

# MP4004

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

- o HIGH POWER SWITCHING APPLICATIONS.
- o HAMMER DRIVE, PULSE MOTOR DRIVE AND INDUCTIVE LOAD SWITCHING.

### FEATURES

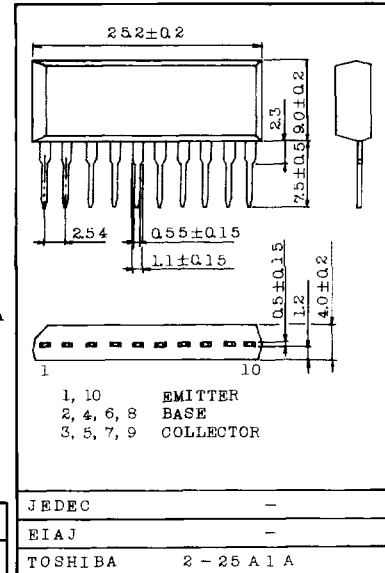
- Small Package by Full Molding. (SIP 10 Pin)
- High Collector Power Dissipation. (4 Devices Action)  
:  $P_T=4W$  @ $T_a=25^\circ C$
- High Collector Current:  $I_C(DC)=3A(Max.)$
- High DC Current Gain :  $h_{FE}=2000(Min.)$  @ $V_{CE}=2V, I_C=1.5A$

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

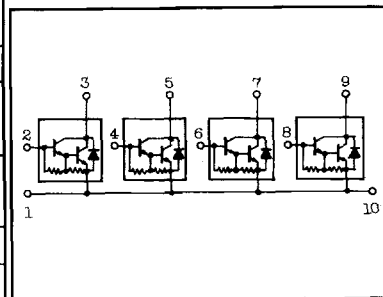
CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CBO}$	120	V
Collector-Emitter Voltage	$V_{CEO}$	100	V
Emitter-Base Voltage	$V_{EBO}$	6	V
Collector Current	DC	$I_C$	3
	Pulse	$I_{CP}$	6
Continuous Base Current	$I_B$	0.5	A
Collector Power Dissipation (1 Device Action, $T_a=25^\circ C$ )	$P_C$	2.0	W
Collector Power Dissipation (4 Devices Action, $T_a=25^\circ C$ )	$P_T$	4.0	W
Junction Temperature	$T_j$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55 ~ 150	$^\circ C$

### INDUSTRIAL APPLICATIONS

Unit in mm



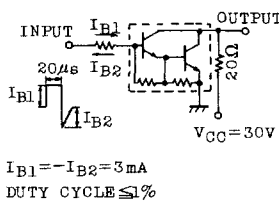
### ARRAY CONFIGURATION



### THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance of Junction to Ambient (4 Devices Action, $T_a=25^\circ C$ )	$\Sigma R_{th}(j-a)$	31.3	$^\circ C/W$
Maximum Lead Temperature for Soldering Purposes (3.2mm from Case for 10 second)	$T_L$	260	$^\circ C$

ELECTRICAL CHARACTERISTICS (Ta=25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		ICBO	V <sub>CB</sub> =120V, I <sub>E</sub> =0	-	-	10	μA
Collector Cut-off Current		ICEO	V <sub>CE</sub> =100V, I <sub>B</sub> =0	-	-	10	μA
Emitter Cut-off Current		IEBO	V <sub>EB</sub> =6V, I <sub>C</sub> =0	0.5	-	2.5	mA
Collector-Base Breakdown Voltage		V(BR)CBO	I <sub>C</sub> =1mA, I <sub>E</sub> =0	120	-	-	V
Collector-Emitter Breakdown Voltage		V(BR)CEO	I <sub>C</sub> =10mA, I <sub>B</sub> =0	100	-	-	V
DC Current Gain		hFE(1)	V <sub>CE</sub> =2V, I <sub>C</sub> =1.5A	2000	-	15000	
		hFE(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> =1.5A, I <sub>B</sub> =3mA	-	-	1.5	V
	Base-Emitter	V <sub>BE(sat)</sub>	I <sub>C</sub> =1.5A, I <sub>B</sub> =3mA	-	-	2.0	V
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> =0, f=1MHz	-	30	-	pF
Switching Time	Turn-on Time	t <sub>on</sub>	 <p>                     INPUT <math>I_{B1}</math> <math>I_{B2}</math> OUTPUT  <math>20\mu F</math>  <math>I_{B1}</math> <math>I_{B2}</math>  <math>V_{CC}=30V</math>  <math>I_{B1}=-I_{B2}=3mA</math>                      DUTY CYCLE <math>\leq 1\%</math> </p>	-	0.3	-	μs
	Storage Time	t <sub>stg</sub>		-	2.0	-	
	Fall Time	t <sub>f</sub>		-	0.4	-	

