

TOSHIBA Transistor Silicon PNP Epitaxial (PCT process)

## 2SA1588

Audio Frequency Low Power Amplifier Applications

Driver Stage Amplifier Applications

Switching Applications

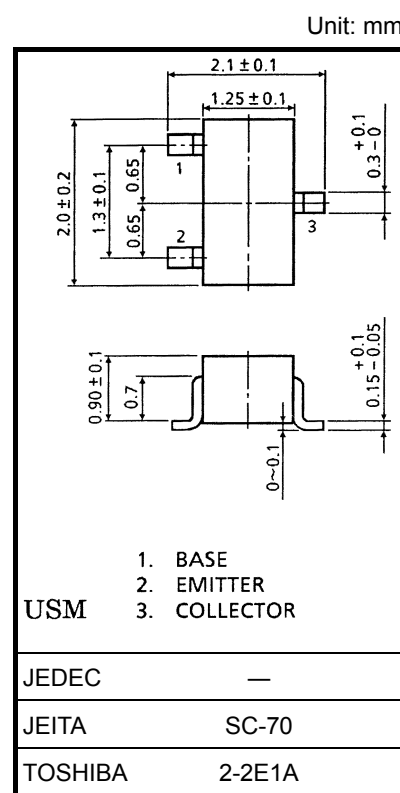
- Excellent  $h_{FE}$  linearity:  $h_{FE} (2) = 25$  (min)  
at  $V_{CE} = -6$  V,  $I_C = -400$  mA
- Complementary to 2SC4118

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

Characteristics	Symbol	Rating	Unit
Collector-base voltage	$V_{CBO}$	-35	V
Collector-emitter voltage	$V_{CEO}$	-30	V
Emitter-base voltage	$V_{EBO}$	-5	V
Collector current	$I_C$	-500	mA
Base current	$I_B$	-50	mA
Collector power dissipation	$P_C$	100	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).



Weight: 0.006 g (typ.)

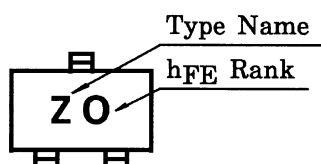
### Electrical Characteristics ( $T_a = 25^\circ\text{C}$ )

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = -35$ V, $I_E = 0$	—	—	-0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = -5$ V, $I_C = 0$	—	—	-0.1	$\mu\text{A}$
DC current gain (Note)	$h_{FE} (1)$	$V_{CE} = -1$ V, $I_C = -100$ mA	70	—	400	
	$h_{FE} (2)$	$V_{CE} = -6$ V, $I_C = -400$ mA	25	—	—	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -100$ mA, $I_B = -10$ mA	—	-0.1	-0.25	V
Base-emitter voltage	$V_{BE}$	$V_{CE} = -1$ V, $I_C = -100$ mA	—	-0.8	-1.0	V
Transition frequency	$f_T$	$V_{CE} = -6$ V, $I_C = -20$ mA	—	200	—	MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = -6$ V, $I_E = 0$ , $f = 1$ MHz	—	13	—	pF

