

To our customers,

Old Company Name in Catalogs and Other Documents

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April 1st, 2010
Renesas Electronics Corporation

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

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Not recommended
for new design

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N-CHANNEL MOS FIELD EFFECT TRANSISTOR
 FOR SWITCHING

DESCRIPTION

The μ PA620TT is a switching device which can be driven directly by a 2.5 V power source.

This device 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

- 2.5 V drive available
- Low on-state resistance
 $R_{DS(on)1} = 38 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.5 \text{ V, } I_D = 2.5 \text{ A)}$
 $R_{DS(on)2} = 39 \text{ m}\Omega \text{ MAX. (} V_{GS} = 4.0 \text{ V, } I_D = 2.5 \text{ A)}$
 $R_{DS(on)3} = 54 \text{ m}\Omega \text{ MAX. (} V_{GS} = 2.5 \text{ V, } I_D = 2.5 \text{ A)}$

ORDERING INFORMATION

PART NUMBER	PACKAGE
μ PA620TT	6 pin WSOF (1620)

Marking: WA

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

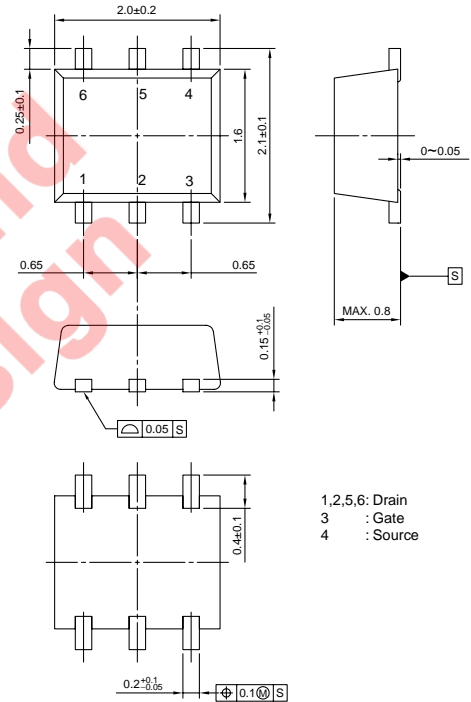
Drain to Source Voltage ($V_{GS} = 0 \text{ V}$)	V_{DSS}	20	V
Gate to Source Voltage ($V_{DS} = 0 \text{ V}$)	V_{GSS}	± 12	V
Drain Current (DC) ($T_A = 25^\circ\text{C}$)	$I_{D(DC)}$	± 5.0	A
Drain Current (pulse) ^{Note1}	$I_{D(pulse)}$	± 20	A
Total Power Dissipation	P_{T1}	0.2	W
Total Power Dissipation ^{Note2}	P_{T2}	1.5	W
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Notes 1. $PW \leq 10 \mu\text{s}$, Duty Cycle $\leq 1\%$

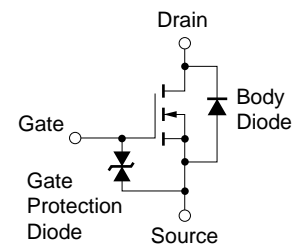
2. Mounted on FR-4 board of $5000 \text{ mm}^2 \times 1.1 \text{ mm}$, $t \leq 5 \text{ sec}$.

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.

PACKAGE DRAWING (Unit: mm)



