

TOSHIBA Transistor Silicon PNP Epitaxial Type (PCT process)

## 2SA1300

Strobe Flash Applications

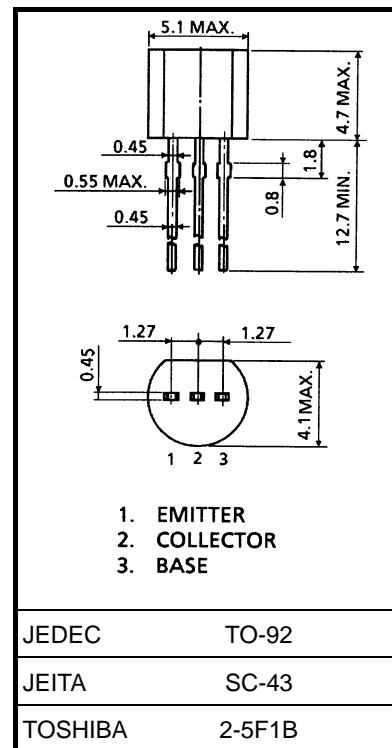
Medium Power Amplifier Applications

Unit: mm

- High DC current gain and excellent  $h_{FE}$  linearity  
 :  $h_{FE} (1) = 140\sim 600$  ( $V_{CE} = -1$  V,  $I_C = -0.5$  A)  
 :  $h_{FE} (2) = 60$  (min), 120 (typ.) ( $V_{CE} = -1$  V,  $I_C = -4$  A)
- Low saturation voltage:  $V_{CE(sat)} = -0.5$  V (max)  
 ( $I_C = -2$  A,  $I_B = -50$  mA)

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

Characteristics		Symbol	Rating	Unit
Collector-base voltage		$V_{CBO}$	-20	V
Collector-emitter voltage		$V_{CES}$	-20	V
		$V_{CEO}$	-10	
Emitter-base voltage		$V_{EBO}$	-6	V
Collector current	DC	$I_C$	-2	A
	Pulsed (Note 1)	$I_{CP}$	-5	
Base current		$I_B$	-0.2	A
Collector power dissipation		$P_C$	750	mW
Junction temperature		$T_j$	150	$^\circ\text{C}$
Storage temperature range		$T_{stg}$	-55~150	$^\circ\text{C}$



Weight: 0.21 g (typ.)

