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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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Not recommended
for new design

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SWITCHING P-CHANNEL POWER MOSFET

DESCRIPTION

The μ PA2732T1A is P-channel MOS Field Effect Transistor designed for power management applications of notebook computers and Li-ion battery protection circuit.

FEATURES

- Low on-state resistance
 $R_{DS(on)1} = 3.7 \text{ m}\Omega \text{ MAX. (} V_{GS} = -10 \text{ V, } I_D = -20 \text{ A)}$
 $R_{DS(on)2} = 6.7 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -20 \text{ A)}$
- Low C_{iss} : $C_{iss} = 3280 \text{ pF TYP.}$
- Built-in gate protection diode
- Small and surface mount package (8pin HVSON)

ORDERING INFORMATION

PART NUMBER	PACKAGE
μ PA2732T1A-E1-AZ ^{Note}	8pin HVSON
μ PA2732T1A-E2-AZ ^{Note}	8pin HVSON

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

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

Drain to Source Voltage (V _{GS} = 0 V)	V _{DSS}	-30	V
Gate to Source Voltage (V _{DS} = 0 V)	V _{GSS}	±20	V
Drain Current (DC)	I _{D(DC)}	±40	A
Drain Current (pulse) ^{Note1}	I _{D(pulse)}	±160	A
Total Power Dissipation ^{Note2}	P _{T1}	1.5	W
Total Power Dissipation (PW = 10 sec) ^{Note2}	P _{T2}	4.6	W
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C
Single Avalanche Current ^{Note3}	I _{AS}	-20	A
Single Avalanche Energy ^{Note3}	E _{AS}	40	mJ

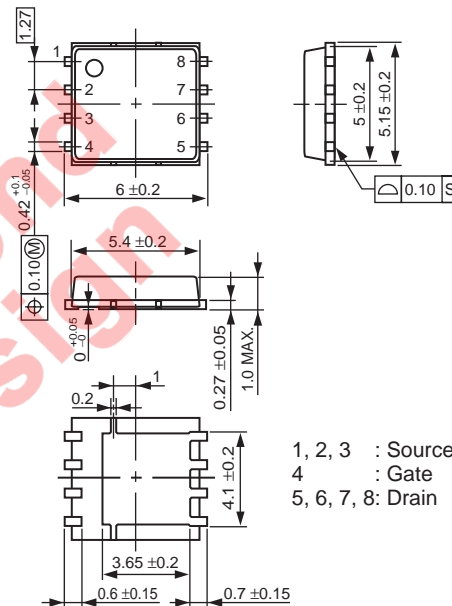
Notes 1. PW ≤ 10 μs, Duty Cycle ≤ 1%

2. Mounted on a glass epoxy board (25.4 mm x 25.4 mm x 0.8 mm)

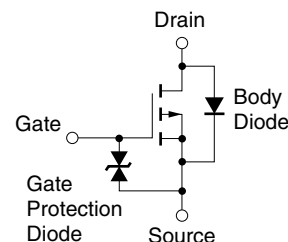
3. Starting T_{ch} = 25°C, V_{DD} = -15 V, R_G = 25 Ω, L = 100 μH, V_{GS} = -20 → 0 V

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.

PACKAGE DRAWING (Unit: mm)



EQUIVALENT CIRCUIT



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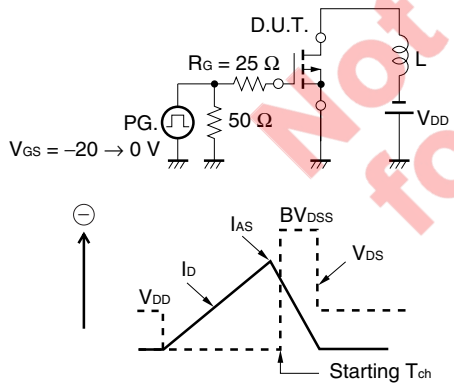
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ELECTRICAL CHARACTERISTICS (T_A = 25°C, All terminals are connected.)

