

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

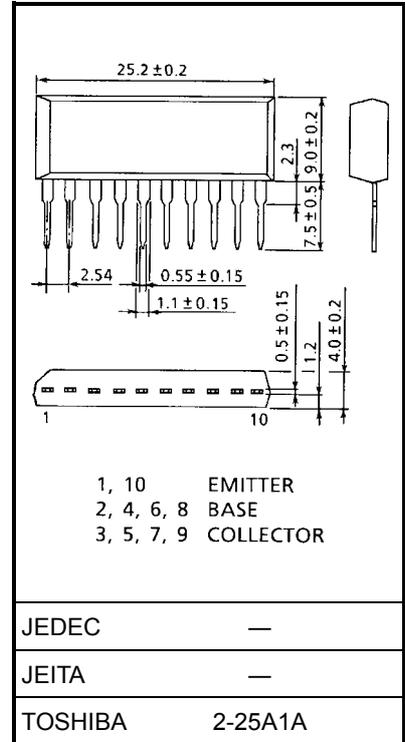
- Small package by full molding (SIP 10 pin)
- Built-in resistance (R_B).
- Surge voltage is clamped by zener diode (C-B).
- Low $V_{CE(sat)}$: $V_{CE(sat)} = 1.2 \text{ V (max)}$ ($I_C = 0.5 \text{ A}$, $V_{BH} = 4.2 \text{ V}$)
- High DC current gain: $h_{FE} = 2000 \text{ (min)}$ ($V_{CE} = 2 \text{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

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

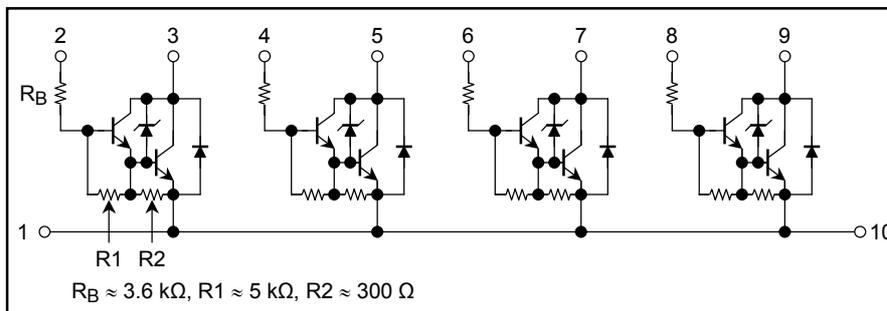
Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	50	V
Collector-emitter voltage	V_{CEO}	60 ± 10	V
Emitter-base voltage	V_{EBO}	6	V
Input voltage	V_B	20	V
Collector current	DC	I_C	A
	Pulse	I_{CP}	
Collector power dissipation (1 device operation)	P_C	2.0	W
Collector power dissipation (4 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: mm



Array Configuration



Thermal Characteristics

Characteristic	Symbol	Max	Unit
Thermal resistance of junction to ambient (4 devices operation, $T_a = 25^\circ\text{C}$)	$\Sigma R_{th(j-a)}$	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	μA
Collector cut-off current		I_{CEO}	$V_{CE} = 45\text{ V}, I_B = 0$	—	—	10	μA
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}	<p>Input $20\ \mu\text{s}$ $V_{BH} = 5\text{ V}$ $V_{CE} \approx 24\text{ V}$ Duty cycle $\leq 1\%$</p>	—	0.3	—	μs
	Storage time	t_{stg}		—	4.0	—	
	Fall time	t_f		—	0.6	—	

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