

TOSHIBA Power Transistor Module  
Silicon PNP Triple Diffused Type (Four Darlingtons Power Transistors in One)

# MP4009

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

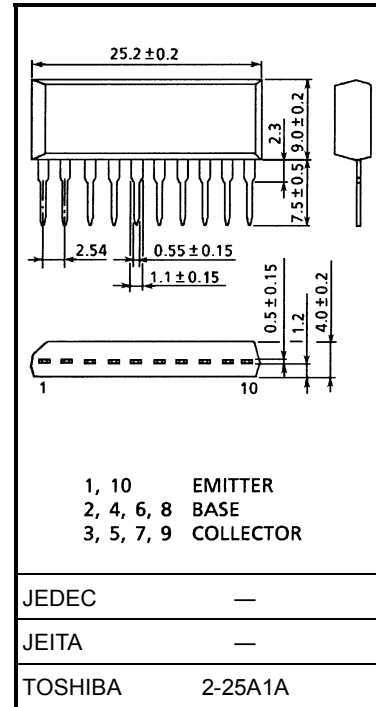
- Small package by full molding (SIP 10 pins)
- High collector power dissipation (4-device operation)  
:  $P_T = 4\text{ W}$  ( $T_a = 25^\circ\text{C}$ )
- High collector current:  $I_C(\text{DC}) = -5\text{ A}$  (max)
- High DC current gain:  $h_{FE} = 1000$  (min) ( $V_{CE} = -3\text{ V}$ ,  $I_C = -3\text{ A}$ )
- Complementary to MP4003

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

Characteristics		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)		$P_C$	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 to 150	$^\circ\text{C}$

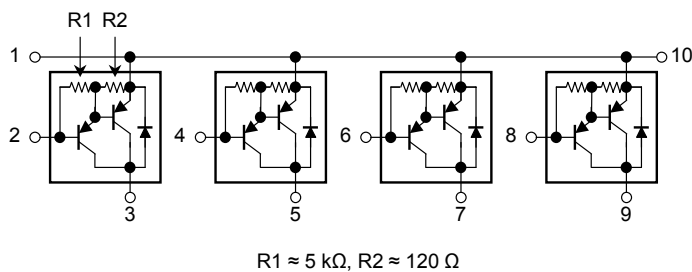
Industrial Applications

Unit: mm



Weight: 2.1 g (typ.)

### Array Configuration



## Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance from junction to ambient (4-device 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 ( $T_a = 25^\circ\text{C}$ )

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		$I_{CBO}$	$V_{CB} = -100\text{ V}, I_E = 0\text{ A}$	—	—	-10	$\mu\text{A}$
Collector cut-off current		$I_{CEO}$	$V_{CE} = -100\text{ V}, I_B = 0\text{ A}$	—	—	-10	$\mu\text{A}$
Emitter cut-off current		$I_{EBO}$	$V_{EB} = -5\text{ V}, I_C = 0\text{ A}$	-0.3	—	-2.0	mA
Collector-base breakdown voltage		$V_{(BR)CBO}$	$I_C = -1\text{ mA}, I_E = 0\text{ A}$	-100	—	—	V
Collector-emitter breakdown voltage		$V_{(BR)CEO}$	$I_C = -30\text{ mA}, I_B = 0\text{ A}$	-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		$C_{ob}$	$V_{CB} = 50\text{ V}, I_E = 0\text{ A}, f = 1\text{ MHz}$	—	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	
			$-I_{B1} = I_{B2} = 12\text{ mA}, \text{duty cycle} \leq 1\%$				

## Marking

