

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

2SK3084

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS

Unit in mm

- 4 V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 40 \text{ m}\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 27 \text{ S}$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu\text{A}$ (Max.) ($V_{DS} = 100 \text{ V}$)
- Enhancement-Mode : $V_{th} = 0.8 \sim 2.0 \text{ V}$
($V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$)

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

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|--|-----------|----------------|------------------|
| Drain-Source Voltage | V_{DSS} | 100 | V |
| Drain-Gate Voltage ($R_{GS} = 20 \text{ k}\Omega$) | V_{DGR} | 100 | V |
| Gate-Source Voltage | V_{GSS} | ± 20 | V |
| DC Drain Current | DC | I_D | 30 |
| | Pulse | I_{DP} | 120 |
| Drain Power Dissipation ($T_c = 25^\circ\text{C}$) | P_D | 65 | W |
| Single Pulse Avalanche Energy** | E_{AS} | 293 | mJ |
| Avalanche Current | I_{AR} | 30 | A |
| Repetitive Avalanche Energy* | E_{AR} | 6.5 | mJ |
| Channel Temperature | T_{ch} | 150 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | $-55 \sim 150$ | $^\circ\text{C}$ |

THERMAL CHARACTERISTICS

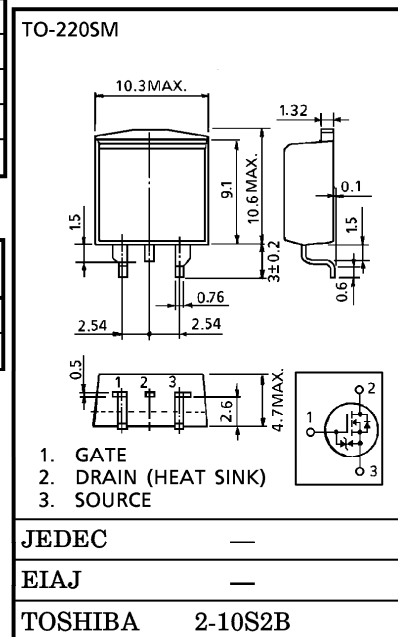
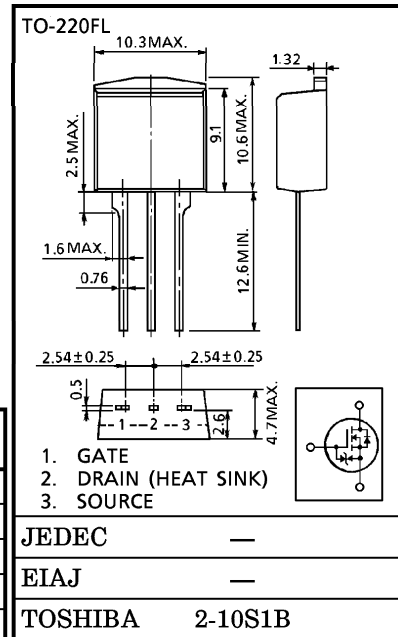
| CHARACTERISTIC | SYMBOL | MAX. | UNIT |
|--|----------------|------|--------------------|
| Thermal Resistance, Channel to Case | $R_{th(ch-c)}$ | 1.92 | $^\circ\text{C/W}$ |
| Thermal Resistance, Channel to Ambient | $R_{th(ch-a)}$ | 83.3 | $^\circ\text{C/W}$ |

Note ;

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

** $V_{DD} = 25 \text{ V}$, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 525 \mu\text{H}$
 $R_G = 25 \Omega$, $I_{AR} = 30 \text{ A}$

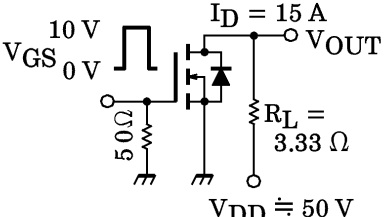
This transistor is an electrostatic sensitive device.
Please handle with caution.



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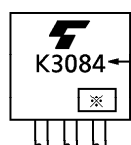
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---------------|----------------|---|------|------|----------|------------------|
| Gate Leakage Current | | I_{GSS} | $V_{GS} = \pm 16 \text{ V}, V_{DS} = 0 \text{ V}$ | — | — | ± 20 | μA |
| Drain Cut-off Current | | I_{DSS} | $V_{DS} = 100 \text{ V}, V_{GS} = 0 \text{ V}$ | — | — | 100 | μA |
| Drain-Source Breakdown Voltage | | $V_{(BR) DSS}$ | $I_D = 10 \text{ mA}, V_{GS} = 0 \text{ V}$ | 100 | — | — | V |
| Gate Threshold Voltage | | V_{th} | $V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$ | 0.8 | — | 2.0 | V |
| Drain-Source ON Resistance | | $R_{DS(ON)}$ | $V_{GS} = 4 \text{ V}, I_D = 15 \text{ A}$ | — | 46 | 70 | $\text{m}\Omega$ |
| | | | $V_{GS} = 10 \text{ V}, I_D = 15 \text{ A}$ | — | 40 | 46 | |
| Forward Transfer Admittance | | $ Y_{fs} $ | $V_{DS} = 10 \text{ V}, I_D = 15 \text{ A}$ | 13 | 27 | — | S |
| Input Capacitance | | C_{iss} | $V_{DS} = 10 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$ | — | 3250 | — | pF |
| Reverse Transfer Capacitance | | C_{rss} | | — | 230 | — | |
| Output Capacitance | | C_{oss} | | — | 520 | — | |
| Switching Time | Rise Time | t_r |  <p>$I_D = 15 \text{ A}$ $V_{GS} = 10 \text{ V}$ $V_{DS} = 0 \text{ V}$ $R_L = 3.33 \Omega$ $V_{DD} \cong 50 \text{ V}$</p> | — | 33 | — | ns |
| | Turn-on Time | t_{on} | | — | 60 | — | |
| | Fall Time | t_f | | — | 95 | — | |
| | Turn-off Time | t_{off} | | — | 230 | — | |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | | Q_g | $V_{DD} \cong 80 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 30 \text{ A}$ | — | 68 | — | nC |
| Gate-Source Charge | | Q_{gs} | | — | 46 | — | |
| Gate-Drain ("Miller") Charge | | Q_{gd} | | — | 22 | — | |

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

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|-----------|---|------|------|------|------|
| Continuous Drain Reverse Current | I_{DR} | — | — | — | 30 | A |
| Pulse Drain Reverse Current | I_{DRP} | — | — | — | 120 | A |
| Diode Forward Voltage | V_{DSF} | $I_{DR} = 30 \text{ A}, V_{GS} = 0 \text{ V}$ | — | — | -1.7 | V |
| Reverse Recovery Time | t_{rr} | $I_{DR} = 30 \text{ A}, V_{GS} = 0 \text{ V}$ | — | 140 | — | ns |
| Reverse Recovery Charge | Q_{rr} | $dI_{DR} / dt = 50 \text{ A} / \mu\text{s}$ | — | 370 | — | nC |

MARKING



※ Lot Number



Month (Starting from Alphabet A)

Year (Last Number of the Christian Era)