

P-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR SWITCHING

DESCRIPTION

The μ PA1810 is a switching device which can be driven directly by a 2.5 V power source.

The μ PA1810 features a low on-state resistance and excellent switching characteristics, and is suitable for applications such as power switch of portable machine and so on.

FEATURES

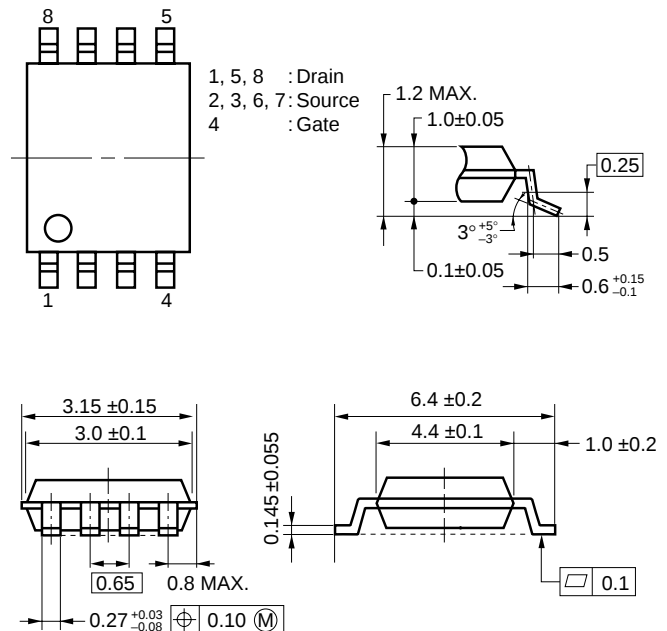
- Can be driven by a 2.5 V power source
- Low on-state resistance

$$R_{DS(on)1} = 55 \text{ m}\Omega \text{ MAX. (V}_{GS} = -4.5 \text{ V, I}_D = -2.0 \text{ A)}$$
$$R_{DS(on)2} = 60 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.0 \text{ V, } I_D = -2.0 \text{ A)}$$
$$R_{DS(on)3} = 100 \text{ m}\Omega \text{ MAX. (V}_{GS} = -2.5 \text{ V, I}_D = -2.0 \text{ A)}$$

ORDERING INFORMATION

PART NUMBER	PACKAGE
μPA1810GR-9JG	Power TSSOP8

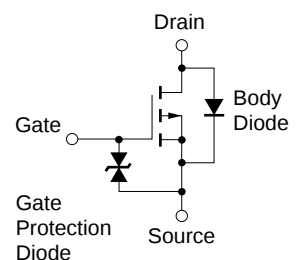
PACKAGE DRAWING (Unit : mm)



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage	V _{DSS}	−12	V
Gate to Source Voltage	V _{GSS}	−10/+5	V
Drain Current (DC)	I _{D(DC)}	±4.0	A
Drain Current (pulse) ^{Note1}	I _{D(pulse)}	±16	A
Total Power Dissipation ^{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 5000 mm² x 1.1 mm

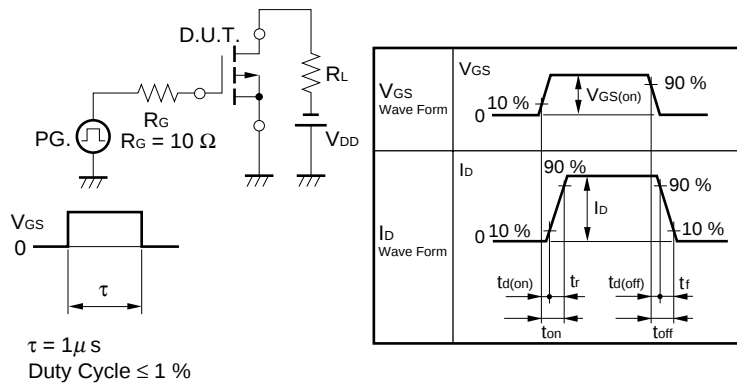
Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

