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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**

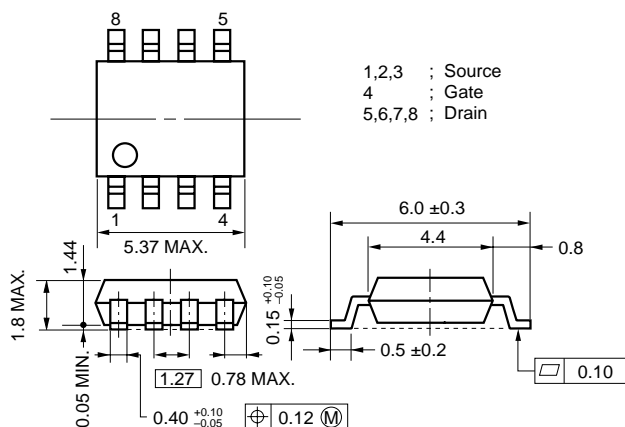
DESCRIPTION

The μ PA1723 is N-Channel MOS Field Effect Transistor designed for power management switch.

FEATURES

- Low on-state resistance
 $R_{DS(on)1} = 6.7 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 7.0 \text{ A)}$
 $R_{DS(on)2} = 7.4 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.0 \text{ V, } I_D = 7.0 \text{ A)}$
 $R_{DS(on)3} = 8.7 \text{ m}\Omega \text{ MAX. (} V_{GS} = 2.5 \text{ V, } I_D = 7.0 \text{ A)}$
- Low C_{iss} : $C_{iss} = 3800 \text{ pF TYP.}$
- Built-in G-S protection diode
- Small and surface mount package (Power SOP8)

PACKAGE DRAWING (Unit : mm)



ORDERING INFORMATION

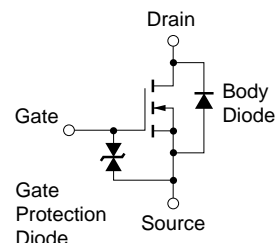
PART NUMBER	PACKAGE
μ PA1723G	Power SOP8

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)}	±13	A
Drain Current (pulse) ^{Note1}	I _{D(pulse)}	±52	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

- Notes 1.** PW ≤ 10 μs, Duty Cycle ≤ 1 %
2. Mounted on ceramic substrate of 1200 mm² x 2.2mm

EQUIVALENT CIRCUIT



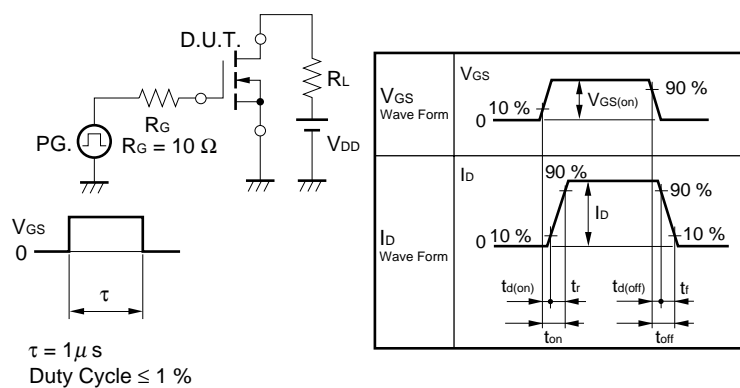
Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

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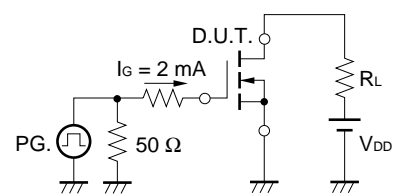
ELECTRICAL CHARACTERISTICS (T_A = 25 °C, All terminals are connected.)

