

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

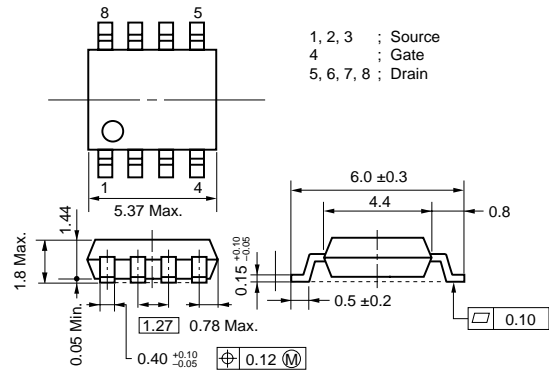
DESCRIPTION

This product is N-Channel MOS Field Effect Transistor designed for DC/DC Converters and power management application of notebook computers.

FEATURES

- Super low on-state resistance
 $R_{DS(on)1} = 19.0 \text{ m}\Omega$ TYP. ($V_{GS} = 10 \text{ V}$, $I_D = 4.0 \text{ A}$)
 $R_{DS(on)2} = 30.0 \text{ m}\Omega$ TYP. ($V_{GS} = 4.5 \text{ V}$, $I_D = 4.0 \text{ A}$)
- Low C_{iss} : $C_{iss} = 750 \text{ pF}$ TYP.
- Built-in G-S protection diode
- Small and surface mount package (Power SOP8)

PACKAGE DRAWING (Unit : mm)



ORDERING INFORMATION

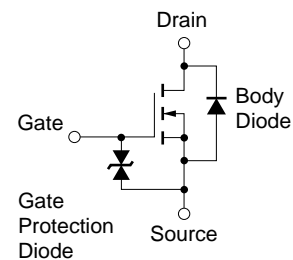
PART NUMBER	PACKAGE
μPA1705G	Power SOP8

ABSOLUTE MAXIMUM RATINGS ($T_A = 25 \text{ }^\circ\text{C}$, All terminals are connected.)

Drain to Source Voltage ($V_{GS} = 0$)	V_{DSS}	30	V
Gate to Source Voltage ($V_{DS} = 0$)	V_{GSS}	±25	V
Drain Current (DC)	$I_{D(DC)}$	±8	A
Drain Current (Pulse) ^{Note1}	$I_{D(pulse)}$	±50	A
Total Power Dissipation ($T_A = 25 \text{ }^\circ\text{C}$) ^{Note2}	P_T	2.0	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	-55 to + 150	°C

- Notes**
1. $PW \leq 10 \mu s$, Duty cycle $\leq 1 \%$
 2. Mounted on ceramic substrate of $1200 \text{ mm}^2 \times 1.7 \text{ mm}$

EQUIVALENT CIRCUIT



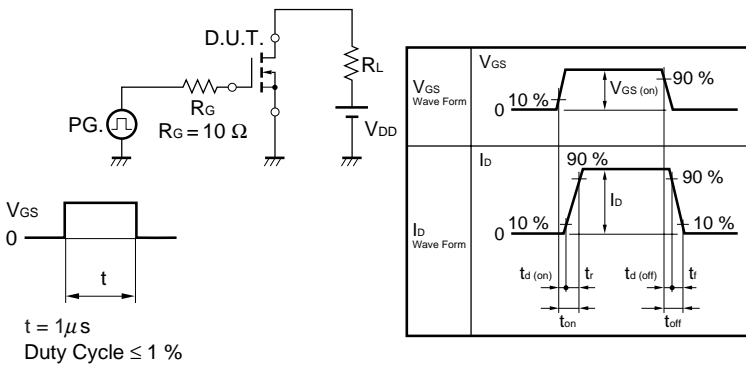
Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage Exceeding the rated voltage may be applied to this device.

