

TOSHIBA Transistor Silicon NPN Triple Diffused Type (Darlington)

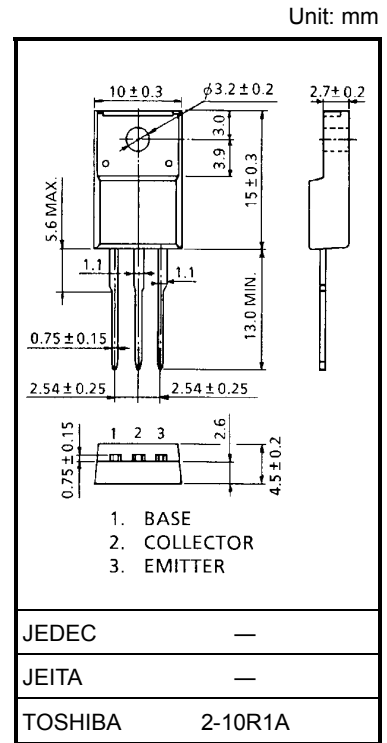
# 2SD1415A

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) ( $I_C = 3\text{ A}$ )

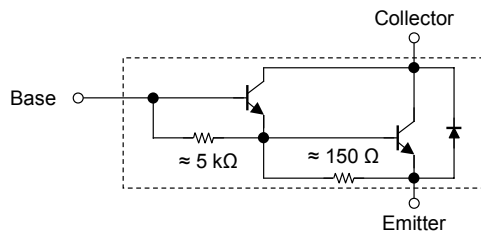
### Maximum Ratings ( $T_c = 25^\circ\text{C}$ )

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

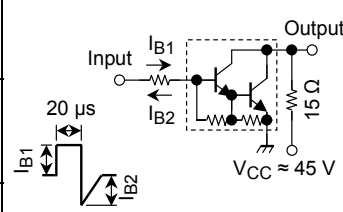


Weight: 1.7 g (typ.)

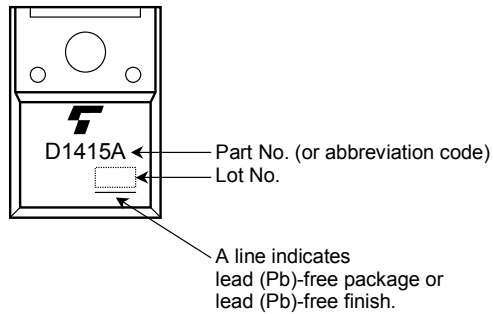
### Equivalent Circuit

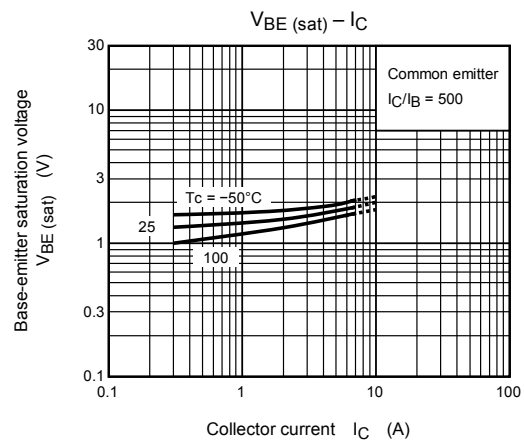
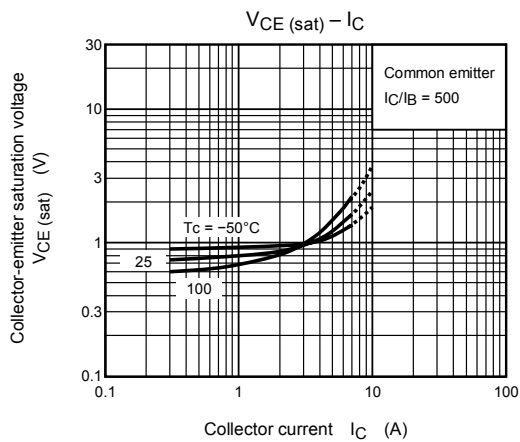
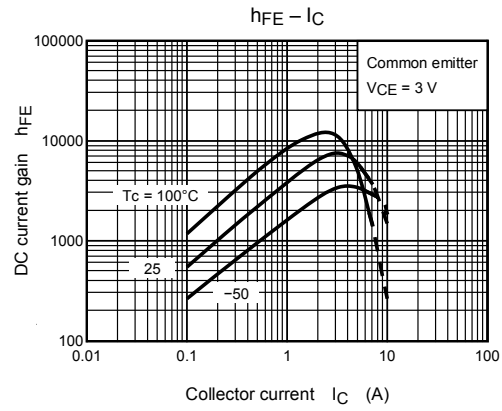
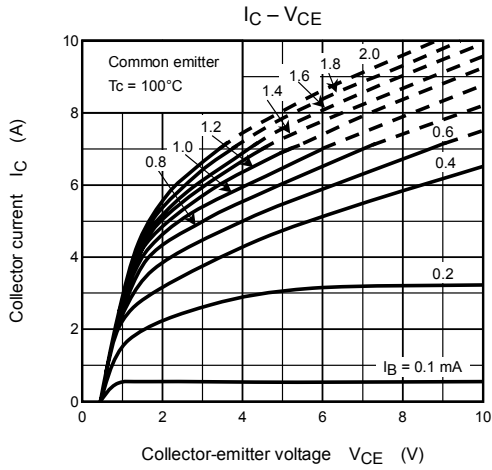
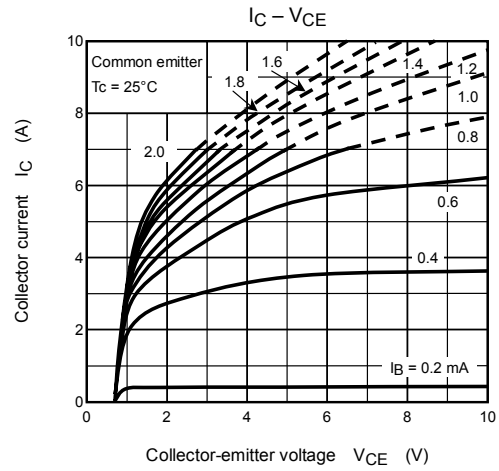
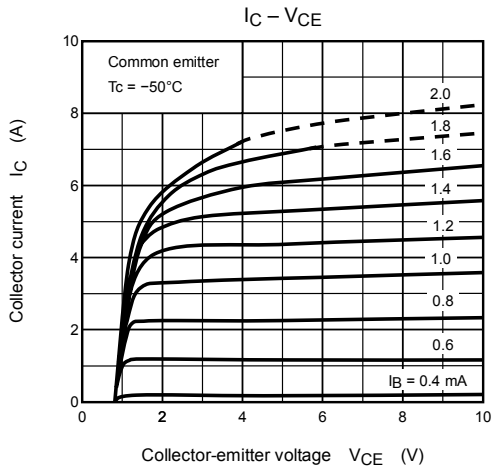


