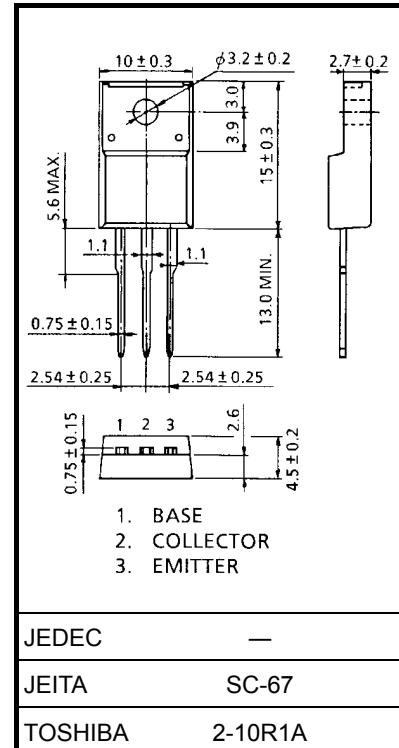


TOSHIBA Transistor Silicon NPN Triple Diffused Type

2SD2204

High-Power Switching Applications
 Hammer Drive, Pulse Motor Drive Applications

Unit: mm



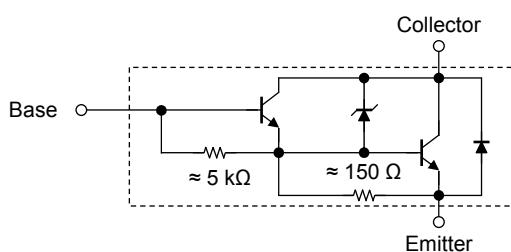
Weight: 1.7 g (typ.)

- High DC current gain: $hFE = 2000$ (min) ($V_{CE} = 3$ V, $I_C = 1.5$ A)
- Low saturation voltage: $V_{CE}(\text{sat}) = 1.5$ V (max) ($I_C = 1.5$ A)

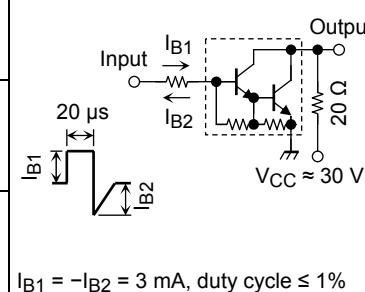
Absolute Maximum Ratings ($T_c = 25^\circ\text{C}$)

Characteristics		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	65 ± 10	V
Collector-emitter voltage		V_{CEO}	65 ± 10	V
Emitter-base voltage		V_{EBO}	7	V
Collector current	DC	I_C	4	A
	Pulse	I_{CP}	6	
Base current		I_B	0.5	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	$^\circ\text{C}$

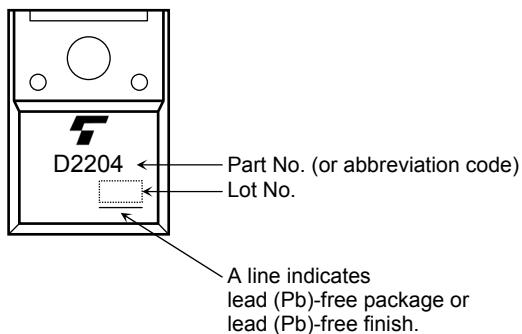
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
 Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc.).