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 Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

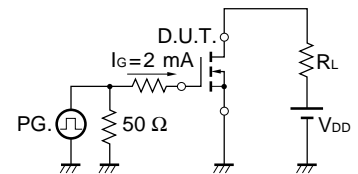
ELECTRICAL CHARACTERISTICS (T_A = 25 °C, All terminals are connected.)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain to Source On-state Resistance	R _{DS(on)1}	V _{GS} = 10 V, I _D = 4.0 A		19	27	mΩ
	R _{DS(on)2}	V _{GS} = 4.5 V, I _D = 4.0 A		30	40	mΩ
Gate to Source Cut-off Voltage	V _{GS(off)}	V _{DS} = 10 V, I _D = 1 mA	1.5	2.0	2.5	V
Forward Transfer Admittance	y _{fs}	V _{DS} = 10 V, I _D = 4.0 A	4.0	8.4		S
Drain Leakage Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V			10	μA
Gate to Source Leakage Current	I _{GSS}	V _{GS} = ±25 V, V _{DS} = 0 V			±10	μA
Input Capacitance	C _{iss}	V _{DS} = 10 V		750		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		350		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		160		pF
Turn-on Delay Time	t _{d(on)}	I _D = 4.0 A		19		ns
Rise Time	t _r	V _{GS(on)} = 10 V		107		ns
Turn-off Delay Time	t _{d(off)}	V _{DD} = 15 V		50		ns
Fall Time	t _f	R _G = 10 Ω		32		ns
Total Gate Charge	Q _G	I _D = 8.0 A		19		nC
Gate to Source Charge	Q _{GS}	V _{DD} = 24 V		2.4		nC
Gate to Drain Charge	Q _{GD}	V _{GS} = 10 V		6.3		nC
Body Diode Forward Voltage	V _{F(S-D)}	I _F = 8.0 A, V _{GS} = 0 V		0.8		V
Reverse Recovery Time	t _{rr}	I _F = 8.0 A, V _{GS} = 0 V		33		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 100A/μs		22		nC

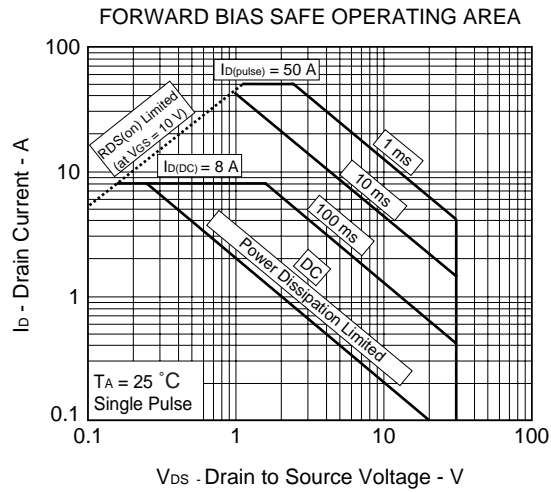
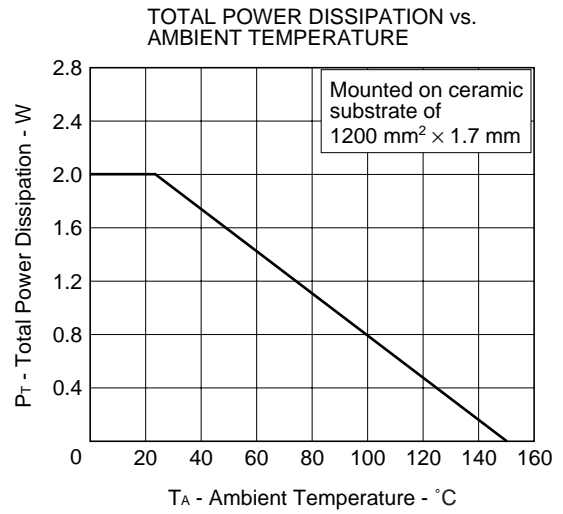
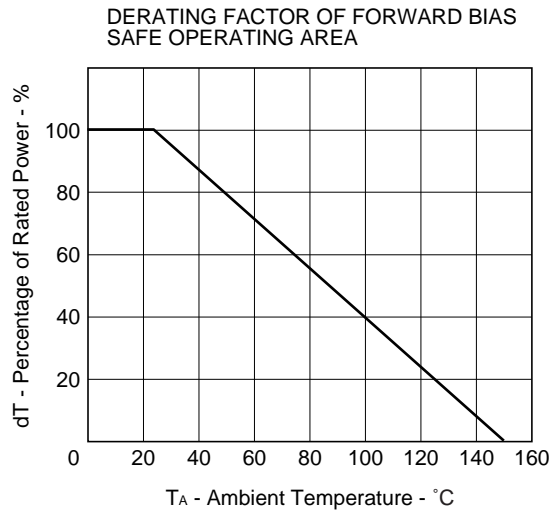
TEST CIRCUIT 1 SWITCHING TIME