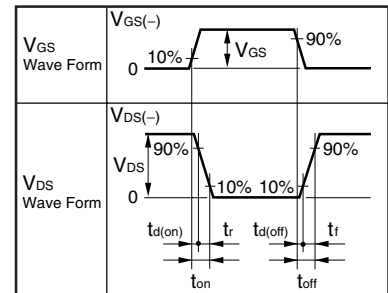
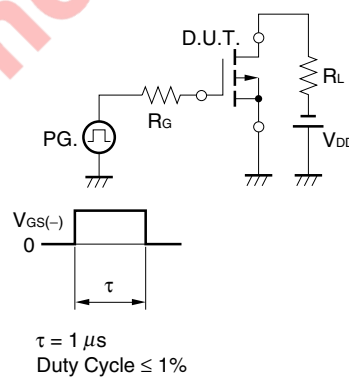
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30 V, V _{GS} = 0 V			-1	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V			±10	μA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = -10 V, I _D = -1 mA	-1.0		-2.5	V
Forward Transfer Admittance ^{Note}	y _{fs}	V _{DS} = -10 V, I _D = -20 A	30			S
Drain to Source On-state Resistance ^{Note}	R _{DS(on)1}	V _{GS} = -10 V, I _D = -20 A		3.1	3.7	mΩ
	R _{DS(on)2}	V _{GS} = -4.5 V, I _D = -20 A		4.3	6.7	mΩ
Input Capacitance	C _{iss}	V _{DS} = -10 V		3280		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		1310		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		560		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = -15 V, I _D = -20 A		14		ns
Rise Time	t _r	V _{GS} = -10 V		15		ns
Turn-off Delay Time	t _{d(off)}	R _G = 10 Ω		680		ns
Fall Time	t _f			440		ns
Total Gate Charge	Q _G	V _{DD} = -24 V		133		nC
Gate to Source Charge	Q _{GS}	V _{GS} = -10 V		14		nC
Gate to Drain Charge	Q _{GD}	I _D = -40 A		41		nC
Body Diode Forward Voltage ^{Note}	V _{F(S-D)}	I _F = 40 A, V _{GS} = 0 V		0.85	1.2	V
Reverse Recovery Time	t _{rr}	I _F = 40 A, V _{GS} = 0 V		88		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 50 A/μs		59		nC

