To our customers,

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Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (http://www.renesas.com)

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RENESAS

MOS FIELD EFFECT TRANSISTOR

μPA610TA

P-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR HIGH SPEED SWITCHING

DESCRIPTION

The μPA610TA is a switching device which can be driven directly by a 2.5 V power source.

The μPA610TA has excellent switching characteristics, and is suitable for use as a high-speed switching device in digital circuits.

FEATURES

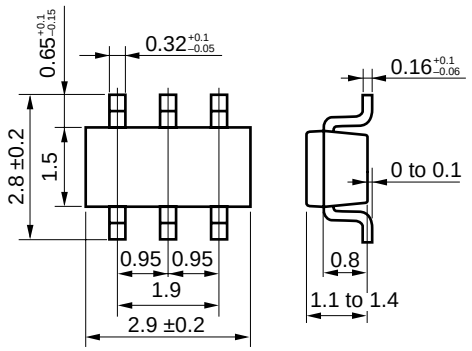
- Can be driven by a 2.5 V power source.
- Low Gate Cut-off Voltage.

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

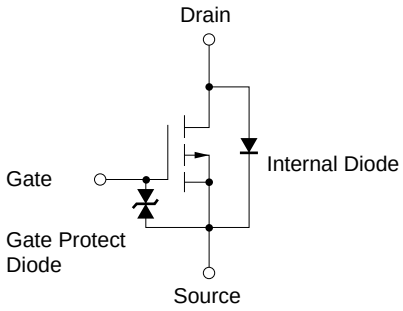
Drain to Source Voltage	V_{DSS}	–30	V
Gate to Source Voltage	V_{GSS}	∓20	V
Drain Current (DC)	$I_{D(DC)}$	∓0.1	A
Drain Current (pulse)	$I_{D(pulse)}$	∓0.4 **Note**	A
Total Power Dissipation	P_T	300 (TOTAL)	mW
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C

Note PW ≤ 10 μs, Duty Cycle ≤ 1 %

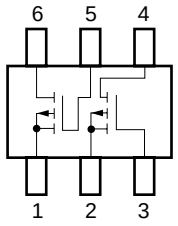
Package Drawings (unit: mm)



Equivalent Circuit



Pin Connection (Top View)



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

Marking : JB

The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device is 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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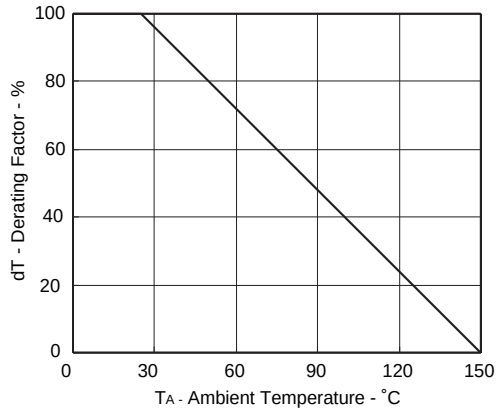
Date Published September 1996 P
Printed in Japan

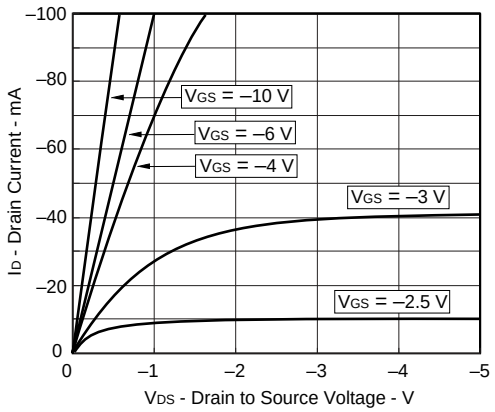
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain Cut-off Current	I_{DSS}			–1	μA	V_{DS} = –30 V, V_{GS} = 0
Gate Leakage Current	I_{GSS}			∓10	μA	V_{GS} = ∓20 V, V_{DS} = 0
Gate Cut-off Voltage	$V_{GS(off)}$	–1.0	–1.4	–1.7	V	V_{DS} = –3 V, I_D = –10 μA
Forward Transfer Admittance	$\lvert y_{fs} \rvert$	20			mS	V_{DS} = –3 V, I_D = –10 mA
Drain to Source On-State Resistance	$R_{DS(on)1}$		23	60	Ω	V_{GS} = –2.5 V, I_D = –1 mA
Drain to Source On-State Resistance	$R_{DS(on)2}$		11	23	Ω	V_{GS} = –4 V, I_D = –10 mA
Drain to Source On-State Resistance	$R_{DS(on)3}$		6	13	Ω	V_{GS} = –10 V, I_D = –10 mA
Input Capacitance	C_{iss}		5		pF	V_{DS} = –3 V
Output Capacitance	C_{oss}		15		pF	V_{GS} = 0
Reverse Transfer Capacitance	C_{rss}		1.3		pF	f = 1 MHz
Turn-on Delay Time	$t_{d(on)}$		140		ns	V_{DD} = –3 V, I_D = –10 mA
Rise Time	t_r		330		ns	$V_{GS(on)}$ = –4 V, R_G = 10 Ω
Turn-off Delay Time	$t_{d(off)}$		220		ns	R_L = 300 Ω
Fall Time	t_f		320		ns	

