

To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

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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P-CHANNEL MOS FIELD EFFECT TRANSISTOR
 FOR HIGH SPEED SWITCHING

DESCRIPTION

The μ PA610TA is a switching device which can be driven directly by a 2.5 V power source.

The μ PA610TA has excellent switching characteristics, and is suitable for use as a high-speed switching device in digital circuits.

FEATURES

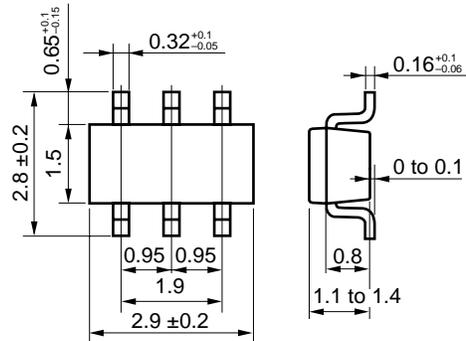
- Can be driven by a 2.5 V power source.
- Low Gate Cut-off Voltage.

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C)

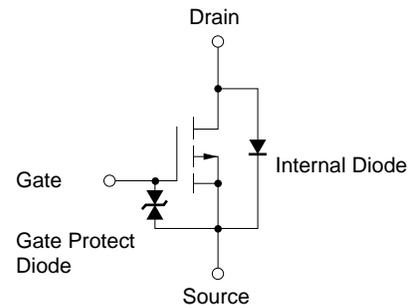
Drain to Source Voltage	V _{DSS}	-30	V
Gate to Source Voltage	V _{GSS}	±20	V
Drain Current (DC)	I _{D(DC)}	±0.1	A
Drain Current (pulse)	I _{D(pulse)}	±0.4 Note	A
Total Power Dissipation	P _T	300 (TOTAL)	mW
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

Note PW ≤ 10 μs, Duty Cycle ≤ 1 %

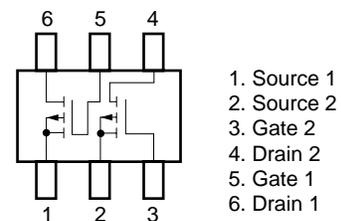
Package Drawings (unit: mm)



Equivalent Circuit



Pin Connection (Top View)



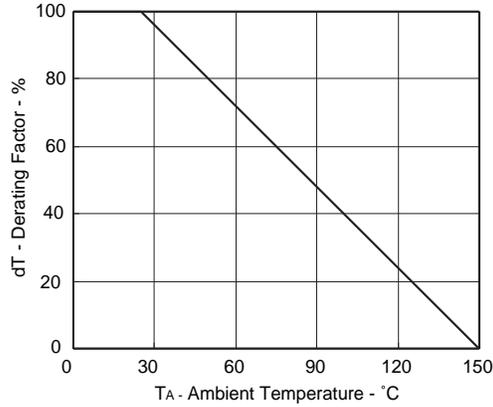
Marking : JB

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.

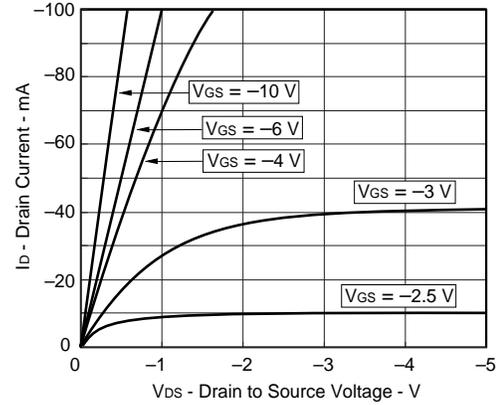
ELECTRICAL CHARACTERISTICS (T_A = 25 °C)

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	y _{fs}	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	

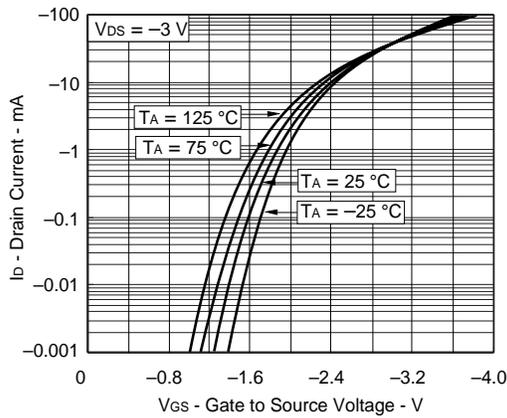
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



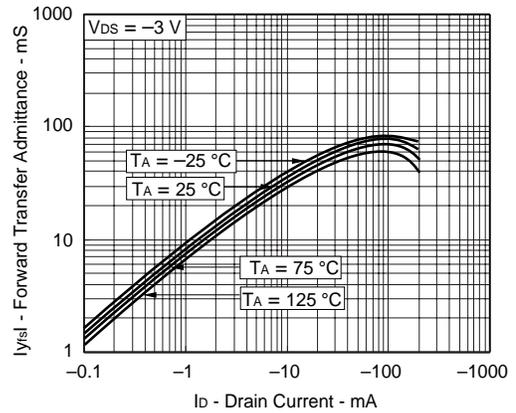
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



