

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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

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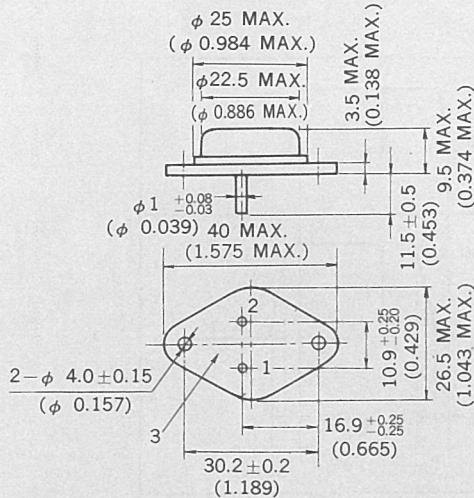
# MOS FIELD EFFECT TRANSISTOR 2SK277, 2SK278

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

**Phase-out/Discontinued**

### PACKAGE DIMENSIONS

in millimeters (inches)



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

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

### DESCRIPTION

Suitable for switching regulator, DC-DC converters.

### FEATURES

- High speed switching.
- Low Drain to Source resistance.  $R_{DS(ON)} < 1.5 \Omega$

### ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Currents ( $T_a = 25^\circ\text{C}$ )

		2SK277	2SK278	
Drain to Source Voltage	$V_{DSS}$	350	400	V
Gate to Source Voltage	$V_{GS}$	±20		V
Continuous Drain Current	$I_D(DC)$	7		A
Peak Drain Current	$I_D(\text{pulse})^*$	10		A
Maximum Power Dissipation				
Total Power Disipation	$P_T(T_c = 25^\circ\text{C})$	100		W
Maximum Temperatures				
Channel Temperature	$T_{ch}$	150		$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-65 to 150		$^\circ\text{C}$

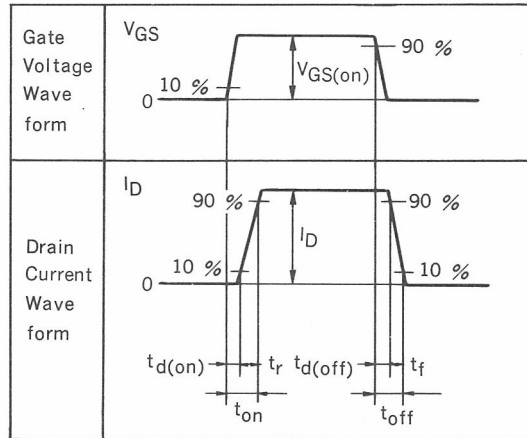
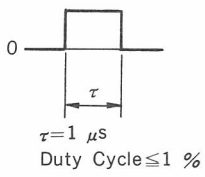
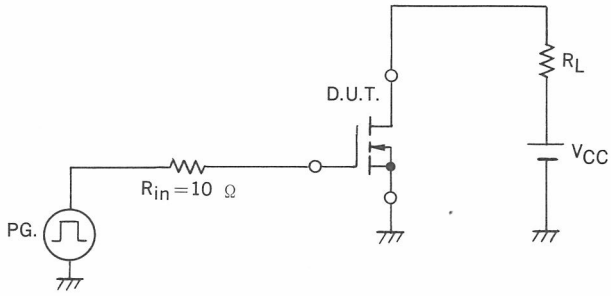
\* Pulse;  $PW \leq 10 \text{ ms}$ , Duty Cycle  $\leq 50 \%$

### ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ unless otherwise noted)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Drain to Source Breakdown Voltage	$BV_{DSS}$	350			V	$V_{GS} = 0 \text{ V}$ , $I_D = 10 \text{ mA}$
		400				
Drain Cutoff Current	$I_{DSS}$			10	mA	$V_{DS} = V_{DSS}$ , $V_{GS} = 0 \text{ V}$
Gate to Source Cutoff Voltage	$V_{GS(\text{off})}$	0.4	1	3	V	$V_{DS} = 10 \text{ V}$ , $I_D = 50 \text{ mA}$
Forward Transfer Admittance	$ Y_{fs} $	0.6	1.0		S	$V_{DS} = 10 \text{ V}$ , $I_D = 3 \text{ A}$
Drain to Source On Resistance	$R_{DS(ON)}$		1.0	1.5	$\Omega$	$V_{GS} = 15 \text{ V}$ , $I_D = 4 \text{ A}$
Input Capacitance	$C_{iss}$		950	1500	pF	$V_{DS} = 10 \text{ V}$ , $V_{GS} = -5 \text{ V}$ , $f = 1 \text{ MHz}$
Output Capacitance	$C_{oss}$		600		pF	
Reverse Transfer Capacitance	$C_{rss}$		10		pF	
Turn-on Delay Time	$t_{d(\text{on})}$		20	50	ns	$I_D = 2 \text{ A}$ , $V_{GS(\text{on})} = 10 \text{ V}$ , $V_{GS(\text{off})} = 0 \text{ V}$ , $R_L = 75 \Omega$ , $V_{CC} = 150 \text{ V}$ , $PW = 1 \mu\text{s}$ , Duty Cycle $\leq 1 \%$
Rise Time	$t_r$		20	50	ns	
Turn-off Delay Time	$t_{d(\text{off})}$		25	50	ns	
Fall Time	$t_f$		35	50	ns	

