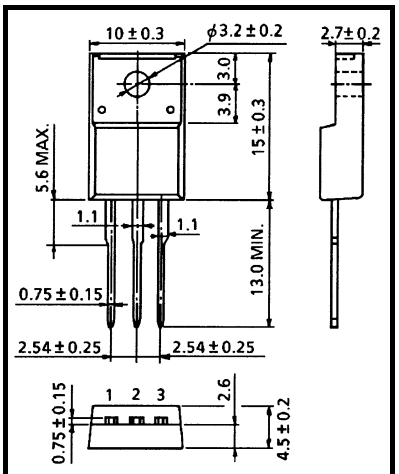
TOSHIBA Transistor Silicon NPN Triple Diffused Type

2SD1411A

High-Current Switching Applications
Power Amplifier Applications

- Low saturation voltage: $V_{CE\ (sat)}$ = 0.5 V (max) at I_C = 4 A
- Complementary to 2SB1018A

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-10R1A

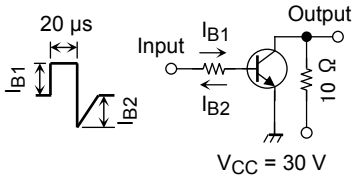
Weight: 1.7 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	100	V
Collector-emitter voltage		V_{CEO}	80	V
Emitter-base voltage		V_{EBO}	5	V
Collector current		I_C	7	A
Base current		I_B	1	A
Collector power dissipation	Ta = 25°C	P_C	2.0	W
	Tc = 25°C		30	
Junction temperature		T_j	150	°C
Storage temperature range		T_{stg}	−55 to 150	°C

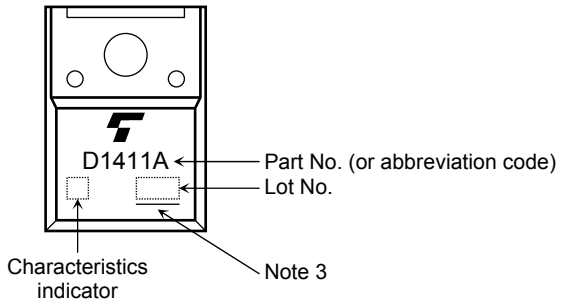
Note1: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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).

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current		I_{CBO}	V_{CB} = 100 V, I_E = 0	—	—	5	μA
Emitter cut-off current		I_{EBO}	V_{EB} = 5 V, I_C = 0	—	—	5	μA
Collector-emitter breakdown voltage		$V_{(BR)\ CEO}$	I_C = 50 mA, I_B = 0	80	—	—	V
DC current gain		$h_{FE\ (1)}$ (Note 2)	V_{CE} = 1 V, I_C = 1 A	70	—	240	
		$h_{FE\ (2)}$	V_{CE} = 1 V, I_C = 4 A	30	—	—	
Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = 4 A, I_B = 0.4 A	—	0.25	0.5	V
Base-emitter saturation voltage		$V_{BE\ (sat)}$	I_C = 4 A, I_B = 0.4 A	—	0.9	1.4	V
Transition frequency		f_T	V_{CE} = 4 V, I_C = 1 A	—	10	—	MHz
Collector output capacitance		C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	200	—	pF
Switching time	Turn-on time	t_{on}		—	0.4	—	μs
	Storage time	t_{stg}		—	2.5	—	
	Fall time	t_f	I_{B1} = 0.3 A, I_{B2} = 0.3 A duty cycle ≤ 1%	—	0.5	—	

Note 2: $h_{FE\ (1)}$ classification O: 70 to 140, Y: 120 to 240

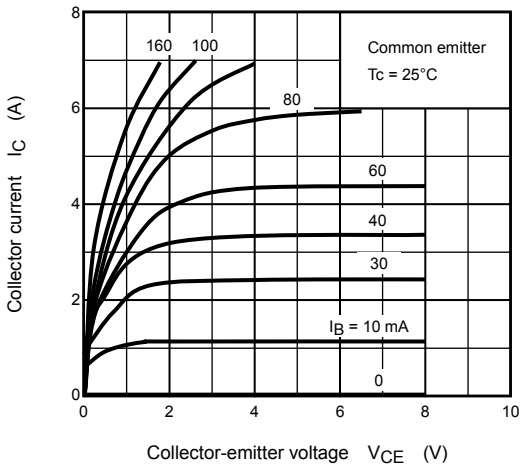
Marking



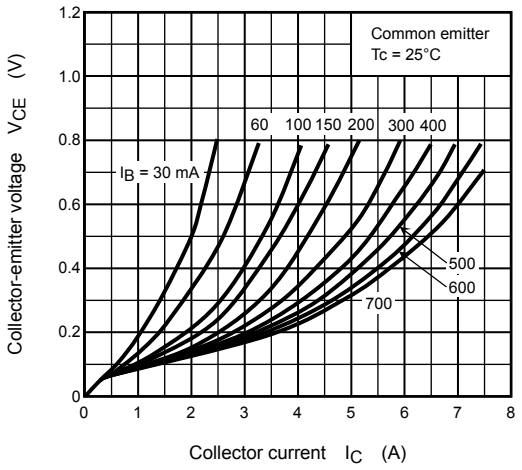
Note 3: A line under a Lot No. identifies the indication of product Labels.
Not underlined: [[Pb]]/INCLUDES > MCV
Underlined: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. The RoHS is the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

