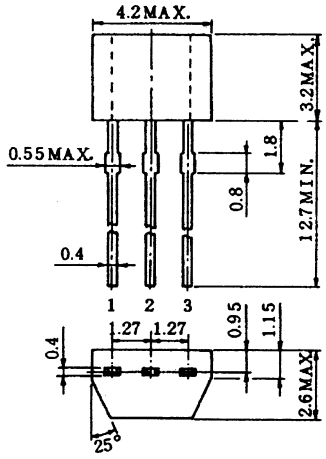
TOSHIBA Transistor Silicon NPN Epitaxial Type

2SC3113

For Audio Amplifier and Switching Applications

- High DC current gain: h_{FE} = 600~3600
- High breakdown voltage: V_{CEO} = 50 V
- High collector current: I_C = 150 mA (max)
- Small package

Unit: mm



1. EMITTER
2. COLLECTOR
3. BASE

JEDEC	—
JEITA	—
TOSHIBA	2-4E1A

Weight: 0.13 g (typ.)

Maximum Ratings (Ta = 25°C)

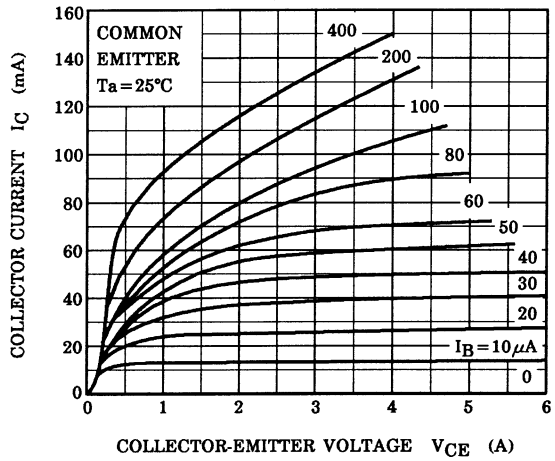
Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	50	V
Collector-emitter voltage	V_{CEO}	50	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	150	mA
Base current	I_B	30	mA
Collector power dissipation	P_C	200	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55~125	°C

Electrical Characteristics (Ta = 25°C)

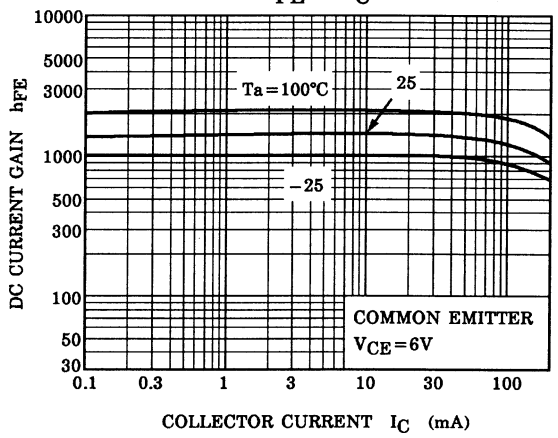
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 50 V, I_E = 0	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 5 V, I_C = 0	—	—	0.1	μA
DC current gain	h_{FE} (Note)	V_{CE} = 6 V, I_C = 2 mA	600	—	3600	
Collector-emitter saturation voltage	$V_{CE\ (sat)}$	I_C = 100 mA, I_B = 10 mA	—	0.12	0.25	V
Transition frequency	f_T	V_{CE} = 10 V, I_C = 10 mA	100	250	—	MHz
Collector output capacitance	C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	3.5	—	pF
Noise figure	NF (1)	V_{CE} = 6 V, I_C = 0.1 mA, f = 100 Hz, R_G = 10 kΩ	—	0.5	—	dB
	NF (2)	V_{CE} = 6 V, I_C = 0.1 mA, f = 1 kHz, R_G = 10 kΩ	—	0.3	—	

