

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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Phase-out/Discontinued

**SWITCHING
N-CHANNEL POWER MOSFET**

DESCRIPTION

The μPA2720GR is N-channel MOS Field Effect Transistor designed for power management applications of notebook computers and Li-ion battery protection circuit.

FEATURES

- Low on-state resistance
 $R_{DS(on)1} = 6.6 \text{ m}\Omega \text{ MAX. (} V_{GS} = 10 \text{ V, } I_D = 7 \text{ A)}$
 $R_{DS(on)2} = 10 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 7 \text{ A)}$
- Low C_{iss} : $C_{iss} = 2800 \text{ pF TYP. (} V_{DS} = 10 \text{ V, } V_{GS} = 0 \text{ V)}$
- Built-in gate protection diode
- Small and surface mount package (Power SOP8)

ORDERING INFORMATION

PART NUMBER	PACKAGE
μ PA2720GR-E1	Power SOP8
μ PA2720GR-E1-A ^{Note}	Power SOP8
μ PA2720GR-E2	Power SOP8
μ PA2720GR-E2-A ^{Note}	Power SOP8

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

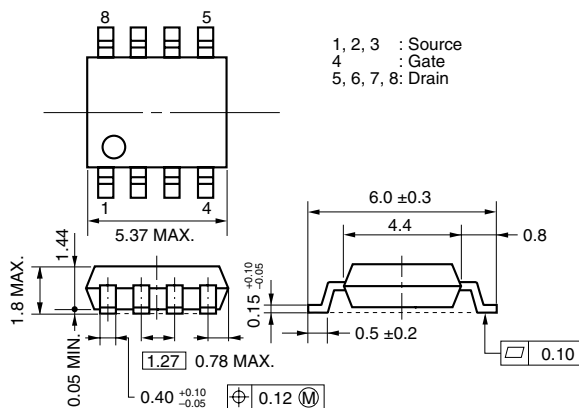
ABSOLUTE MAXIMUM RATINGS (T_A = 25°C, All terminals are connected.)

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)}	±14	A
Drain Current (pulse) ^{Note1}	I _{D(pulse)}	±140	A
Total Power Dissipation ^{Note2}	P _{T1}	1.1	W
Total Power Dissipation (PW = 10 sec) ^{Note2}	P _{T2}	2.5	W
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

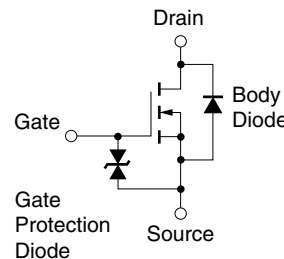
- Notes**
1. PW ≤ 10 μs, Duty Cycle ≤ 1%
 2. Mounted on glass epoxy board of 1 inch x 1 inch x 0.8 mm

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



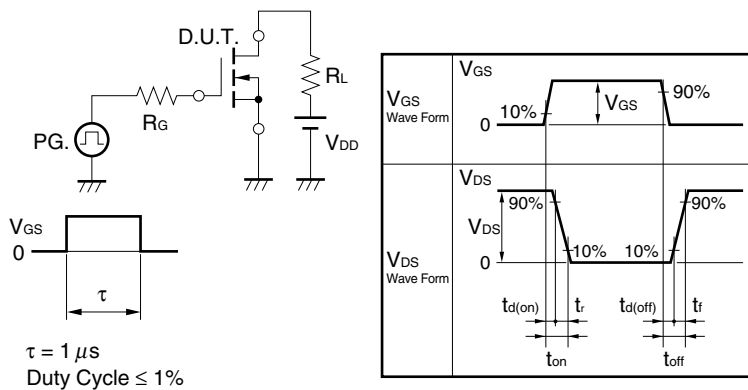
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ELECTRICAL CHARACTERISTICS (T_A = 25°C, All terminals are connected.)

