

TOSHIBA FIELD EFFECT TRANSISTOR

2SK1717

**SILICON N CHANNEL MOS TYPE
(L² - π - MOS IV)**

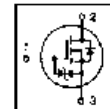
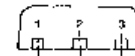
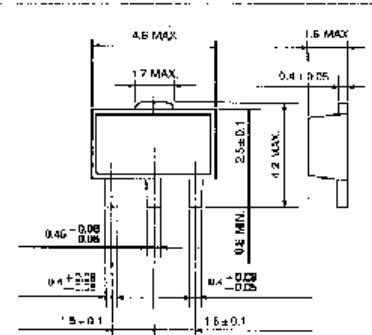
**HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS
CHOPPER REGULATOR, DC-DC CONVERTER AND
MOTOR DRIVE APPLICATIONS**

**INDUSTRIAL
APPLICATIONS**

Unit in mm

FEATURES:

- 4-Volt Gate Drive
- Low Drain-Source ON Resistance: $R_{DS(ON)} = 0.28 \Omega$ (Typ.)
- High Forward Transfer Admittance: $|Y_{fs}| = 1.6 S$ (Typ.)
- Low Leakage Current: $I_{DSS} = 100 \mu A$ (Max.) ($V_{DS} = 60 V$)
- Enhancement-Mode: $V_{th} = 0.8 \sim 2.0 V$ ($V_{DS} = 10 V, I_D = 1 mA$)



1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

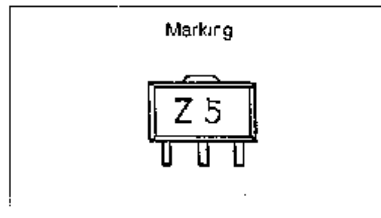
| | |
|---------|-------|
| JEDEC | — |
| EIAJ | SC-62 |
| TOSHIBA | 2SK1B |

Weight: 0.05 g

MAXIMUM RATINGS (Ta = 25 °C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|--|-----------|-----------|------|
| Drain-Source Voltage | V_{DS} | 60 | V |
| Drain-Gate Voltage ($R_{GS} = 20 k\Omega$) | V_{DGR} | 60 | V |
| Gate-Source Voltage | V_{GSS} | ±20 | V |
| Drain Current | DC | I_D | 2 |
| | Pulse | I_{DP} | 6 |
| Drain Power Dissipation (Ta = 25 °C) | P_D | 0.5 | W |
| Drain Power Dissipation | P_D^* | 1.5 | W |
| Channel Temperature | T_{ch} | 150 | °C |
| Storage Temperature Range | T_{stg} | -65 - 150 | °C |

P_D^* : mounted on ceramic substrate (800 mm² × 0.8 t)



THERMAL CHARACTERISTIC

| CHARACTERISTIC | SYMBOL | MAX. | UNIT |
|-------------------------------------|----------------|------|------|
| Thermal Resistance, Channel to Case | $R_{th(ch-c)}$ | 250 | °C/W |

THIS TRANSISTOR IS AN ELECTROSTATIC DEVICE. PLEASE HANDLE WITH CAUTION.

| | |
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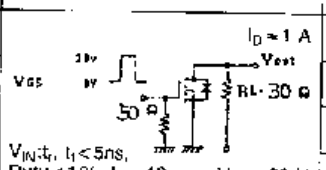
GY1A2(1)-A

TOSHIBA FIELD EFFECT TRANSISTOR

2SK1717

SILICON N CHANNEL MOS TYPE (L² - π - MOS IV)

ELECTRICAL CHARACTERISTICS (Ta = 25 °C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---------------|---------------------|---|---|------|------|------|
| Gate Leakage Current | | I _{GSS} | V _{GS} = ± 16 V, V _{DS} = 0 V | — | — | ± 10 | μA |
| Drain Cut-off Current | | I _{DSS} | V _{DS} = 60 V, V _{GS} = 0 V | — | — | 100 | μA |
| Drain-Source Breakdown Voltage | | V _(DSS) | I _D = 10 mA, V _{GS} = 0 V | 60 | — | — | V |
| Gate Threshold Voltage | | V _{th} | V _{GS} = 10 V, I _D = 1 mA | 0.8 | — | 2.0 | V |
| Drain-Source ON Resistance | | R _{DS(ON)} | V _{GS} = 4 V, I _D = 1 A | — | 0.38 | 0.53 | Ω |
| | | | V _{GS} = 10 V, I _D = 1 A | — | 0.28 | 0.37 | |
| Forward Transfer Admittance | | Y _{fs} | V _{DS} = 10 V, I _D = 1 A | 1.0 | 1.6 | — | S |
| Input Capacitance | | C _{iss} | V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz | — | 125 | 180 | pF |
| Reverse Transfer Capacitance | | C _{rss} | | — | 30 | 60 | |
| Output Capacitance | | C _{oss} | | — | 85 | 130 | |
| Switching Time | Rise Time | t _r |  I _D = 1 A V _{GS} = 10 V, V _{DS} = 30 V, RL = 30 Ω | — | 30 | 60 | nS |
| | Turn-on Time | t _{on} | | — | 60 | 120 | |
| | Fall Time | t _f | | — | 40 | 80 | |
| | Turn-off Time | t _{off} | | V _{IN} : t _r < 5 ns, Duty ≤ 1%, I _w = 10 μs | — | 135 | |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | | Q _g | V _{DD} = 48 V, V _{GS} = 10 V, I _D = 2 A | — | 6.5 | 13 | nC |
| Gate-Source Charge | | Q _{gs} | | — | 4.5 | — | |
| Gate-Drain ("Miller") Charge | | Q _{gd} | | — | 2.0 | — | |

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

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|------------------|--|------|------|------|------|
| Continuous Drain Reverse Current | I _{DR} | — | — | — | 2 | A |
| Pulse Drain Reverse Current | I _{DRP} | — | — | — | 6 | A |
| Diode Forward Voltage | V _{DSF} | I _{DR} = 2 A, V _{GS} = 0 V | — | — | -1.5 | V |
| Reverse Recovery Time | t _{rr} | I _{DR} = 2 A, V _{GS} = 0 V | — | 75 | — | nS |
| Reverse Recovery Charge | Q _{rr} | dI _{DR} /dt = 50 A/μs | — | 75 | — | μC |

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