Note: h_{FE} classification A: 600~1800, B: 1200~3600

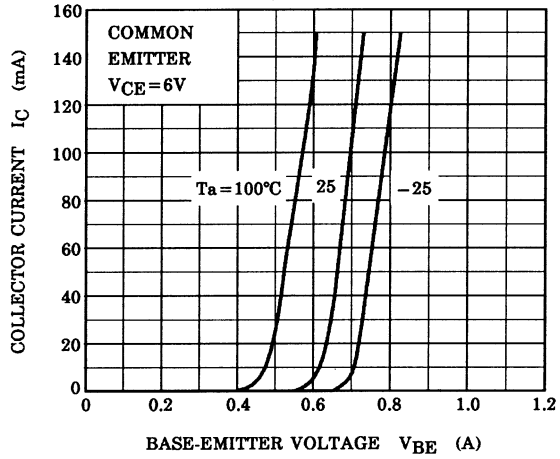
I_C – V_{CE}



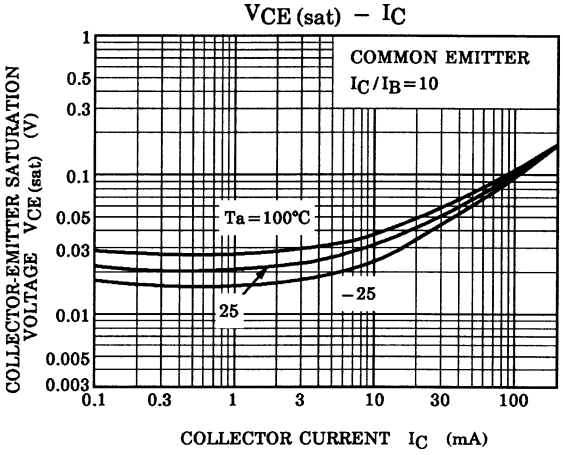
h_{FE} – I_C



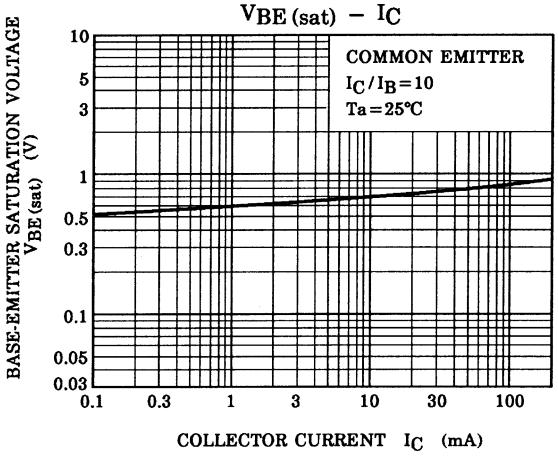
I_C – V_{BE}



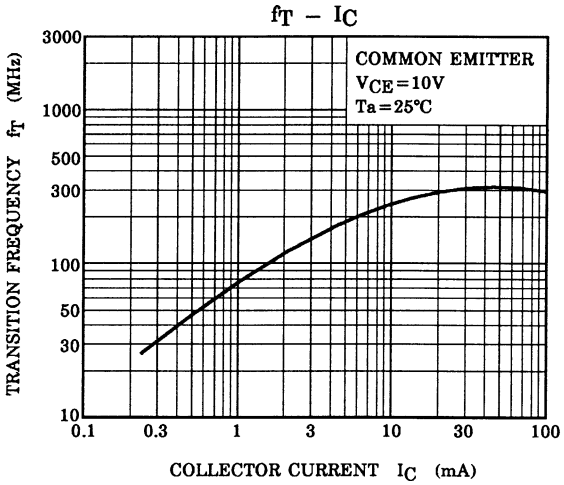
$V_{CE\,(sat)}$ – I_C



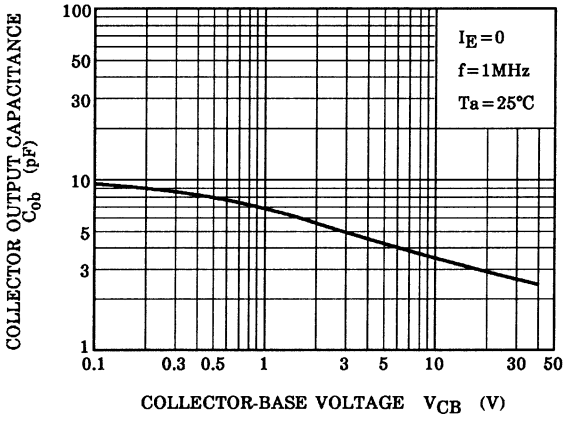
$V_{BE\,(sat)}$ – I_C



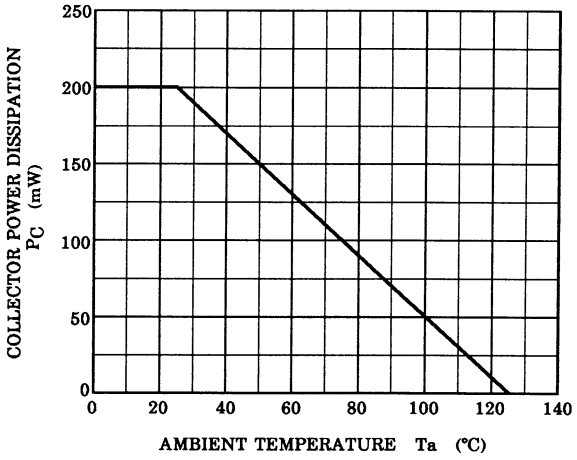
f_T – I_C



C_{ob} – V_{CB}


COLLECTOR OUTPUT CAPACITANCE Cob (pF)
100
50
30
10
5
3
1
0.1
0.3
0.5
1
3
5
10
30
50
IE=0
f=1MHz
Ta=25°C
COLLECTOR-BASE VOLTAGE VCB (V)

P_C – Ta


COLLECTOR POWER DISSIPATION PC (mW)
250
200
150
100
50
0
0
20
40
60
80
100
120
140
AMBIENT TEMPERATURE Ta (°C)

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