

### N-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR HIGH SPEED SWITCHING

#### DESCRIPTION

The  $\mu$ PA611TA is a switching device which can be driven directly by a 2.5-V power source.

The  $\mu$ PA611TA has excellent switching characteristics, and is suitable for use as a high-speed switching device in digital circuits.

#### FEATURES

- Can be driven by a 2.5-V power source
- Low gate cut-off voltage

#### ORDERING INFORMATION

PART NUMBER	PACKAGE
$\mu$ PA611TA	SC-74 (Mini Mold)

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

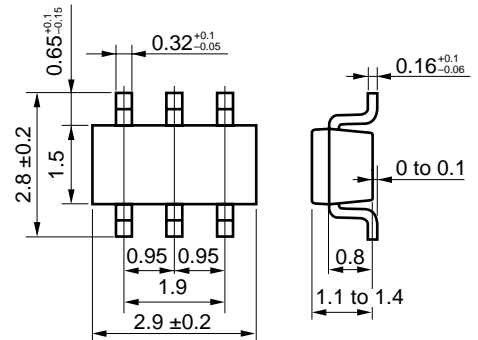
Drain to Source Voltage	V <sub>DSS</sub>	30	V
Gate to Source Voltage	V <sub>GSS</sub>	±20	V
Drain Current (DC)	I <sub>D(DC)</sub>	±0.1	A
Drain Current (pulse) <sup>Note</sup>	I <sub>D(pulse)</sub>	±0.4	A
Total Power Dissipation	P <sub>T</sub>	300 (TOTAL)	mW
Channel Temperature	T <sub>ch</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 to +150	°C

**Note** PW ≤ 10 μs, Duty Cycle ≤ 1 %

**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.

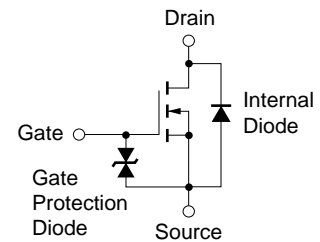
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Not all devices/types available in every country. Please check with local NEC representative for availability and additional information.

#### PACKAGE DRAWING (Unit : mm)

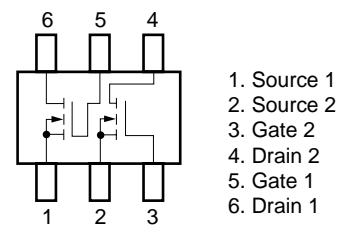


#### EQUIVALENT CIRCUIT

(1/2 Circuit)



