

P-CHANNEL MOS FIELD EFFECT TRANSISTOR  
 FOR SWITCHING

DESCRIPTION

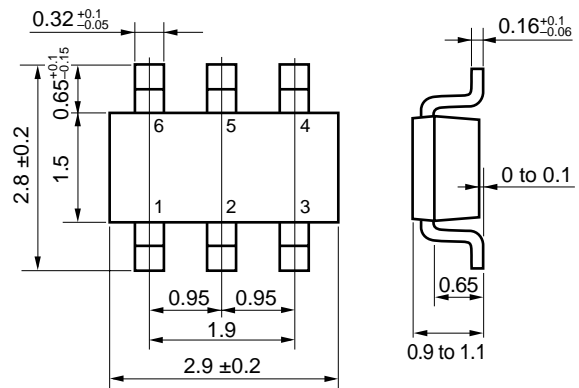
The  $\mu$ PA1911A is a switching device which can be driven directly by a 2.5 V power source.

The  $\mu$ PA1911A 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  
 $R_{DS(on)1} = 115 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -1.5 \text{ A)}$   
 $R_{DS(on)2} = 120 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.0 \text{ V, } I_D = -1.5 \text{ A)}$   
 $R_{DS(on)3} = 190 \text{ m}\Omega \text{ MAX. (} V_{GS} = -2.5 \text{ V, } I_D = -1.0 \text{ A)}$

PACKAGE DRAWING (Unit : mm)



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

ORDERING INFORMATION

PART NUMBER	PACKAGE
$\mu$ PA1911ATE <sup>Note</sup>	SC-95 (Mini Mold Thin Type)

Note Marking: TK

ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)

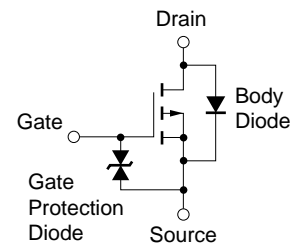
Drain to Source Voltage (V <sub>GS</sub> = 0 V)	V <sub>DSS</sub>	-20	V
Gate to Source Voltage (V <sub>DS</sub> = 0 V)	V <sub>GSS</sub>	±12	V
Drain Current (DC)	I <sub>D(DC)</sub>	±2.5	A
Drain Current (pulse) <sup>Note1</sup>	I <sub>D(pulse)</sub>	±10	A
Total Power Dissipation	P <sub>T1</sub>	0.2	W
Total Power Dissipation (T <sub>A</sub> = 25°C) <sup>Note2</sup>	P <sub>T2</sub>	2	W
Channel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

- Notes 1. PW ≤ 10 μs, Duty Cycle ≤ 1%  
 2. Mounted on FR-4 board, t ≤ 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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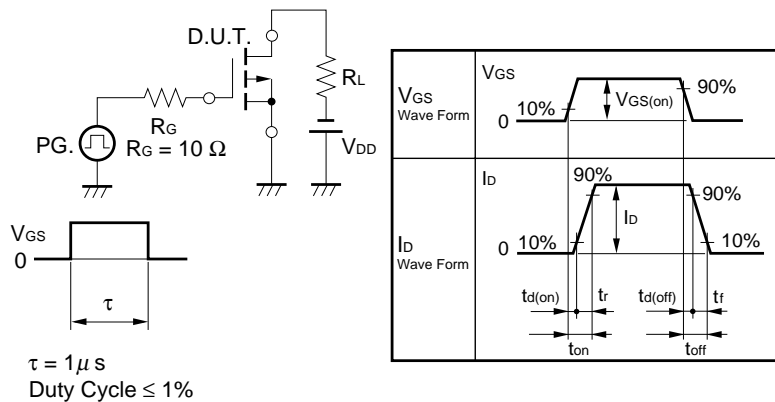
EQUIVALENT CIRCUIT



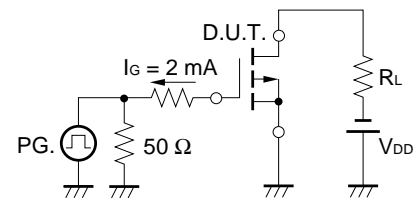
**ELECTRICAL CHARACTERISTICS (TA = 25°C)**

