

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

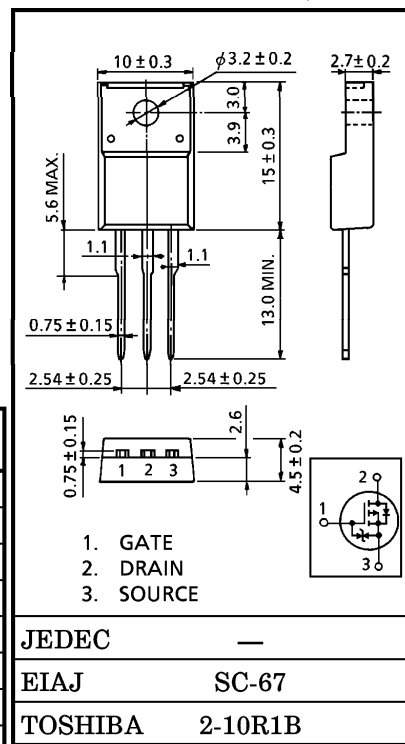
2SJ407

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

INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.8\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 4.0S$ (Typ.)
- Low Leakage Current : $I_{DSS} = -100\mu A$ (Max.) ($V_{DS} = -200V$)
- Enhancement-Mode : $V_{th} = -1.5 \sim -3.5V$
 ($V_{DS} = -10V, I_D = -1mA$)



MAXIMUM RATINGS ($T_a = 25^\circ C$)

| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|------------------------------------------------|-------|-----------|----------|------------|
| Drain-Source Voltage | | V_{DSS} | -200 | V |
| Drain-Gate Voltage ($R_{GS} = 20k\Omega$) | | V_{DGR} | -200 | V |
| Gate-Source Voltage | | V_{GSS} | ± 20 | V |
| Drain Current | DC | I_D | -5 | A |
| | Pulse | I_{DP} | -20 | A |
| Drain Power Dissipation ($T_c = 25^\circ C$) | | P_D | 30 | W |
| Single Pulse Avalanche Energy** | | E_{AS} | 195 | mJ |
| Avalanche Current | | I_{AR} | -5 | A |
| Repetitive Avalanche Energy* | | E_{AR} | 3.0 | mJ |
| Chanel Temperature | | T_{ch} | 150 | $^\circ C$ |
| Storage Temperature Range | | T_{stg} | -55~150 | $^\circ C$ |

| | |
|---------|---------|
| JEDEC | — |
| EIAJ | SC-67 |
| TOSHIBA | 2-10R1B |

Weight : 1.9g

THERMAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | MAX. | UNIT |
|---------------------------------------|----------------|------|--------------|
| Thermal Resistance, Chanel To Case | $R_{th(ch-c)}$ | 4.16 | $^\circ C/W$ |
| Thermal Resistance, Chanel to Ambient | $R_{th(ch-a)}$ | 62.5 | $^\circ C/W$ |

Note ;

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

** $V_{DD} = -50V$, Starting $T_{ch} = 25^\circ C$, $L = 12.6mH$, $R_G = 25\Omega$, $I_{AR} = -5A$

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

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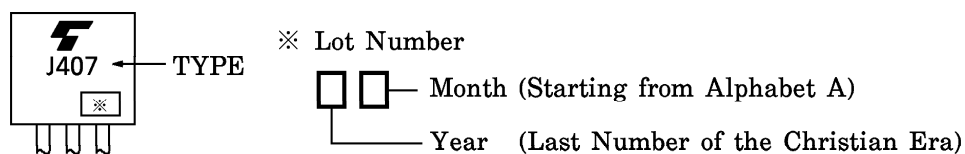
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

