

TOSHIBA POWER TRANSISTOR MODULE SILICON PNP TRIPLE DIFFUSED TYPE (DARLINGTON POWER TRANSISTOR 4 IN 1)

MP4508

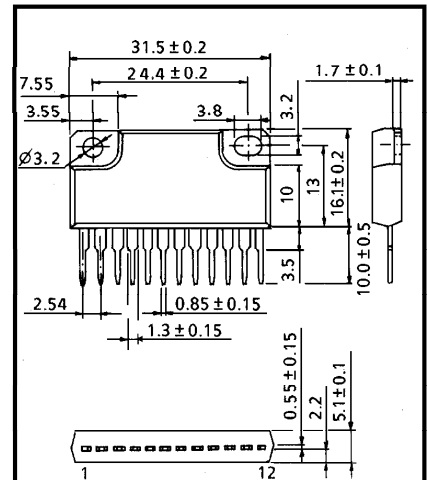
HIGH POWER SWITCHING APPLICATIONS.

HAMMER DRIVE, PULSE MOTOR DRIVE AND INDUCTIVE LOAD SWITCHING.

INDUSTRIAL APPLICATIONS

Unit in mm

- Package with Heat Sink Isolated to Lead (SIP 12 Pin)
- High Collector Power Dissipation (4 Devices Operation)
: $P_T = 5W$ ($T_a = 25^\circ C$)
- High Collector Current : I_C (DC) = -5A (Max.)
- High DC Current Gain : $h_{FE} = 1000$ (Min.)
($V_{CE} = -3V, I_C = -3A$)



- 1, 5, 8, 12 BASE
- 2, 4, 9, 11 COLLECTOR
- 3, 6, 7, 10 EMITTER

| | |
|---------|---------|
| JEDEC | — |
| EIAJ | — |
| TOSHIBA | 2-32B1B |

Weight : 6.0g

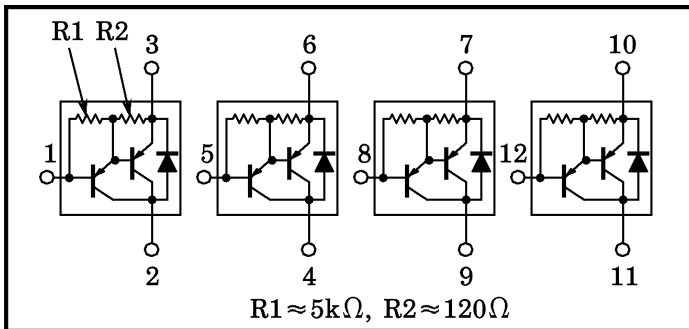
MAXIMUM RATINGS ($T_a = 25^\circ C$)

| CHARACTERISTIC | | SYMBOL | RATING | UNIT |
|---|--------------------|------------|---------|------------|
| Collector-Base Voltage | | V_{CBO} | -100 | V |
| Collector-Emitter Voltage | | V_{CEO} | -100 | V |
| Emitter-Base Voltage | | V_{EBO} | -5 | V |
| Collector Current | DC | I_C | -5 | A |
| | Pulse | I_{CP} | -8 | |
| Continuous Base Current | | I_B | -0.1 | A |
| Collector Power Dissipation (1 Device Operation) | | P_C | 3.0 | W |
| Collector Power Dissipation (4 Devices Operation) | $T_a = 25^\circ C$ | P_T | 5.0 | W |
| | $T_c = 25^\circ C$ | | 25 | |
| Isolation Voltage | | V_{Isol} | 1000 | V |
| Junction Temperature | | T_j | 150 | $^\circ C$ |
| Storage Temperature Range | | T_{stg} | -55~150 | $^\circ C$ |

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ARRAY CONFIGURATION



THERMAL CHARACTERISTICS

| CHARACTERISTIC | SYMBOL | MAX. | UNIT |
|---|----------------------|------|-----------------------------|
| Thermal Resistance of Junction to Ambient (4 Devices Operation, $T_a = 25^\circ\text{C}$) | $\Sigma R_{th(j-a)}$ | 25 | $^\circ\text{C} / \text{W}$ |
| Thermal Resistance of Junction to Case (4 Devices Operation, $T_c = 25^\circ\text{C}$) | $\Sigma R_{th(j-c)}$ | 5.0 | $^\circ\text{C} / \text{W}$ |
| Maximum Lead Temperature for Soldering Purposes (3.2mm from Case for 10s) | T_L | 260 | $^\circ\text{C}$ |

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

| CHARACTERISTIC | | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-------------------------------------|-------------------|---------------|--|---|------|------|---------------|
| Collector Cut-off Current | | I_{CBO} | $V_{CB} = -100\text{V}, I_E = 0$ | — | — | -10 | μA |
| Collector Cut-off Current | | I_{CEO} | $V_{CE} = -100\text{V}, I_B = 0$ | — | — | -10 | μA |
| Emitter Cut-off Current | | I_{EBO} | $V_{EB} = -5\text{V}, I_C = 0$ | -0.3 | — | -2.0 | mA |
| Collector-Base Breakdown Voltage | | $V_{(BR)CBO}$ | $I_C = -1\text{mA}, I_E = 0$ | -100 | — | — | V |
| Collector-Emitter Breakdown Voltage | | $V_{(BR)CEO}$ | $I_C = -30\text{mA}, I_B = 0$ | -100 | — | — | V |
| DC Current Gain | | $h_{FE(1)}$ | $V_{CE} = -3\text{V}, I_C = -0.5\text{A}$ | 1000 | — | — | |
| | | $h_{FE(2)}$ | $V_{CE} = -3\text{V}, I_C = -3\text{A}$ | 1000 | — | — | |
| Saturation Voltage | Collector-Emitter | $V_{CE(sat)}$ | $I_C = -3\text{A}, I_B = -12\text{mA}$ | — | — | -2.0 | V |
| | Base-Emitter | $V_{BE(sat)}$ | $I_C = -3\text{A}, I_B = -12\text{mA}$ | — | — | -2.5 | |
| Transition Frequency | | f_T | $V_{CE} = -3\text{V}, I_C = -0.5\text{A}$ | 3 | — | — | MHz |
| Collector Output Capacitance | | C_{ob} | $V_{CB} = -50\text{V}, I_E = 0, f = 1\text{MHz}$ | — | 40 | — | pF |
| Switching Time | Turn-on Time | t_{on} | <p style="text-align: center;">$V_{CC} = -30\text{V}$</p> | — | 0.5 | — | μs |
| | Storage Time | t_{stg} | | — | 3.0 | — | |
| | Fall Time | t_f | | <p style="text-align: center;">$-I_{B1} = I_{B2} = 12\text{mA}$ DUTY CYCLE $\leq 1\%$</p> | — | 2.0 | |

EMITTER-COLLECTOR DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|-------------------------|-----------|---------------------------|------|------|------|---------|
| Forward Current | I_{FM} | — | — | — | 5 | A |
| Surge Current | I_{FSM} | t = 1s, 1 shot | — | — | 8 | A |
| Forward Voltage | V_F | $I_F = 1A, I_B = 0$ | — | — | 2.0 | V |
| Reverse Recovery Time | t_{rr} | $I_F = 5A, V_{BE} = 3V,$ | — | 1.0 | — | μs |
| Reverse Recovery Charge | Q_{rr} | $dI_F / dt = 50A / \mu s$ | — | 8 | — | μC |