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 = 7.0 A		5.4	6.7	mΩ
	R _{DS(on)2}	V _{GS} = 4.0 V, I _D = 7.0 A		5.5	7.4	mΩ
	R _{DS(on)3}	V _{GS} = 2.5 V, I _D = 7.0 A		6.5	8.7	mΩ
Gate to Source Cut-off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 mA	0.5	0.9	1.5	V
Forward Transfer Admittance	y _{fs}	V _{DS} = 10 V, I _D = 7.0 A	15.0	32		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		3800		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		1200		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		700		pF
Turn-on Delay Time	t _{d(on)}	I _D = 7.0 A		70		ns
Rise Time	t _r	V _{GS(on)} = 4.5 V		440		ns
Turn-off Delay Time	t _{d(off)}	V _{DD} = 10 V		230		ns
Fall Time	t _f	R _G = 10 Ω		300		ns
Total Gate Charge	Q _G	I _D = 13 A		47.0		nC
Gate to Source Charge	Q _{GS}	V _{DD} = 16 V		11.0		nC
Gate to Drain Charge	Q _{GD}	V _{GS} = 4.5 V		12.0		nC
Body Diode Forward Voltage	V _{F(S-D)}	I _F = 13.0 A, V _{GS} = 0 V		0.75		V
Reverse Recovery Time	t _{rr}	I _F = 13.0 A, V _{GS} = 0 V		68		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 100 A/μs		70		nC

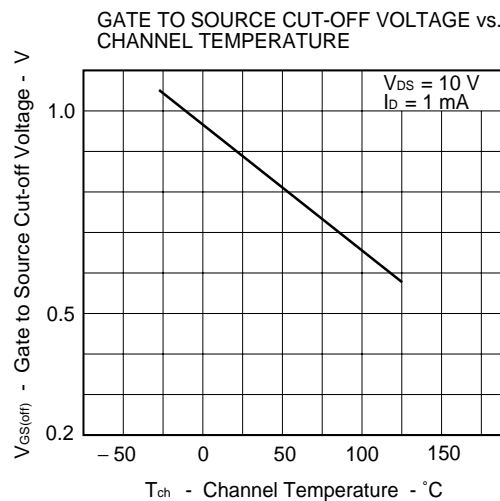
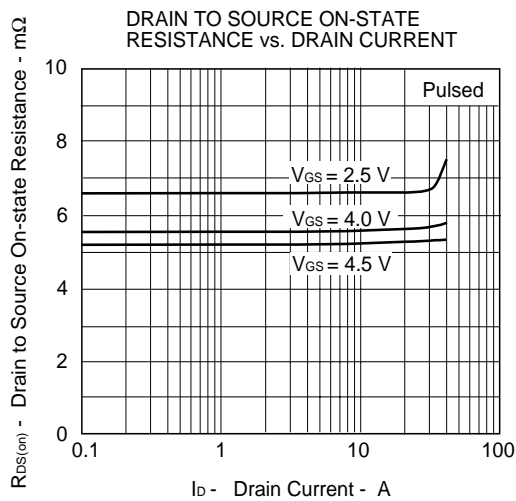
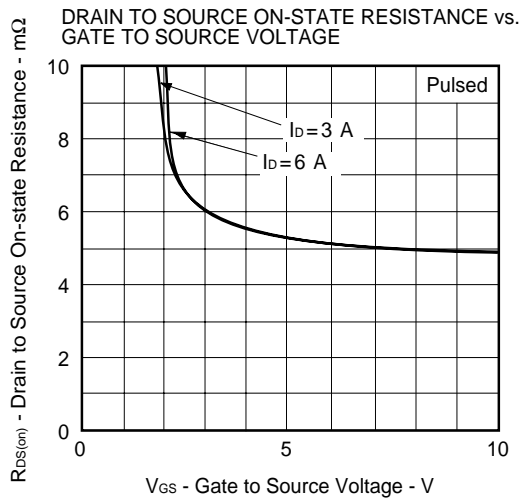
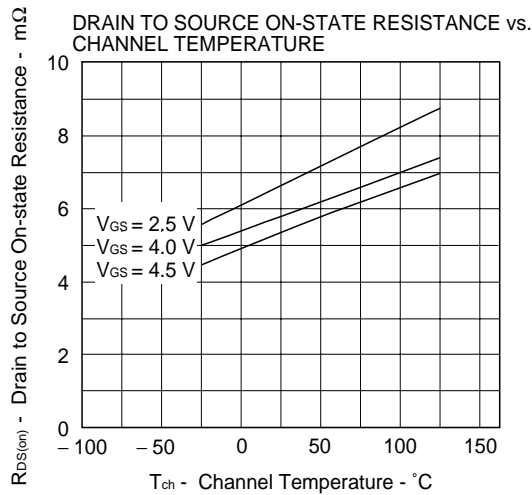
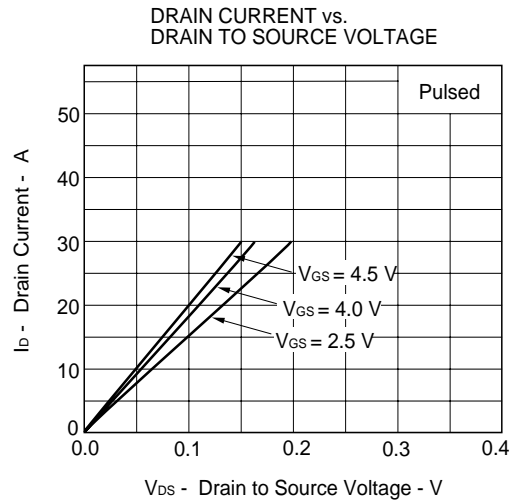
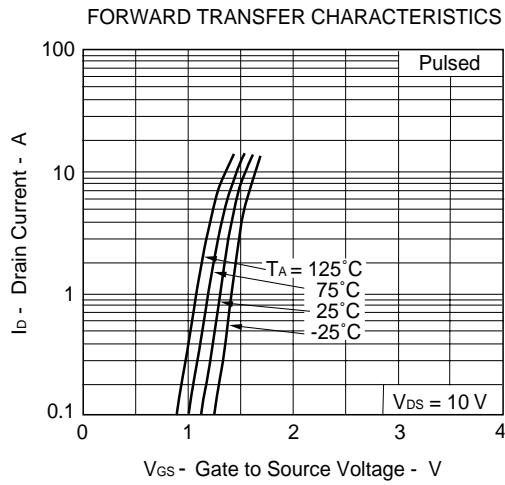
TEST CIRCUIT 1 SWITCHING TIME

