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

# CHANNEL MOS FIELD EFFECT POWER TRANSISTOR

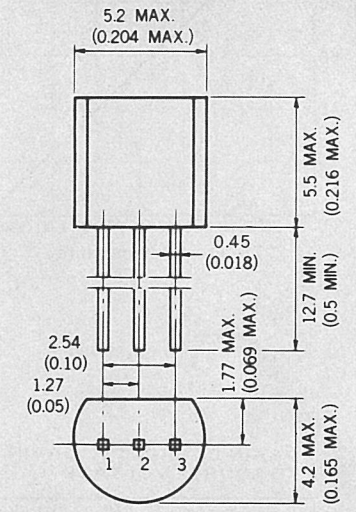
Phase-out/Discontinued

# 2SK679

**FEATURES**

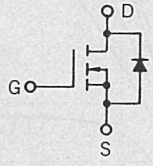
- Suitable for switching power supplies, actuater controls, and pulse circuits
- Low $R_{DS(on)}$; $R_{DS(on)}$ = 0.95 Ω TYP. ($V_{GS}$ = 4 V, $I_D$ = 0.5 A)
- No second breakdown

**PACKAGE DIMENSIONS**
in millimeters (inches)




1. Gate (G)
2. Drain (D)
3. Source (S)

EIAJ : SC-43B
JEDEC : TO-92
IEC : PA33




**ABSOLUTE MAXIMUM RATINGS**

Maximum Temperatures

Storage Temperature . . . . . −55 to +150 °C

Channel Temperature. . . . . 150 °C Maximum

Maximum Power Dissipation ($T_a$ = 25 °C)

Total Power Dissipation . . . . . 0.75 W

Maximum Voltages and Currents ($T_a$ = 25 °C)

| | | | |
|---|---|---|---|
| $V_{DSS}$ | Drain to Source Voltage . . . . | 30 | V |
| $V_{GSS}$ | Gate to Source Voltage. . . . . | ±20 | V |
| $I_{D(DC)}$ | Drain Current (DC) . . . . . | ±1.0 | A |
| $I_{D(pulse)}$ | Drain Current (pulse)* . . . . . | ±2.0 | A |

* PW ≦ 300 μs, Duty Cycle ≦ 10 %

**ELECTRICAL CHARACTERISTICS ($T_a$ = 25 °C)**

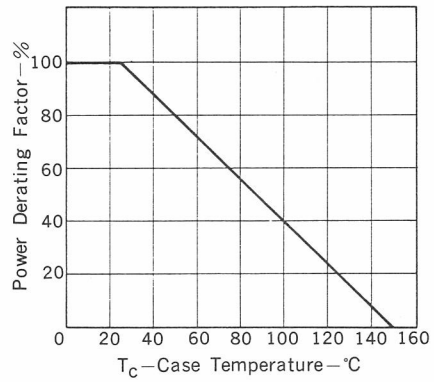
| SYMBOL | CHARACTERISTIC | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| $I_{DSS}$ | Drain Leakage Current | | | 10 | μA | $V_{DS}$ = 20 V, $V_{GS}$ = 0 |
| $I_{GSS}$ | Gate to Source Leakage Current | | | ±100 | nA | $V_{GS}$ = ±20 V, $V_{DS}$ = 0 |
| $V_{GS(off)}$ | Gate to Source Cutoff Voltage | 1.0 | | 2.5 | V | $V_{DS}$ = 10 V, $I_D$ = 1.0 mA |
| $\|y_{fs}\|$ | Forward Transfer Admittance | 0.4 | | | S | $V_{DS}$ = 10 V, $I_D$ = 0.5 A |
| $R_{DS(on)}$ | Drain to Source On-State Resistance | | 0.5 | 1.0 | Ω | $V_{GS}$ = 10 V, $I_D$ = 0.5 A |
| $R_{DS(on)}$ | Drain to Source On-State Resistance | | 0.95 | 1.5 | Ω | $V_{GS}$ = 4.0 V, $I_D$ = 0.5 A |
| $C_{iss}$ | Input Capacitance | | 40 | | pF | $V_{DS}$ = 10 V, $V_{GS}$ = 0, f = 1 MHz |
| $C_{oss}$ | Output Capacitance | | 65 | | pF | |
| $C_{rss}$ | Reverse Transfer Capacitance | | 10 | | pF | |
| $t_{d(on)}$ | Turn-On Delay Time | | 60 | | ns | $I_D$ = 0.5 A, $V_{CC}$ = 25 V, $V_{GS(on)}$ = 10 V, $R_L$ = 50 Ω, $R_{in}$ = 10 Ω |
| $t_r$ | Rise Time | | 180 | | ns | |
| $t_{d(off)}$ | Turn-Off Delay Time | | 550 | | ns | |
| $t_f$ | Fall Time | | 400 | | ns | |

