

NEC
ELECTRON DEVICE

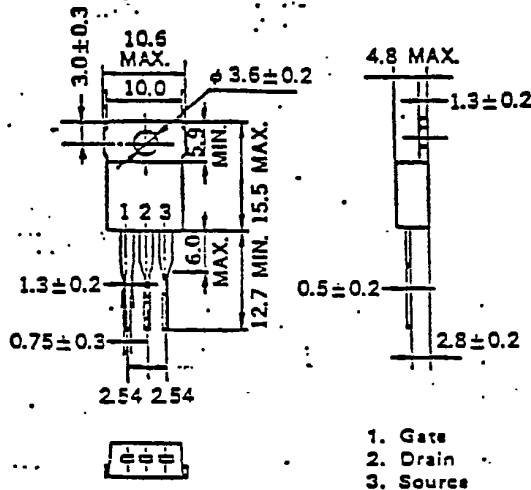
MOS FIELD EFFECT TRANSISTOR

2SJ136

FAST SWITCHING
P-CHANNEL SILICON POWER MOS FET

PACKAGE DIMENSIONS

(Unit: mm)



Features

Suitable for switching power supplies,
actuator controls and pulse circuits

4V Gate Drive — Logic Level —

Large current switching: $I_D(DC)=12A$

Low $R_{DS(on)}$

No Secondary Breakdown

Absolute Maximum Ratings ($T_a=25^\circ C$)

Drain to Source Voltage V_{DS} - 60V

Gate to Source Voltage V_{GS} $\pm 20V$

Continuous Drain Current $I_D(DC)$ $\pm 12A$

Pulse Drain Current $I_D(pulse)$ * $\pm 48A$

Total Power Dissipation P_T 1.5W

Total Power Dissipation P_{T**} 40W

Channel Temperature T_{ch} 150 $^\circ C$

Storage Temperature T_{stg} -55to+150 $^\circ C$

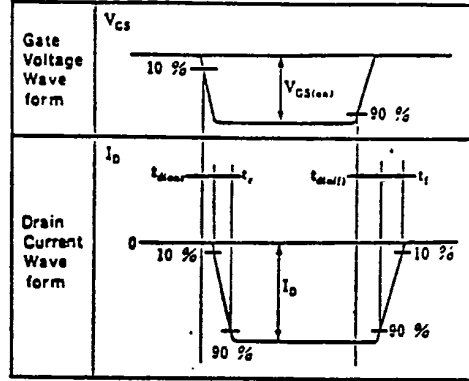
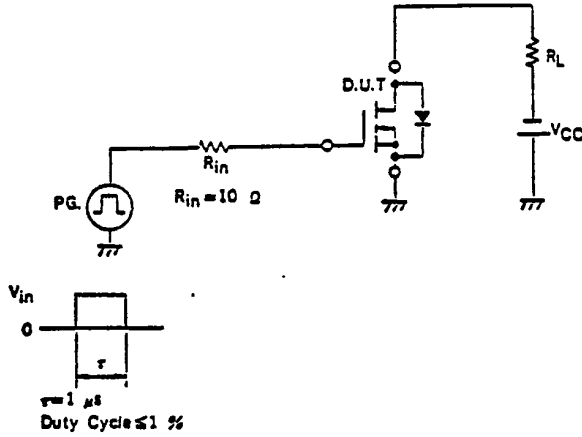
* $T_{ch} \leq 150^\circ C$

** $T_c=25^\circ C$

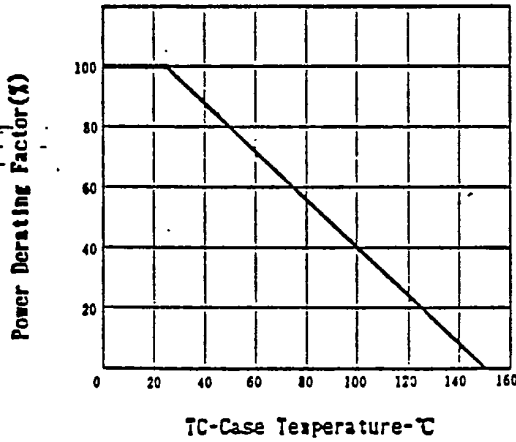
Electrical Characteristics ($T_a=25^\circ C$)