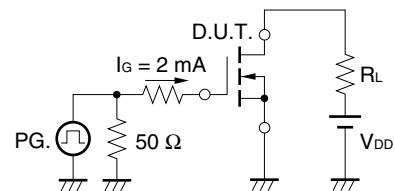
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V			1	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V			±10	μA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 mA	1.0		2.5	V
Forward Transfer Admittance ^{Note}	y _{fs}	V _{DS} = 10 V, I _D = 7 A	8			S
Drain to Source On-state Resistance ^{Note}	R _{DS(on)1}	V _{GS} = 10 V, I _D = 7 A		5.2	6.6	mΩ
	R _{DS(on)2}	V _{GS} = 4.5 V, I _D = 7 A		7.0	10	mΩ
Input Capacitance	C _{iss}	V _{DS} = 10 V		2800		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		540		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		360		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = 15 V, I _D = 7 A		16		ns
Rise Time	t _r	V _{GS} = 10 V		25		ns
Turn-off Delay Time	t _{d(off)}	R _G = 10 Ω		70		ns
Fall Time	t _f			26		ns
Total Gate Charge	Q _G	V _{DD} = 15 V		27		nC
Gate to Source Charge	Q _{GS}	V _{GS} = 5 V		7		nC
Gate to Drain Charge	Q _{GD}	I _D = 14 A		12		nC
Body Diode Forward Voltage ^{Note}	V _{F(S-D)}	I _F = 14 A, V _{GS} = 0 V		0.8		V
Reverse Recovery Time	t _{rr}	I _F = 14 A, V _{GS} = 0 V		34		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 50 A/μs		27		nC

Note Pulsed

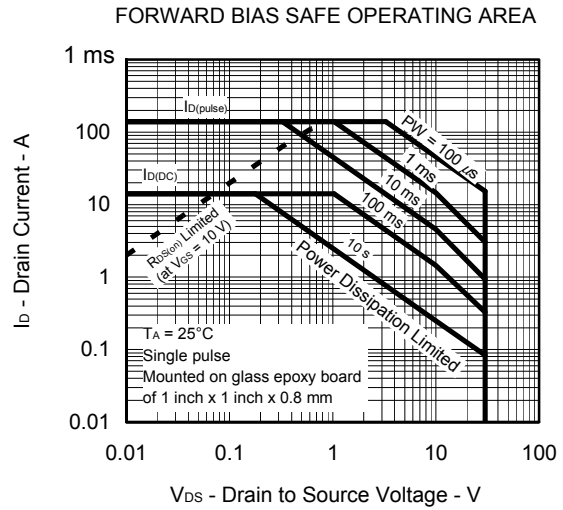
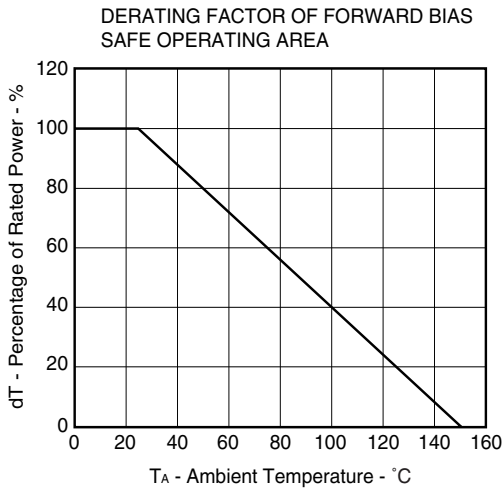
TEST CIRCUIT 1 SWITCHING TIME



