

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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Phase-out/Discontinued

2SK704

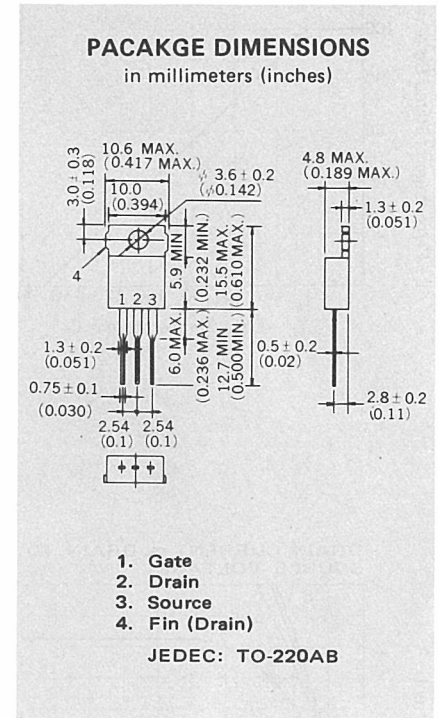
DESCRIPTION The 2SK704 is N-Channel MOS Field Effect Power Transistor designed for solenoid, motor and lamp driver.

- FEATURES**
- 4 V Gate Drive – Logic level –
 - Low $R_{DS(on)}$
 - No Second Breakdown

ABSOLUTE MAXIMUM RATINGS

| | |
|--|----------------|
| Maximum Temperatures | |
| Storage Temperature | –55 to +150 °C |
| Junction Temperature | 150 °C Maximum |
| Maximum Power Dissipations | |
| Total Power Dissipation | 1.5 W |
| Total Power Dissipation ($T_C = 25\text{ °C}$) | 50 W |
| Maximum Voltages and Currents ($T_a = 25\text{ °C}$) | |
| V_{DSS} Drain to Source Voltage | 60 V |
| V_{GSS} Gate to Source Voltage | ±20 V |
| $I_{D(DC)}$ Drain Current (DC) | ±5 A |
| $I_{D(pulse)}$ Drain Current (pulse)* | ±20 A |

