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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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**SWITCHING
N-CHANNEL POWER MOS FET
INDUSTRIAL USE**

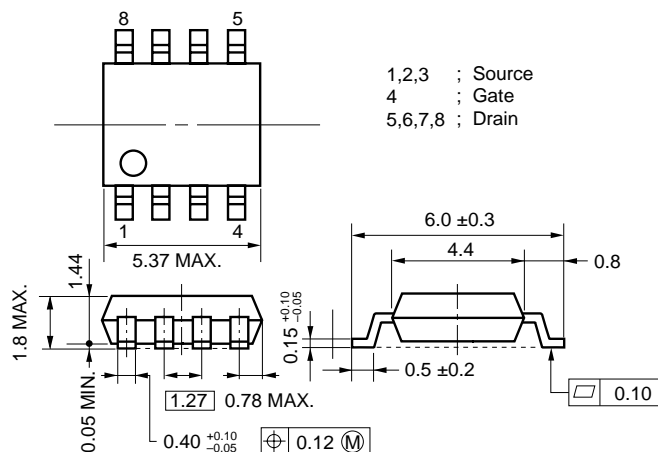
★ **DESCRIPTION**

The μ PA1724 is N-Channel MOS Field Effect Transistor designed for power management applications of notebook computers and so on.

FEATURES

- 2.5-V gate drive and low on-resistance
 $R_{DS(on)1} = 11.0 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 5.0 \text{ A)}$
- ★ $R_{DS(on)2} = 12.0 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.0 \text{ V, } I_D = 5.0 \text{ A)}$
 $R_{DS(on)3} = 15.0 \text{ m}\Omega \text{ MAX. (} V_{GS} = 2.5 \text{ V, } I_D = 5.0 \text{ A)}$
- Low C_{iss} : $C_{iss} = 1850 \text{ pF TYP.}$
- Built-in G-S protection diode
- Small and surface mount package (Power SOP8)

PACKAGE DRAWING (Unit : mm)



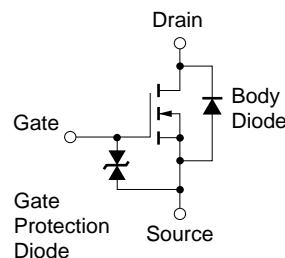
ORDERING INFORMATION

PART NUMBER	PACKAGE
μ PA1724G	Power SOP8

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

Drain to Source Voltage (V _{GS} = 0 V)	V _{DSS}	20	V
Gate to Source Voltage (V _{DS} = 0 V)	V _{GSS}	± 12	V
Drain Current (DC)	I _{D(DC)}	± 10	A
Drain Current (pulse) ^{Note1}	I _{D(pulse)}	± 40	A
Total Power Dissipation (T _A = 25°C) ^{Note2}	P _T	2.0	W
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

EQUIVALENT CIRCUIT



- Notes**
1. $PW \leq 10 \mu s$, Duty Cycle $\leq 1 \%$
 2. Mounted on ceramic substrate of $1200 \text{ mm}^2 \times 2.2 \text{ mm}$

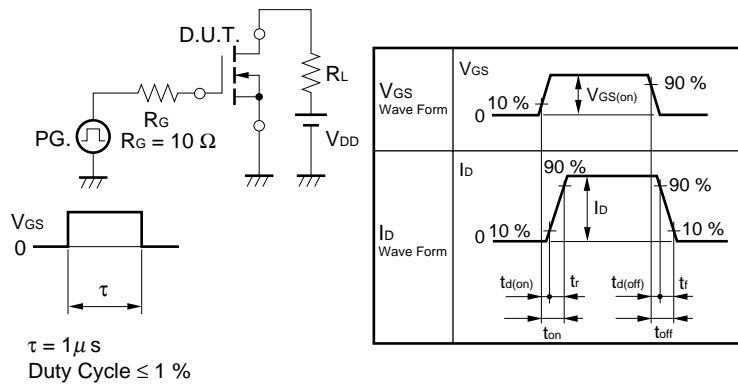
Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

