

TOSHIBA TRANSISTOR SILICON NPN TRIPLE DIFFUSED TYPE (DARLINGTON)

# 2SD1415A

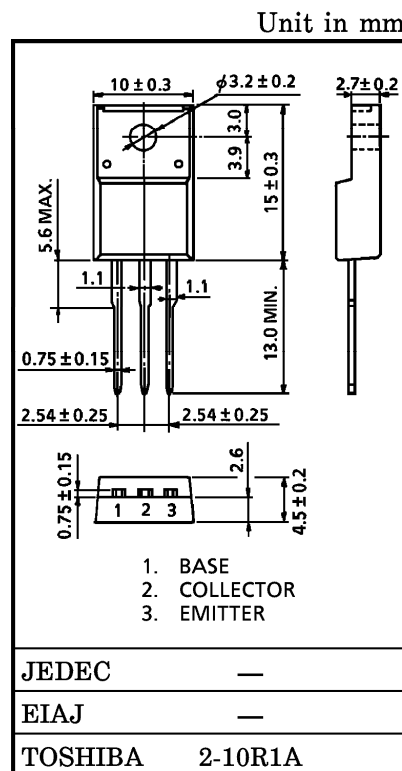
HIGH POWER SWITCHING APPLICATIONS

HAMMER DRIVE, PULSE MOTOR DRIVE APPLICATIONS

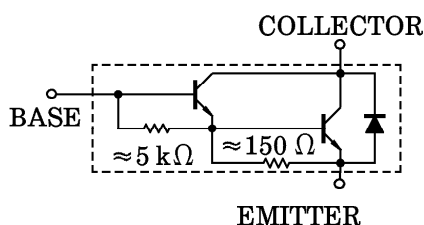
- High DC Current Gain  
:  $h_{FE} = 2000$  (Min.) ( $V_{CE} = 3\text{ V}$ ,  $I_C = 3\text{ A}$ )
- Low Saturation Voltage :  $V_{CE(sat)} = 1.5\text{ V}$  (Max.) ( $I_C = 3\text{ A}$ )

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

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	$I_C$	7	A
	Pulse	$I_{CP}$	10	
Base Current		$I_B$	0.7	A
Collector Power Dissipation	$T_a = 25^\circ\text{C}$	$P_C$	2.0	W
	$T_c = 25^\circ\text{C}$		25	
Junction Temperature		$T_j$	150	$^\circ\text{C}$
Storage Temperature Range		$T_{stg}$	-55~150	$^\circ\text{C}$



EQUIVALENT CIRCUIT



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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Collector Cut-off Current		ICBO	V <sub>CB</sub> = 100 V, I <sub>E</sub> = 0	—	—	100	μA
Emitter Cut-off Current		IEBO	V <sub>EB</sub> = 6 V, I <sub>C</sub> = 0	0.75	—	3.0	mA
Collector-Emitter Breakdown Voltage		V (BR) CEO	I <sub>C</sub> = 50 mA, I <sub>B</sub> = 0	100	—	—	V
DC Current Gain		hFE (1)	V <sub>CE</sub> = 3 V, I <sub>C</sub> = 3 A	2000	—	15000	
		hFE (2)	V <sub>CE</sub> = 3 V, I <sub>C</sub> = 6 A	1000	—	—	
Collector-Emitter Saturation Voltage		V <sub>CE</sub> (sat)	I <sub>C</sub> = 3 A, I <sub>B</sub> = 6 mA	—	0.9	1.5	V
Base-Emitter Saturation Voltage		V <sub>BE</sub> (sat)	I <sub>C</sub> = 3 A, I <sub>B</sub> = 6 mA	—	1.5	2.0	V
Switching Time	Turn-on Time	t <sub>on</sub>	<p> <math>I_{B1} = -I_{B2} = 6 \text{ mA}</math>, <math>V_{CC} = 45 \text{ V}</math>                      DUTY CYCLE <math>\leq 1\%</math> </p>	—	0.3	—	μs
	Storage Time	t <sub>stg</sub>		—	5.1	—	
	Fall Time	t <sub>f</sub>		—	—	0.6	