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -20\text{ V}, V_{GS} = 0\text{ V}$			-10	μA
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 12\text{ V}, V_{DS} = 0\text{ V}$			± 10	μA
Gate Cut-off Voltage	$V_{GS(off)}$	$V_{DS} = -10\text{ V}, I_D = -1\text{ mA}$	-0.5	-1.0	-1.5	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = -10\text{ V}, I_D = -1.5\text{ A}$	1	5.4		S
Drain to Source On-state Resistance	$R_{DS(on)1}$	$V_{GS} = -4.5\text{ V}, I_D = -1.5\text{ A}$		82	115	mΩ
	$R_{DS(on)2}$	$V_{GS} = -4.0\text{ V}, I_D = -1.5\text{ A}$		86	120	mΩ
	$R_{DS(on)3}$	$V_{GS} = -2.5\text{ V}, I_D = -1.0\text{ A}$		122	190	mΩ
Input Capacitance	$C_{iss}$	$V_{DS} = -10\text{ V}$		370		pF
Output Capacitance	$C_{oss}$	$V_{GS} = 0\text{ V}$		110		pF
Reverse Transfer Capacitance	$C_{rss}$	$f = 1\text{ MHz}$		40		pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = -10\text{ V}, I_D = -1.5\text{ A}$		130		ns
Rise Time	$t_r$	$V_{GS} = -4.0\text{ V}$		230		ns
Turn-off Delay Time	$t_{d(off)}$	$R_G = 10\ \Omega$		470		ns
Fall Time	$t_f$			380		ns
Total Gate Charge	$Q_G$	$V_{DD} = -10\text{ V}$		2.3		nC
Gate to Source Charge	$Q_{GS}$	$I_D = -2.5\text{ A}$		1.0		nC
Gate to Drain Charge	$Q_{GD}$	$V_{GS} = -4.0\text{ V}$		1.0		nC
Body Diode Forward Voltage	$V_{F(S-D)}$	$I_F = 2.5\text{ A}, V_{GS} = 0\text{ V}$		0.84		V
Reverse Recovery Time	$t_{rr}$	$I_F = 2.5\text{ A}, V_{GS} = 0\text{ V}$		14		ns
Reverse Recovery Charge	$Q_{rr}$	$di/dt = 10\text{ A}/\mu\text{s}$		1.4		nC

