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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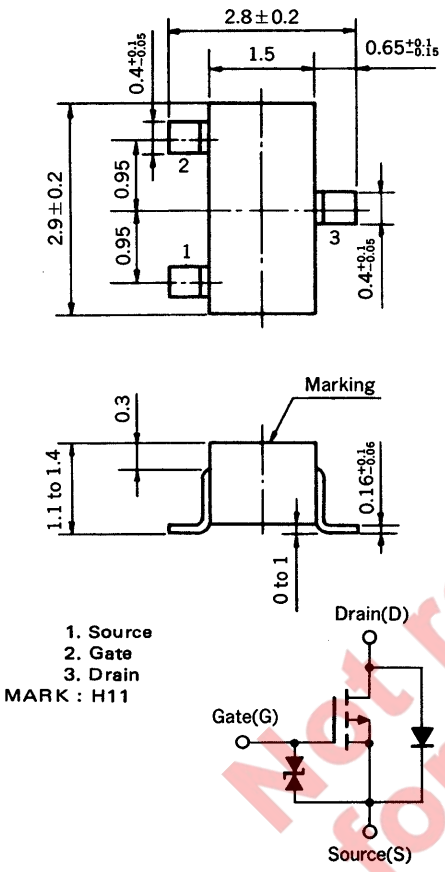
RENESAS

MOS FIELD EFFECT TRANSISTOR

2SJ166

P-CHANNEL MOS FET
FOR HIGH SPEED SWITCHING

PACKAGE DIMENSIONS (Unit : mm)



1. Source
2. Gate
3. Drain

MARK : H11

(Diode in the figure is the parasitic diode.)

The 2SJ166, P-channel vertical type MOS FET, is a switching device which can be driven directly by the output of ICs having a 5 V power source.

The MOS FET has excellent switching characteristics and is suitable as a high-speed switching device in digital circuits.

FEATURES

- Directly driven by the output of ICs having a 5 V power source.
- Not necessary to consider driving current because of its high input impedance.
- Possible to reduce the number of parts by omitting the bias resistor.
- Complementary to 2SK1132.

QUALITY GRADE

Standard

Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

PARAMETER	SYMBOL	RATINGS	UNIT	TEST CONDITIONS
Drain to Source Voltage	V_{DSS}	−50	V	V_{GS} = 0
Gate to Source Voltage	V_{GSS}	∓7.0	V	V_{DS} = 0
Drain Current	$I_{D(DC)}$	∓100	mA	
Drain Current	$I_{D(pulse)}$	∓200	mA	PW ≦ 10 ms, Duty Cycle ≦ 50 %
Total Power Dissipation	P_T	200	mW	
Channel Temperature	T_{ch}	150	°C	
Storage Temperature	T_{stg}	−50 to +150	°C	

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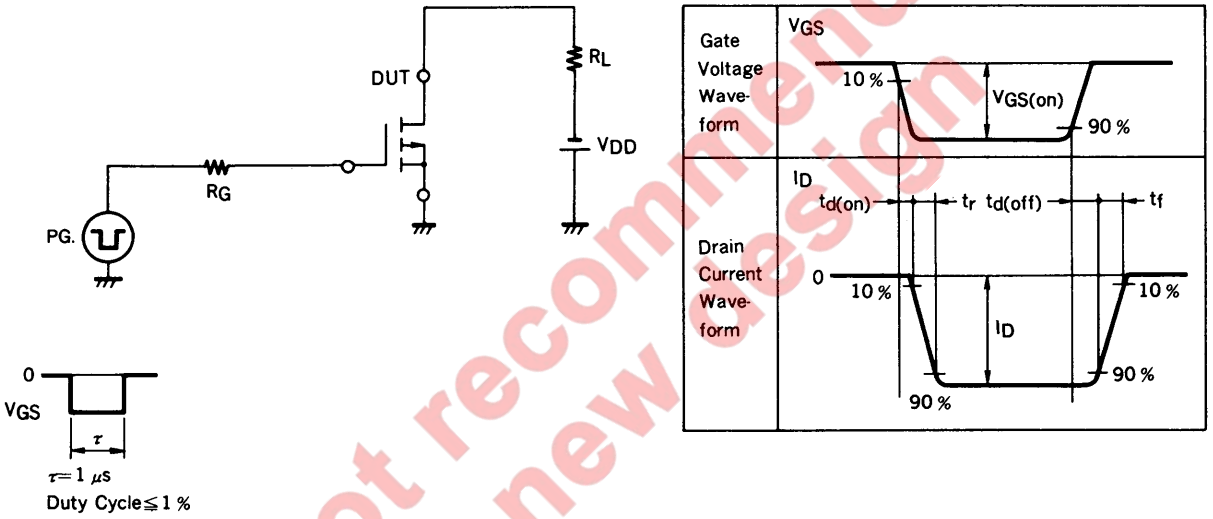
Date Published July 1991 M
Printed in Japan

