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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**

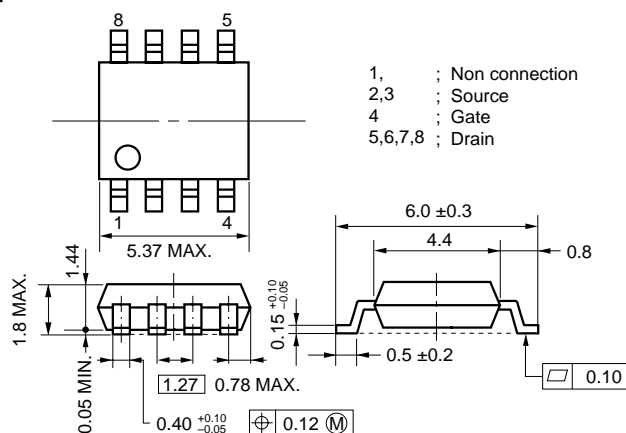
DESCRIPTION

This μPA1725 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
 $R_{DS(on)1} = 21.0 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 3.5 \text{ A)}$
 $R_{DS(on)2} = 22.0 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.0 \text{ V, } I_D = 3.5 \text{ A)}$
 $R_{DS(on)3} = 30.0 \text{ m}\Omega \text{ MAX. (} V_{GS} = 2.5 \text{ V, } I_D = 3.5 \text{ A)}$
- Low C_{iss} : $C_{iss} = 950 \text{ pF TYP.}$
- Built-in G-S protection diode
- Small and surface mount package (Power SOP8)

PACKAGE DRAWING (Unit : mm)



ORDERING INFORMATION

PART NUMBER	PACKAGE
μPA1725G	Power SOP8

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

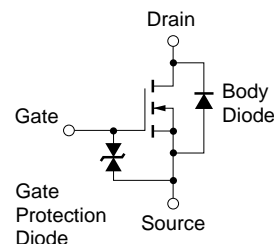
Drain to Source Voltage (V _{GS} = 0 V)	V _{DS}	20	V
Gate to Source Voltage (V _{DS} = 0 V)	V _{GSS}	±12	V
Drain Current (DC)	I _{D(DC)}	±7	A
Drain Current (pulse) ^{Note1}	I _{D(pulse)}	±28	A
Total Power Dissipation (T _A = 25°C) ^{Note2}	P _T	2.0	W
Channel Temperature	T _{ch}	150	°C
Storage Temperature	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

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.

EQUIVALENT CIRCUIT

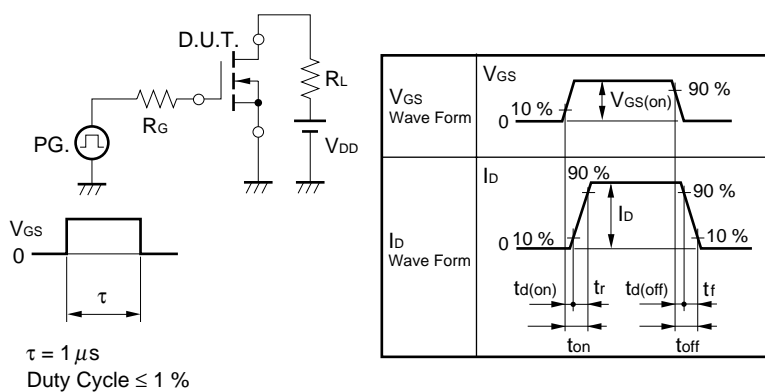


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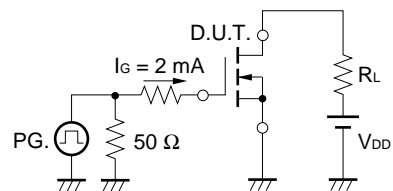
ELECTRICAL CHARACTERISTICS (T_A = 25 °C, All terminals are connected.)

