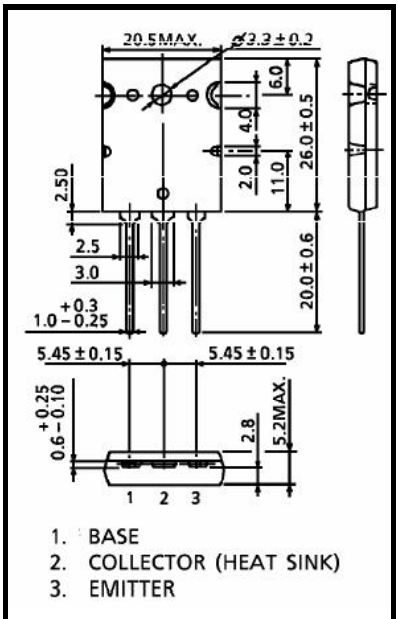
TOSHIBA Transistor Silicon NPN Triple Diffused Type

2SC5949

Power Amplifier Applications

- Complementary to 2SA2121
- Recommended for audio frequency amplifier output stage.

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-21F1A

Weight: 9.75 g (typ.)

Absolute Maximum Ratings (Tc = 25°C)

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	200	V
Collector-emitter voltage	V_{CEO}	200	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	15	A
Base current	I_B	1.5	A
Collector power dissipation	P_C	220	W
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−55 to 150	°C

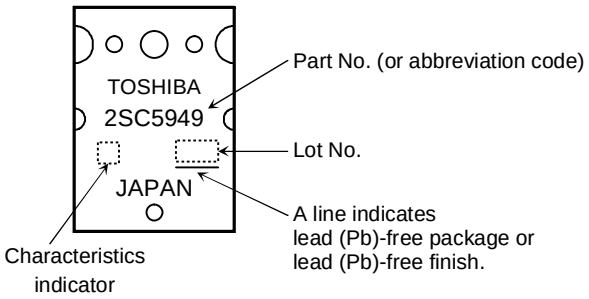
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

Electrical Characteristics (Tc = 25°C)

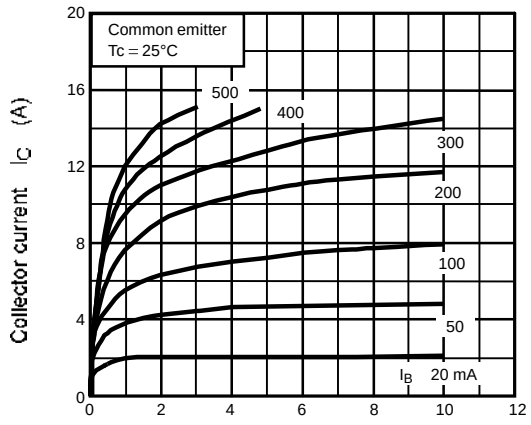
Characteristic	Symbol	Test Conditions	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 200 V, I_E = 0	—	—	5.0	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 5 V, I_C = 0	—	—	5.0	μA
Collector-emitter breakdown voltage	$V_{(BR)\ CEO}$	I_C = 50 mA, I_B = 0	200	—	—	V
DC current gain	$h_{FE\ (1)}$ (Note 1)	V_{CE} = 5 V, I_C = 1 A	55	—	160	
	$h_{FE\ (2)}$	V_{CE} = 5 V, I_C = 8 A	35	60	—	
Collector-emitter saturation voltage	$V_{CE\ (sat)}$	I_C = 10 A, I_B = 1 A	—	0.4	3.0	V
Base-emitter voltage	V_{BE}	V_{CE} = 5 V, I_C = 8 A	—	1.0	1.5	V
Transition frequency	f_T	V_{CE} = 5 V, I_C = 1 A	—	30	—	MHz
Collector output capacitance	C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	270	—	pF

