TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT Process)

2SC3709A

High-Current Switching Applications

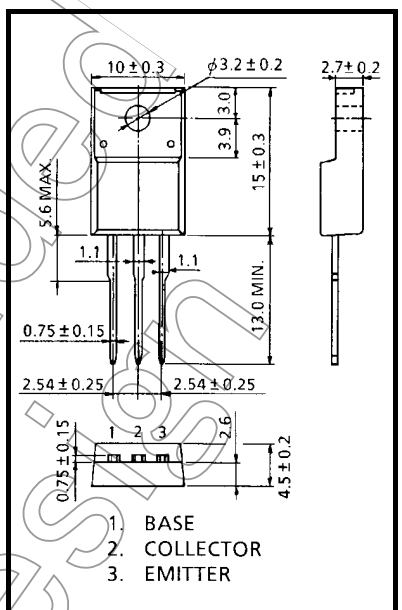
- Low collector saturation voltage: $V_{CE\ (sat)}$ = 0.4 V (max)
- High-speed switching: t_{stg} = 1.0 μs (typ.)
- Complementary to 2SA1451A

Absolute Maximum Ratings (Tc = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	60	V
Collector-emitter voltage	V_{CEO}	50	V
Emitter-base voltage	V_{EBO}	6	V
Collector current	I_C	12	A
Base current	I_B	2	A
Collector power dissipation (Tc = 25°C)	P_C	30	W
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−55 to 150	°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).

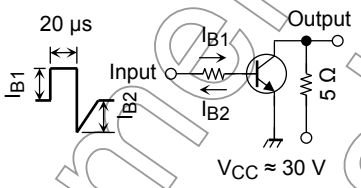
Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-10R1A

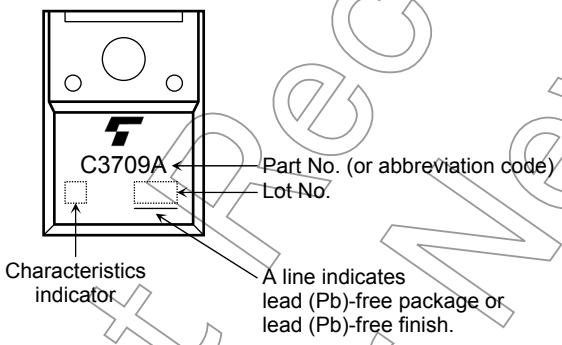
Weight: 1.7 g (typ.)

Electrical Characteristics (Tc = 25°C)

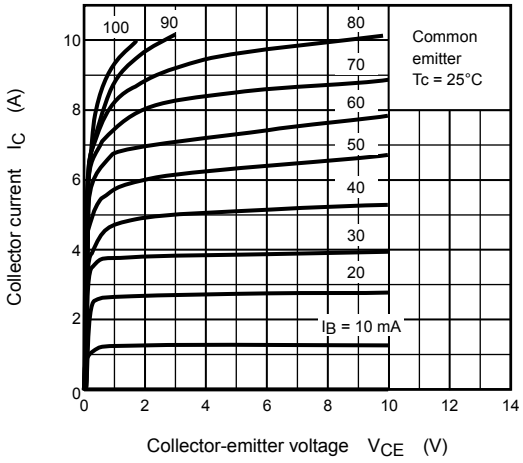
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	V_{CB} = 60 V, I_E = 0	—	—	10	μA
Emitter cut-off current		I_{EBO}	V_{EB} = 6 V, I_C = 0	—	—	10	μA
Collector-emitter breakdown voltage		$V_{(BR)\ CEO}$	I_C = 50 mA, I_B = 0	50	—	—	V
DC current gain		$h_{FE\ (1)}$ (Note)	V_{CE} = 1 V, I_C = 1 A	70	—	240	
		$h_{FE\ (2)}$	V_{CE} = 1 V, I_C = 6 A	40	—	—	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = 6 A, I_B = 0.3 A	—	0.25	0.4	V
Base-emitter saturation voltage		$V_{BE\ (sat)}$	I_C = 6 A, I_B = 0.3 A	—	0.9	1.2	V
Transition frequency		f_T	V_{CE} = 5 V, I_C = 1 A	—	90	—	MHz
Collector output capacitance		C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	180	—	pF
Switching time	Turn-on time	t_{on}	 I_{B1} = −I_{B2} = 0.3 A, duty cycle ≤ 1%	—	0.2	—	μs
	Storage time	t_{stg}		—	1.0	—	
	Fall time	t_f		—	0.2	—	