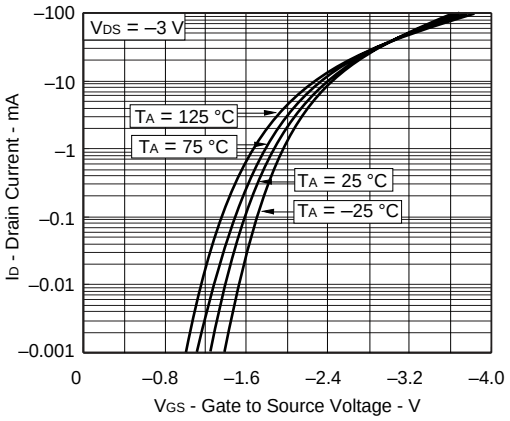
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



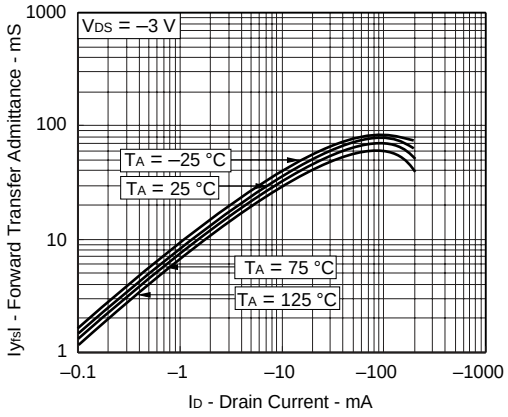
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



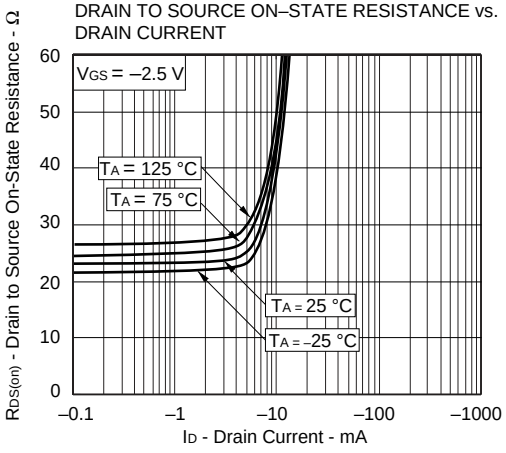
TRANSFER CHARACTERISTICS



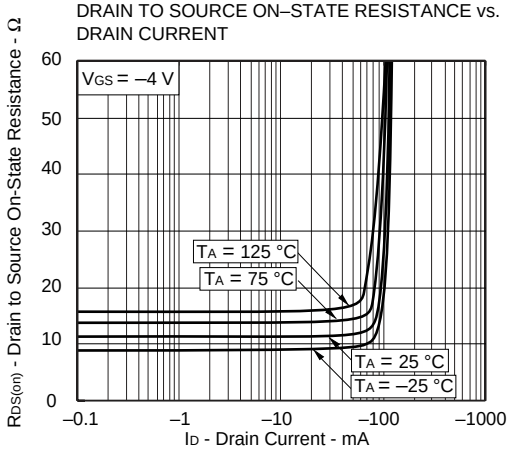
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



