

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

2SJ377

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 : $R_{DS(ON)} = 0.16 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 4.0 S$ (Typ.)
- Low Leakage Current : $I_{DSS} = -100 \mu A$ (Max.) ($V_{DS} = -60 V$)
- Enhancement-Mode : $V_{th} = -0.8 \sim 2.0 V$
($V_{DS} = -10 V, I_D = -1 mA$)

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|----------------------------------------------|-----------|----------|-------|
| Drain-Source Voltage | V_{DSS} | -60 | V |
| Drain-Gate Voltage ($R_{GS} = 20 k\Omega$) | V_{DGR} | -60 | V |
| Gate-Source Voltage | V_{GSS} | ±20 | V |
| Drain Current | DC | I_D | -5 A |
| | Pulse | I_{DP} | -20 A |
| Drain Power Dissipation (Tc = 25°C) | P_D | 20 | W |
| Single Pulse Avalanche Energy** | E_{AS} | 273 | mJ |
| Avalanche Current | I_{AR} | -5 | A |
| Repetitive Avalanche Energy* | E_{AR} | 2 | mJ |
| Channel Temperature | T_{ch} | 150 | °C |
| Storage Temperature Range | T_{stg} | -55~150 | °C |

THERMAL CHARACTERISTICS

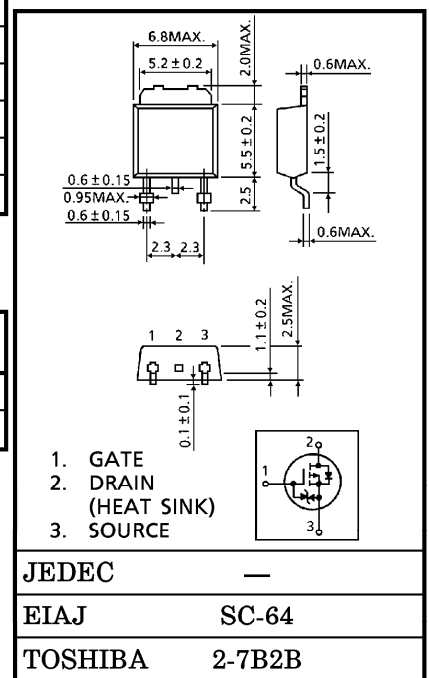
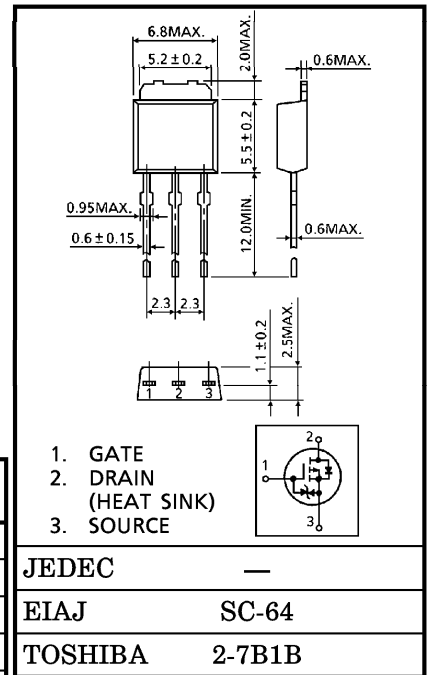
| CHARACTERISTIC | SYMBOL | MAX. | UNIT |
|----------------------------------------|----------------|------|------|
| Thermal Resistance, Channel to Case | $R_{th(ch-c)}$ | 6.25 | °C/W |
| Thermal Resistance, Channel to Ambient | $R_{th(ch-a)}$ | 125 | °C/W |

Note ;

