

# NPN SILICON POWER TRANSISTOR

## 2SD1691

**DESCRIPTION** The 2SD1691 is a Low  $V_{CE(sat)}$  transistor which has a large current capability and wide SOA. It is suitable for DC-DC converter, or driver of solenoid or motor.

- FEATURES**
- Low Collector Saturation Voltage.  
 $V_{CE(sat)} = 0.1 \text{ V TYP. (@ } I_C/I_B = 2.0 \text{ A/0.2 A)}$
  - Large Current.  
 $I_{C(DC)} = 5.0 \text{ A, } I_{C(pulse)} = 8.0 \text{ A}$
  - High Total Power Dissipation :  $P_T = 1.3 \text{ W}$
  - Complementary to 2SB1151.

**ABSOLUTE MAXIMUM RATINGS**

Maximum Temperatures

Storage Temperature . . . . .  $-55 \text{ to } +150 \text{ }^\circ\text{C}$   
 Junction Temperature . . . . .  $+150 \text{ }^\circ\text{C Maximum}$

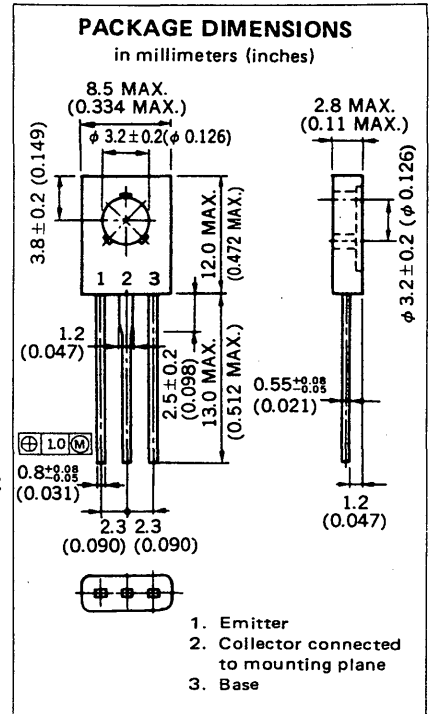
Maximum Power Dissipations

Total Power Dissipation ( $T_a = 25 \text{ }^\circ\text{C}$ ) . . . . .  $1.3 \text{ W}$   
 Total Power Dissipation ( $T_c = 25 \text{ }^\circ\text{C}$ ) . . . . .  $20 \text{ W}$

Maximum Voltages and Currents ( $T_a = 25 \text{ }^\circ\text{C}$ )

$V_{CBO}$  Collector to Base Voltage . . . . .  $60 \text{ V}$   
 $V_{CEO}$  Collector to Emitter Voltage . . . . .  $60 \text{ V}$   
 $V_{EBO}$  Emitter to Base Voltage . . . . .  $7.0 \text{ V}$   
 $I_{C(DC)}$  Collector Current . . . . .  $5.0 \text{ A}$   
 $I_{C(pulse)}$  Collector Current\* . . . . .  $8.0 \text{ A}$   
 $I_{B(DC)}$  Base Current . . . . .  $1.0 \text{ A}$

\*  $PW \leq 10 \text{ ms, Duty Cycle } \leq 50 \%$



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

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
$V_{CE(sat)}^{**}$	Collector Saturation Voltage		0.1	0.3	V	$I_C = 2.0 \text{ A, } I_B = 0.2 \text{ A}$
$V_{BE(sat)}^{**}$	Base Saturation Voltage		0.9	1.2	V	$I_C = 2.0 \text{ A, } I_B = 0.2 \text{ A}$
$h_{FE1}^{**}$	DC Current Gain	60			-	$V_{CE} = 1.0 \text{ V, } I_C = 0.1 \text{ A}$
$h_{FE2}^{**}$	DC Current Gain	100		400	-	$V_{CE} = 1.0 \text{ V, } I_C = 2.0 \text{ A}$
$h_{FE3}^{**}$	DC Current Gain	50			-	$V_{CE} = 1.0 \text{ V, } I_C = 5.0 \text{ A}$
$I_{CBO}$	Collector Cutoff Current			10	$\mu\text{A}$	$V_{CB} = 50 \text{ V, } I_E = 0$
$I_{EBO}$	Emitter Cutoff Current			10	$\mu\text{A}$	$V_{EB} = 7.0 \text{ V, } I_C = 0$
$t_{on}$	Turn On Time		0.2	1.0	$\mu\text{s}$	$I_C = 2.0 \text{ A, } I_{B1} = -I_{B2} = 0.2 \text{ A}$ $R_L = 5.0 \Omega, V_{CC} \approx 10 \text{ V}$
$t_{stg}$	Storage Time		1.1	2.5	$\mu\text{s}$	
$t_f$	Fall Time		0.2	1.0	$\mu\text{s}$	

\*\*  $PW \leq 350 \mu\text{s, Duty Cycle } \leq 2 \%$

Classification of  $h_{FE2}$

Rank	M	L	K
Range	100 to 200	160 to 320	200 to 400

Test Conditions:  $V_{CE} = 1.0 \text{ V, } I_C = 2.0 \text{ A}$

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