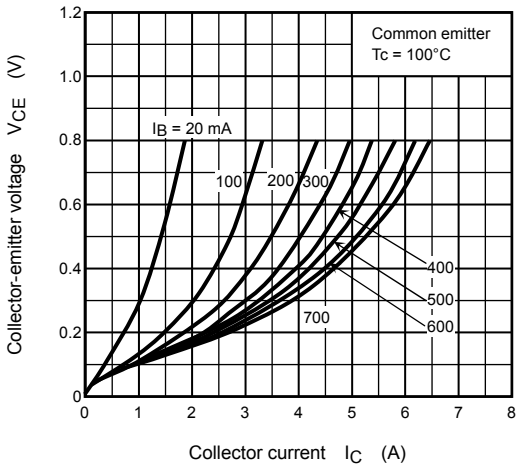
$I_C - V_{CE}$



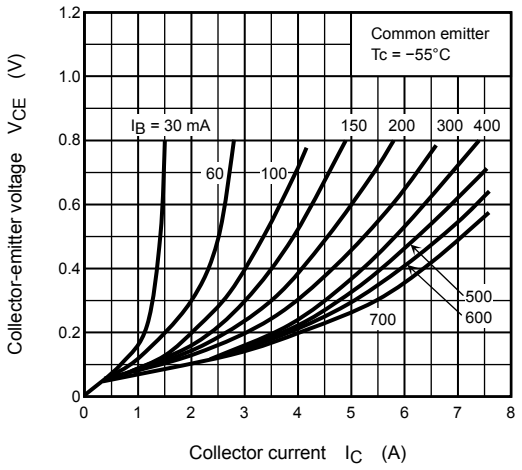
$V_{CE} - I_C$



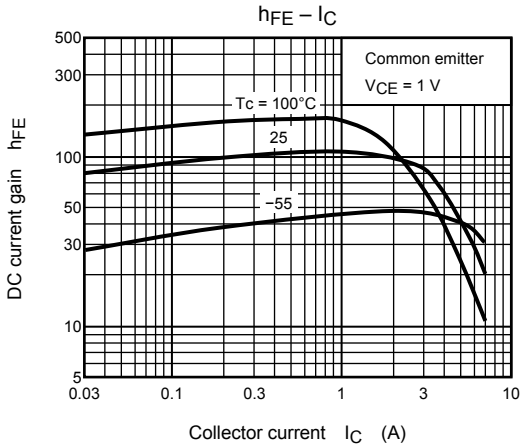
$V_{CE} - I_C$



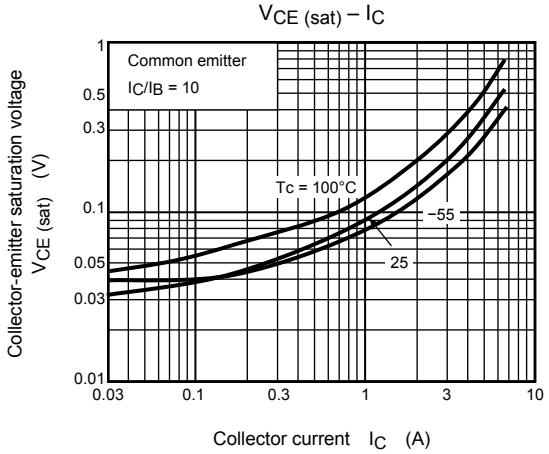
$V_{CE} - I_C$



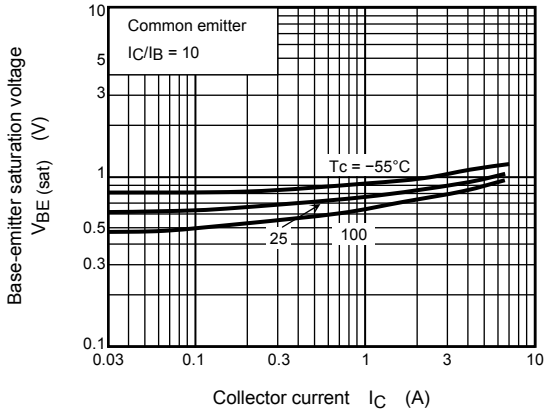
$h_{FE} - I_C$



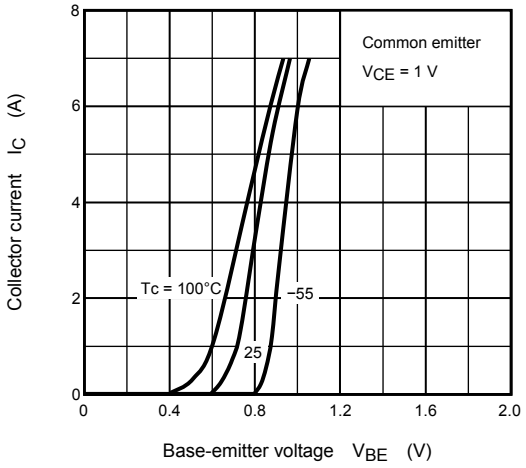
$V_{CE\ (sat)} - I_C$



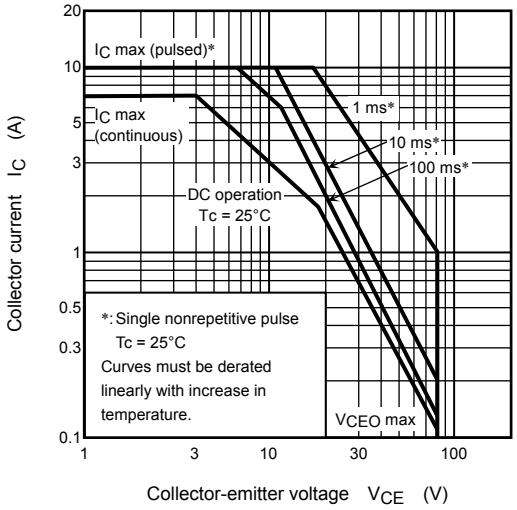
$V_{BE\ (sat)} - I_C$



$I_C - V_{BE}$



Safe Operating Area



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