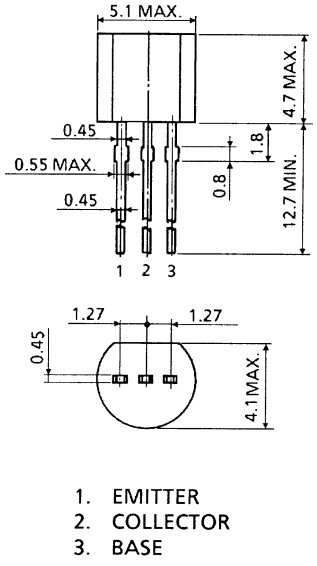
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

2SC3329

For Low Noise Audio Amplifier Applications and Recommended for The First Stages of MC Head Amplifiers

- Very low noise in the region of low signal source impedance equivalent input noise voltage: E_n = 0.6 nV/Hz$^{1/2}$ (typ.)
- Low pulse noise. Low 1/f noise
- Low base spreading resistance: $r_{bb'}$ = 2.0 Ω (typ.)
- Complementary to 2SA1316

Unit: mm



1. EMITTER
2. COLLECTOR
3. BASE

JEDEC	TO-92
JEITA	SC-43
TOSHIBA	2-5F1B

Weight: 0.21 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	80	V
Collector-emitter voltage	V_{CEO}	80	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	100	mA
Base current	I_B	20	mA
Collector power dissipation	P_C	400	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55~125	°C

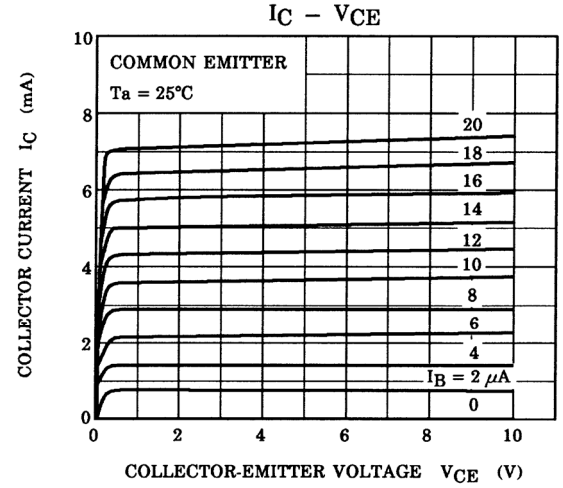
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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 (Ta = 25°C)

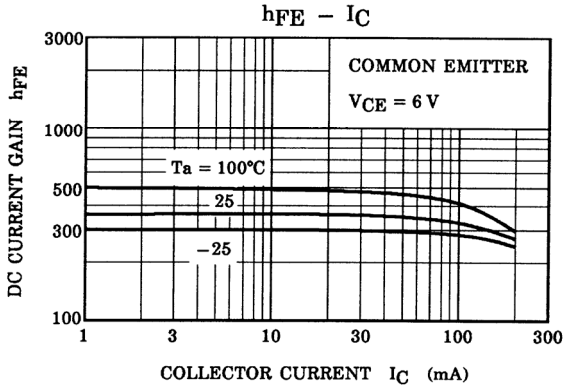
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 80 V, I_E = 0	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 5 V, I_C = 0	—	—	0.1	μA
Collector-emitter breakdown voltage	$V_{(BR)\ CEO}$	I_C = 1 mA, I_B = 0	80	—	—	V
DC current gain	h_{FE} (Note)	V_{CE} = 6 V, I_C = 2 mA	200	—	700	
Collector-emitter saturation voltage	$V_{CE\ (sat)}$	I_C = 10 mA, I_B = 1 mA	—	—	0.1	V
Base-emitter voltage	V_{BE}	V_{CE} = 6 V, I_C = 2 mA	—	0.6	—	V
Base spreading resistance	$r_{bb'}$	V_{CE} = 6 V, I_C = 1 mA, f = 100 MHz	—	2.0	—	Ω
Transition frequency	f_T	V_{CE} = 6 V, I_C = 1 mA	—	42	—	MHz
Collector output capacitance	C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	6.2	—	pF
Noise figure	NF	V_{CE} = 6 V, I_C = 0.1 mA, f = 10 Hz, R_G = 10 kΩ	—	2	6	dB
		V_{CE} = 6 V, I_C = 0.1 mA, f = 1 kHz, R_G = 10 kΩ	—	1	2	
		V_{CE} = 6 V, I_C = 0.1 mA, f = 1 kHz, R_G = 100 Ω	—	2.5	—	