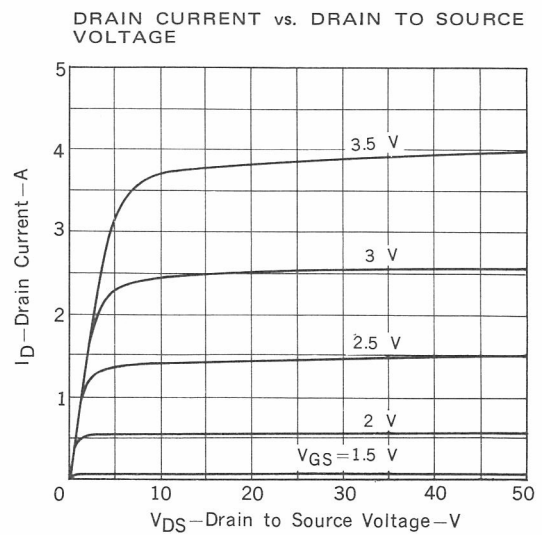
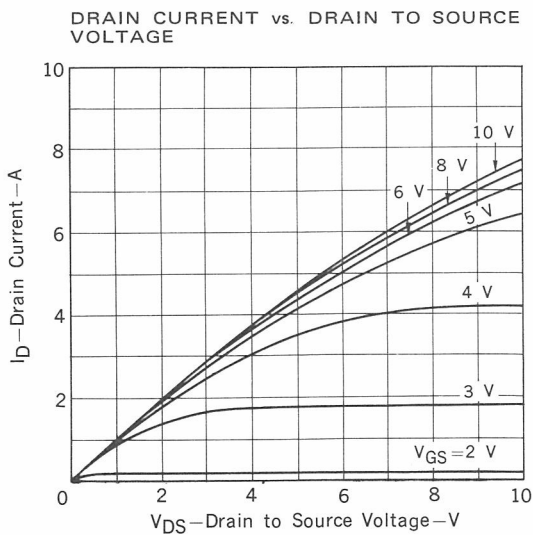
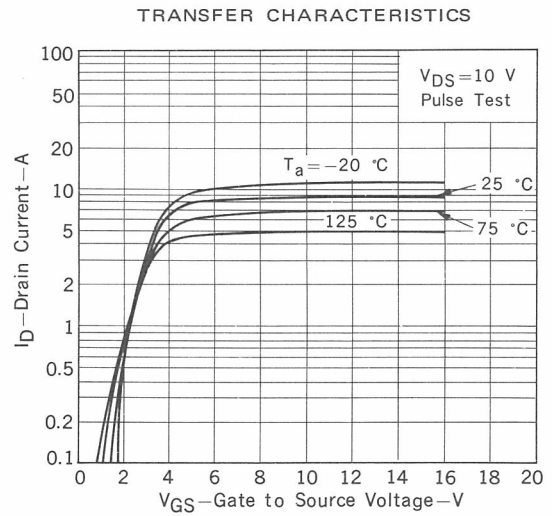
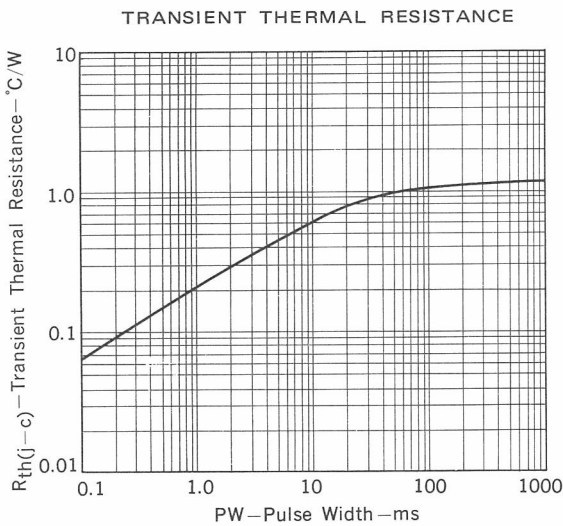
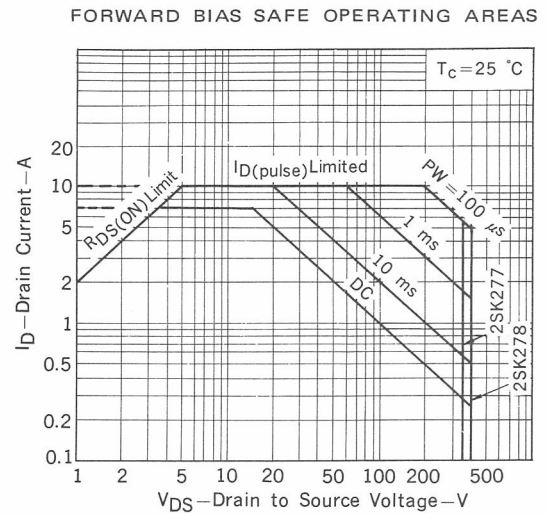
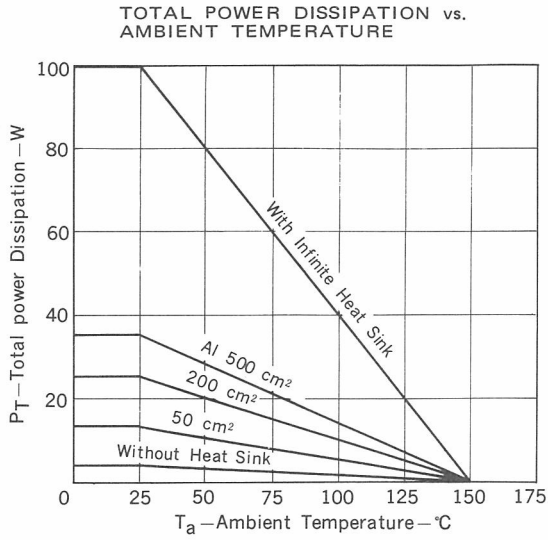
**Phase-out/Discontinued**

