

To our customers,

Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

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

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MOS FIELD EFFECT TRANSISTOR

μ PA2810

SWITCHING

P-CHANNEL POWER MOSFET

DESCRIPTION

The μ PA2810 is P-channel MOSFET designed for DC/DC converter and power management applications of portable equipments.

FEATURES

- Low on-state resistance
 $R_{DS(on)1} = 12 \text{ m}\Omega \text{ MAX. (} V_{GS} = -10 \text{ V, } I_D = -13 \text{ A)}$
 $R_{DS(on)2} = 23 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -6.5 \text{ A)}$
- Built-in gate protection diode
- Thin type surface mount package with heat spreader
- RoHS Compliant

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$, All terminals are connected.)

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)	$I_{D(DC)}$	± 13	A
Drain Current (pulse) ^{Note1}	$I_{D(pulse)}$	± 78	A
Total Power Dissipation ^{Note2}	P_{T1}	1.5	W
Total Power Dissipation ($PW = 10 \text{ sec}$) ^{Note2}	P_{T2}	3.8	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$
Single Avalanche Current ^{Note3}	I_{AS}	-13	A
Single Avalanche Energy ^{Note3}	E_{AS}	16.9	mJ

THERMAL RESISTANCE

Channel to Ambient Thermal Resistance ^{Note2}	$R_{th(ch-A)}$	83.3	$^\circ\text{C/W}$
Channel to Case (Drain) Thermal Resistance	$R_{th(ch-C)}$	2.4	$^\circ\text{C/W}$

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

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

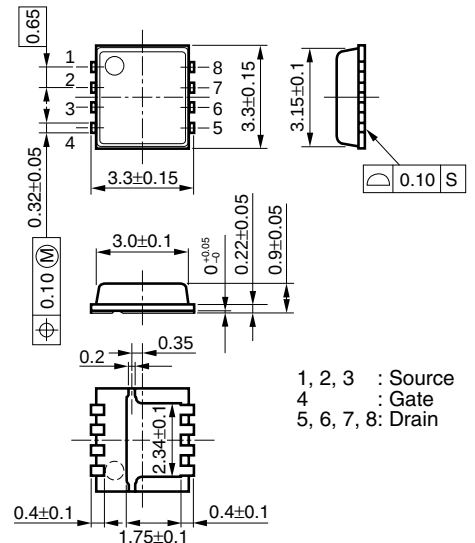
3. Starting $T_{ch} = 25^\circ\text{C}$, $V_{DD} = -15 \text{ V}$, $R_G = 25 \Omega$, $V_{GS} = -20 \rightarrow 0 \text{ V}$, $L = 100 \mu\text{H}$

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.

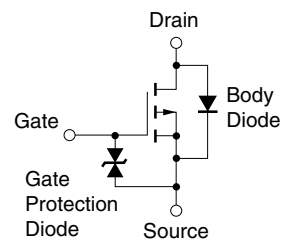
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PACKAGE DRAWING (Unit: mm)



EQUIVALENT CIRCUIT

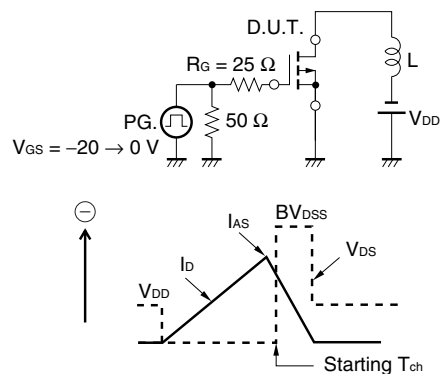


ELECTRICAL CHARACTERISTICS (T_A = 25°C, All terminals are connected.)