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

** $V_{DD} = -25 V, T_{ch} = 25^\circ C$ (initial), $L = 14.84 mH,$
 $R_G = 25 \Omega, I_{AR} = -5 A$

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



Weight : 0.35 g

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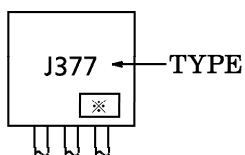
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT | |
|-------------------------------------------------|-----------------------|---------------------------------------------------------------------------|------|----------------------------------------------------------------------------------------------|------|------|----|
| Gate Leakage Current | I _{GSS} | V _{GS} = ±16 V, V _{DS} = 0 V | — | — | ±10 | μA | |
| Drain Cut-off Current | I _{DSS} | V _{DS} = -60 V, V _{GS} = 0 V | — | — | -100 | μA | |
| Drain-Source Breakdown Voltage | V _{(BR) DSS} | I _D = -10mA, V _{GS} = 0 V | -60 | — | — | V | |
| Gate Threshold Voltage | V _{th} | V _{DS} = -10 V, I _D = -1 mA | -0.8 | — | -2.0 | V | |
| Drain-Source ON Resistance | R _{DS (ON)} | V _{GS} = -4 V, I _D = -2.5 A | — | 0.24 | 0.28 | Ω | |
| | | V _{GS} = -10 V, I _D = -2.5 A | — | 0.16 | 0.19 | | |
| Forward Transfer Admittance | Y _{fs} | V _{DS} = -10 V, I _D = -2.5 A | 2.0 | 4.0 | — | S | |
| Input Capacitance | C _{iss} | V _{DS} = -10 V, V _{GS} = 0 V, f = 1 MHz | — | 630 | — | pF | |
| Reverse Transfer Capacitance | C _{rss} | | — | 95 | — | | |
| Output Capacitance | C _{oss} | | — | 290 | — | | |
| Switching Time | Rise Time | t _r | | — | 25 | — | ns |
| | Turn-on Time | t _{on} | | — | 45 | — | |
| | Fall Time | t _f | | — | 55 | — | |
| | Turn-off Time | t _{off} | | V _{IN} : t _r , t _f < 5ns Duty ≤ 1%, t _w = 10 μs | — | 200 | |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | Q _g | V _{DD} ≐ -48 V, V _{GS} = -10 V I _D = -5 A | — | 22 | — | nC | |
| Gate-Source Charge | Q _{gs} | | — | 16 | — | | |
| Gate-Drain ("Miller") Charge | Q _{gd} | | — | 6 | — | | |

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

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|------------------|-----------------------------------------------|------|------|------|------|
| Continuous Drain Reverse Current | I _{DR} | — | — | — | -5 | A |
| Pulse Drain Reverse Current | I _{DRP} | — | — | — | -20 | A |
| Diode Forward Voltage | V _{DSF} | I _{DR} = -5 A, V _{GS} = 0 V | — | — | 1.7 | V |
| Reverse Recovery Time | t _{rr} | I _{DR} = -5 A, V _{GS} = 0 V | — | 80 | — | ns |
| Reverse Recovery Charge | Q _{rr} | dI _{DR} / dt = 50 A / μs | — | 0.1 | — | μC |