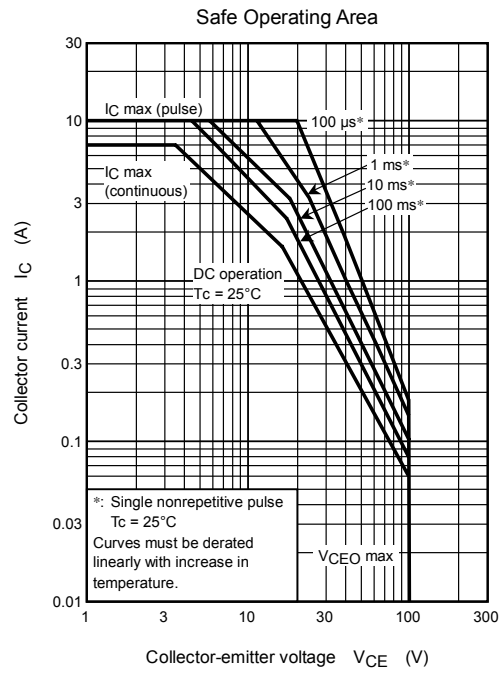
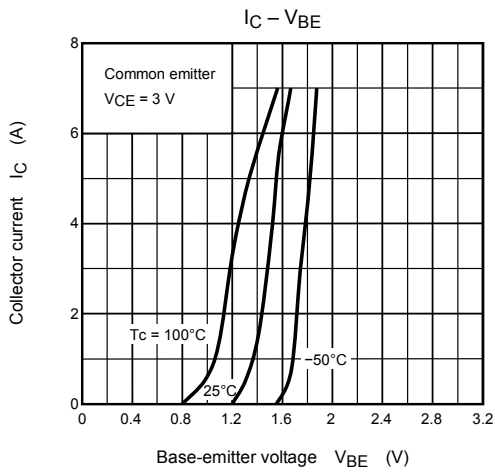
## Electrical Characteristics (Tc = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		$I_{CBO}$	$V_{CB} = 100\text{ V}, I_E = 0$	—	—	100	$\mu\text{A}$
Emitter cut-off current		$I_{EBO}$	$V_{EB} = 6\text{ V}, I_C = 0$	0.75	—	3.0	mA
Collector-emitter breakdown voltage		$V_{(BR)CEO}$	$I_C = 50\text{ mA}, I_B = 0$	100	—	—	V
DC current gain		$h_{FE(1)}$	$V_{CE} = 3\text{ V}, I_C = 3\text{ A}$	2000	—	15000	
		$h_{FE(2)}$	$V_{CE} = 3\text{ V}, I_C = 6\text{ A}$	1000	—	—	
Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_C = 3\text{ A}, I_B = 6\text{ mA}$	—	0.9	1.5	V
Base-emitter saturation voltage		$V_{BE(sat)}$	$I_C = 3\text{ A}, I_B = 6\text{ mA}$	—	1.5	2.0	V
Switching time	Turn-on time	$t_{on}$	 <p><math>I_{B1} = -I_{B2} = 6\text{ mA}, \text{duty cycle} \leq 1\%</math></p>	—	0.3	—	$\mu\text{s}$
	Storage time	$t_{stg}$		—	5.1	—	
	Fall time	$t_f$		—	0.6	—	

## Marking







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