SWITCHING TEST CIRCUIT TIME

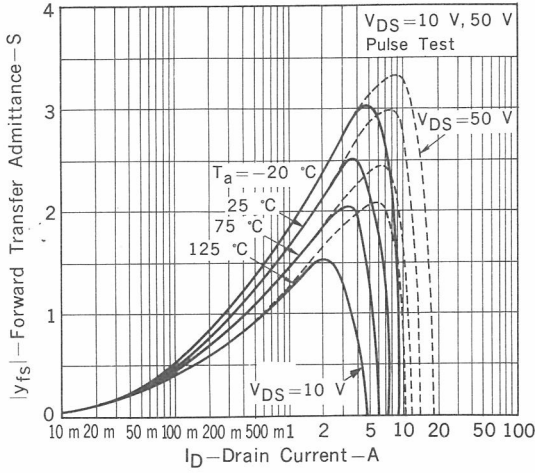


**Phase-out/Discontinued**

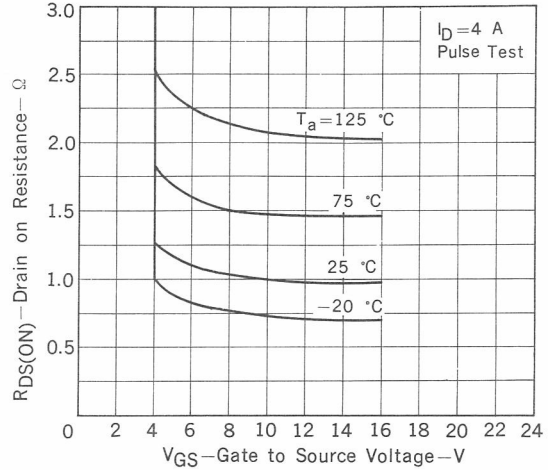
TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )



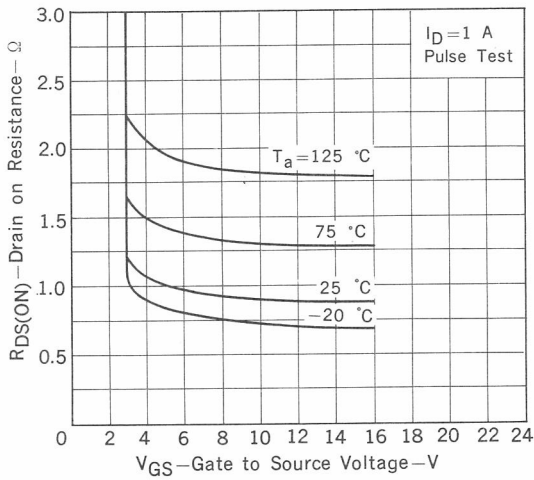
FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



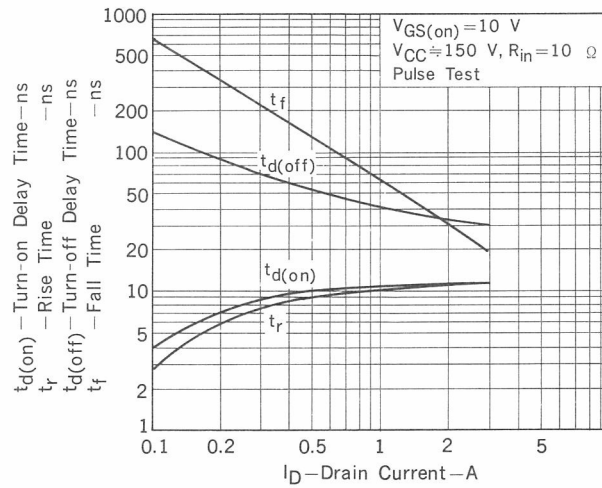
DRAIN ON RESISTANCE vs. GATE TO SOURCE VOLTAGE



DRAIN ON RESISTANCE vs. GATE TO SOURCE VOLTAGE



SWITCHING CHARACTERISTICS



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