

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

2SK3265

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATORS, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

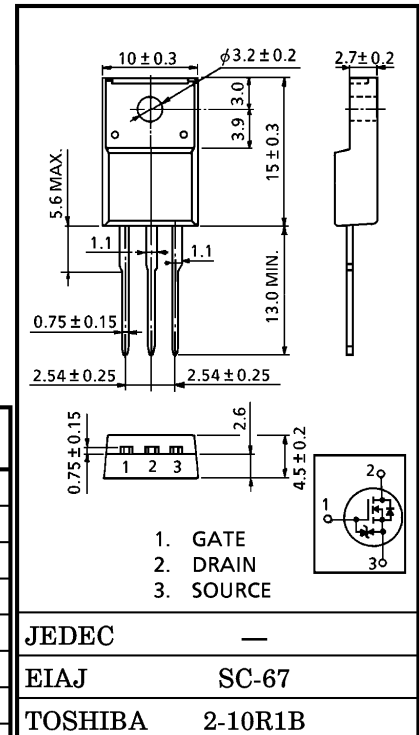
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.72 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 7.0 S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu A$ (Max.) ($V_{DS} = 700 V$)
- Enhancement-Mode : $V_{th} = 2.0 \sim 4.0 V$
($V_{DS} = 10 V, I_D = 1 mA$)

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

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|--|-----------|----------------|------------|
| Drain-Source Voltage | V_{DSS} | 700 | V |
| Drain-Gate Voltage ($R_{GS} = 20 k\Omega$) | V_{DGR} | 700 | V |
| Gate-Source Voltage | V_{GSS} | ± 30 | V |
| Drain Current | DC | I_D | 10 A |
| | Pulse | I_{DP} | 30 A |
| Drain Power Dissipation ($T_c = 25^\circ C$) | P_D | 45 | W |
| Single Pulse Avalanche Energy** | E_{AS} | 420 | mJ |
| Avalanche Current | I_{AR} | 10 | A |
| Repetitive Avalanche Energy* | E_{AR} | 4.5 | mJ |
| Channel Temperature | T_{ch} | 150 | $^\circ C$ |
| Storage Temperature Range | T_{stg} | $-55 \sim 150$ | $^\circ C$ |



Weight : 1.9 g (Typ.)

HERMAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | MAX. | UNIT |
|--|----------------|------|----------------|
| Thermal Resistance, Channel to Case | $R_{th(ch-c)}$ | 2.78 | $^\circ C / W$ |
| Thermal Resistance, Channel to Ambient | $R_{th(ch-a)}$ | 62.5 | $^\circ C / W$ |

Note ;

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

** $V_{DD} = 90 V, T_{ch} = 25^\circ C$ (initial), $L = 7.5 mH, R_G = 25 \Omega, I_{AR} = 10 A$

This transistor is an electrostatic sensitive device.

Please handle with caution.

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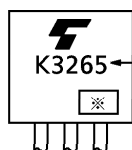
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---------------|---------------|--|--|------|----------|---------------|
| Gate Leakage Current | | I_{GSS} | $V_{GS} = \pm 25 \text{ V}, V_{DS} = 0 \text{ V}$ | — | — | ± 10 | μA |
| Gate-Source Breakdown Voltage | | $V_{(BR)GSS}$ | $I_G = \pm 10 \mu\text{A}, V_{DS} = 0 \text{ V}$ | ± 30 | — | — | V |
| Drain Cut-off Current | | I_{DSS} | $V_{DS} = 700 \text{ V}, V_{GS} = 0 \text{ V}$ | — | — | 100 | μA |
| Drain-Source Breakdown Voltage | | $V_{(BR)DSS}$ | $I_D = 10 \text{ mA}, V_{GS} = 0 \text{ V}$ | 700 | — | — | V |
| Gate Threshold Voltage | | V_{th} | $V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$ | 2.0 | — | 4.0 | V |
| Drain-Source ON Resistance | | $R_{DS(ON)}$ | $V_{GS} = 10 \text{ V}, I_D = 5 \text{ A}$ | — | 0.72 | 0.75 | Ω |
| Forward Transfer Admittance | | $ Y_{fs} $ | $V_{DS} = 10 \text{ V}, I_D = 5 \text{ A}$ | 4.0 | 7.0 | — | S |
| Input Capacitance | | C_{iss} | $V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$ | — | 1700 | — | pF |
| Reverse Transfer Capacitance | | C_{rss} | | — | 40 | — | |
| Output Capacitance | | C_{oss} | | — | 200 | — | |
| Switching Time | Rise Time | t_r | <p>$I_D = 5 \text{ A}$ $V_{GS} = 10 \text{ V}$ V_{OUT} $R_L = 40 \Omega$ $V_{DD} \cong 200 \text{ V}$</p> | — | 40 | — | ns |
| | Turn-on Time | t_{on} | | — | 72 | — | |
| | Fall Time | t_f | | — | 42 | — | |
| | Turn-off Time | t_{off} | | $V_{IN} : t_r, t_f < 5 \text{ ns}, \text{Duty} \leq 1\%, t_w = 10 \mu\text{s}$ | — | 145 | |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | | Q_g | $V_{DD} \cong 400 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 10 \text{ A}$ | — | 53 | — | nC |
| Gate-Source Charge | | Q_{gs} | | — | 25 | — | |
| Gate-Drain ("Miller") Charge | | Q_{gd} | | — | 28 | — | |

