

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process)

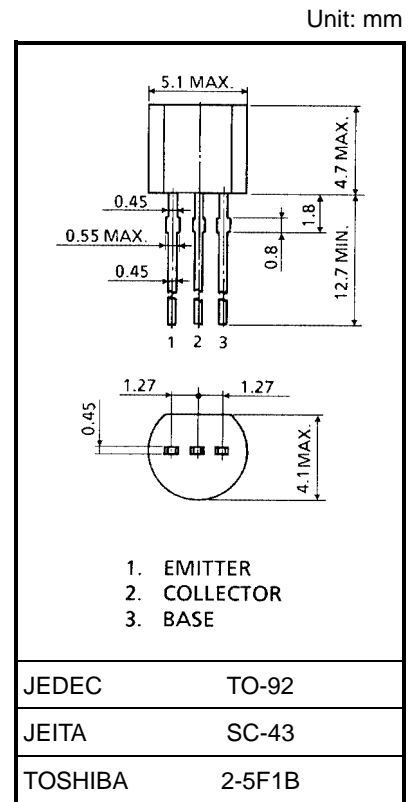
# 2SA1316

For Low Noise Audio Amplifier Applications and Recommended for the First Stages of MC Head Amplifiers

- Very low noise in the region of low signal source impedance equivalent input noise voltage:  $E_n = 0.6 \text{ nV/Hz}^{1/2}$  (typ.)
- Low pulse noise. Low 1/f noise
- Low base spreading resistance:  $r_{bb'} = 2.0 \Omega$  (typ.)
- Complementary to 2SC3329

### Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	-80	V
Collector-emitter voltage	$V_{CEO}$	-80	V
Emitter-base voltage	$V_{EBO}$	-5	V
Collector current	$I_C$	-100	mA
Base current	$I_B$	-20	mA
Collector power dissipation	$P_C$	400	mW
Junction temperature	$T_j$	125	°C
Storage temperature range	$T_{stg}$	-55~125	°C

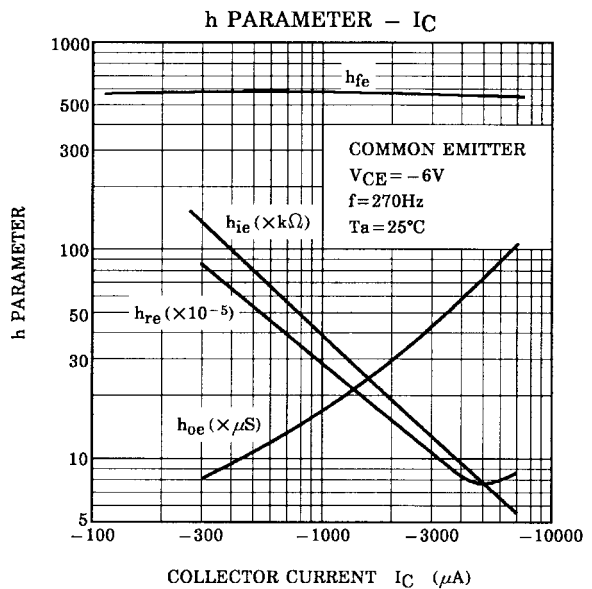
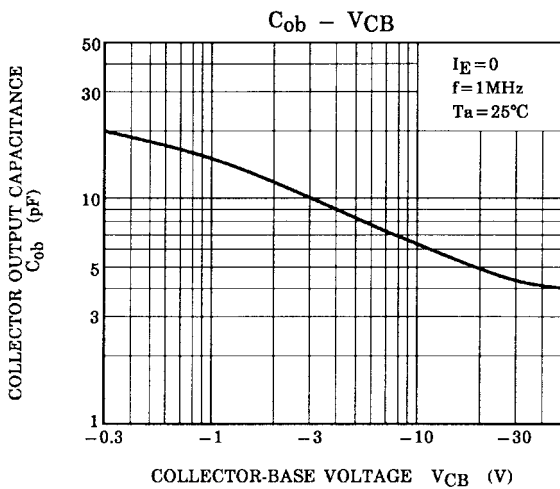
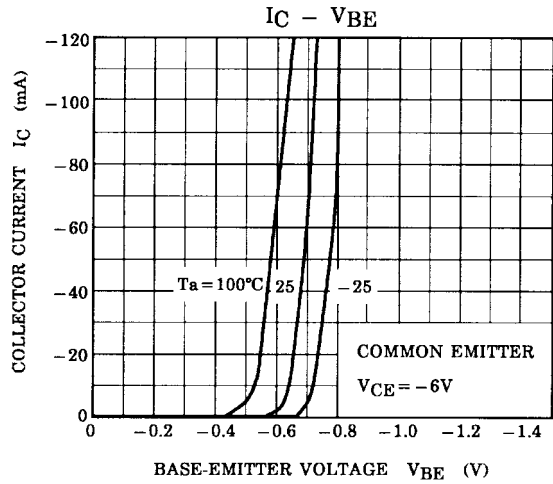
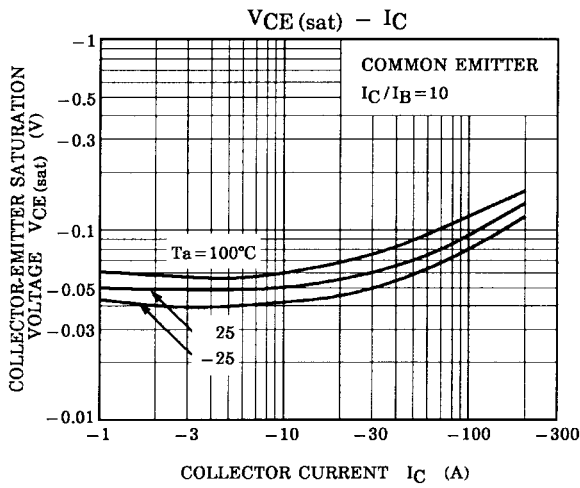
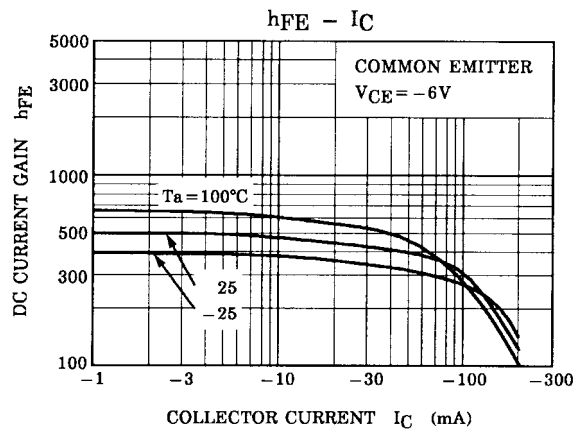
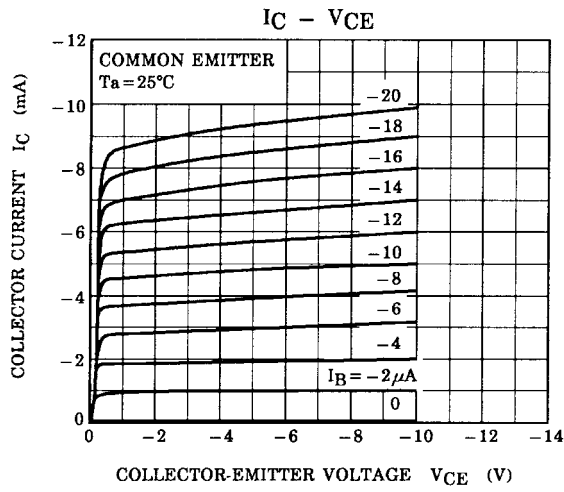


