

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

# MP4508

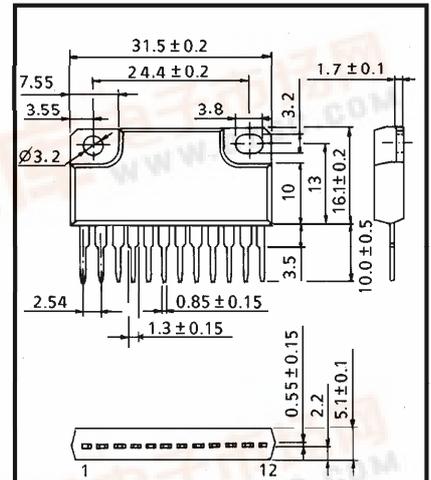
HIGH POWER SWITCHING APPLICATIONS.

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 ( $T_a = 25^\circ C$ )

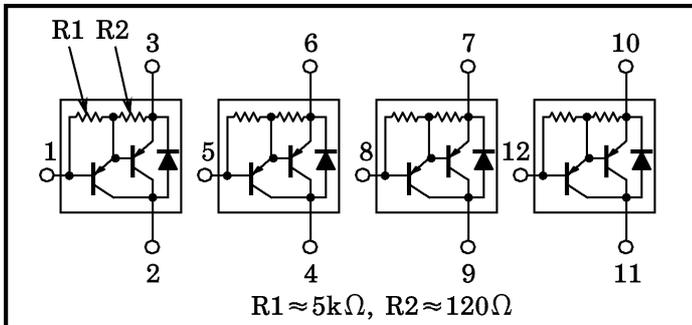
CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		$V_{CBO}$	-100	V
Collector-Emitter Voltage		$V_{CEO}$	-100	V
Emitter-Base Voltage		$V_{EBO}$	-5	V
Collector Current	DC	$I_C$	-5	A
	Pulse	$I_{CP}$	-8	
Continuous Base Current		$I_B$	-0.1	A
Collector Power Dissipation (1 Device Operation)		$P_C$	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	$\mu\text{A}$	
Collector Cut-off Current	$I_{CEO}$	$V_{CE} = -100\text{V}, I_B = 0$	—	—	-10	$\mu\text{A}$	
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	$t_{on}$		—	0.5	—	$\mu\text{s}$
	Storage Time	$t_{stg}$		—	3.0	—	
	Fall Time	$t_f$		—	—	2.0	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Forward Current	I <sub>FM</sub>	—	—	—	5	A
Surge Current	I <sub>FSM</sub>	t = 1s, 1 shot	—	—	8	A
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 1A, I <sub>B</sub> = 0	—	—	2.0	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 5A, V <sub>BE</sub> = 3V,	—	1.0	—	μs
Reverse Recovery Charge	Q <sub>rr</sub>	dI <sub>F</sub> / dt = 50A / μs	—	8	—	μC