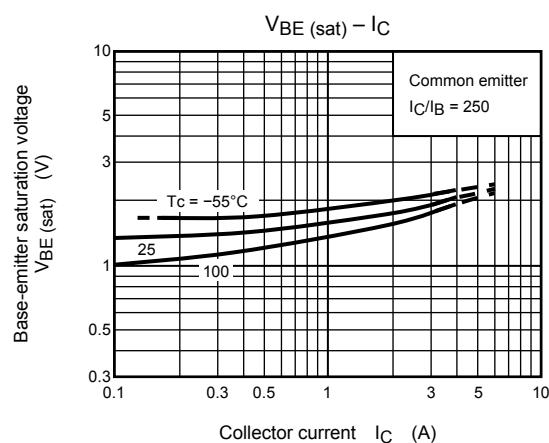
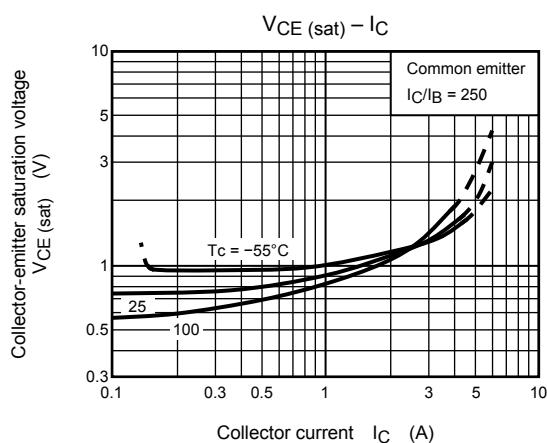
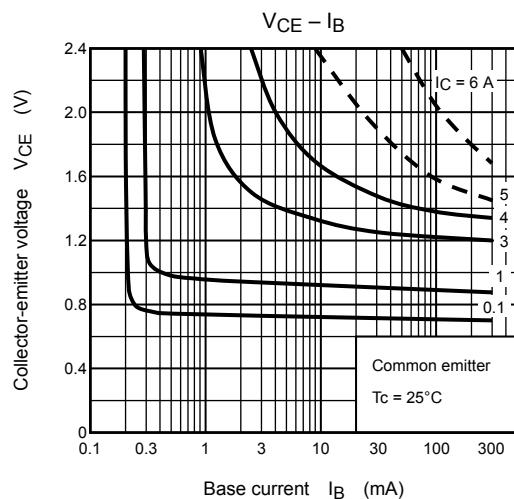
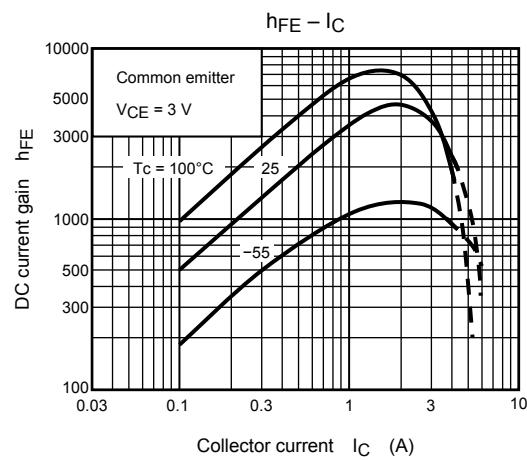
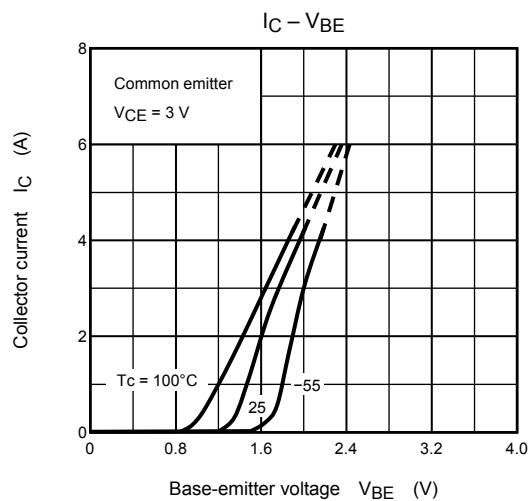
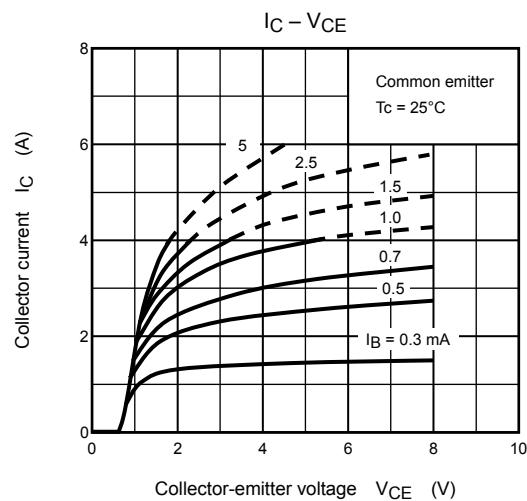
Equivalent Circuit

