

DESCRIPTION The 2SD1692 is a darlington transistor built-in diode at E-C.

It is suitable for use to operate from IC without predriver, such as hammer driver.

FEATURES

- High DC Current Gain.
- Low Collector Saturation Voltage.
- Built-in a diode at E-C.
- High Power Dissipation: $P_T = 1.3 \text{ W}$ (at $T_a = 25^\circ \text{C}$)

ABSOLUTE MAXIMUM RATINGS

Maximum Temperatures

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

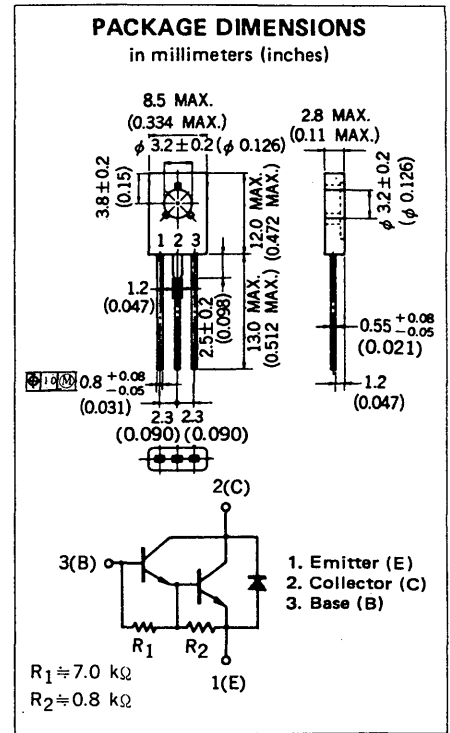
Maximum Power Dissipations

Total Power Dissipation ($T_a = 25^\circ \text{C}$) 1.3 W
 Total Power Dissipation ($T_c = 25^\circ \text{C}$) 15 W

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

V_{CBO} Collector to Base Voltage 150 V
 V_{CEO} Collector to Emitter Voltage 100 V
 V_{EBO} Emitter to Base Voltage 8.0 V
 $I_{C(DC)}$ Collector Current $\pm 3.0 \text{ A}$
 $I_{C(pulse)}$ Collector Current $\pm 5.0 \text{ A}$

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



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

| SYMBOL | CHARACTERISTIC | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|--------------------|------------------------------|------|------|-------|---------------|---|
| h_{FE1}^{**} | DC Current Gain | 2000 | | 20000 | — | $V_{CE} = 2.0 \text{ V}$, $I_C = 1.5 \text{ A}$ |
| h_{FE2}^{**} | DC Current Gain | 1000 | | | — | $V_{CE} = 2.0 \text{ V}$, $I_C = 3.0 \text{ A}$ |
| t_{on} | Turn On Time | | 0.5 | | μs | $I_C = 1.5 \text{ A}$, $R_L = 27 \Omega$ $I_{B1} = -I_{B2} = 1.5 \text{ mA}$, $V_{CC} \cong 40 \text{ V}$ See Test Circuit. |
| t_{stg} | Storage Time | | 2.0 | | μs | |
| t_f | Fall Time | | 1.0 | | μs | |
| I_{CBO} | Collector Cutoff Current | | | 10 | μA | $V_{CB} = 100 \text{ V}$, $I_E = 0$ |
| I_{EBO} | Emitter Cutoff Current | | | 1.0 | mA | $V_{EB} = 5.0 \text{ V}$, $I_C = 0$ |
| $V_{CE(sat)}^{**}$ | Collector Saturation Voltage | | 0.9 | 1.2 | V | $I_C = 1.5 \text{ A}$, $I_B = 1.5 \text{ mA}$ |
| $V_{BE(sat)}^{**}$ | Base Saturation Voltage | | 1.5 | 2.0 | V | $I_C = 1.5 \text{ A}$, $I_B = 1.5 \text{ mA}$ |

