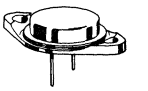
2N5692 thru 2N5696 (GERMANIUM)

PNP GERMANIUM POWER SWITCHING TRANSISTORS

. . . designed for high-current, fast-switching applications requiring low saturation voltage and excellent safe operating area.

40 AMPERE "ADE" POWER TRANSISTORS
PNP GERMANIUM
50–140 VOLTS
120 WATTS



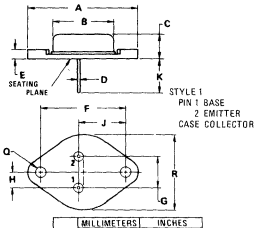
MAXIMUM RATINGS

Rating	Symbol	2N5692	2N5693	2N5694	2N5695	2N5696	Unit
*Collector-Emitter Voltage	V_{CEO}	30	60	80	100	120	Vdc
*Collector-Base Voltage	V_{CB}	50	80	100	120	140	Vdc
*Emitter-Base Voltage	V_{EB}	2.5					Vdc
*Collector Current — Continuous	I_C	40					Adc
— Peak		60					
*Base Current — Continuous	I_B	12					Adc
*Total Device Dissipation @ $T_C = 25^oC$	P_D	120					Watts
Derate above 25^oC		1.43					$W/^oC$
*Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +110					^oC

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
*Thermal Resistance, Junction to Case	θ_{JC}	0.7	$^oC/W$

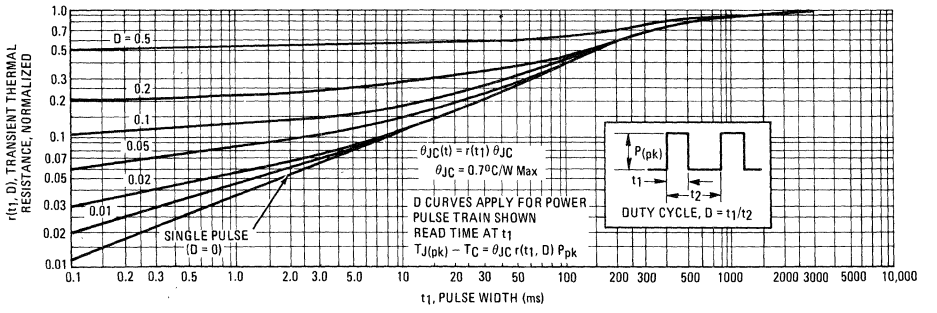
*Indicates JEDEC Registered Data.



DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
A	–	39.37	–	1.550
B	–	21.08	–	0.830
C	–	9.14	–	0.360
D	1.52	1.65	0.060	0.065
E	–	3.43	–	0.135
F	29.90	30.40	1.177	1.197
G	10.67	11.18	0.420	0.440
H	5.33	5.59	0.210	0.220
J	16.84	17.15	0.655	0.675
K	15.49	18.03	0.610	0.710
Q	3.84	4.08	0.151	0.161
R	–	26.67	–	1.050

CASE 3-04

FIGURE 1 — THERMAL RESPONSE



ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
* Collector-Emitter Breakdown Voltage (I_C = 0.1 Adc, I_B = 0)	2N5692	BV_{CEO}	30	–	Vdc
	2N5693		60	–	
	2N5694		80	–	
	2N5695		100	–	
	2N5696		120	–	
* Collector Cutoff Current		I_{CEX1}			mAdc
(V_{CE} = 50 Vdc) $V_{BE(off)}$ = 0.2 Vdc	2N5692		–	10	
(V_{CE} = 80 Vdc)	2N5693		–	10	
(V_{CE} = 100 Vdc) For	2N5694		–	10	
(V_{CE} = 120 Vdc) All Types	2N5695		–	10	
(V_{CE} = 140 Vdc)	2N5696		–	10	
* Collector Cutoff Current		I_{CEX2}(1)			mAdc
(V_{CE} = 50 Vdc) $V_{BE(off)}$ = 0.2 Vdc, T_C = +85°C	2N5692		–	30	
(V_{CE} = 80 Vdc) For	2N5693		–	30	
(V_{CE} = 100 Vdc)	2N5694		–	30	
(V_{CE} = 120 Vdc) All Types	2N5695		–	30	
(V_{CE} = 140 Vdc)	2N5696		–	30	
* Collector-Emitter Sustaining Voltage (See Figure 3)		$V_{CEX(sus)}$			Vdc
(I_C = 10 Adc)	2N5692		50	–	
	2N5693		80	–	
	2N5694		100	–	
	2N5695		120	–	
	2N5696		140	–	
(I_C = 40 Adc)	2N5692		45	–	
	2N5693		50	–	
	2N5694		55	–	
	2N5695		60	–	
	2N5696		65	–	
* Collector Cutoff Current (V_{CB} = 2.0 Vdc, I_E = 0)		I_{CBO}	–	200	μAdc
* Emitter Cutoff Current (V_{BE} = 2.5 Vdc, I_C = 0)		I_{EBO}	–	500	mAdc
ON CHARACTERISTICS (1)					
* DC Current Gain		h_{FE}			–
(I_C = 25 Adc, V_{CE} = 2.0 Vdc)			20	65	
(I_C = 40 Adc, V_{CE} = 2.0 Vdc)			10	–	
* Collector-Emitter Saturation Voltage (I_C = 60 Adc, I_B = 12 Adc)		$V_{CE(sat)}$	–	0.75	Vdc
* Base-Emitter Saturation Voltage (I_C = 60 Adc, I_B = 12 Adc)		$V_{BE(sat)}$	–	1.2	Vdc
SMALL-SIGNAL CHARACTERISTICS					
* Current-Gain–Bandwidth Product (I_C = 5.0 Adc, V_{CE} = 5.0 Vdc, f = 100 kHz)		f_T	200	–	kHz
SWITCHING CHARACTERISTICS					
* Rise Time	(I_C = 25 Adc, I_{B1} = 2.5 Adc, I_{B2} = 2.5 Adc) (See Figure 2)	t_r	–	20	μs
* Storage Time		t_s	–	8.0	μs
* Fall Time		t_f	–	15	μs

*Indicates JEDEC Registered Data.

(1) To avoid excessive heating of the collector junction, perform test with pulse method. (PW ≤ 300 μs, DC ≤ 2.0%).

FIGURE 2 – SWITCHING TIME TEST CIRCUIT

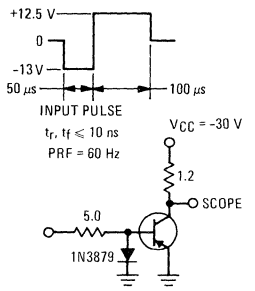
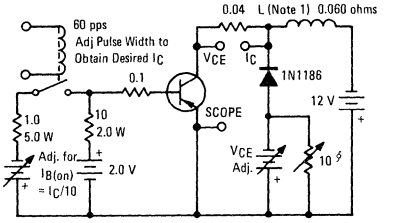


FIGURE 3 – CLAMPED INDUCTIVE SAFE OPERATING AREA TEST CIRCUIT



ϕ Set to allow reverse surge current to by pass power supply. Not needed for power supply with low reverse impedance.

NOTE 1. L = 10 mH at I_C = 10 A
L = 0.25 mH at I_C = 40 A