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

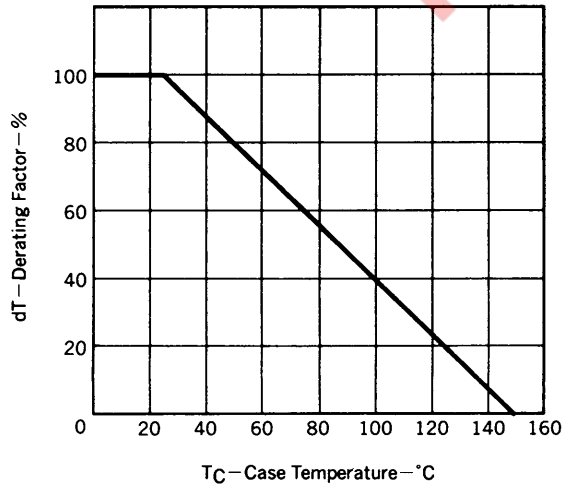
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain Cut-off Current	I_{DSS}			−10	μA	V_{DS} = −50 V, V_{GS} = 0
Gate Leakage Current	I_{GSS}			∓1.0	μA	V_{GS} = ∓7.0 V, V_{DS} = 0
Gate Cut-off Voltage	$V_{GS(off)}$	−1.0	−2.1	−3.0	V	V_{DS} = −5.0 V, I_D = −1.0 μA
Forward Transfer Admittance	$\|y_{fs}\|$	30	50		mS	V_{DS} = −5.0 V, I_D = −20 mA
Drain to Source On-State Resistance	$R_{DS(on)}$		18	50	Ω	V_{GS} = −4.0 V, I_D = −20 mA
Input Capacitance	C_{iss}		18		pF	V_{DS} = −5.0 V, V_{GS} = 0, f = 1 MHz
Output Capacitance	C_{oss}		11		pF	
Feedback Capacitance	C_{rss}		3		pF	
Turn-On Delay Time	$t_{d(on)}$		40		ns	V_{DD} = −5.0 V, I_D = −20 mA, $V_{GS(on)}$ = −5.0 V, R_G = 10 Ω, R_L = 250 Ω
Rise Time	t_r		58		ns	
Turn-Off Delay Time	$t_{d(off)}$		62		ns	
Fall Time	t_f		62		ns	

SWITCHING TIME MEASUREMENT CIRCUIT AND CONDITIONS

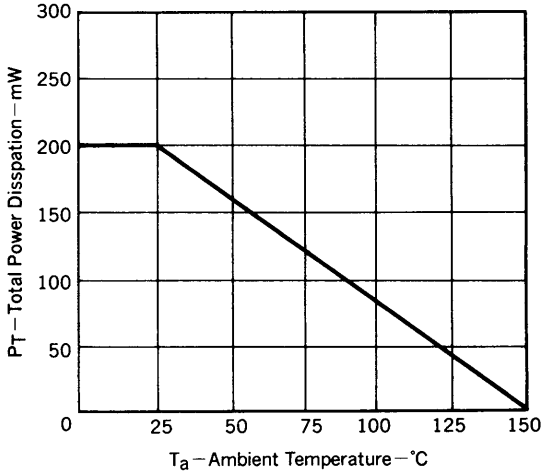


TYPICAL CHARACTERISTICS (T_a = 25 °C)

