To our customers,

Old Company Name in Catalogs and Other Documents

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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

DATA SHEET

MOS FIELD EFFECT TRANSISTOR
N0300P

P-CHANNEL MOS FIELD EFFECT TRANSISTOR FOR SWITCHING

DESCRIPTION

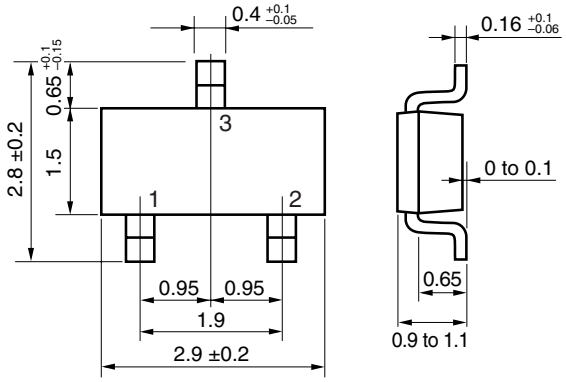
The N0300P is a switching device which can be driven directly by a 4.5 V power source.

The 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

- 4.5 V drive available
- Low on-state resistance
  $R_{DS(on)1}$ = 72 mΩ MAX. (V_{GS} = –10 V, I_D = –2.0 A)
  $R_{DS(on)2}$ = 105 mΩ MAX. (V_{GS} = –4.5 V, I_D = –2.0 A)
- Built-in gate protection diode

PACKAGE DRAWING (Unit: mm)



1. Gate
2. Source
3. Drain

ORDERING INFORMATION

PART NUMBER	PACKAGE
N0300P-T1B-AT Note	SC-96 (Mini Mold Thin Type)

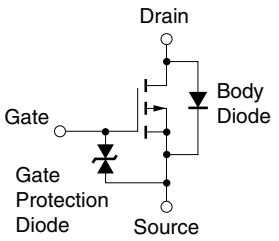
Note Pb-free (This product does not contain Pb in the external electrode and other parts.)

Marking: XZ

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage (V_{GS} = 0 V)	V_{DSS}	–30	V
Gate to Source Voltage (V_{DS} = 0 V)	V_{GSS}	∓20	V
Drain Current (DC)	$I_{D(DC)}$	∓4.5	A
Drain Current (pulse) Note1	$I_{D(pulse)}$	∓18	A
Total Power Dissipation	P_{T1}	0.2	W
Total Power Dissipation Note2	P_{T2}	1.25	W
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	–55 to +150	°C