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

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|-----------|---|------|------|------|---------------|
| Continuous Drain Reverse Current | I_{DR} | — | — | — | 10 | A |
| Pulse Drain Reverse Current | I_{DRP} | — | — | — | 30 | A |
| Diode Forward Voltage | V_{DSF} | $I_{DR} = 10 \text{ A}, V_{GS} = 0 \text{ V}$ | — | — | -1.9 | V |
| Reverse Recovery Time | t_{rr} | $I_{DR} = 10 \text{ A}, V_{GS} = 0 \text{ V}$ | — | 1400 | — | ns |
| Reverse Recovery Charge | Q_{rr} | $dI_{DR}/dt = 100 \text{ A}/\mu\text{s}$ | — | 17.5 | — | μC |

MARKING

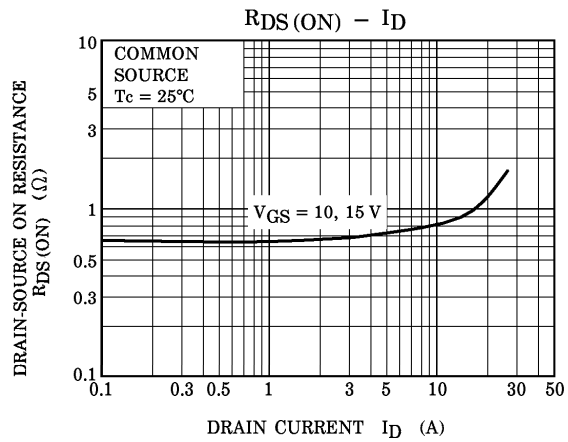
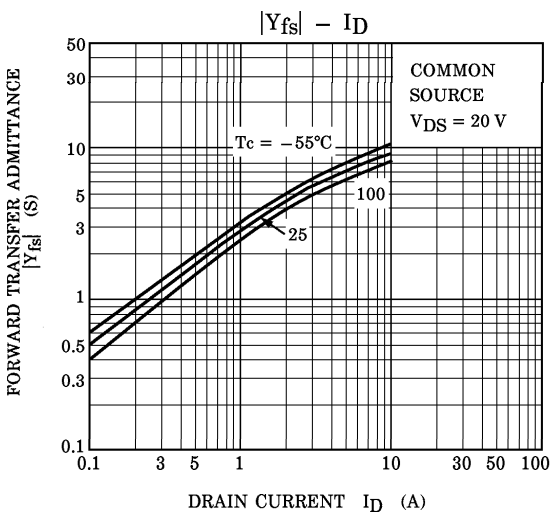
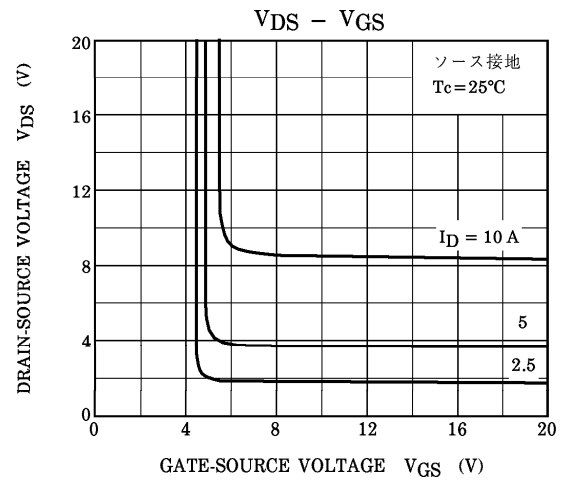
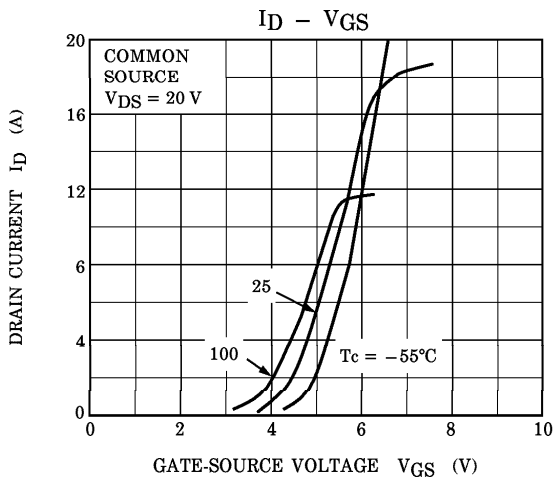
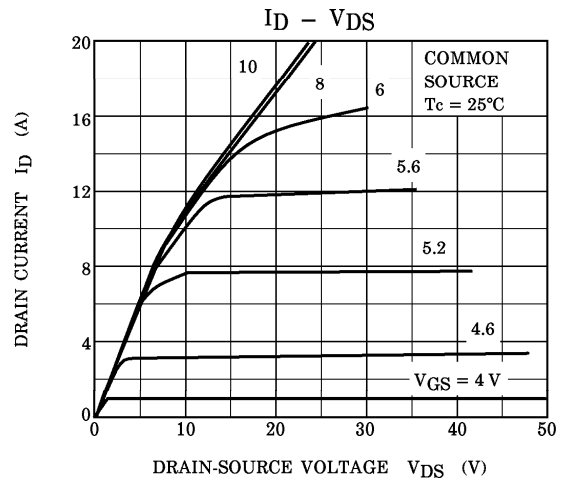
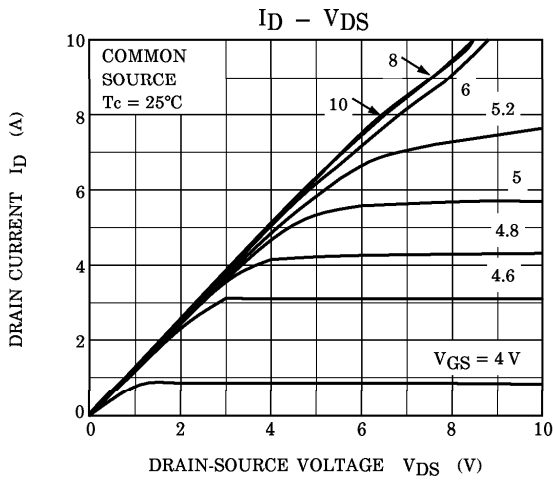


