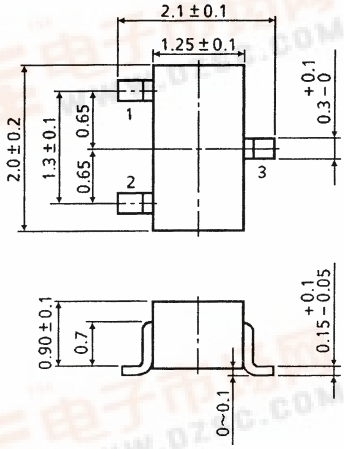
TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

2SC4116

Audio Frequency General Purpose Amplifier Applications

- High voltage and high current: V_{CEO} = 50 V, I_C = 150 mA (max)
- Excellent h_{FE} linearity: h_{FE} (I_C = 0.1 mA)/h_{FE} (I_C = 2 mA) = 0.95 (typ.)
- High h_{FE}: h_{FE} = 70~700
- Low noise: NF = 1dB (typ.), 10dB (max)
- Complementary to 2SA1586
- Small package

Unit: mm



1. BASE
2. EMITTER
3. COLLECTOR

USM

JEDEC	—
JEITA	SC-70
TOSHIBA	2-2E1A

Weight: 0.006 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	60	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	100	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55~125	°C

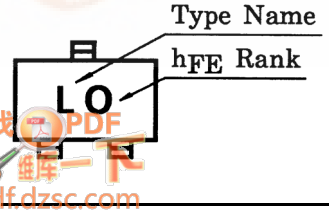
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

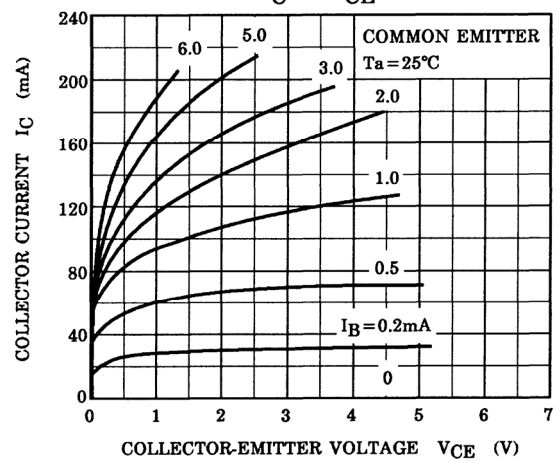
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 60 V, I_E = 0	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	V_{EB} = 5 V, I_C = 0	—	—	0.1	μA
DC current gain (Note)	h_{FE} (Note)	V_{CE} = 6 V, I_C = 2 mA	70	—	700	
Collector-emitter saturation voltage	$V_{CE\ (sat)}$	I_C = 100 mA, I_B = 10 mA	—	0.1	0.25	V
Transition frequency	f_T	V_{CE} = 10 V, I_C = 1 mA	80	—	—	MHz
Collector output capacitance	C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	2.0	3.5	pF
Noise figure	NF	V_{CE} = 6 V, I_C = 0.1 mA, f = 1 kHz, R_g = 10 kΩ,	—	1.0	10	dB

Note: h_{FE} classification O (O): 70~140, Y (Y): 120~240, GR (G): 200~400, BL (L): 350~700, ( ) marking symbol