Note 1: $h_{FE(1)}$ classification R: 55 to 110, O: 80 to 160

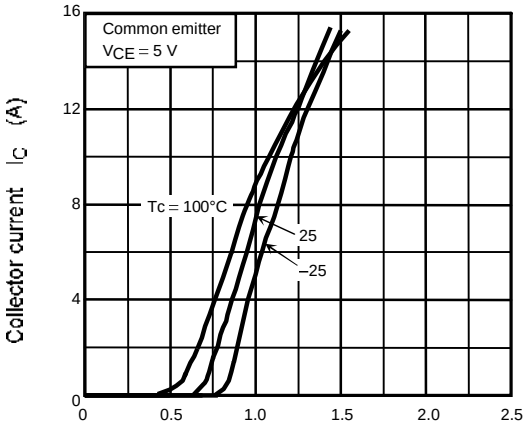
Marking



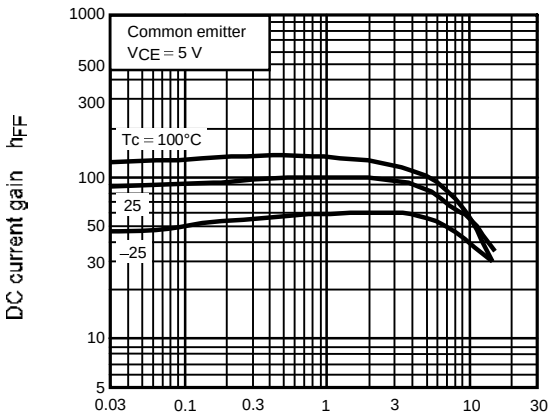
$I_C - V_{CE}$



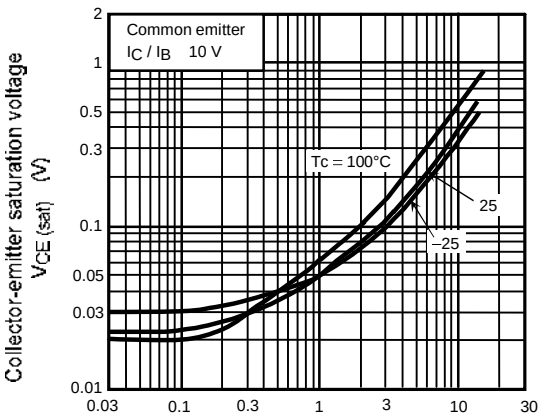
$I_C - V_{BE}$



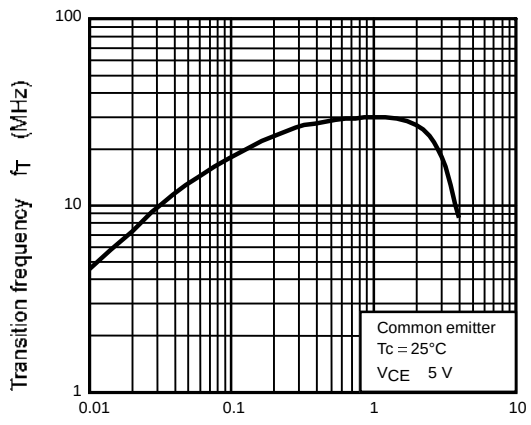
$h_{FE} - I_C$



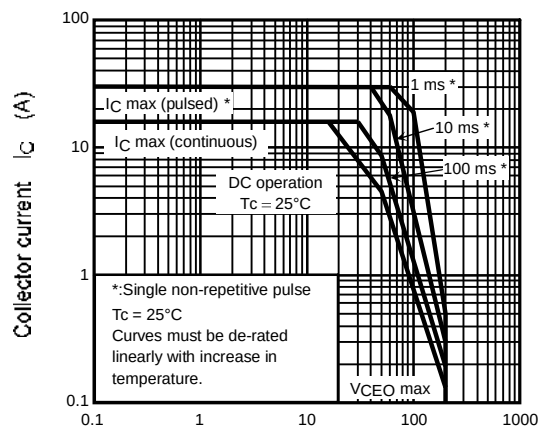
$V_{CE\ (sat)} - I_C$



$f_T - I_C$



Safe operating area



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TOSHIBA Transistor Silicon PNP Triple Diffused Type

2SA2121

Power Amplifier Applications

- Complementary to 2SC5949
- Recommended for audio frequency amplifier output stage.

Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	−200	V
Collector-emitter voltage	V_{CEO}	−200	V
Emitter-base voltage	V_{EBO}	−5	V
Collector current	I_C	−15	A
Base current	I_B	−1.5	A
Collector power dissipation (T_C=25°C)	P_C	220	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.
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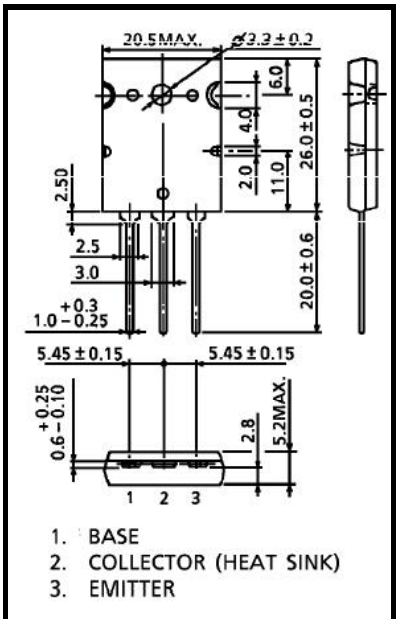
Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-21F1A

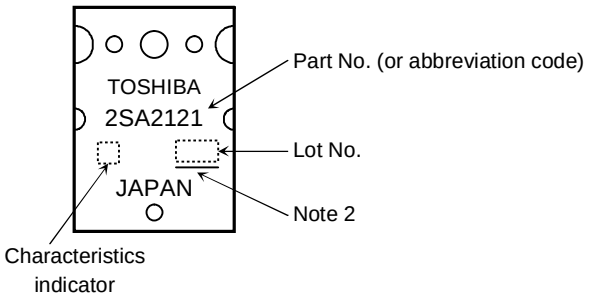
Weight: 9.75 g (typ.)

Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Conditions	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = −200 V, I_E = 0	—	—	−5.0	μA
Emitter cut-off current	I_{EBO}	V_{EB} = −5 V, I_C = 0	—	—	−5.0	μA
Collector-emitter breakdown voltage	$V_{(BR)\ CEO}$	I_C = −50 mA, I_B = 0	−200	—	—	V
DC current gain	$h_{FE\ (1)}$ (Note 1)	V_{CE} = −5 V, I_C = −1 A	55	—	160	
	$h_{FE\ (2)}$	V_{CE} = −5 V, I_C = −8 A	35	60	—	
Collector-emitter saturation voltage	$V_{CE\ (sat)}$	I_C = −10 A, I_B = −1 A	—	−1.5	−3.0	V
Base-emitter voltage	V_{BE}	V_{CE} = −5 V, I_C = −8 A	—	−1.0	−1.5	V
Transition frequency	f_T	V_{CE} = −5 V, I_C = −1 A	—	25	—	MHz
Collector output capacitance	C_{ob}	V_{CB} = −10 V, I_E = 0, f = 1 MHz	—	470	—	pF

Note 1: $h_{FE(1)}$ classification R: 55 to 110, O: 80 to 160

Marking



Note2: 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]]

