

MOS FIELD EFFECT TRANSISTOR

μ PA1814

P-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR SWITCHING

DESCRIPTION

The μ PA1814 is a switching device which can be driven directly by a 4 V power source.

The μ PA1814 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.

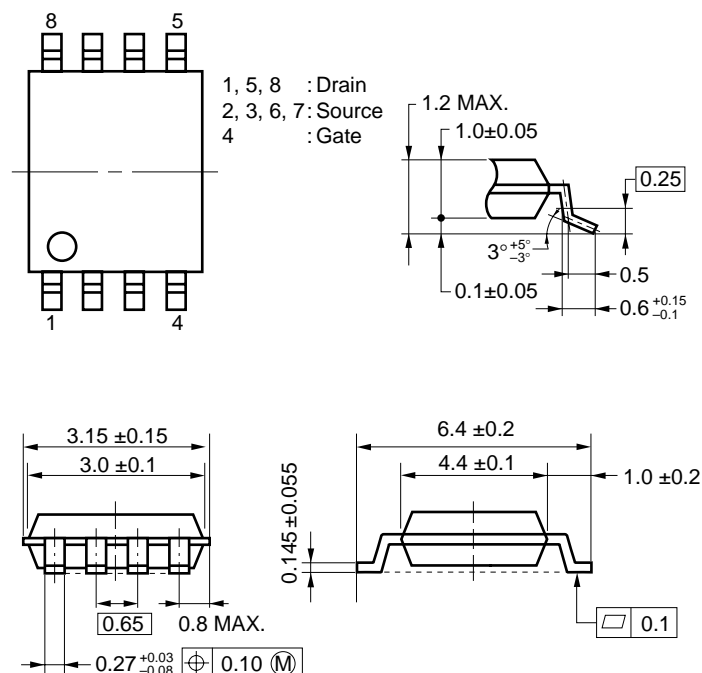
FEATURES

- Can be driven by a 4 V power source
- ★ • Low on-state resistance
 $R_{DS(on)1} = 16 \text{ m}\Omega \text{ MAX. (} V_{GS} = -10 \text{ V, } I_D = -3.5 \text{ A)}$
 $R_{DS(on)2} = 24 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -3.5 \text{ A)}$
 $R_{DS(on)3} = 27 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.0 \text{ V, } I_D = -3.5 \text{ A)}$
- Built-in G-S protection diode against ESD

ORDERING INFORMATION

PART NUMBER	PACKAGE
μ PA1814GR-9JG	Power TSSOP8

PACKAGE DRAWING (Unit : mm)



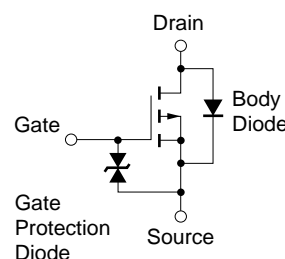
ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage	V _{DSS}	-30	V
Gate to Source Voltage	V _{GSS}	±20	V
Drain Current (DC)	I _{D(DC)}	±7.0	A
Drain Current (pulse) ^{Note1}	I _{D(pulse)}	±28	A
Total Power Dissipation ^{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 $5000 \text{ mm}^2 \times 1.1 \text{ mm}$

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.