EQUIVALENT CIRCUIT

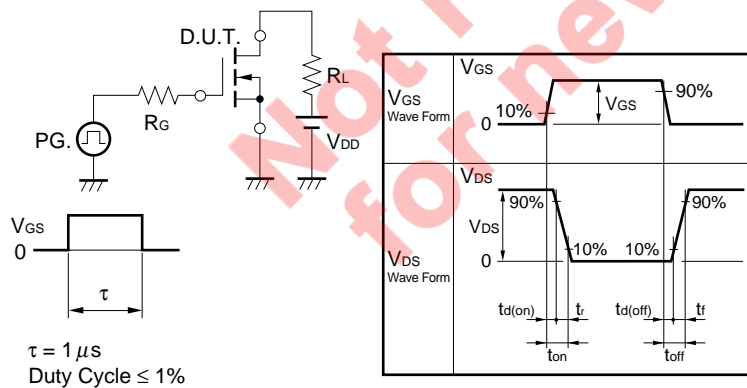


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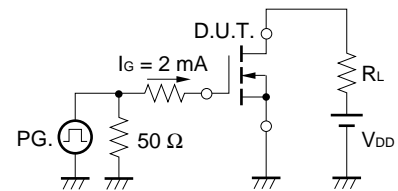
ELECTRICAL CHARACTERISTICS (TA = 25°C)

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	$V_{GS(off)}$	$V_{DS} = 10\text{ V}, I_D = 1.0\text{ mA}$	0.5	1.0	1.5	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = 10\text{ V}, I_D = 2.5\text{ A}$	3.0	6.0		S
Drain to Source On-state Resistance	$R_{DS(on)1}$	$V_{GS} = 4.5\text{ V}, I_D = 2.5\text{ A}$		30	38	mΩ
	$R_{DS(on)2}$	$V_{GS} = 4.0\text{ V}, I_D = 2.5\text{ A}$		31	39	mΩ
	$R_{DS(on)3}$	$V_{GS} = 2.5\text{ V}, I_D = 2.5\text{ A}$		40	54	mΩ
Input Capacitance	C_{iss}	$V_{DS} = 10\text{ V}$		450		pF
Output Capacitance	C_{oss}	$V_{GS} = 0\text{ V}$		130		pF
Reverse Transfer Capacitance	C_{rss}	$f = 1.0\text{ MHz}$		90		pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 10\text{ V}, I_D = 2.5\text{ A}$		36		ns
Rise Time	t_r	$V_{GS} = 4.0\text{ V}$		210		ns
Turn-off Delay Time	$t_{d(off)}$	$R_G = 10\text{ }\Omega$		150		ns
Fall Time	t_f			200		ns
Total Gate Charge	Q_G	$V_{DD} = 16\text{ V}$		5.5		nC
Gate to Source Charge	Q_{GS}	$V_{GS} = 4.0\text{ V}$		1.0		nC
Gate to Drain Charge	Q_{GD}	$I_D = 5.0\text{ A}$		2.8		nC
Body Diode Forward Voltage	$V_{F(S-D)}$	$I_F = 5.0\text{ A}, V_{GS} = 0\text{ V}$		0.87		V

