

SILICON POWER TRANSISTOR

2SD1691

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}	$-55 \text{ to } +150$	$^\circ\text{C}$

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

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

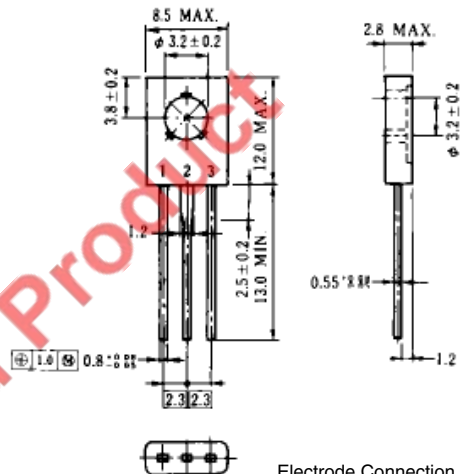
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	$V_{CB} = 50 \text{ V, } I_E = 0$			10	μA
Emitter cutoff current	I_{EBO}	$V_{EB} = 7.0 \text{ V, } I_C = 0$			10	μA
DC current gain	h_{FE1}^{**}	$V_{CE} = 1.0 \text{ V, } I_C = 0.1 \text{ A}$	60			
DC current gain	h_{FE2}^{**}	$V_{CE} = 1.0 \text{ V, } I_C = 2.0 \text{ A}$	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}	$I_C = 2.0 \text{ A, } I_{B1} = -I_{B2} = 0.2 \text{ A}$ $R_L = 5.0 \Omega, V_{CC} \equiv 10 \text{ V}$		0.2	1.0	μs
Storage time	t_{stg}			1.1	2.5	μs
Fall time	t_f			0.2	1.0	μs

** 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

PACKAGE DRAWING (UNIT: mm)

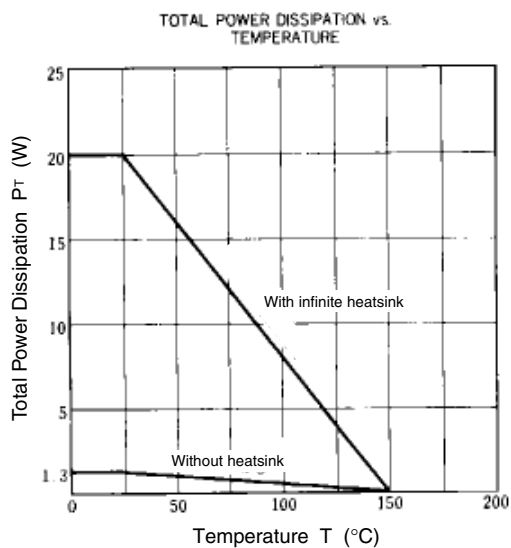
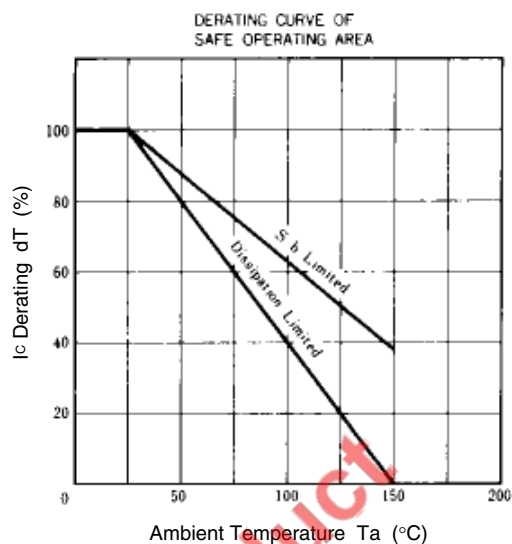
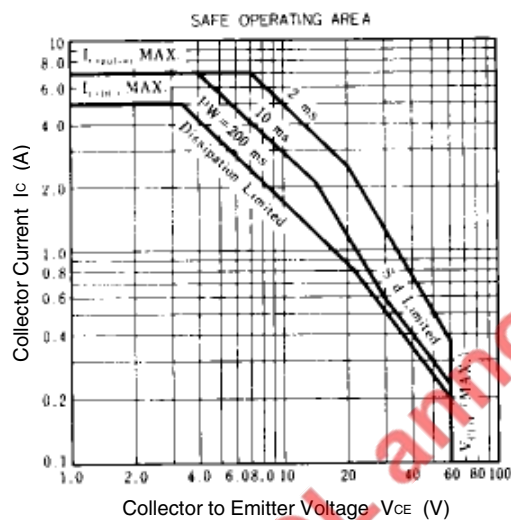
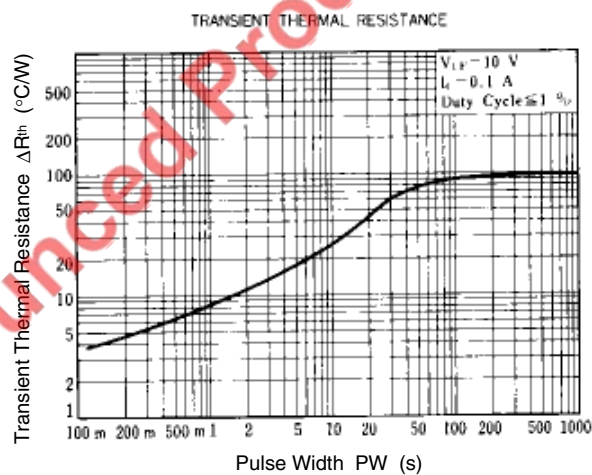
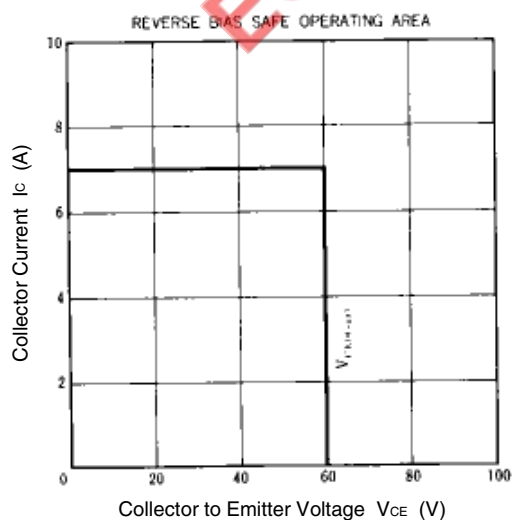
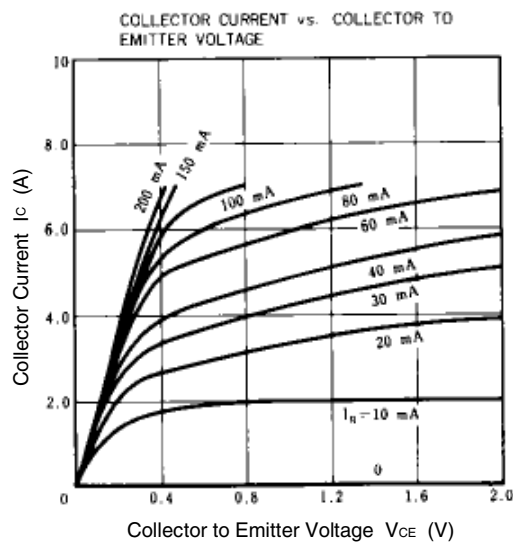