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 = 3.5 A		16.5	21.0	mΩ
	R _{DS(on)2}	V _{GS} = 4.0 V, I _D = 3.5 A		17.0	22.0	mΩ
	R _{DS(on)3}	V _{GS} = 2.5 V, I _D = 3.5 A		22.0	30.0	mΩ
Gate to Source Cut-off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 mA	0.5	1.0	1.5	V
Forward Transfer Admittance	y _{fs}	V _{DS} = 10 V, I _D = 3.5 A	5.0	11.0		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		950		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		310		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		160		pF
Turn-on Delay Time	t _{d(on)}	I _D = 3.5 A		30		ns
Rise Time	t _r	V _{GS(on)} = 4.5 V		120		ns
Turn-off Delay Time	t _{d(off)}	V _{DD} = 10 V		70		ns
Fall Time	t _f	R _G = 10 Ω		70		ns
Total Gate Charge	Q _G	I _D = 7 A		9.6		nC
Gate to Source Charge	Q _{GS}	V _{DD} = 16 V		1.7		nC
Gate to Drain Charge	Q _{GD}	V _{GS} = 4.5 V		4.1		nC
Body Diode Forward Voltage	V _{F(S-D)}	I _F = 7 A, V _{GS} = 0 V		0.8		V
Reverse Recovery Time	t _{rr}	I _F = 7 A, V _{GS} = 0 V		40		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 100 A/μs		27		nC