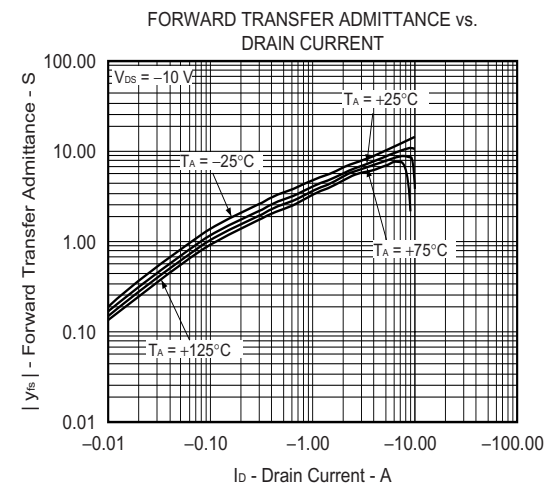
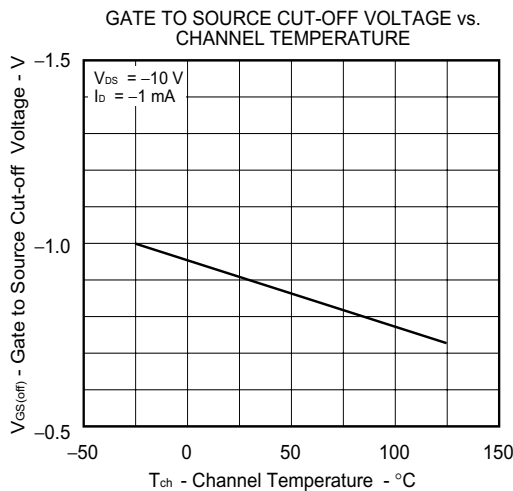
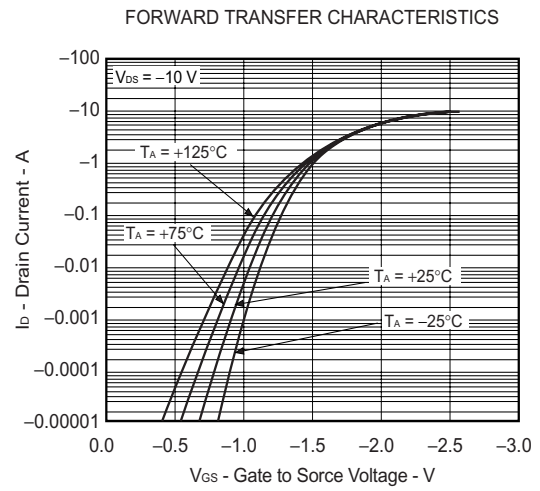
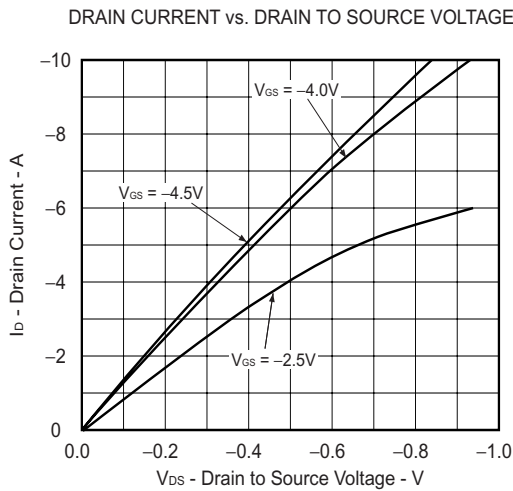
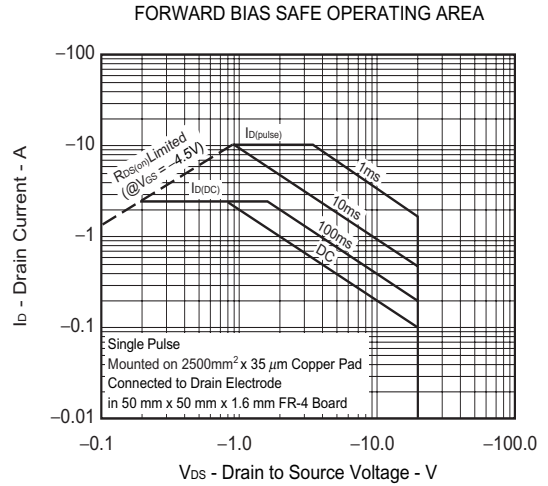
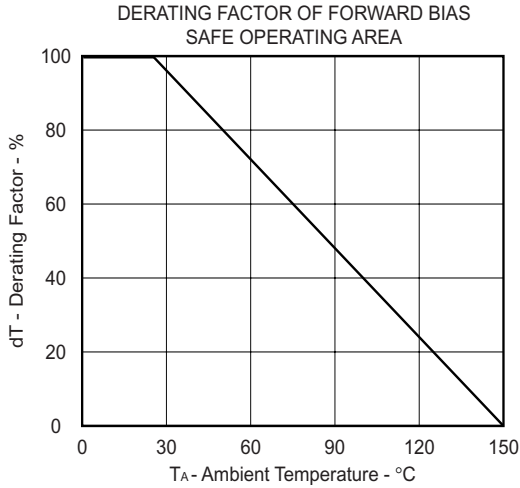
**TEST CIRCUIT 1 SWITCHING TIME**