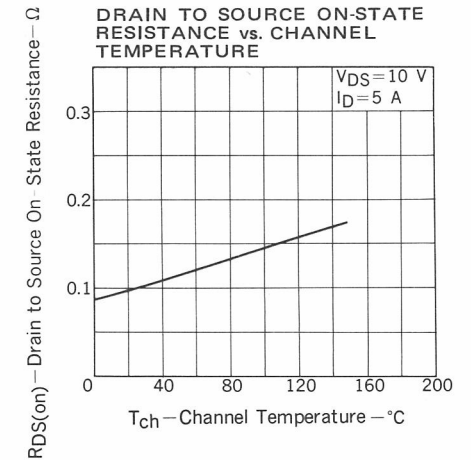
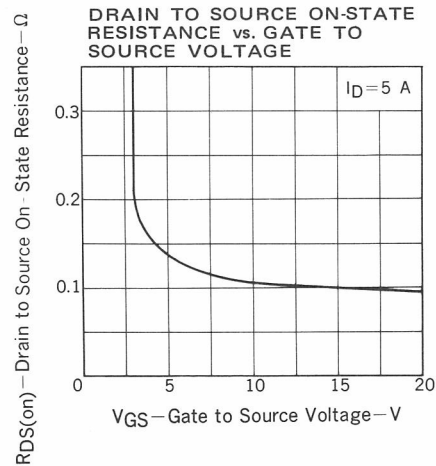
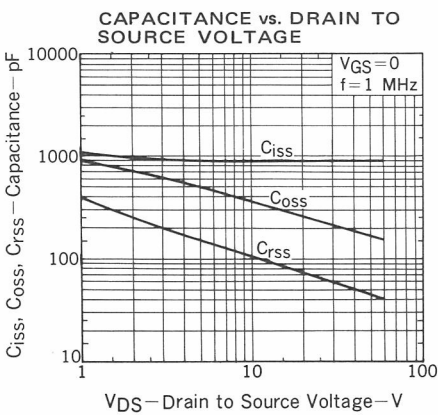
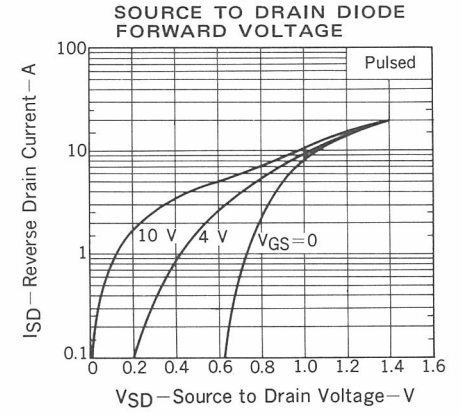
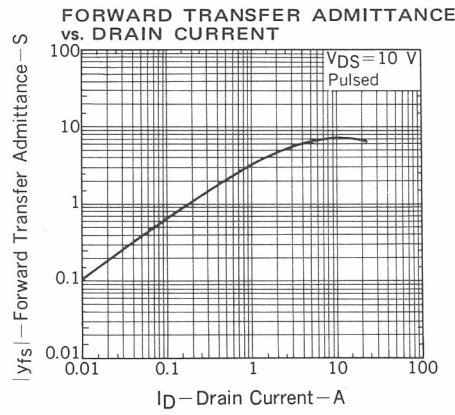
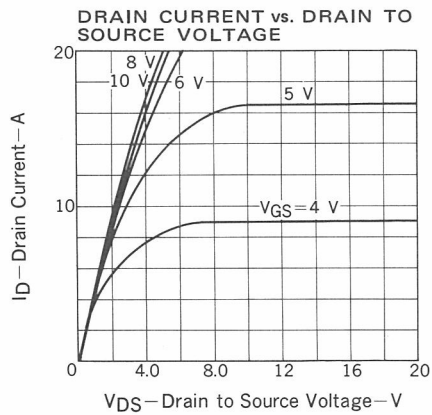
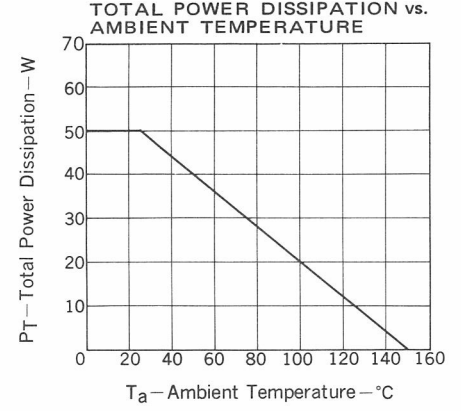
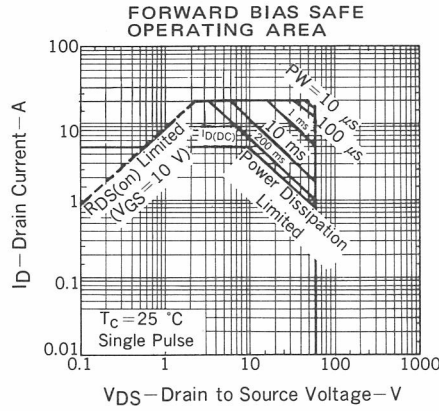
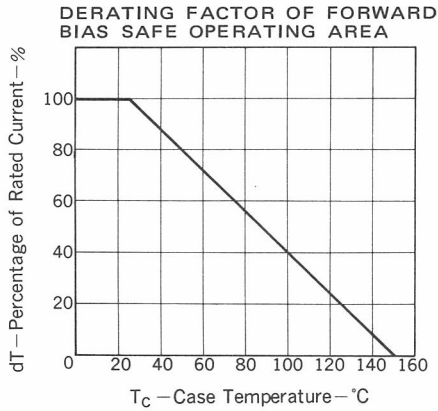
* $PW \leq 300\ \mu s$, Duty Cycle $\leq 10\%$

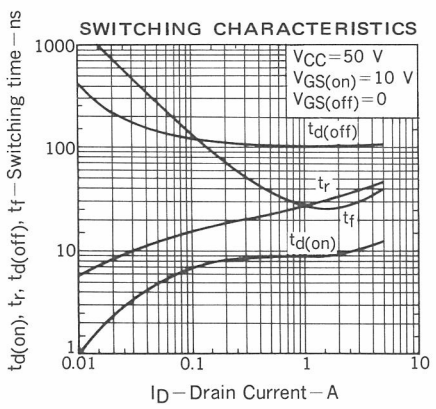
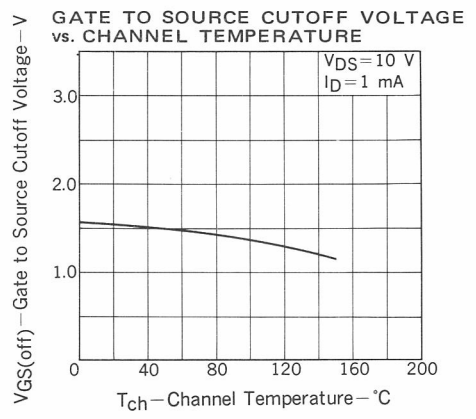
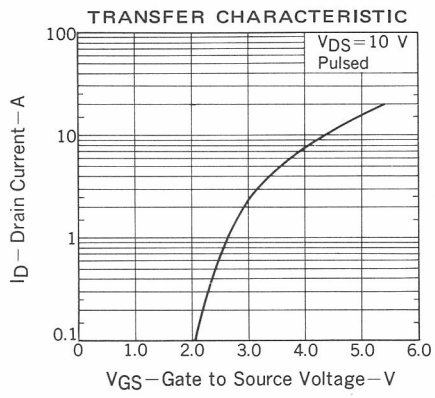
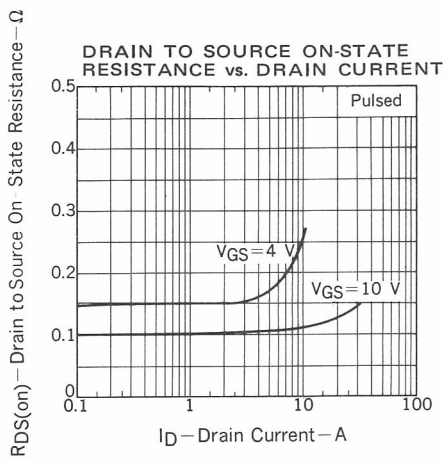


