

TOSHIBA Transistor Silicon NPN Epitaxial Type

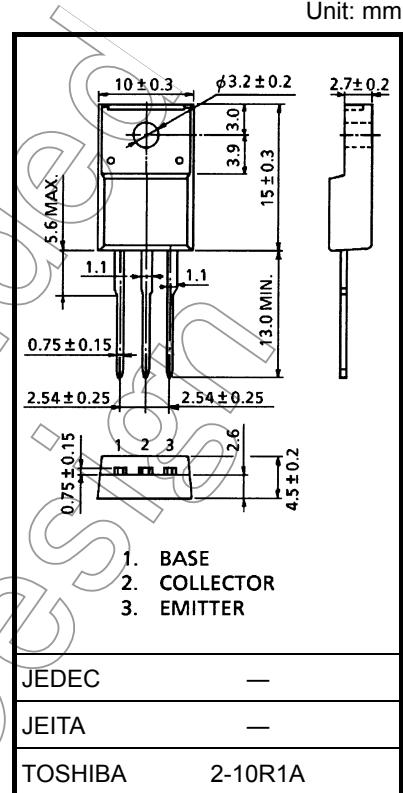
2SD1947A

High-Current Switching Applications
Lamp, Solenoid Drive Applications

- High DC current gain: $hFE = 500$ to 1500 ($I_C = 1$ A)
- Low collector saturation voltage: $V_{CE}(\text{sat}) = 0.3$ V (max) ($I_C = 5$ A)

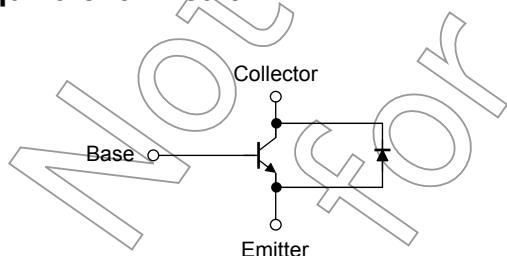
Absolute Maximum Ratings ($T_c = 25^\circ\text{C}$)

Characteristics		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	100	V
Collector-emitter voltage		V_{CEO}	100	V
Emitter-base voltage		V_{EBO}	7	V
Collector current	DC	I_C	10	A
	Pulse	I_{CP}	15	
Base current		I_B	2	A
Collector power dissipation	$T_a = 25^\circ\text{C}$	P_C	2.0	W
	$T_c = 25^\circ\text{C}$		40	
Junction temperature		T_j	150	$^\circ\text{C}$
Storage temperature range		T_{stg}	-55 to 150	$^\circ\text{C}$



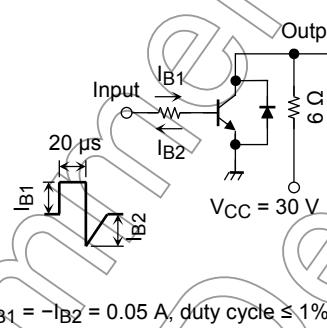
Weight: 1.7 g (typ.)

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.).

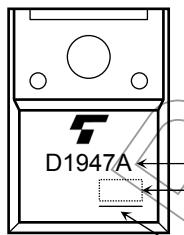
Equivalent Circuit

Electrical Characteristics (Tc = 25°C)

