

NPN SILICON POWER TRANSISTOR

2SD1694

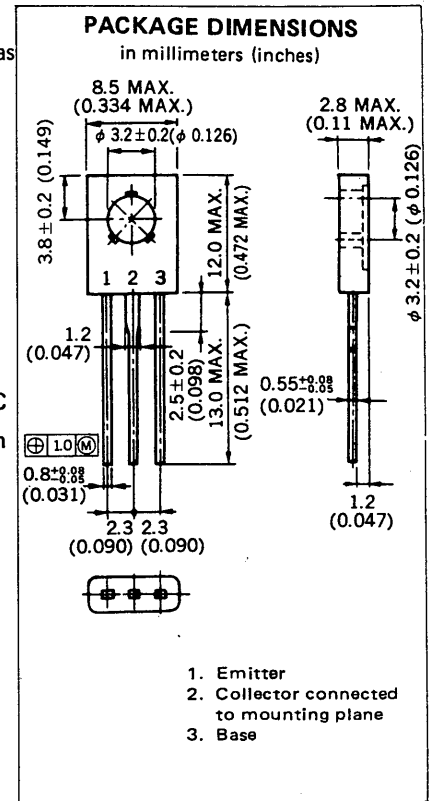
DESCRIPTION The 2SD1694 is High h_{FE} and Low $V_{CE(sat)}$ transistor. It is suitable for use to operate from IC without predriver, such as hammer driver.

- FEATURES**
- High DC Current Gain : $h_{FE} = 800$ to 3200 .
 - Low Collector Saturation Voltage.
 $V_{CE(sat)} = 0.4$ V MAX. (@ $I_C/I_B = 2.0$ A/20 mA)
 - High Total Power Dissipation : $P_T = 1.3$ W

ABSOLUTE MAXIMUM RATINGS

| | |
|---|-----------------|
| Maximum Temperatures | |
| Storage Temperature | -55 to +150 °C |
| Junction Temperature | +150 °C Maximum |
| Maximum Power Dissipations | |
| Total Power Dissipation ($T_a = 25$ °C) | 1.3 W |
| Total Power Dissipation ($T_c = 25$ °C) | 20 W |
| Maximum Voltages and Currents ($T_a = 25$ °C) | |
| V_{CBO} Collector to Base Voltage | 60 V |
| V_{CEO} Collector to Emitter Voltage | 60 V |
| V_{EBO} Emitter to Base Voltage | 7.0 V |
| $I_{C(DC)}$ Collector Current | 3.0 A |
| $I_{C(pulse)*}$ Collector Current | 5.0 A |
| $I_{B(DC)}$ Base Current | 0.5 A |

* $PW \leq 10$ ms, Duty Cycle ≤ 50 %



ELECTRICAL CHARACTERISTICS ($T_a = 25$ °C)

| SYMBOL | CHARACTERISTIC | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|--------------------|------------------------------|------|------|------|---------|---|
| h_{FE1}^{**} | DC Current Gain | 700 | 1400 | | — | $V_{CE} = 5.0$ V, $I_C = 50$ mA |
| h_{FE2}^{**} | DC Current Gain | 800 | 1500 | 3200 | — | $V_{CE} = 5.0$ V, $I_C = 0.5$ A |
| h_{FE3}^{**} | DC Current Gain | 500 | 1200 | | — | $V_{CE} = 5.0$ V, $I_C = 3.0$ A |
| t_{on} | Turn-On Time | | 0.9 | 2.0 | μ s | $I_C = 2.0$ A, $I_{B1} = -I_{B2} = 20$ mA $R_L = 5$ Ω , $V_{CC} \approx 10$ V |
| t_{stg} | Storage Time | | 2.6 | 4.0 | μ s | |
| t_f | Fall Time | | 1.0 | 2.0 | μ s | |
| $V_{CE(sat)}^{**}$ | Collector Saturation Voltage | | 0.2 | 0.4 | V | $I_C = 2.0$ A, $I_B = 20$ mA |
| $V_{BE(sat)}^{**}$ | Base Saturation Voltage | | 0.85 | 1.2 | V | $I_C = 2.0$ A, $I_B = 20$ mA |
| I_{CBO} | Collector Cutoff Current | | | 10 | μ A | $V_{CB} = 60$ V, $I_E = 0$ |
| I_{EBO} | Emitter Cutoff Current | | | 10 | μ A | $V_{EB} = 5.0$ V, $I_C = 0$ |
| f_T | Gain Bandwidth Product | 100 | 250 | | MHz | $V_{CE} = 5.0$ V, $I_C = 1.0$ A |
| C_{ob} | Output Capacitance | | 50 | 60 | pF | $V_{CB} = 10$ V, $I_E = 0$, $f = 1$ MHz |

** $PW \leq 350$ μ s, Duty Cycle ≤ 2 %

Classification of h_{FE2}

| Rank | M | L | K |
|-------|-------------|--------------|--------------|
| Range | 800 to 1600 | 1000 to 2000 | 1600 to 3200 |

Test Conditions: $V_{CE} = 5.0$ V, $I_C = 0.5$ A

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