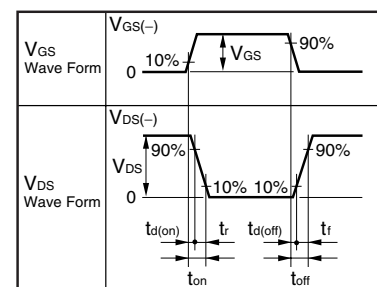
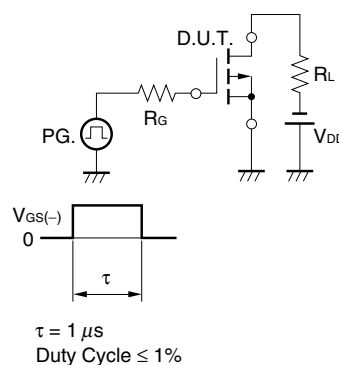
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30 V, V _{GS} = 0 V			-1	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V			±10	μA
Gate to Source Cut-off Voltage	V _{GS(off)}	V _{DS} = -10 V, I _D = -1 mA	-1.0		-2.5	V
Forward Transfer Admittance ^{Note}	y _{fs}	V _{DS} = -10 V, I _D = -6.5 A	7			S
Drain to Source On-state Resistance ^{Note}	R _{DS(on)1}	V _{GS} = -10 V, I _D = -13 A		9.5	12	mΩ
	R _{DS(on)2}	V _{GS} = -4.5 V, I _D = -6.5 A		15	23	mΩ
Input Capacitance	C _{iss}	V _{DS} = -10 V,		1860		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V,		400		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		300		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = -15 V, I _D = -6.5 A,		11		ns
Rise Time	t _r	V _{GS} = -10 V,		19		ns
Turn-off Delay Time	t _{d(off)}	R _G = 10 Ω		160		ns
Fall Time	t _f			100		ns
Total Gate Charge	Q _G	V _{DD} = -24 V,		40		nC
Gate to Source Charge	Q _{GS}	V _{GS} = -10 V,		6		nC
Gate to Drain Charge	Q _{GD}	I _D = -13 A		14		nC
Body Diode Forward Voltage ^{Note}	V _{F(S-D)}	I _F = 13 A, V _{GS} = 0 V		0.87		V
Reverse Recovery Time	t _{rr}	I _F = 13 A, V _{GS} = 0 V,		50		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 100 A/μs		40		nC

