

TOSHIBA Transistor Silicon NPN Epitaxial Type (PCT process)

2SC1815

Audio Frequency General Purpose Amplifier Applications
 Driver Stage Amplifier Applications

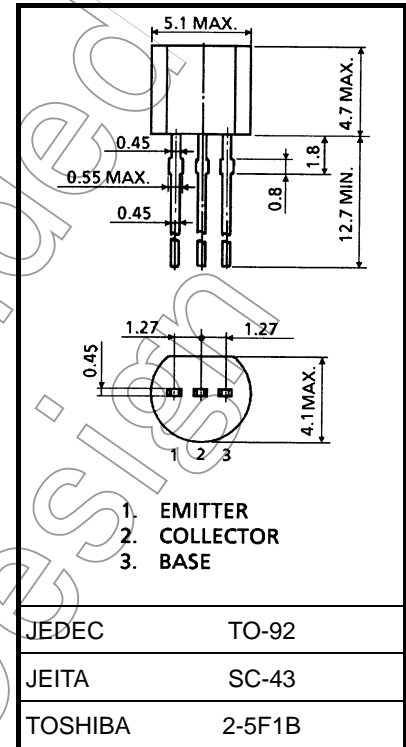
Unit: mm

High voltage and high current: $V_{CEO} = 50 \text{ V (min)}$,
 $I_C = 150 \text{ mA (max)}$

- Excellent h_{FE} linearity: $h_{FE} (2) = 100 \text{ (typ.)}$
 at $V_{CE} = 6 \text{ V}$, $I_C = 150 \text{ mA}$
 : $h_{FE} (I_C = 0.1 \text{ mA})/h_{FE} (I_C = 2 \text{ mA})$
 = 0.95 (typ.)
- Low noise: $NF = 1 \text{ dB (typ.)}$ at $f = 1 \text{ kHz}$
- Complementary to 2SA1015 (O, Y, GR class)

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

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	60	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	$^\circ\text{C}$