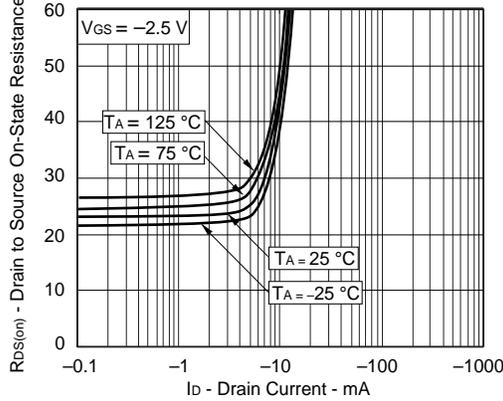
TRANSFER CHARACTERISTICS



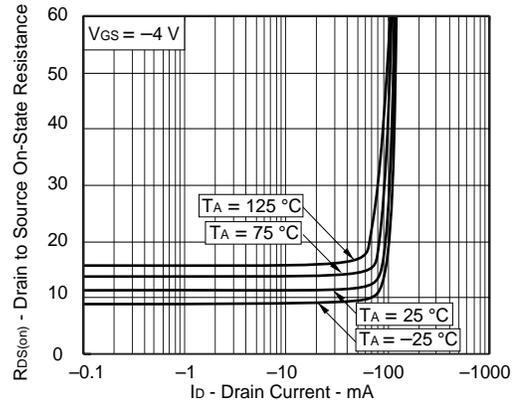
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT

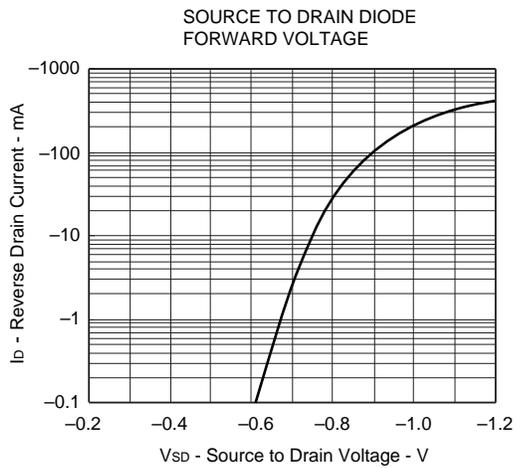
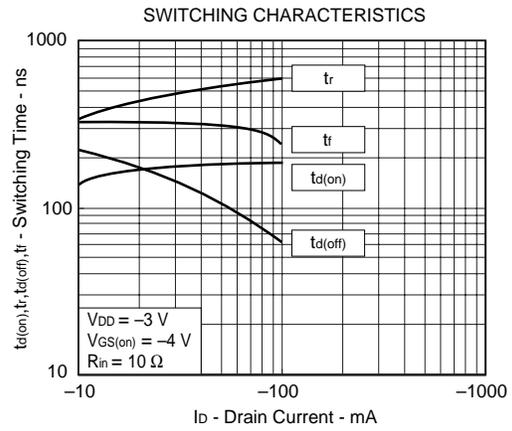
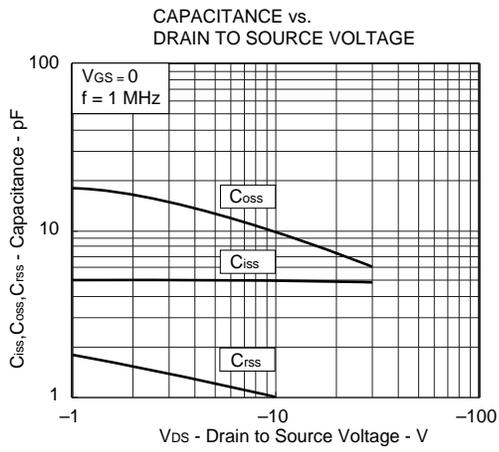
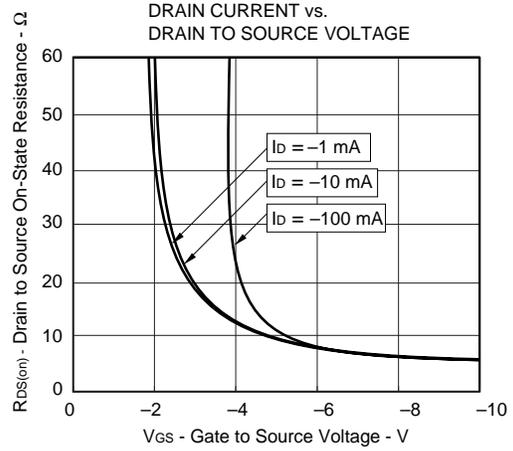
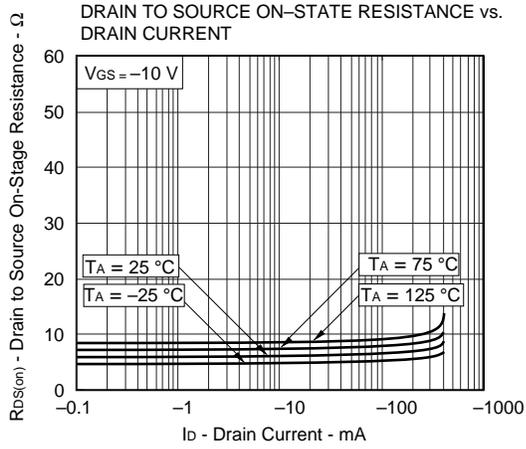


DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT





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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Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

Specific: Aircrafts, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems or medical equipment for life support, etc.

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Anti-radioactive design is not implemented in this product.