Note Pulsed

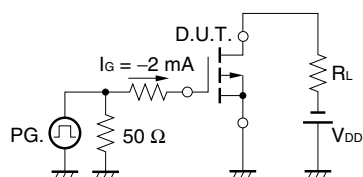
TEST CIRCUIT 1 AVALANCHE CAPABILITY



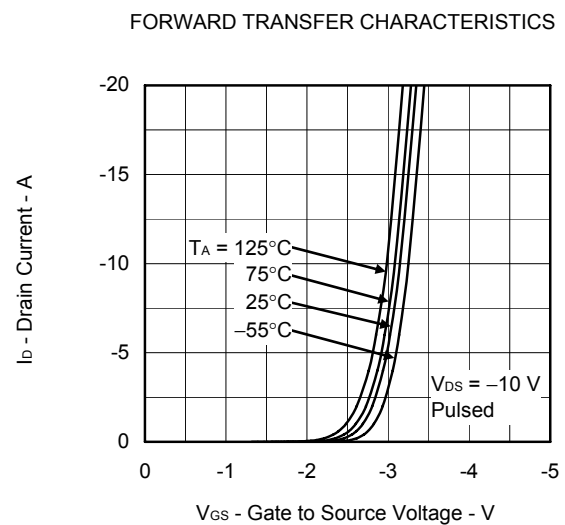
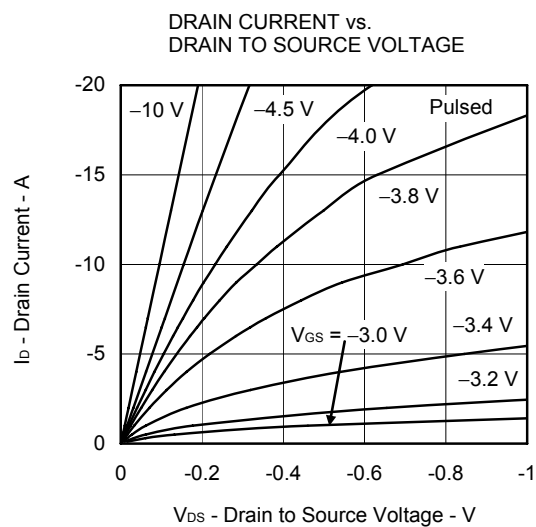
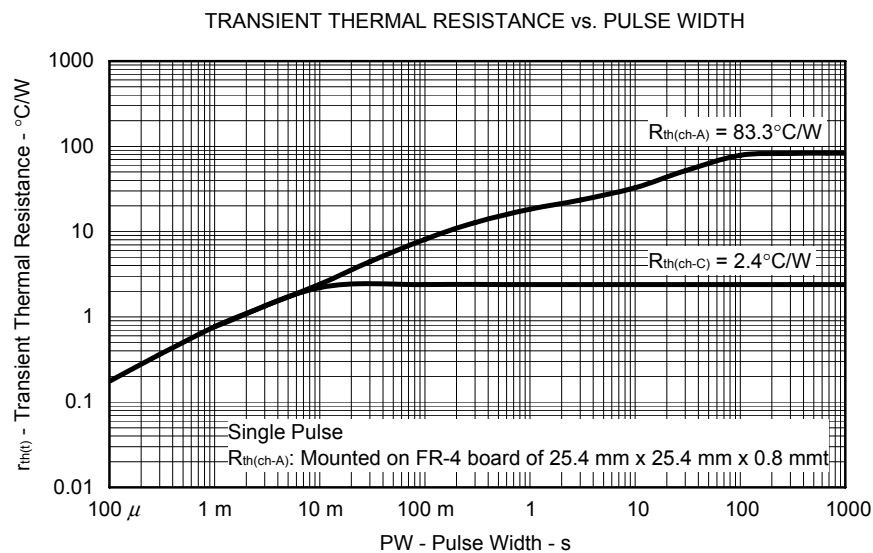
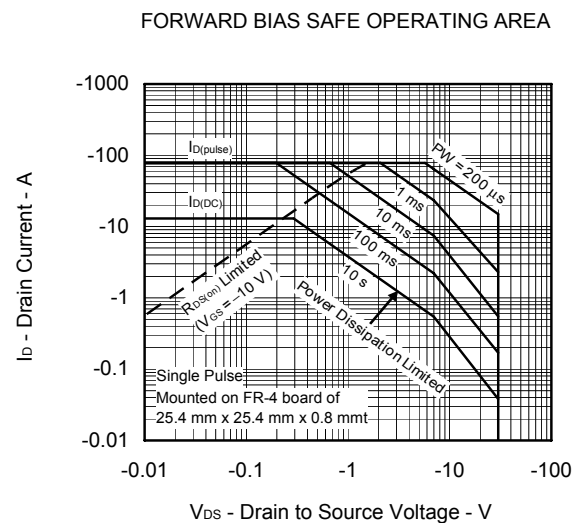
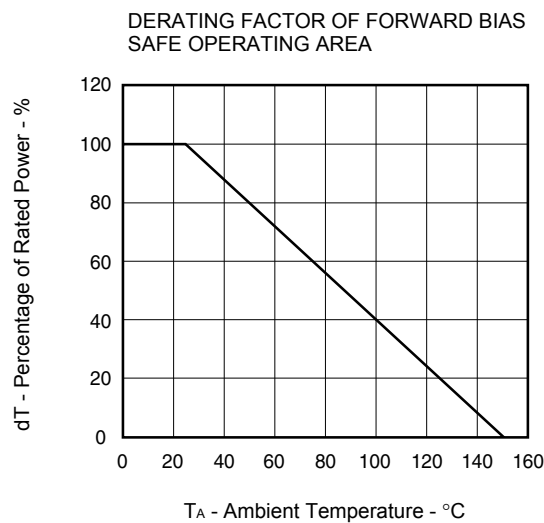
TEST CIRCUIT 2 SWITCHING TIME