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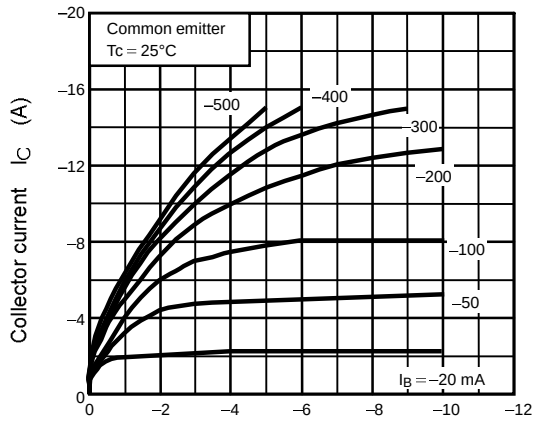
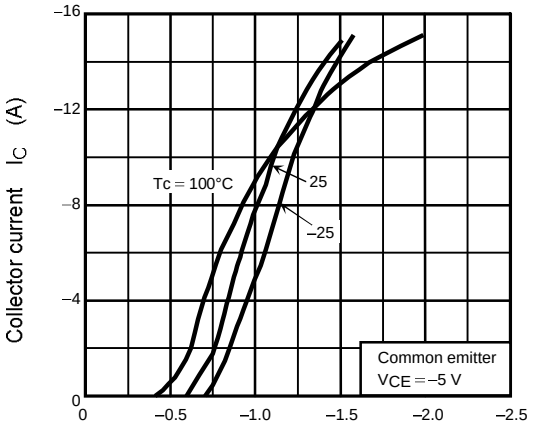
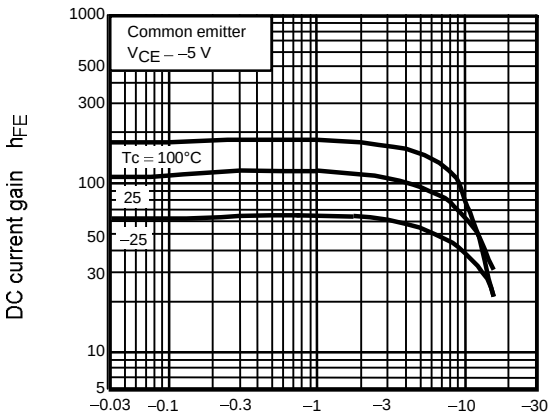
$I_C - V_{CE}$



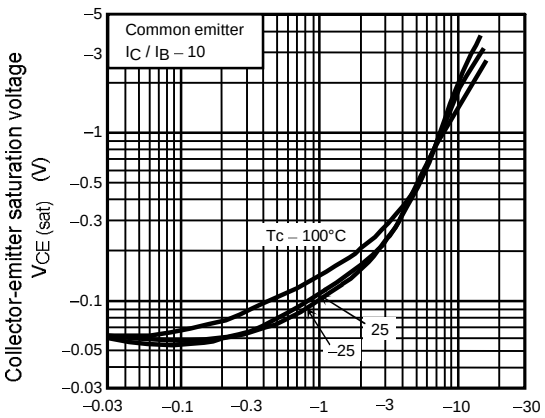
$I_C - V_{BE}$



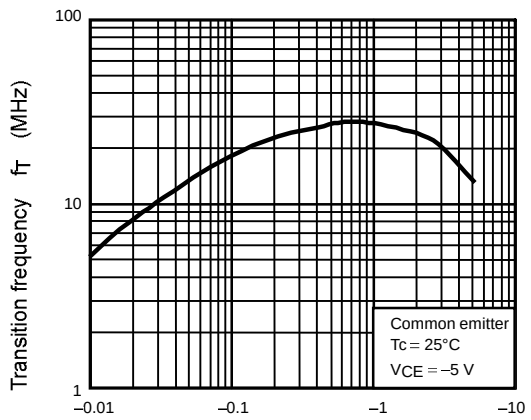
$h_{FE} - I_C$



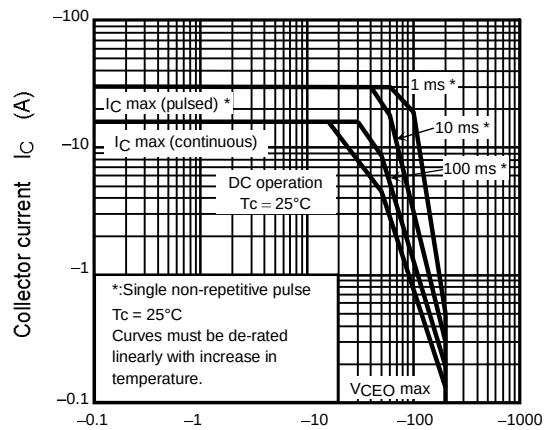
$V_{CE\ (sat)} - I_C$



$f_T - I_C$



Safe Operating Area



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