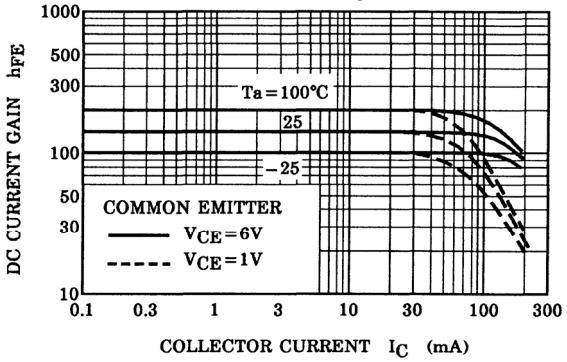
Marking



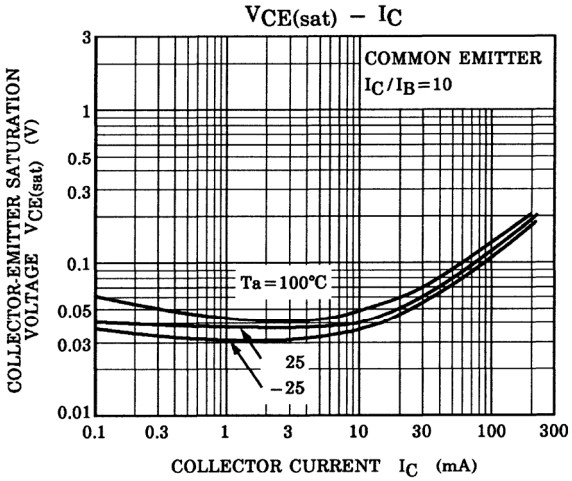
I_C – V_{CE}



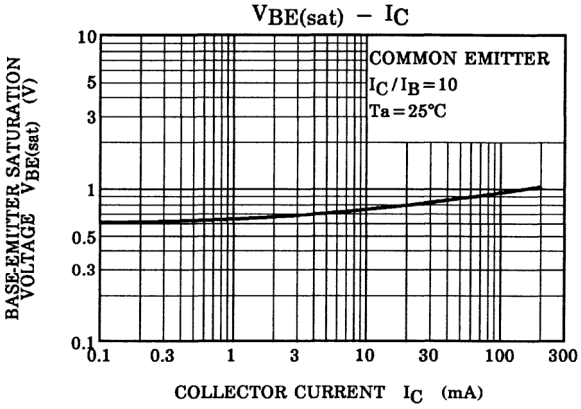
h_{FE} – I_C



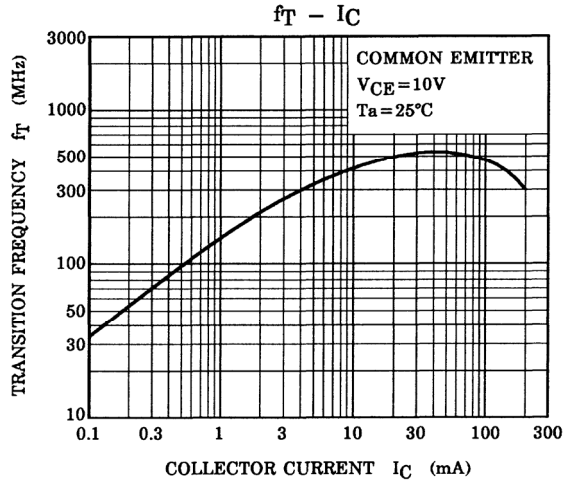
$V_{CE(sat)}$ – I_C



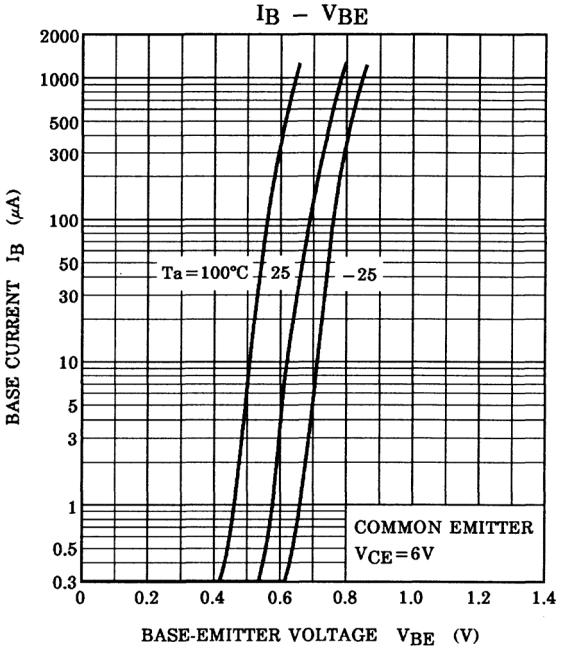
$V_{BE(sat)}$ – I_C



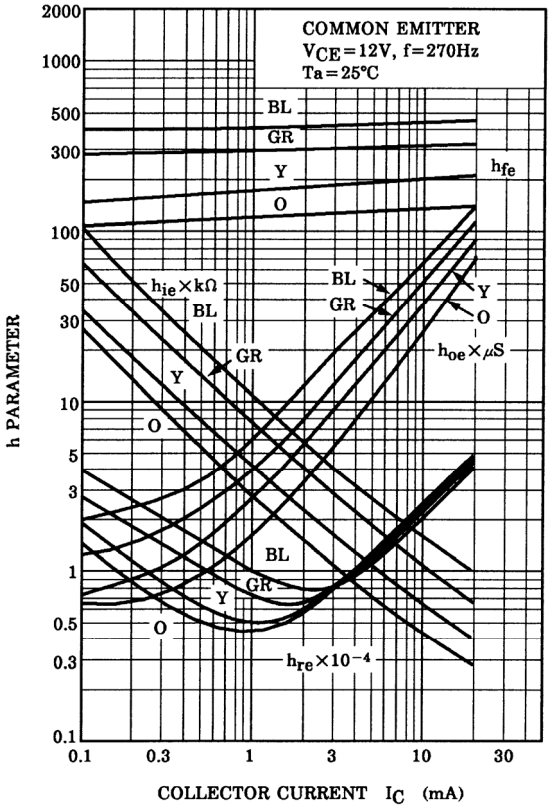