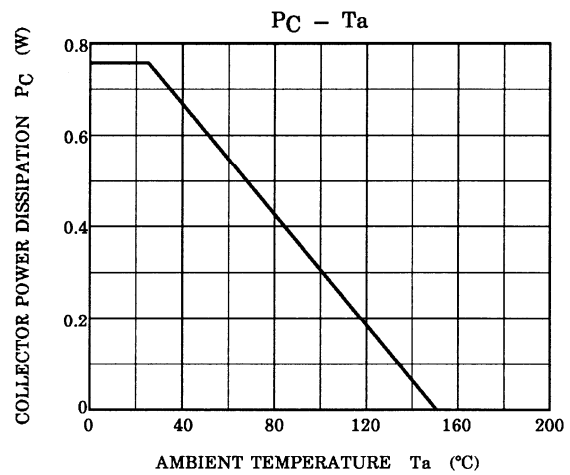
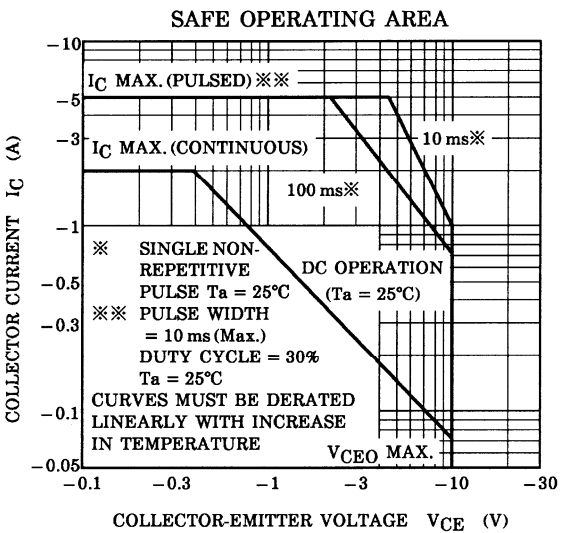
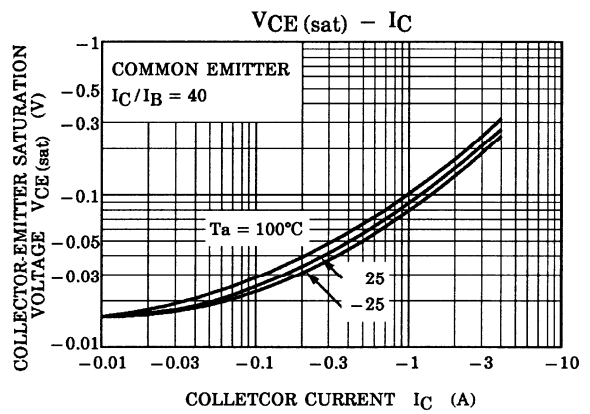
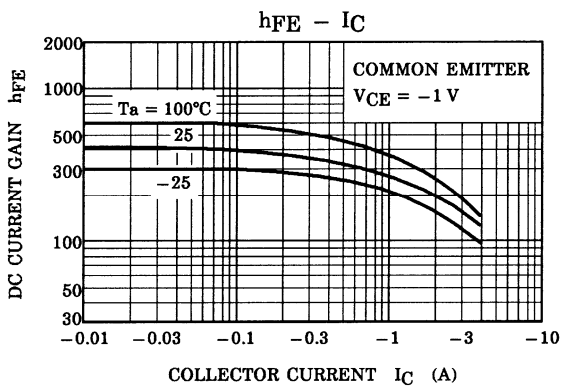
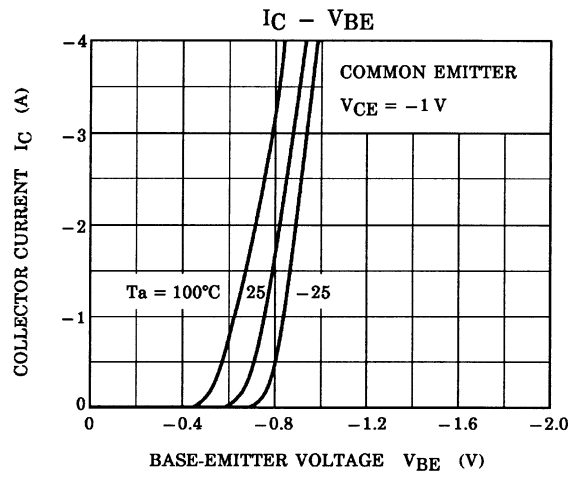
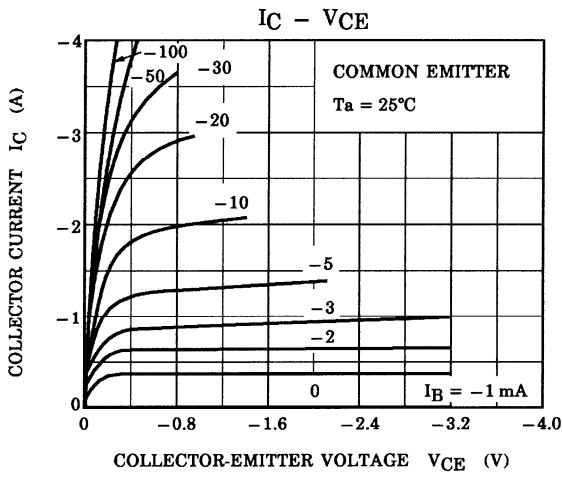
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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).

Note 1: Pulse width = 10 ms (max), duty cycle = 30% (max)

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

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = -20$ V, $I_E = 0$	—	—	-0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = -6$ V, $I_C = 0$	—	—	-0.1	$\mu\text{A}$
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = -10$ mA, $I_B = 0$	-10	—	—	V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = -1$ mA, $I_C = 0$	-6	—	—	V
DC current gain	$h_{FE} (1)$ (Note 2)	$V_{CE} = -1$ V, $I_C = -0.5$ A	140	—	600	
	$h_{FE} (2)$	$V_{CE} = -1$ V, $I_C = -4$ A	60	120	—	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -2$ A, $I_B = -50$ mA	—	-0.2	-0.5	V
Base-emitter voltage	$V_{BE}$	$V_{CE} = -1$ V, $I_C = -2$ A	—	-0.83	-1.5	V
Transition frequency	$f_T$	$V_{CE} = -1$ V, $I_C = -0.5$ A	—	140	—	MHz
Collector output capacitance	$C_{ob}$	$V_{CB} = -10$ V, $I_E = 0$ , $f = 1$ MHz	—	50	—	pF

Note 2:  $h_{FE} (1)$  classification Y: 140~280, GR: 200~400, BL: 300~600



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