NEC

MOS FIELD EFFECT TRANSISTOR
μPA611TA

N-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR HIGH SPEED SWITCHING

DESCRIPTION

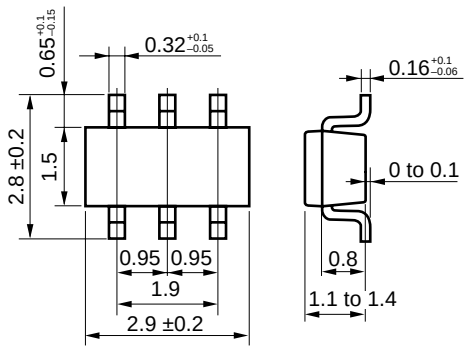
The μPA611TA is a switching device which can be driven directly by a 2.5-V power source.

The μPA611TA 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

PACKAGE DRAWING (Unit : mm)

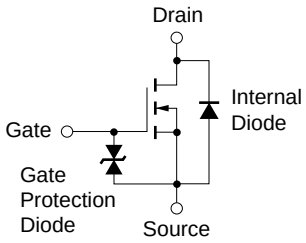


ORDERING INFORMATION

PART NUMBER	PACKAGE
μPA611TA	SC-74 (Mini Mold)

EQUIVALENT CIRCUIT

(1/2 Circuit)

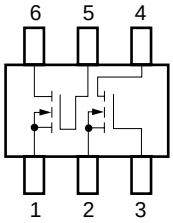


ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage	V_{DSS}	30	V
Gate to Source Voltage	V_{GSS}	±20	V
Drain Current (DC)	$I_{D(DC)}$	±0.1	A
Drain Current (pulse) Note	$I_{D(pulse)}$	±0.4	A
Total Power Dissipation	P_T	300 (TOTAL)	mW
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C

Note PW ≤ 10 μs, Duty Cycle ≤ 1 %

PIN CONNECTION (Top View)



1. Source 1
2. Source 2
3. Gate 2
4. Drain 2
5. Gate 1
6. Drain 1

Marking : IB

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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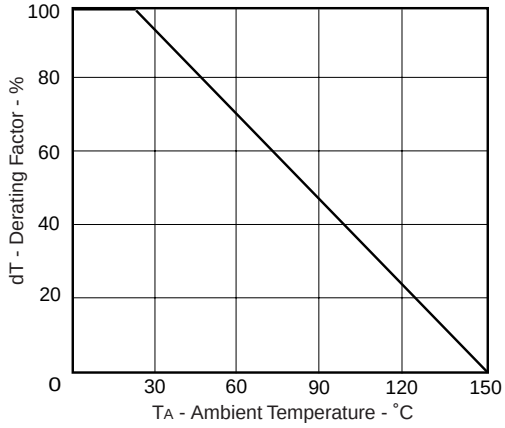
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

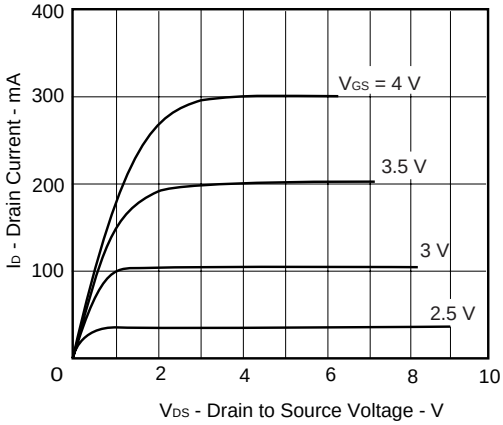
CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Drain Cut-off Current	I_{DSS}	V_{DS} = 30 V, V_{GS} = 0 V			1	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ±20 V, V_{DS} = 0 V			±10	μA
Gate Cut-off Voltage	$V_{GS(off)}$	V_{DS} = 3 V, I_D = 10 μA	1.0	1.4	1.8	V
Forward Transfer Admittance	$\|y_{fs}\|$	V_{DS} = 3 V, I_D = 10 m A	20			mS
Drain to Source On-state Resistance	$R_{DS(on)1}$	V_{GS} = 2.5 V, I_D = 1 m A		8	15	Ω
	$R_{DS(on)2}$	V_{GS} = 4 V, I_D = 10 mA		4	8	Ω
	$R_{DS(on)3}$	V_{GS} = 10 V, I_D = 10 mA		3	5	Ω
Input Capacitance	C_{iss}	V_{DS} = 3 V		9		pF
Output Capacitance	C_{oss}	V_{GS} = 0 V		12		pF
Reverse Transfer Capacitance	C_{rss}	f = 1 MHz		2.1		pF
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 3 V		40		ns
Rise Time	t_r	I_D = 10 mA		55		ns
Turn-off Delay Time	$t_{d(off)}$	$V_{GS(on)}$ = 4 V		68		ns
Fall Time	t_f	R_G = 10 Ω, R_L = 300 Ω		64		ns

