

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process)

2SA1048

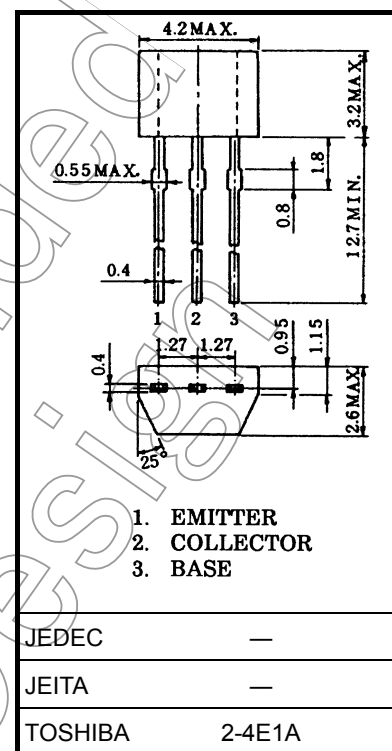
Audio Frequency Amplifier Applications

Unit: mm

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

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

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	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55~125	$^\circ\text{C}$



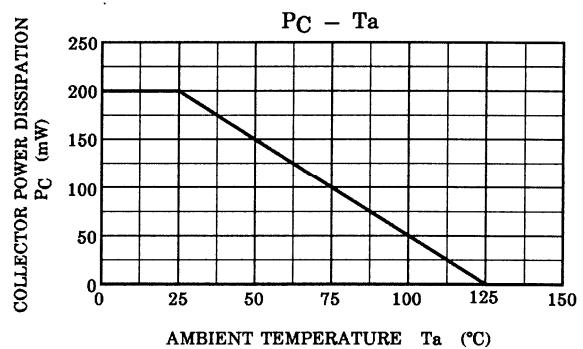
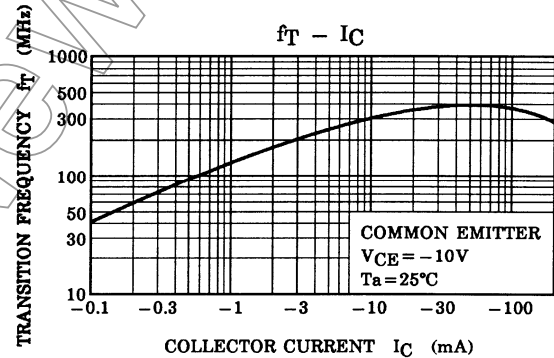
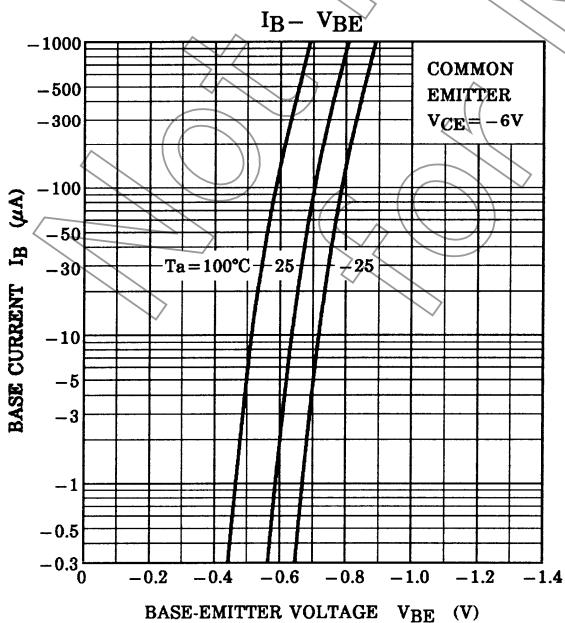
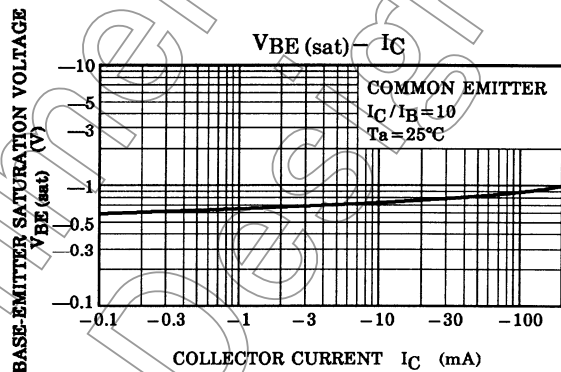
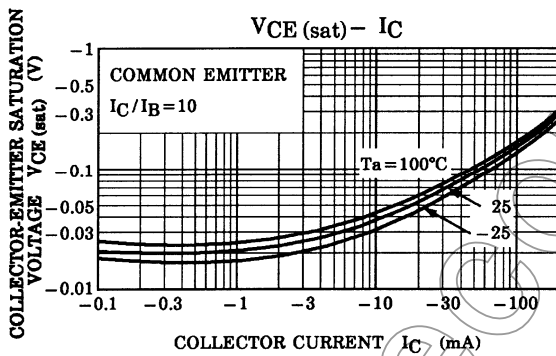
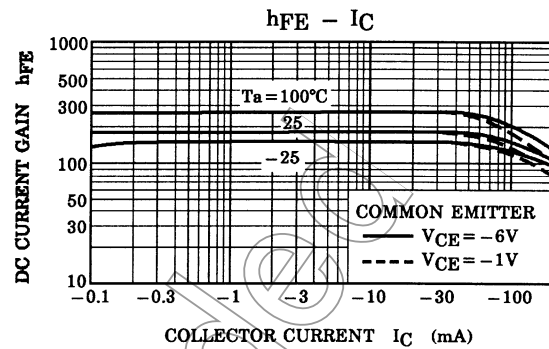
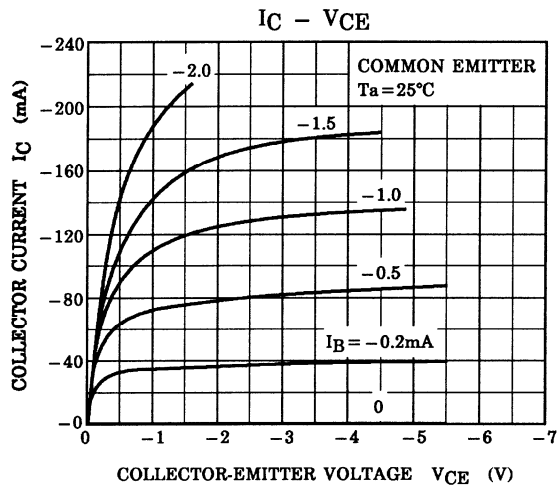
Weight: 0.13 g (typ.)

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 ($T_a = 25^\circ\text{C}$)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = -50 \text{ V}, I_E = 0$	—	—	-0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = -5 \text{ V}, I_C = 0$	—	—	-0.1	μA
DC current gain	h_{FE} (Note)	$V_{CE} = -6 \text{ V}, I_C = -2 \text{ mA}$	70	—	400	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -100 \text{ mA}, I_B = -10 \text{ mA}$	—	-0.1	-0.3	V
Transition frequency	f_T	$V_{CE} = -10 \text{ V}, I_C = -1 \text{ mA}$	80	—	—	MHz
Collector output capacitance	C_{ob}	$V_{CB} = -10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$	—	4	7	pF
Noise figure	NF	$V_{CE} = -6 \text{ V}, I_C = -0.1 \text{ mA}, f = 1 \text{ kHz}, R_G = 10 \text{ k}\Omega$	—	1.0	10	dB

Note: h_{FE} classification O: 70~140, Y: 120~240, GR: 200~400



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