EQUIVALENT CIRCUIT

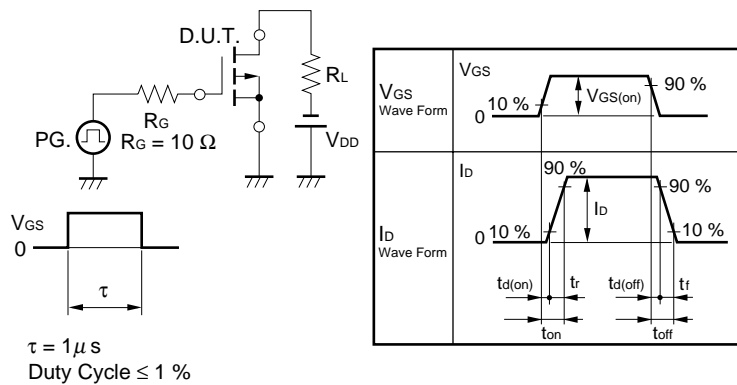


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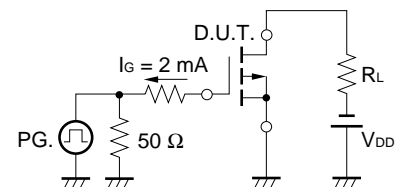
★ ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30 V, V _{GS} = 0 V			-10	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20 V, V _{DS} = 0 V			±10	μA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = -10 V, I _D = -1 mA	-1.0	-1.7	-2.5	V
Forward Transfer Admittance	y _{fs}	V _{DS} = -10 V, I _D = -3.5 A	3	14		S
Drain to Source On-state Resistance	R _{DS(on)1}	V _{GS} = -10 V, I _D = -3.5 A		12	16	mΩ
	R _{DS(on)2}	V _{GS} = -4.5 V, I _D = -3.5 A		18	24	mΩ
	R _{DS(on)3}	V _{GS} = -4.0 V, I _D = -3.5 A		20	27	mΩ
Input Capacitance	C _{iss}	V _{DS} = -10 V		2180		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		658		pF
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz		303		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = -15 V		30		ns
Rise Time	t _r	I _D = -3.5 A		140		ns
Turn-off Delay Time	t _{d(off)}	V _{GS(on)} = -10 V		97		ns
Fall Time	t _f	R _G = 10 Ω		86		ns
Total Gate Charge	Q _G	V _{DS} = -24 V		38		nC
Gate to Source Charge	Q _{GS}	I _D = -7.0 A		5.9		nC
Gate to Drain Charge	Q _{GD}	V _{GS} = -10 V		8.5		nC
Diode Forward Voltage	V _{F(S-D)}	I _F = 7.0 A, V _{GS} = 0 V		0.79		V