| Characteristics | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|-------------------------------------|---------------|------|------|------|----------|---------------------------|
| Drain Leakage Current | I_{DSS} | | | - 10 | μA | $V_{DS}=-60V, V_{GS}=0$ |
| Gate to Source Leakage Current | I_{GSS} | | | 100 | nA | $V_{GS}=20V, V_{DS}=0$ |
| Gate to Source Cutoff Voltage | $V_{GS(off)}$ | -1.0 | | -3.0 | V | $V_{DS}=-10V, I_D=-1.0mA$ |
| Forward Transfer Admittance | $ y_{fs} $ | 2.0 | | | S | $V_{DS}=-10V, I_D=-6.5A$ |
| Drain to Source On-State Resistance | $R_{DS(on)}$ | | | 0.3 | Ω | $V_{GS}=-10V, I_D=-6.5A$ |
| Drain to Source On-State Resistance | $R_{DS(on)}$ | | | 0.5 | Ω | $V_{GS}=-4.0V, I_D=-4.0A$ |
| Input Capacitance | C_{iss} | | 1500 | | pF | $V_{DS}=-10V,$ |
| Output Capacitance | C_{oss} | | 450 | | pF | $V_{GS}=0,$ |
| Reverse Transfer Capacitance | C_{rss} | | 80 | | pF | $f=1.0MHz$ |
| Turn-On Delay Time | $t_d(on)$ | | 13 | | ns | $I_D=-6.5A,$ |
| Rise Time | t_r | | 55 | | ns | $V_{GS(on)}=-10V,$ |
| Turn-Off Delay Time | $t_d(off)$ | | 45 | | ns | $V_{cc}=-30V,$ |
| Fall Time | t_f | | 120 | | ns | $R_L=5\Omega$ |

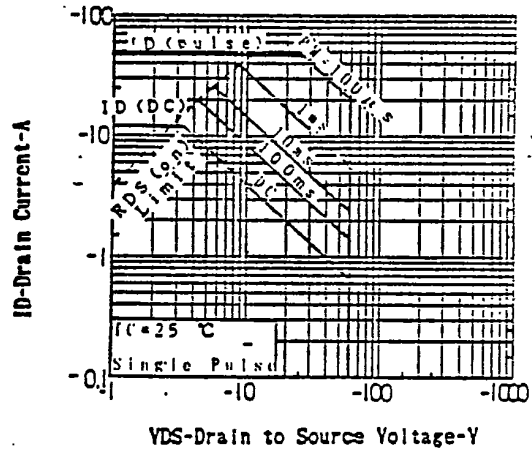
TURN-ON AND TURN-OFF TIME TEST CIRCUIT



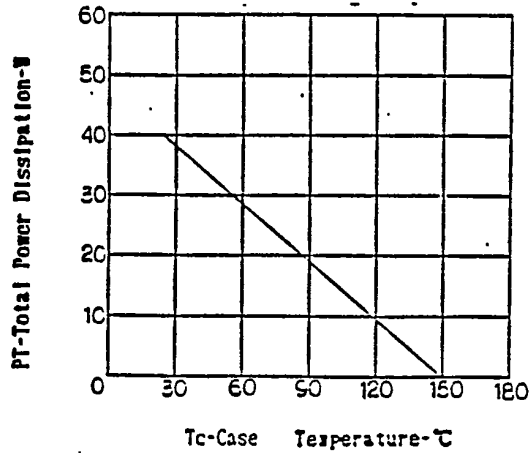
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