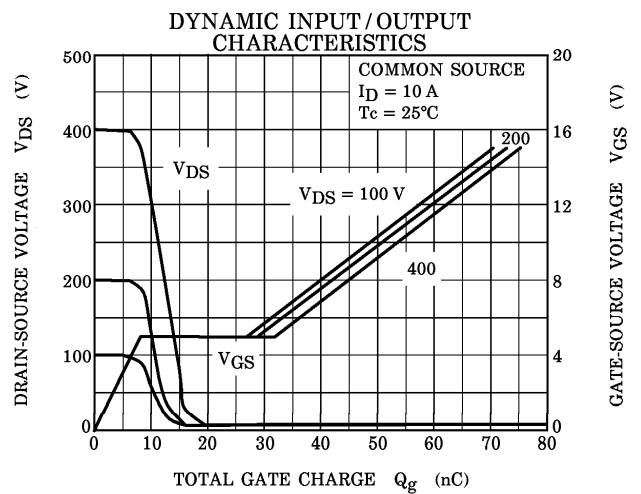
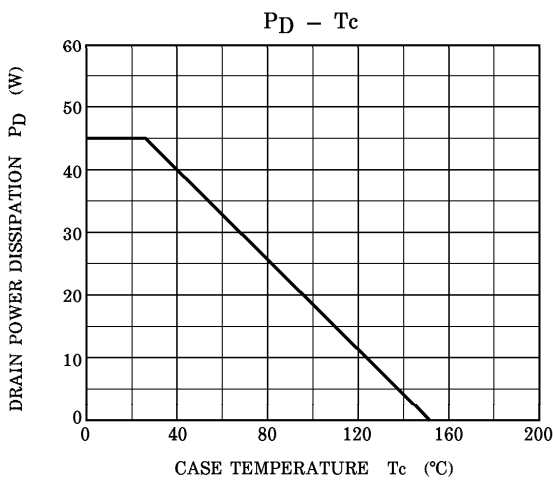
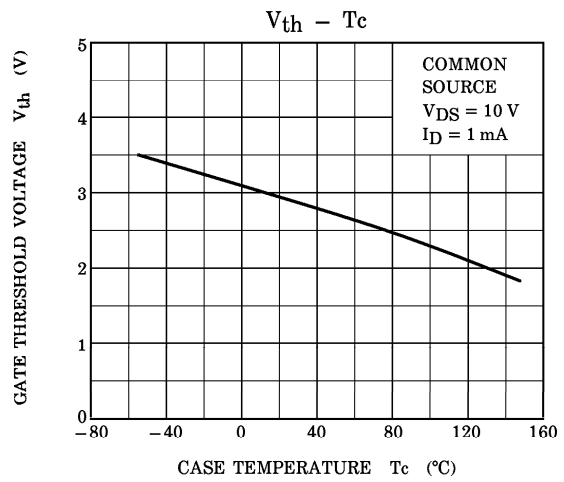
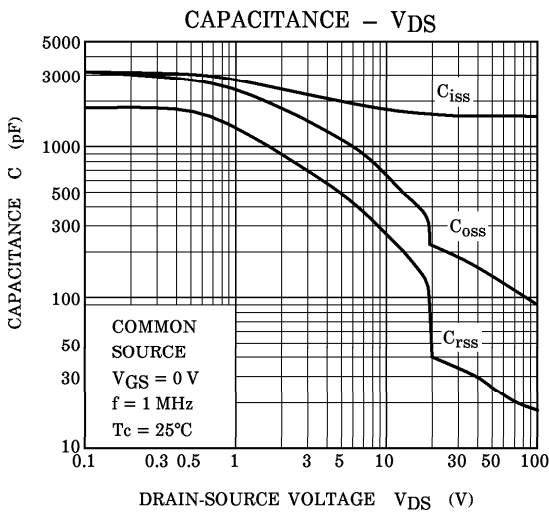
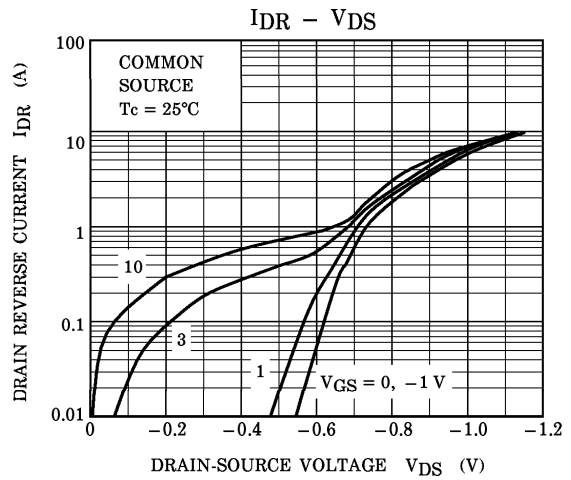
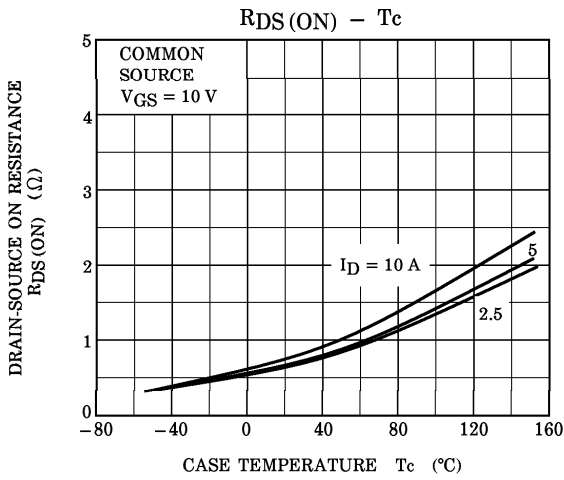
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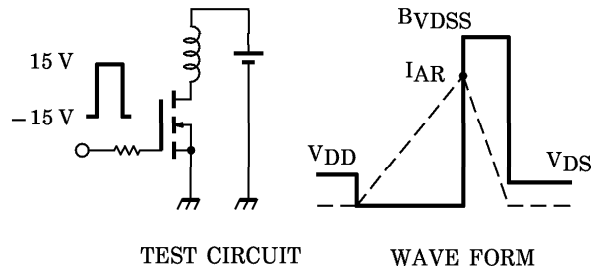