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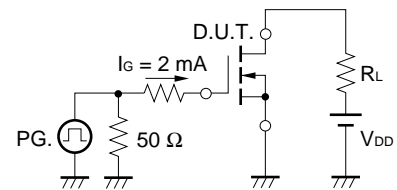
ELECTRICAL CHARACTERISTICS (T_A = 25 °C, All terminals are connected.)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
★ Drain to Source On-state Resistance	R _{DS(on)1}	V _{GS} = 4.5 V, I _D = 5.0 A		8.6	11.0	mΩ
	R _{DS(on)2}	V _{GS} = 4.0 V, I _D = 5.0 A		8.8	12.0	mΩ
	R _{DS(on)3}	V _{GS} = 2.5 V, I _D = 5.0 A		11.0	15.0	mΩ
Gate to Source Cut-off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 mA	0.5	0.84	1.5	V
Forward Transfer Admittance	y _{fs}	V _{DS} = 10 V, I _D = 5.0 A	10.0	19		S
Drain Leakage Current	I _{DSS}	V _{DS} = 20 V, V _{GS} = 0 V			10	μA
Gate to Source Leakage Current	I _{GSS}	V _{GS} = ±12 V, V _{DS} = 0 V			±10	μA
Input Capacitance	C _{iSS}	V _{DS} = 10 V		1850		pF
Output Capacitance	C _{oSS}	V _{GS} = 0 V		610		pF
Reverse Transfer Capacitance	C _{rSS}	f = 1 MHz		320		pF
Turn-on Delay Time	t _{d(on)}	I _D = 5.0 A		43		ns
Rise Time	t _r	V _{GS(on)} = 4.5 V		170		ns
Turn-off Delay Time	t _{d(off)}	V _{DD} = 10 V		90		ns
Fall Time	t _f	R _G = 10 Ω		130		ns
Total Gate Charge	Q _G	I _D = 10 A		18		nC
★ Gate to Source Charge	Q _{GS}	V _{DD} = 16 V		3.2		nC
★ Gate to Drain Charge	Q _{GD}	V _{GS} = 4.5 V		7.8		nC
Body Diode Forward Voltage	V _{F(S-D)}	I _F = 10 A, V _{GS} = 0 V		0.78		V
Reverse Recovery Time	t _{rr}	I _F = 10 A, V _{GS} = 0 V		45		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 100 A / μs		40		nC

