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TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process)

2SA1312

Audio Frequency Low Noise Amplifier Applications

- High voltage: $V_{CEO} = -120\text{ V}$
- Excellent h_{FE} linearity: $h_{FE}(I_C = -0.1\text{ mA}) / h_{FE}(I_C = -2\text{ mA})$
 $h = 0.95$ (typ.)
- High h_{FE} : $h_{FE} = 200$ to 700
- Low noise: $NF(2) = 0.2\text{ dB}$ (typ.), 3 dB (max) at $f = 1\text{ kHz}$
- Complementary to 2SC3324
- Small package

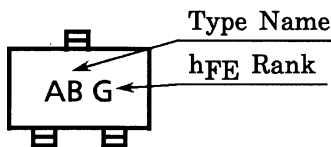
Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	-120	V
Collector-emitter voltage	V_{CEO}	-120	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	150	mW
Junction temperature	T_j	125	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55 to 125	$^\circ\text{C}$

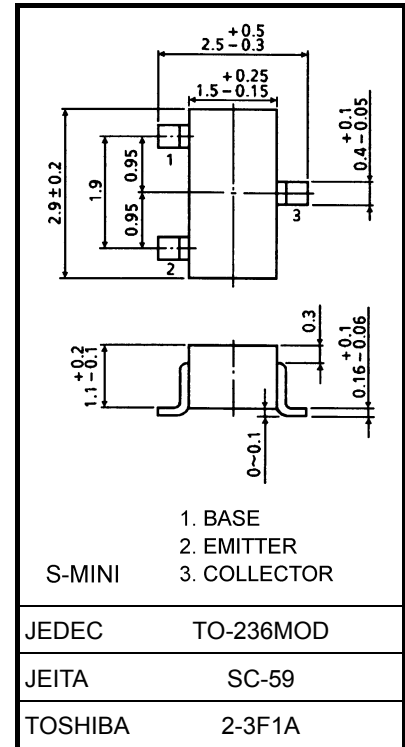
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

Marking



Unit: mm



Weight: 0.012 g (typ.)

