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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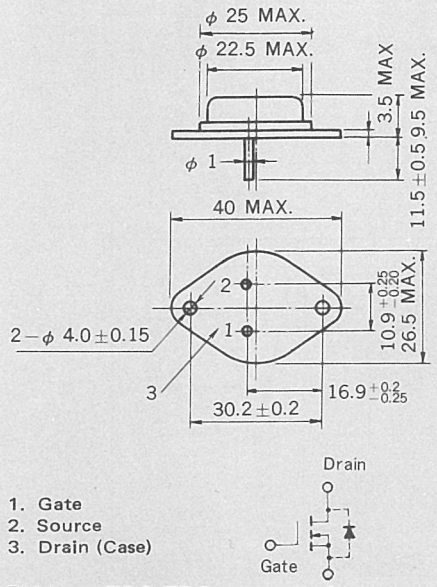
RENESAS

MOS FIELD EFFECT TRANSISTOR
2SK293

Phase-out/Discontinued

HIGH VOLTAGE HIGH CURRENT AND HIGH SPEED SWITCHING N-CHANNEL POWER MOS FET INDUSTRIAL USE

PACKAGE DIMENSIONS
in millimeters



1. Gate
2. Source
3. Drain (Case)

EIAJ : TC-3, TB-3
JEDEC : TO-3
IEC : C14A, B18

DESCRIPTION

Suitable for switching regulator.

FEATURES

- High voltage. $V_{DSS} \geqq 300$ V
- Low on-resistance. $R_{D(ON)} \leqq 1.3\ \Omega$
- High speed switching. $t_r \leqq 50$ ns, $t_f < 50$ ns (at 2 A)

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents (T_a = 25 °C)

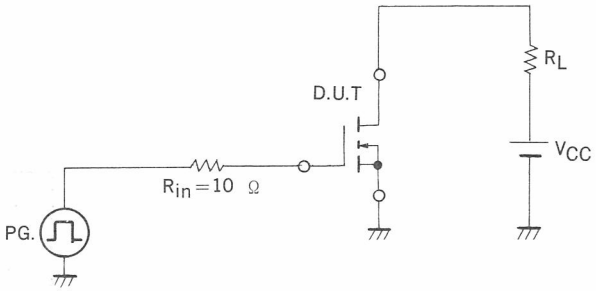
Drain to Source Voltage	V_{DSS}	300	V
Gate to Source Voltage	V_{GSS}	±20	V
Continuous Drain Current	$I_{D(DC)}$	7.0	A
Peak Drain Current	$I_{D(pulse)}$*	10	A
Maximum Power Dissipation			
Total Power Dissipation	$P_{T(T_c = 25\,°C)}$	100	W
Maximum Temperatures			
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	−65 to +150	°C

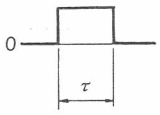
* Pulse; PW ≦ 10 ms, Duty Cycle ≦ 50 %

ELECTRICAL CHARACTERISTICS (T_a = 25 °C unless otherwise noted)

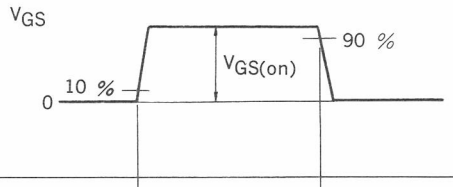
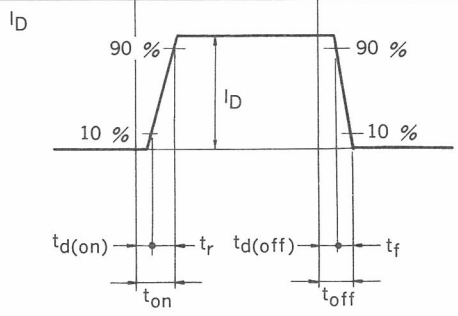
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Gate Cutoff Current	I_{GSS}			±100	nA	V_{GS} = ±20 V, V_{DS} = 0
Drain Cutoff Current	I_{DSS1}			5	mA	V_{DS} = 300 V, V_{GS} = 0
Drain Cutoff Current	I_{DSS2}			5	mA	V_{DS} = 300 V, V_{GS} = 0, T_a = 125 °C
Gate to Source Cutoff Voltage	$V_{GS(off)}$	0.4	1	3.0	V	V_{DS} = 10 V, I_D = 50 mA
Forward Transfer Admittance	$\|y_{fs}\|$	0.6	1.0		S	V_{DS} = 10 V, I_D = 3 A
Drain to Source On Voltage	$V_{DS(ON)}$		3.8	5.2	V	V_{GS} = 15 V, I_D = 4 A
Drain to Source On Resistance	$R_{DS(ON)}$		1.0	1.3	Ω	V_{GS} = 15 V, I_D = 4 A
Input Capacitance	C_{iss}		950	1500	pF	V_{DS} = 10 V, V_{GS} = −5V, f = 1 MHz
Output Capacitance	C_{oss}		600		pF	
Reverse Transfer Capacitance	C_{rss}		10		pF	
Turn-on Delay Time	$t_{d(on)}$		20	50	ns	I_D = 2 A, $V_{GS(on)}$ = 10 V, $V_{GS(off)}$ = 0, R_L = 75 Ω, V_{CC} ≒ 150 V, PW = 1 μs, Duty Cycle ≦ 1 % See Test Circuit
Rise Time	t_r		20	50	ns	
Turn-off Delay Time	$t_{d(off)}$		25	50	ns	
Fall Time	t_f		35	50	ns	