TYPICAL CHARACTERISTICS (T_A = 25 °C)

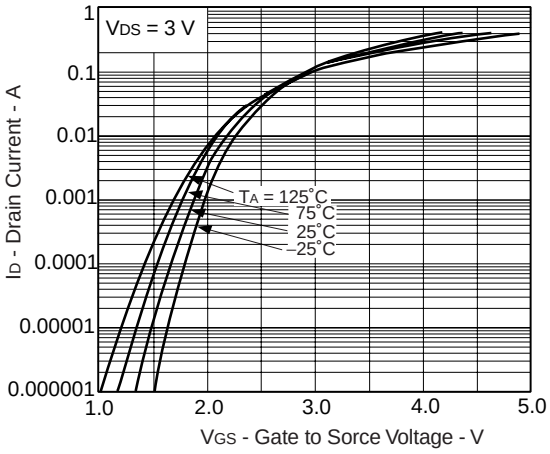
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



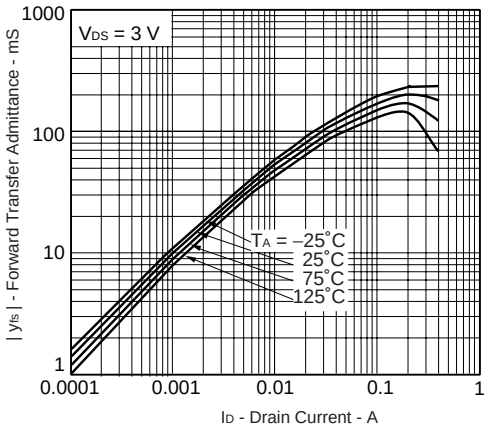
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



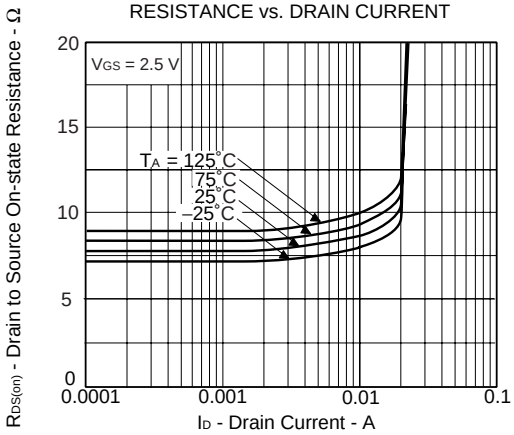
TRANSFER CHARACTERISTICS



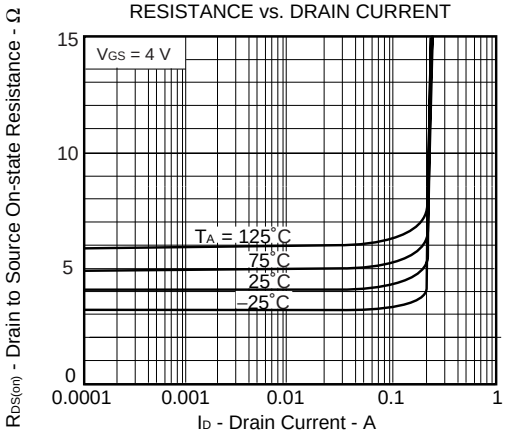
FORWARD TRANSFER ADMMITTANCE Vs. DRAIN CURRENT