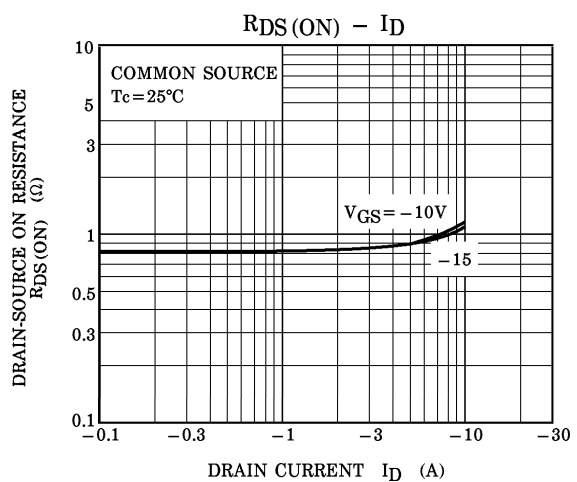
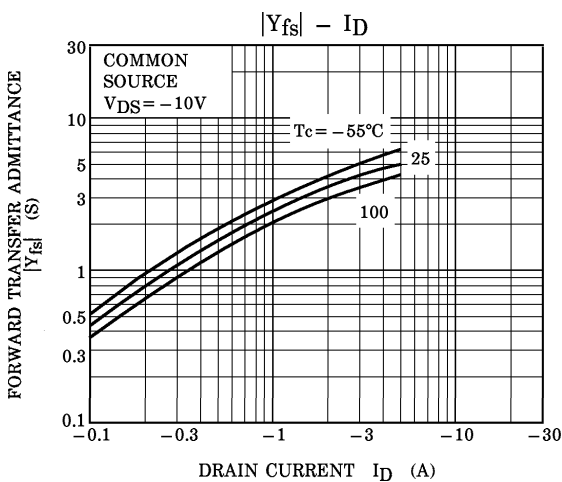
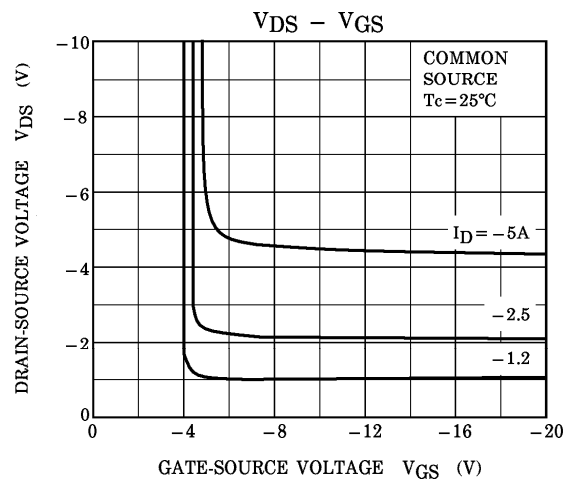
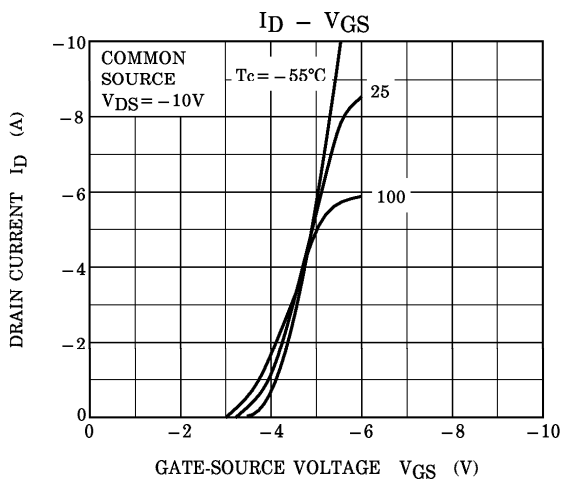
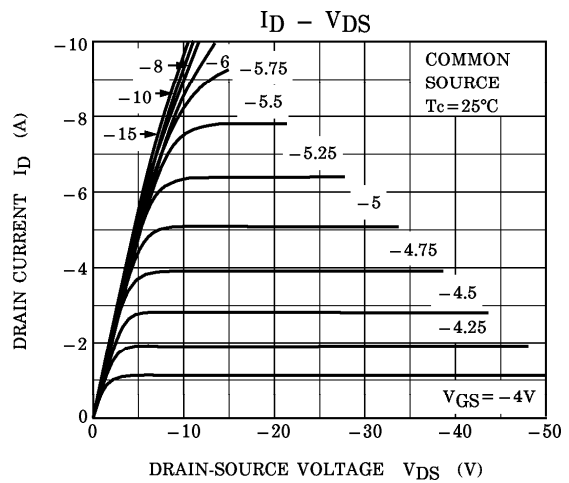
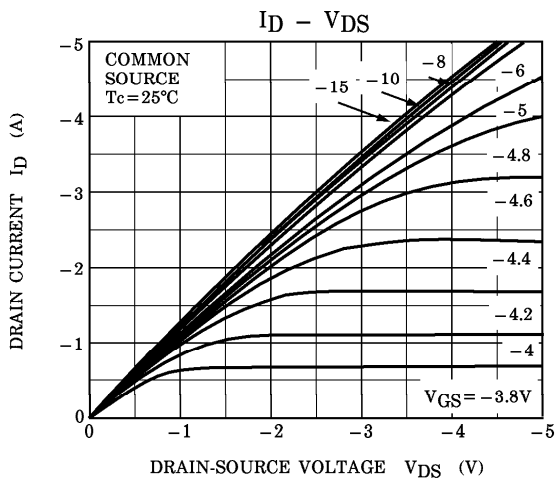
| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-------------------------------------------------|---------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|----------|----------|
| Gate Leakage Current | | I_{GSS} | $V_{GS} = \pm 16V, V_{DS} = 0V$ | — | — | ± 10 | μA |
| Drain Cut-off Current | | I_{DSS} | $V_{DS} = -200V, V_{GS} = 0V$ | — | — | -100 | μA |
| Drain-Source Breakdown Voltage | | $V_{(BR)DSS}$ | $I_D = -10mA, V_{GS} = 0V$ | -200 | — | — | V |
| Gate Threshold Voltage | | V_{th} | $V_{DS} = -10V, I_D = -1mA$ | -1.5 | — | -3.5 | V |
| Drain-Source ON Resistance | | $R_{DS(ON)}$ | $V_{GS} = -10V, I_D = -2.5A$ | — | 0.8 | 1.0 | Ω |