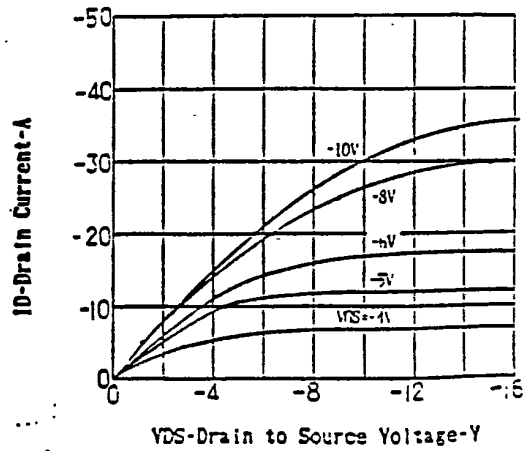
FORWARD BIAS SAFE OPERATING AREA



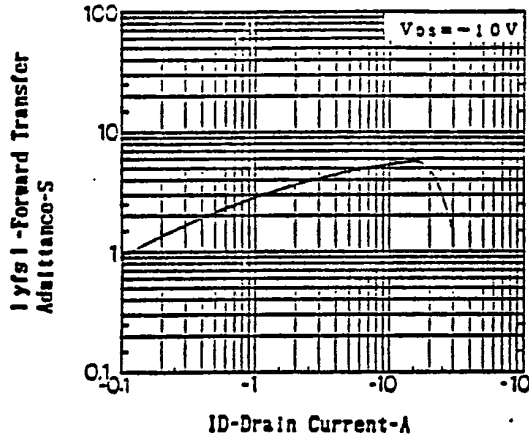
TOTAL POWER DISSIPATION vs. CASE TEMPERATURE



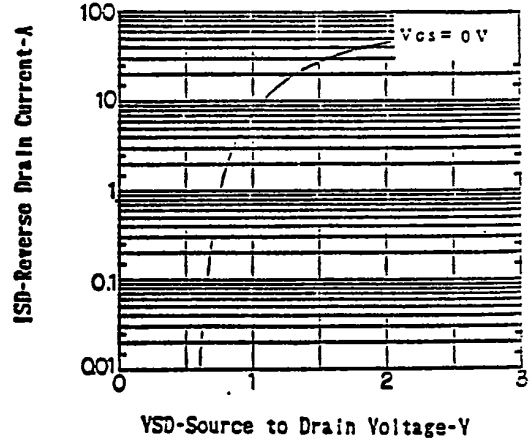
DRAIN CURRENT vs. DRAIN TO SOURCE VOLTAGE



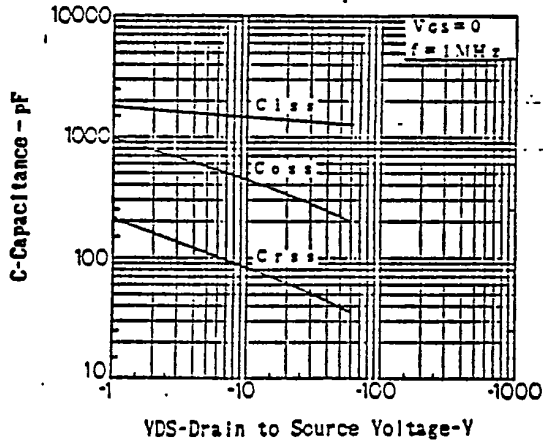
FORWARD TRANSFER ADMITTANCE
 vs. DRAIN CURRENT



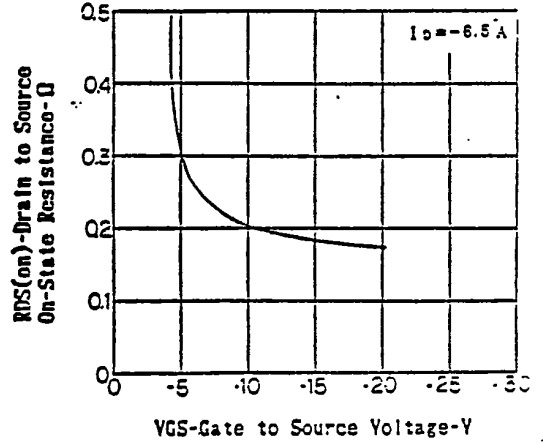
SOURCE TO DRAIN DIODE
 FORWARD VOLTAGE



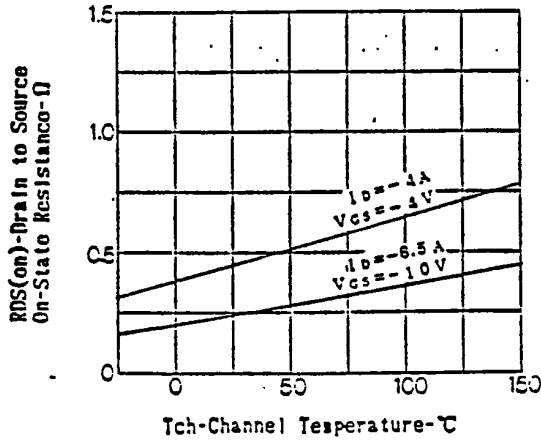
CAPACITANCE vs. DRAIN TO
 SOURCE VOLTAGE



