

**DESCRIPTION** The 2SD1697 is NPN silicon epitaxial darlington transistor designed for pulse motor, printer driver, solenoid driver.

- FEATURES**
- High DC current gain
  - Includes a dumper diode of E-C.

**ABSOLUTE MAXIMUM RATINGS**

Maximum Temperatures

Storage Temperature . . . . . -55 to +150 °C

Junction Temperature . . . . . 150 °C Maximum

Maximum Power Dissipation (T<sub>a</sub> = 25 °C)

Total Power Dissipation . . . . . 1.0 W

Maximum Voltages and Currents (T<sub>a</sub> = 25 °C)

V<sub>CB0</sub> Collector to Base Voltage . . . . . 100 V

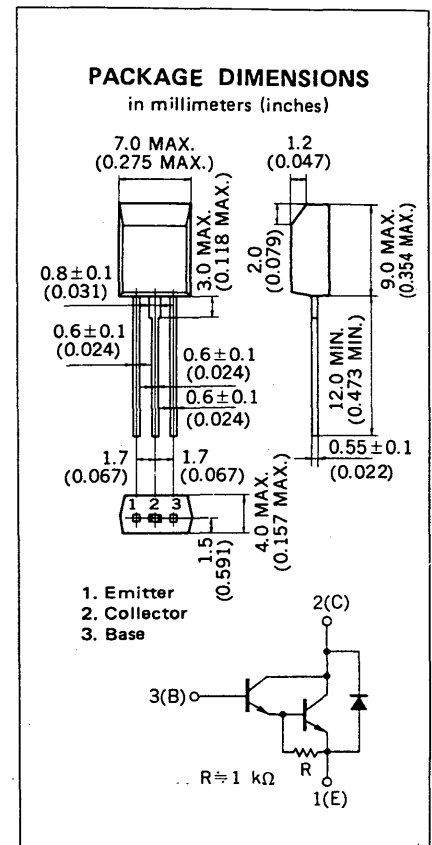
V<sub>CEO</sub> Collector to Emitter Voltage . . . . . 80 V

V<sub>EB0</sub> Emitter to Base Voltage . . . . . 8.0 V

I<sub>C</sub> Collector Current (DC) . . . . . ±0.8 A

I<sub>C</sub> Collector Current (pulse)\* . . . . . ±1.2 A

\* PW ≤ 10 ms, Duty Cycle ≤ 50 %



**ELECTRICAL CHARACTERISTICS (T<sub>a</sub> = 25 °C)**

SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
h <sub>FE1</sub> **	DC Current Gain	4000		50000		V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.3 A
h <sub>FE2</sub> **	DC Current Gain	1000				V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.8 A
t <sub>on</sub>	Turn-on Time		0.5		μs	$\left( \begin{array}{l} I_C = 0.5 \text{ A} \\ I_{B1} = -I_{B2} = 1.0 \text{ mA} \\ V_{CC} = 40 \text{ V}, R_L = 80 \Omega \end{array} \right)$
t <sub>stg</sub>	Storage Time		2.5		μs	
t <sub>f</sub>	Fall Time		1.0		μs	
V <sub>CE(sat)</sub> **	Collector Saturation Voltage		0.9	1.2	V	I <sub>C</sub> = 0.5 A, I <sub>B</sub> = 1.0 mA
V <sub>BE(sat)</sub> **	Base Saturation Voltage		1.5	2.0	V	I <sub>C</sub> = 0.5 A, I <sub>B</sub> = 1.0 mA
V <sub>CB0</sub>	Collector to Base Voltage	100			V	I <sub>C</sub> = 0.1 mA, I <sub>E</sub> = 0
V <sub>CEO</sub>	Collector to Emitter Voltage	80			V	I <sub>C</sub> = 5.0 mA, I <sub>B</sub> = 0
I <sub>CB0</sub>	Collector Cutoff Current			1.0	μA	V <sub>CB</sub> = 80 V, I <sub>E</sub> = 0
I <sub>EBO</sub>	Emitter Cutoff Current			1.0	μA	V <sub>EB</sub> = 5.0 V, I <sub>C</sub> = 0

\*\* Pulsed: PW ≤ 350 μs, Duty Cycle ≤ 2 %

**Classification of h<sub>FE1</sub>**

Rank	L	K
Range	4000 to 12000	8000 to 50000

Test Conditions: V<sub>CE</sub> = 2.0 V, I<sub>C</sub> = 0.3 A

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