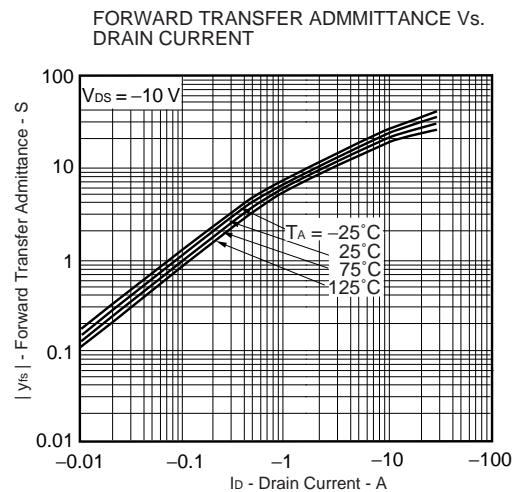
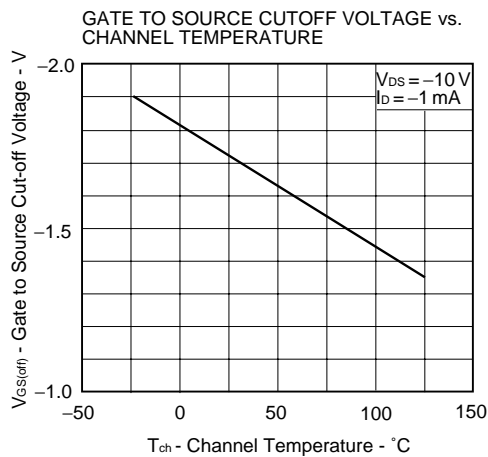
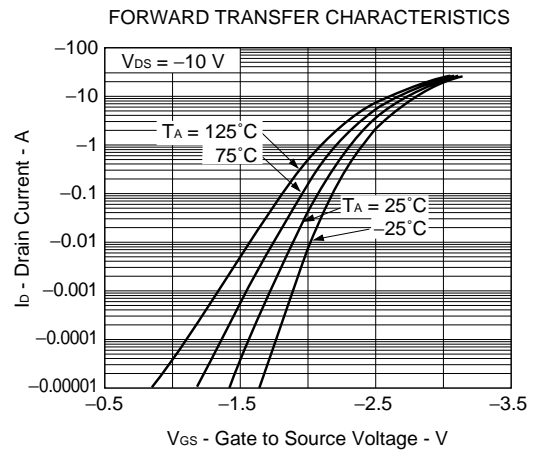
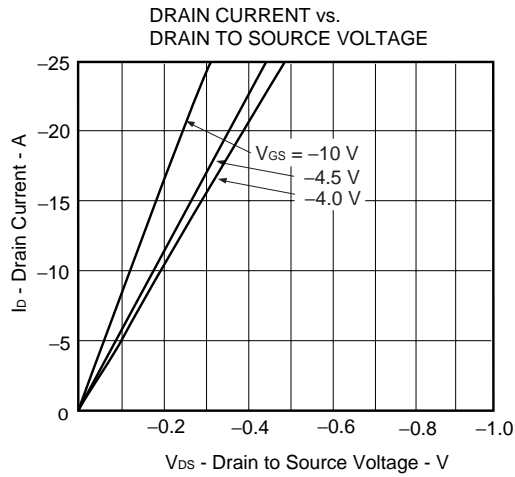
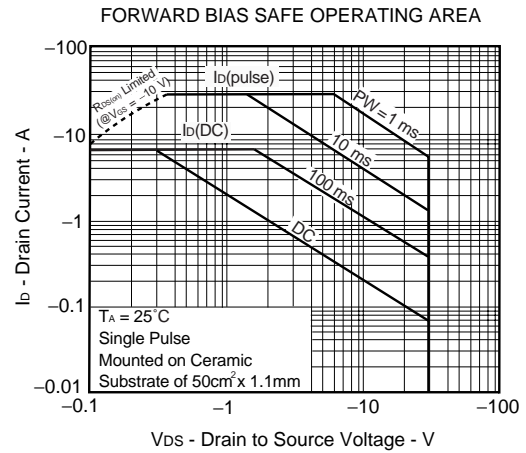
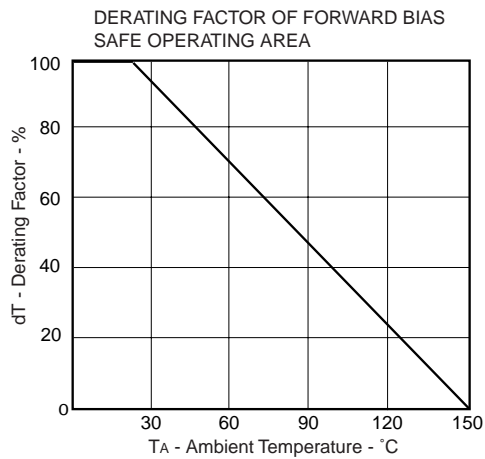
TEST CIRCUIT 1 SWITCHING TIME