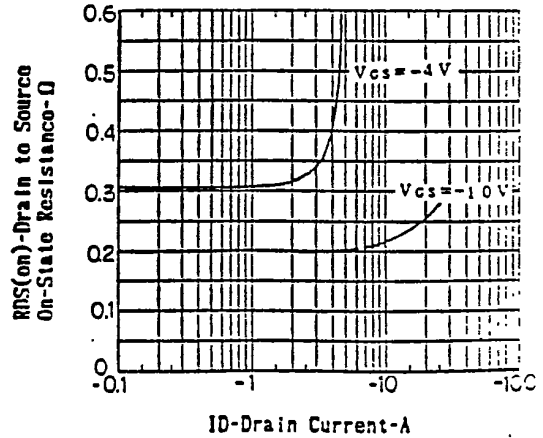
DRAIN TO SOURCE ON-STATE RESISTANCE
 vs. GATE TO SOURCE VOLTAGE



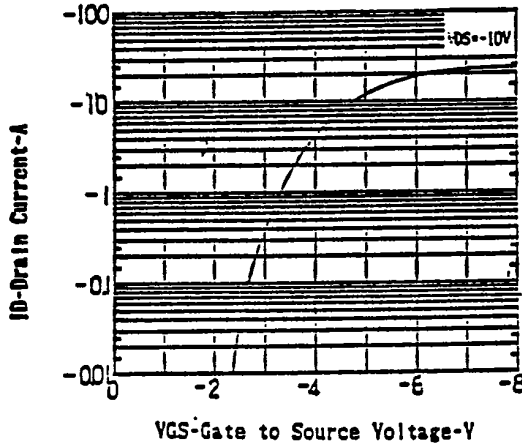
DRAIN TO SOURCE ON-STATE RESISTANCE
 vs. CHANNEL TEMPERATURE



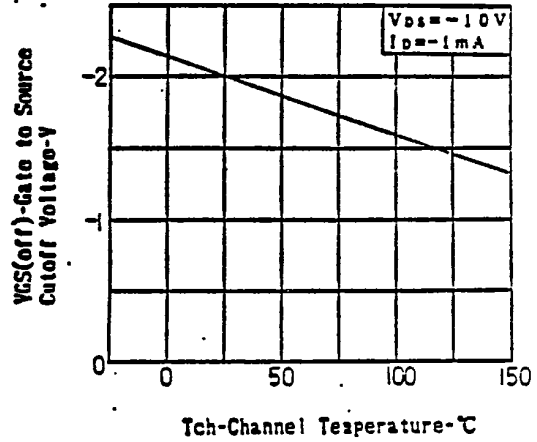
DRAIN TO SOURCE ON-STATE RESISTANCE
 vs. DRAIN CURRENT



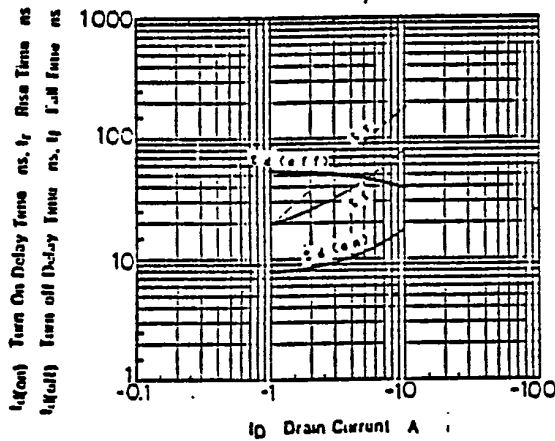
TRANSFER CHARACTERISTICS



GATE TO SOURCE CUTOFF VOLTAGE vs. CHANNEL TEMPERATURE



SWITCHING TIME vs. DRAIN CURRENT



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