

MOS FIELD EFFECT TRANSISTOR μ PA1919

P-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR SWITCHING

DESCRIPTION

The μ PA1919 is a switching device, which can be driven directly by a 2.5 V power source.

This device 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

- 2.5 V drive available
- · Low on-state resistance

RDS(on)1 = 58 m Ω MAX. (VGS = -4.5 V, ID = -3.0 A)

RDS(on)2 = 60 m Ω MAX. (VGS = -4.0 V, ID = -3.0 A)

 $R_{DS(on)3} = 84 \text{ m}\Omega \text{ MAX.}$ (Vgs = -2.5 V, ID = -3.0 A)

ORDERING INFORMATION

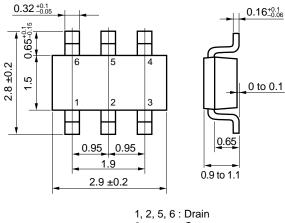
PART NUMBER	PACKAGE		
μPA1919TE	SC-95 (Mini Mold Thin Type)		

Marking: TX

ABSOLUTE MAXIMUM RATINGS (TA = 25°C)

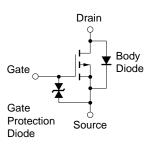
Drain to Source Voltage (Vgs = 0 V)	Voss	-20	V	
Gate to Source Voltage (VDS = 0 V)	Vgss	∓12	V	
Drain Current (DC) (TA = 25°C)	I _{D(DC)}	∓6.0	Α	
Drain Current (pulse) Note1	ID(pulse)	∓24	Α	
Total Power Dissipation	P _{T1}	0.2	W	
Total Power Dissipation Note2	P _{T2}	2.0	W	
Channel Temperature	Tch	150	°C	
Storage Temperature	Tstg	-55 to +150	°C	

PACKAGE DRAWING (Unit: mm)



1, 2, 5, 6 : Drain 3 : Gate 4 : Source

EQUIVALENT CIRCUIT



Notes 1. PW \leq 10 μ s, Duty Cycle \leq 1%

2. Mounted on FR-4 board of 2500 mm² x 1.6 mm, $t \le 5$ sec.

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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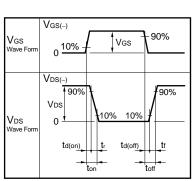


ELECTRICAL CHARACTERISTICS (TA = 25°C)

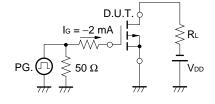
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	Ipss	V _{DS} = -20 V, V _{GS} = 0 V			-1.0	μΑ
Gate Leakage Current	Igss	V _G S = ∓12 V, V _D S = 0 V			∓10	μΑ
Gate to Source Cut-off Voltage	V _{GS(off)}	$V_{DS} = -10 \text{ V}, I_{D} = -1.0 \text{ mA}$	-0.5	-1.0	-1.5	V
Forward Transfer Admittance	yfs	V _{DS} = -10 V, I _D = -3.0 A	5.0	9.5		S
Drain to Source On-state Resistance	RDS(on)1	Vgs = -4.5 V, ID = -3.0 A		46	58	mΩ
	RDS(on)2	$V_{GS} = -4.0 \text{ V}, I_{D} = -3.0 \text{ A}$		48	60	mΩ
	RDS(on)3	Vgs = -2.5 V, ID = -3.0 A		63	84	mΩ
Input Capacitance	Ciss	V _{DS} = −10 V		680		pF
Output Capacitance	Coss	Vgs = 0 V		170		pF
Reverse Transfer Capacitance	Crss	f = 1.0 MHz		95		pF
Turn-on Delay Time	t d(on)	$V_{DD} = -10 \text{ V}, \text{ ID} = -3.0 \text{ A}$		15		ns
Rise Time	tr	Vgs = -4.0 V		19		ns
Turn-off Delay Time	t _{d(off)}	$R_G = 10 \Omega$		47		ns
Fall Time	t f			65		ns
Total Gate Charge	Q _G	V _{DD} = −16 V		6.0		nC
Gate to Source Charge	Qgs	Vgs = -4.0 V		1.5		nC
Gate to Drain Charge	Q _{GD}	I _D = -6.0 A		2.4		nC
Diode Forward Voltage	V _{F(S-D)}	IF = 6.0 A, VGS = 0 V		0.93		V

TEST CIRCUIT 1 SWITCHING TIME

PG. R_{G} $T = 1 \mu S$ Duty Cycle $\leq 1\%$

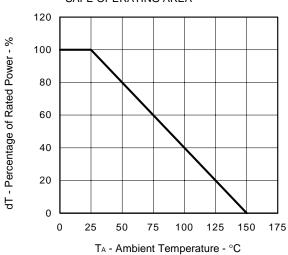


TEST CIRCUIT 2 GATE CHARGE

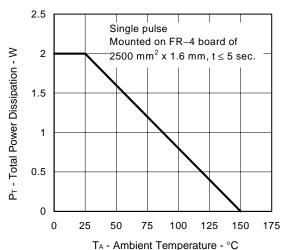


YPICAL CHARACTERISTICS (TA = 25°C)