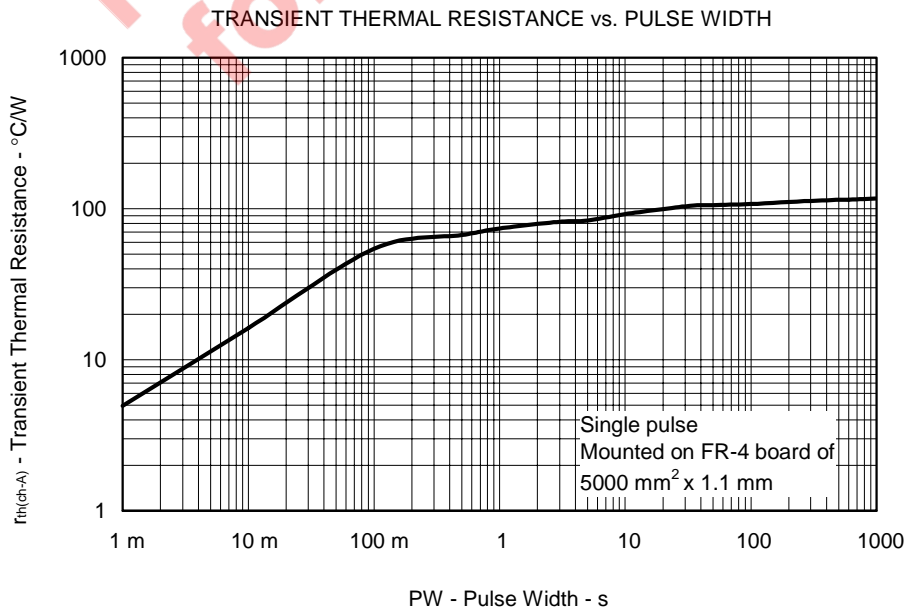
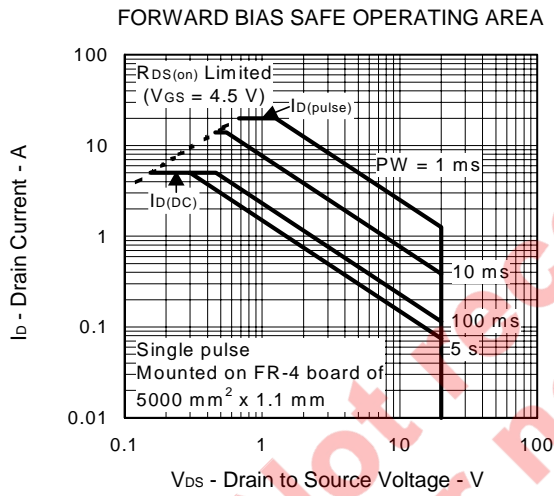
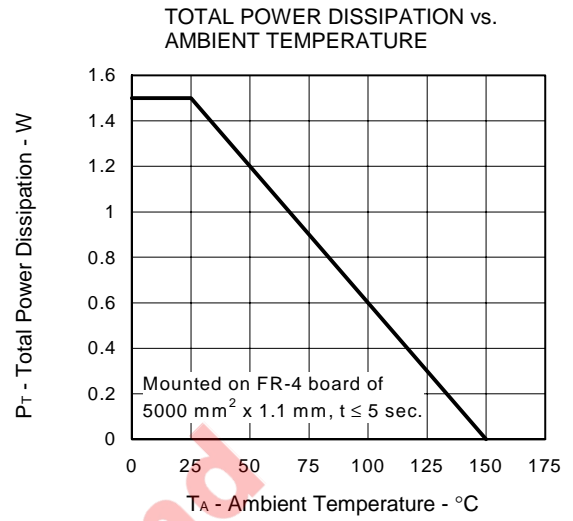
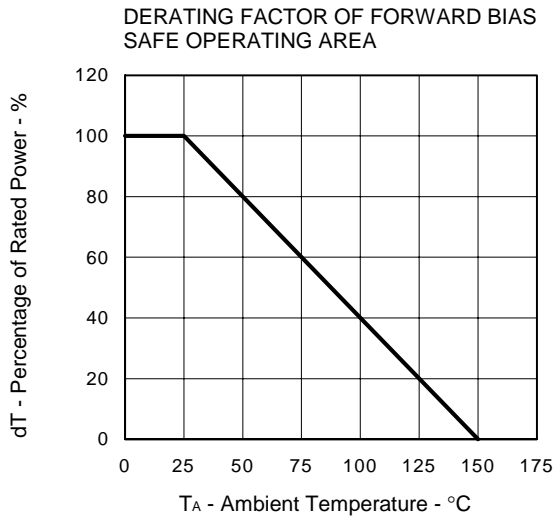
TEST CIRCUIT 1 SWITCHING TIME



