

### NPN SILICON EPITAXIAL TRANSISTOR FOR LOW-FREQUENCY POWER AMPLIFIERS AND MID-SPEED SWITCHING

#### FEATURES

- Large current capacity and low  $V_{CE(sat)}$ :  
 $I_{C(DC)} = 5.0 \text{ A}$ ,  $I_{C(pulse)} = 8.0 \text{ A}$   
 $V_{CE(sat)} = 0.1 \text{ V TYP.}$  (@  $I_C = 2.0 \text{ A}$ ,  $I_B = 0.2 \text{ A}$ )
- Large power dissipation TO-126 type power transistor  
 $P_T = 1.3 \text{ W}$  (@  $T_a = 25^\circ\text{C}$ ),  $20 \text{ W}$  (@  $T_c = 25^\circ\text{C}$ )
- Complementary transistor: 2SB1151

#### ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Ratings	Unit
Collector to base voltage	$V_{CBO}$	60	V
Collector to emitter voltage	$V_{CEO}$	60	V
Emitter to base voltage	$V_{EBO}$	7.0	V
Collector current (DC)	$I_{C(DC)}$	5.0	A
Collector current (pulse)	$I_{C(pulse)^*}$	8.0	A
Base current (DC)	$I_{B(DC)}$	1.0	A
Total power dissipation	$P_T$ ( $T_a = 25^\circ\text{C}$ )	1.3	W
Total power dissipation	$P_T$ ( $T_c = 25^\circ\text{C}$ )	20	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

\*  $PW \leq 10 \text{ ms}$ , duty cycle  $\leq 50\%$

#### ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	$I_{CBO}$	$V_{CB} = 50 \text{ V}$ , $I_E = 0$			10	$\mu\text{A}$
Emitter cutoff current	$I_{EBO}$	$V_{EB} = 7.0 \text{ V}$ , $I_C = 0$			10	$\mu\text{A}$
DC current gain	$h_{FE1}^{**}$	$V_{CE} = 1.0 \text{ V}$ , $I_C = 0.1 \text{ A}$	60			
DC current gain	$h_{FE2}^{**}$	$V_{CE} = 1.0 \text{ V}$ , $I_C = 2.0 \text{ A}$	100		400	
DC current gain	$h_{FE3}^{**}$	$V_{CE} = 1.0 \text{ V}$ , $I_C = 5.0 \text{ A}$	50			
Collector saturation voltage	$V_{CE(sat)}^{**}$	$I_C = 2.0 \text{ A}$ , $I_B = 0.2 \text{ A}$		0.1	0.3	V
Base saturation voltage	$V_{BE(sat)}^{**}$	$I_C = 2.0 \text{ A}$ , $I_B = 0.2 \text{ A}$		0.9	1.2	V
Turn-on time	$t_{on}$	$I_C = 2.0 \text{ A}$ , $I_{B1} = -I_{B2} = 0.2 \text{ A}$		0.2	1.0	$\mu\text{s}$
Storage time	$t_{stg}$	$R_L = 5.0 \Omega$ , $V_{CC} \equiv 10 \text{ V}$		1.1	2.5	$\mu\text{s}$
Fall time	$t_f$			0.2	1.0	$\mu\text{s}$

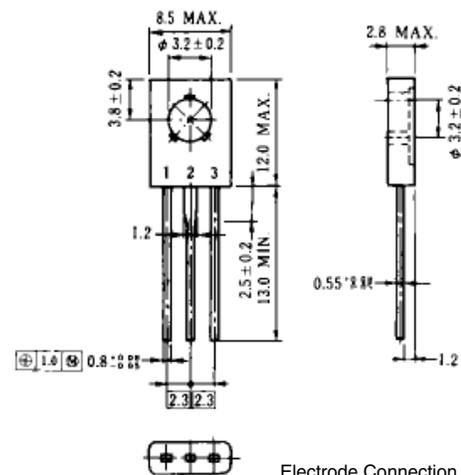
\*\* Pulse test  $PW \leq 350 \mu\text{s}$ , duty cycle  $\leq 2\%$