Note: $h_{FE\ (1)}$ classification O: 70 to 140, Y: 120 to 240

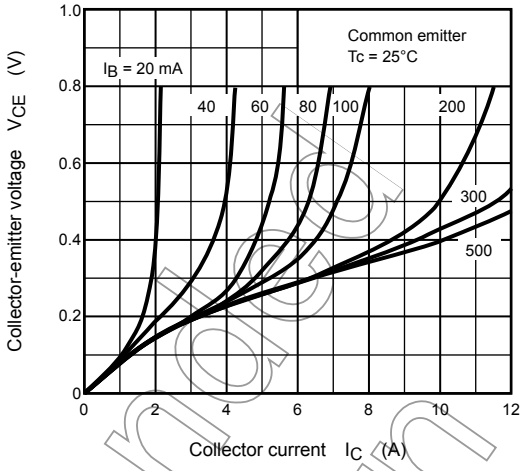
Marking



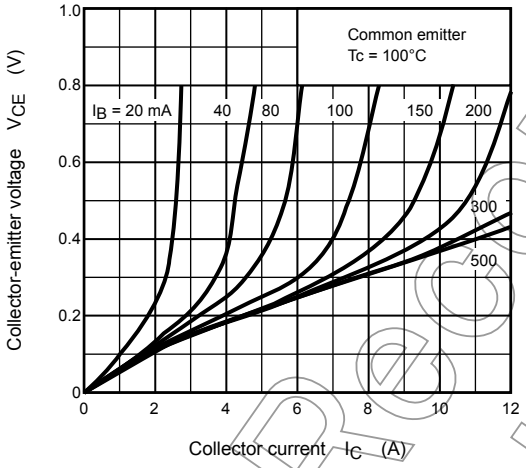
$I_C - V_{CE}$



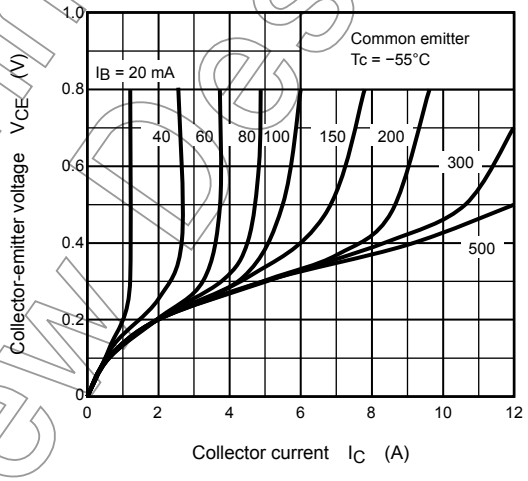
$V_{CE} - I_C$



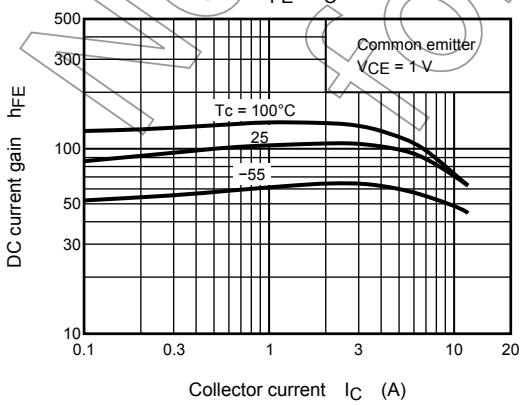
$V_{CE} - I_C$



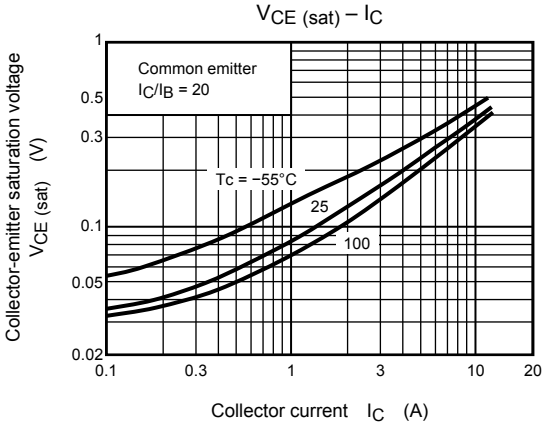
$V_{CE} - I_C$



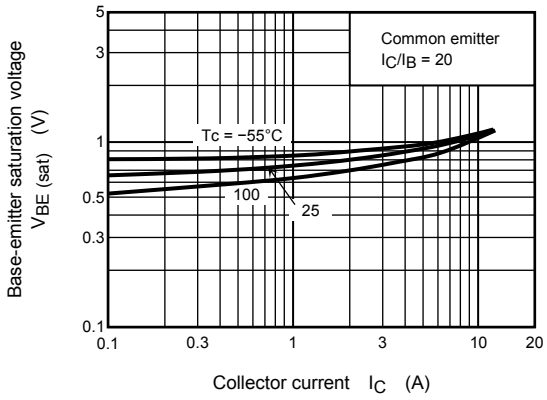