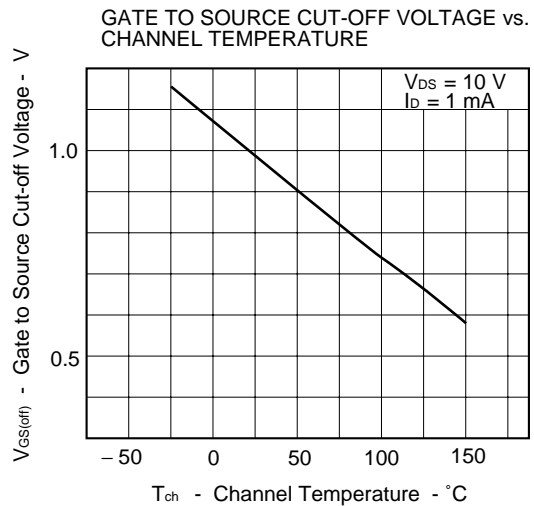
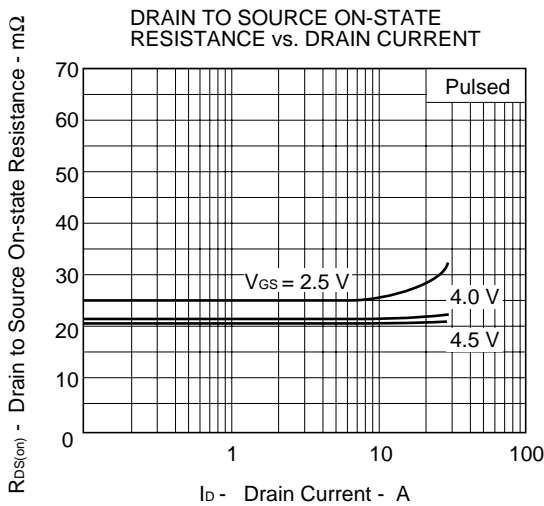
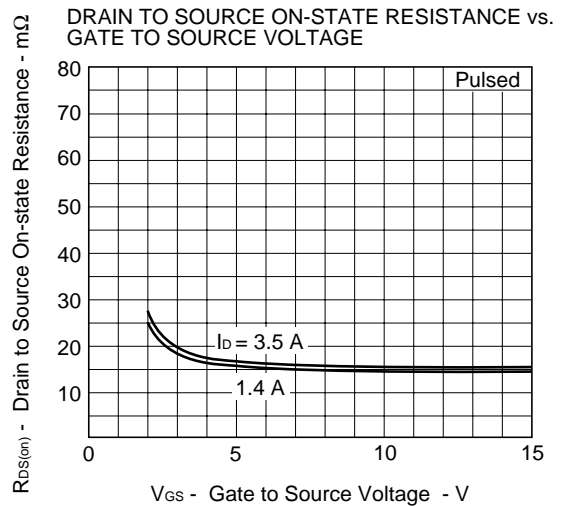
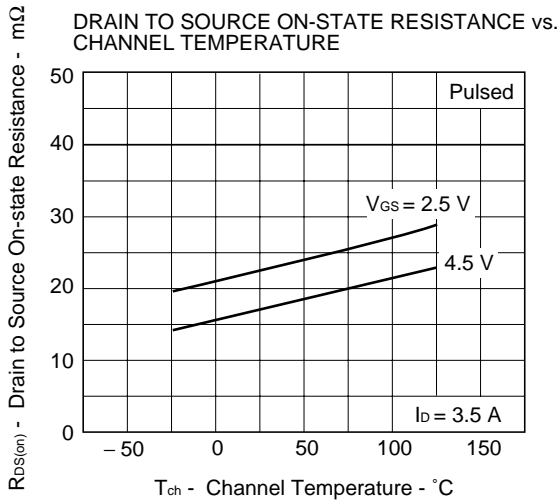
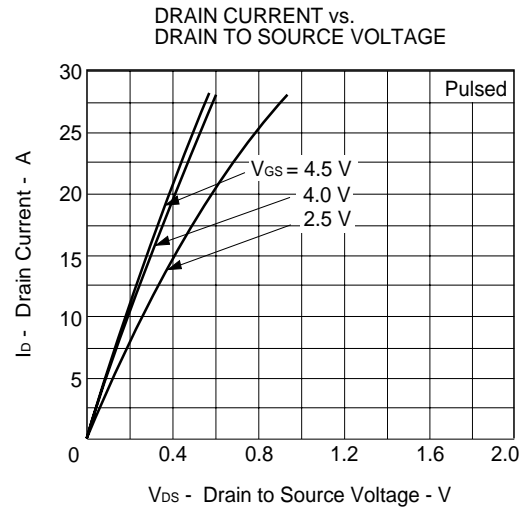
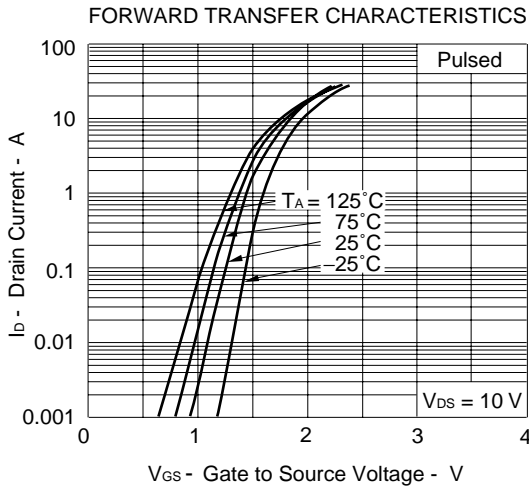
TEST CIRCUIT 2 SWITCHING TIME