EQUIVALENT CIRCUIT



Notes 1. PW ≤ 10 μs, Duty Cycle ≤ 1%

2. Mounted on FR-4 board of 50 mm x 50 mm x 1.6 mmt, t ≤ 5 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.

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Date Published April 2009 NS
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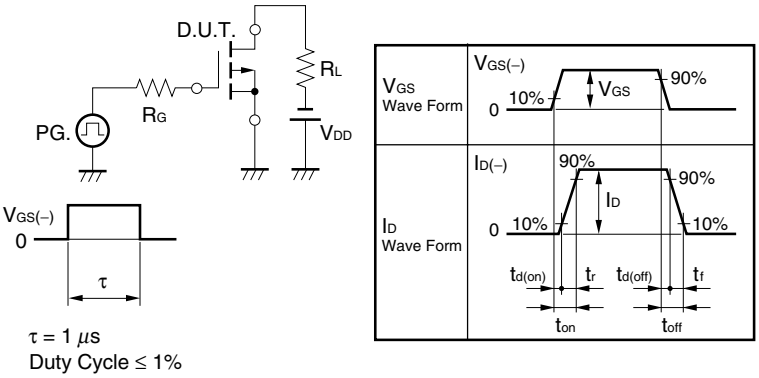
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ELECTRICAL CHARACTERISTICS (T_A = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = –30 V, V_{GS} = 0 V			–1	μA
Gate Leakage Current	I_{GSS}	V_{GS} = ∓16 V, V_{DS} = 0 V			∓10	μA
Gate to Source Cut-off Voltage	$V_{GS(off)}$	V_{DS} = –10 V, I_D = –1.0 mA	–1.0		–2.5	V
Forward Transfer Admittance **Note**	$\|y_{fs}\|$	V_{DS} = –10 V, I_D = –1.5 A	1.0			S
Drain to Source On-state Resistance **Note**	$R_{DS(on)1}$	V_{GS} = –10 V, I_D = –2.0 A		56	72	mΩ
	$R_{DS(on)2}$	V_{GS} = –4.5 V, I_D = –2.0 A		75	105	mΩ
Input Capacitance	C_{iss}	V_{DS} = –10 V,		345		pF
Output Capacitance	C_{oss}	V_{GS} = 0 V,		78		pF
Reverse Transfer Capacitance	C_{rss}	f = 1.0 MHz		65		pF
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = –15 V, I_D = –2.0 A,		6.5		ns
Rise Time	t_r	V_{GS} = –10 V,		4.0		ns
Turn-off Delay Time	$t_{d(off)}$	R_G = 6 Ω		34		ns
Fall Time	t_f			12		ns
Total Gate Charge	Q_G	V_{DD} = –24 V, V_{GS} = –10.0 V, I_D = –4.5 A		8.3		nC
Body Diode Forward Voltage **Note**	$V_{F(S-D)}$	I_F = 4.5 A, V_{GS} = 0 V		0.95		V

Note Pulsed

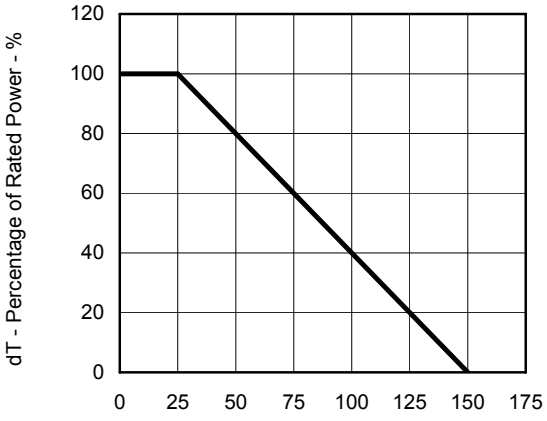
TEST CIRCUIT SWITCHING TIME



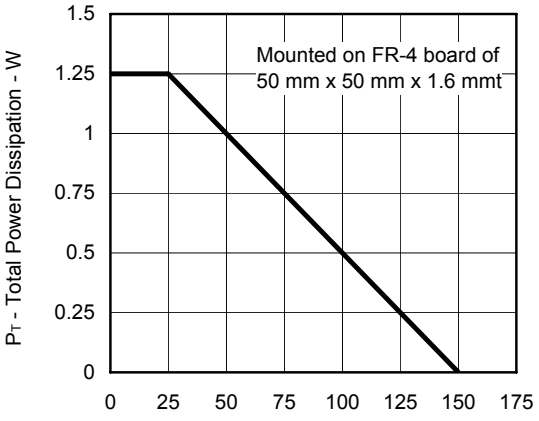
τ = 1 μs
Duty Cycle ≤ 1%

TYPICAL CHARACTERISTICS (T_A = 25°C)

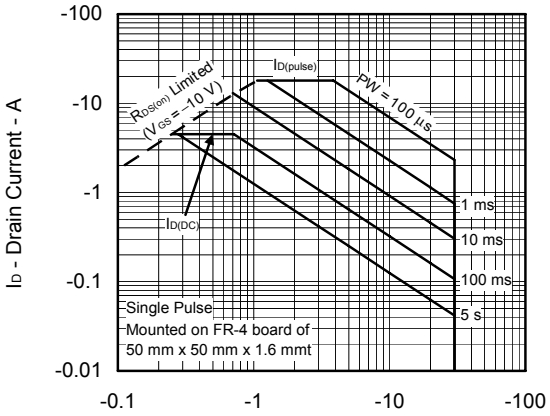
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



