

TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE (L²-π-MOSV)

2SJ380

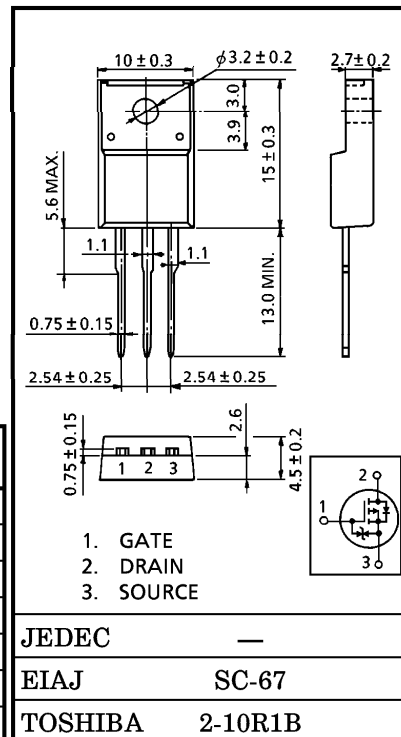
HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS
 RELAY DRIVE, DC-DC CONVERTER AND MOTOR DRIVE
 APPLICATIONS

INDUSTRIAL APPLICATIONS
 Unit in mm

- 4V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.15\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 6.0S$ (Typ.)
- Low Leakage Current : $I_{DSS} = -100\mu A$ (Max.) ($V_{DS} = -60V$)
- Enhancement-Mode : $V_{th} = -0.8 \sim -2.0V$
 ($V_{DS} = -10V, I_D = -1mA$)

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|---|-------|-----------|---------|------|
| Drain-Source Voltage | | V_{DSS} | -100 | V |
| Drain-Gate Voltage ($R_{GS} = 20k\Omega$) | | V_{DGR} | -100 | V |
| Gate-Source Voltage | | V_{GSS} | ±20 | V |
| Drain Current | DC | I_D | -12 | A |
| | Pulse | I_{DP} | -48 | A |
| Drain Power Dissipation (Tc = 25°C) | | P_D | 35 | W |
| Single Pulse Avalanche Energy** | | E_{AS} | 312 | mJ |
| Avalanche Current | | I_{AR} | -12 | A |
| Repetitive Avalanche Energy* | | E_{AR} | 3.5 | mJ |
| Channel Temperature | | T_{ch} | 150 | °C |
| Storage Temperature Range | | T_{stg} | -55~150 | °C |



Weight : 1.9g

HERMAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | MAX. | UNIT |
|--|----------------|------|------|
| Thermal Resistance, Channel to Case | $R_{th(ch-c)}$ | 3.57 | °C/W |
| Thermal Resistance, Channel to Ambient | $R_{th(ch-a)}$ | 62.5 | °C/W |

Note ;

* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

** $V_{DD} = -25V$, Starting $T_{ch} = 25°C$, $L = 2.94mH$, $R_G = 25\Omega$, $I_{AR} = -12A$

**This transistor is an electrostatic sensitive device.
 Please handle with caution.**

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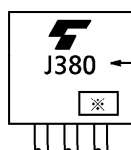
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---------------|----------------------|---|---|------|------|------|
| Gate Leakage Current | | I _{GSS} | V _{GS} = ±16V, V _{DS} = 0V | — | — | ±10 | μA |
| Drain Cut-off Current | | I _{DSS} | V _{DS} = -100V, V _{GS} = 0V | — | — | -100 | μA |
| Drain-Source Breakdown Voltage | | V (BR) DSS | I _D = -10mA, V _{GS} = 0V | -100 | — | — | V |
| Gate Threshold Voltage | | V _{th} | V _{DS} = -10V, I _D = -1mA | -0.8 | — | -2.0 | V |
| Drain-Source ON Resistance | | R _{D(S) ON} | V _{GS} = -4V, I _D = -6A | — | 0.25 | 0.32 | Ω |
| | | | V _{GS} = -10V, I _D = -6A | — | 0.15 | 0.21 | |
| Forward Transfer Admittance | | Y _{fs} | V _{DS} = -10V, I _D = -6A | 4.5 | 7.7 | — | S |
| Input Capacitance | | C _{iss} | V _{DS} = -10V, V _{GS} = 0V f = 1MHz | — | 1100 | — | pF |
| Reverse Transfer Capacitance | | C _{rss} | | — | 200 | — | |
| Output Capacitance | | C _{oss} | | — | 440 | — | |
| Switching Time | Rise Time | t _r | | — | 18 | — | ns |
| | Turn-on Time | t _{on} | | — | 30 | — | |
| | Fall Time | t _f | | — | 18 | — | |
| | Turn-off Time | t _{off} | | V _{IN} : t _r , t _f < 5ns Duty ≤ 1%, t _w = 10μs | — | 65 | |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | | Q _g | V _{DD} ≐ -80V, V _{GS} = -10V I _D = -12A | — | 48 | — | nC |
| Gate-Source Charge | | Q _{gs} | | — | 29 | — | |
| Gate-Drain ("Miller") Charge | | Q _{gd} | | — | 19 | — | |

