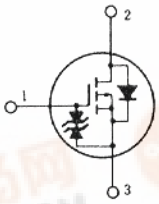
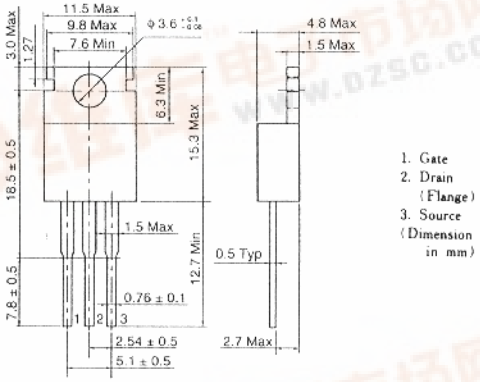
# 2SJ173

## SILICON P-CHANNEL MOS FET
## HIGH SPEED POWER SWITCHING

### ■ FEATURES

- Low On-Resistance
- High Speed Switching
- Low Drive Current
- 4 V Gate Drive Device
  - Can be driven from 5 V source
- Suitable for Motor Drive, DC-DC Converter, Power Switch and Solenoid Drive



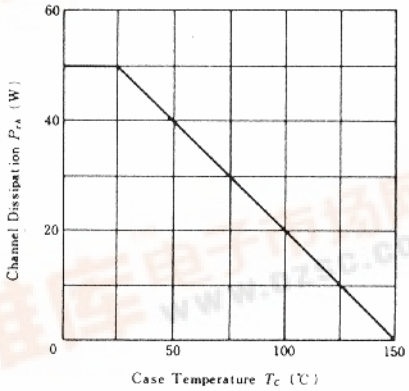

(JEDEC TO-220AB)

### ■ ABSOLUTE MAXIMUM RATINGS ($Ta$=25°C)

| Item | Symbol | Rating | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DSS}$ | −60 | V |
| Gate-Source Voltage | $V_{GSS}$ | ±20 | V |
| Drain Current | $I_D$ | −15 | A |
| Drain Peak Current | $I_{D(pulse)}$* | −60 | A |
| Body-Drain Diode Reverse Drain Current | $I_{DR}$ | −15 | A |
| Channel Dissipation | $P_{ch}$** | 50 | W |
| Channel Temperature | $T_{ch}$ | 150 | °C |
| Storage Temperature | $T_{stg}$ | −55～+150 | °C |

* PW≤10μs, duty cycle≤1%
** Value at $Tc$=25°C

POWER VS. TEMPERATURE DERATING




### ■ ELECTRICAL CHARACTERISTICS ($Ta$=25°C)

| Item | Symbol | Test Condition | min. | typ. | max. | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $I_D$=−10mA, $V_{GS}$=0 | −60 | — | — | V |
| Gate-Source Breakdown Voltage | $V_{(BR)GSS}$ | $I_G$=±100μA, $V_{DS}$=0 | ±20 | — | — | V |
| Gate-Source Leak Current | $I_{GSS}$ | $V_{GS}$=±16V, $V_{DS}$=0 | — | — | ±10 | μA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=−50V, $V_{GS}$=0 | — | — | −250 | μA |
| Gate-Source Cutoff Voltage | $V_{GS(off)}$ | $I_D$=−1mA, $V_{DS}$=−10V | −1.0 | — | −2.0 | V |
| Static Drain-Source on State Resistance | $R_{DS(on)}$ | $I_D$=−8A, $V_{GS}$=−10V* | — | 0.09 | 0.11 | Ω |
| | | $I_D$=−8A, $V_{GS}$=−4V* | — | 0.13 | 0.17 | |
| Forward Transfer Admittance | $\|y_{fs}\|$ | $I_D$=−8A, $V_{DS}$=−10V* | 6.0 | 9.5 | — | S |
| Input Capacitance | $C_{iss}$ | $V_{DS}$=−10V, $V_{GS}$=0 f=1MHz | — | 1400 | — | pF |
| Output Capacitance | $C_{oss}$ | | — | 720 | — | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | — | 220 | — | pF |
| Turn-on Delay Time | $t_{d(on)}$ | $I_D$=−8A, $V_{GS}$=−10V, $R_L$=3.75Ω | — | 15 | — | ns |
| Rise Time | $t_r$ | | — | 120 | — | ns |
| Turn-off Delay Time | $t_{d(off)}$ | | — | 220 | — | ns |
| Fall Time | $t_f$ | | — | 160 | — | ns |
| Body-Drain Diode Forward Voltage | $V_{DF}$ | $I_F$=−15A, $V_{GS}$=0 | — | −1.2 | — | V |
| Body-Drain Diode Reverse Recovery Time | $t_{rr}$ | $I_F$=−15A, $V_{GS}$=0 $di_F/dt$=50A/μs | — | 230 | — | ns |