Note Pulsed

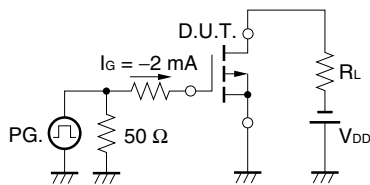
TEST CIRCUIT 1 AVALANCHE CAPABILITY



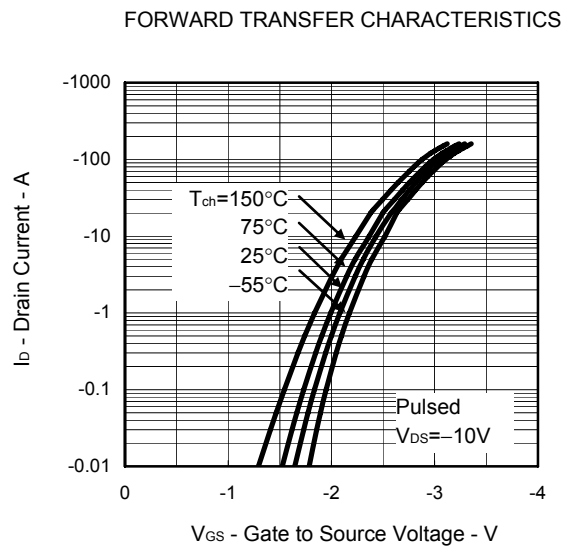
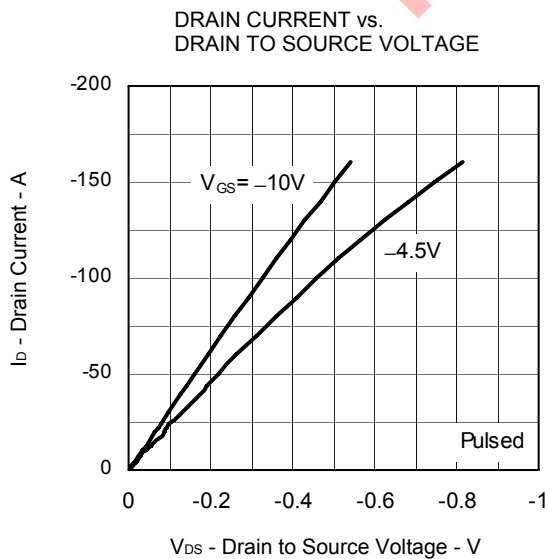
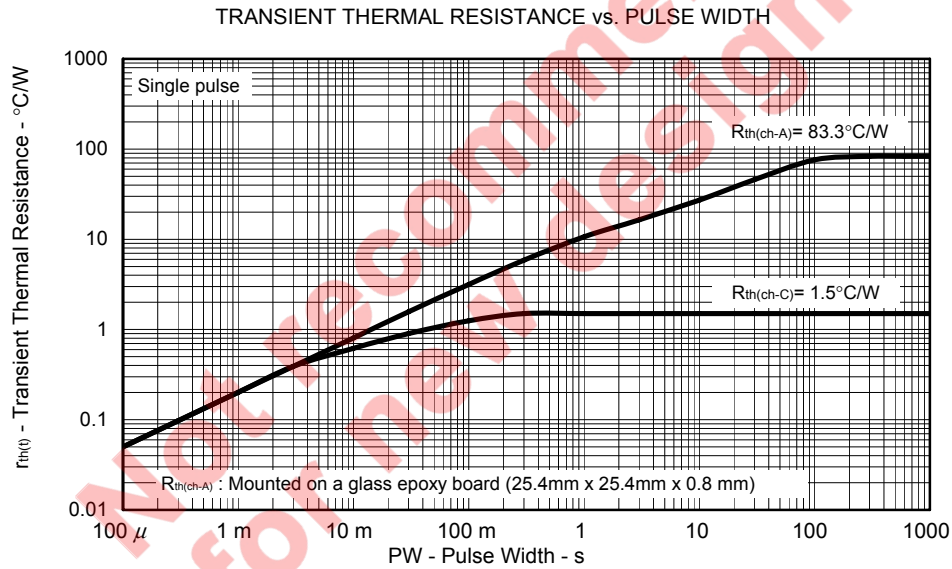
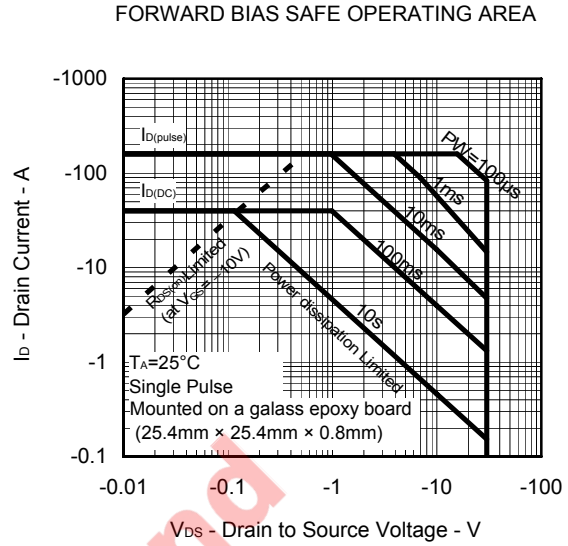
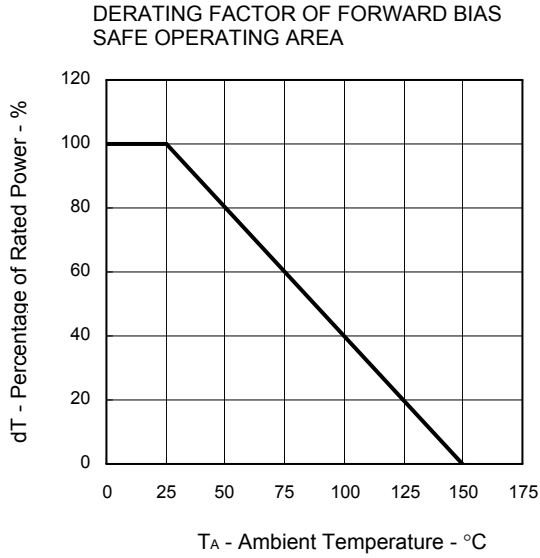
TEST CIRCUIT 2 SWITCHING TIME