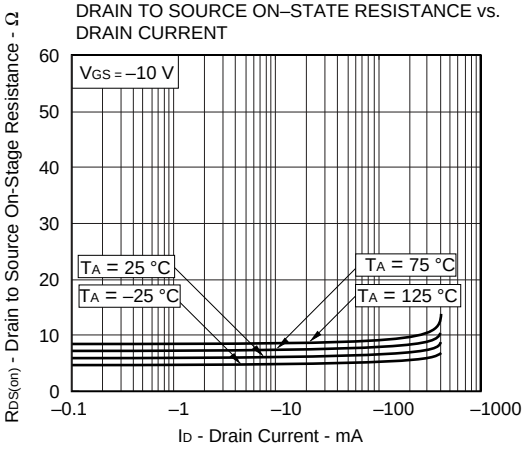
DRAIN TO SOURCE ON–STATE RESISTANCE vs. DRAIN CURRENT



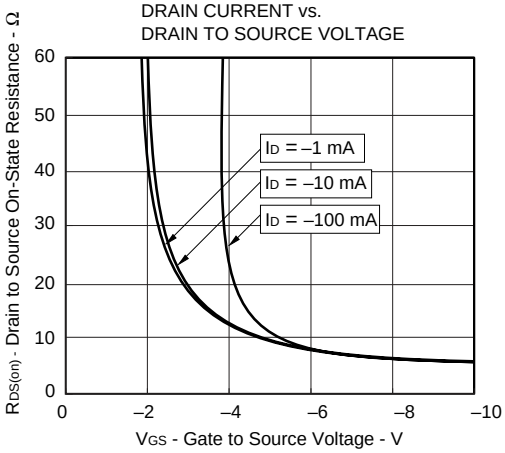
DRAIN TO SOURCE ON–STATE RESISTANCE vs. DRAIN CURRENT



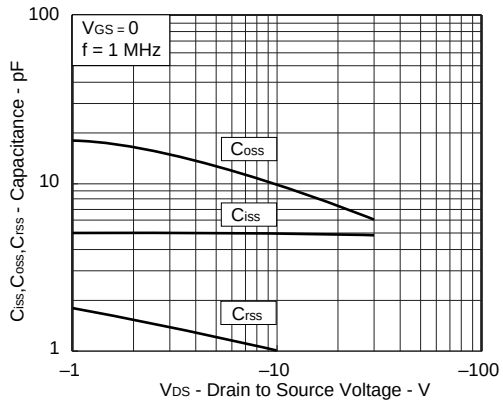
DRAIN TO SOURCE ON–STATE RESISTANCE vs.
DRAIN CURRENT



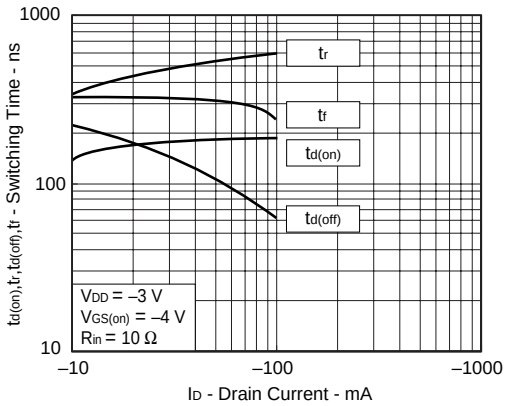
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



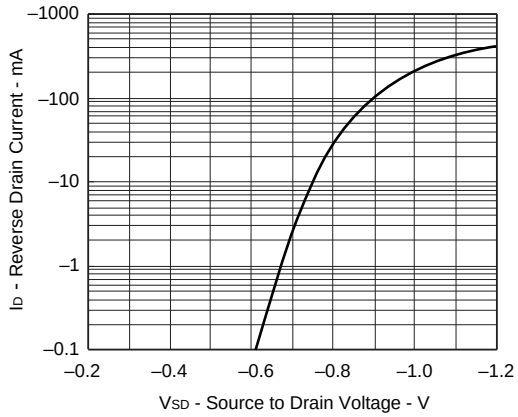
CAPACITANCE vs.
DRAIN TO SOURCE VOLTAGE



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

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