

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (L²-π-MOSIII)

2SK1381

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

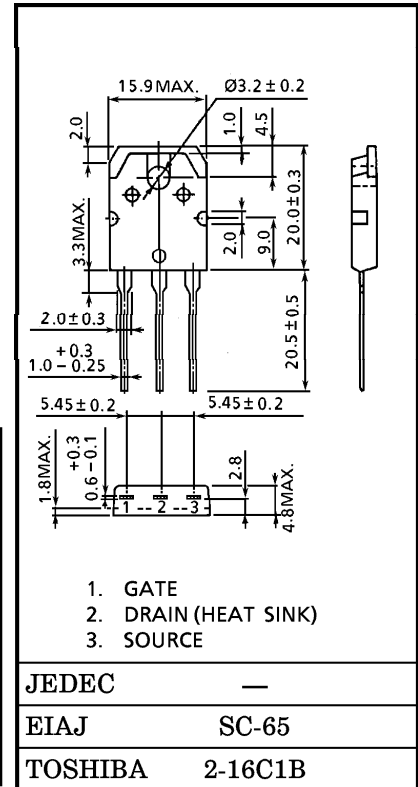
INDUSTRIAL APPLICATIONS

Unit in mm

- 4V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 25m\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 33S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100\mu A$ (Max.) ($V_{DS} = 100V$)
- 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 | 50 |
| | Pulse | I_{DP} | 200 |
| Drain Power Dissipation (Tc = 25°C) | P_D | 150 | W |
| Channel Temperature | T_{ch} | 150 | °C |
| Storage Temperature Range | T_{stg} | -55~150 | °C |



Weight : 4.6g

THERMAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | MAX. | UNIT |
|--|----------------|-------|------|
| Thermal Resistance, Channel to Case | $R_{th(ch-c)}$ | 0.833 | °C/W |
| Thermal Resistance, Channel to Ambient | $R_{th(ch-a)}$ | 50 | °C/W |

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

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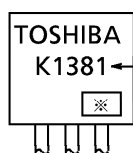
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT | |
|---|----------------|--|------|------|----------|------------|----|
| Gate Leakage Current | I_{GSS} | $V_{GS} = \pm 20V, V_{DS} = 0V$ | — | — | ± 10 | nA | |
| 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 | $R_{DS(ON)}$ | $V_{GS} = 4V, I_D = 25A$ | — | 31 | 46 | m Ω | |
| | | $V_{GS} = 10V, I_D = 25A$ | — | 25 | 32 | | |
| Forward Transfer Admittance | $ Y_{fs} $ | $V_{DS} = 10V, I_D = 25A$ | 20 | 33 | — | S | |
| Input Capacitance | C_{iss} | $V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$ | — | 3700 | — | pF | |
| Reverse Transfer Capacitance | C_{rss} | | — | 580 | — | | |
| Output Capacitance | C_{oss} | | — | 1500 | — | | |
| Switching Time | Rise Time | t_r | | — | 16 | — | ns |
| | Turn-on Time | t_{on} | | — | 46 | — | |
| | Fall Time | t_f | | — | 60 | — | |
| | Turn-off Time | t_{off} | | — | 185 | — | |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | Q_g | $V_{DD} \doteq 80V, V_{GS} = 10V, I_D = 50A$ | — | 88 | — | nC | |
| Gate-Source Charge | Q_{gs} | | — | 62 | — | | |
| Gate-Drain ("Miller") Charge | Q_{gd} | | — | 26 | — | | |

