

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

MP4020

HIGH POWER SWITCHING APPLICATIONS.

HAMMER DRIVE, PULSE MOTOR DRIVE AND INDUCTIVE
LOAD SWITCHING.

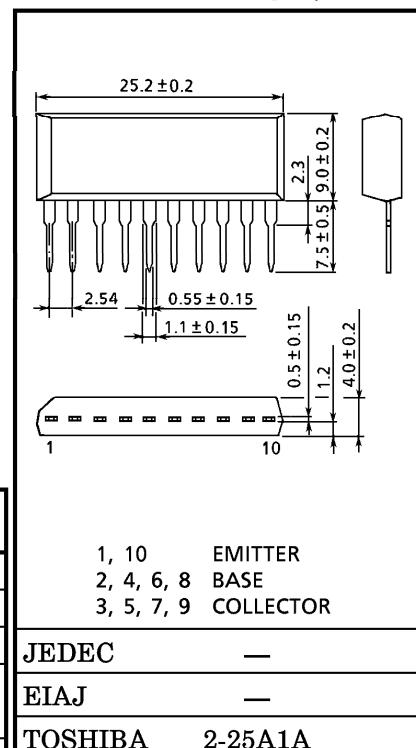
- Small Package by Full Molding (SIP 10 Pin)
- High Collector Power Dissipation (4 Devices Operation) : $P_T = 4W$ ($T_a = 25^\circ C$)
- High Collector Current : $I_C(DC) = 2A$ (Max.)
- High DC Current Gain : $h_{FE} = 2000$ (Min.) ($V_{CE} = 2V$, $I_C = 1A$)
- Zener Diode Included Between Collector and Base.

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	60 ± 10	V
Emitter-Base Voltage	V_{EBO}	8	V
Collector Current	DC	I_C	A
	Pulse	I_{CP}	
Continuous Base Current	I_B	0.5	A
Collector Power Dissipation (1 Device Operation)	P_C	2.0	W
Collector Power Dissipation (4 Devices Operation)	P_T	4.0	W
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	$-55 \sim 150$	°C

INDUSTRIAL APPLICATIONS

Unit in mm



1, 10 Emitter
2, 4, 6, 8 Base
3, 5, 7, 9 Collector

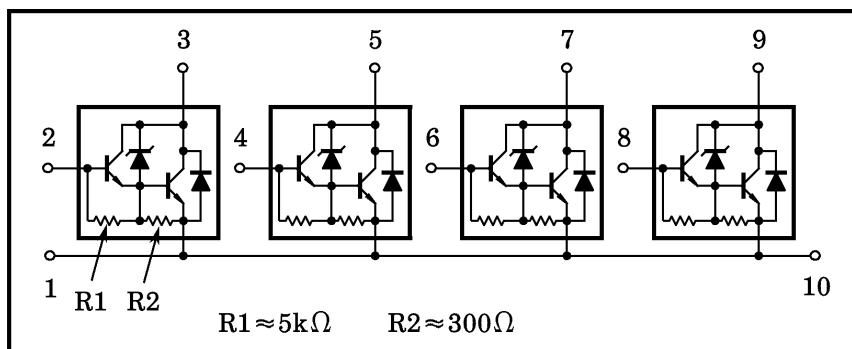
JEDEC —

EIAJ —

TOSHIBA 2-25A1A

Weight : 2.1g

ARRAY CONFIGURATION



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THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance of Junction to Ambient (4 Devices Operation, $T_a = 25^\circ\text{C}$)	$\Sigma R_{\text{th}} (\text{j-a})$	31.3	$^\circ\text{C} / \text{W}$
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}	$V_{\text{CB}} = 45\text{V}, I_{\text{E}} = 0$	—	—	10	μA	
Collector Cut-off Current	I_{CEO}	$V_{\text{CE}} = 45\text{V}, I_{\text{B}} = 0$	—	—	10	μA	
Emitter Cut-off Current	I_{EBO}	$V_{\text{EB}} = 8\text{V}, I_{\text{C}} = 0$	0.8	—	4.0	mA	
Collector-Emitter Breakdown Voltage	$V_{(\text{BR})\text{CEO}}$	$I_{\text{C}} = 10\text{mA}, I_{\text{B}} = 0$	50	60	70	V	
DC Current Gain	h_{FE}	$V_{\text{CE}} = 2\text{V}, I_{\text{C}} = 1\text{A}$	2000	—	—		
Saturation Voltage	Collector-Emitter	$V_{\text{CE}}(\text{sat})$	$I_{\text{C}} = 1\text{A}, I_{\text{B}} = 1\text{mA}$	—	—	1.5	
	Base-Emitter	$V_{\text{BE}}(\text{sat})$	$I_{\text{C}} = 1\text{A}, I_{\text{B}} = 1\text{mA}$	—	—	2.0	
Transition Frequency	f_T	$V_{\text{CE}} = 2\text{V}, I_{\text{C}} = 0.5\text{A}$	—	100	—	MHz	
Collector Output Capacitance	C_{ob}	$V_{\text{CB}} = 10\text{V}, I_{\text{E}} = 0, f = 1\text{MHz}$	—	20	—	pF	
Switching Time	Turn-on Time	t_{on}			—	0.4	—
	Storage Time	t_{stg}			—	4.0	—
	Fall Time	t_f			—	0.6	—

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