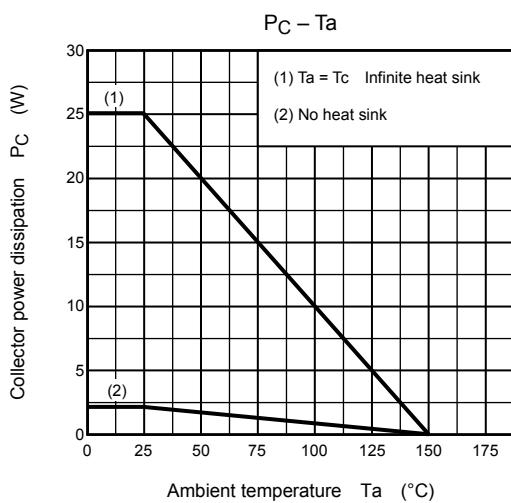
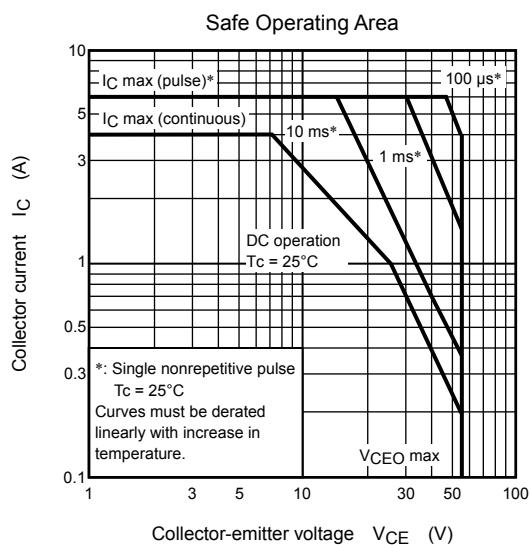
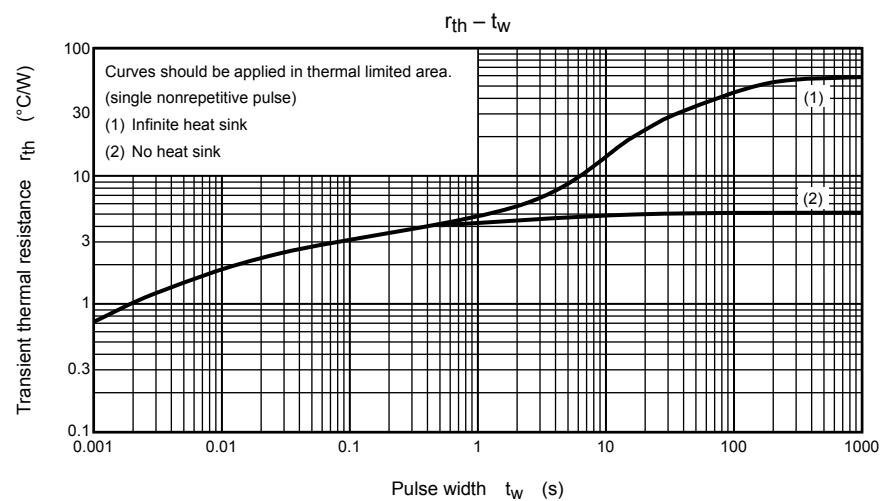
Electrical Characteristics ($T_c = 25^\circ\text{C}$)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = 45\text{ V}, I_E = 0$	—	—	100	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 6\text{ V}, I_C = 0$	—	—	2.5	mA
Collector-emitter breakdown voltage	$V_{(BR)\text{CEO}}$	$I_C = 10\text{ mA}, I_B = 0$	55	65	75	V
DC current gain	h_{FE} (1)	$V_{CE} = 3\text{ V}, I_C = 1.5\text{ A}$	2000	—	15000	V
	h_{FE} (2)	$V_{CE} = 3\text{ V}, I_C = 3\text{ A}$	1000	—	—	
Collector-emitter saturation voltage	$V_{CE\text{ (sat)}}(1)$	$I_C = 1.5\text{ A}, I_B = 3\text{ mA}$	—	—	1.5	V
	$V_{CE\text{ (sat)}}(2)$	$I_C = 3\text{ A}, I_B = 12\text{ mA}$	—	—	2.0	
Base-emitter saturation voltage	$V_{BE\text{ (sat)}}$	$I_C = 1.5\text{ A}, I_B = 3\text{ mA}$	—	—	2.0	V
Switching time	Turn-on time	t_{on}		—	1.0	μs
	Storage time	t_{stg}		—	5.0	
	Fall time	t_f		—	2.0	

Marking







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20070701-EN

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