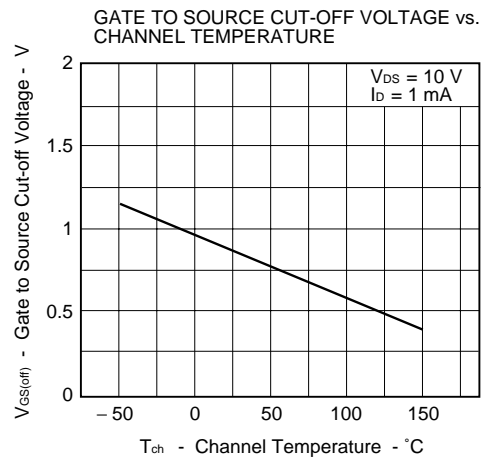
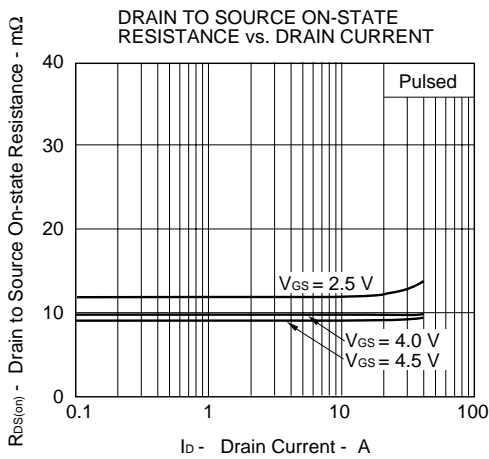
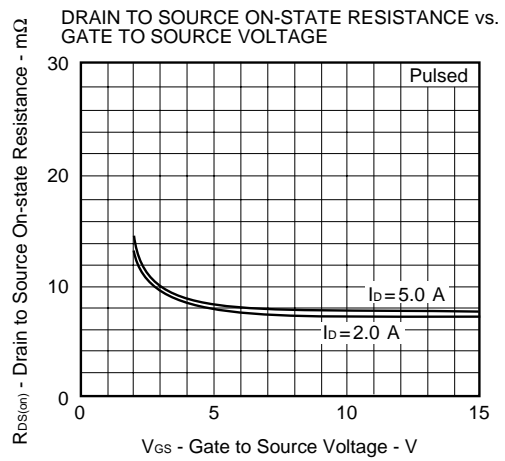
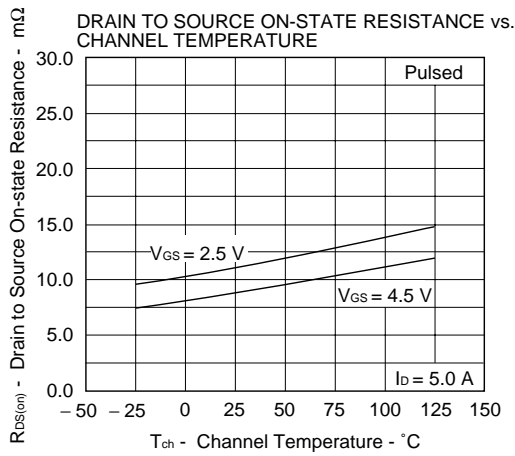
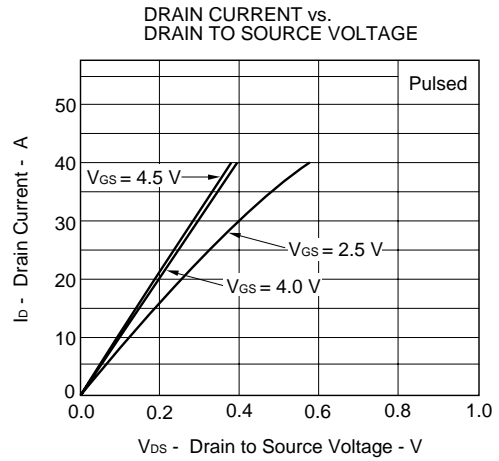
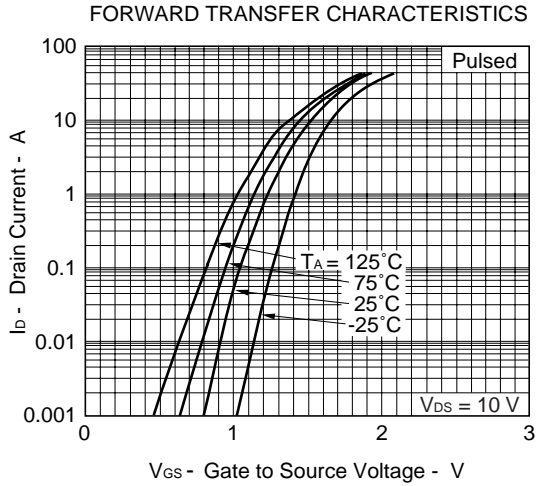
TEST CIRCUIT 1 SWITCHING TIME