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|------------------|--|------|------|------|------|
| Continuous Drain Reverse Current | I _{DR} | — | — | — | -12 | A |
| Pulse Drain Reverse Current | I _{DRP} | — | — | — | -48 | A |
| Diode Forward Voltage | V _{DSF} | I _{DR} = -12A, V _{GS} = 0V | — | — | 1.7 | V |
| Reverse Recovery Time | t _{rr} | I _{DR} = -12A, V _{GS} = 0V | — | 160 | — | ns |
| Reverse Recovery Charge | Q _{rr} | dI _{DR} / dt = 50A / μs | — | 0.5 | — | μC |

MARKING

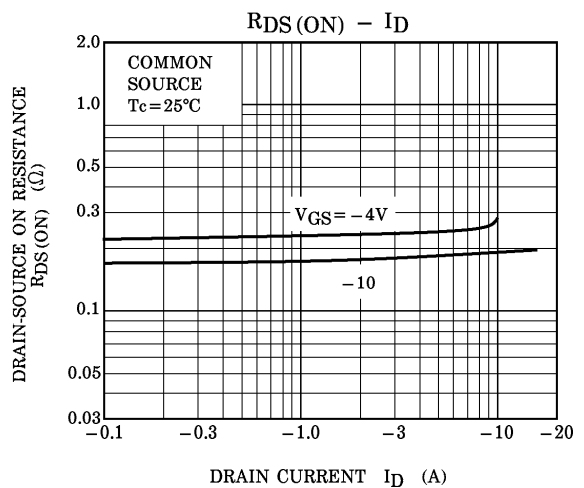
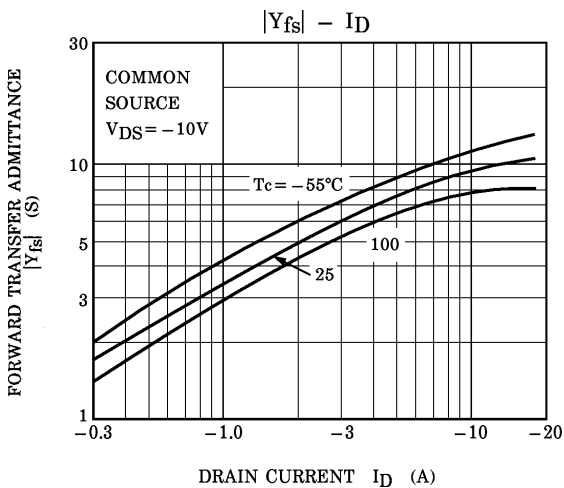
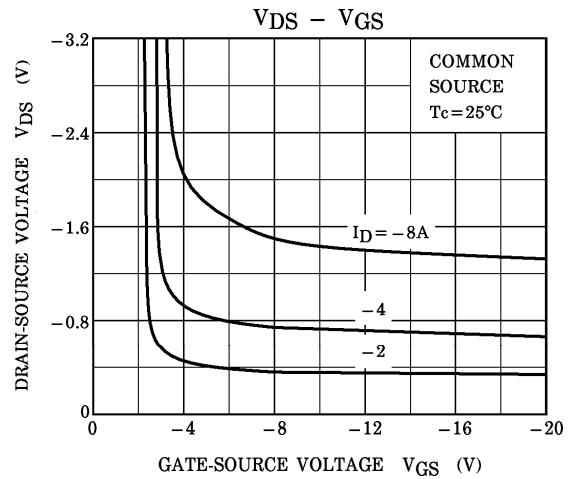
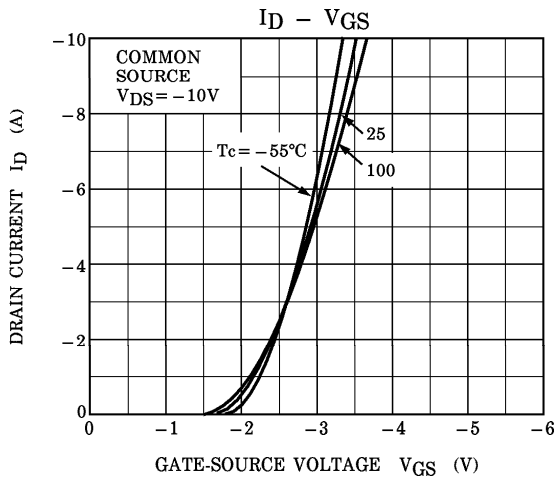
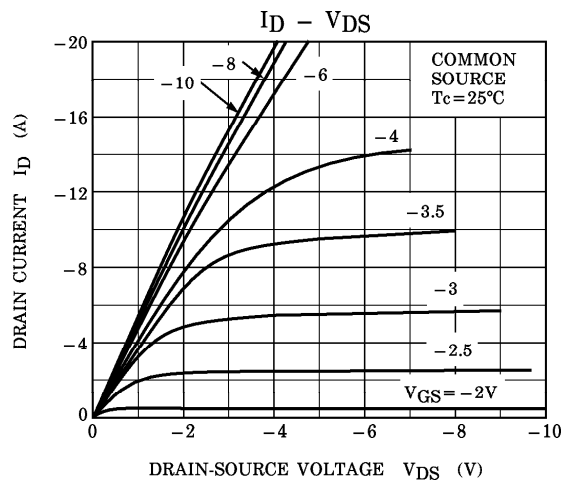
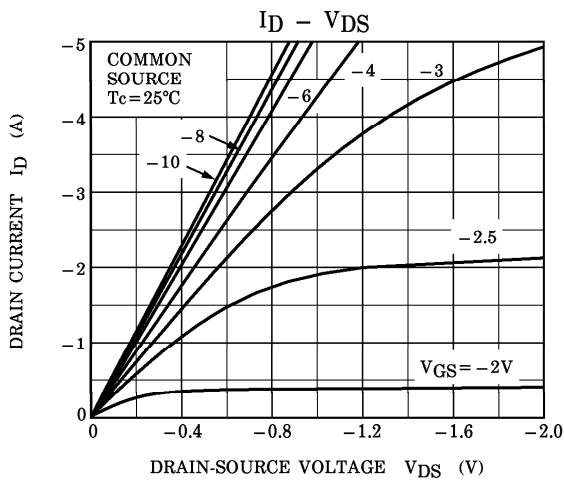