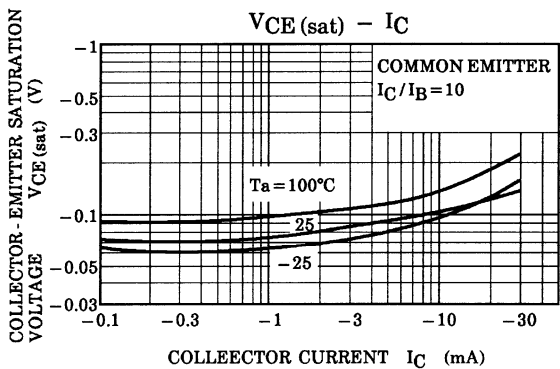
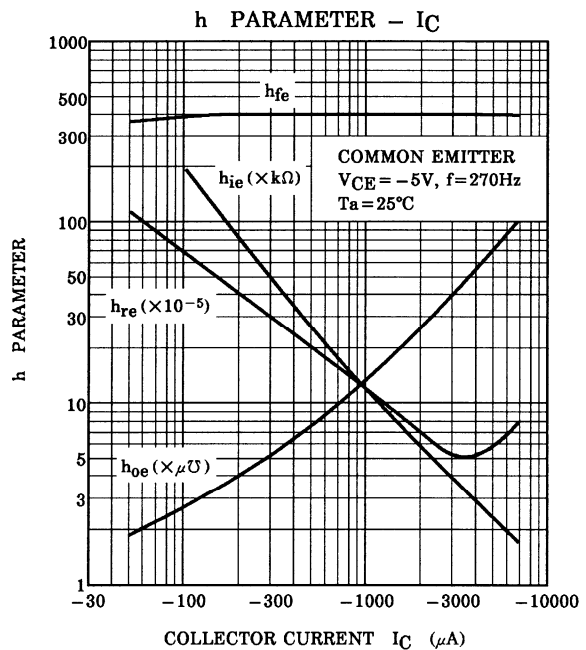
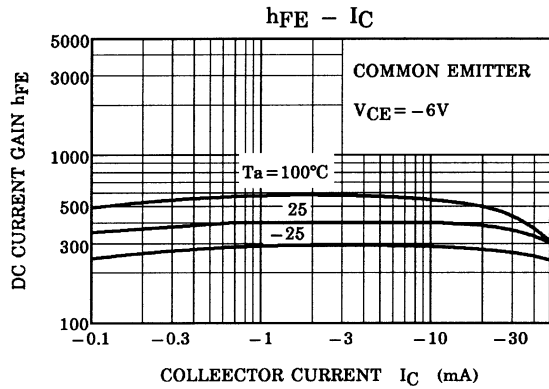
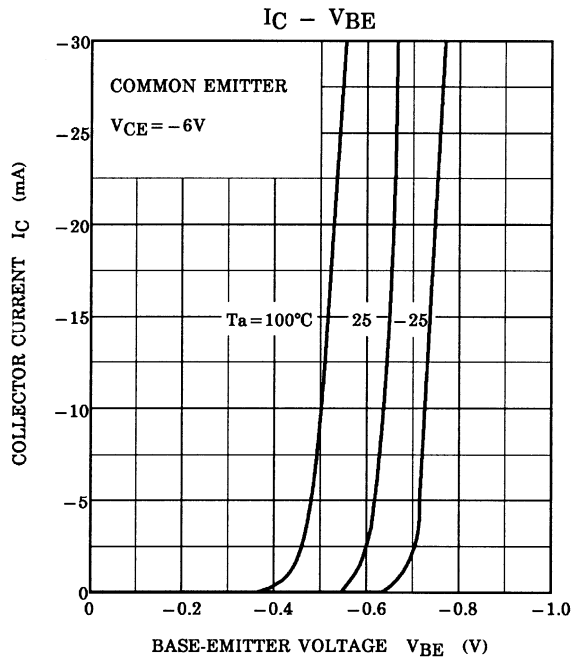
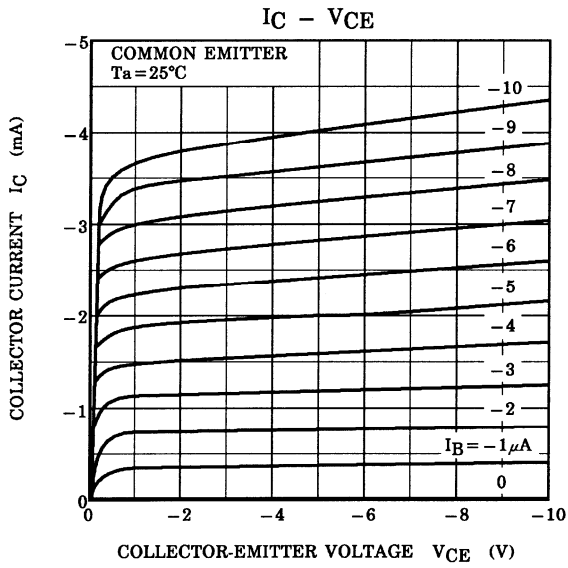
Start of commercial production
1982-12