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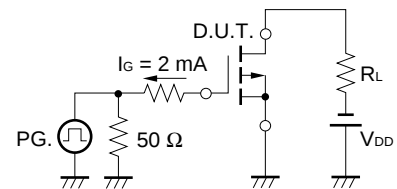
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -12 V, V _{GS} = 0 V			-10	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±10 V, V _{DS} = 0 V			±10	μA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = -10 V, I _D = -1 mA	-0.5	-0.8	-1.5	V
Forward Transfer Admittance	y _{fs}	V _{DS} = -10 V, I _D = -2.0 A	2.5	8.5		S
Drain to Source On-state Resistance	R _{DS(on)1}	V _{GS} = -4.5 V, I _D = -2.0 A		41	55	mΩ
	R _{DS(on)2}	V _{GS} = -4.0 V, I _D = -2.0 A		43	60	mΩ
	R _{DS(on)3}	V _{GS} = -2.5 V, I _D = -2.0 A		71	100	mΩ
Input Capacitance	C _{iss}	V _{DS} = -10 V		1100		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		750		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		240		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = -10 V		40		ns
Rise Time	t _r	I _D = -2.0 A		100		ns
Turn-off Delay Time	t _{d(off)}	V _{GS(on)} = -4.0 V		90		ns
Fall Time	t _f	R _G = 5 Ω		70		ns
Total Gate Charge	Q _G	V _{DD} = -10 V		35		nC
Gate to Source Charge	Q _{GS}	I _D = -4.0 A		5		nC
Gate to Drain Charge	Q _{GD}	V _{GS} = -4.0 V		16		nC
Diode Forward Voltage	V _{F(S-D)}	I _F = 4.0 A, V _{GS} = 0 V		0.75		V
Reverse Recovery Time	t _{rr}	I _F = 4.0 A, V _{GS} = 0 V		50		ns
Reverse Recovery Charge	Q _{rr}	di/dt = 100 A/μS		35		nC