* Pulse Test

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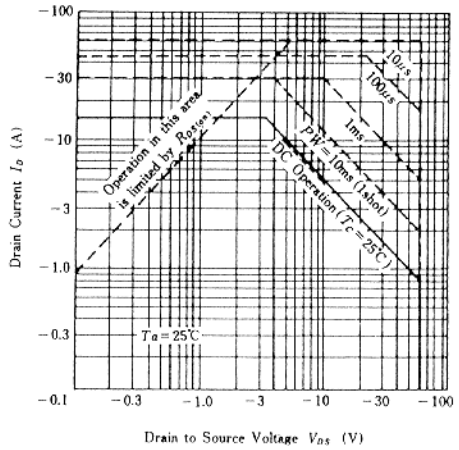
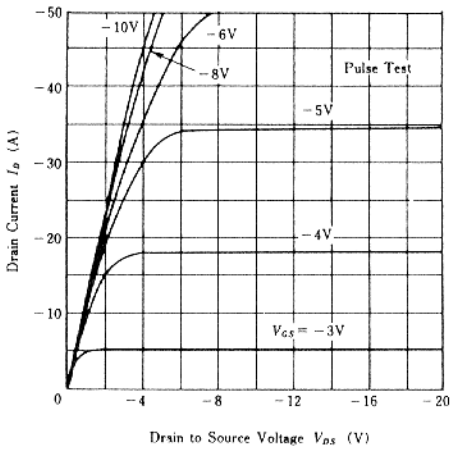
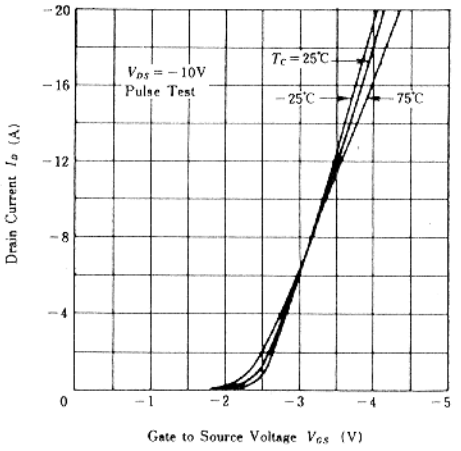
MAXIMUM SAFE OPERATION AREA