#### $h_{FE}$ CLASSIFICATION

Marking	M	L	K
$h_{FE2}$	100 to 200	160 to 320	200 to 400

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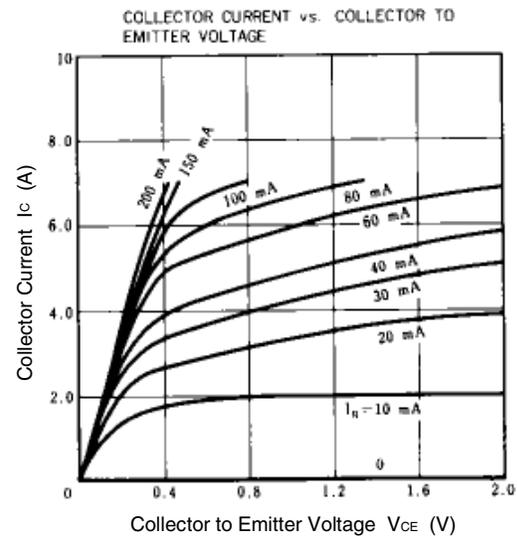
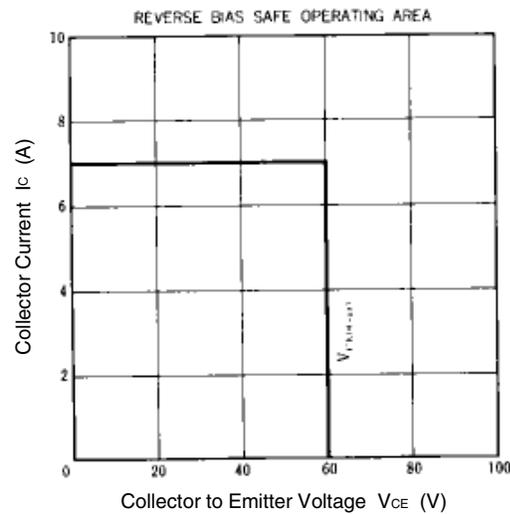
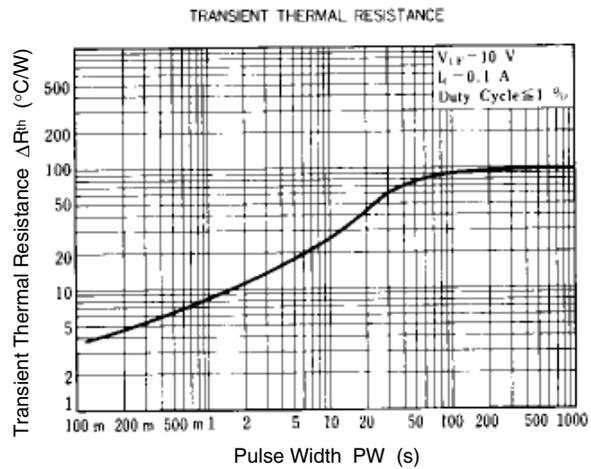
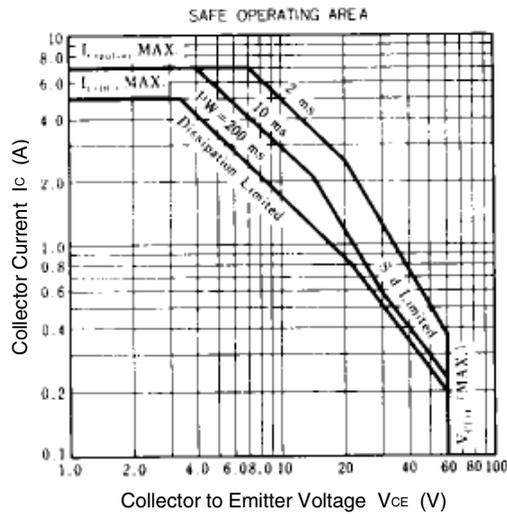
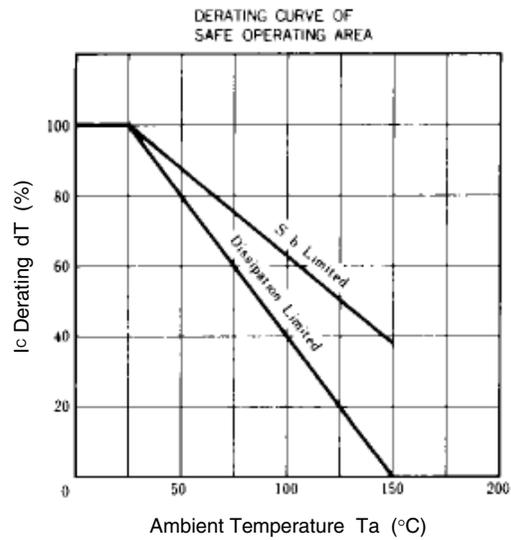
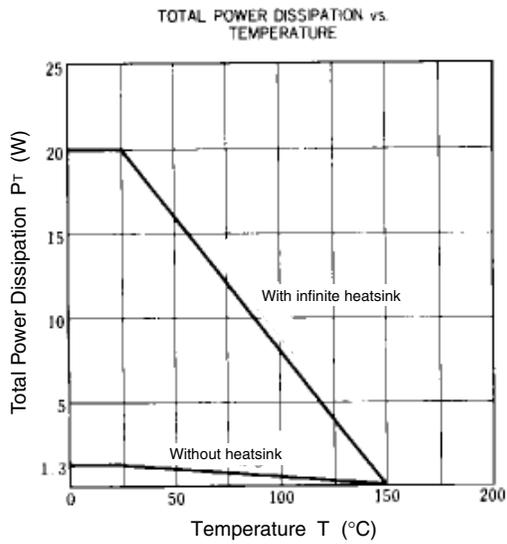
#### PACKAGE DRAWING (UNIT: mm)