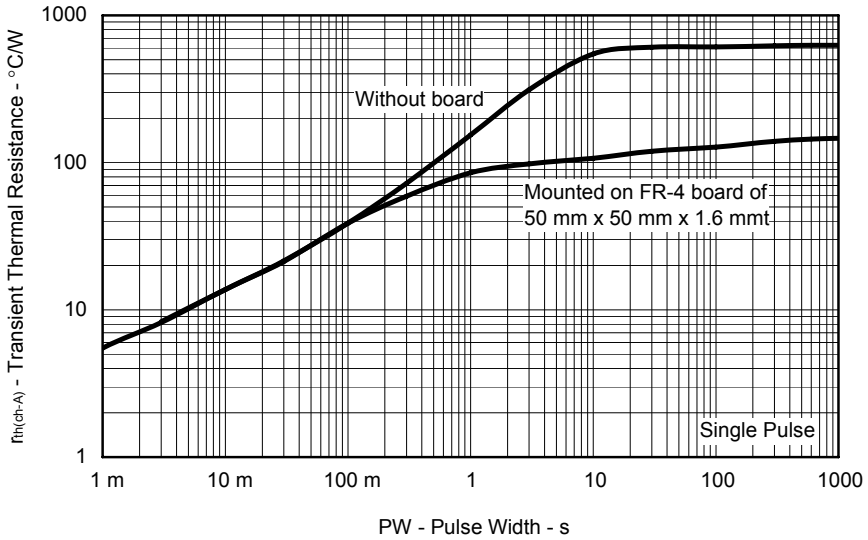
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



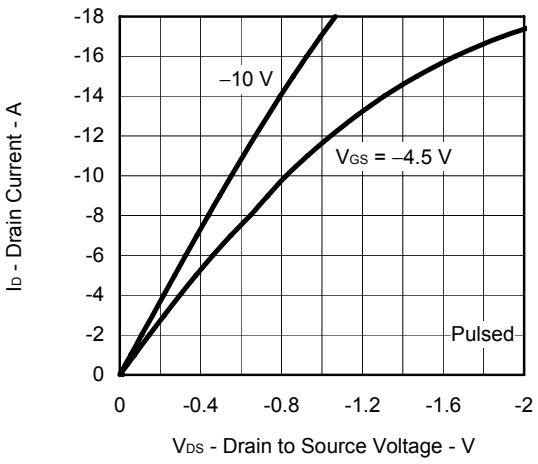
FORWARD BIAS SAFE OPERATING AREA



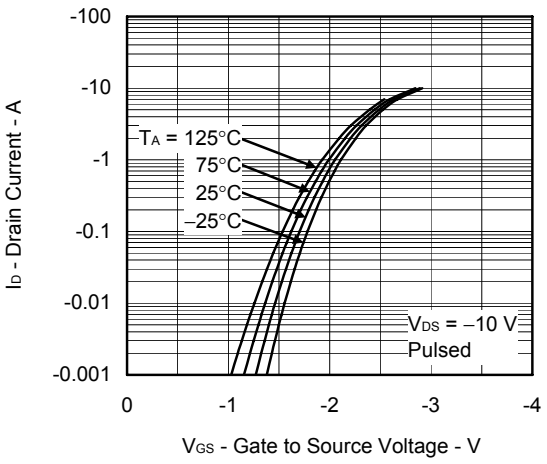
TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