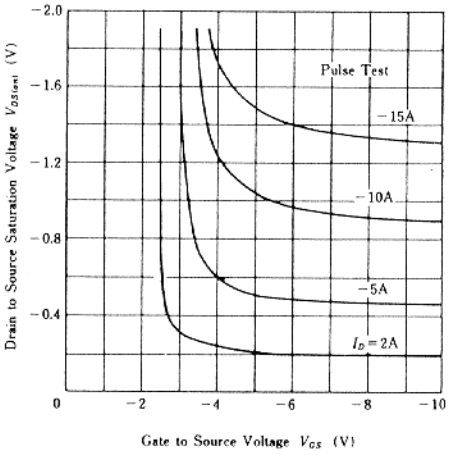

TYPICAL OUTPUT CHARACTERISTICS



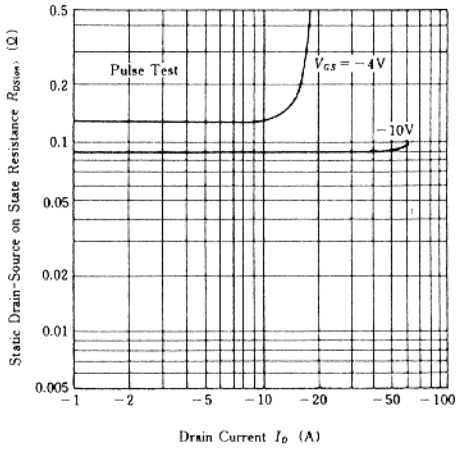

TYPICAL TRANSFER CHARACTERISTICS



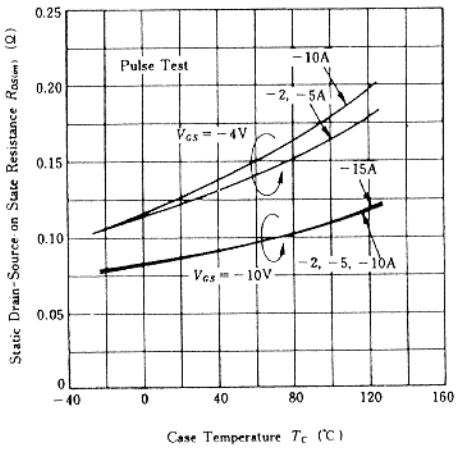

DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



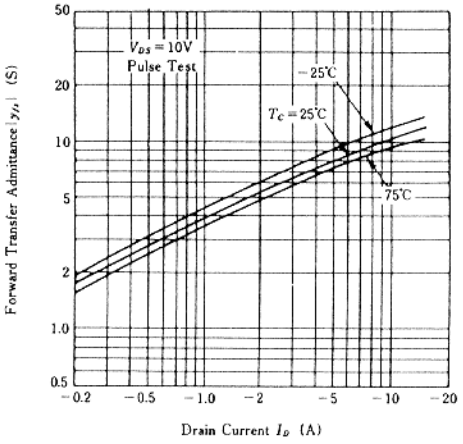

STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. DRAIN CURRENT



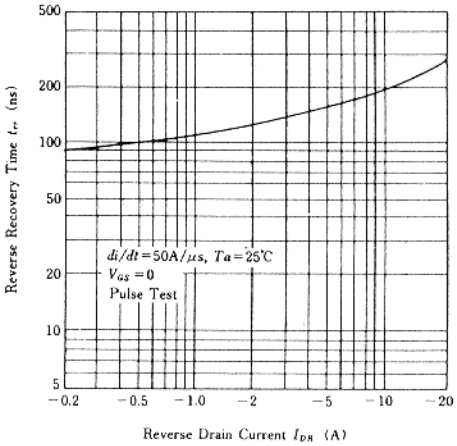

STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



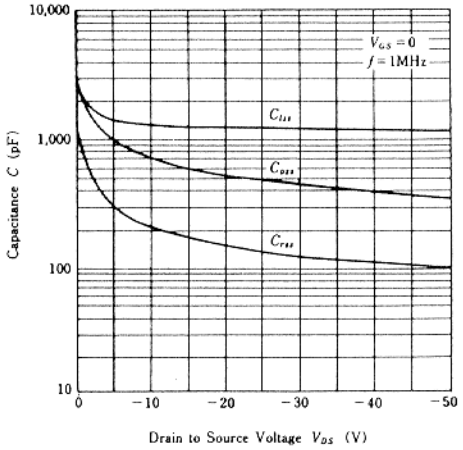
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT



