

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process)

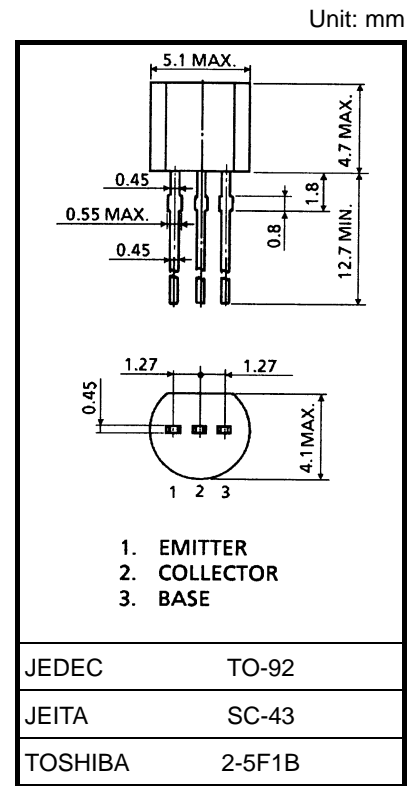
2SA1015

Audio Frequency General Purpose Amplifier Applications
 Driver Stage Amplifier Applications

- High voltage and high current: $V_{CE0} = -50$ V (min),
 $I_C = -150$ mA (max)
- Excellent h_{FE} linearity: $h_{FE} (2) = 80$ (typ.) at $V_{CE} = -6$ V, $I_C = -150$ mA
 : $h_{FE} (I_C = -0.1$ mA)/ $h_{FE} (I_C = -2$ mA) = 0.95 (typ.)
- Low noise: NF = 1dB (typ.) ($f = 1$ kHz)
- Complementary to 2SC1815.