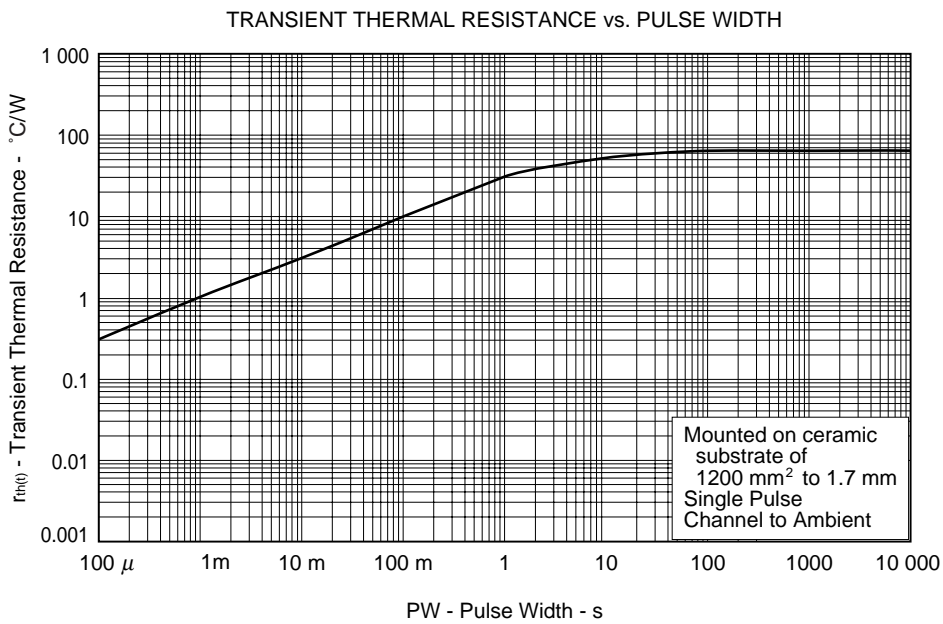
TEST CIRCUIT 2 GATE CHARGE

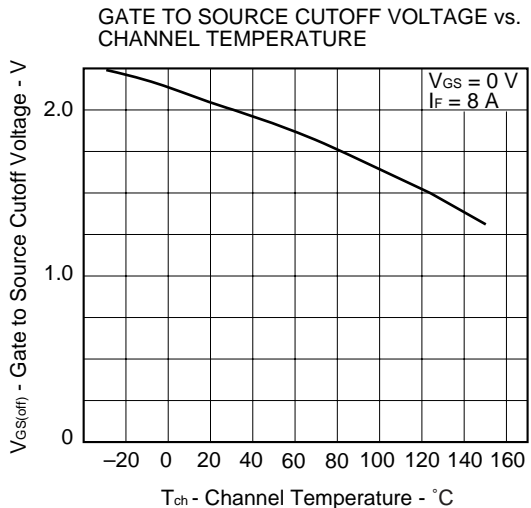
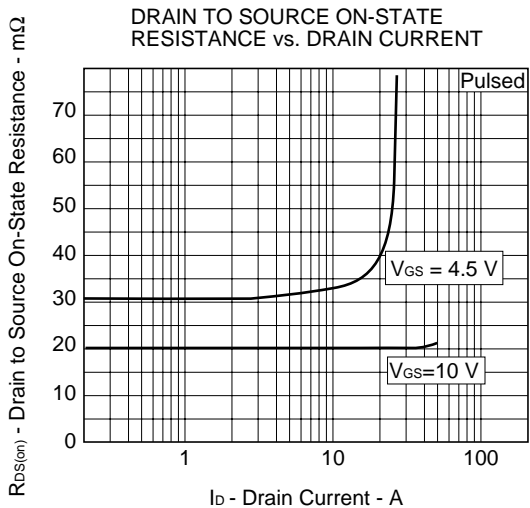
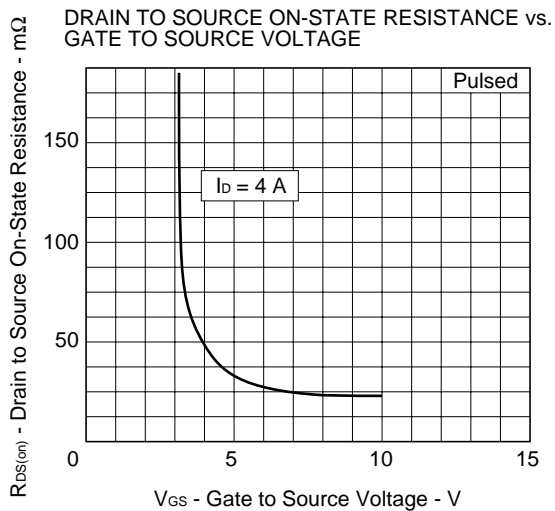