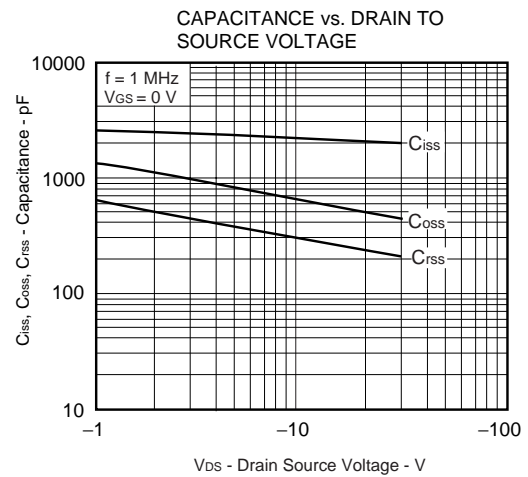
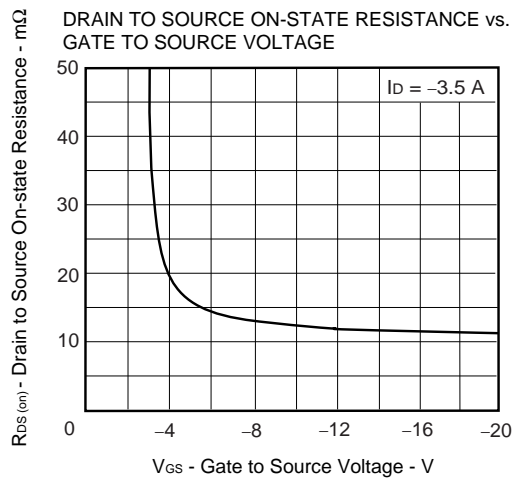
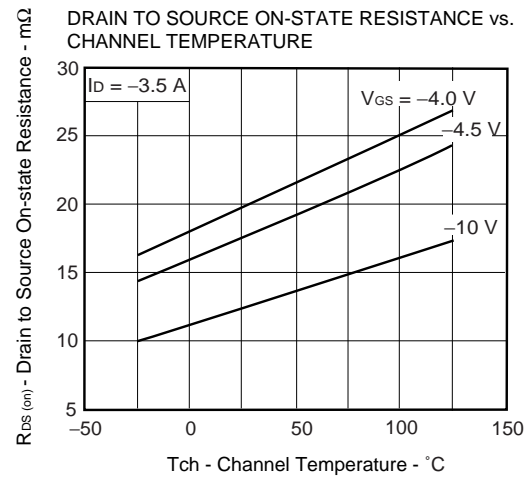
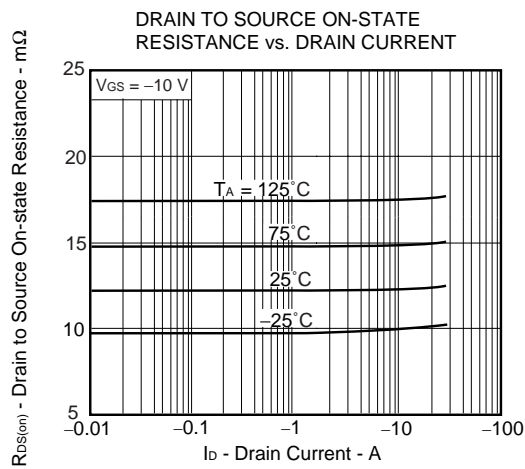
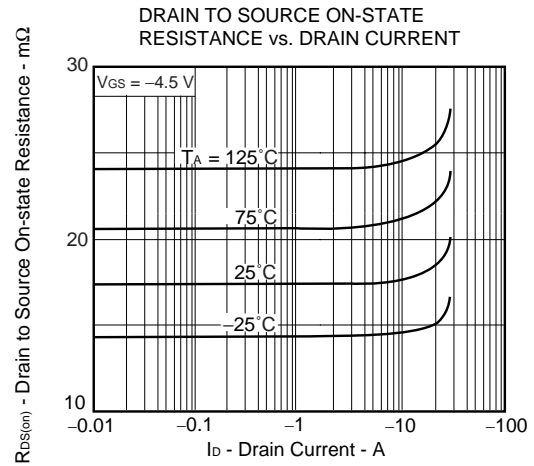
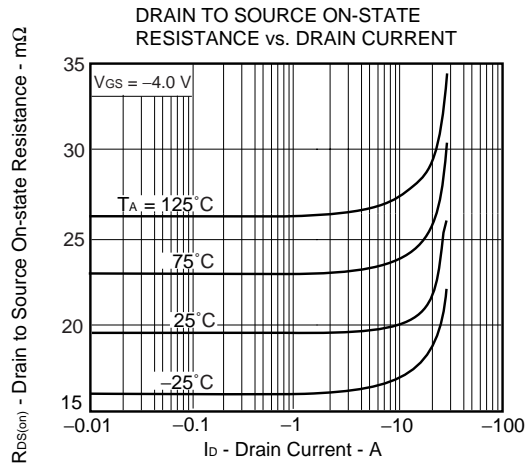