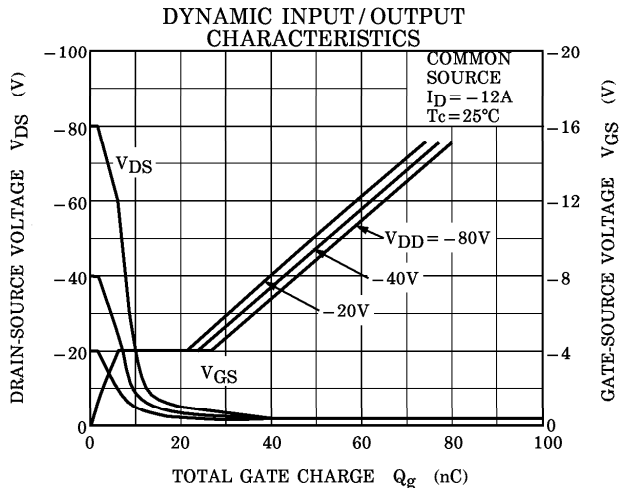
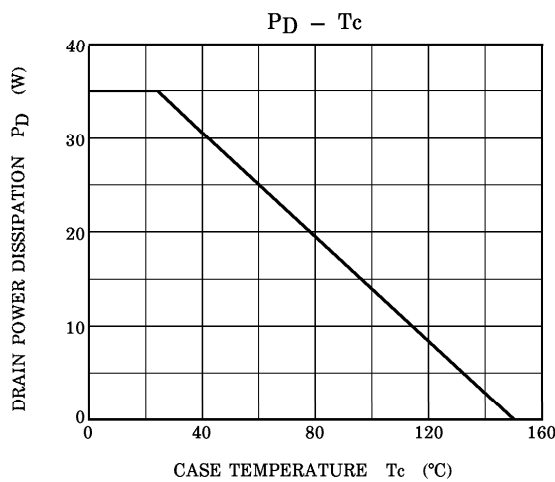
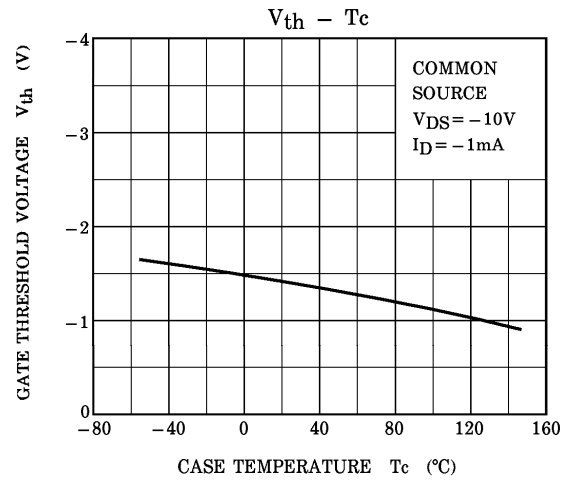
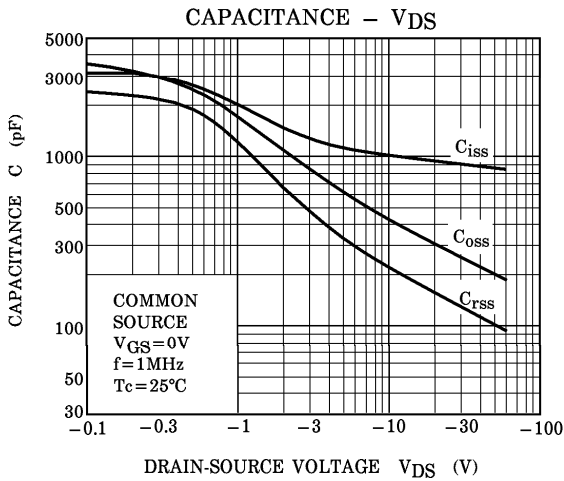
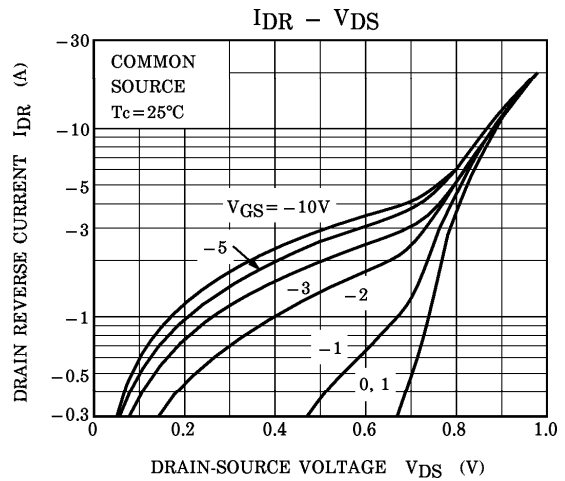
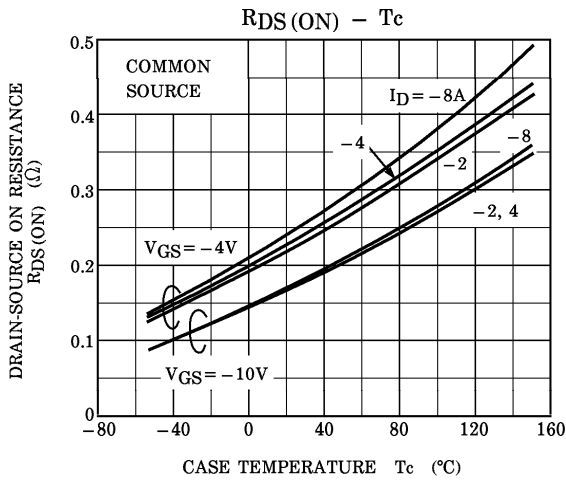
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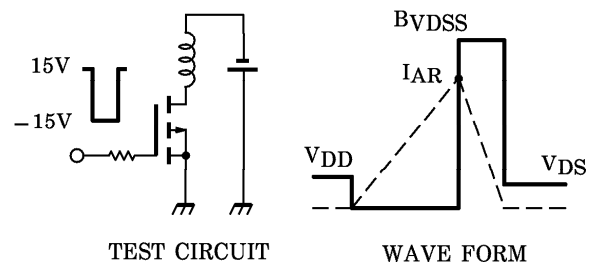