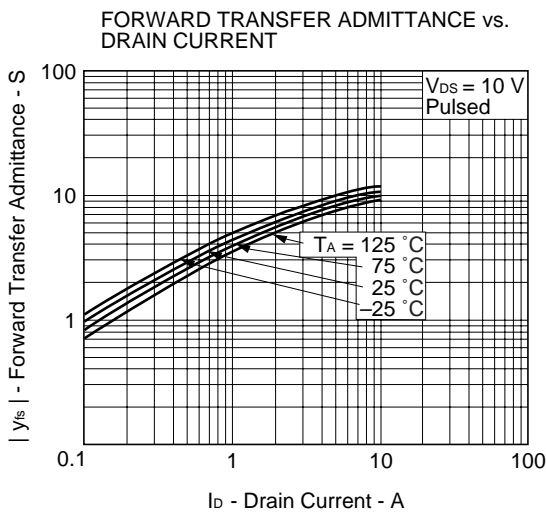
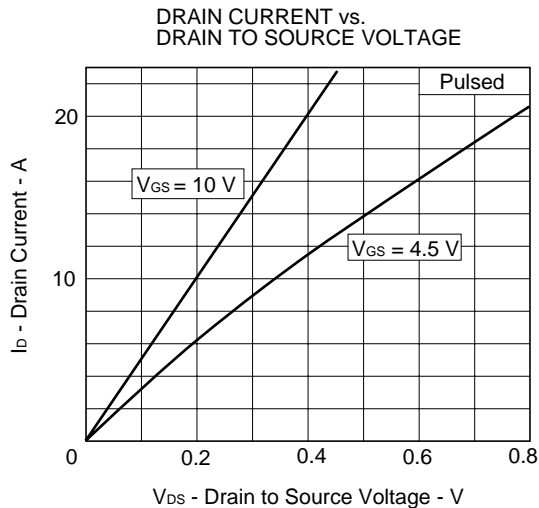
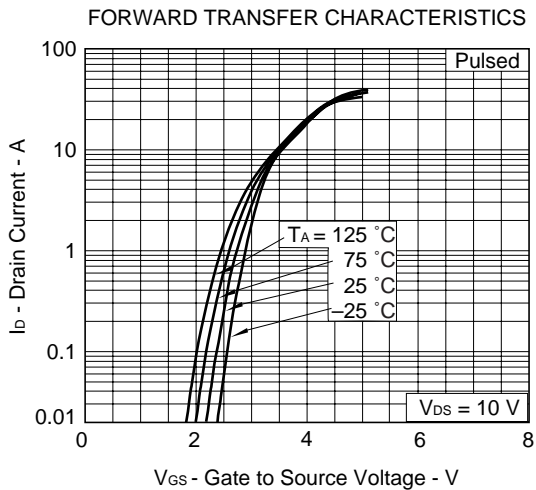


TYPICAL CHARACTERISTICS (T_A = 25 °C, All terminals are connected.)