f_T – I_C



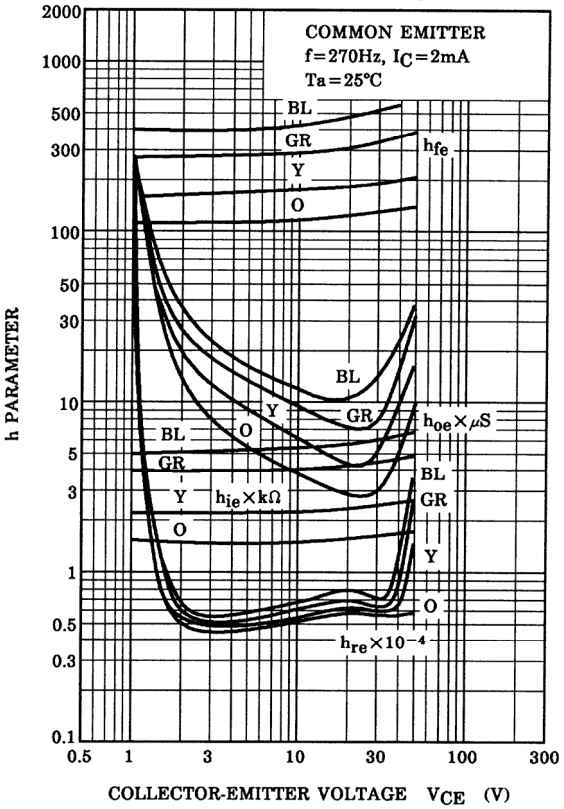
I_B – V_{BE}



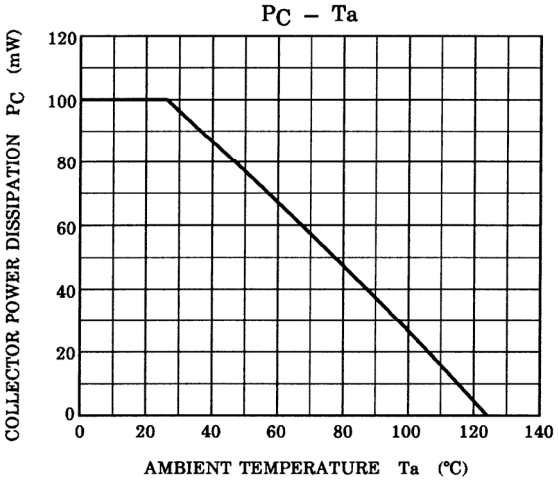
h PARAMETER – I_C



h PARAMETER – V_{CE}



P_C – Ta



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20070701-EN GENERAL

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