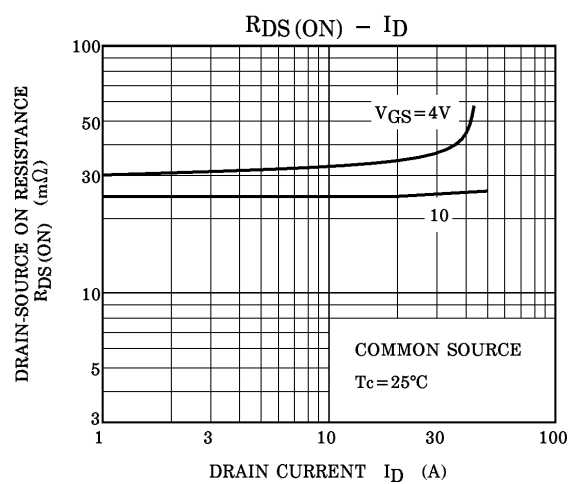
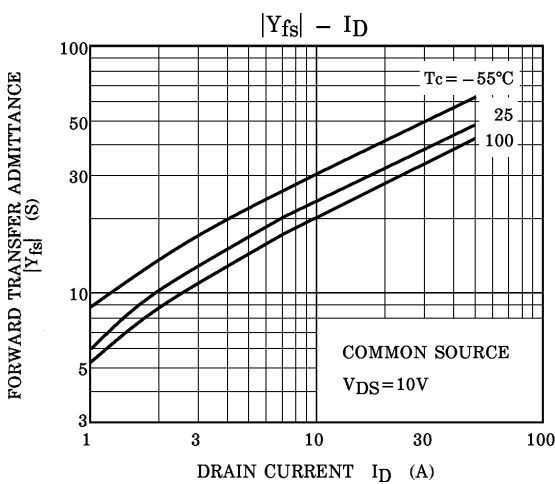
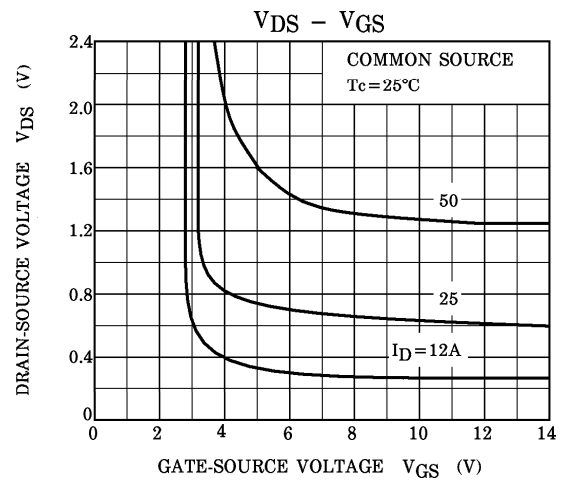
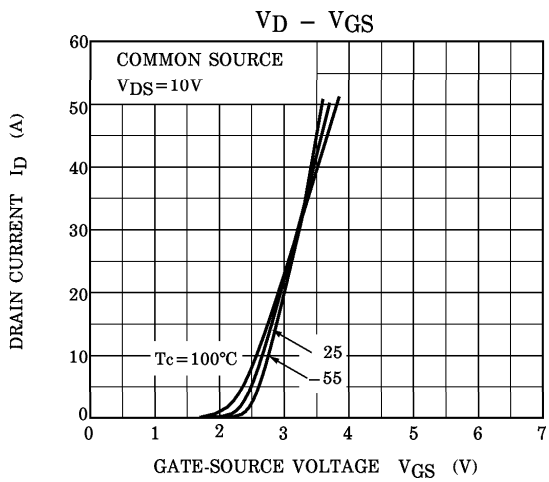
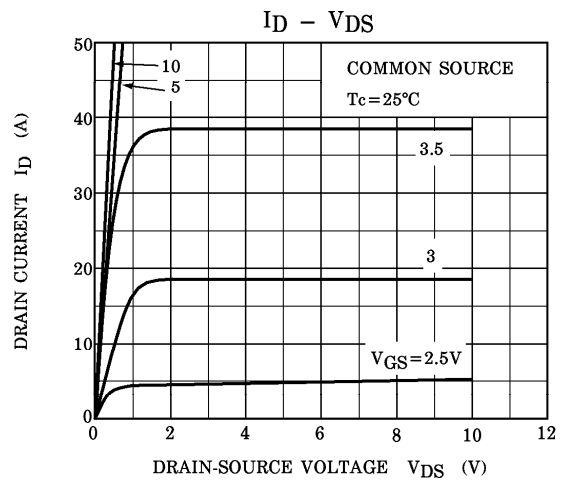
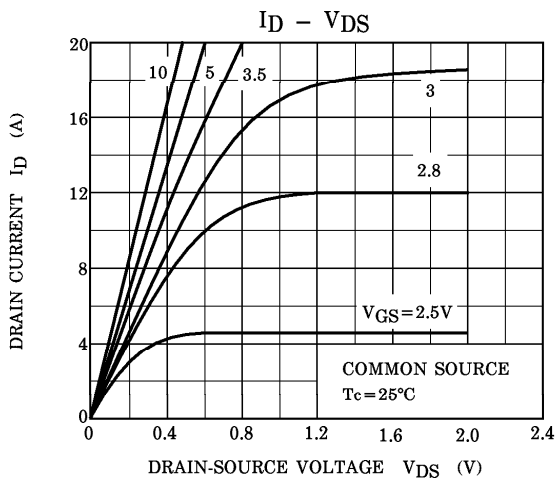
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