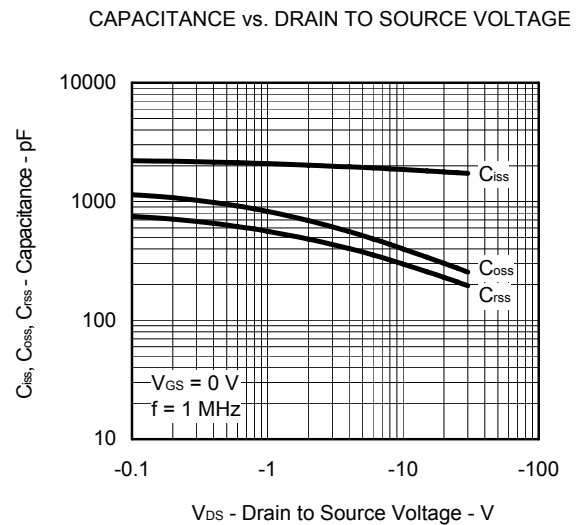
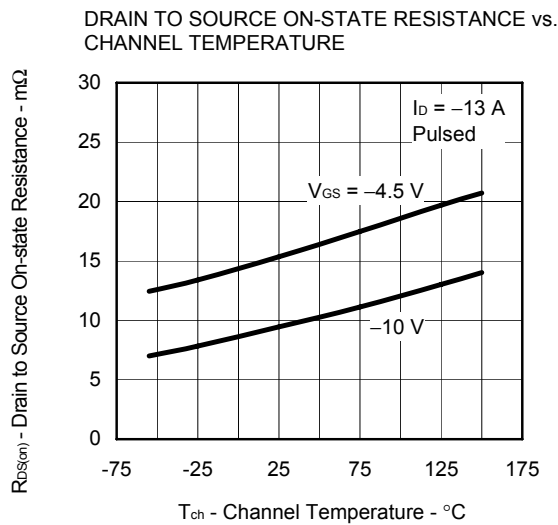
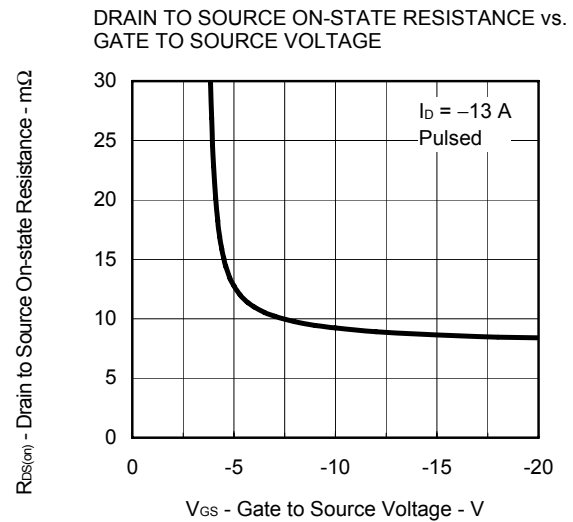
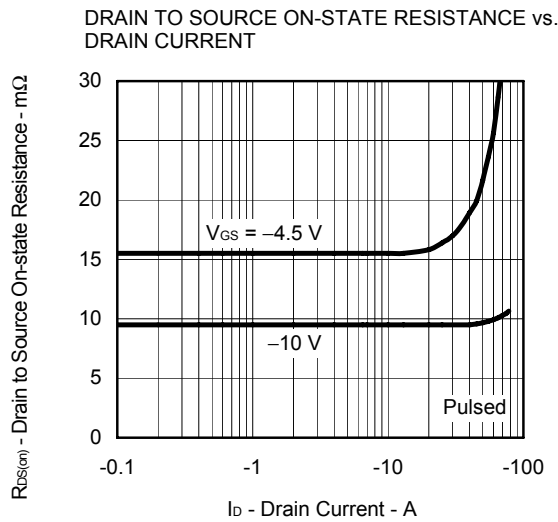
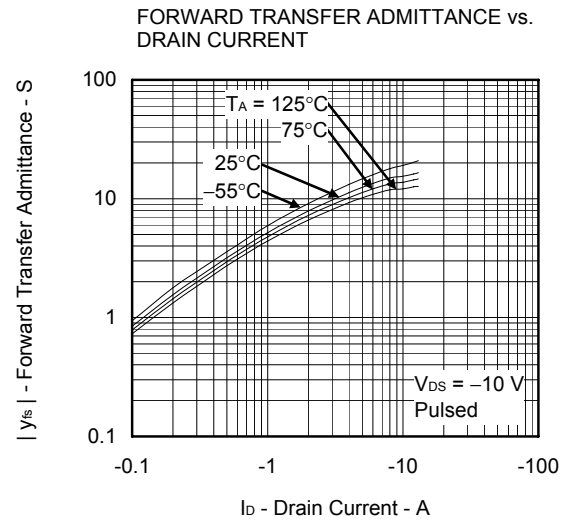
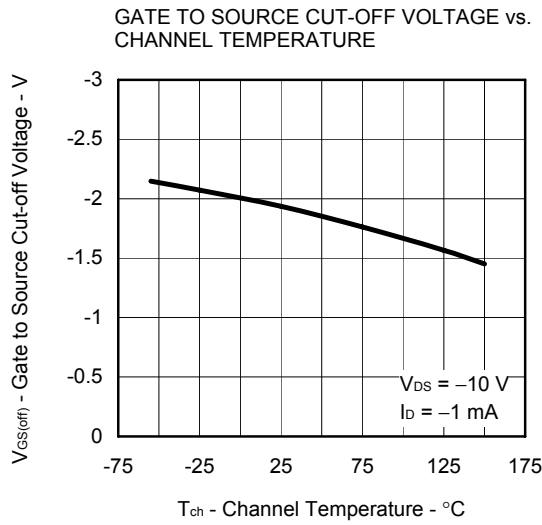