#### PIN CONNECTION (Top View)

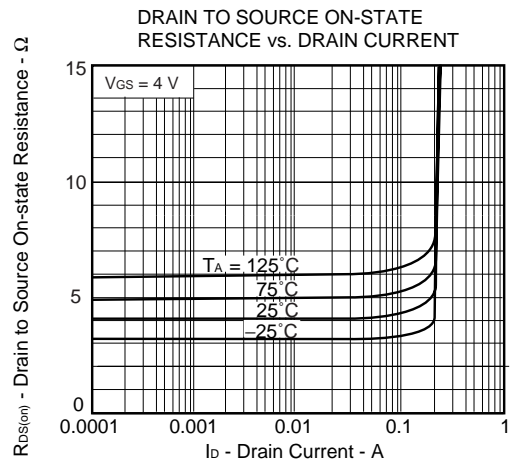
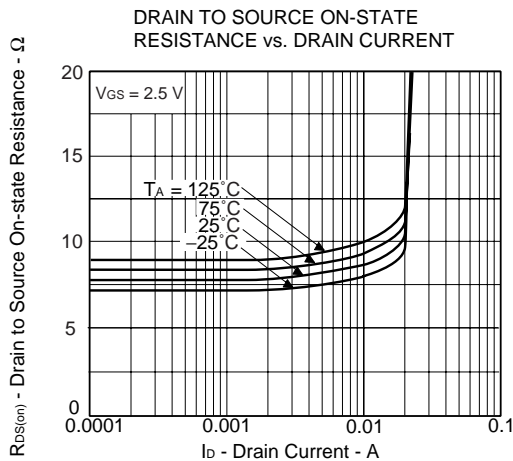
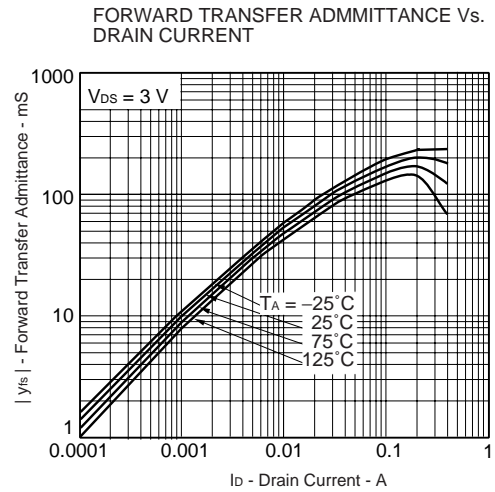
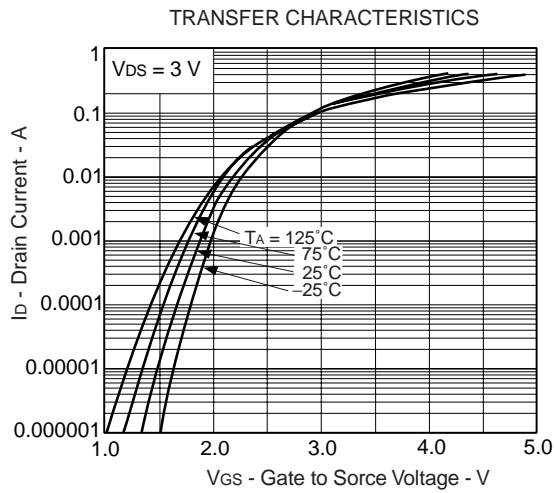
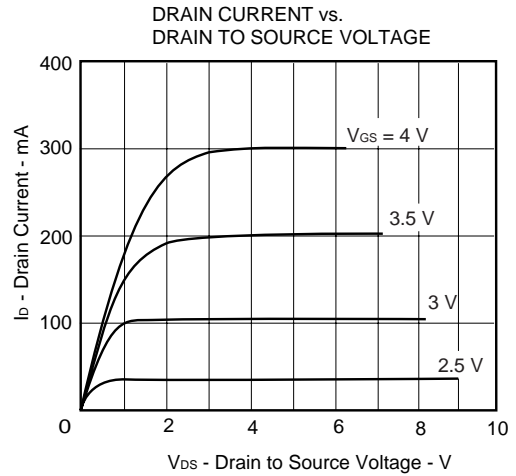
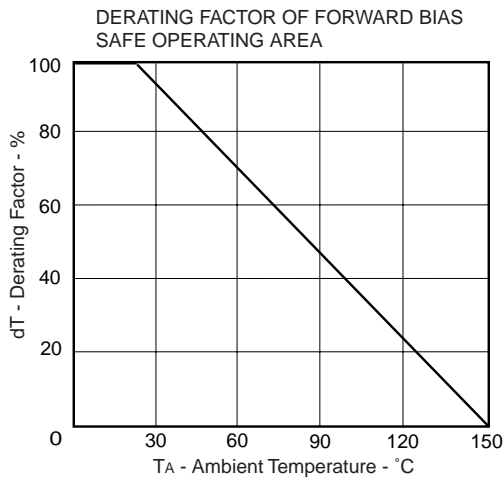


