

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process)

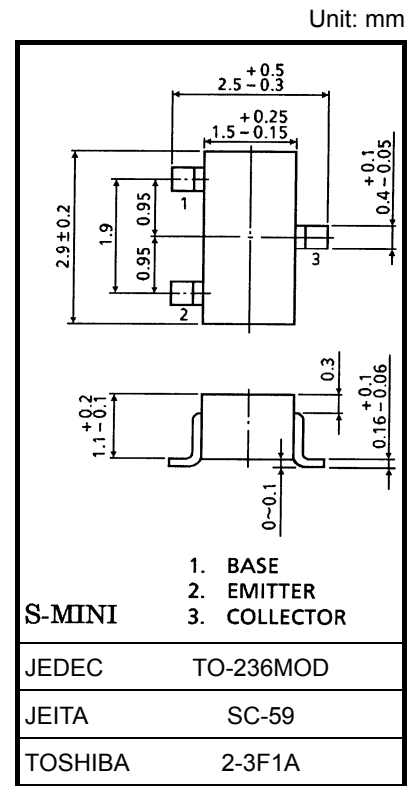
# 2SA1313

Audio Frequency Low Power Amplifier Applications  
 Driver Stage Amplifier Applications  
 Switching Applications

- Excellent hFE linearity:  $h_{FE} (2) = 25$  (min)  
 at  $V_{CE} = -6$  V,  $I_C = -400$  mA
- High voltage:  $V_{CEO} = -50$  V (min)
- Complementary to 2SC3325
- Small package

### 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	$I_C$	-500	mA
Base current	$I_B$	-50	mA
Collector power dissipation	$P_C$	200	mW
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	-55 to 150	°C

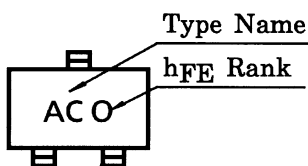


Weight: 0.012 g (typ.)

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).

### Marking



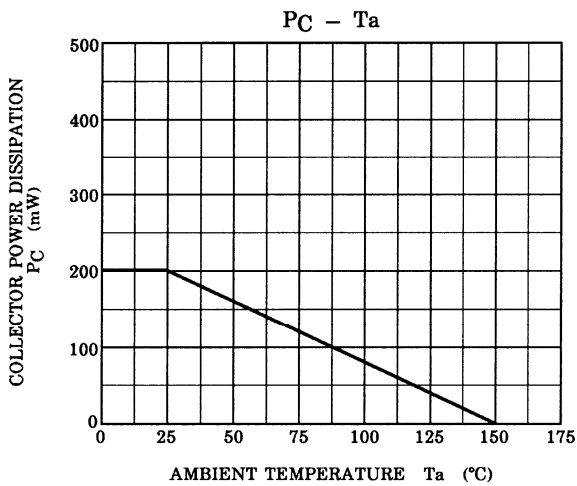
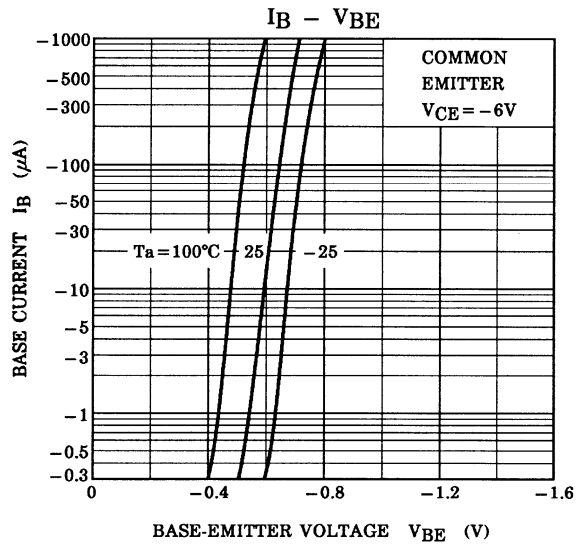
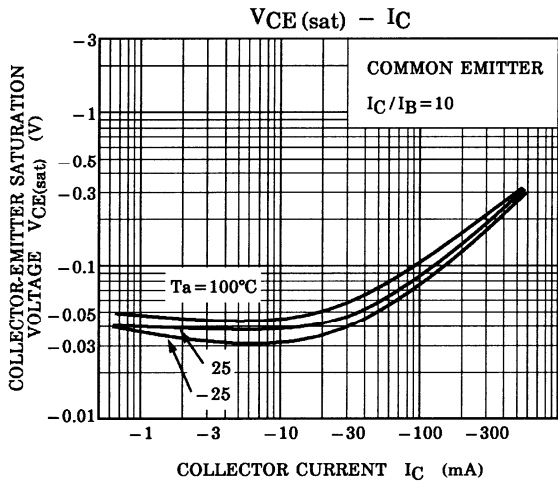
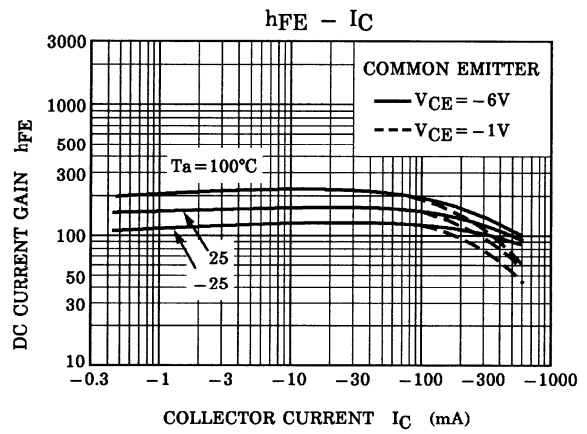
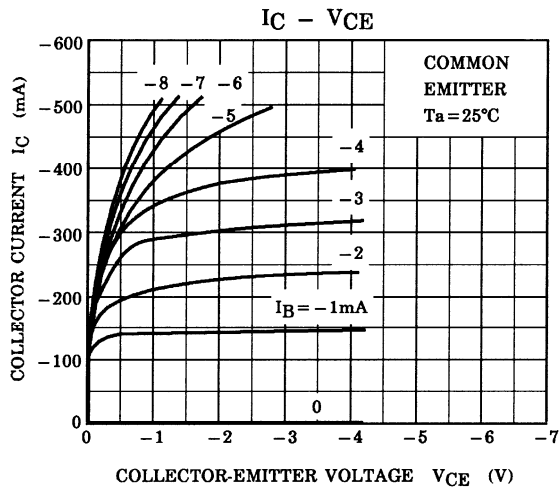
Start of commercial production  
 1982-12

## Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = -5\text{ V}, I_E = 0$	—	—	-0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = -5\text{ V}, I_C = 0$	—	—	-0.1	$\mu\text{A}$
DC current gain	$h_{FE(1)}$ (Note)	$V_{CE} = -1\text{ V}, I_C = -100\text{ mA}$	70	—	240	
	$h_{FE(2)}$ (Note)	$V_{CE} = -6\text{ V}, I_C = -400\text{ mA}$	25	—	—	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -100\text{ mA}, I_B = -10\text{ mA}$	—	-0.1	-0.25	V
Base-emitter voltage	$V_{BE}$	$V_{CE} = -1\text{ V}, I_C = -100\text{ mA}$	—	-0.8	-1.0	V
Transition frequency	$f_T$	$V_{CE} = -6\text{ V}, I_C = -20\text{ mA}$	—	200	—	MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = -6\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	13	—	pF

Note:  $h_{FE(1)}$  classification O: 70~140, Y: 120~240

$h_{FE(2)}$  classification O: 25 (min), Y: 40 (min)



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