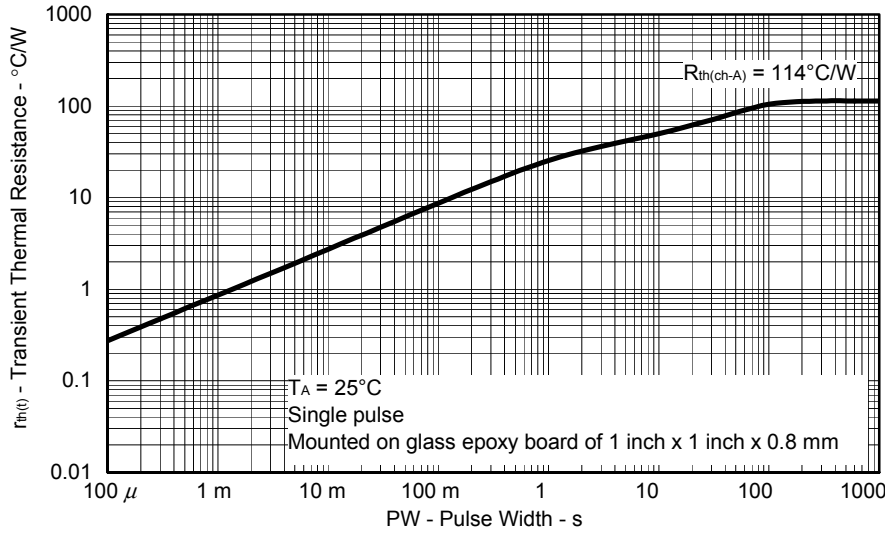
TEST CIRCUIT 2 GATE CHARGE



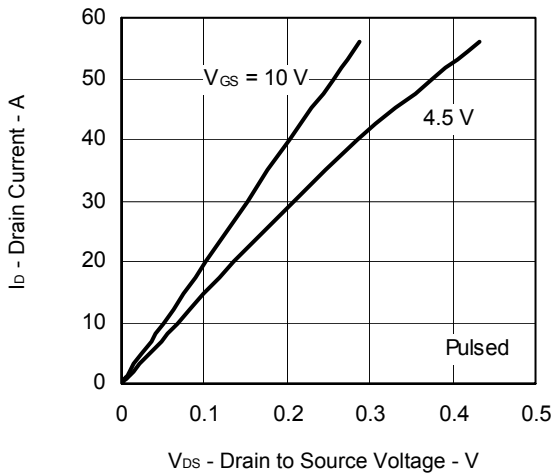
TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)



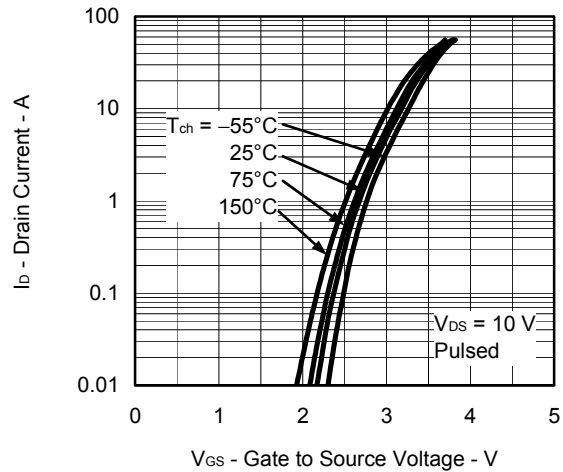
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



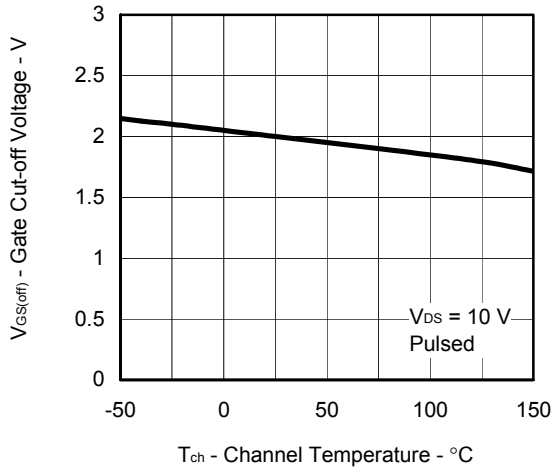
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