Note: h_{FE} classification GR: 200~400, BL: 350~700

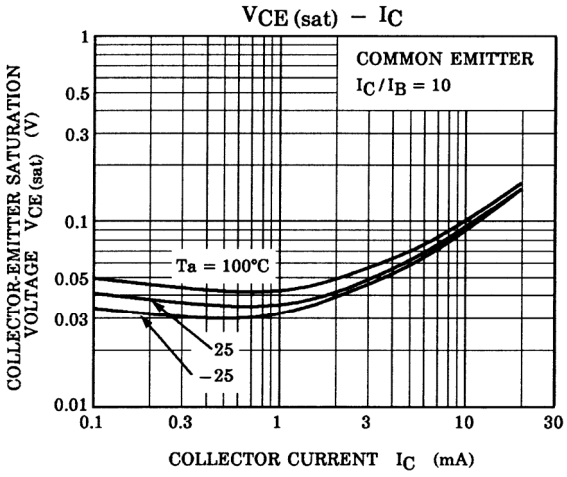
$I_C - V_{CE}$



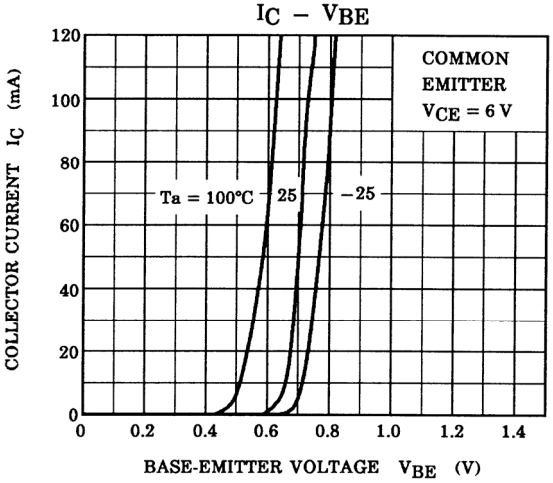
$h_{FE} - I_C$



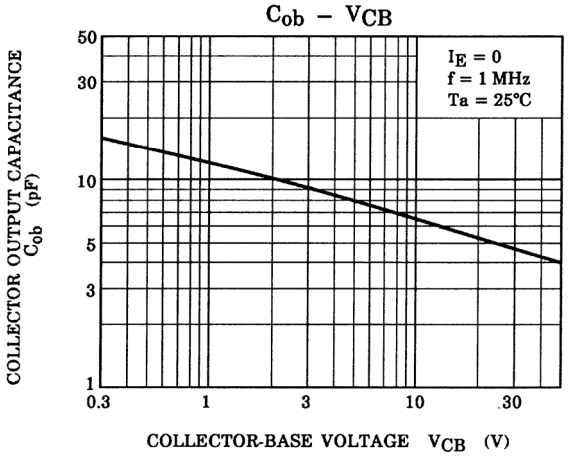
$V_{CE\,(sat)} - I_C$



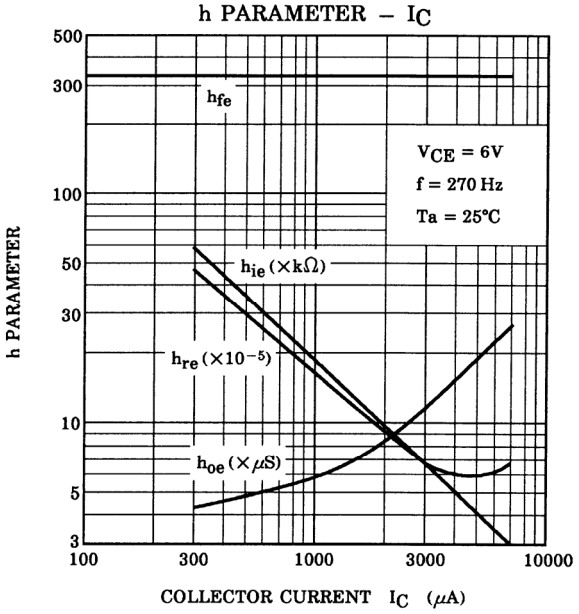
$I_C - V_{BE}$



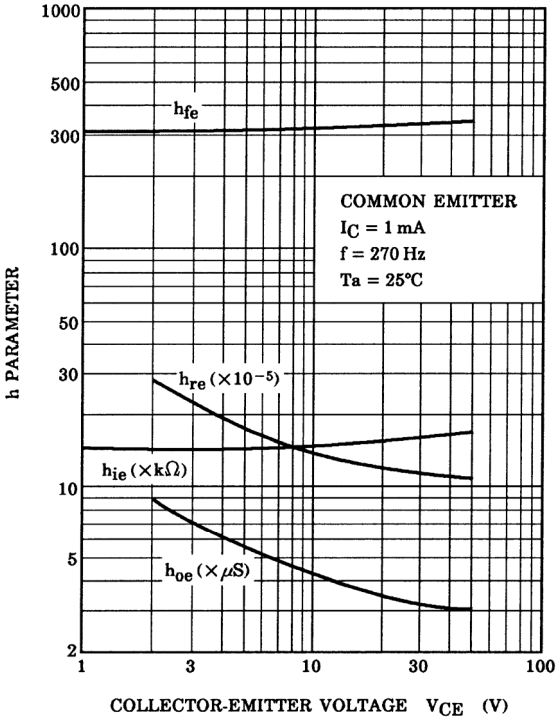
$C_{ob} - V_{CB}$