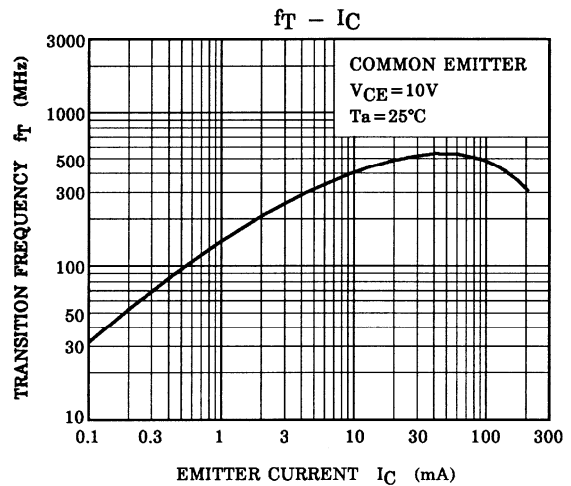
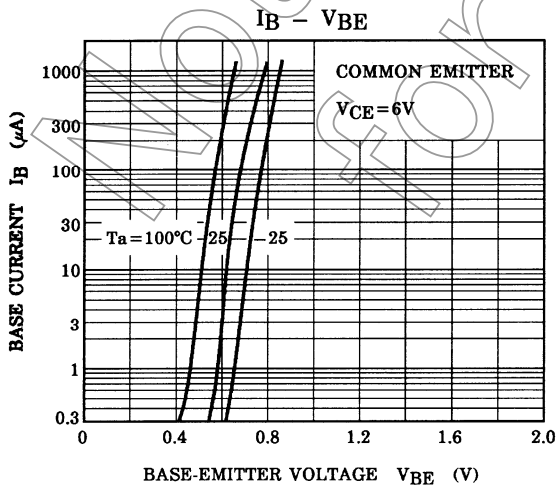
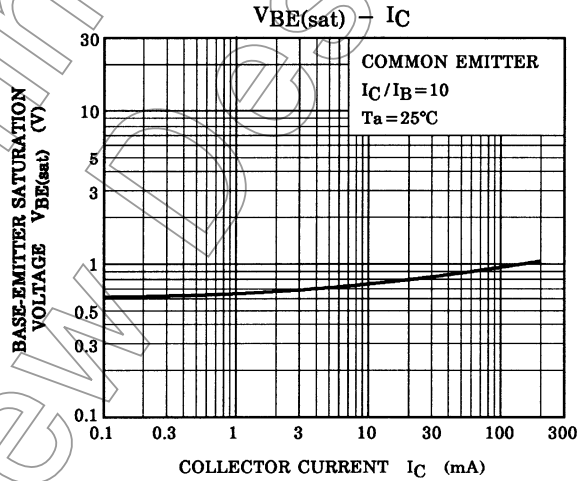
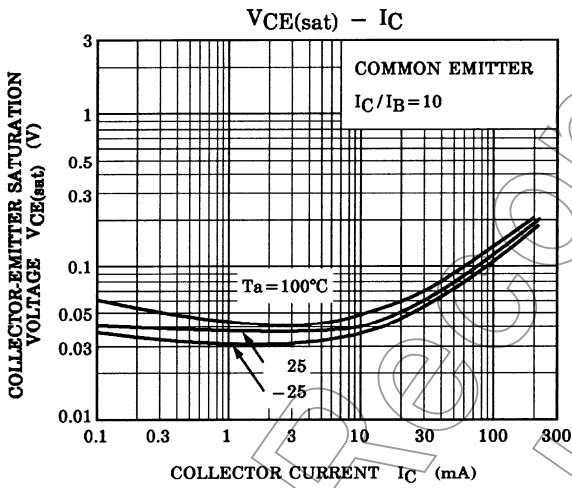
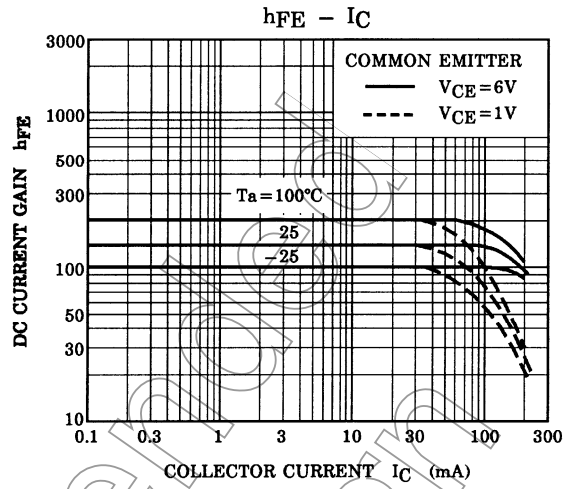
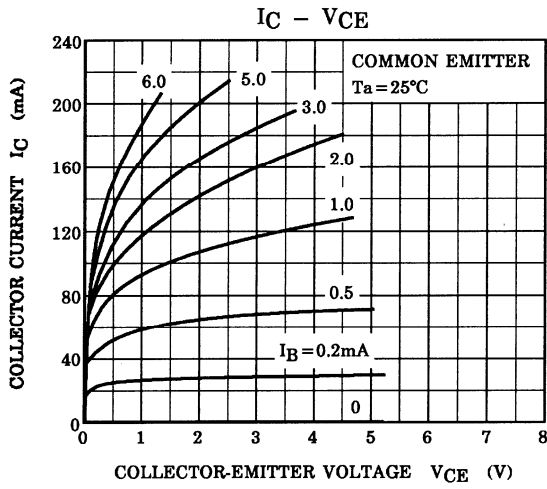
Weight: 0.21 g (typ.)