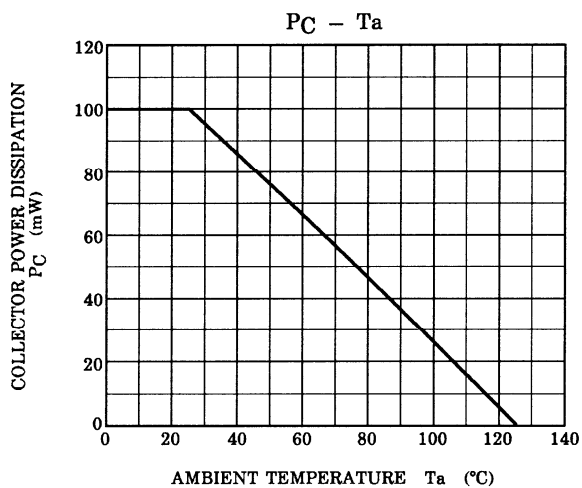
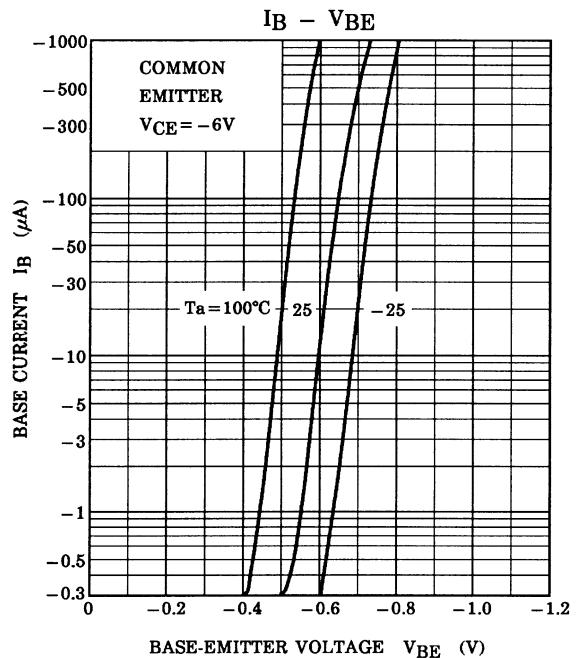
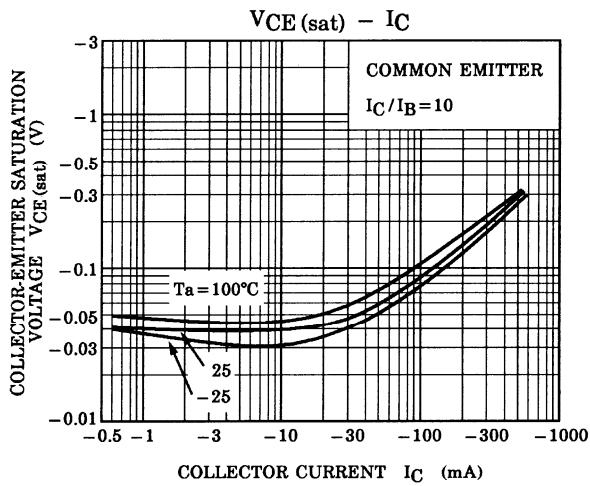
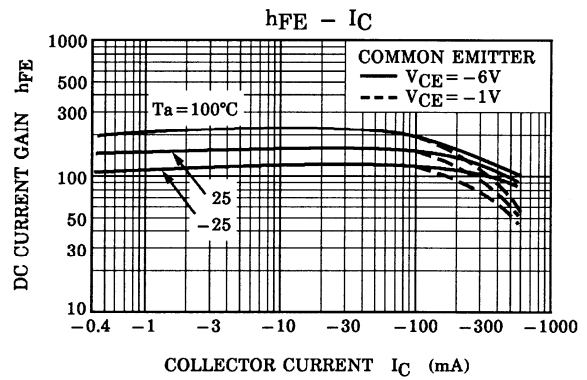
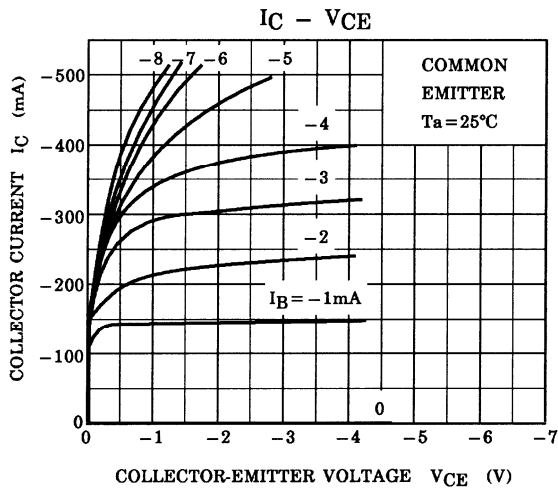
Note:  $h_{FE} (1)$  classification O(O): 70~140, Y(Y): 120~240, GR(G): 200~400 ( ) Marking Symbol

$h_{FE} (2)$  classification O: 25 (min), Y: 40 (min), GR: 75 (min)

### Marking



Start of commercial production  
1987-01



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[2SA1588-O,LF](#) [2SA1588-GR,LF](#)



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