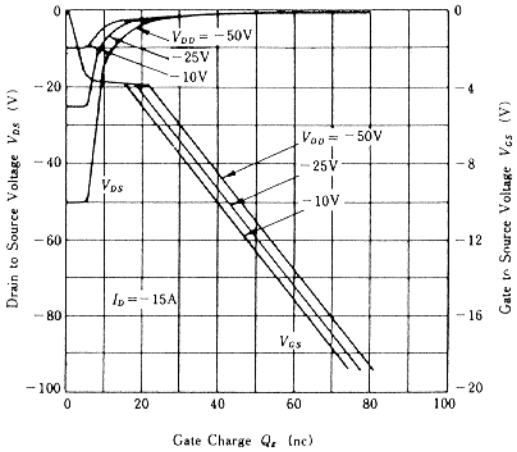

BODY-DRAIN DIODE REVERSE RECOVERY TIME



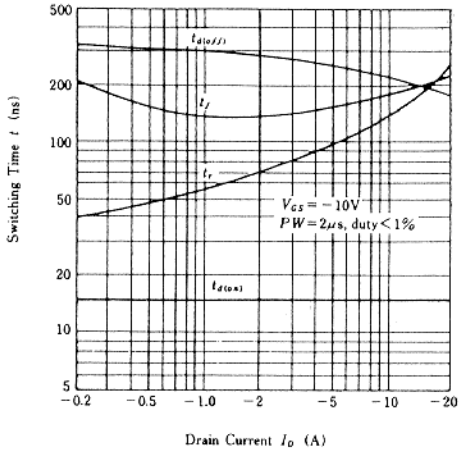

TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE



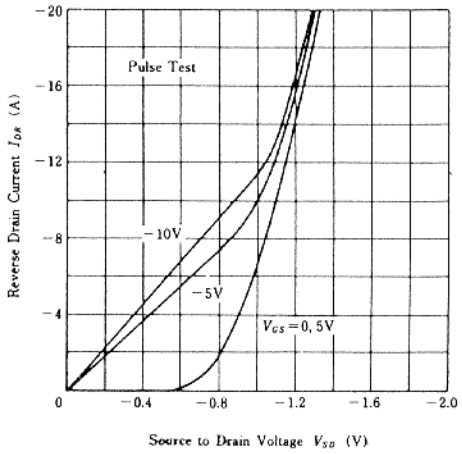

DYNAMIC INPUT CHARACTERISTICS



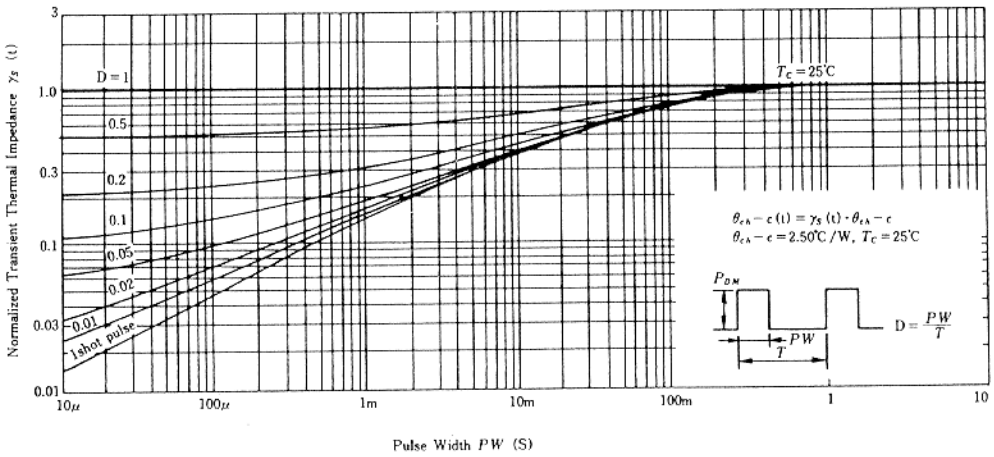

SWITCHING CHARACTERISTICS



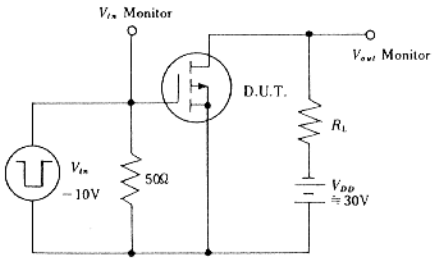

REVERSE DRAIN CURRENT VS. SOURCE TO DRAIN VOLTAGE

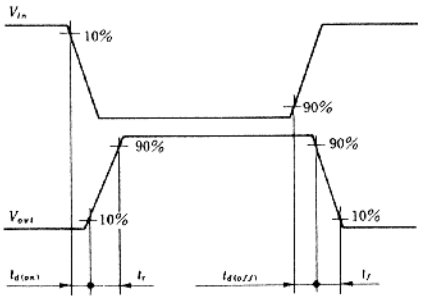


## NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH




## SWITCHING TIME TEST CIRCUIT




## WAVEFORMS