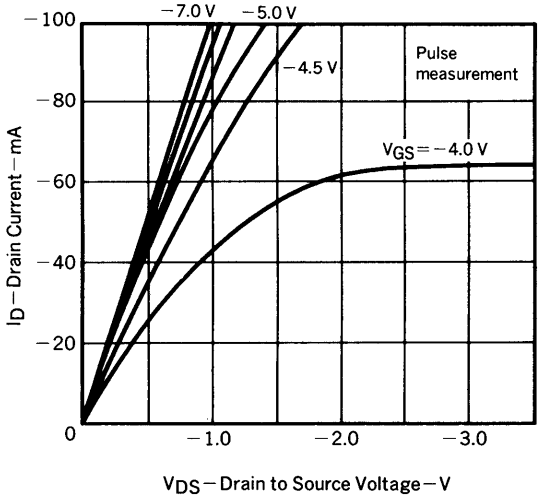
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



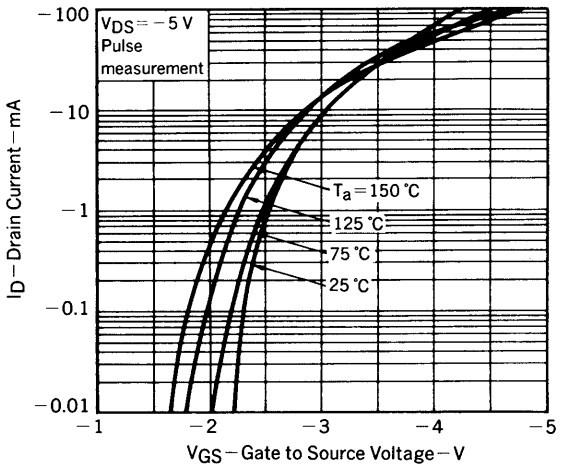
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



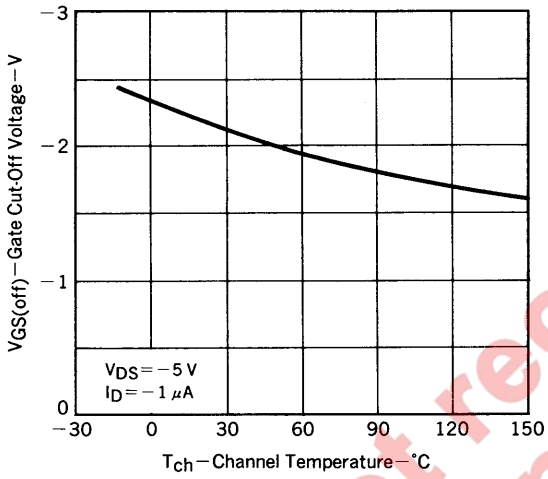
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