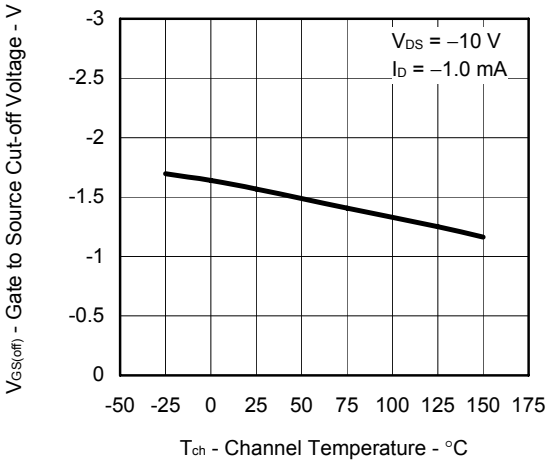
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



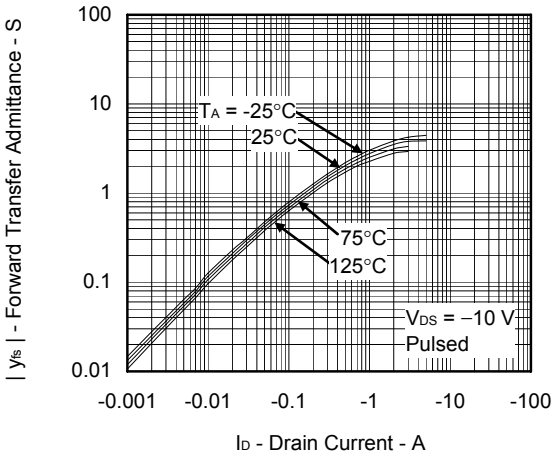
FORWARD TRANSFER CHARACTERISTICS



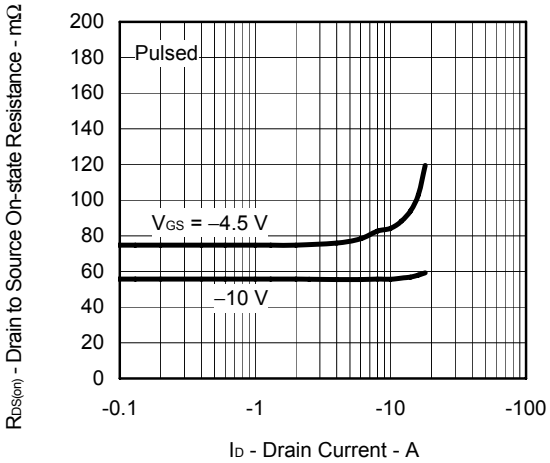
GATE TO SOURCE CUT-OFF VOLTAGE vs.
CHANNEL TEMPERATURE



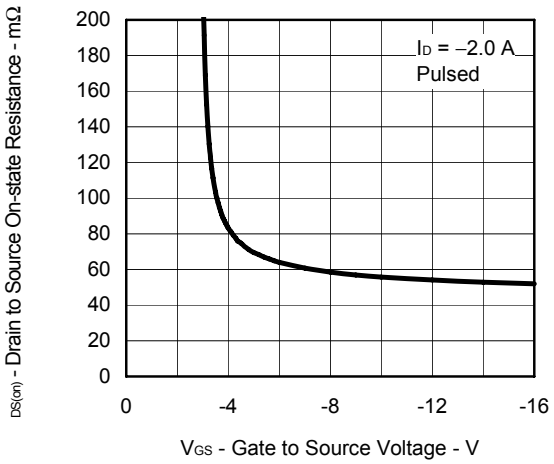
FORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENT



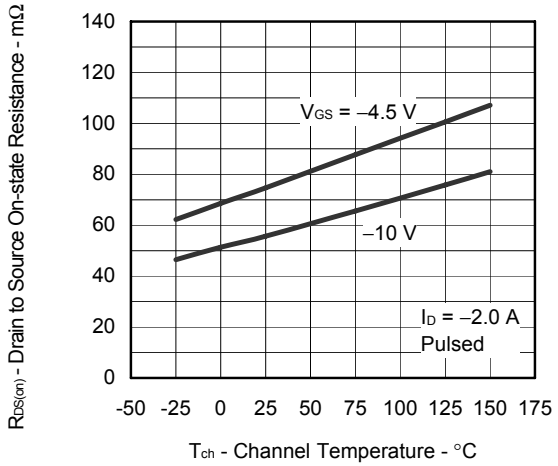
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