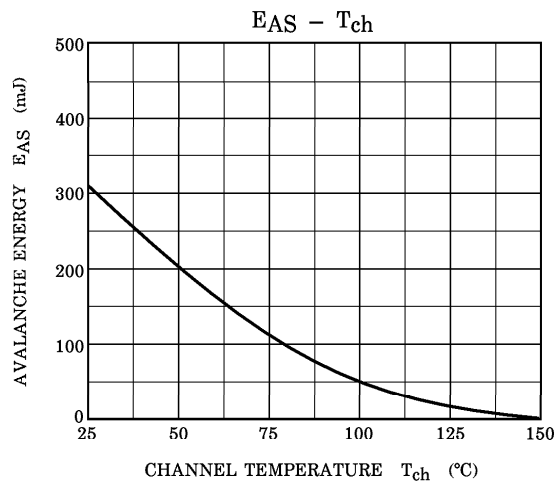
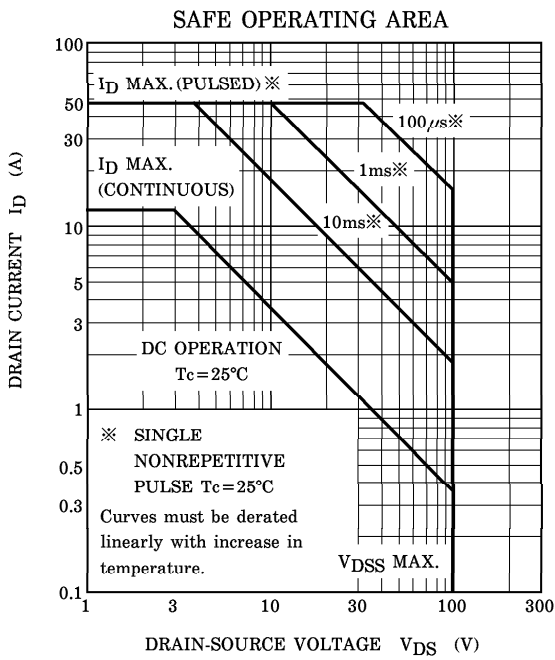
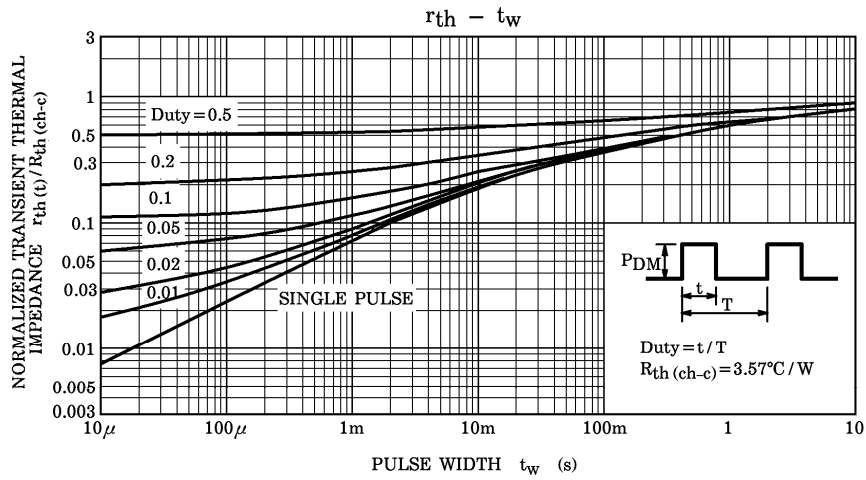
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = -12A$, $R_G = 25\Omega$ $V_{DD} = -25V$, $L = 2.94mH$

$$E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BVDSS}{BVDSS - V_{DD}} \right)$$