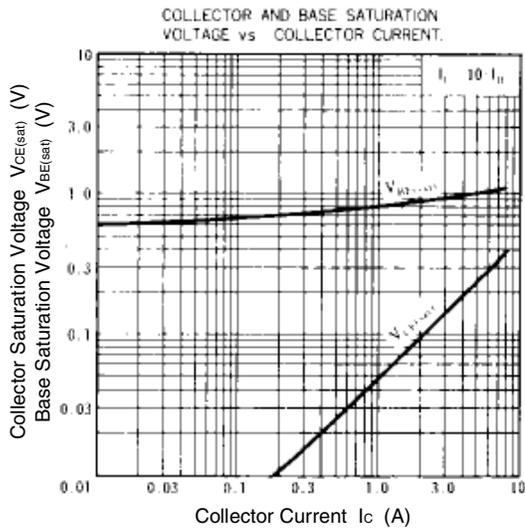
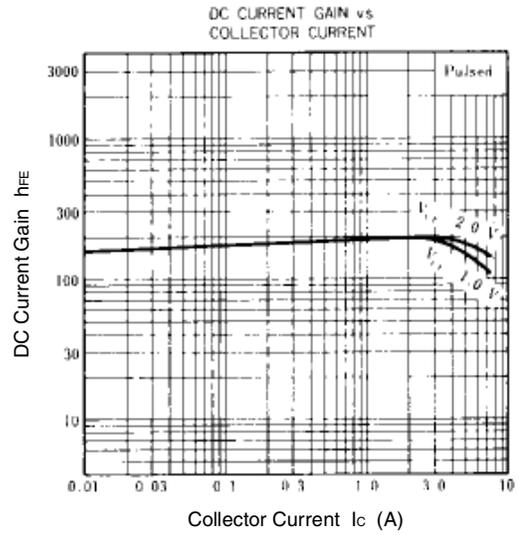
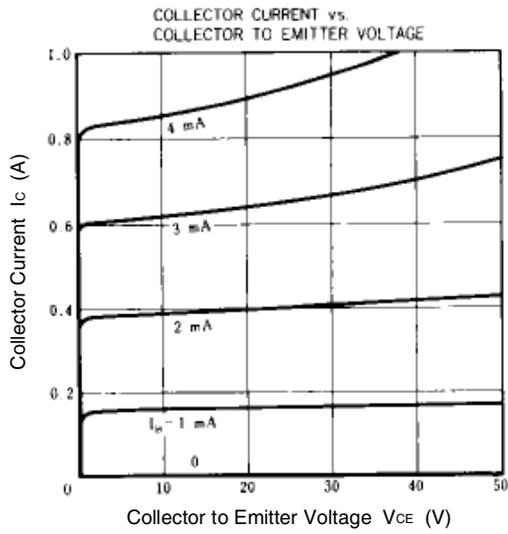


Electrode Connection

1. Emitter (E)
2. Collector (C)
3. Base (B)

TYPICAL CHARACTERISTICS (Ta = 25°C)





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