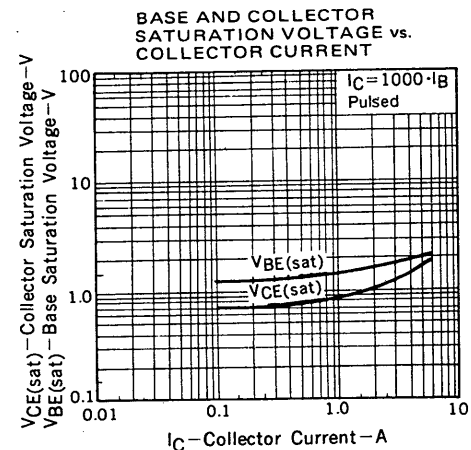
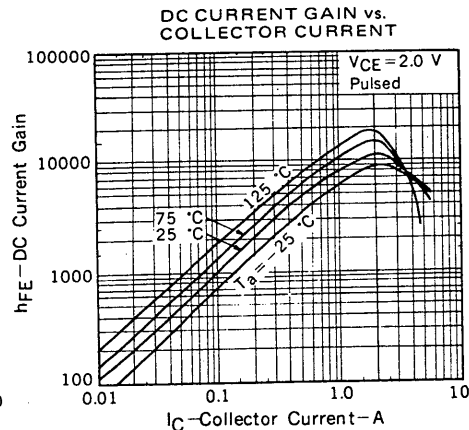
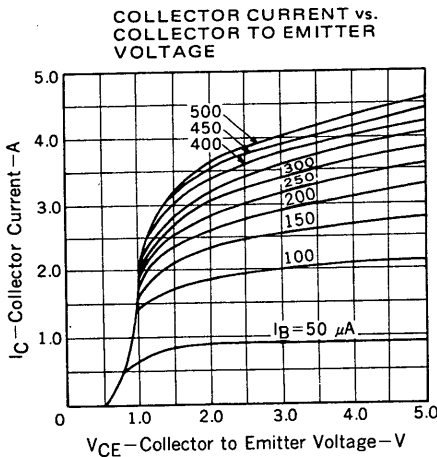
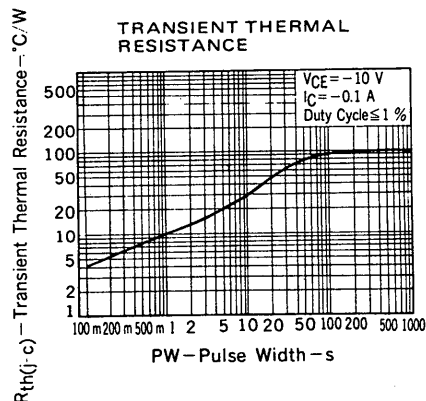
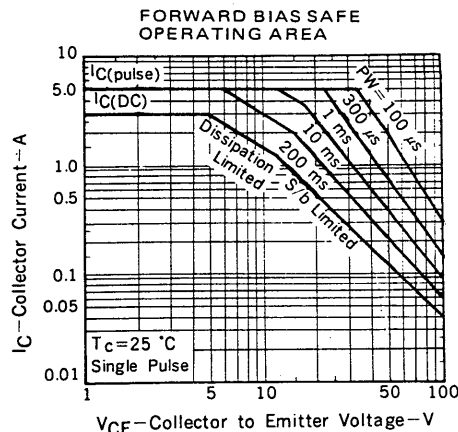
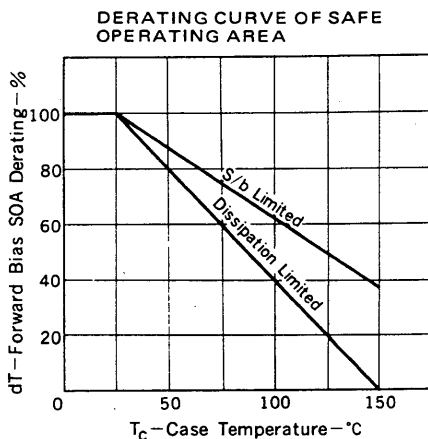
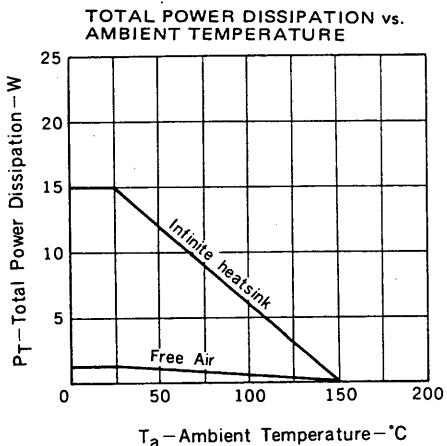
** Pulsed / $PW \leq 350 \mu\text{s}$, Duty Cycle $\leq 2 \%$

Classification of h_{FE1}

| Rank | M | L | K |
|-------|--------------|---------------|---------------|
| Range | 2000 to 5000 | 4000 to 10000 | 8000 to 20000 |

Test Conditions: $V_{CE} = 2.0 \text{ V}$, $I_C = 1.5 \text{ A}$

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



SWITCHING TIME (t_{on} , t_{stg} , t_f) TEST CIRCUIT