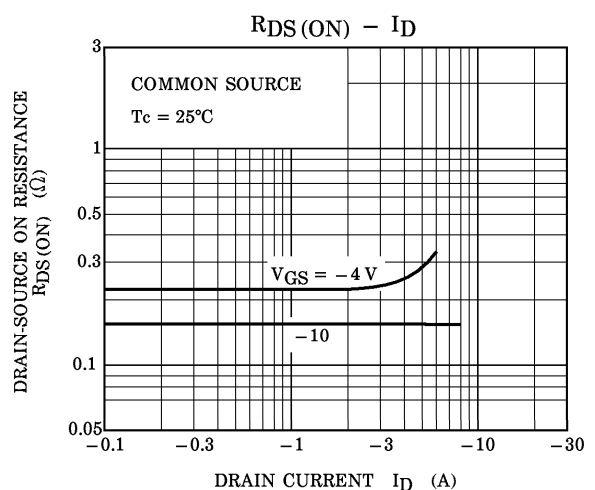
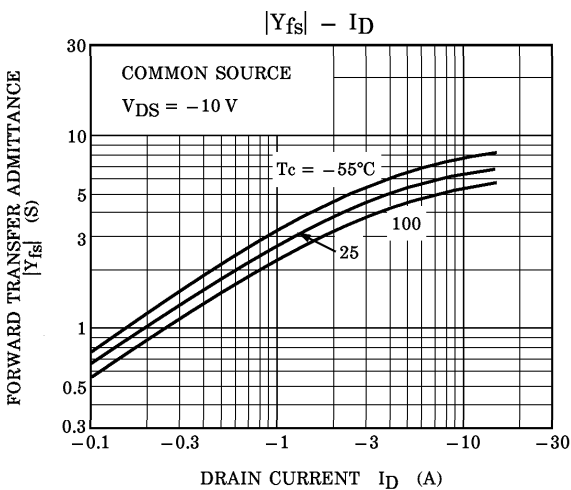
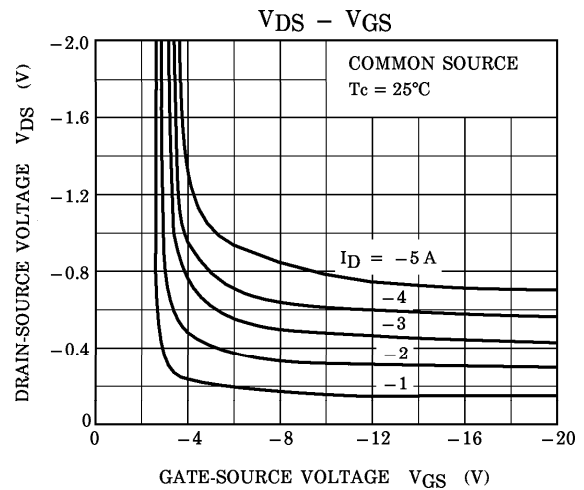
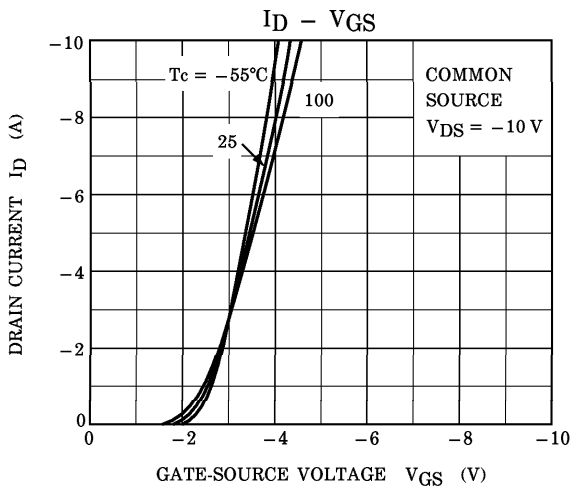
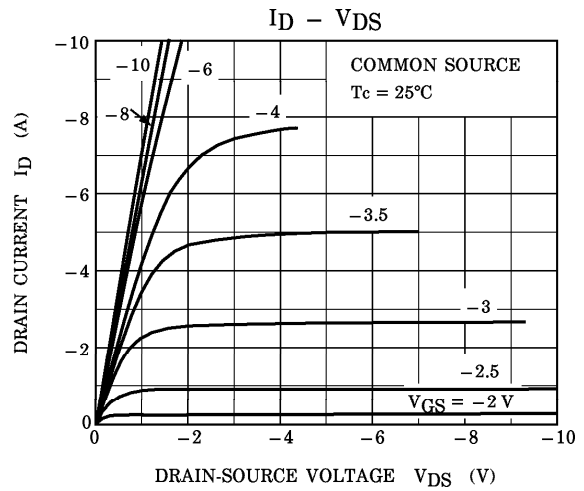
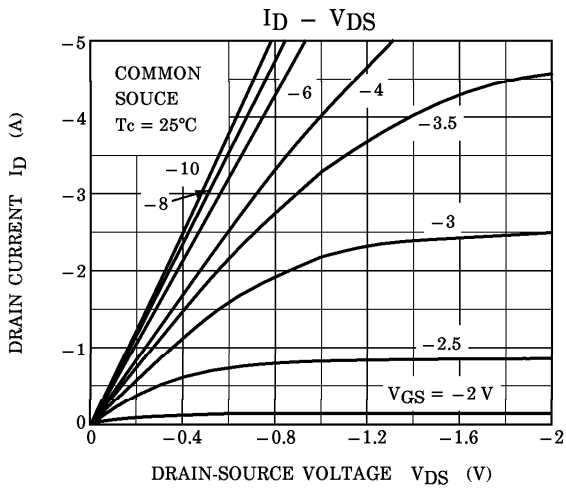