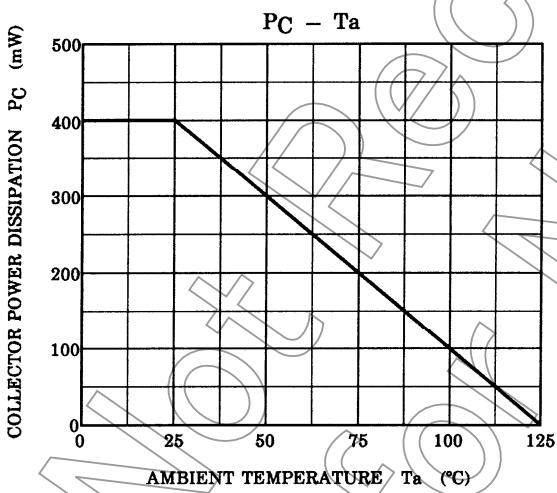
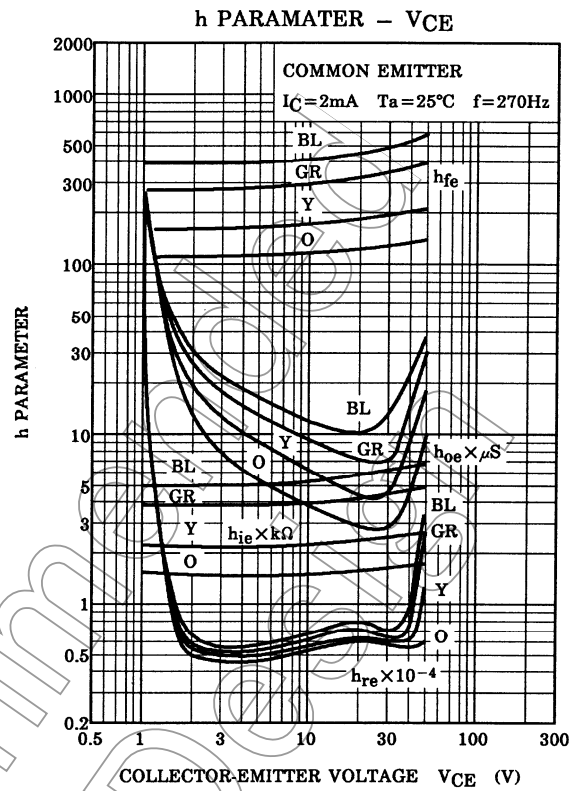
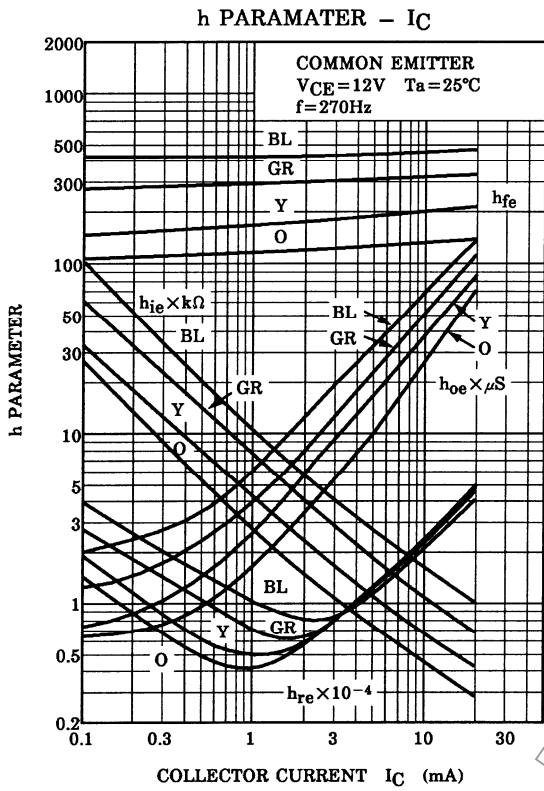
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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}	$V_{CB} = 60 \text{ V}$, $I_E = 0$	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 5 \text{ V}$, $I_C = 0$	—	—	0.1	μA
DC current gain	$h_{FE} (1)$ (Note)	$V_{CE} = 6 \text{ V}$, $I_C = 2 \text{ mA}$	70	—	700	
	$h_{FE} (2)$	$V_{CE} = 6 \text{ V}$, $I_C = 150 \text{ mA}$	25	100	—	
Collector-emitter saturation voltage	$V_{CE} \text{ (sat)}$	$I_C = 100 \text{ mA}$, $I_B = 10 \text{ mA}$	—	0.1	0.25	V
Base-emitter saturation voltage	$V_{BE} \text{ (sat)}$	$I_C = 100 \text{ mA}$, $I_B = 10 \text{ mA}$	—	—	1.0	V
Transition frequency	f_T	$V_{CE} = 10 \text{ V}$, $I_C = 1 \text{ mA}$	80	—	—	MHz
Collector output capacitance	C_{ob}	$V_{CB} = 10 \text{ V}$, $I_E = 0$, $f = 1 \text{ MHz}$	—	2.0	3.5	pF
Base intrinsic resistance	$r_{bb'}$	$V_{CE} = 10 \text{ V}$, $I_E = -1 \text{ mA}$ $f = 30 \text{ MHz}$	—	50	—	Ω
Noise figure	NF	$V_{CE} = 6 \text{ V}$, $I_C = 0.1 \text{ mA}$ $f = 1 \text{ kHz}$, $R_G = 10 \text{ k}\Omega$	—	1.0	10	dB

Note: h_{FE} classification O: 70~140, Y: 120~240, GR: 200~400, BL: 350~700





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