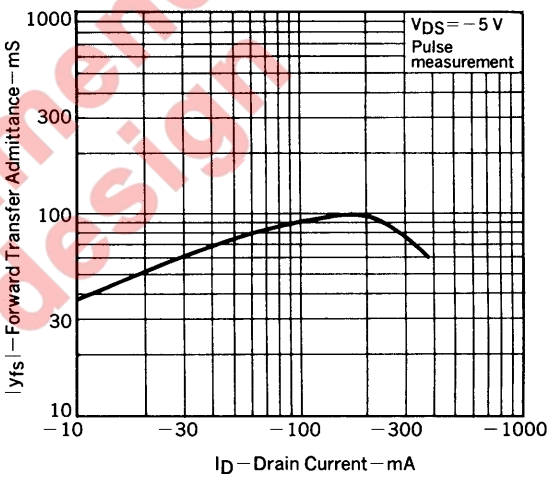
TRANSFER CHARACTERISTICS



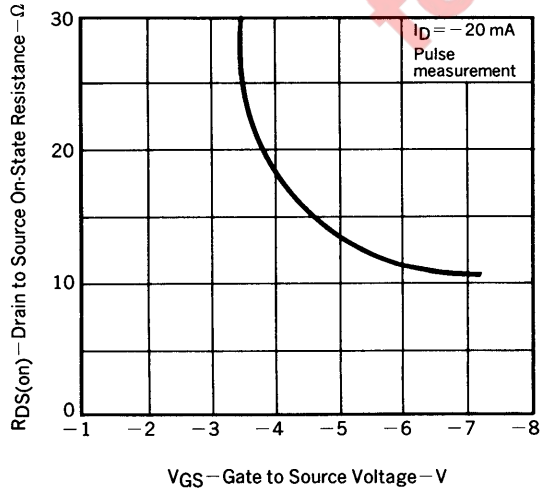
GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE



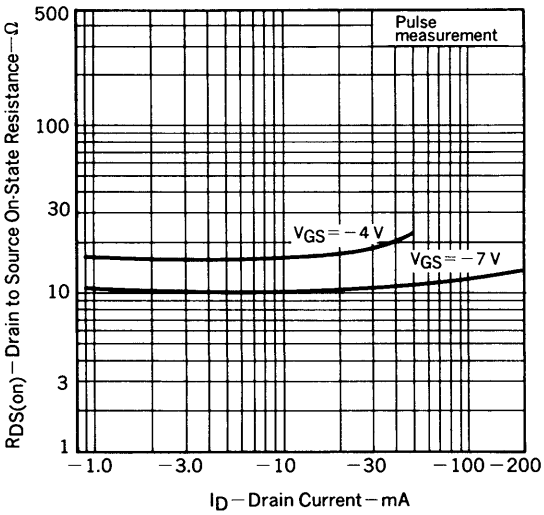
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



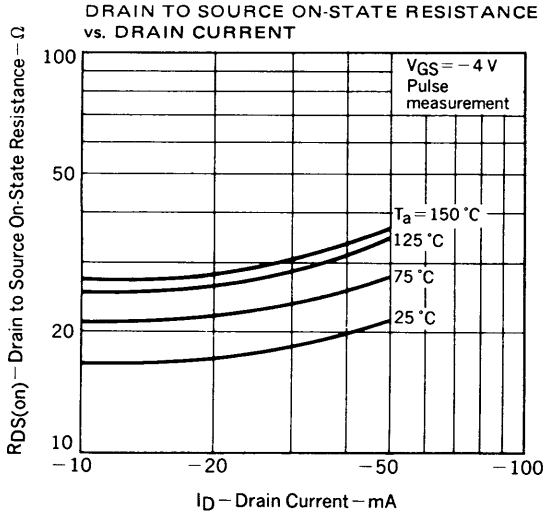
DRAIN TO SOURCE ON-STATE RESISTANCE vs. GATE TO SOURCE VOLTAGE



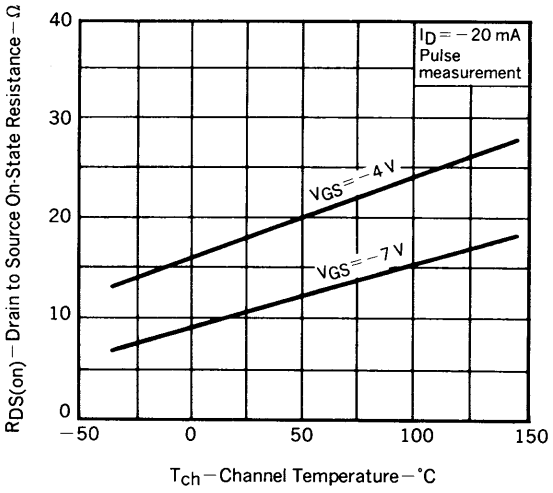
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