SWITCHING TIME TEST CIRCUIT





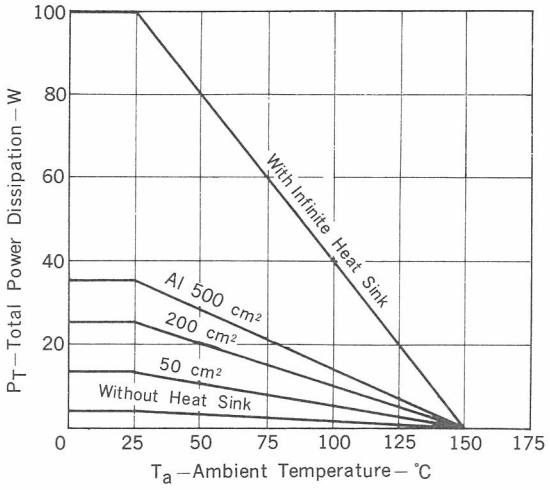
τ = 1 μs
Duty Cycle ≦ 1 %

Gate Voltage Wave form	
Drain Current Wave form	

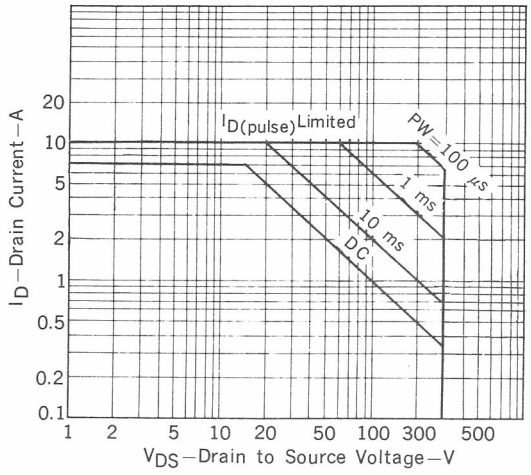
Phase-out/Discontinued

TYPICAL CHARACTERISTICS (T_a = 25 °C)

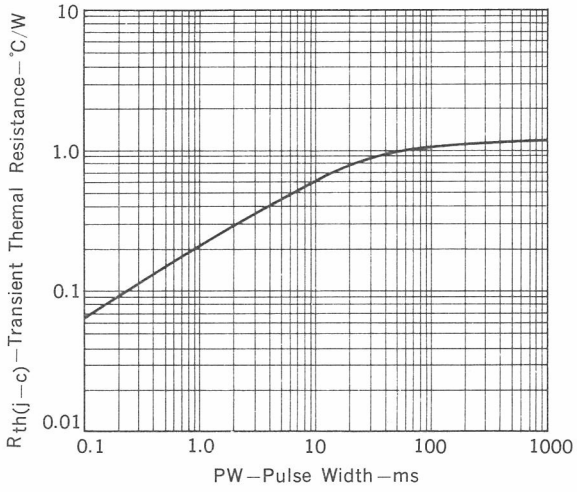
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