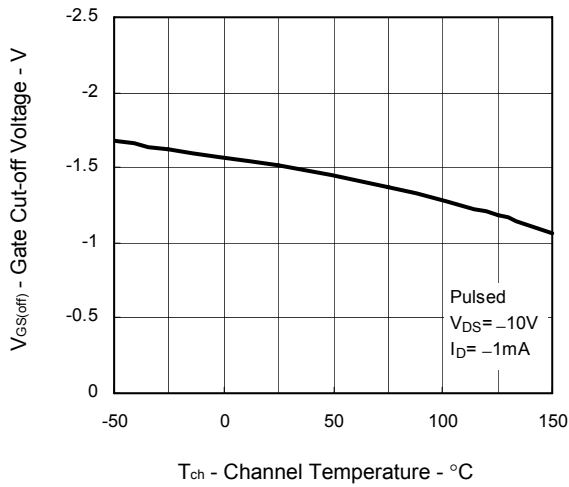
TEST CIRCUIT 3 GATE CHARGE



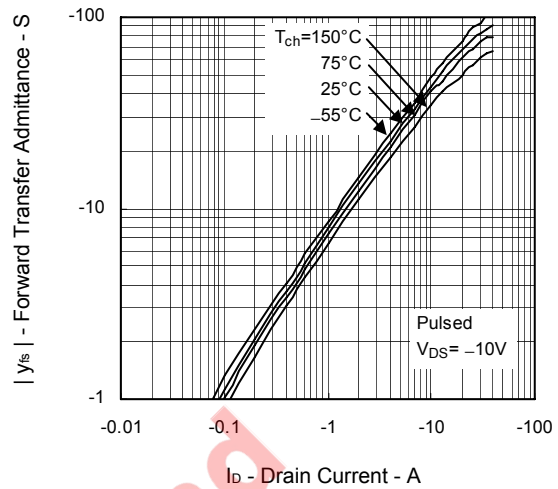
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



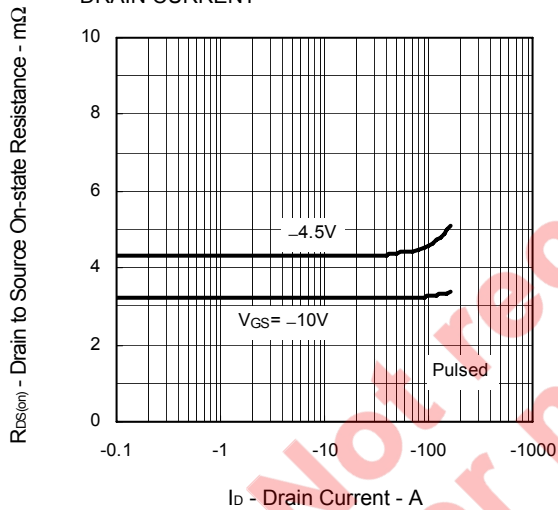
GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



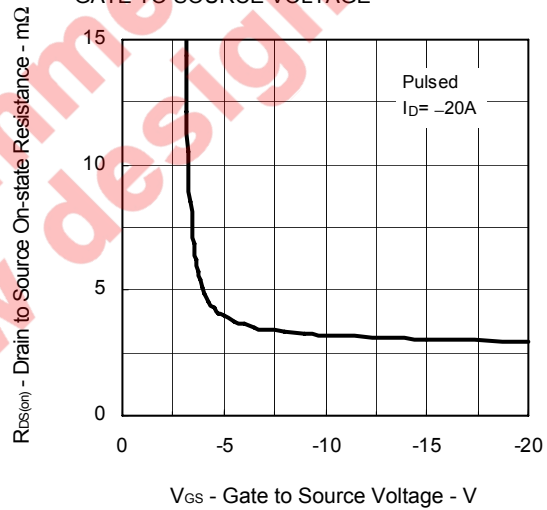
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



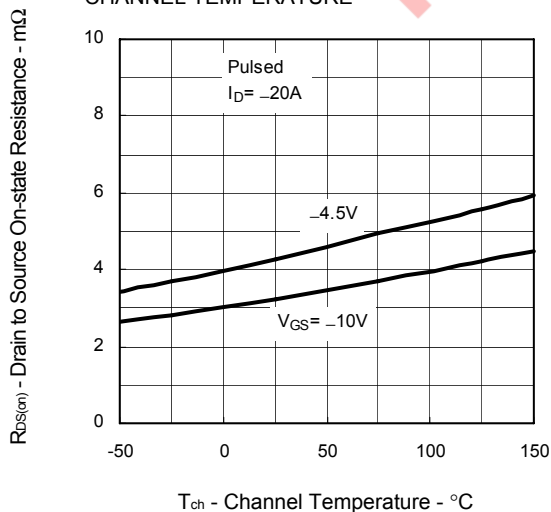
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