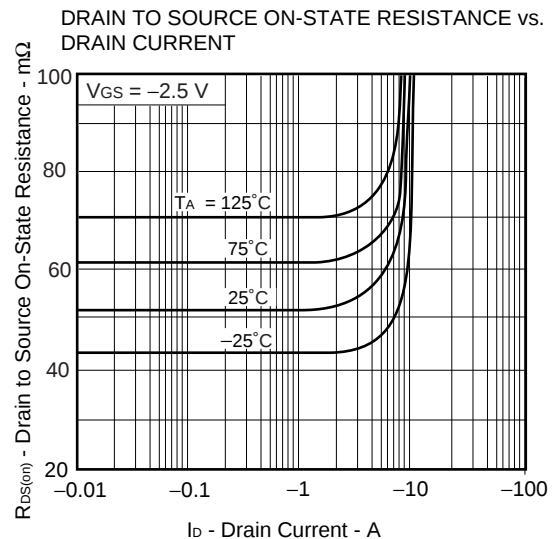
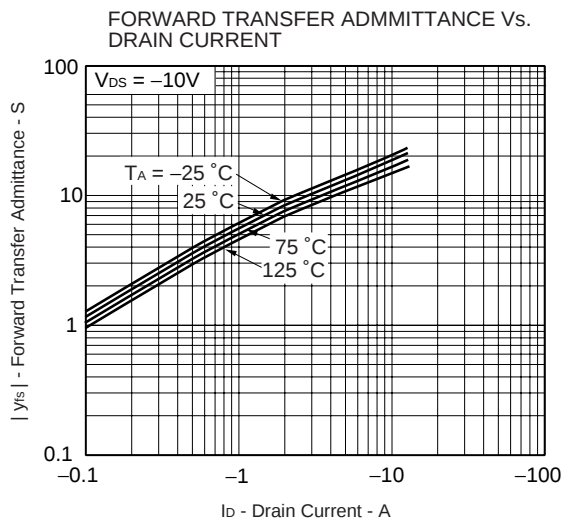
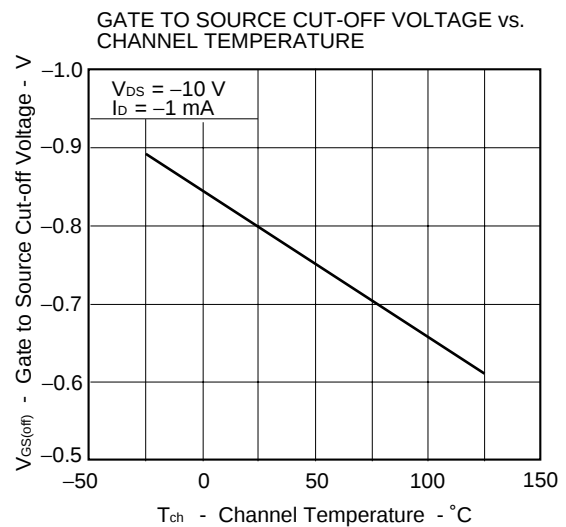
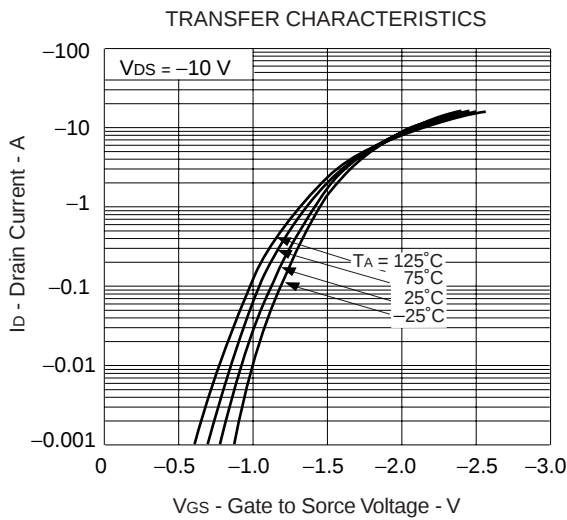
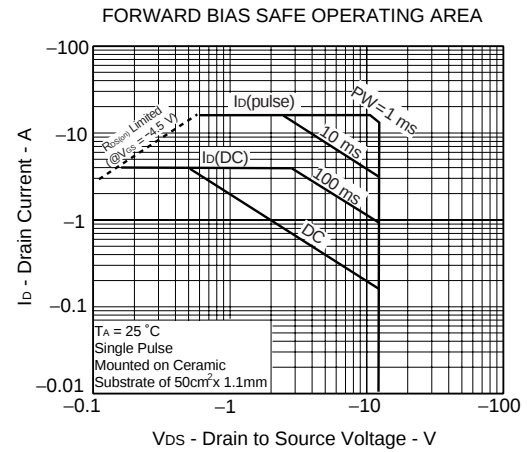
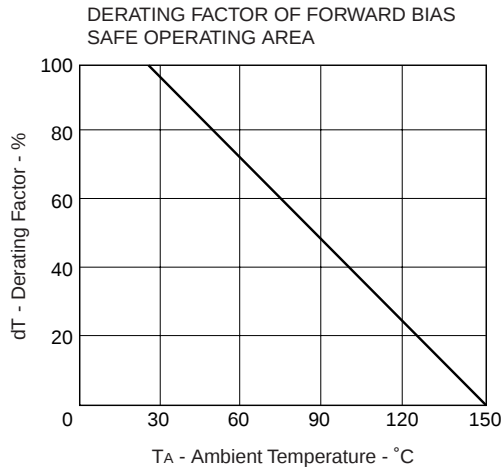
TEST CIRCUIT 1 SWITCHING TIME