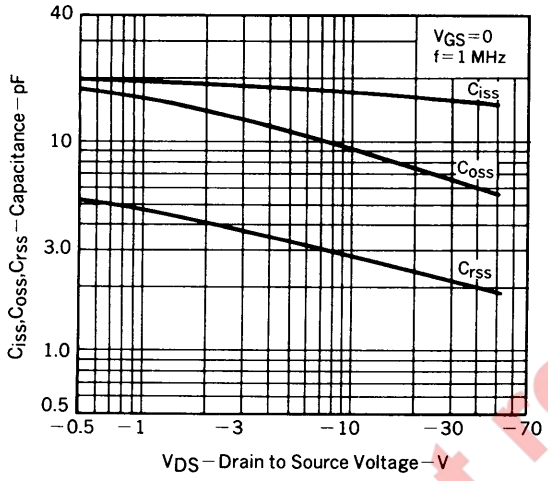
DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



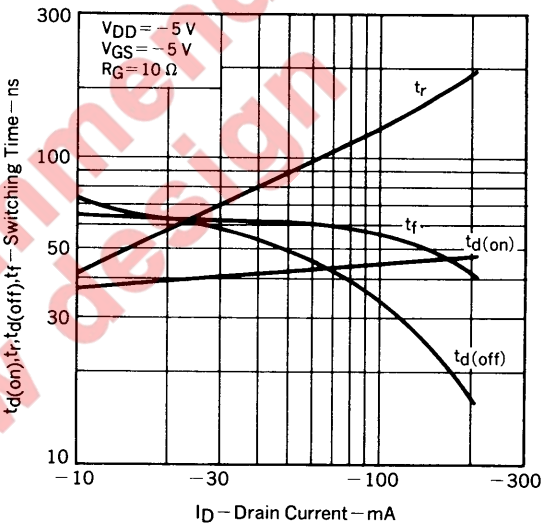
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



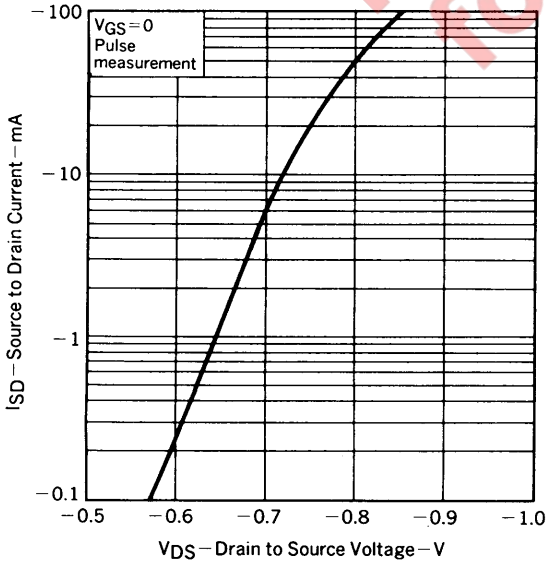
CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



RECOMMENDED SOLDERING CONDITIONS

Mounting of this product by soldering should be done under the following conditions.
Please consult our representatives about soldering methods and conditions other than these.

SURFACE MOUNT TYPE

For details of the recommended soldering conditions, see the information document "SMT MANUAL" (IEI-1207).

Soldering Method	Soldering Conditions	Symbol for Recommended Conditions
Infrared Reflow	Package peak temp.: 230 °C Soldering time: within 30 sec (above 210 °C) Soldering times: 1, Days limitation: none*	IR30-00
Vapor Phase Soldering	Package peak temp.: 215 °C Soldering time: within 40 sec (above 200 °C) Soldering times: 1, Days limitation: none*	VP15-00
Wave Soldering	Soldering bath temp.: below 260 °C Soldering time: within 10 sec Soldering times: 1, Days limitation: none*	WS60-00

*: Stored days under storage conditions at 25 °C and below 65 % R.H. after the dry-pack has been opened.
Note 1 Combination of soldering methods should be avoided.

〔MEMO〕