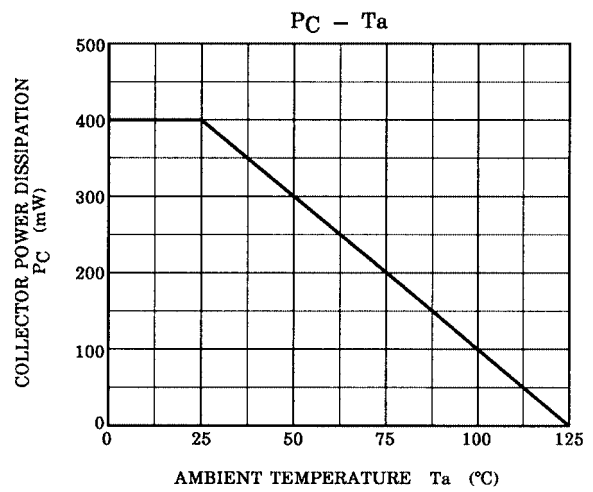
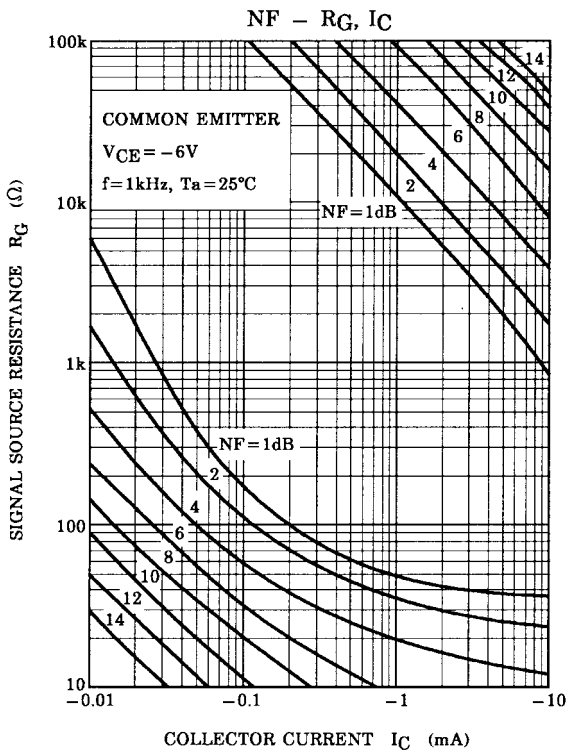
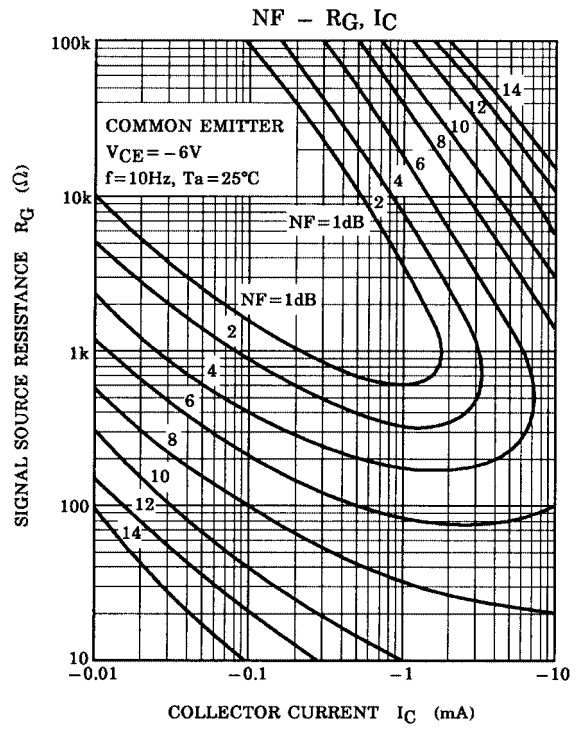
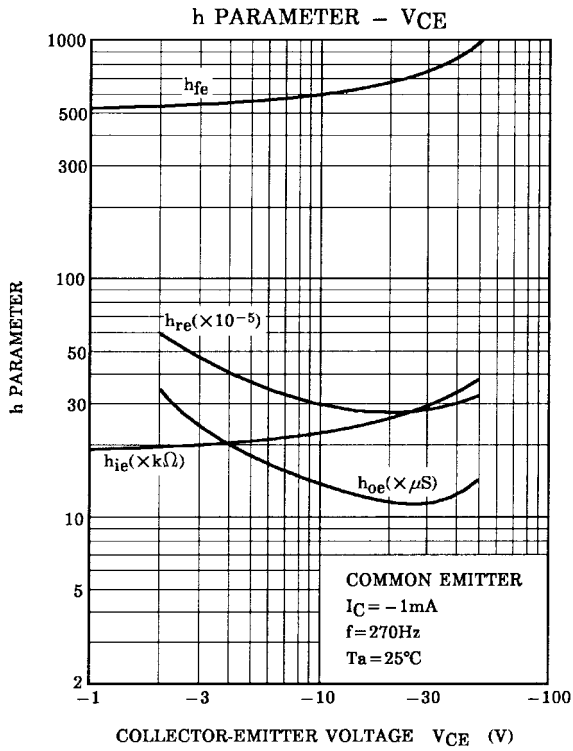
Weight: 0.21 g (typ.)

### Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = -80 \text{ V}, I_E = 0$	—	—	-0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = -5 \text{ V}, I_C = 0$	—	—	-0.1	$\mu\text{A}$
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = -1 \text{ mA}, I_B = 0$	-80	—	—	V
DC current gain	$h_{FE}$ (Note)	$V_{CE} = -6 \text{ V}, I_C = -2 \text{ mA}$	200	—	700	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -10 \text{ mA}, I_B = -1 \text{ mA}$	—	—	-0.1	V
Base-emitter voltage	$V_{BE}$	$V_{CE} = -6 \text{ V}, I_C = -2 \text{ mA}$	—	-0.6	—	V
Base spreading resistance	$r_{bb'}$	$V_{CE} = -6 \text{ V}, I_C = -1 \text{ mA}, f = 100 \text{ MHz}$	—	2.0	—	$\Omega$
Transition frequency	$f_T$	$V_{CE} = -6 \text{ V}, I_C = -1 \text{ mA}, f = 100 \text{ MHz}$	—	50	—	MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = -10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$	—	6.2	—	pF
Noise figure	NF	$V_{CE} = -6 \text{ V}, I_C = -0.1 \text{ mA}$ $f = 10 \text{ Hz}, R_G = 10 \text{ k}\Omega$	—	1	6	dB
		$V_{CE} = -6 \text{ V}, I_C = -0.1 \text{ mA}$ $f = 1 \text{ kHz}, R_G = 10 \text{ k}\Omega$	—	0.5	2	
		$V_{CE} = -6 \text{ V}, I_C = -0.1 \text{ mA}$ $f = 1 \text{ kHz}, R_G = 100 \Omega$	—	2.5	—	

Note:  $h_{FE}$  classification GR: 200~400, BL: 350~700





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