ELECTRICAL CHARACTERISTICS ($T_a = 25\text{ °C}$)

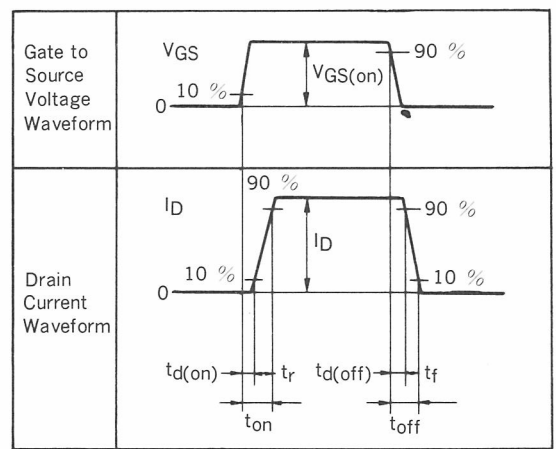
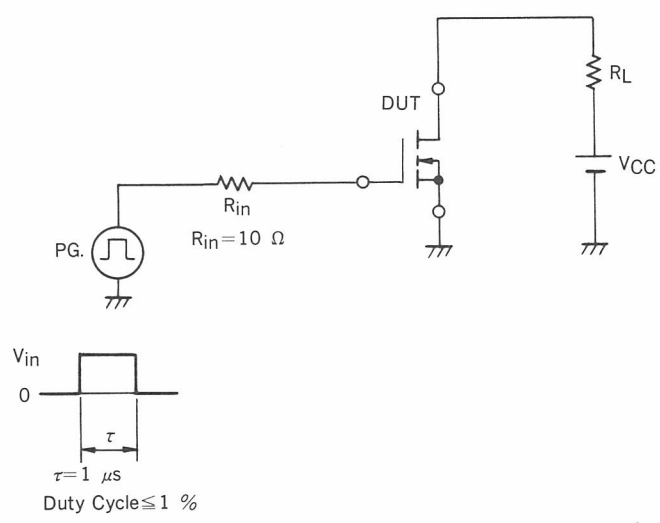
| SYMBOL | CHARACTERISTIC | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|---------------|-------------------------------------|------|------|------|----------|---|
| $R_{DS(on)}$ | Drain to Source On-State Resistance | | 0.11 | 0.25 | Ω | $V_{GS} = 10\text{ V}, I_D = 5\text{ A}$ |
| $R_{DS(on)}$ | Drain to Source On-State Resistance | | 0.17 | 0.30 | Ω | $V_{GS} = 4\text{ V}, I_D = 5\text{ A}$ |
| $V_{GS(off)}$ | Gate to Source Cutoff Voltage | 1.0 | | 2.5 | V | $V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$ |
| $ y_{fs} $ | Forward Transfer Admittance | 4.0 | | | S | $V_{DS} = 10\text{ V}, I_D = 3\text{ A}$ |
| I_{DSS} | Drain Leakage Current | | | 10 | μA | $V_{DS} = 60\text{ V}, V_{GS} = 0$ |
| I_{GSS} | Gate to Source Leakage Current | | | ±100 | nA | $V_{GS} = \pm 20\text{ V}, V_{DS} = 0$ |
| C_{iss} | Input Capacitance | | 900 | | pF | $V_{DS} = 10\text{ V}$ $V_{GS} = 0$ $f = 1\text{ MHz}$ |
| C_{oss} | Output Capacitance | | 350 | | pF | |
| C_{rss} | Reverse Transfer Capacitance | | 100 | | pF | |
| $t_{d(on)}$ | Turn-On Delay Time | | 10 | | ns | $I_D = 3\text{ A}, V_{CC} = 10\text{ V}$ $R_L = 17\ \Omega$ $R_{in} = 10\ \Omega$ |
| t_r | Rise Time | | 40 | | ns | |
| $t_{d(off)}$ | Turn-Off Delay Time | | 110 | | ns | |
| t_f | Fall Time | | 30 | | ns | |

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





SWITCHING TIME TEST CIRCUIT



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