

Field Effect Transistor**Silicon N Channel MOS Type (L²-π-MOS III)****High Speed, High Current DC-DC Converter,****Relay Drive and Motor Drive Applications****Features**

- 4-Volt Gate Drive
- Low Drain-Source ON Resistance
 - $R_{DS(ON)} = 0.4\Omega$ (Typ.)
- High Forward Transfer Admittance
 - $|Y_{fs}| = 0.75S$ (Typ.)
- Low Leakage Current
 - $I_{GSS} = \pm 3\mu A$ (Max.) @ $V_{GS} = \pm 16V$
 - $I_{DSS} = 100\mu A$ (Max.) @ $V_{DS} = 60V$
- Enhancement-Mode
 - $V_{th} = -0.8 \sim -2.0V$ @ $V_{DS} = 10V, I_D = 1mA$

Absolute Maximum Ratings (Ta = 25°C)

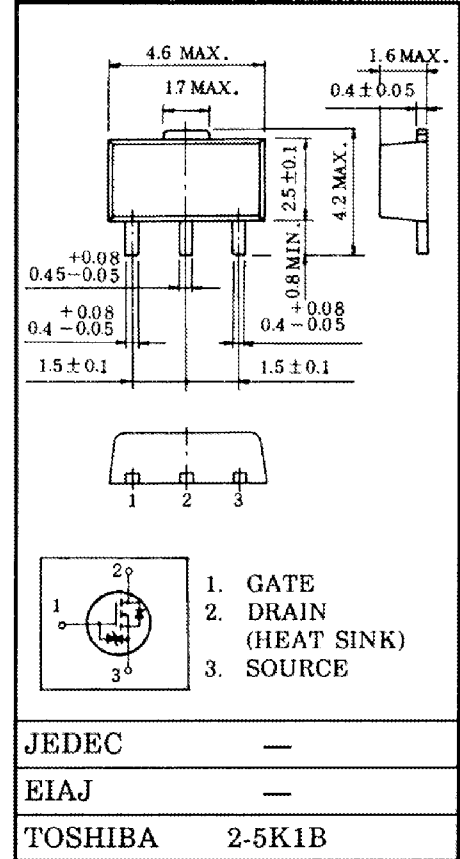
| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|---|-------|-----------|-----------|------|
| Drain-Source Voltage | | V_{DSS} | 60 | V |
| Drain-Gate Voltage ($R_{GS} = 20k\Omega$) | | V_{DGR} | 60 | V |
| Gate-Source Voltage | | V_{GSS} | ± 20 | V |
| Drain Current | DC | I_D | 0.8 | A |
| | Pulse | I_{DP} | 2.4 | |
| Drain Power Dissipation (Ta = 25°C) | | P_D | 0.5 | W |
| Drain Power Dissipation | | P_D^* | 1.0 | W |
| Channel Temperature | | T_{ch} | 150 | °C |
| Storage Temperature Range | | T_{stg} | -55 ~ 150 | °C |

P_D^* : 2SK1078 mounted on ceramic substrate (250 mm² x 0.8t)

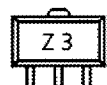
Thermal Characteristics

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

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

Industrial Applications Unit in mm

Weight : 0.05g

Marking

Electrical Characteristics (Ta = 25°C)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---------------|---------------|---|------|------|----------|----------|
| Gate Leakage Current | | I_{GSS} | $V_{GS} = \pm 16V, V_{DS} = 0V$ | - | - | ± 10 | μA |
| Drain Cut-off Current | | I_{DSS} | $V_{DS} = 60V, V_{GS} = 0V$ | - | - | 100 | μA |
| Drain-Source Breakdown Voltage | | $V_{(BR)DSS}$ | $I_D = 10mA, V_{GS} = 0V$ | 60 | - | - | V |
| Gate Threshold Voltage | | V_{th} | $V_{DS} = 10V, I_D = -1mA$ | 0.8 | - | -2.0 | V |
| ON State Drain Current | | $I_D(ON)$ | $V_{DS} = 4V, V_{GS} = 4V$ | 0.8 | - | - | A |
| Drain-Source ON Resistance | | $R_{DS(ON)}$ | $V_{GS} = 4V, I_{DS} = 0.4A$ | - | 0.75 | 1.1 | Ω |
| | | | $V_{GS} = 10V, I_{DS} = 0.4A$ | - | 0.40 | 0.55 | |
| Forward Transfer Admittance | | $ Y_{fs} $ | $V_{DS} = 10V, I_{DS} = 0.4A$ | 0.50 | 0.75 | - | S |
| Input Capacitance | | C_{iss} | $V_{DS} = 10V, V_{GS} = 0V,$ $f = 1MHz$ | - | 95 | 140 | pF |
| Reverse Transfer Capacitance | | C_{rss} | | - | 25 | 50 | |
| Output Capacitance | | C_{oss} | | - | 60 | 110 | |
| Switching Time | Rise Time | t_r | <p>$I_D = 0.4A$ $R_L = 75\Omega$ $V_{IN}: t_r, t_f < 5ns, V_{DD} = 30V$ Duty $\leq 1\%, t_w = 10\mu s$</p> | - | 4 | 15 | ns |
| | Turn-on Time | t_{on} | | - | 9 | 25 | |
| | Fall Time | t_f | | - | 25 | 60 | |
| | Turn-off Time | t_{off} | | - | 55 | 120 | |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | | Q_g | $V_{DD} = 48V, V_{GS} = 10V,$ $I_D = 0.8A$ | - | 5.2 | 10 | nC |
| Gate-Source Charge | | Q_{gs} | | - | 3.5 | - | |
| Gate-Drain ("Miller") Charge | | Q_{gd} | | - | 1.7 | - | |

Source-Drain Diode Ratings and Characteristics (Ta = 25°C)

| CHARACTERISTICS | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|----------------------------------|-----------|------------------------------|------|------|------|------|
| Continuous Drain Reverse Current | I_{DR} | - | - | - | 0.8 | A |
| Pulse Drain Reverse Current | I_{DRP} | - | - | - | 2.4 | A |
| Diode Forward Voltage | V_{DSF} | $I_{DR} = 0.8A, V_{GS} = 0V$ | - | -0.9 | -1.5 | V |
| Reverse Recovery Time | t_{rr} | $I_{DR} = 0.8A, V_{GS} = 0V$ | - | 90 | - | ns |
| Reverse Recovered Charge | Q_{rr-} | $dI_{DR}/dt = 20A/\mu s$ | - | 35 | - | nC |