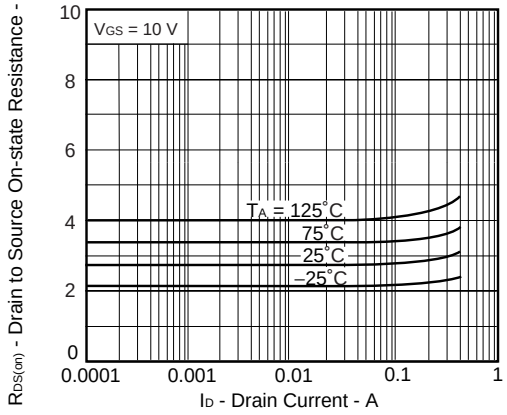
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



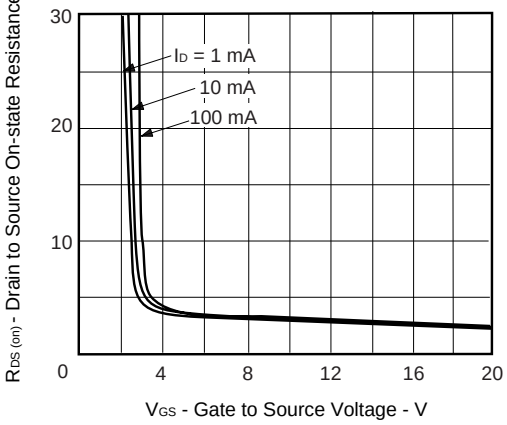
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



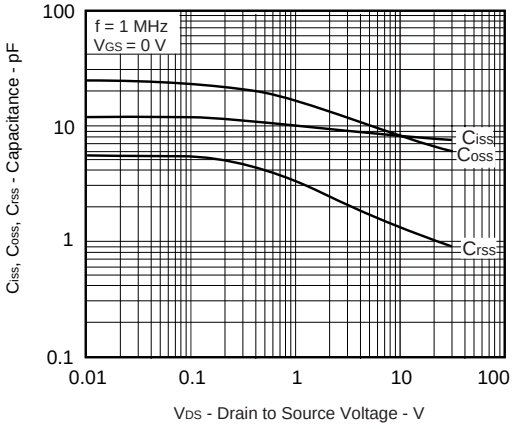
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



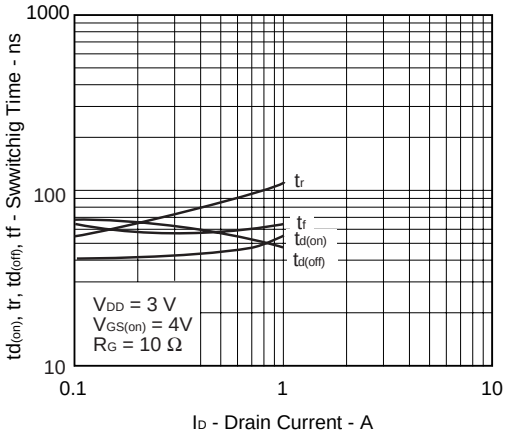
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



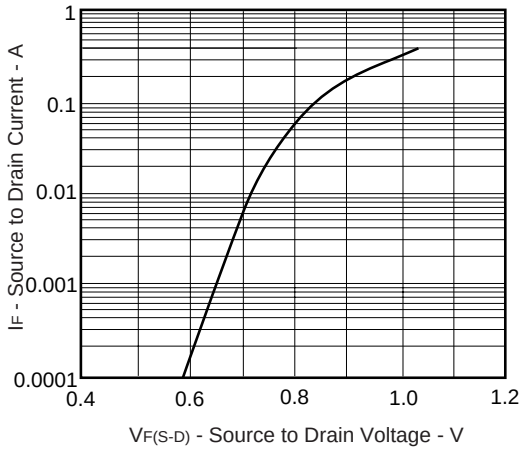
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



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]

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