

NPN SILICON POWER TRANSISTOR

2SD1694

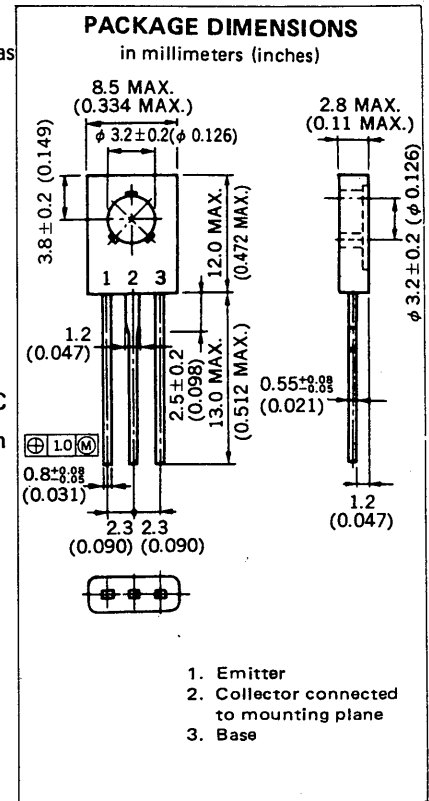
DESCRIPTION The 2SD1694 is High h_{FE} and Low $V_{CE(sat)}$ transistor. It is suitable for use to operate from IC without predriver, such as hammer driver.

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