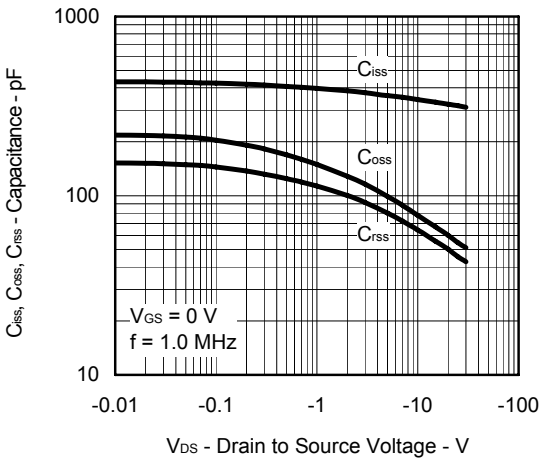
DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



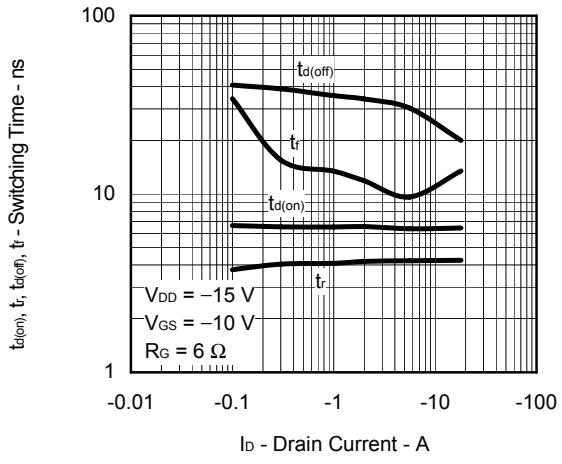
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



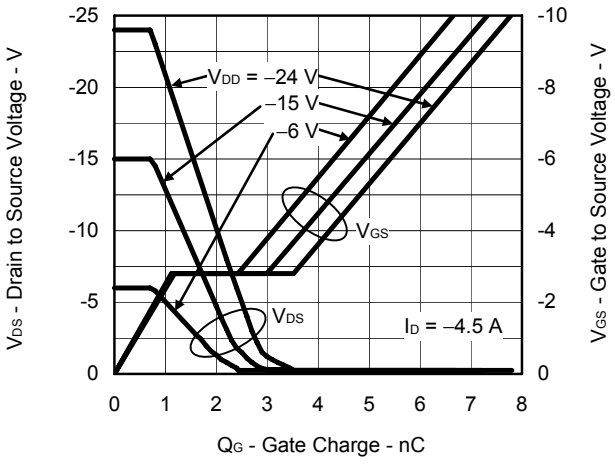
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



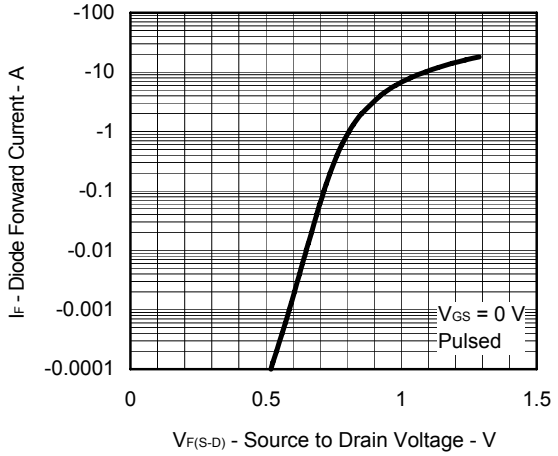
SWITCHING CHARACTERISTICS



DYNAMIC INPUT/OUTPUT CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



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