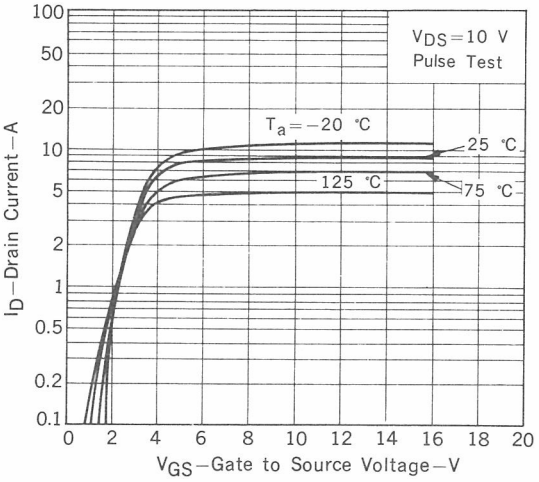
FORWARD BIAS SAFE OPERATING AREAS



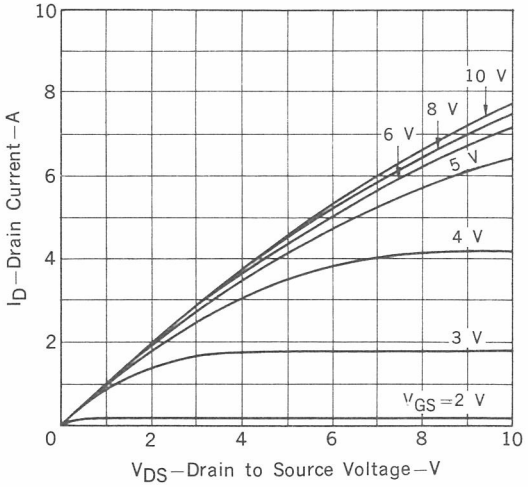
TRANSIENT THERMAL RESISTANCE



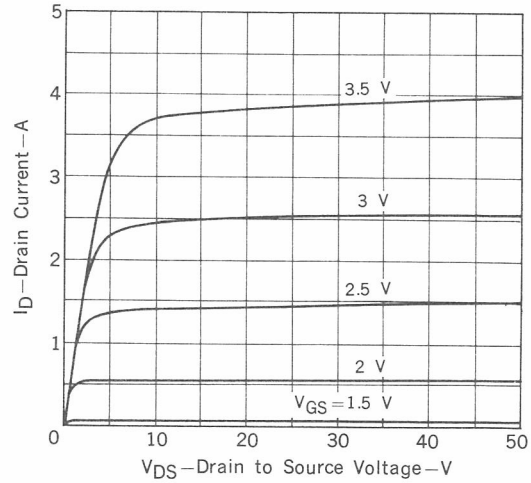
TRANSFER CHARACTERISTICS



DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE

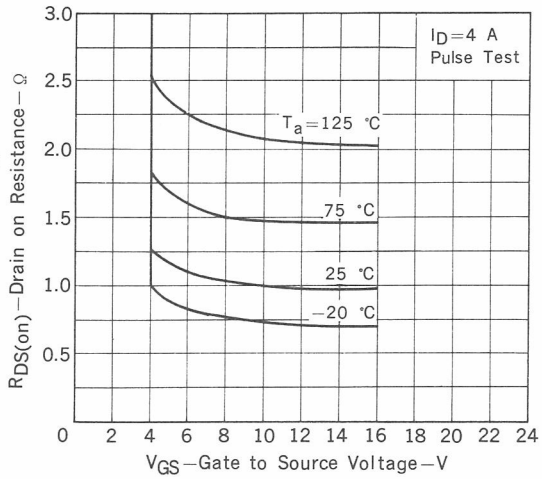


DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE

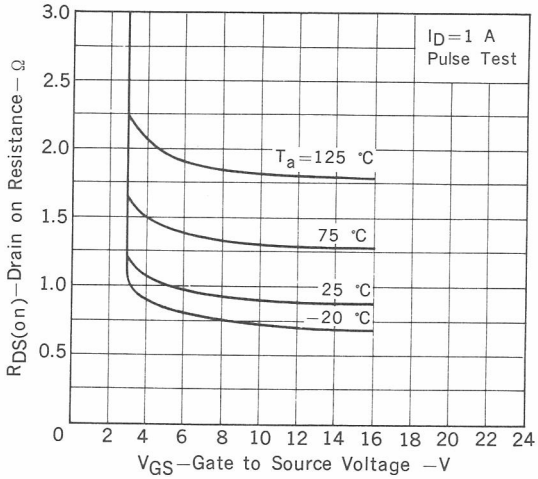


Phase-out/Discontinued

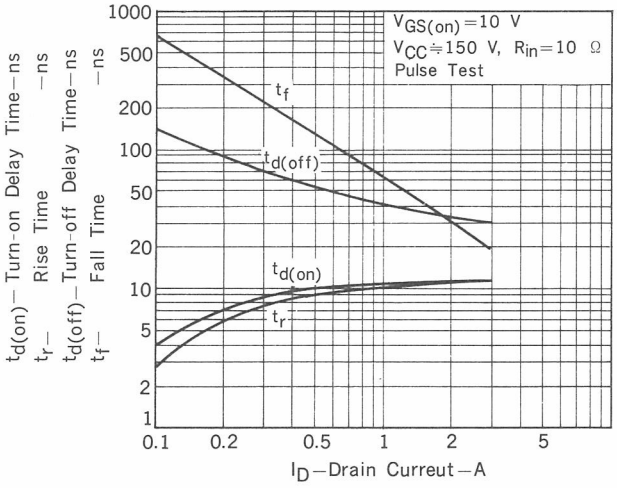
DRAIN ON RESISTANCE vs. GATE TO SOURCE VOLTAGE



DRAIN ON RESISTANCE vs. GATE TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



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