

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

# MP4024

HIGH POWER SWITCHING APPLICATIONS.

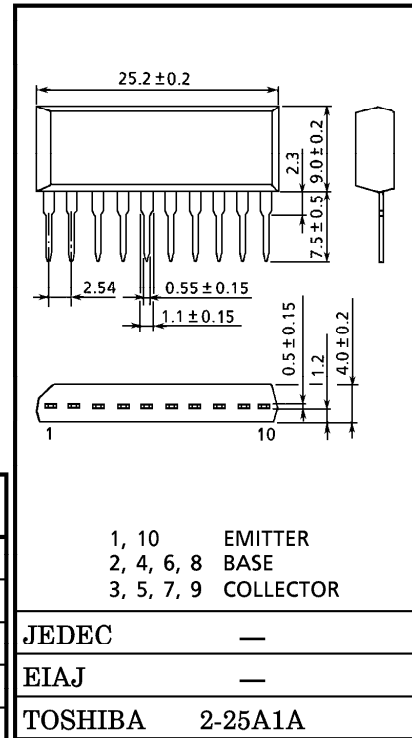
HAMMER DRIVE, PULSE MOTOR DRIVE AND INDUCTIVE

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  $V_{CE(sat)}$  :  $V_{CE(sat)} = 1.5V$  (Max.) ( $I_C = 1A$ ,  $V_{BH} = 4.2V$ )
- High DC Current Gain :  $h_{FE} = 2000$  (Min.) ( $V_{CE} = 2V$ ,  $I_C = 1A$ )

INDUSTRIAL APPLICATIONS

Unit in mm

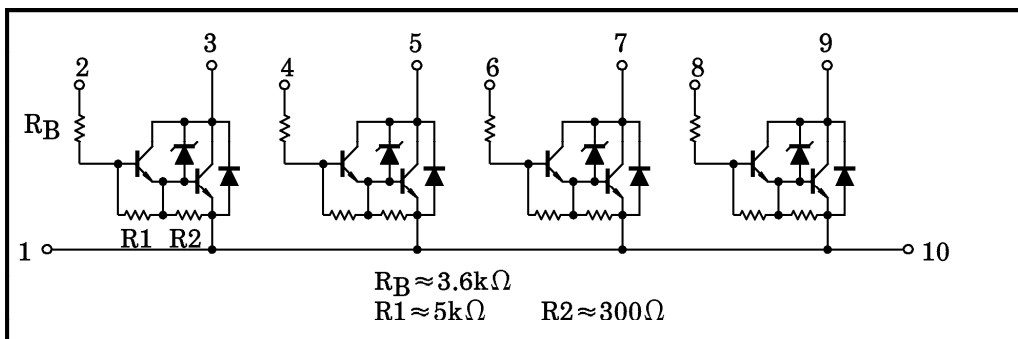


Weight : 2.1g

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector-Base Voltage		$V_{CB0}$	85	V
Collector-Emitter Voltage		$V_{CEO}$	$100 \pm 15$	V
Emitter-Base Voltage		$V_{EB0}$	6	V
Input Voltage		$V_B$	20	V
Collector Current	DC	$I_C$	3	A
	Pulse	$I_{CP}$	4	
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		$T_{stg}$	$-55 \sim 150$	$^\circ C$

ARRAY CONFIGURATION



961001EAA2

● TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

**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>CB0</sub>	V <sub>CB</sub> = 80V, I <sub>E</sub> = 0	—	—	10	μA	
Collector Cut-off Current	I <sub>CEO</sub>	V <sub>CE</sub> = 80V, 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	0.3	—	1.5	mA	
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> = 10mA, I <sub>B</sub> = 0	85	100	115	V	
Resistance	R <sub>B</sub>	—	2.5	3.6	4.7	kΩ	
DC Current Gain	h <sub>FE</sub> (1)	V <sub>CE</sub> = 2V, I <sub>C</sub> = 1A	2000	—	—		
	h <sub>FE</sub> (2)	V <sub>CE</sub> = 2V, I <sub>C</sub> = 2A	1000	—	—		
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub> (1)	I <sub>C</sub> = 1A, V <sub>BH</sub> = 4.2V	—	—	1.5	V	
	V <sub>CE(sat)</sub> (2)	I <sub>C</sub> = 1.5A, V <sub>BH</sub> = 9V	—	—	1.5		
Input Voltage (Low)	V <sub>BL</sub>	V <sub>CE</sub> = 50V, I <sub>C</sub> = 100μA	—	—	0.7	V	
Switching Time	Turn-on Time	t <sub>on</sub>		—	0.3	—	μs
	Storage Time	t <sub>stg</sub>		—	4.0	—	
	Fall Time	t <sub>f</sub>		—	—	0.6	

961001EAA2'

● The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.  
 ● The information contained herein is subject to change without notice.

