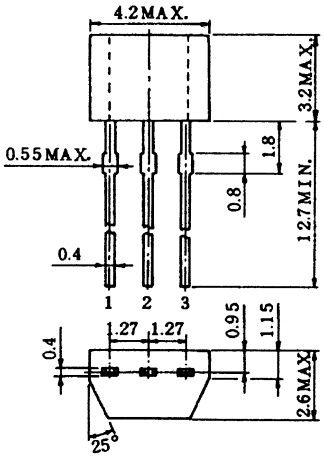
TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process)

2SA1048

Audio Frequency Amplifier Applications

- Small package
- High voltage: V_{CEO} = −50 V (min)
- High h_{FE}: h_{FE} = 70~400
- Excellent h_{FE} linearity: h_{FE} (I_C = −0.1 mA)/h_{FE} (I_C = −2 mA) = 0.95 (typ.)
- Low noise: NF = 1dB (typ.), 10dB (max)
- Complementary to 2SC2458

Unit: mm



1. EMITTER
2. COLLECTOR
3. BASE

JEDEC	—
JEITA	—
TOSHIBA	2-4E1A

Weight: 0.13 g (typ.)

Absolute 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	−50	mA
Collector power dissipation	P_C	200	mW
Junction temperature	T_j	125	°C
Storage temperature range	T_{stg}	−55~125	°C

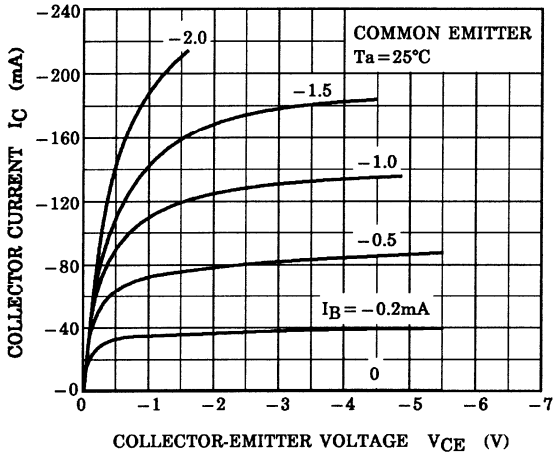
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

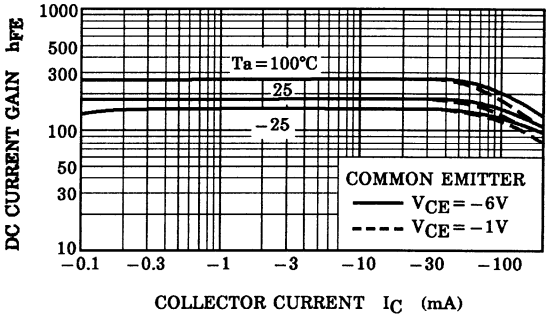
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = −50 V, I_E = 0	—	—	−0.1	μA
Emitter cut-off current	I_{EBO}	V_{EB} = −5 V, I_C = 0	—	—	−0.1	μA
DC current gain	h_{FE} (Note)	V_{CE} = −6 V, I_C = −2 mA	70	—	400	
Collector-emitter saturation voltage	$V_{CE\ (sat)}$	I_C = −100 mA, I_B = −10 mA	—	−0.1	−0.3	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	—	4	7	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: 70~140, Y: 120~240, GR: 200~400

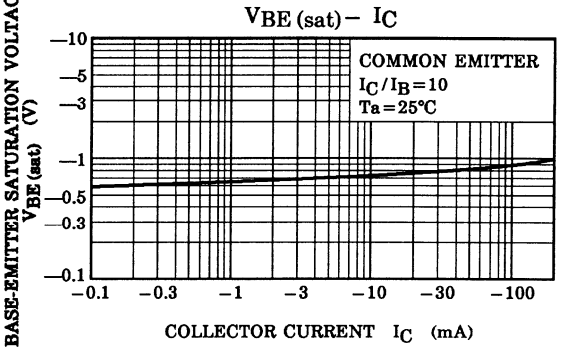
$I_C - V_{CE}$



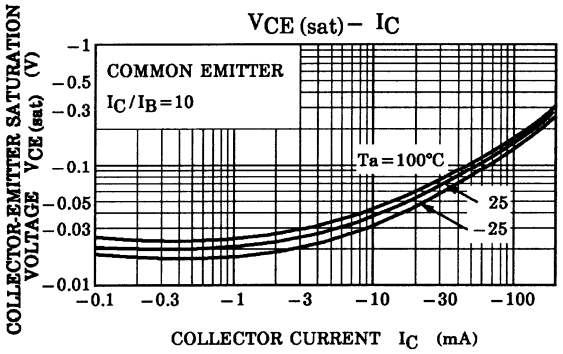
$h_{FE} - I_C$



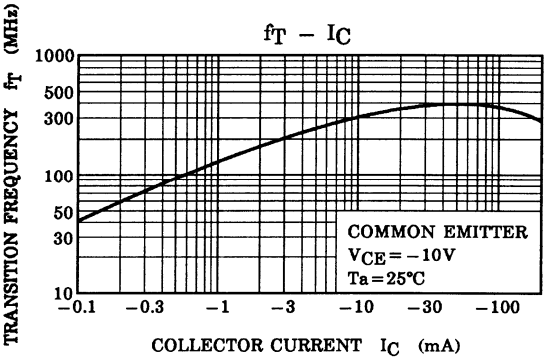
$V_{BE\,(sat)} - I_C$



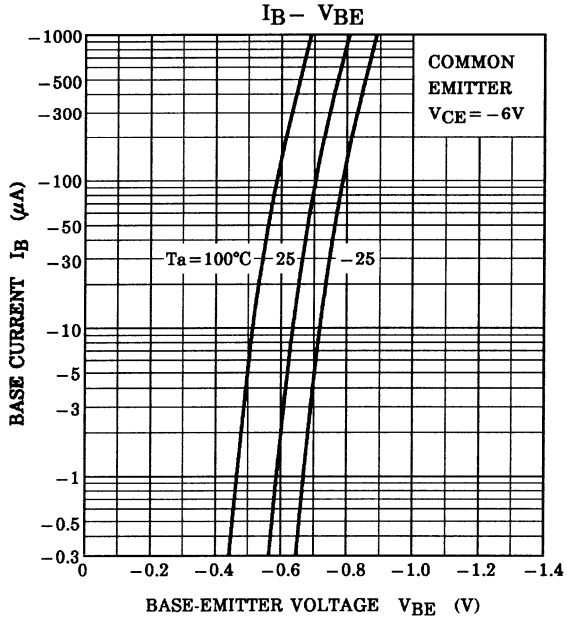
$V_{CE\,(sat)} - I_C$



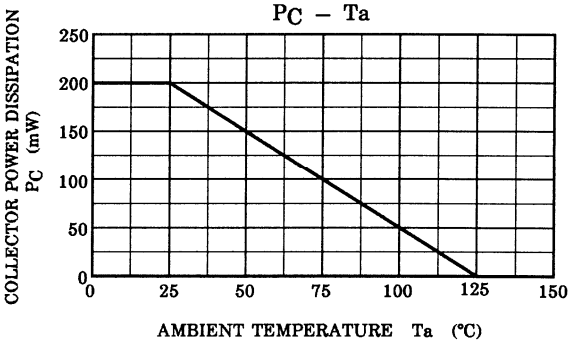
$f_T - I_C$



$I_B - V_{BE}$



$P_C - Ta$



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