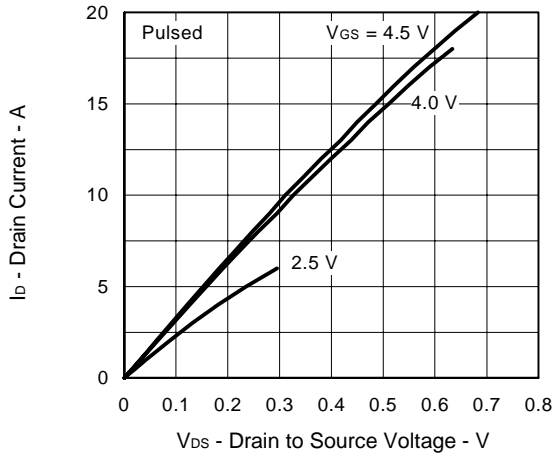
TEST CIRCUIT 2 GATE CHARGE



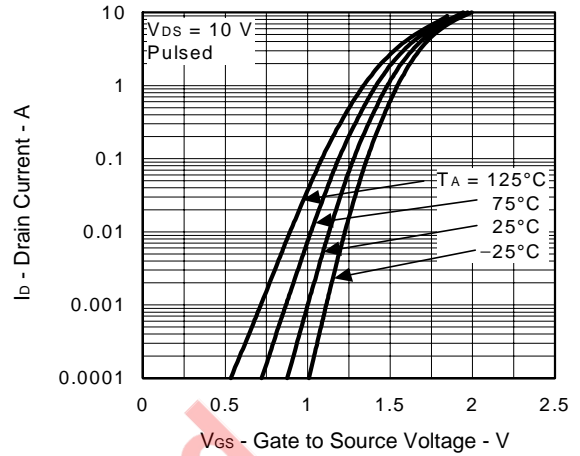
TYPICAL CHARACTERISTICS (T_A = 25°C)



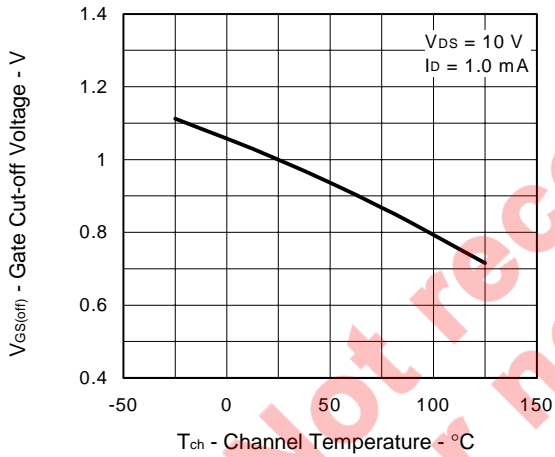
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



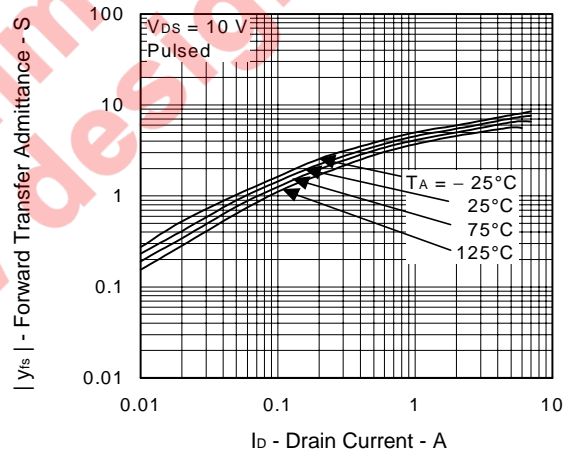
FORWARD TRANSFER CHARACTERISTICS



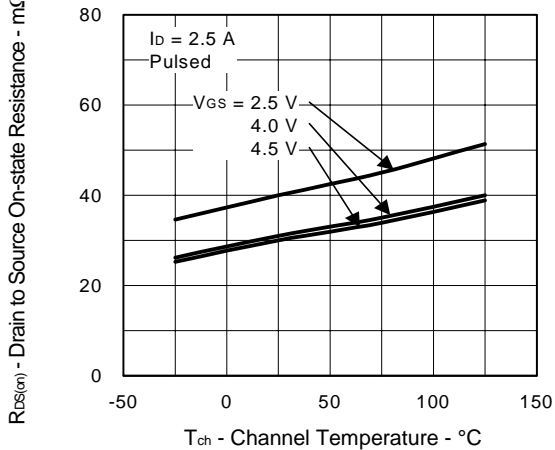
GATE CUT-OFF VOLTAGE vs. CHANNEL TEMPERATURE