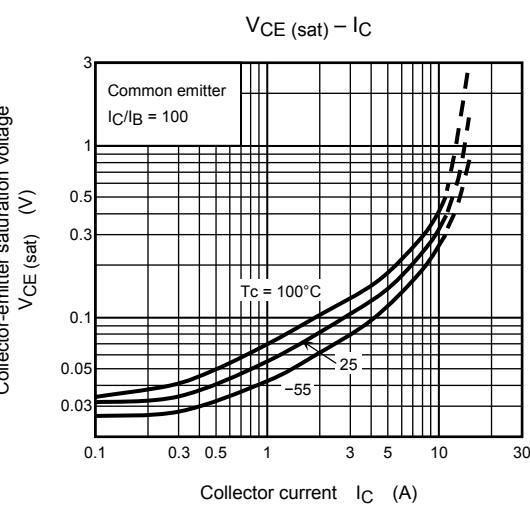
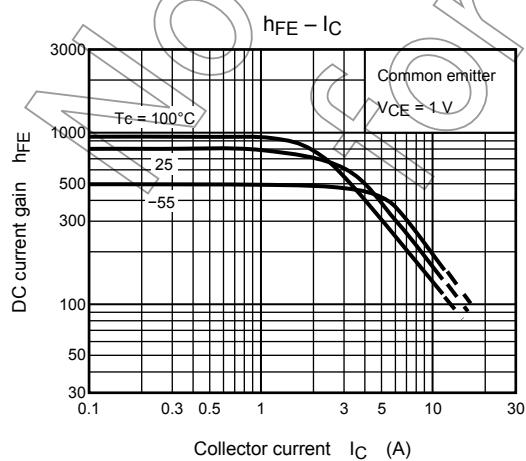
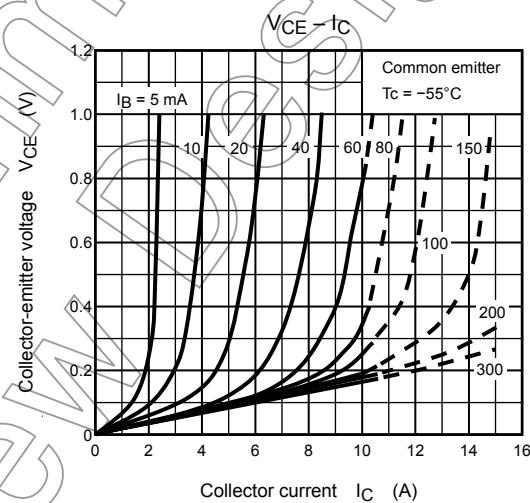
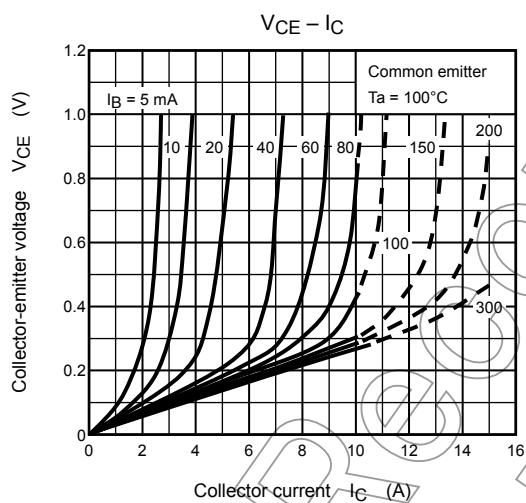
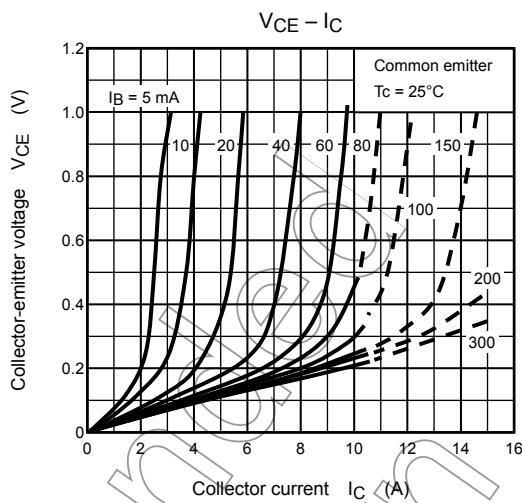
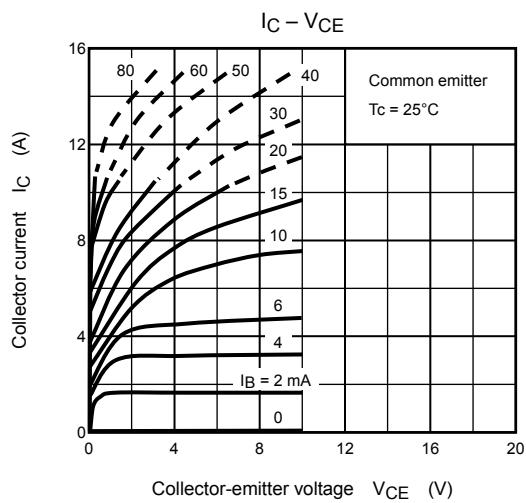
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I _{CBO}	V _{CB} = 100 V, I _E = 0	—	—	10	μA
Emitter cut-off current	I _{EBO}	V _{EB} = 7 V, I _C = 0	—	—	10	μA
Collector-emitter breakdown voltage	V _{(BR) CEO}	I _C = 50 mA, I _B = 0	100	—	—	V
DC current gain	h _{FE} (1)	V _{CE} = 1 V, I _C = 1 A	500	—	1500	
	h _{FE} (2)	V _{CE} = 1 V, I _C = 5 A	150	—	—	
Collector-emitter saturation voltage	V _{CE} (sat)	I _C = 5 A, I _B = 0.05 A	—	—	0.3	V
Base-emitter saturation voltage	V _{BE} (sat)	I _C = 5 A, I _B = 0.05 A	—	—	1.2	V
Collector-emitter forward voltage	V _{ECF}	I _E = 5 A, I _B = 0	—	—	2.0	V
Transition frequency	f _T	V _{CE} = 5 V, I _C = 1 A	—	70	—	MHz
Collector output capacitance	C _{ob}	V _{CB} = 10 V, I _E = 0, f = 1 MHz	—	160	—	pF
Switching time	Turn-on time	t _{on}		0.5	—	μs
	Storage time	t _{stg}		6.0	—	
	Fall time	t _f		1.0	—	