| Forward Transfer Admittance | | $ Y_{fs} $ | $V_{DS} = -10V, I_D = -2.5A$ | 2.0 | 4.0 | — | S |
| Input Capacitance | | C_{iss} | $V_{DS} = -10V, V_{GS} = 0V$ $f = 1MHz$ | — | 800 | — | pF |
| Reverse Transfer Capacitance | | C_{rss} | | — | 80 | — | |
| Output Capacitance | | C_{oss} | | — | 270 | — | |
| Switching Time | Rise Time | t_r | <p>$I_D = -2.5A$ $V_{GS} = 0V, -10V$ $R_L = 40\Omega$ $V_{DD} = -100V$ $V_{IN} : t_r, t_f < 5ns$ $Duty \leq 1\%, t_w = 10\mu s$</p> | — | 15 | — | ns |
| | Turn-on Time | t_{on} | | — | 30 | — | |
| | Fall Time | t_f | | — | 6 | — | |
| | Turn-off Time | t_{off} | | — | 65 | — | |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | | Q_g | $V_{DD} = -160V$ $V_{GS} = -10V$ $I_D = -5A$ | — | 20 | — | nC |
| Gate-Source Charge | | Q_{gs} | | — | 13 | — | |
| Gate-Drain ("Miller") Charge | | Q_{gd} | | — | 7 | — | |