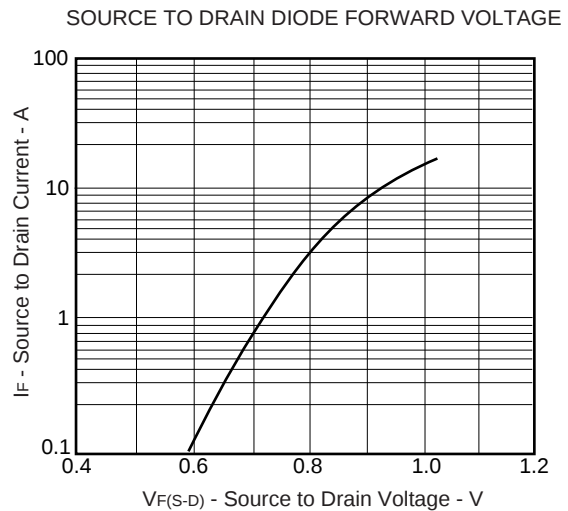
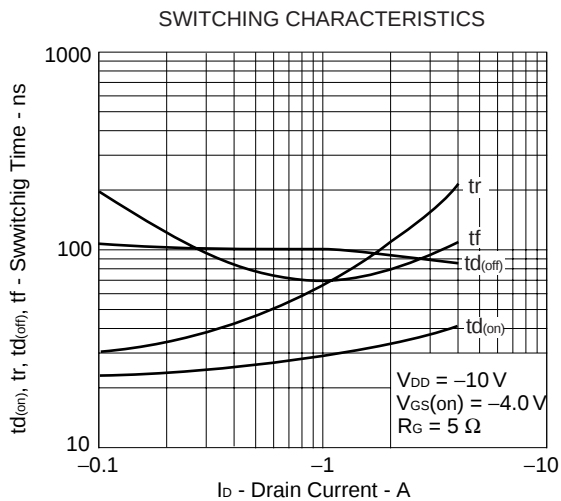
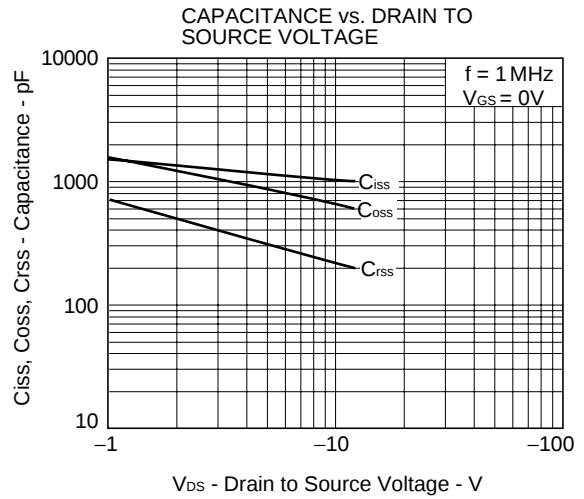
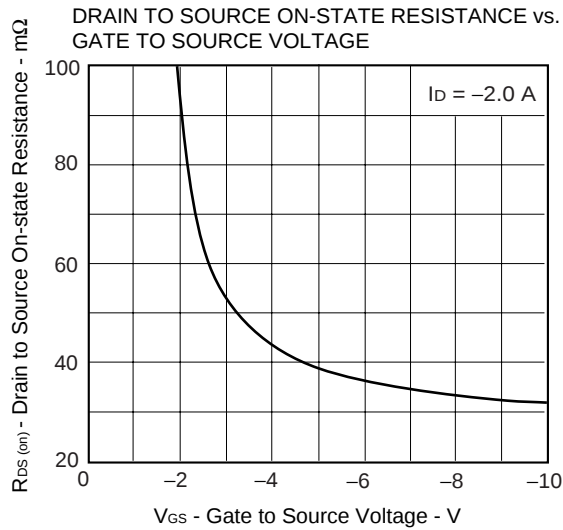
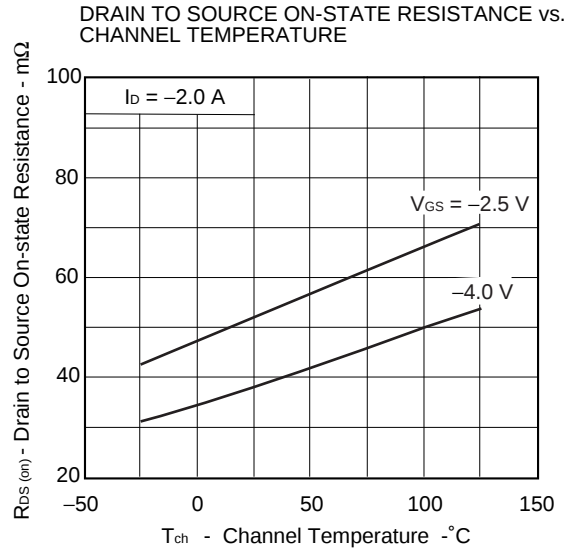
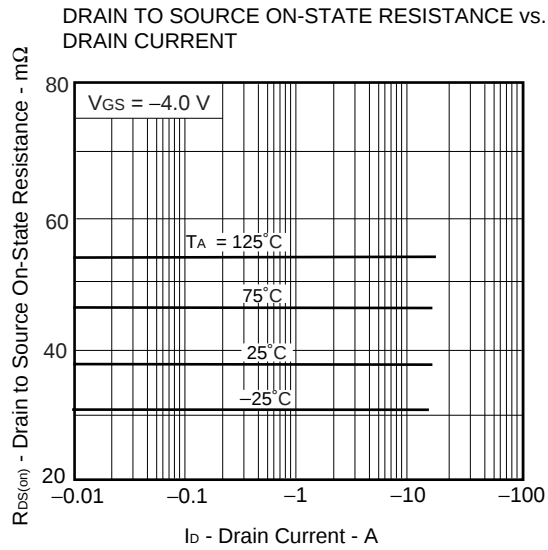