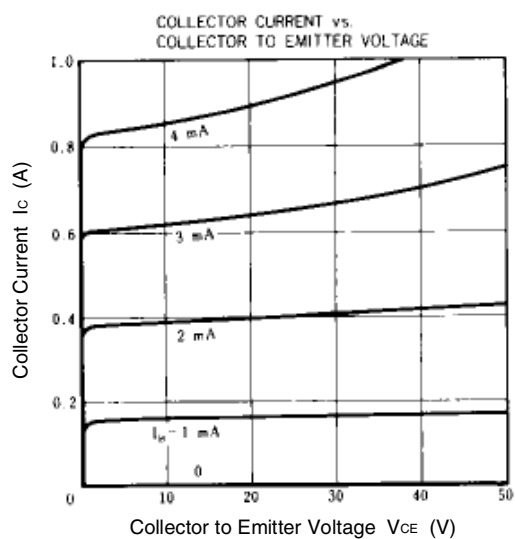
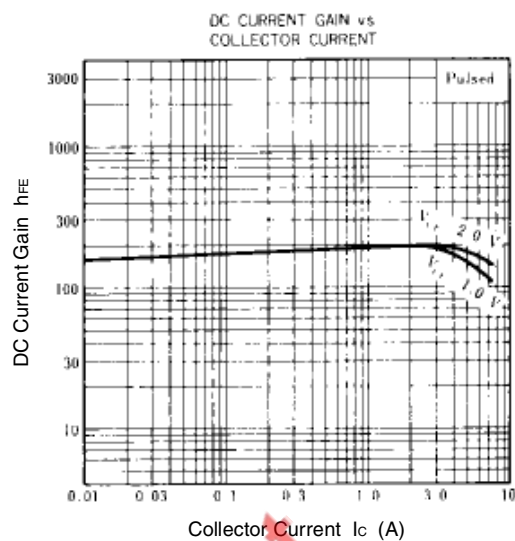
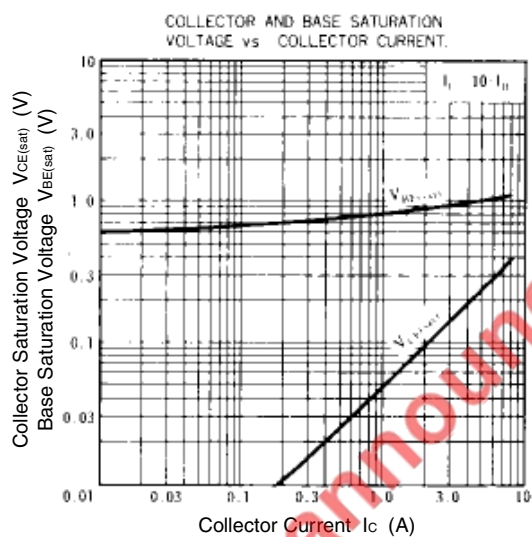
Electrode Connection

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

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





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