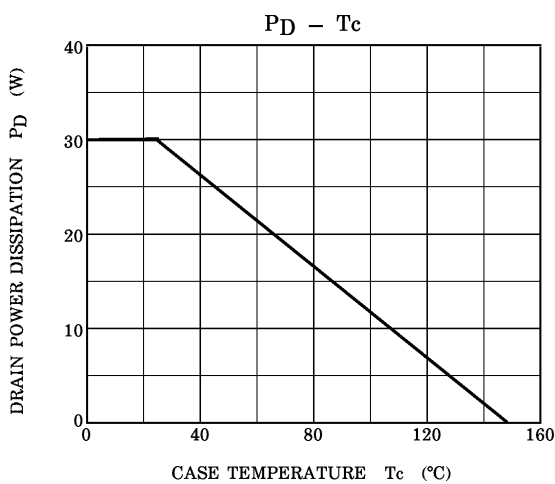
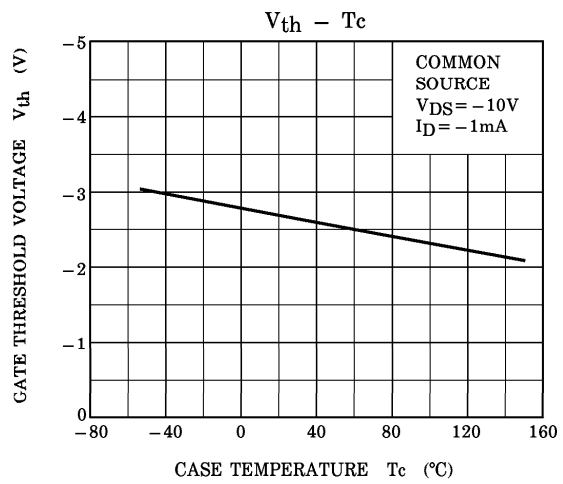
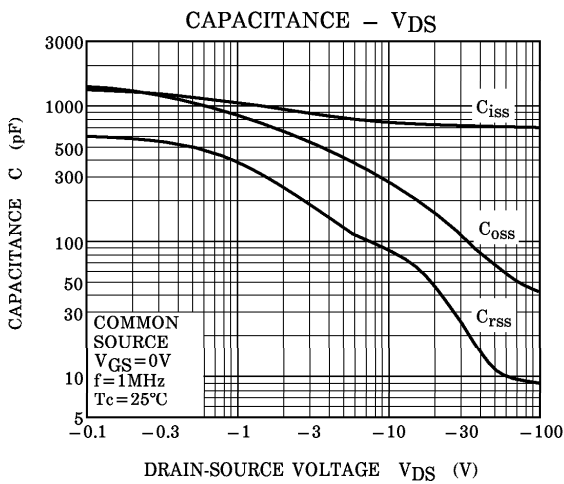
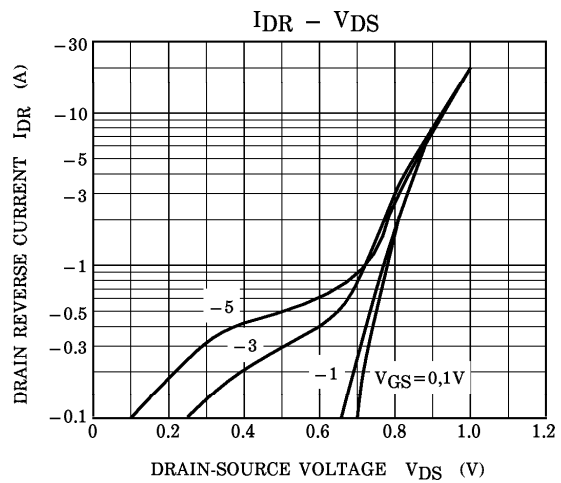
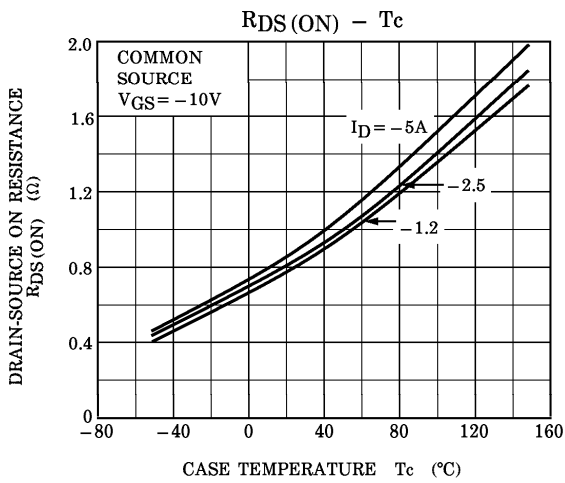
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