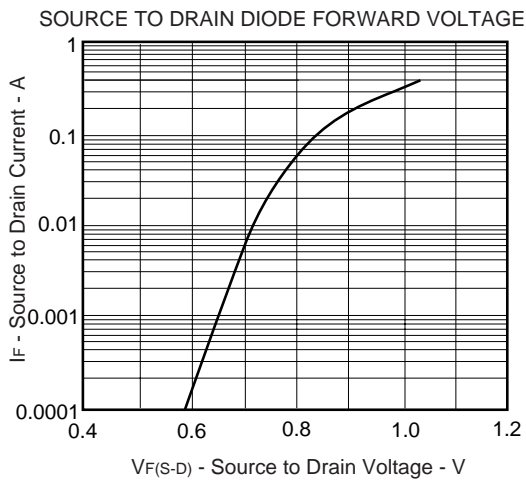
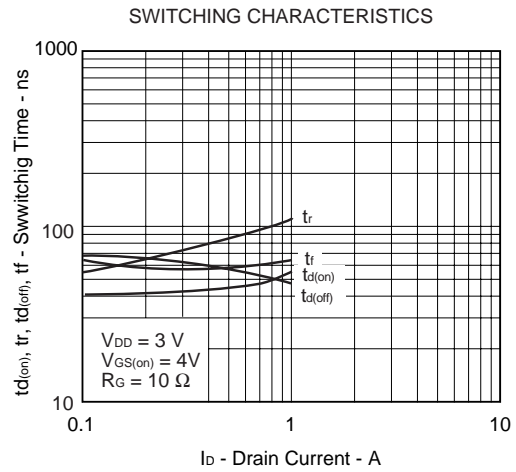
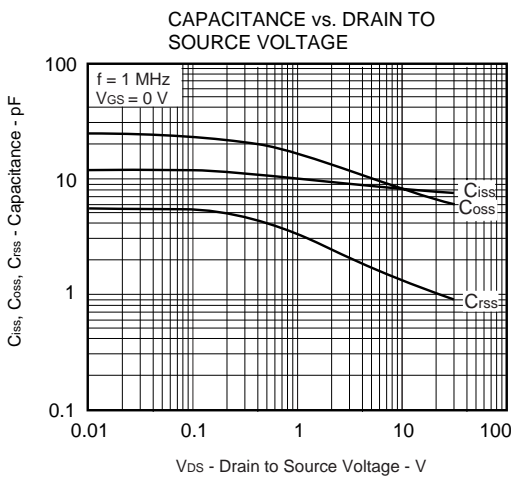
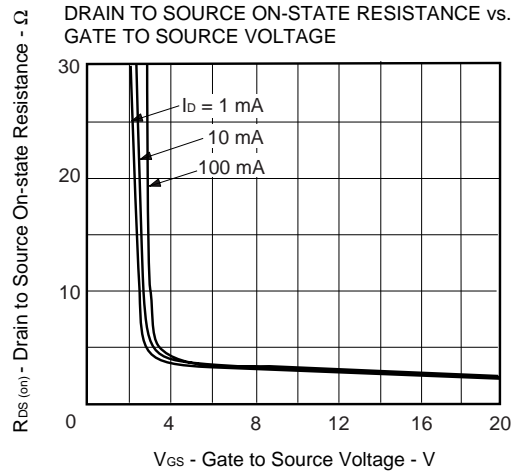
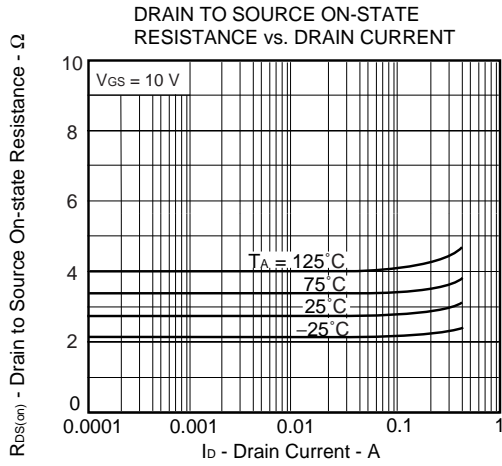
Marking : IB

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25 °C)**

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-off Current	I <sub>DSS</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V			1	μA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> = 0 V			±10	μA
Gate Cut-off Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> = 3 V, I <sub>D</sub> = 10 μA	1.0	1.4	1.8	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> = 3 V, I <sub>D</sub> = 10 mA	20			mS
Drain to Source On-state Resistance	R <sub>DS(on)1</sub>	V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 1 mA		8	15	Ω
	R <sub>DS(on)2</sub>	V <sub>GS</sub> = 4 V, I <sub>D</sub> = 10 mA		4	8	Ω
	R <sub>DS(on)3</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 10 mA		3	5	Ω
Input Capacitance	C <sub>iSS</sub>	V <sub>DS</sub> = 3 V		9		pF
Output Capacitance	C <sub>oSS</sub>	V <sub>GS</sub> = 0 V		12		pF
Reverse Transfer Capacitance	C <sub>rSS</sub>	f = 1 MHz		2.1		pF
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 3 V		40		ns
Rise Time	t <sub>r</sub>	I <sub>D</sub> = 10 mA		55		ns
Turn-off Delay Time	t <sub>d(off)</sub>	V <sub>GS(on)</sub> = 4 V		68		ns
Fall Time	t <sub>f</sub>	R <sub>G</sub> = 10 Ω, R <sub>L</sub> = 300 Ω		64		ns

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





## REFERENCE

Document Name	Document No.
NEC semiconductor device reliability / quality control system	TEI-1202
Quality grade on NEC semiconductor devices	C11531E
Semiconductor device mounting technology manual	C10535E
Guide to quality assurance for semiconductor devices	MEI-1202
Semiconductor selection guide	X10679E

[MEMO]

[MEMO]

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