

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

2SJ508

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

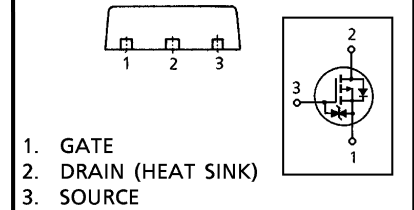
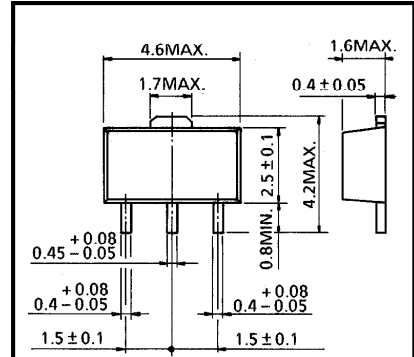
INDUSTRIAL APPLICATIONS

Unit in mm

- 4 V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 1.35 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 0.7 S$ (Typ.)
- Low Leakage Current
: $I_{DSS} = -100 \mu A$ ($V_{DS} = -100 V$)
- Enhancement-Mode
: $V_{th} = -0.8 \sim -2.0 V$ ($V_{DS} = -10 V, I_D = -1 mA$)

MAXIMUM RATINGS (Ta = 25°C)

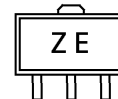
| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|--|-------|-----------|----------|------|
| Drain-Source Voltage | | V_{DSS} | -100 | V |
| Drain-Gate Voltage ($R_{GS} = 20 k\Omega$) | | V_{DGR} | -100 | V |
| Gate-Source Voltage | | V_{GSS} | ± 20 | V |
| Drain Current | DC | I_D | -1 | A |
| | Pulse | I_{DP} | -3 | A |
| Drain Power Dissipation (Ta = 25°C)*** | | P_D | 1.5 | W |
| Single Pulse Avalanche Energy** | | E_{AS} | 136.5 | mJ |
| Avalanche Current | | I_{AR} | -1 | A |
| Repetitive Avalanche Energy* | | E_{AR} | 0.15 | mJ |
| Channel Temperature | | T_{ch} | 150 | °C |
| Storage Temperature Range | | T_{stg} | -55~150 | °C |



| | |
|---------|--------|
| JEDEC | — |
| EIAJ | — |
| TOSHIBA | 2-5K1B |

Weight : 0.05 g (Typ.)

MARKING



THERMAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | MAX. | UNIT |
|--|----------------|------|------|
| Thermal Resistance, Channel to Ambient | $R_{th(ch-a)}$ | 83.3 | °C/W |

Note ;

- * Repetitive rating ; Pulse Width Limited by Max. junction temperature.
- ** $V_{DD} = -50 V$, Starting $T_{ch} = 25^\circ C$, $L = 168 mH$, $R_G = 25 \Omega$, $I_{AR} = -1 A$
- *** Mounted on ceramic substrate (1 inch² × 0.8 t)

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 | | IGSS | VGS = ±16 V, VDS = 0 V | — | — | ±10 | μA |
| Drain Cut-off Current | | IDSS | VDS = -100 V, VGS = 0 V | — | — | -100 | μA |
| Drain-Source Breakdown Voltage | | V(BR)DSS | ID = -10 mA, VGS = 0 V | -100 | — | — | V |
| Gate Threshold Voltage | | Vth | VDS = -10 V, ID = -1 mA | -0.8 | — | -2.0 | V |
| Drain-Source ON Resistance | | RDS(ON) | VGS = -4 V, ID = -0.5 A | — | 1.68 | 2.5 | Ω |
| | | | VGS = -10 V, ID = -0.5 A | — | 1.34 | 1.9 | |
| Forward Transfer Admittance | | Yfs | VDS = -10 V, ID = -0.5 A | 0.3 | 0.7 | — | S |
| Input Capacitance | | Ciss | VDS = -10 V, VGS = 0 V, f = 1 MHz | — | 135 | — | pF |
| Reverse Transfer Capacitance | | Crss | | — | 22 | — | |
| Output Capacitance | | Coss | | — | 48 | — | |
| Switching Time | Rise Time | tr | <p>VGS = 0 V, -10 V ID = -0.5 A VOUT RL = 100 Ω VDD ≐ -50 V VIN : tr, tf < 5 ns, Duty ≤ 1%, tw = 10 μs</p> | — | 20 | — | ns |
| | Turn-on Time | ton | | — | 32 | — | |
| | Fall Time | tf | | — | 25 | — | |
| | Turn-off Time | t _{off} | | — | 130 | — | |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | | Qg | VDD ≐ -80 V, VGS = -10 V, ID = -1 A | — | 6.3 | — | nC |
| Gate-Source Charge | | Qgs | | — | 4.1 | — | |
| Gate-Drain (“Miller”) Charge | | Qgd | | — | 2.2 | — | |

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

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|-----------------|-----------------------|------|------|------|------|
| Continuous Drain Reverse Current | IDR | — | — | — | -1 | A |
| Pulse Drain Reverse Current | IDRP | — | — | — | -3 | A |
| Diode Forward Voltage | VDSF | IDR = -1 A, VGS = 0 V | — | — | 1.5 | V |
| Reverse Recovery Time | t _{rr} | IDR = -1 A, VGS = 0 V | — | 90 | — | ns |
| Reverse Recovery Charge | Q _{rr} | dIDR/dt = 50 A/μs | — | 180 | — | nC |