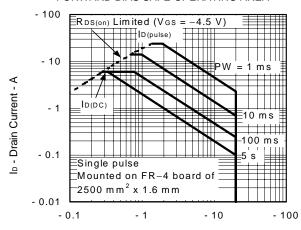
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE

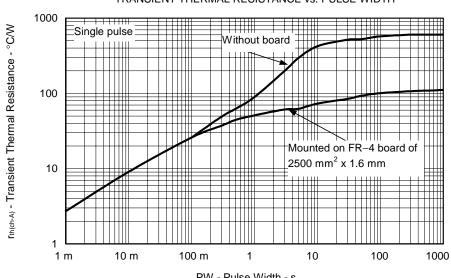


FORWARD BIAS SAFE OPERATING AREA



V_{DS} - Drain to Source Voltage - V

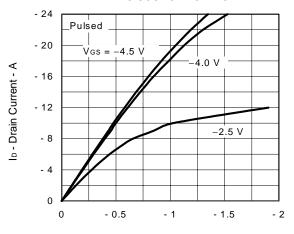
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



PW - Pulse Width - s

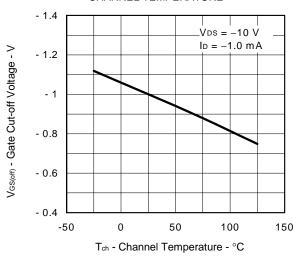
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DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE

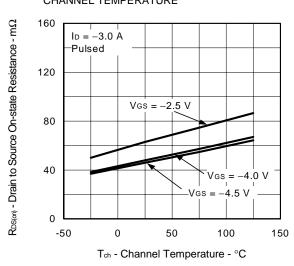


V_{DS} - Drain to Source Voltage - V

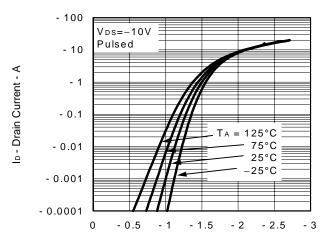
GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE

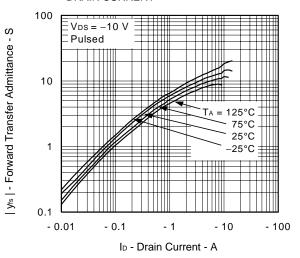


FORWARD TRANSFER CHARACTERISTICS

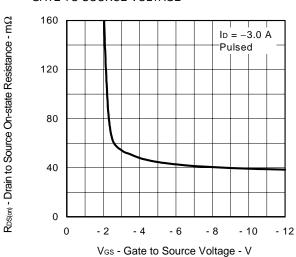


V_{GS} - Gate to Source Voltage - V

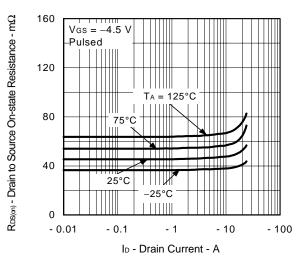
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



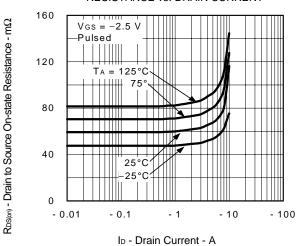
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



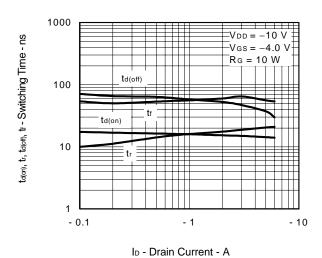
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



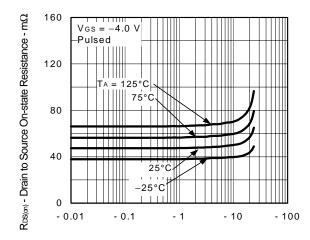
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



SWITCHING CHARACTERISTICS

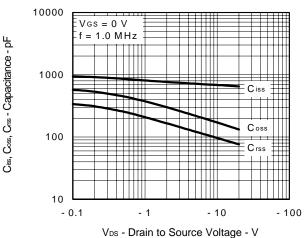


DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT

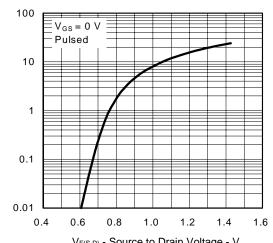


ID - Drain Current - A

CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



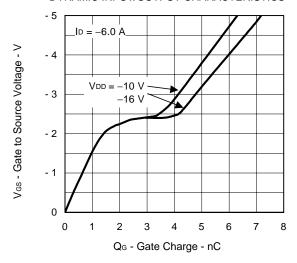
SOURCE TO DRAIN DIODE FORWARD VOLTAGE



 $V_{F(S\text{-}D)}$ - Source to Drain Voltage - V

IF - Diode Forward Current - A

DYNAMIC INPUT/OUTPUT CHARACTERISTICS



 μ PA1919



[MEMO]

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