$h_{FE} - I_C$



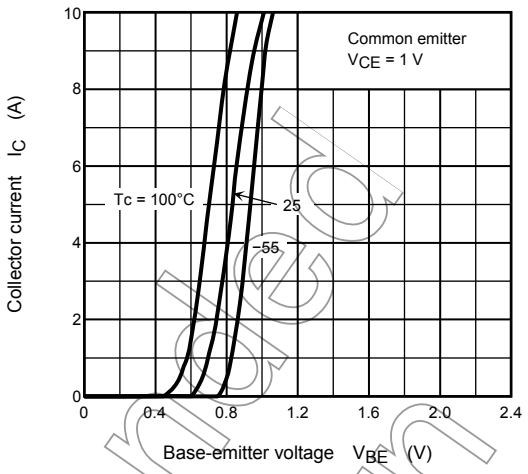
$V_{CE\ (sat)} - I_C$



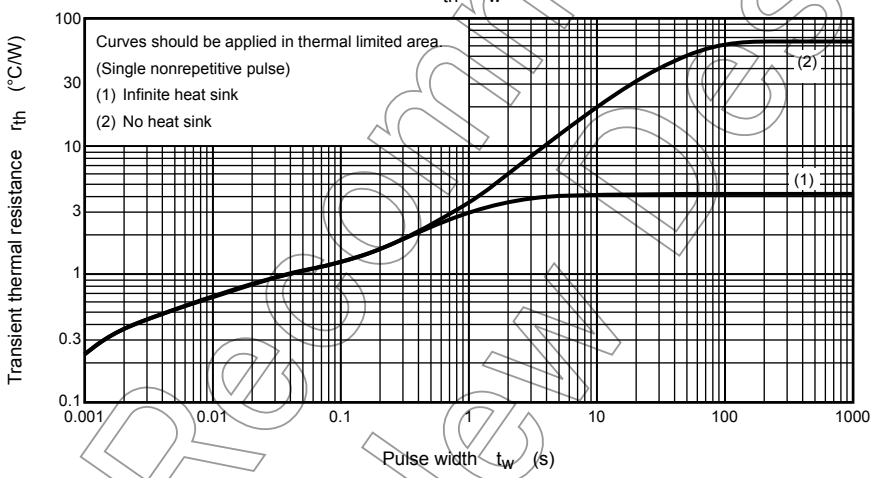
$V_{BE\ (sat)} - I_C$



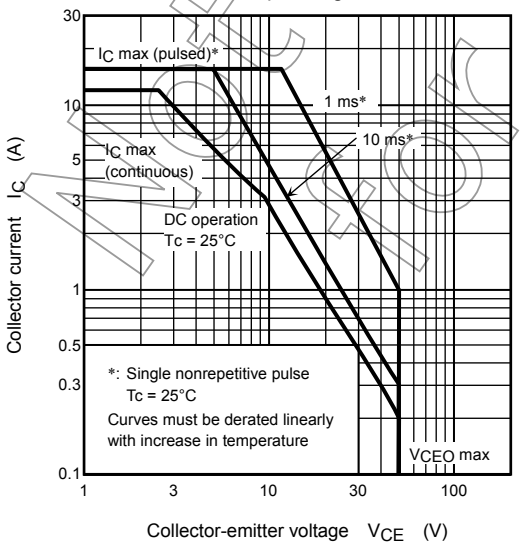
$I_C - V_{BE}$



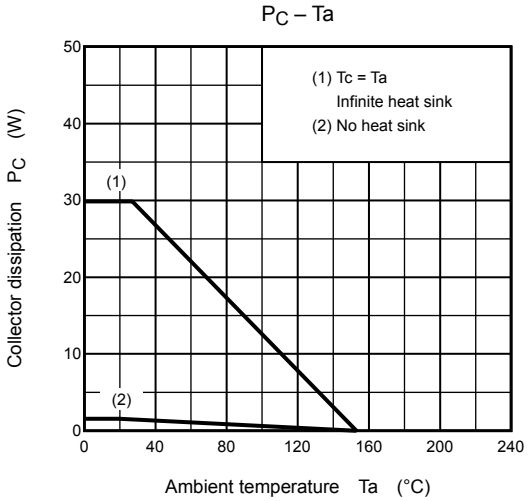
$r_{th} - t_w$



Safe Operating Area



$P_C - Ta$



RESTRICTIONS ON PRODUCT USE

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