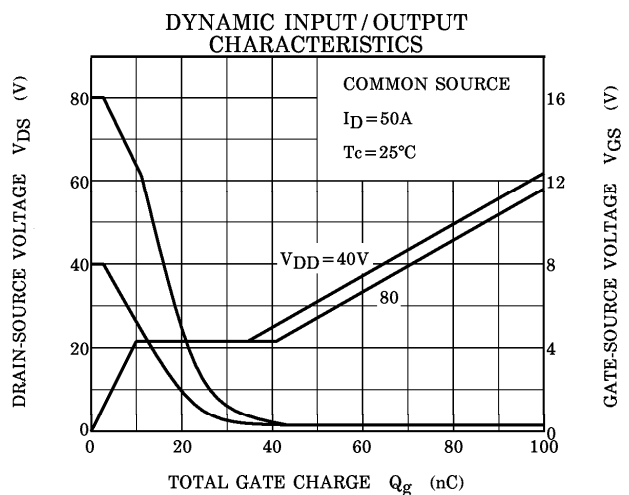
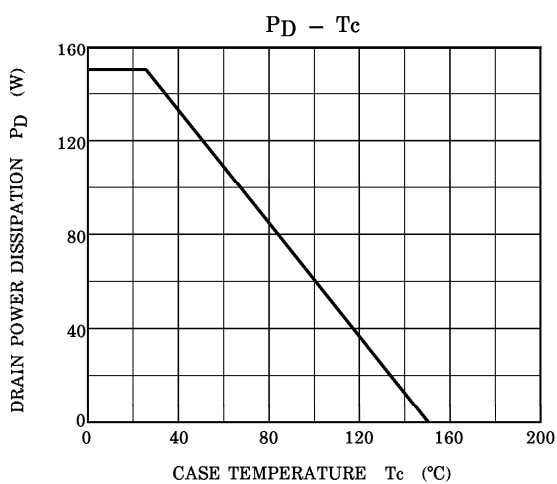
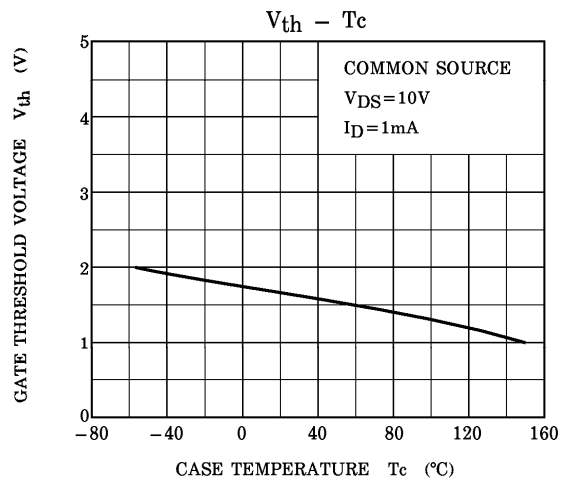
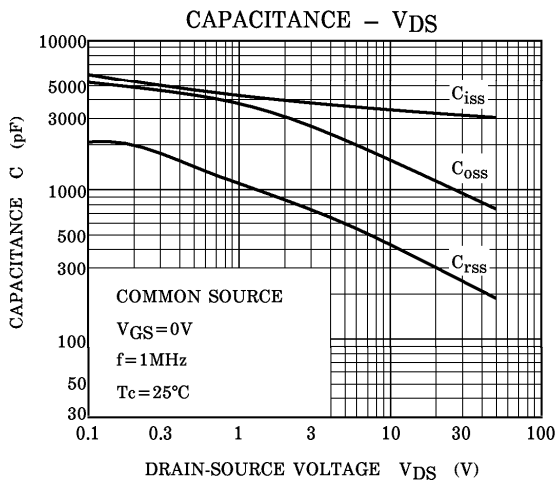
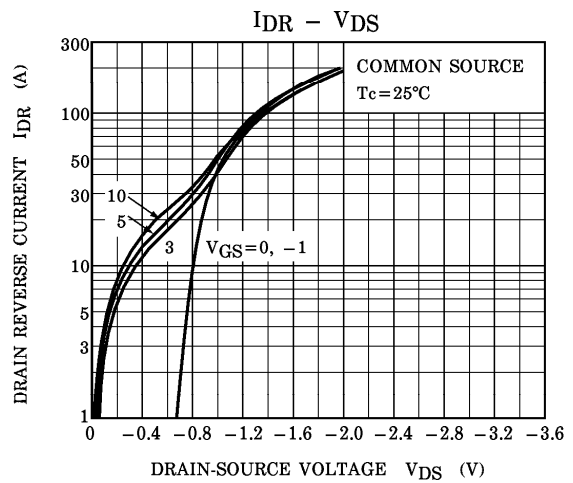
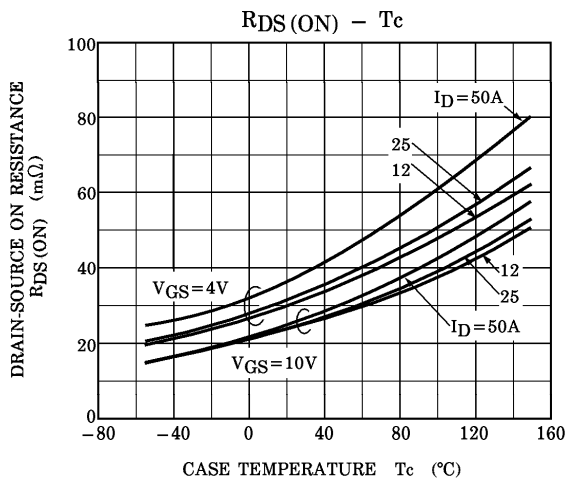
| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|-----------|------------------------------|------|------|------|---------|
| Continuous Drain Reverse Current | I_{DR} | — | — | — | 50 | A |
| Pulse Drain Reverse Current | I_{DRP} | — | — | — | 200 | A |
| Diode Forward Voltage | V_{DSF} | $I_{DR} = 50A, V_{GS} = 0V$ | — | — | -1.6 | V |
| Reverse Recovery Time | t_{rr} | $I_{DR} = 50A, V_{GS} = 0V$ | — | 280 | — | ns |
| Reverse Recovered Charge | Q_{rr} | $dI_{DR} / dt = 50A / \mu s$ | — | 0.56 | — | μC |

