

TOSHIBA Power Transistor Module Silicon NPN Epitaxial Type  
(darlington power transistor 4 in 1)

# MP4025

High Power Switching Applications  
Hammer Drive, Pulse Motor Drive and Inductive  
Load Switching

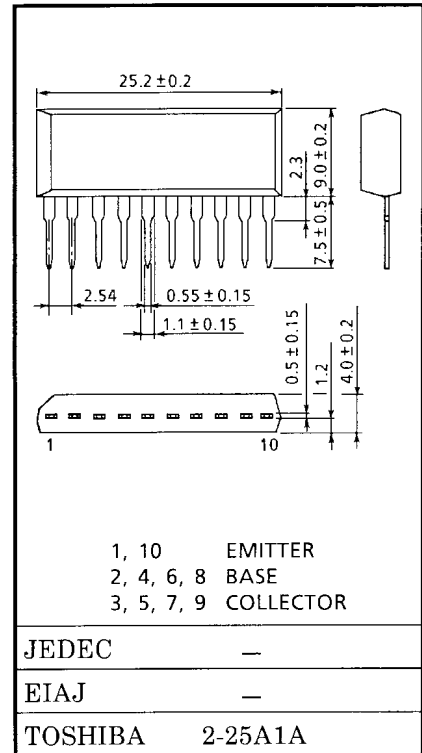
- Small package by full molding (SIP 10 pin)
- Built-in resistance ( $R_B$ ).
- Surge voltage is clamped by zener diode (C-B).
- Low  $V_{CE(sat)}$ :  $V_{CE(sat)} = 1.2\text{ V (max)}$  ( $I_C = 0.5\text{ A}$ ,  $V_{BH} = 4.2\text{ V}$ )
- High DC current gain:  $h_{FE} = 2000\text{ (min)}$  ( $V_{CE} = 2\text{ V}$ ,  $I_C = 0.7\text{ A}$ )

### Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

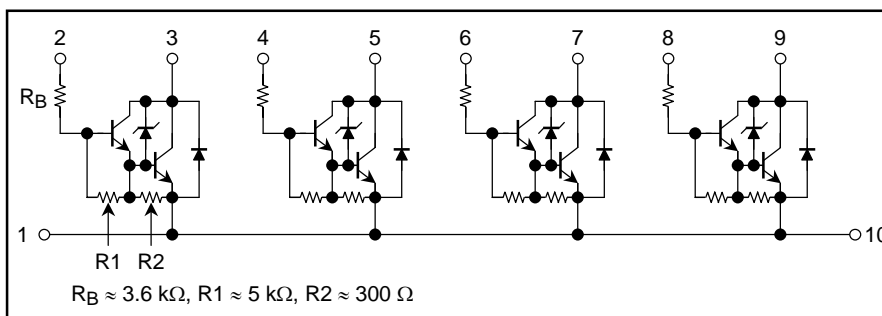
Characteristic	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	50	V
Collector-emitter voltage	$V_{CEO}$	$60 \pm 10$	V
Emitter-base voltage	$V_{EBO}$	6	V
Input voltage	$V_B$	20	V
Collector current	DC	$I_C$	1.5
	Pulse	$I_{CP}$	2.0
Collector power dissipation (1 device operation)	$P_C$	2.0	W
Collector power dissipation (4 devices operation)	$P_T$	4.0	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-55~150	$^\circ\text{C}$

### INDUSTRIAL APPLICATIONS

Unit in mm



### Array Configuration



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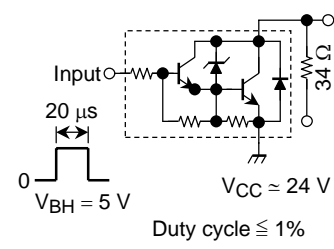
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**Thermal Characteristics**

Characteristic	Symbol	Max	Unit
Thermal resistance of junction to ambient (4 devices operation, $T_a = 25^\circ\text{C}$ )	$\Sigma R_{th(j-a)}$	31.3	$^\circ\text{C/W}$
Maximum lead temperature for soldering purposes (3.2 mm from case for 10 s)	$T_L$	260	$^\circ\text{C}$

**Electrical Characteristics ( $T_a = 25^\circ\text{C}$ )**

Characteristic		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		$I_{CBO}$	$V_{CB} = 45\text{ V}, I_E = 0$	—	—	10	$\mu\text{A}$
Collector cut-off current		$I_{CEO}$	$V_{CE} = 45\text{ V}, I_B = 0$	—	—	10	$\mu\text{A}$
Emitter cut-off current		$I_{EBO}$	$V_{EB} = 6\text{ V}, I_C = 0$	0.46	—	1.25	mA
Collector-emitter breakdown voltage		$V_{(BR)CEO}$	$I_C = 10\text{ mA}, I_B = 0$	50	60	70	V
Resistance		$R_B$	—	2.5	3.6	4.7	$\text{k}\Omega$
DC current gain		$h_{FE}$	$V_{CE} = 2\text{ V}, I_C = 0.7\text{ A}$	2000	—	—	—
Collector-emitter saturation voltage		$V_{CE(sat)(1)}$	$I_C = 0.5\text{ A}, V_{BH} = 4.2\text{ V}$	—	—	1.2	V
		$V_{CE(sat)(2)}$	$I_C = 0.7\text{ A}, V_{BH} = 9\text{ V}$	—	—	1.5	
Input voltage (low)		$V_{BL}$	$V_{CE} = 30\text{ V}, I_C = 100\ \mu\text{A}$	—	—	0.7	V
Switching time	Turn-on time	$t_{on}$		—	0.3	—	$\mu\text{s}$
	Storage time	$t_{stg}$		—	4.0	—	
	Fall time	$t_f$		—	—	0.6	

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