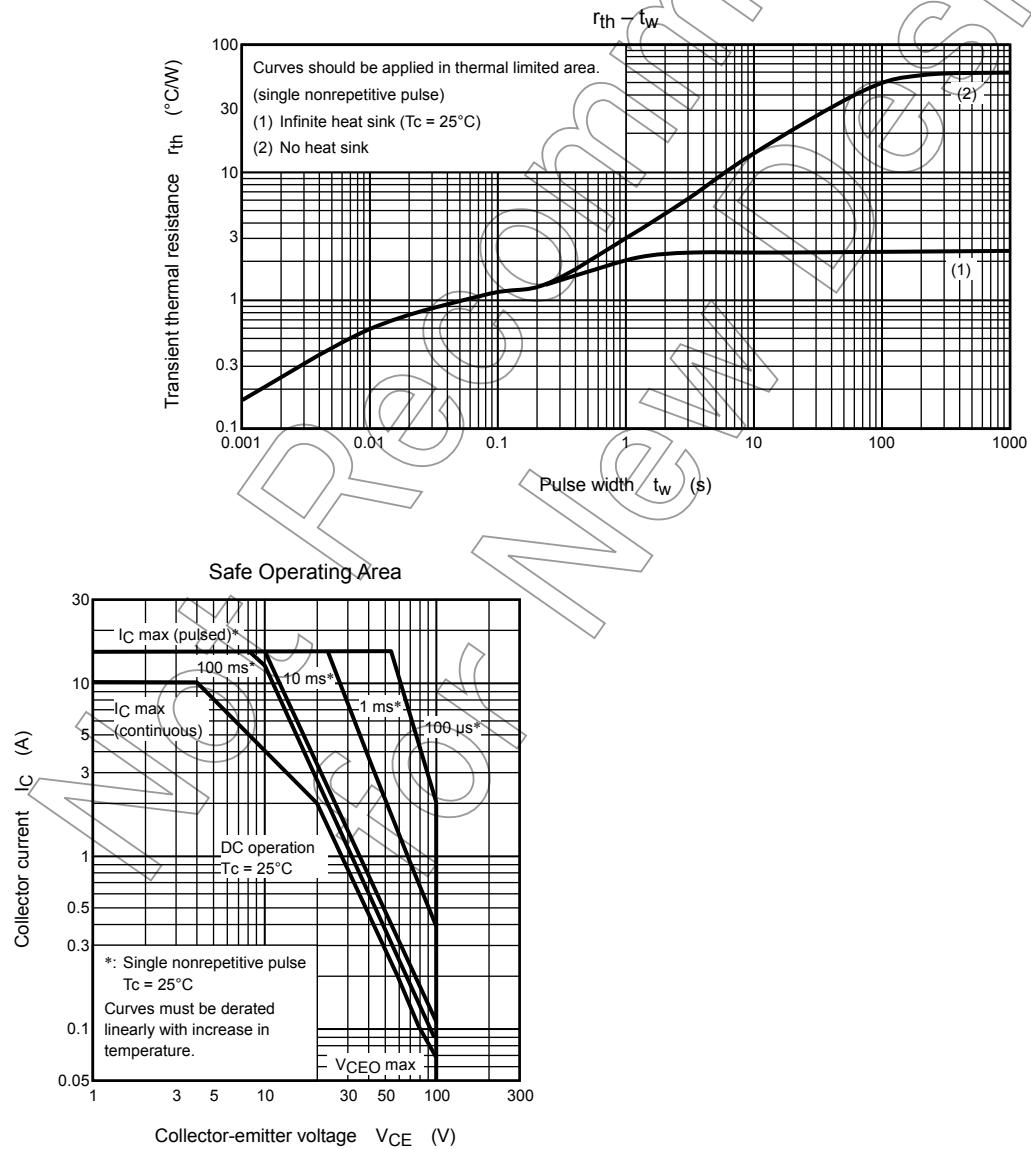
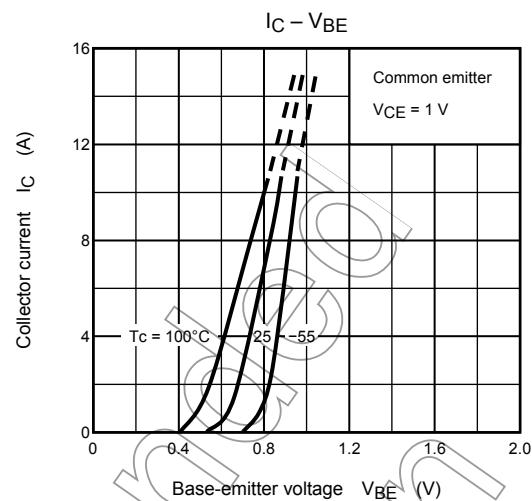
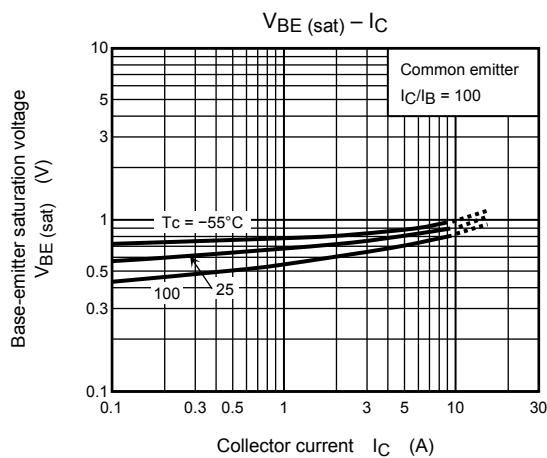


Marking



Part No. (or abbreviation code)
Lot No.
A line indicates
lead (Pb)-free package or
lead (Pb)-free finish.





RESTRICTIONS ON PRODUCT USE

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