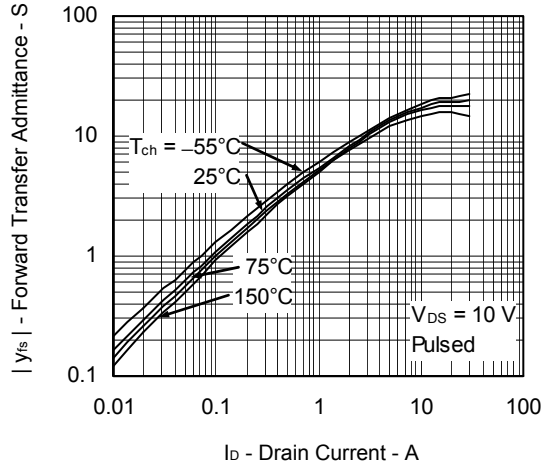
FORWARD TRANSFER CHARACTERISTICS



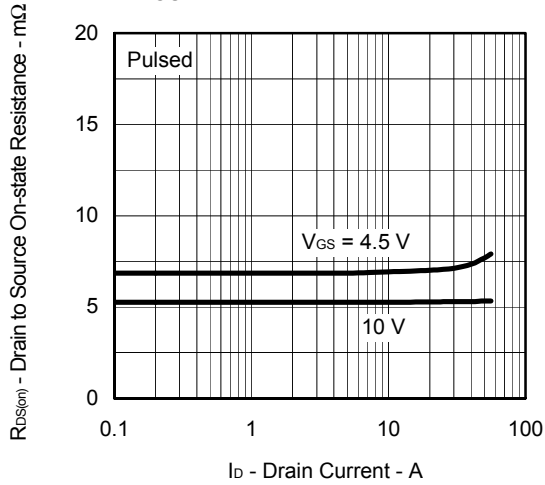
GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



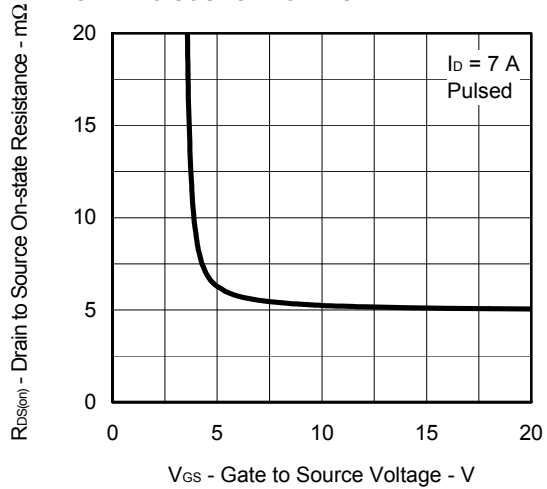
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



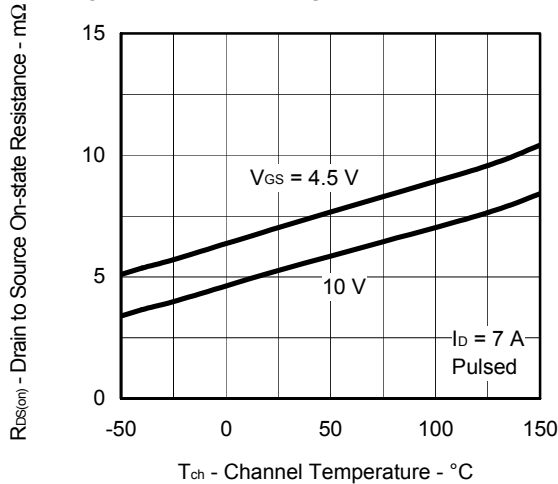
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



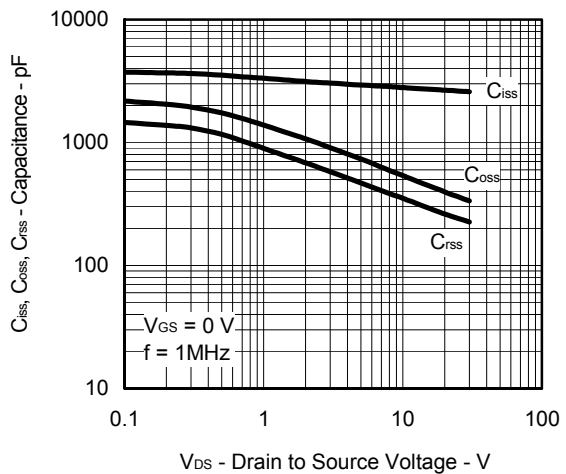
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