TEST CIRCUIT 3 GATE CHARGE

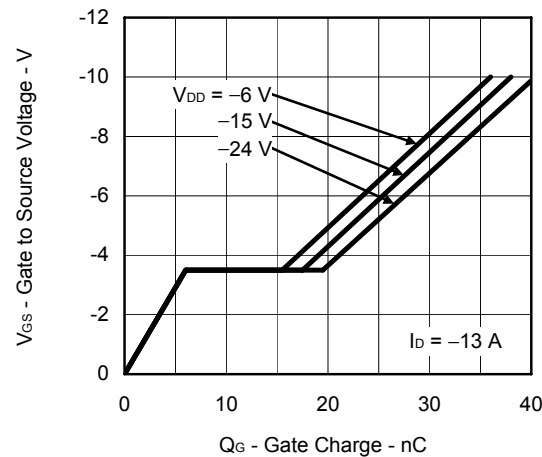


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

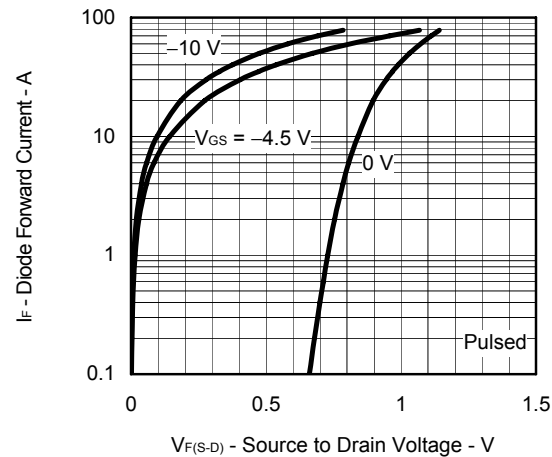




DYNAMIC INPUT/OUTPUT CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



ORDERING INFORMATION

PART NUMBER	LEAD PLATING	PACKING	PACKAGE
μPA2810T1L-E1-AY Note	Pure Sn	Tape 3000 p/reel	8-pin HVSON (3333) 0.028 g TYP.
μPA2810T1L-E2-AY Note			

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

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