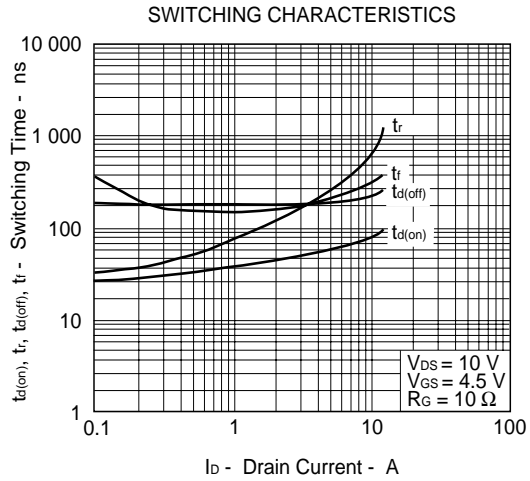
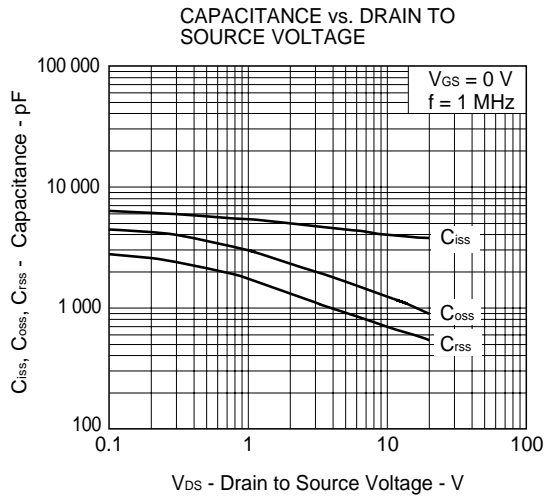
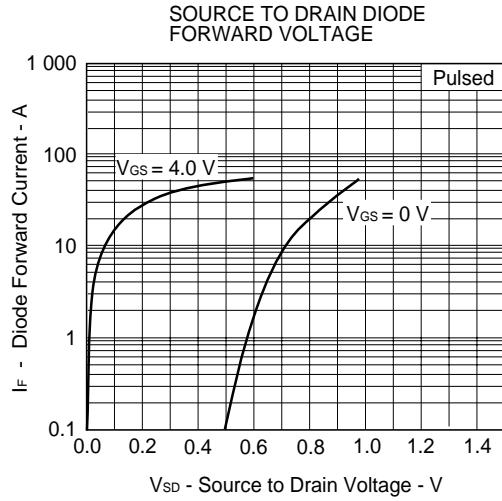
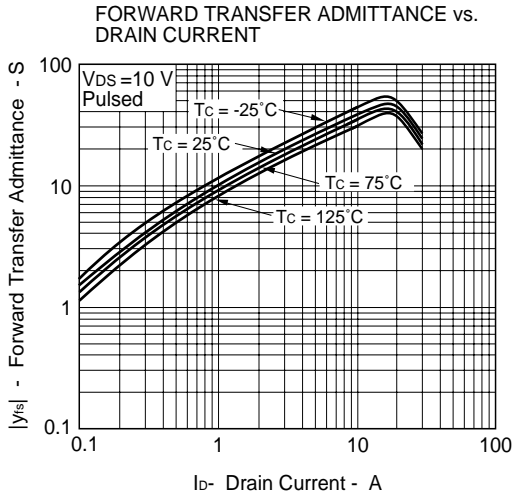