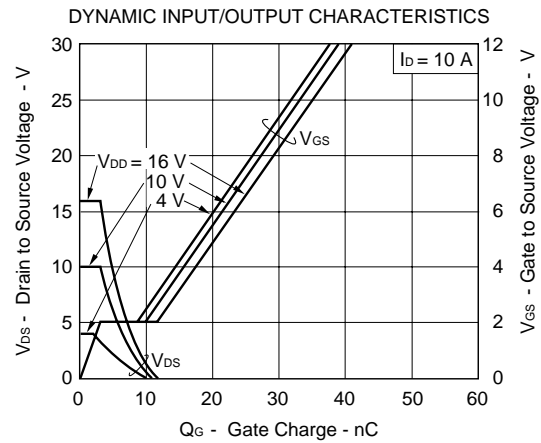
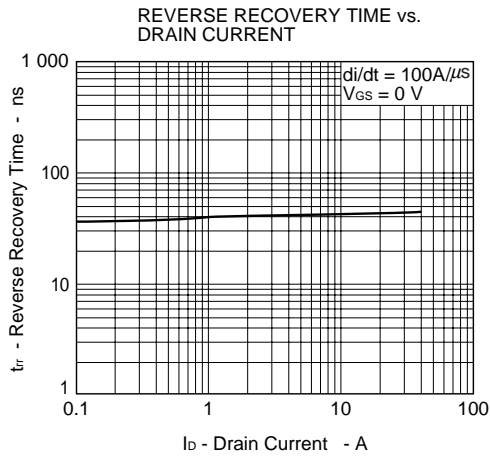
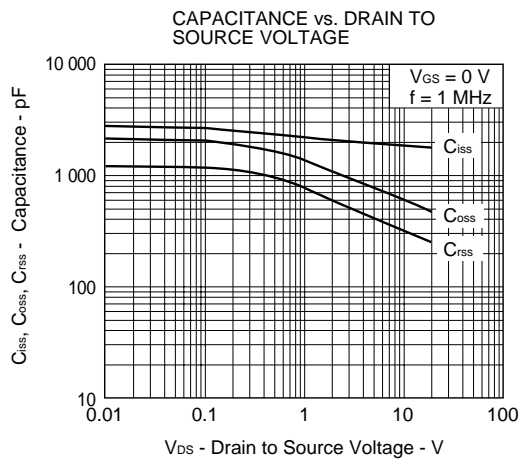
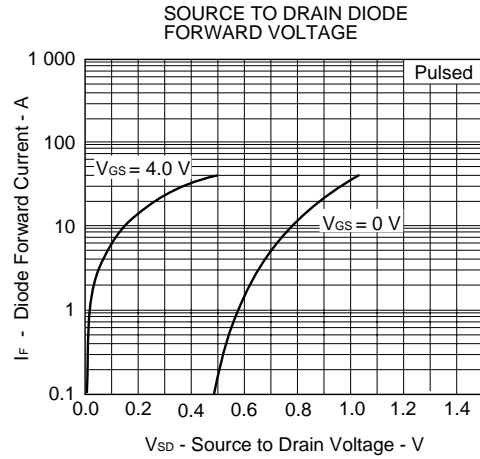
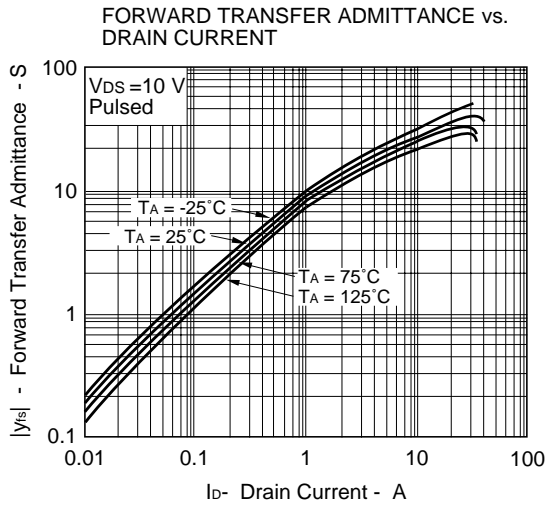