Phase-out/Discontinued

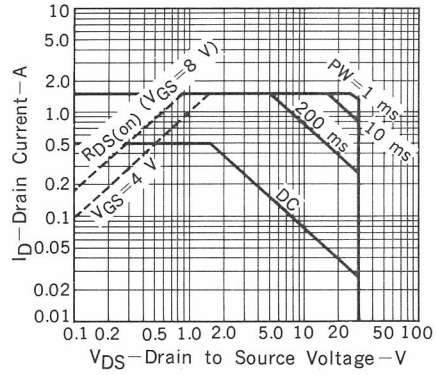


## TYPICAL CHARACTERISTICS ($T_a$ = 25 °C)

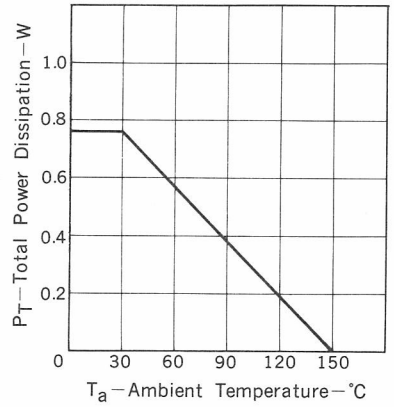
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



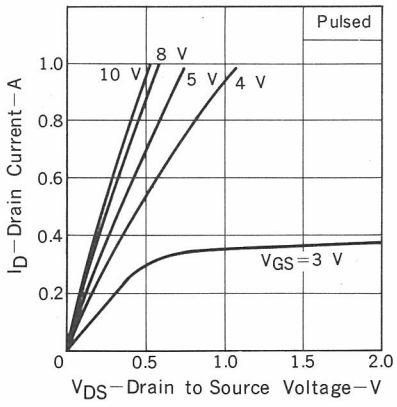

FORWARD BIAS SAFE OPERATING AREA



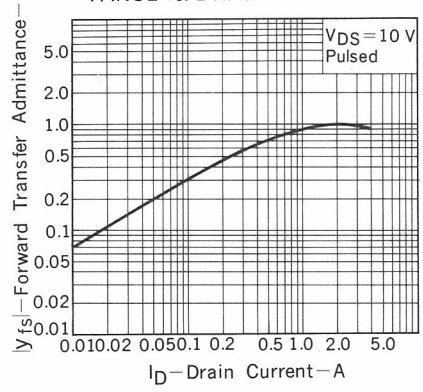

TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



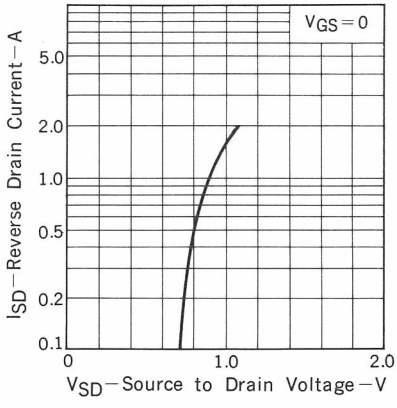

DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



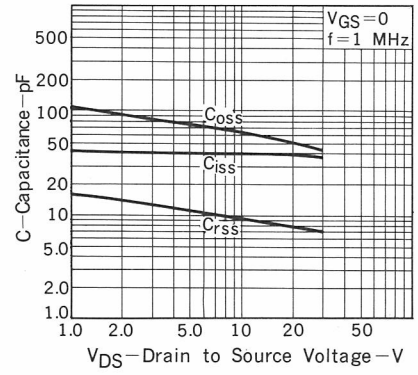

FORWARD TRANSFER ADMITTANCE vs. DRAIN CURRENT



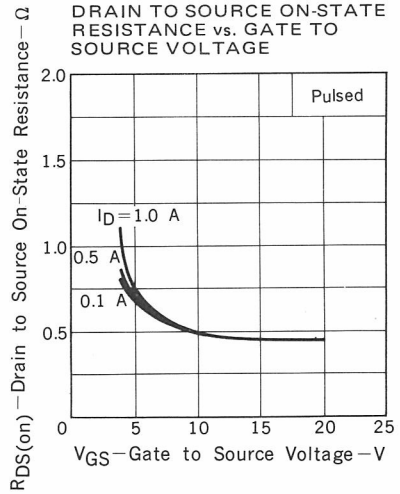

SOURCE TO DRAIN DIODE FORWARD VOLTAGE



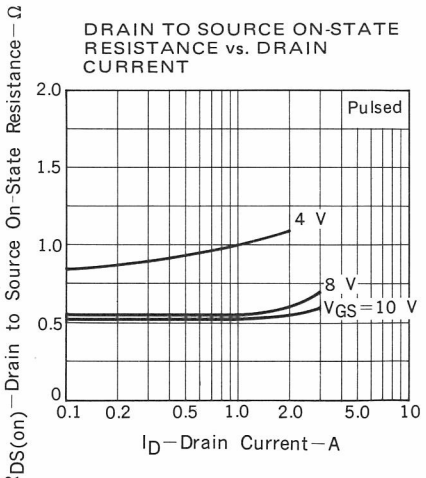

CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE




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



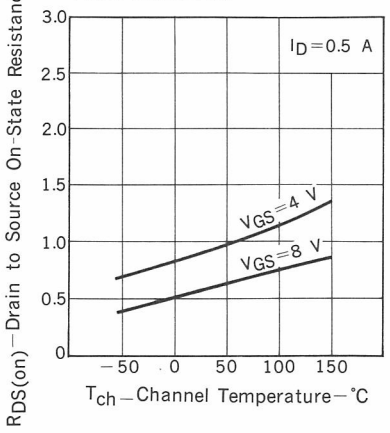

DRAIN TO SOURCE ON-STATE RESISTANCE vs. DRAIN CURRENT



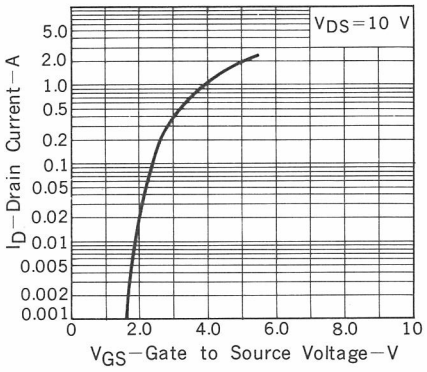
Phase-out/Discontinued



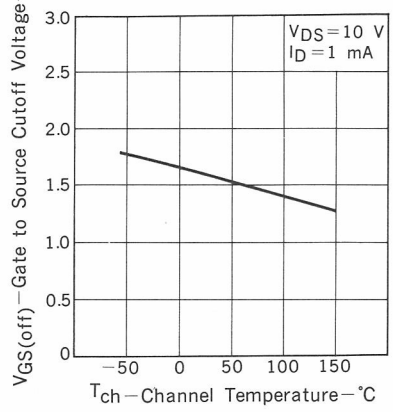
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



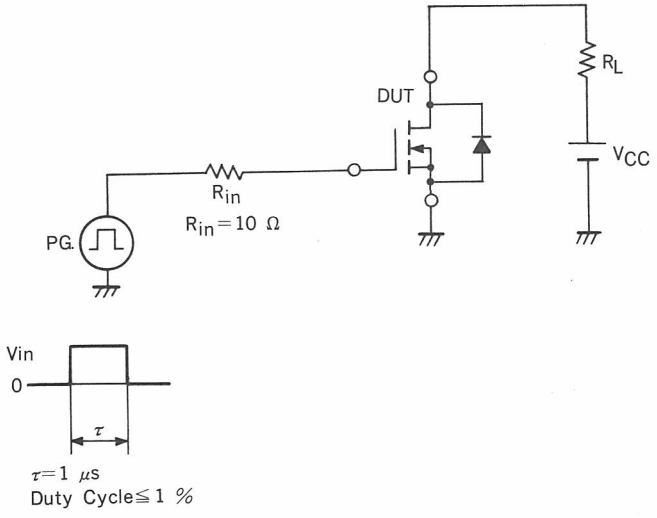

TRANSFER CHARACTERISTICS

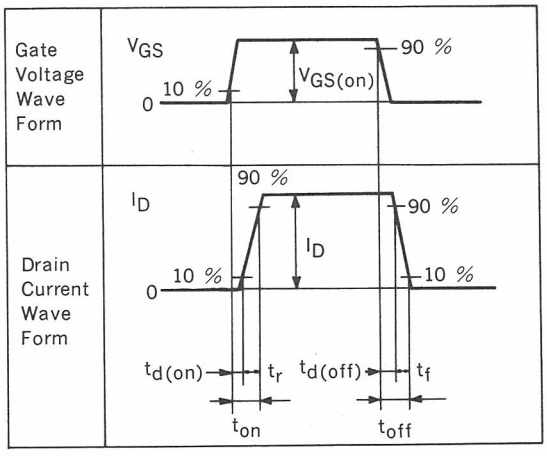



GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE




## TURN-ON AND TURN-OFF TIME TEST CIRCUIT



Phase-out/Discontinued



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TC—3781
September 1986M
Printed in Japan