TEST CIRCUIT 2 GATE CHARGE

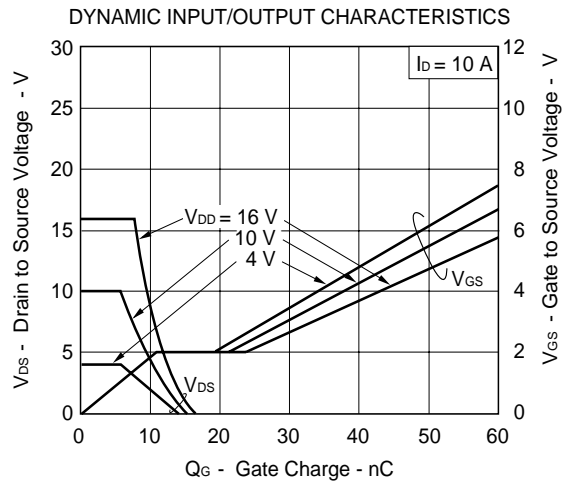
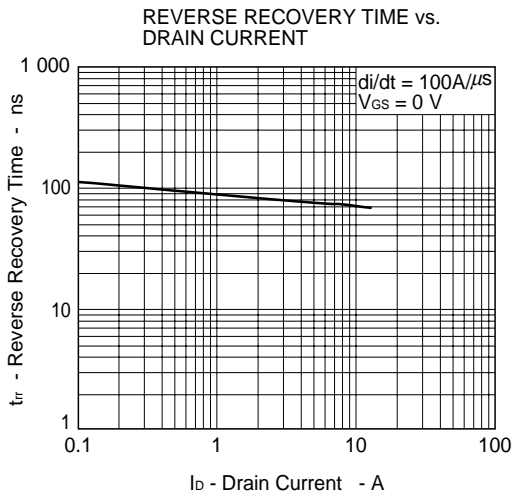