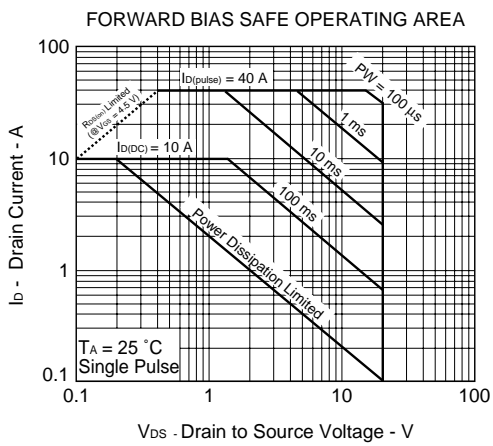
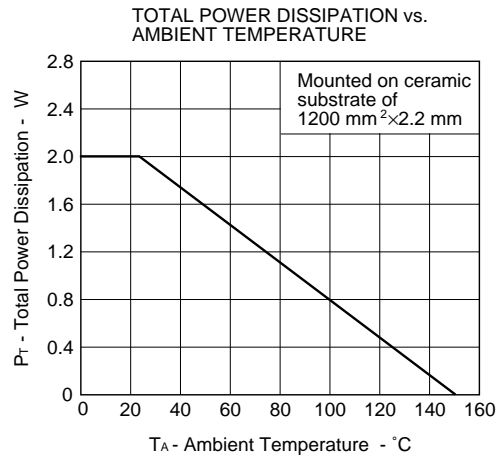
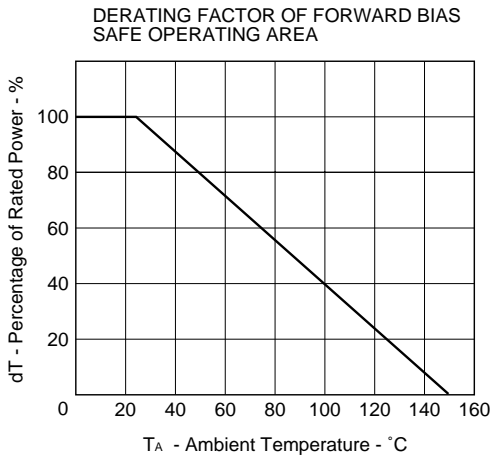
TEST CIRCUIT 2 GATE CHARGE



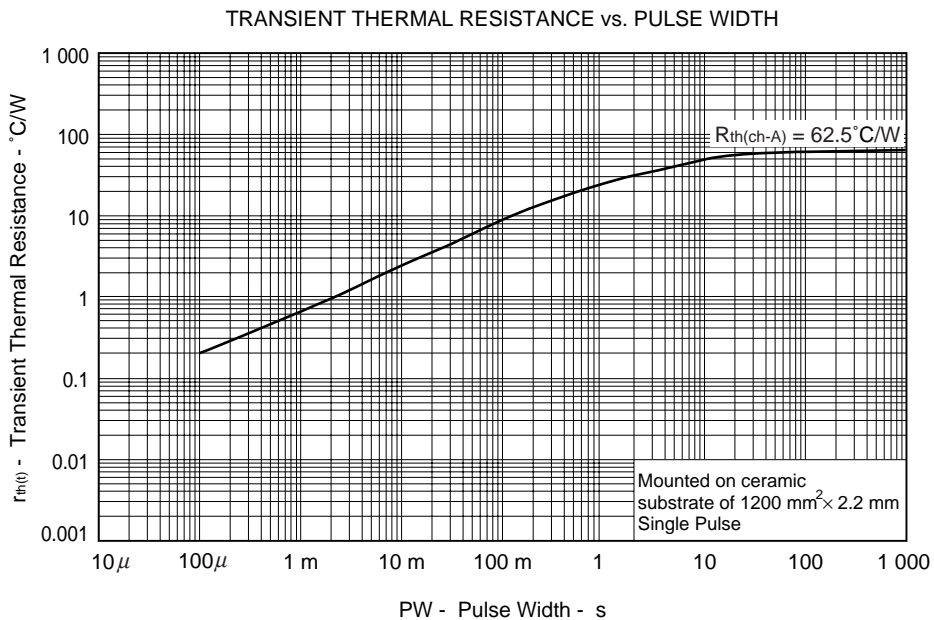
★ TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)







Remark
Mounted on ceramic substrate of 1200 mm² × 2.2 mm



[MEMO]

[MEMO]

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 - Specific: Aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.
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