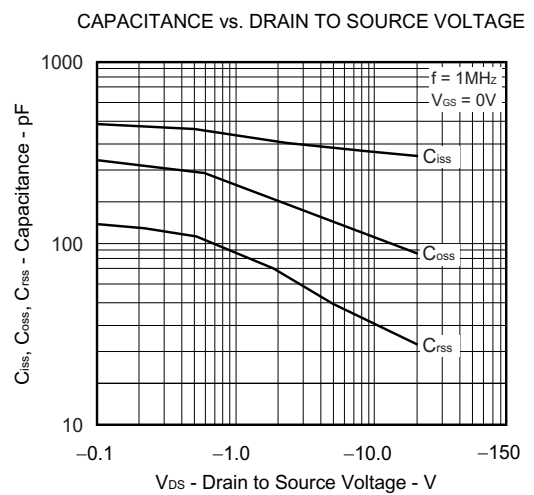
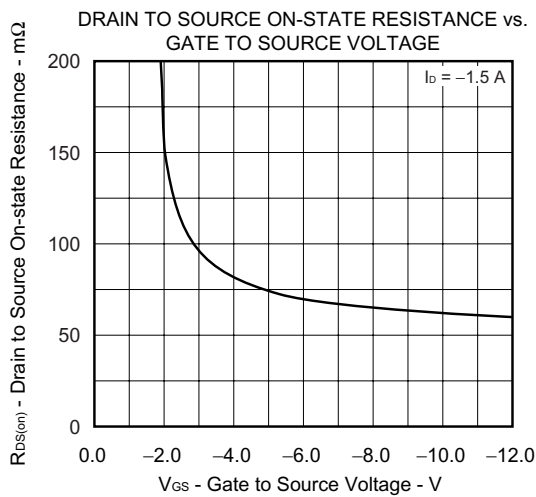
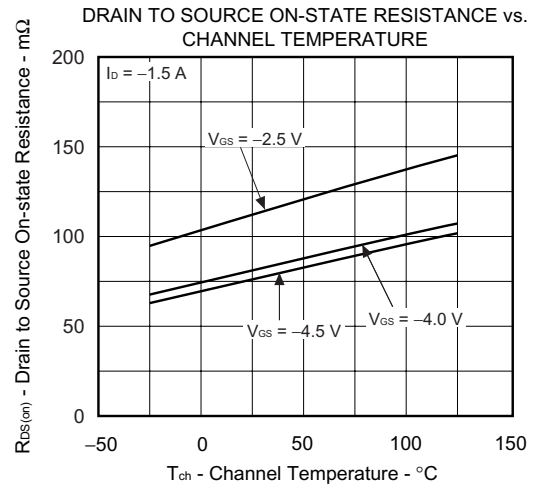
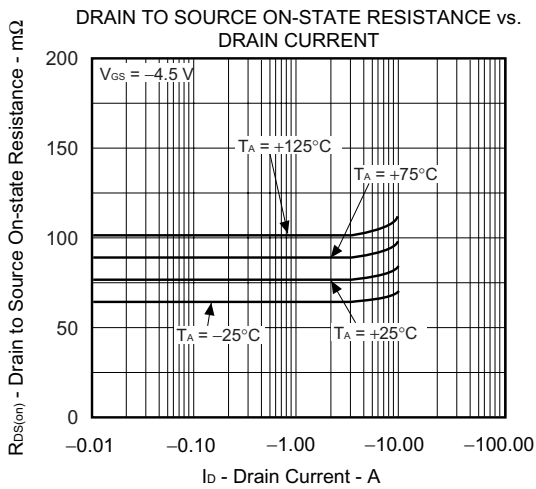
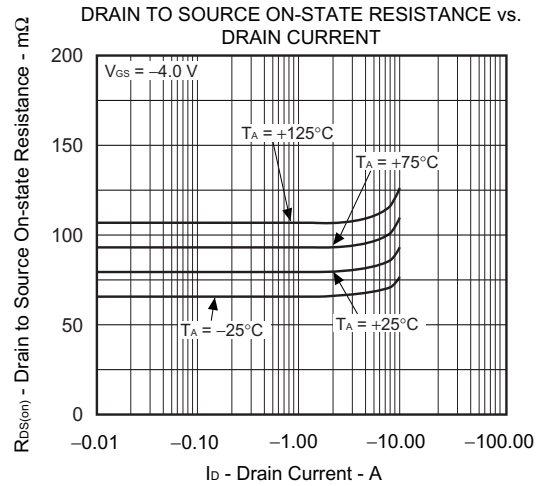
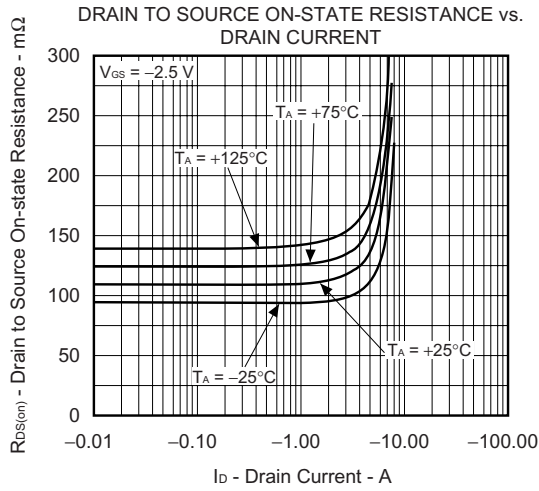