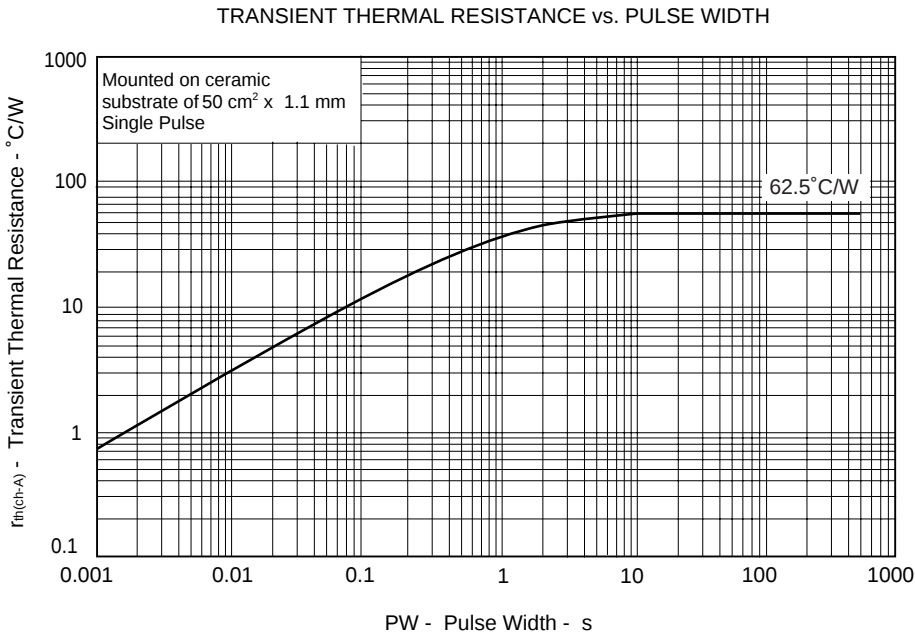
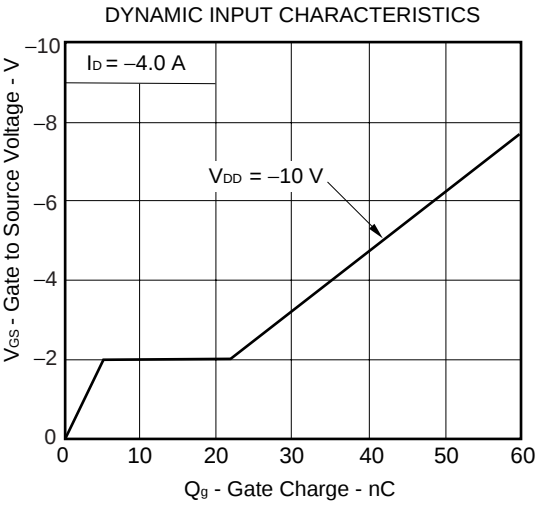
TEST CIRCUIT 2 GATE CHARGE



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







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