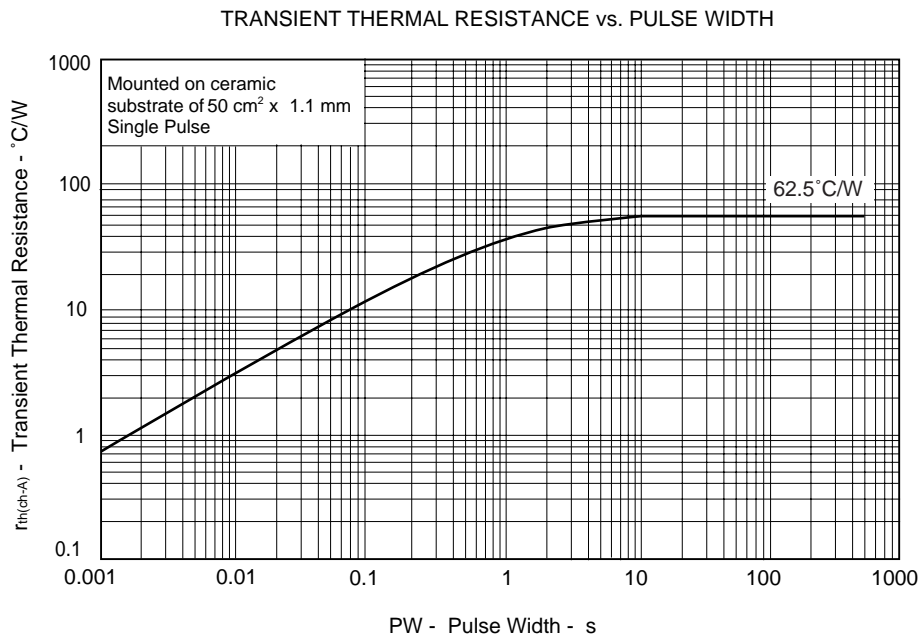
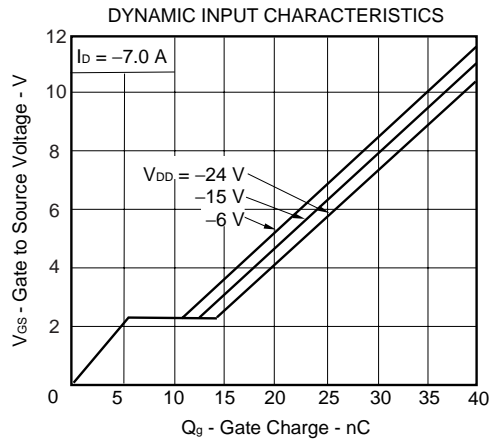
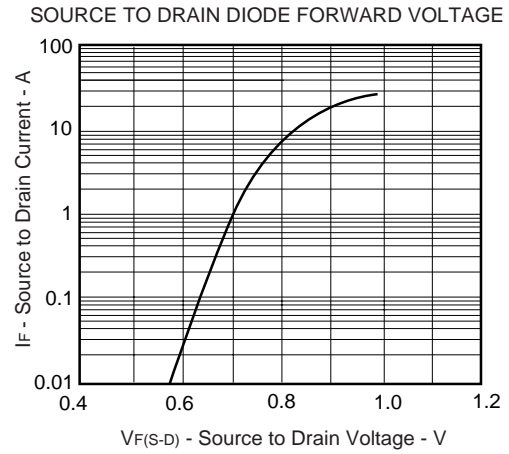
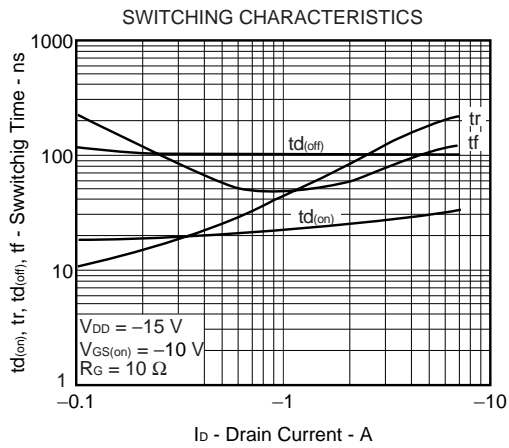
TEST CIRCUIT 2 GATE CHARGE



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







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