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

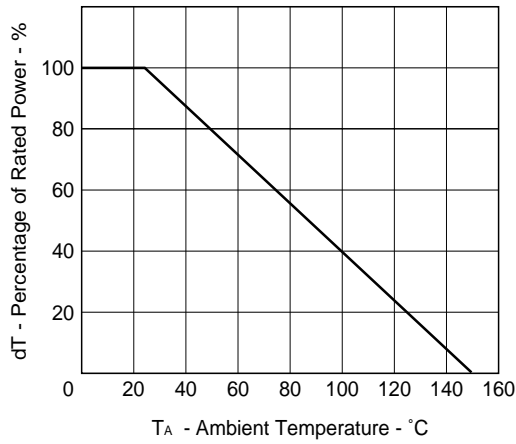




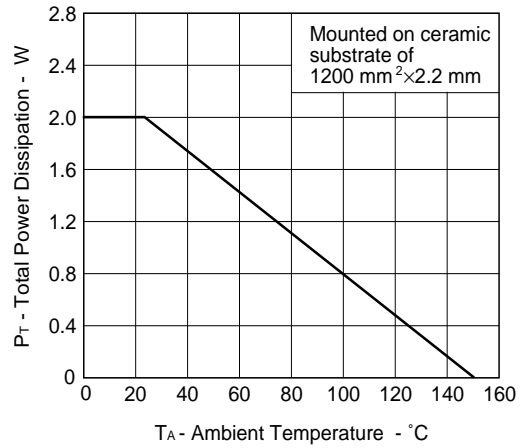
Remark
Mounted on ceramic substrate of 1200 mm² x 2.2 mm



DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA

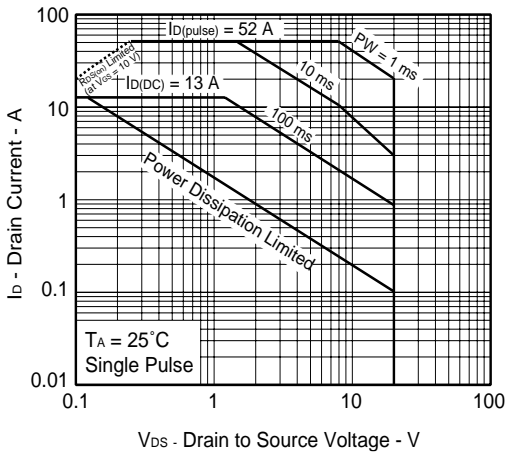


TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



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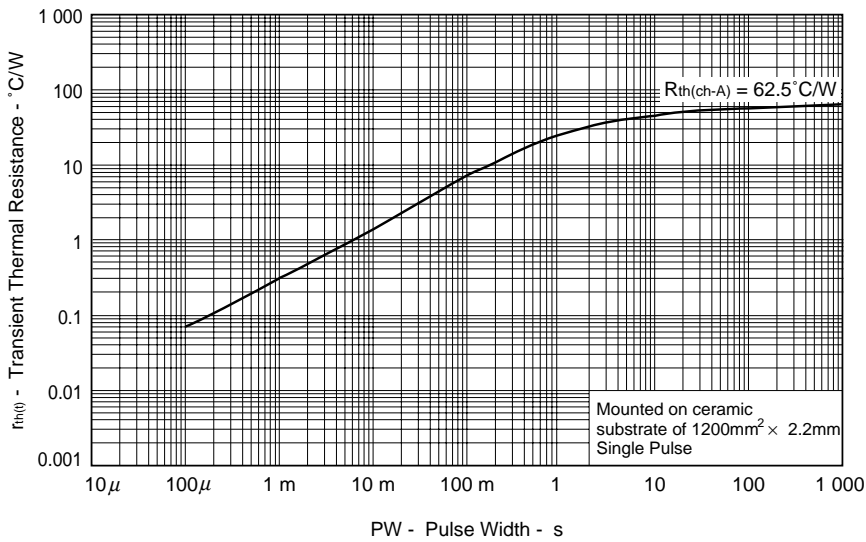
FORWARD BIAS SAFE OPERATING AREA



Remark

Mounted on ceramic substrate of 1200 mm² x 2.2 mm

TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



[MEMO]

[MEMO]

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