

TOSHIBA POWER TRANSISTOR MODULE SILICON NPN EPITAXIAL TYPE (DARLINGTON POWER TRANSISTOR 4 IN 1)

MP4501

HIGH POWER SWITCHING APPLICATIONS.

HAMMER DRIVE, PULSE MOTOR DRIVE AND INDUCTIVE LOAD SWITCHING.

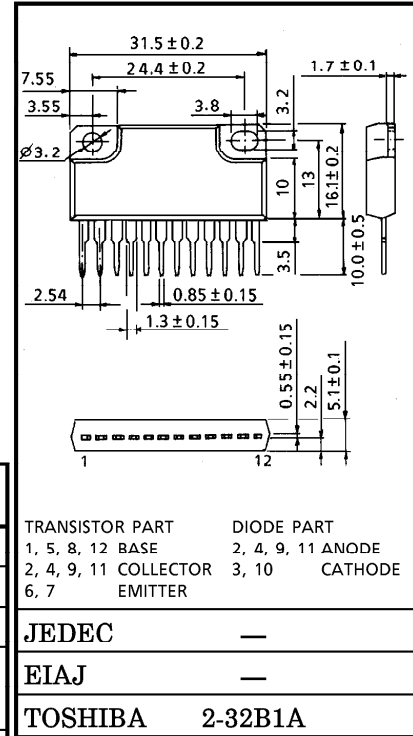
- Package with Heat Sink Isolated to Lead (SIP 12 Pin)
- High Collector Power Dissipation (4 Devices Operation)
: $P_T = 5W$ ($T_a = 25^\circ C$)
- High Collector Current : I_C (DC) = 3A (Max.)
- High DC Current Gain : $h_{FE} = 2000$ (Min.) ($V_{CE} = 2V$, $I_C = 1.5A$)
- Diode Included for Absorbing Fly-Back Voltage.

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	120	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	DC	I_C	3
	Pulse	I_{CP}	6
Continuous Base Current	I_B	0.5	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
	$T_c = 25^\circ C$		25
Isolation Voltage	V_{Isol}	1000	$^\circ C$
Junction Temperature	T_j	150	$^\circ C$
Storage Temperature Range	T_{stg}	-55~150	$^\circ C$

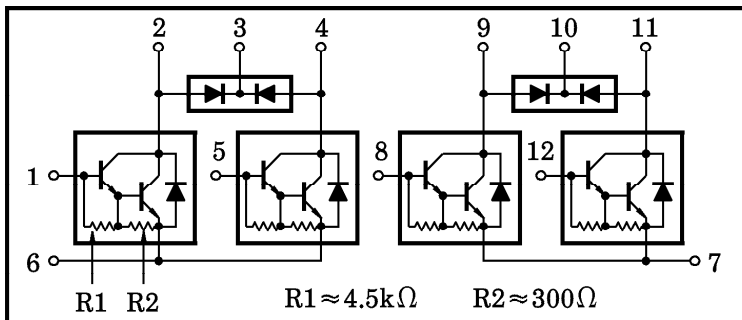
INDUSTRIAL APPLICATIONS

Unit in mm



Weight : 6.0g

ARRAY CONFIGURATION



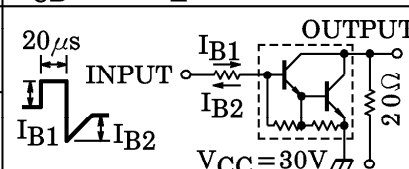
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THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance of Junction to Ambient (4 Devices Operation, Ta=25°C)	$\Sigma R_{th(j-a)}$	25	°C / W
Thermal Resistance of Junction to Case (4 Devices Operation, Tc=25°C)	$\Sigma R_{th(j-e)}$	5.0	°C / W
Maximum Lead Temperature for Soldering Purposes (3.2mm from Case for 10s)	T _L	260	°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		I _{CBO}	V _{CB} = 120V, I _E = 0	—	—	10	μA
Collector Cut-off Current		I _{CEO}	V _{CE} = 100V, I _B = 0	—	—	10	μA
Emitter Cut-off Current		I _{EBO}	V _{EB} = 6V, I _C = 0	0.5	—	2.5	mA
Collector-Base Breakdown Voltage		V _{(BR) CBO}	I _C = 1mA, I _E = 0	120	—	—	V
Collector-Emitter Breakdown Voltage		V _{(BR) CEO}	I _C = 10mA, I _B = 0	100	—	—	V
DC Current Gain		h _{FE} (1)	V _{CE} = 2V, I _C = 1.5A	2000	—	15000	
		h _{FE} (2)	V _{CE} = 2V, I _C = 3A	1000	—	—	
Saturation Voltage	Collector-Emitter	V _{CE(sat)}	I _C = 1.5A, I _B = 3mA	—	—	1.5	V
	Base-Emitter	V _{BE(sat)}	I _C = 1.5A, I _B = 3mA	—	—	2.0	
Transition Frequency		f _T	V _{CE} = 2V, I _C = 0.5A	—	60	—	MHz
Collector Output Capacitance		C _{ob}	V _{CB} = 10V, I _E = 0, f = 1MHz	—	30	—	pF
Switching Time	Turn-on Time	t _{on}	 <p> $I_{B1} = -I_{B2} = 3mA,$ DUTY CYCLE $\leq 1\%$ </p>	—	0.3	—	μs
	Storage Time	t _{stg}		—	2.0	—	
	Fall Time	t _f		—	0.4	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Maximum Forward Current	I_{FM}	—	—	—	3	A
Surge Current	I_{FSM}	t = 1s, 1 shot	—	—	6	A
Forward Voltage	V_F	$I_F = 1A, I_B = 0$	—	1.2	1.8	V
Reverse Recovery Time	t_{rr}	$I_F = 3A, V_{BE} = -3V,$ $dI_F / dt = -50A / \mu s$	—	1.0	—	μs
Reverse Recovery Charge	Q_{rr}		—	5	—	μC

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Maximum Forward Current	I_{FM}	—	—	—	3	A
Reverse Current	I_R	$V_R = 120V$	—	—	0.4	μA
Reverse Voltage	V_R	$I_R = 100 \mu A$	120	—	—	V
Forward Voltage	V_F	$I_F = 0.5A$	—	—	1.8	V