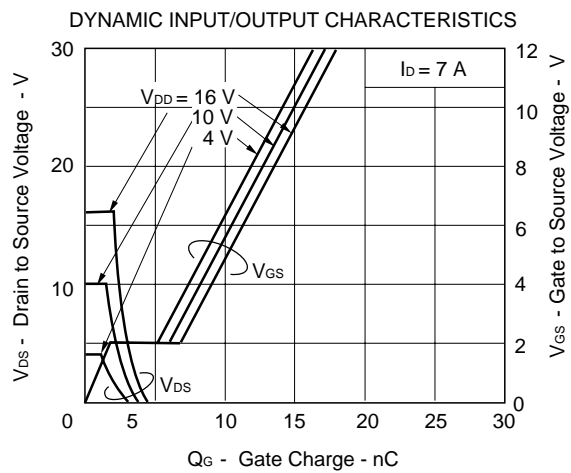
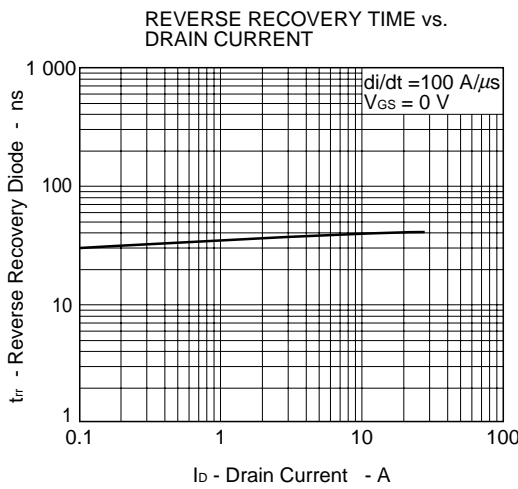
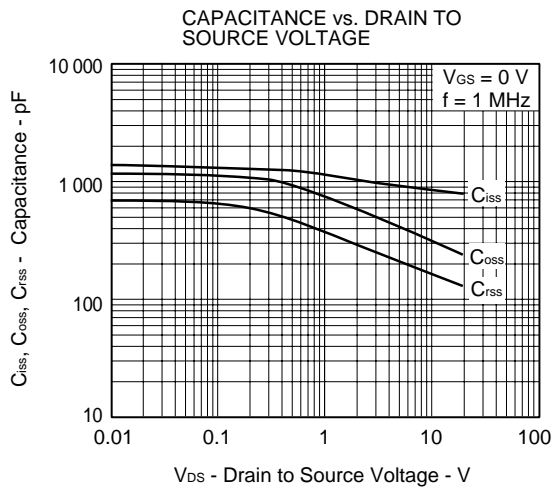
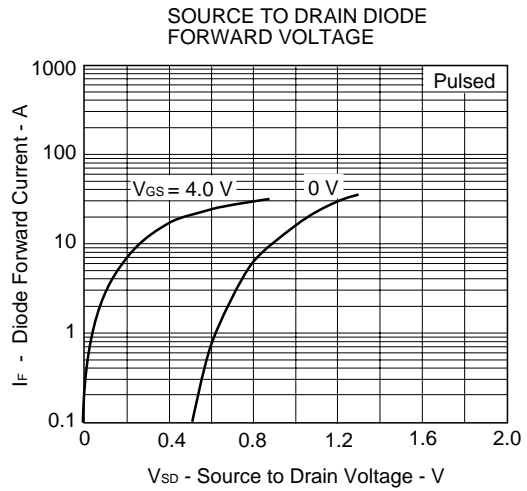
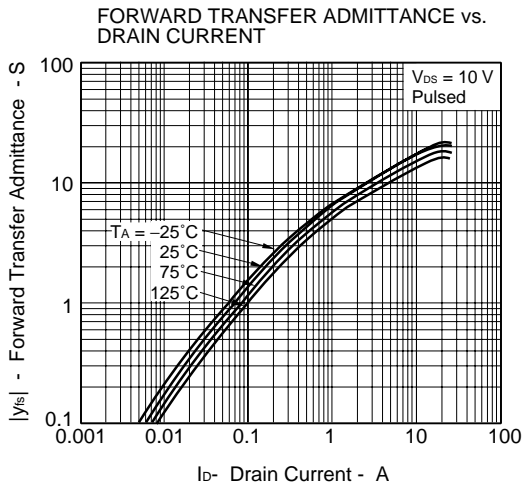