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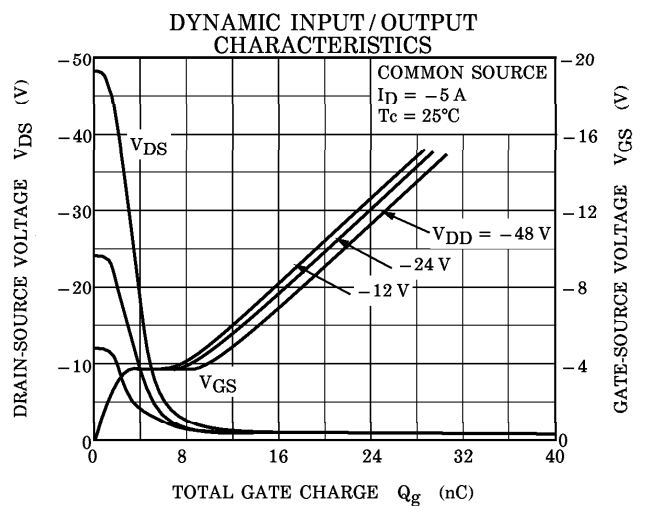
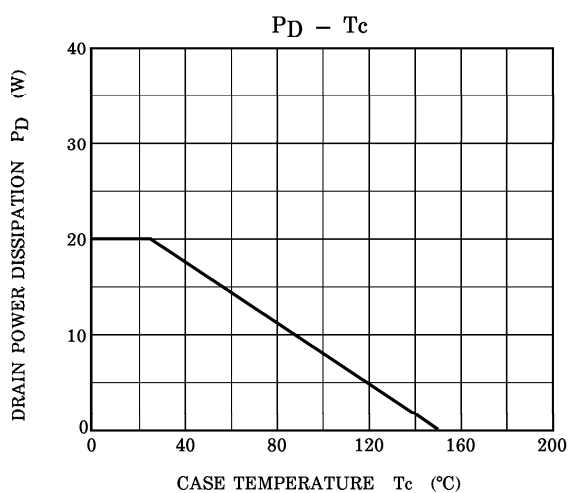
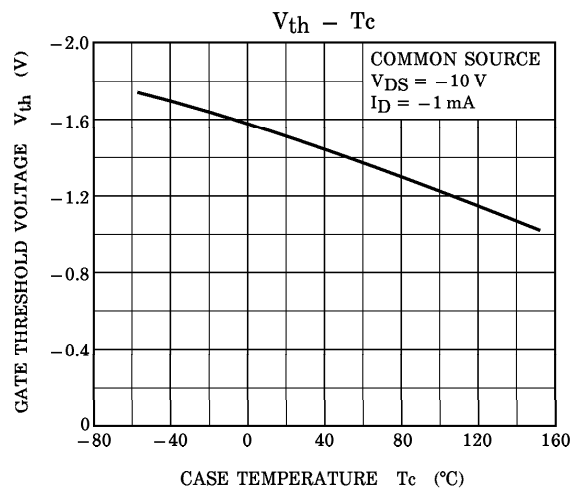
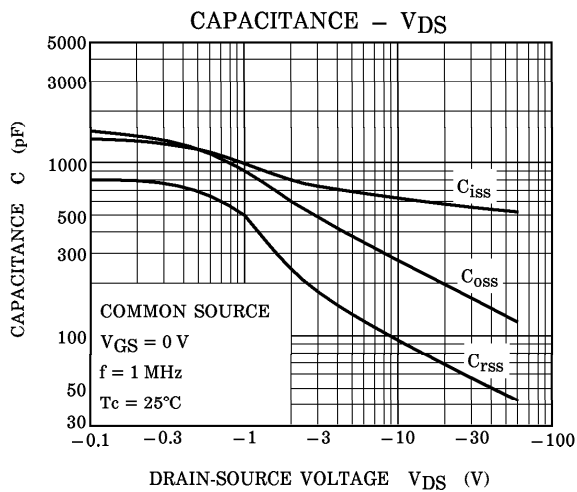
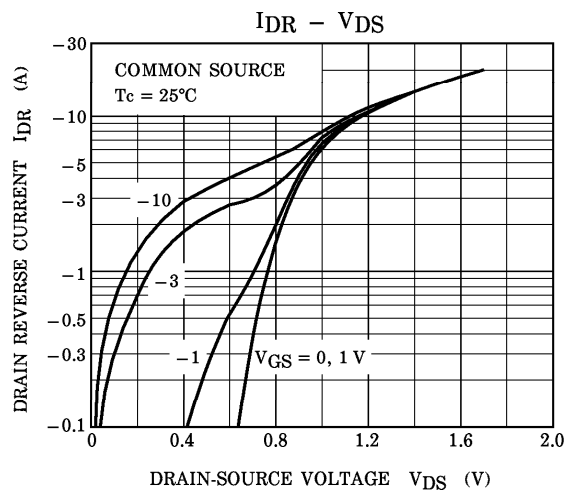
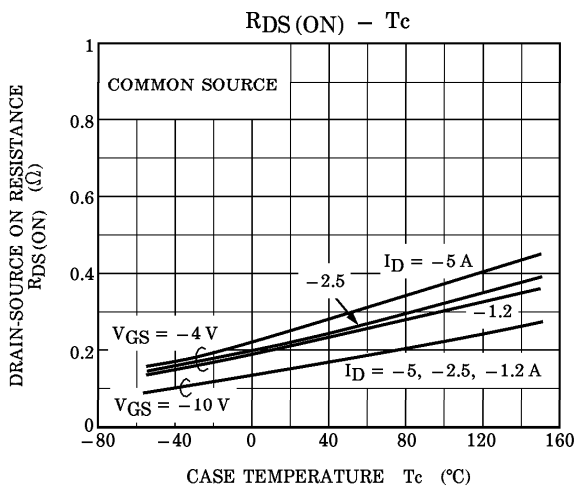