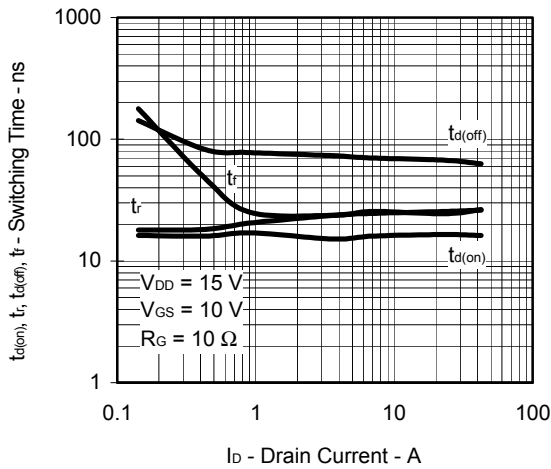
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



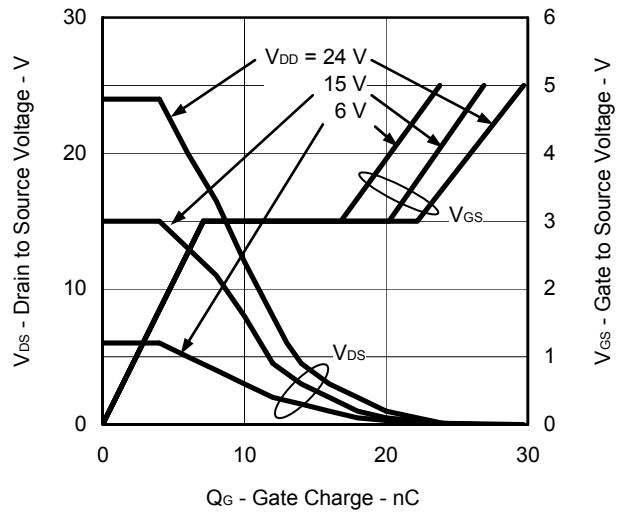
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



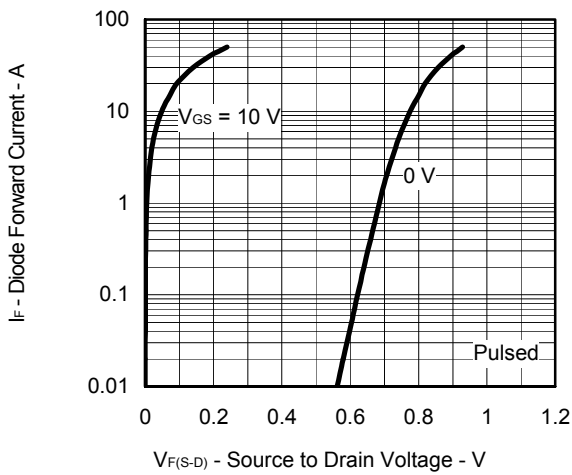
SWITCHING CHARACTERISTICS



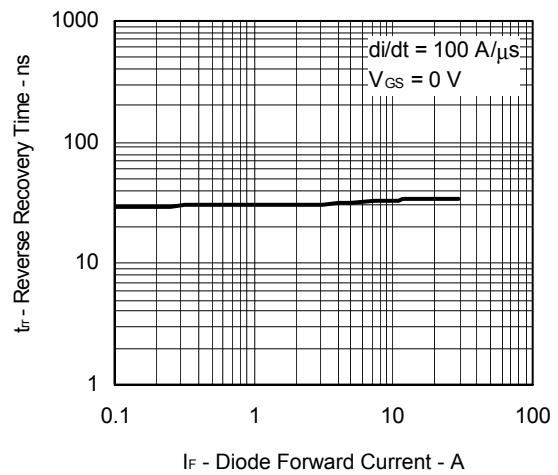
DYNAMIC INPUT/OUTPUT CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



REVERSE RECOVERY TIME vs. DIODE FORWARD CURRENT



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