**TEST CIRCUIT 2 GATE CHARGE**

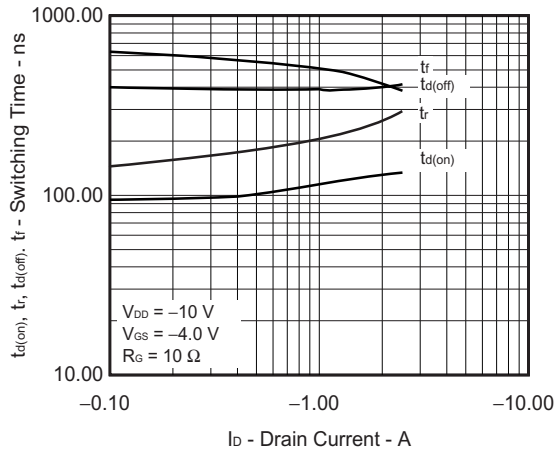


TYPICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

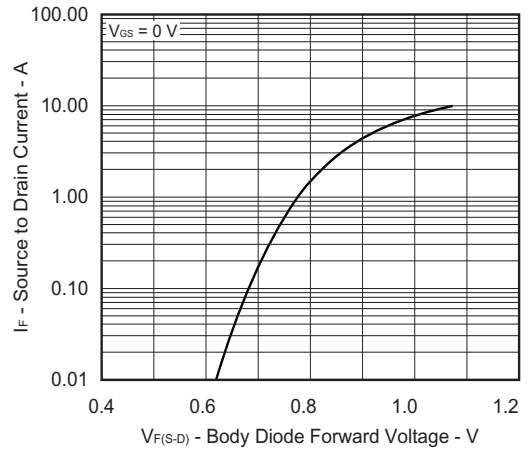




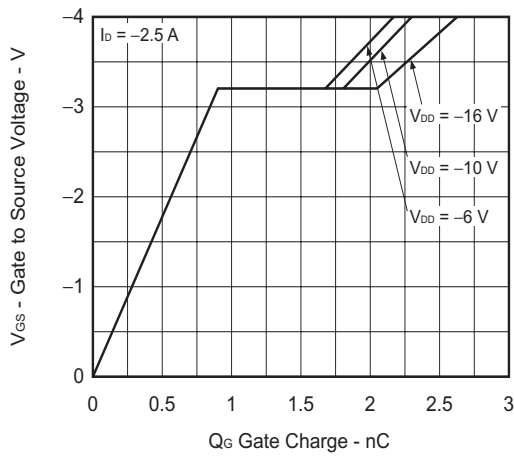
SWITCHING CHARACTERISTICS



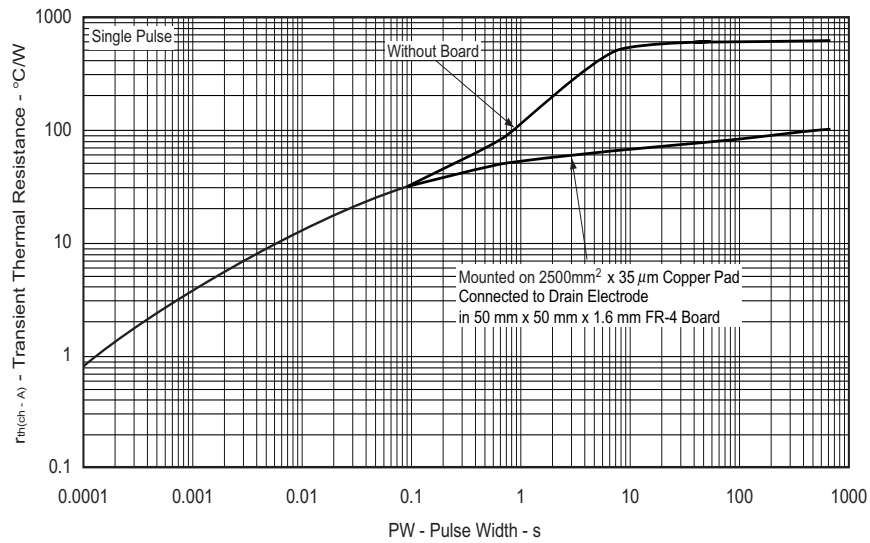
SOURCE TO DRAIN FORWARD VOLTAGE



DYNAMIC INPUT CHARACTERISTICS



TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



[MEMO]

[MEMO]

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