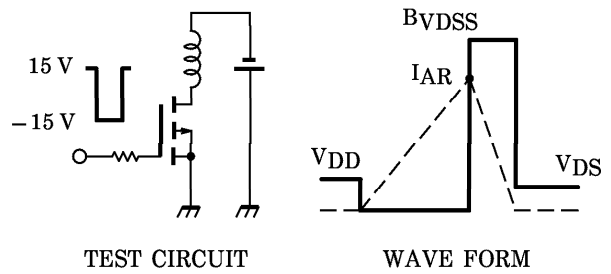
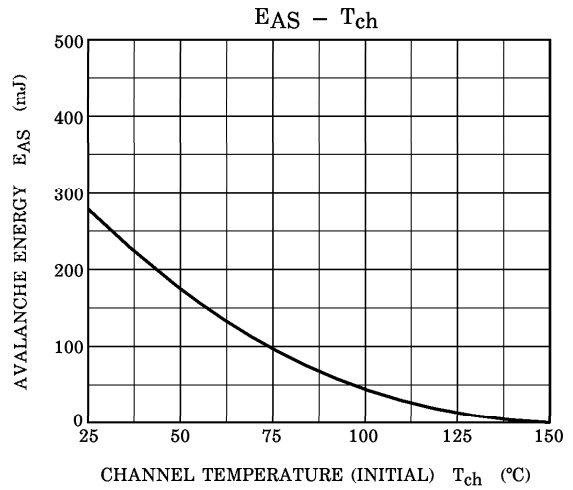
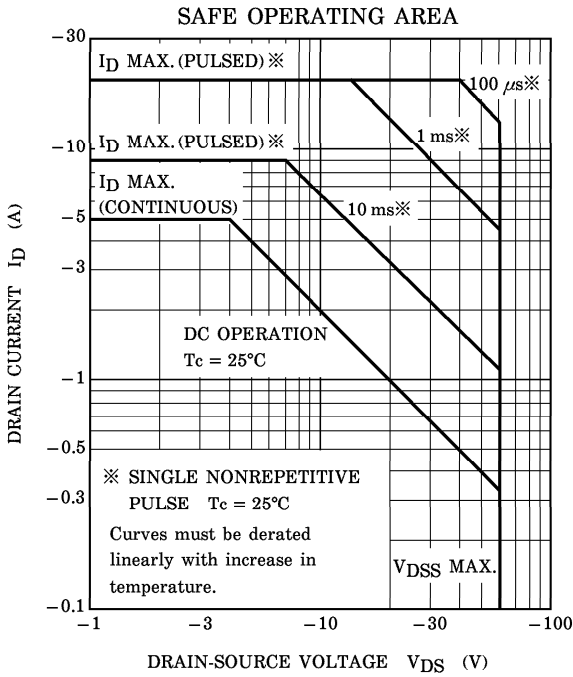
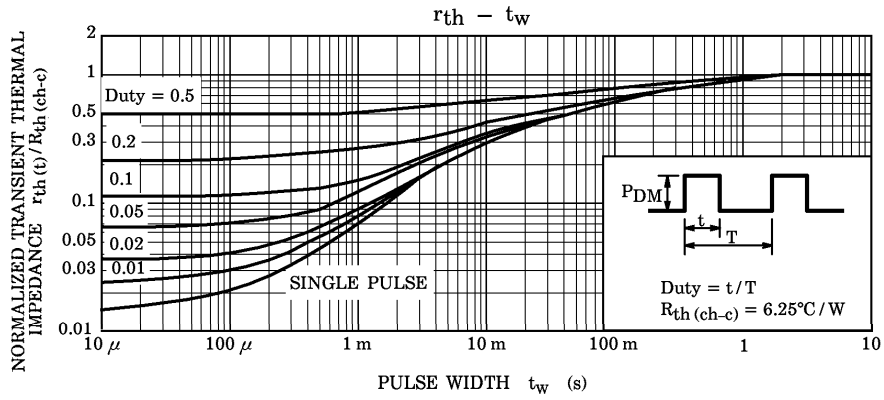
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = -5 \text{ A}$, $R_G = 25 \Omega$
 $V_{DD} = -25 \text{ V}$, $L = 14.84 \text{ mH}$

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