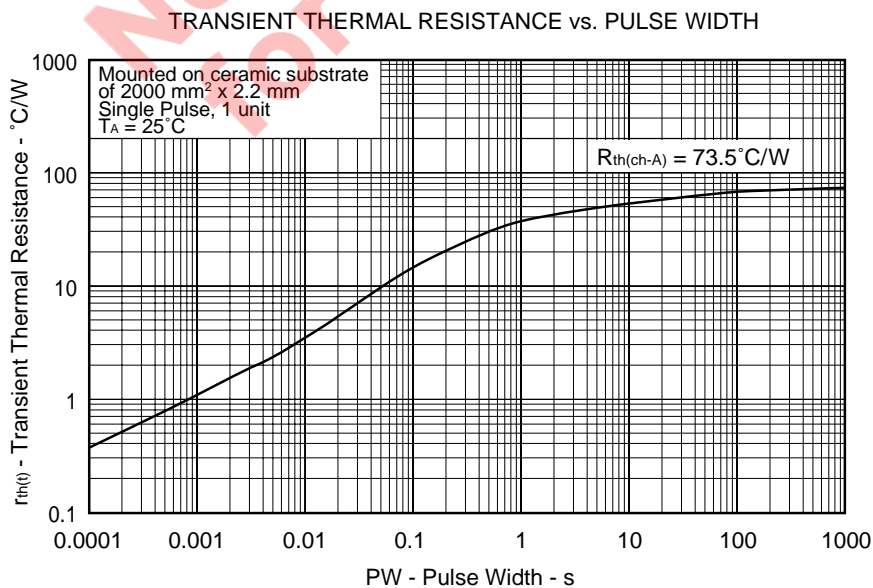
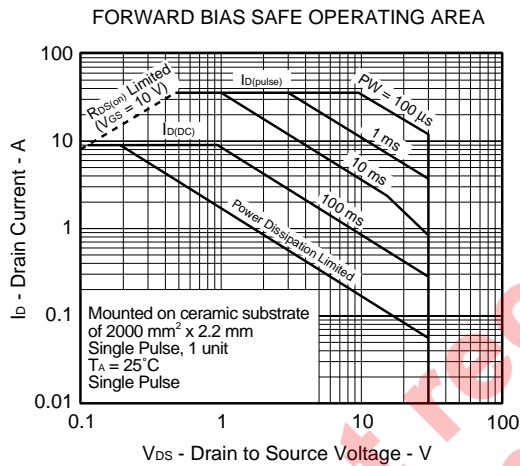
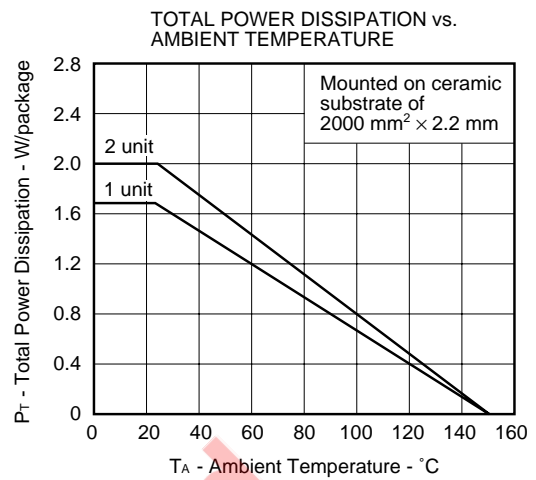
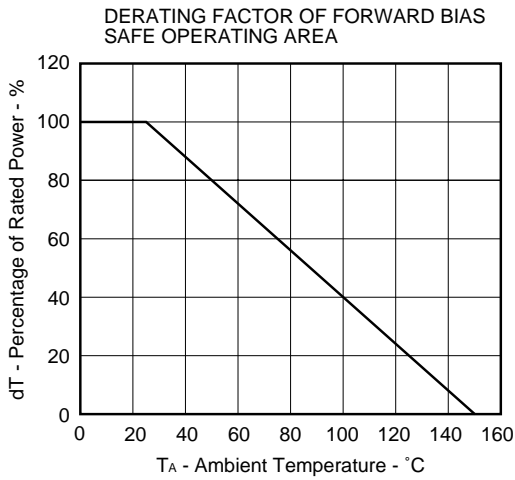
TEST CIRCUIT 3 GATE CHARGE

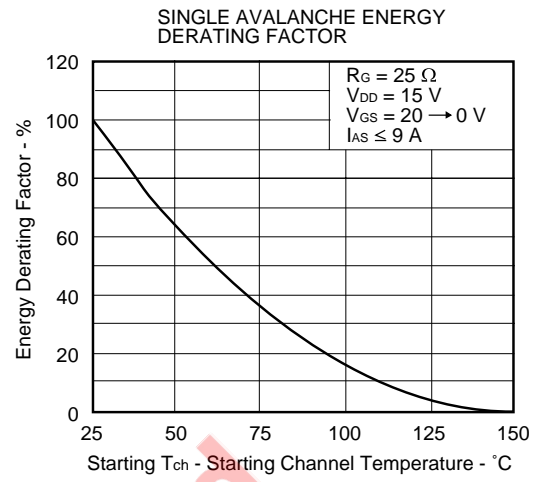
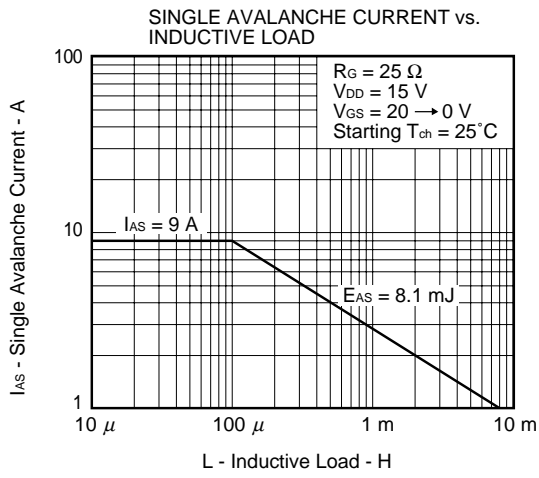


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)









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[MEMO]

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