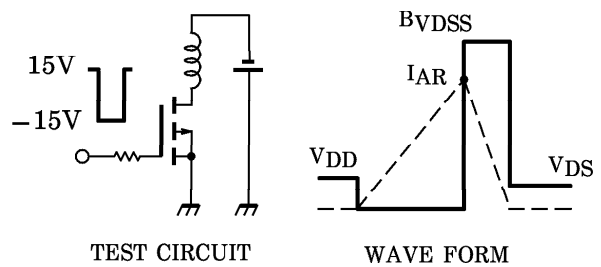
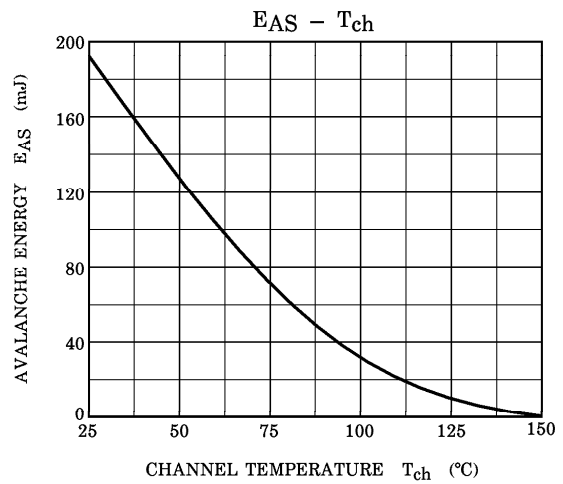
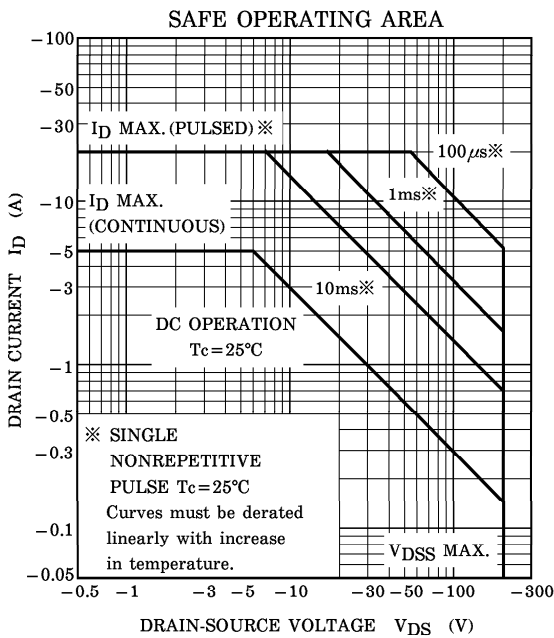
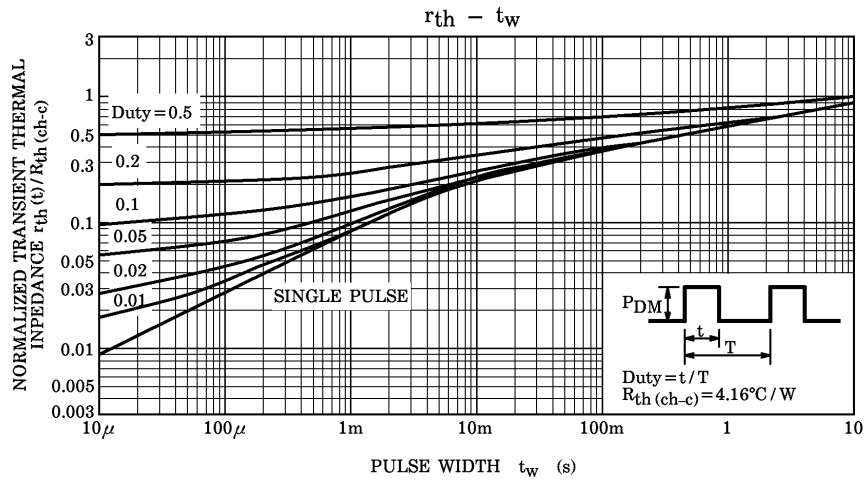
| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|-----------|----------------------------------------------------------|------|------|------|---------|
| Continuous Drain Reverse Current | I_{DR} | — | — | — | -5 | A |
| Pulse Drain Reverse Current | I_{DRP} | — | — | — | -20 | A |
| Diode Forward Voltage | V_{DSF} | $I_{DR} = -5A, V_{GS} = 0V$ | — | — | 2.0 | V |
| Reverse Recovery Time | t_{rr} | $I_{DR} = -5A, V_{GS} = 0V$ $dI_{DR}/dt = 100A/\mu s$ | — | 210 | — | ns |
| Reverse Recovery Charge | Q_{rr} | | — | 1.2 | — | μC |

MARKING









Peak $I_{AR} = -5A$, $R_G = 25\Omega$
 $V_{DD} = -50V$, $L = 12.6mH$ $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$