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



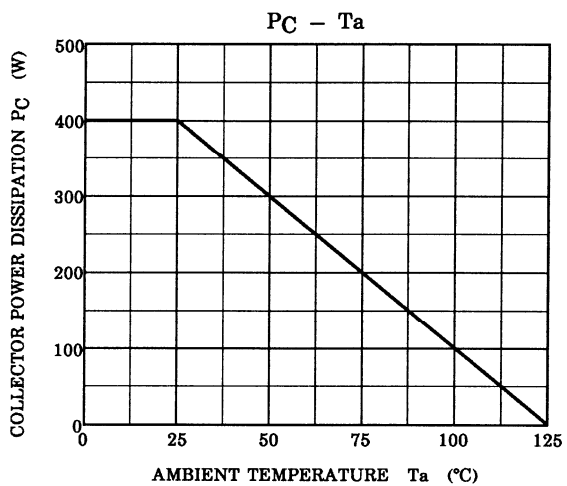
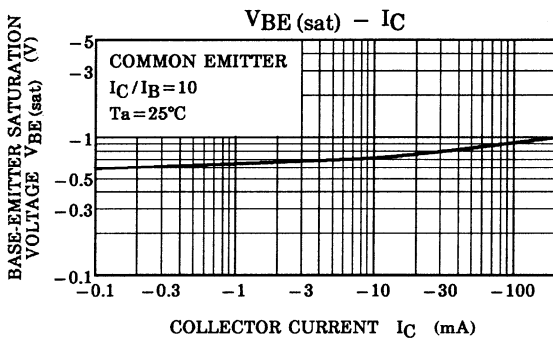
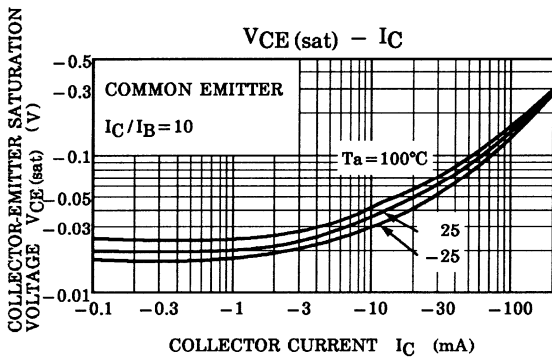
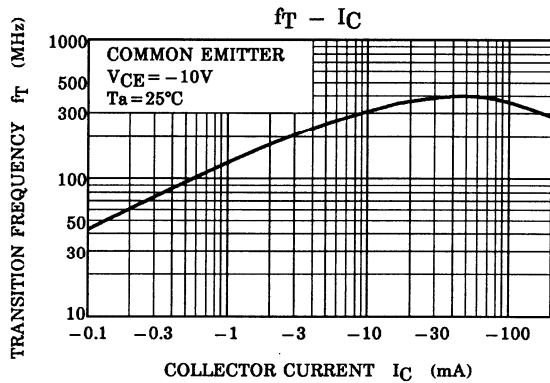
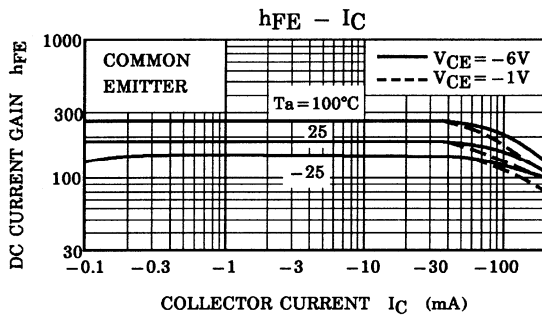
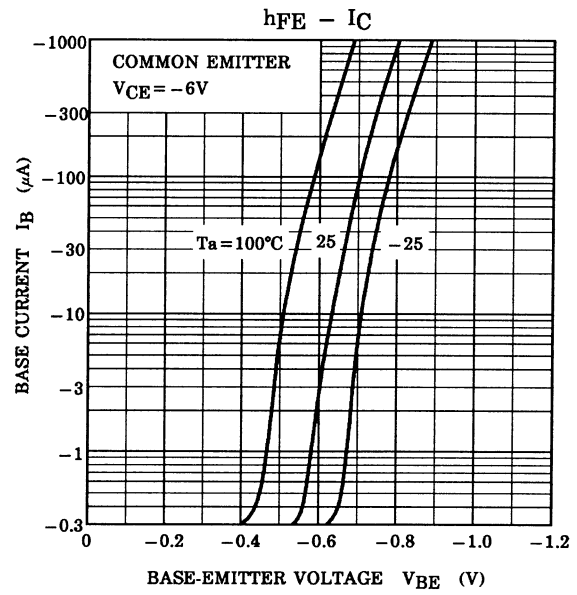
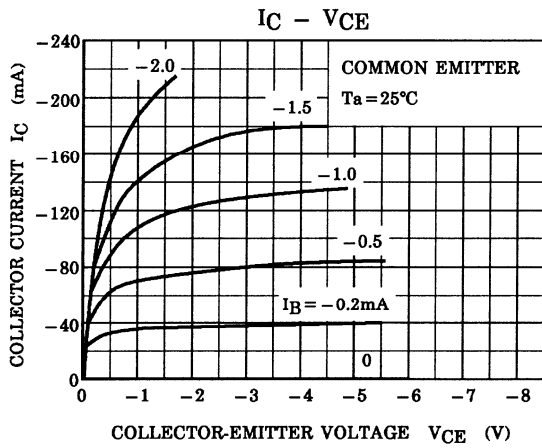
Weight: 0.21 g (typ.)

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}	$V_{CB} = -50$ V, $I_E = 0$	—	—	-0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = -5$ V, $I_C = 0$	—	—	-0.1	μA
DC current gain	$h_{FE} (1)$ (Note)	$V_{CE} = -6$ V, $I_C = -2$ mA	70	—	400	
	$h_{FE} (2)$	$V_{CE} = -6$ V, $I_C = -150$ mA	25	80	—	
Collector-emitter saturation voltage	$V_{CE} (sat)$	$I_C = -100$ mA, $I_B = -10$ mA	—	-0.1	-0.3	V
Base-emitter saturation voltage	$V_{BE} (sat)$	$I_C = -100$ mA, $I_B = -10$ mA	—	—	-1.1	V
Transition frequency	f_T	$V_{CE} = -10$ V, $I_C = -1$ mA	80	—	—	MHz
Collector output capacitance	C_{ob}	$V_{CB} = -10$ V, $I_E = 0$, $f = 1$ MHz	—	4	7	pF
Base intrinsic resistance	$r_{bb'}$	$V_{CE} = -10$ V, $I_E = 1$ mA, $f = 30$ MHz	—	30	—	Ω
Noise figure	NF	$V_{CE} = -6$ V, $I_C = -0.1$ mA, $R_G = 10$ k Ω , $f = 1$ kHz	—	1.0	10	dB

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



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