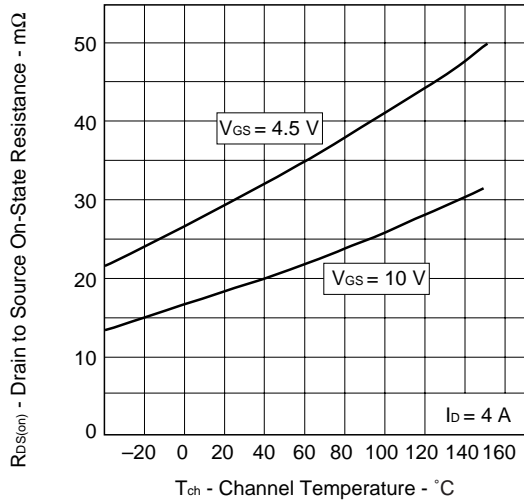


Remark
Mounted on ceramic substrate of 2000 mm² × 1.7 mm

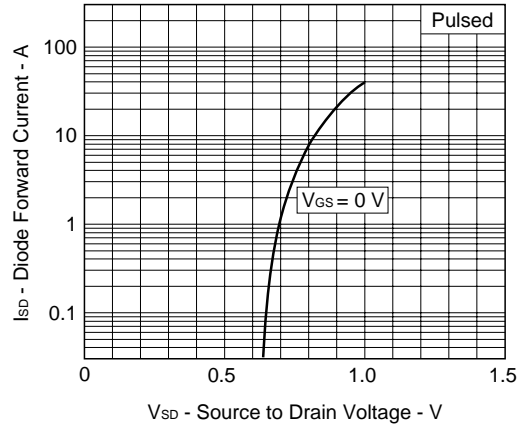




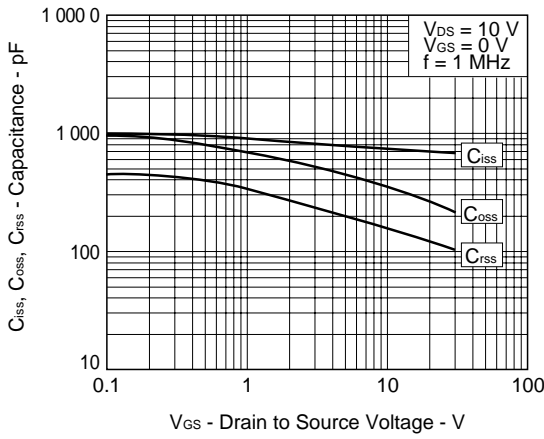
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



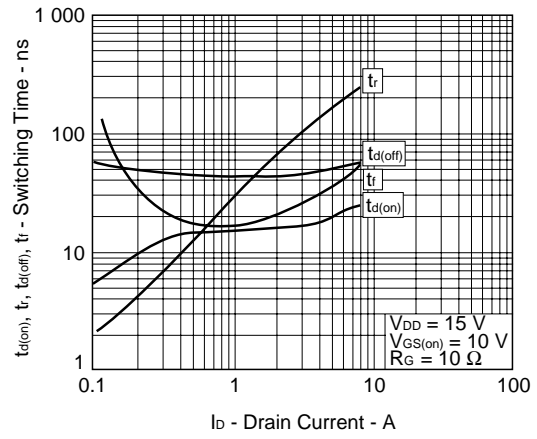
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



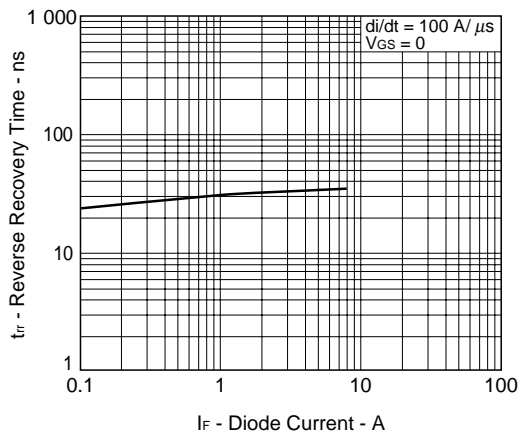
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



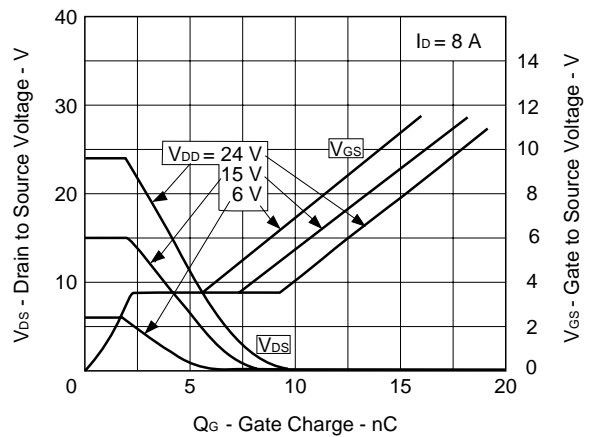
SWITCHING CHARACTERISTICS



REVERSE RECOVERY TIME vs. DRAIN CURRENT



DYNAMIC INPUT/OUTPUT CHARACTERISTICS



[MEMO]

[MEMO]

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