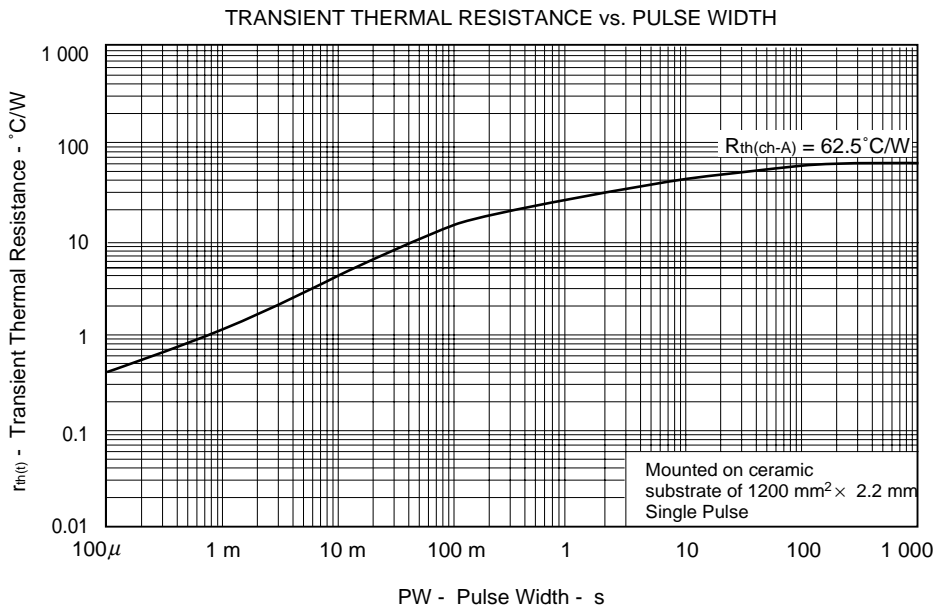
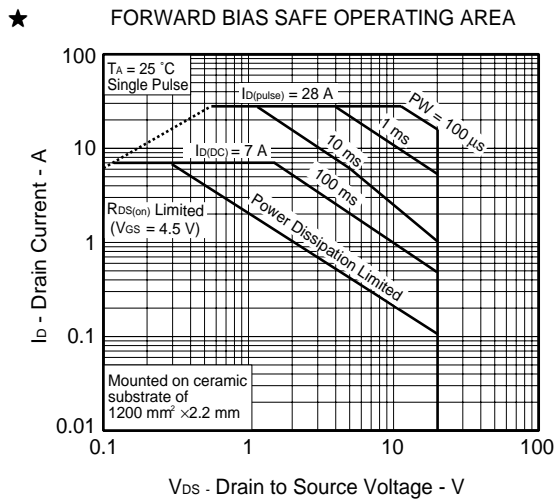
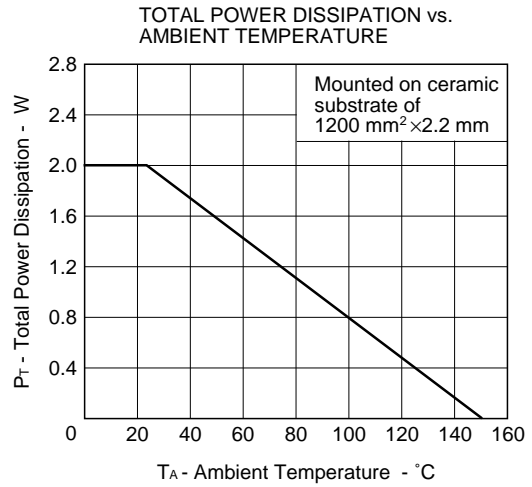
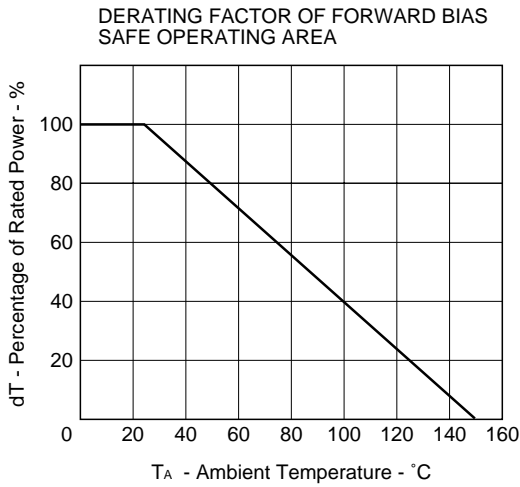
TEST CIRCUIT 3 GATE CHARGE



TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, All terminals are connected.)







[MEMO]

[MEMO]

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