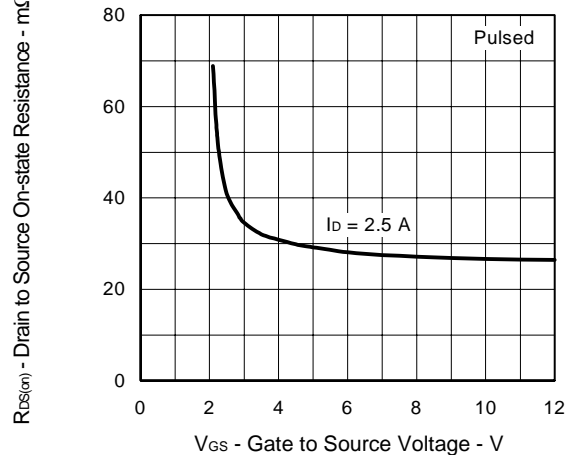
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT

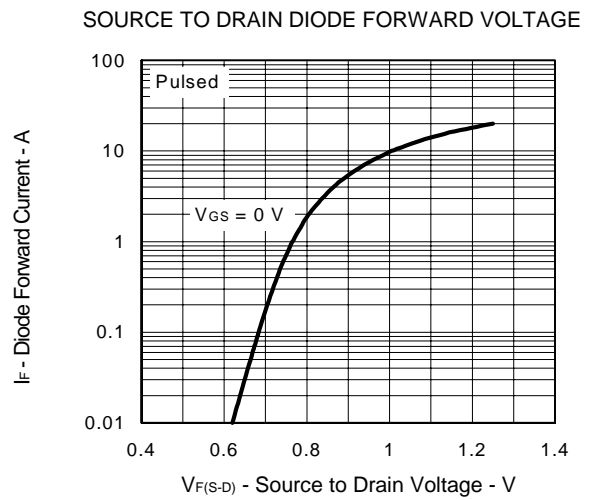
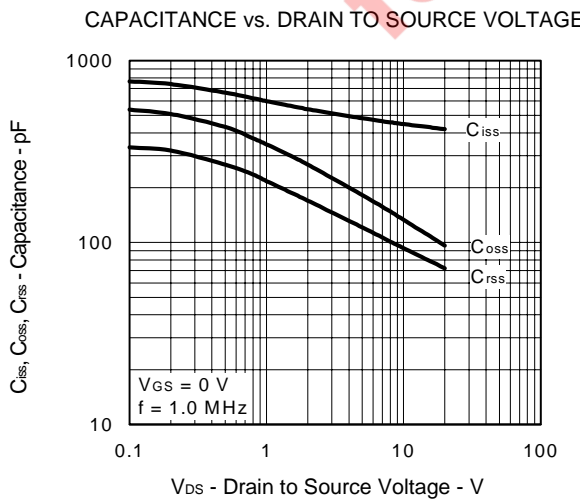
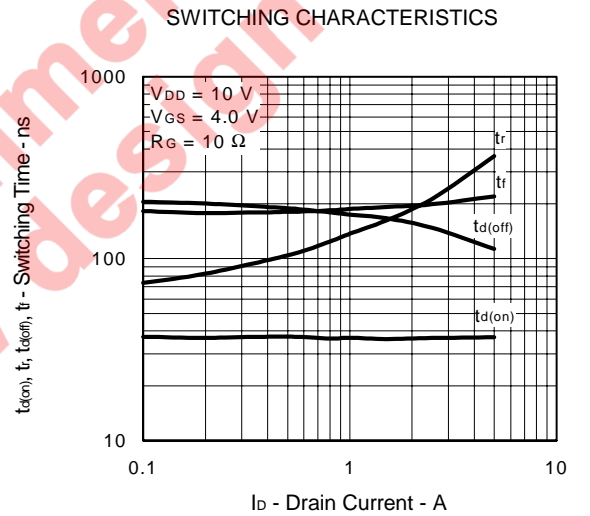
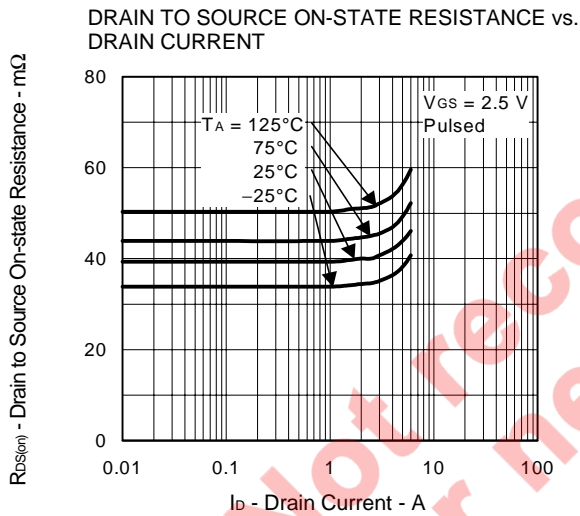
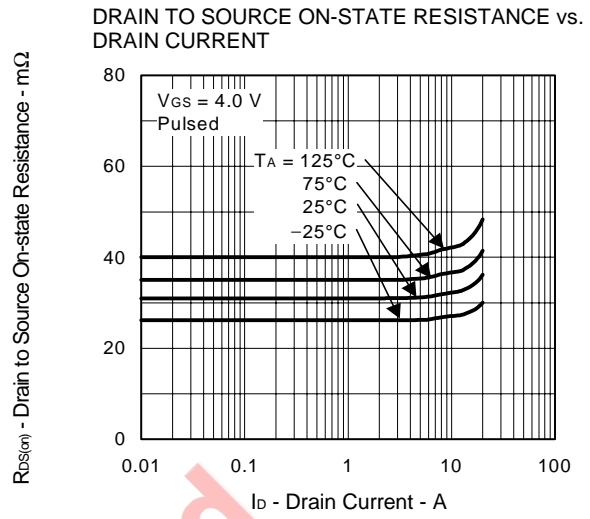
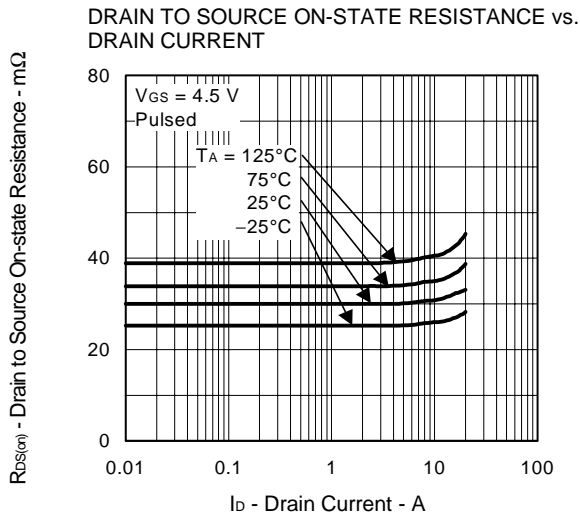


DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE

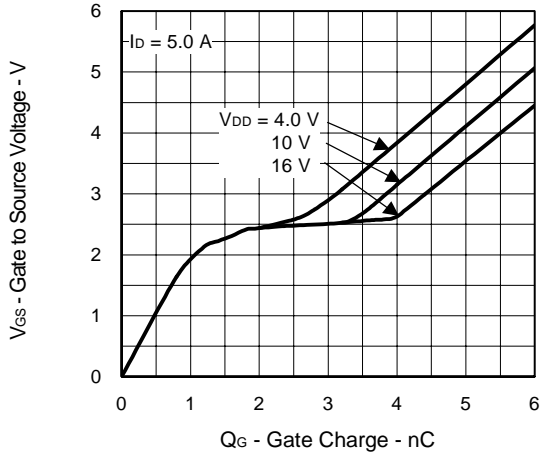


DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE





DYNAMIC INPUT/OUTPUT CHARACTERISTICS



Not recommend
for new design

[MEMO]

**Not recommend
for new design**

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