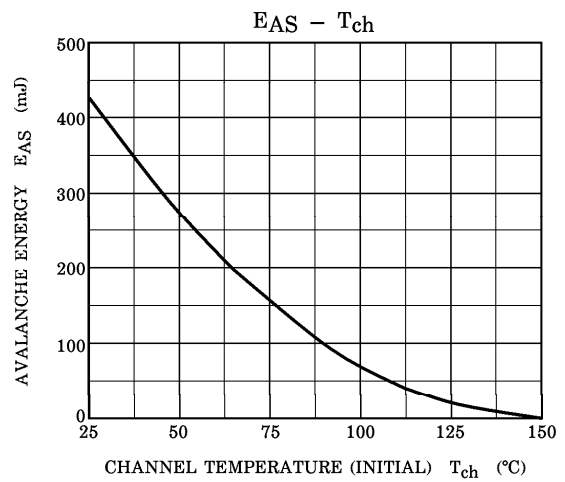
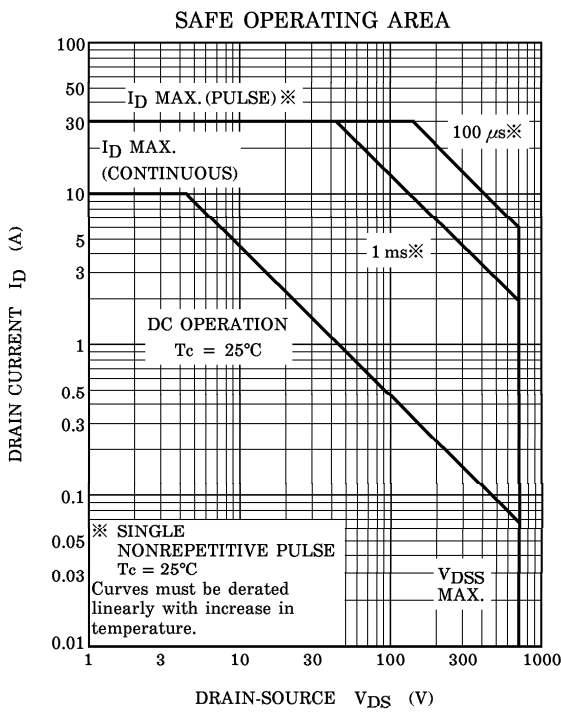
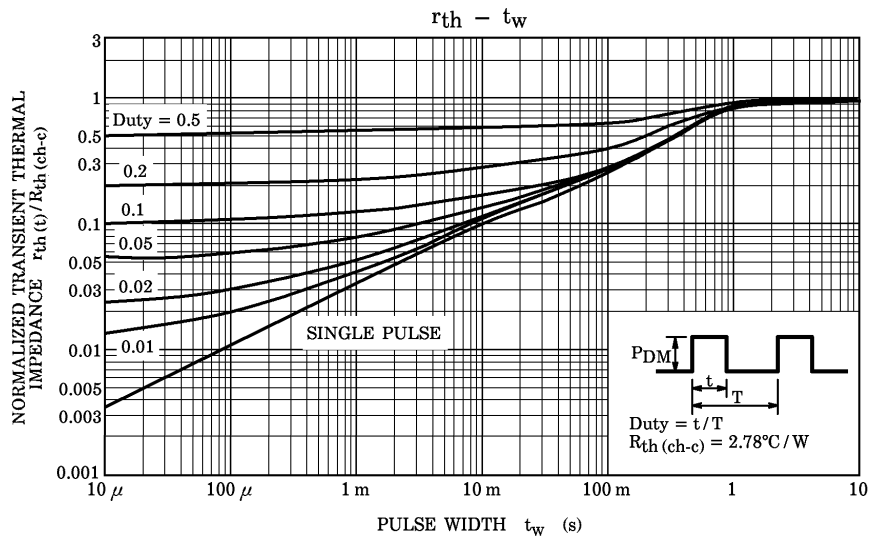
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 10\text{ A}$, $R_G = 25\ \Omega$, $V_{DD} = 90\text{ V}$, $L = 7.5\text{ mH}$

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