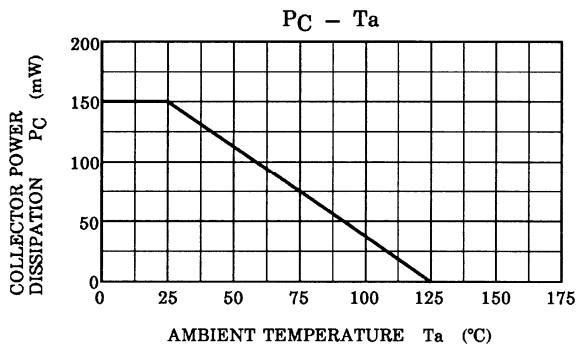
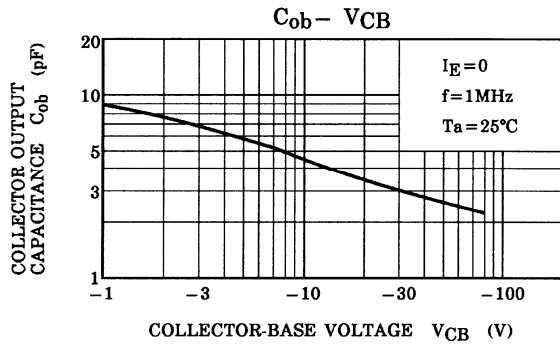
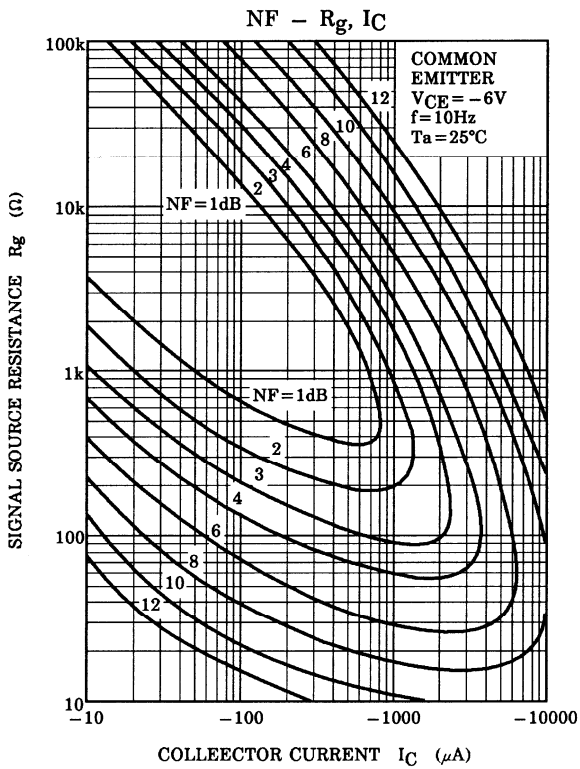
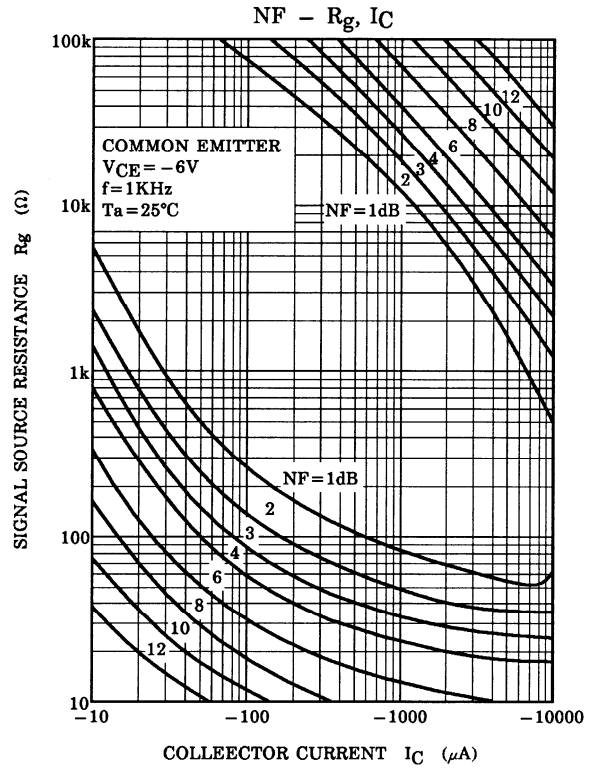
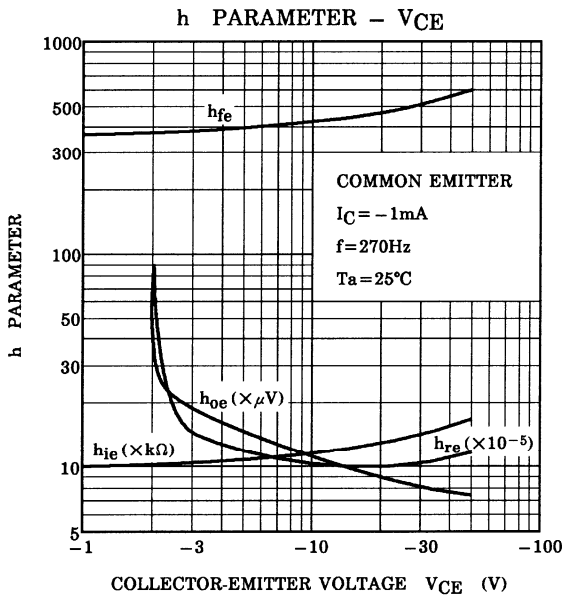
Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	$V_{CB} = -120\text{ V}, I_E = 0$	—	—	-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)	$V_{CE} = -6\text{ V}, I_C = -2\text{ mA}$	200	—	700	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -10\text{ mA}, I_B = -1\text{ mA}$	—	—	-0.3	V
Transition frequency	f_T	$V_{CE} = -6\text{ V}, I_C = -1\text{ mA}$	—	100	—	MHz
Collector output capacitance	C_{ob}	$V_{CB} = -10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	4	—	pF
Noise figure	NF (1)	$V_{CE} = -6\text{ V}, I_C = -0.1\text{ mA}, f = 100\text{ Hz},$ $R_g = 10\text{ k}\Omega$	—	0.5	6	dB
	NF (2)	$V_{CE} = -6\text{ V}, I_C = -0.1\text{ mA}, f = 1\text{ kHz},$ $R_g = 10\text{ k}\Omega$	—	0.2	3	

Note: h_{FE} classification GR (G): 200 to 400, BL (L): 350 to 700

() marking symbol





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