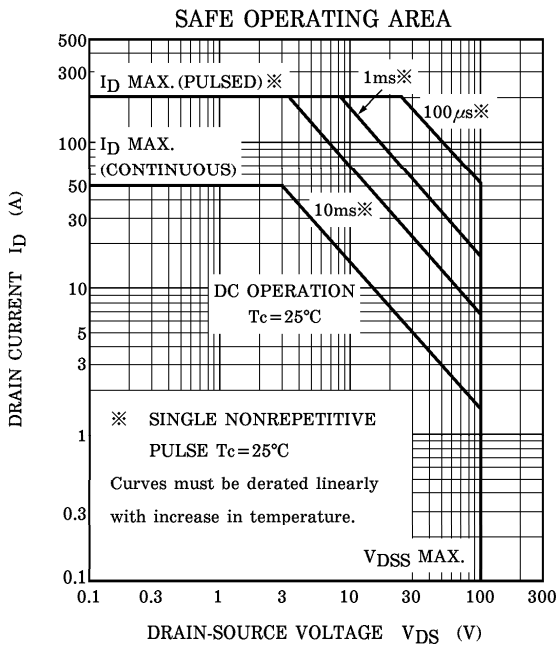
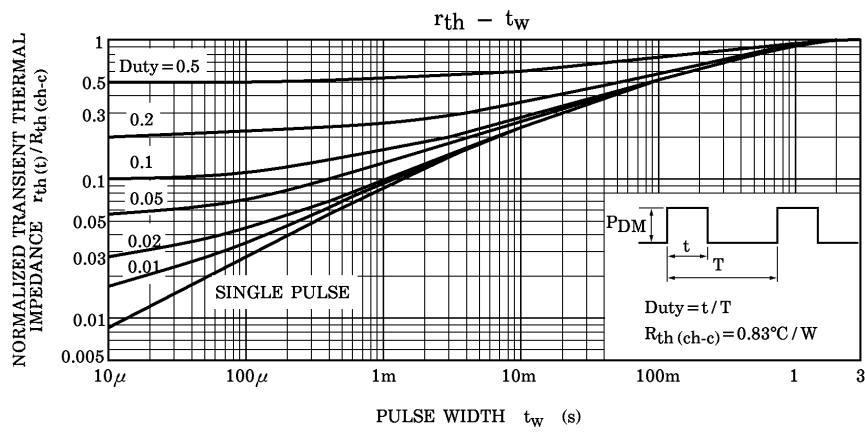
MARKING



TYPE
 ※ Lot Number
 □ □ — Month (Starting from Alphabet A)
 — Year (Last Number of the Christian Era)







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