

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

# MP4101

HIGH POWER SWITCHING APPLICATIONS.

HAMMER DRIVE, PULSE MOTOR DRIVE.

INDUCTIVE LOAD SWITCHING.

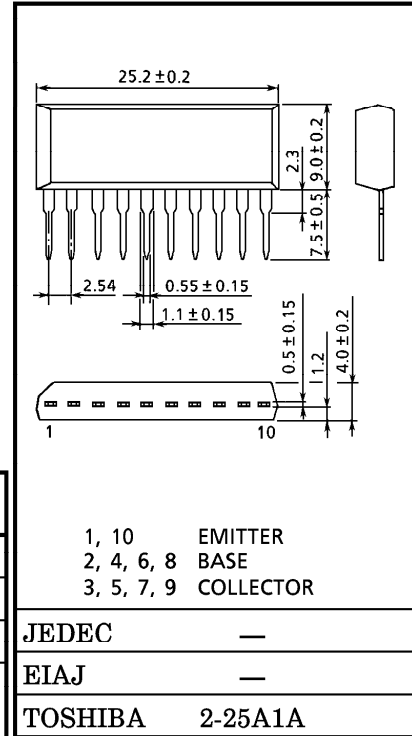
- Small Package by Full Molding (SIP 10 Pin)
- High Collector Power Dissipation (4 Devices Operation)  
:  $P_T = 4W$  ( $T_a = 25^\circ C$ )
- High Collector Current :  $I_C$  (DC) = 4A (Max.)
- High DC Current Gain :  $h_{FE} = 2000$  (Min.) ( $V_{CE} = 2V$ ,  $I_C = 1A$ )
- Zener Diode Included Between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

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		$V_{CBO}$	$60 \pm 10$	V
Collector-Emitter Voltage		$V_{CEO}$	$60 \pm 10$	V
Emitter-Base Voltage		$V_{EBO}$	6	V
Collector Current	DC	$I_C$	4	A
	Pulse	$I_{CP}$	6	
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	$^\circ C$
Storage Temperature Range		$T_{stg}$	$-55 \sim 150$	$^\circ C$

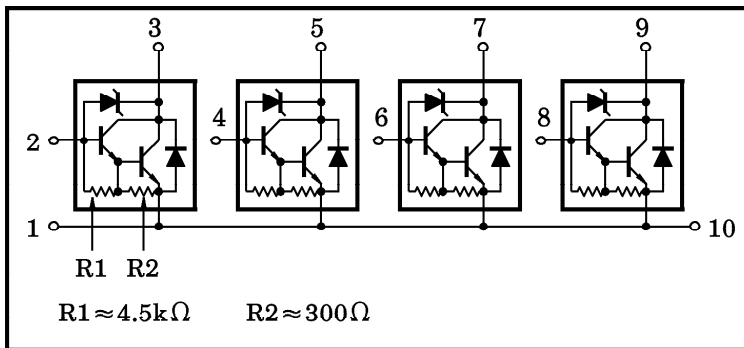
**INDUSTRIAL APPLICATIONS**

Unit in mm



Weight : 2.1g

**ARRAY CONFIGURATION**



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**THERMAL CHARACTERISTICS**

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance of Junction to Ambient (4 Devices Operation, Ta=25°C)	$\Sigma R_{th(j-a)}$	31.3	°C / W
Maximum Lead Temperature for Soldering Purposes (3.2mm from Case for 10s)	T <sub>L</sub>	260	°C

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Collector Cut-off Current	I <sub>CBO</sub>	V <sub>CB</sub> =45V, I <sub>E</sub> =0	—	—	10	μA	
Collector Cut-off Current	I <sub>CEO</sub>	V <sub>CE</sub> =45V, I <sub>B</sub> =0	—	—	10	μA	
Emitter Cut-off Current	I <sub>EBO</sub>	V <sub>EB</sub> =6V, I <sub>C</sub> =0	0.6	—	20	mA	
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> =10mA, I <sub>E</sub> =0	50	60	70	V	
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> =10mA, I <sub>B</sub> =0	50	60	70	V	
DC Current Gain	h <sub>FE</sub> (1)	V <sub>CE</sub> =2V, I <sub>C</sub> =1A	2000	—	15000		
	h <sub>FE</sub> (2)	V <sub>CE</sub> =2V, I <sub>C</sub> =3A	1000	—	—		
Saturation Voltage	Collector-Emitter	V <sub>CE(sat)</sub>	I <sub>C</sub> =3A, I <sub>B</sub> =10mA	—	—	1.5	V
	Base-Emitter	V <sub>BE(sat)</sub>	I <sub>C</sub> =3A, I <sub>B</sub> =10mA	—	—	2.0	
Transition Frequency	f <sub>T</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =0.5A	—	60	—	MHz	
Collector Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, I <sub>E</sub> =0A, f=1MHz	—	30	—	pF	
Switching Time	Turn-on Time	t <sub>on</sub>		—	0.2	—	μs
	Storage Time	t <sub>stg</sub>		—	3.0	—	
	Fall Time	t <sub>f</sub>		I <sub>B1</sub> = -I <sub>B2</sub> = 10mA, DUTY CYCLE ≤ 1%	—	0.5	

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