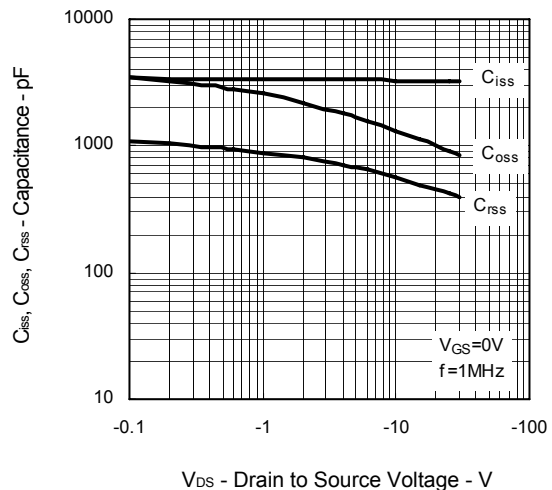
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



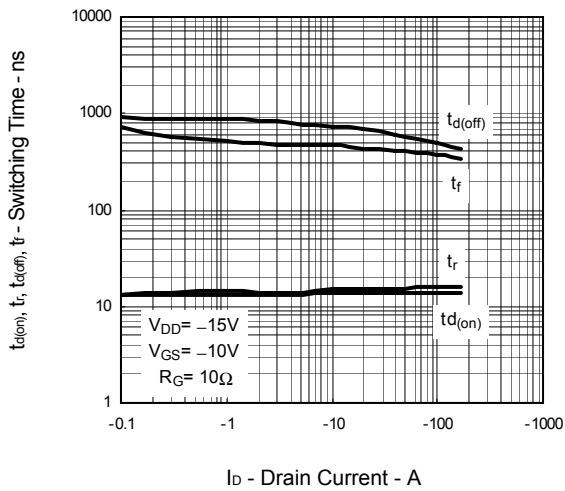
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



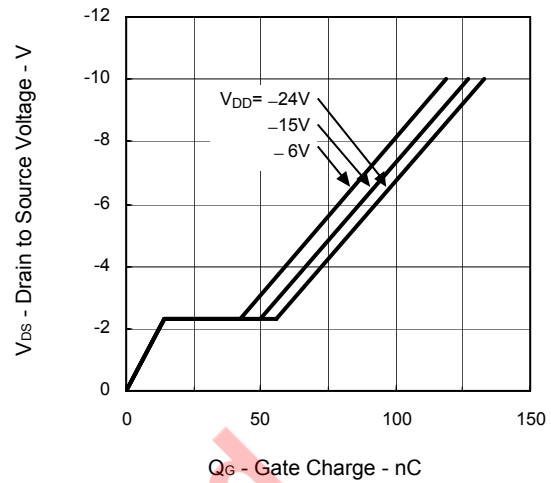
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



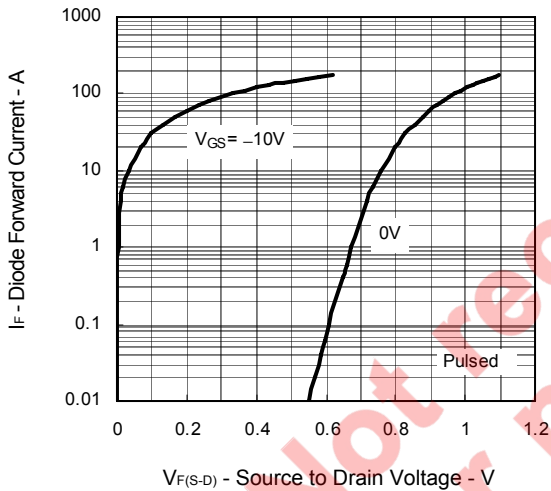
SWITCHING CHARACTERISTICS



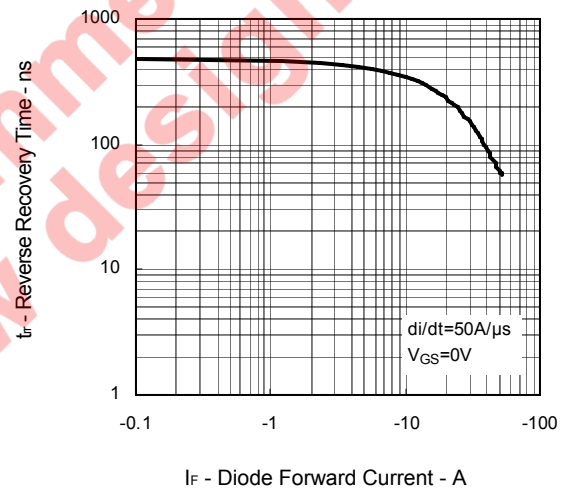
DYNAMIC INPUT CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



REVERSE RECOVERY TIME vs. DIODE FORWARD CURRENT



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