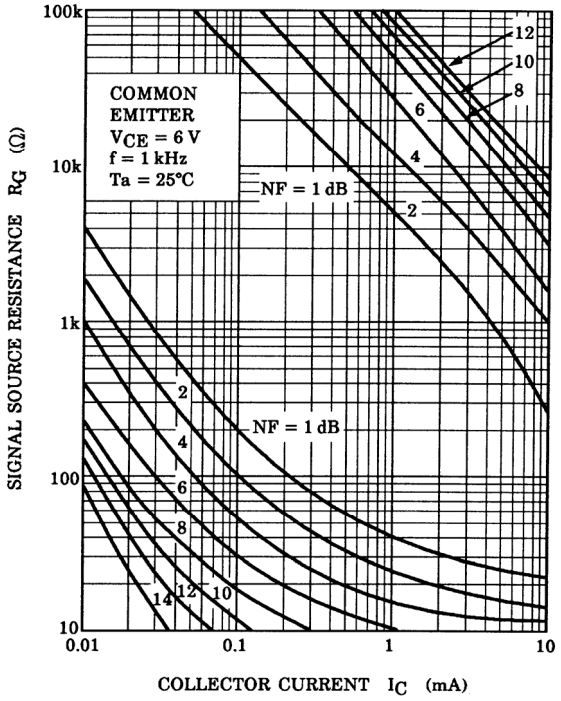
h PARAMETER − I_C



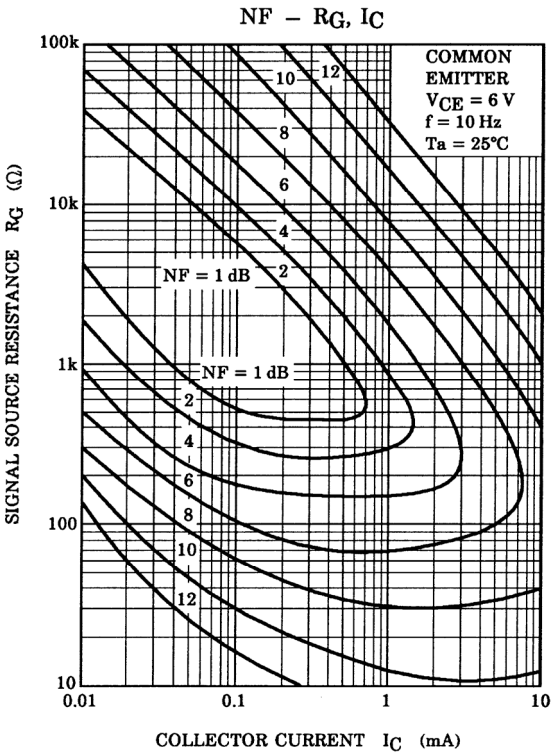
h PARAMETER – V_{CE}



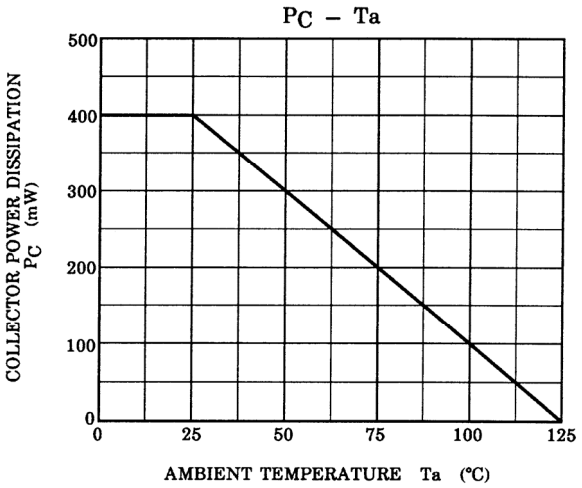
NF – R_G, I_C



NF – R_G, I_C



P_C – Ta



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20070701-EN GENERAL

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