



NPN TRANSISTOR MEDIUM POWER

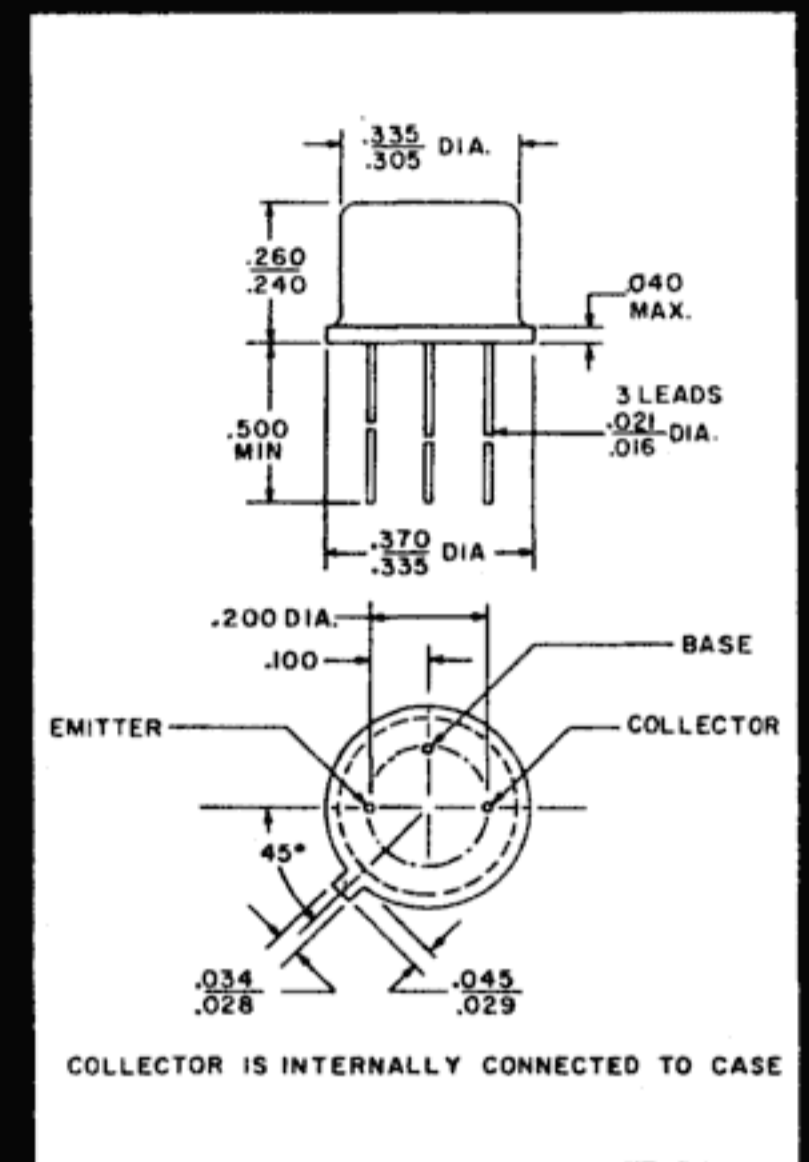
- HIGH CURRENT
- LOW SATURATION VOLTAGE
- HIGH CURRENT GAIN

JANUARY 1968

2N2192, A, B
2N2193, A, B
2N2194, A, B
2N2195, A, B

MAXIMUM RATINGS

CHARACTERISTIC	SYMBOL	2N2192 2N2192A 2N2192B 2N2194 2N2194A 2N2194B	2N2193 2N2193A 2N2193B	2N2195 2N2195A 2N2195B	UNIT
Collector-Base Voltage	V_{CBO}	60	80	45	Volts
Collector-Emitter Voltage	V_{CEO}	40	50	25	Volts
Emitter-Base Voltage	V_{EBO}	5	8	5	Volts
Collector Current	I_C	1.0	1.0	1.0	Amp
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$ @ $T_C = 100^\circ\text{C}$	P_D	0.8 2.8 1.6	0.8 2.8 1.6	0.6 2.8 1.6	Watt
Derating Factor Above 25°C @ $T_A = 25^\circ\text{C}$ @ $T_C = 25^\circ\text{C}$		4.56 16	4.56 16	3.43 16	mW/ $^\circ\text{C}$
Storage Temperature	T_{stg}		-65 to +200		$^\circ\text{C}$



ELECTRICAL CHARACTERISTICS at $+25^\circ\text{C}$ (Unless Otherwise Specified)

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CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	MAX.	UNIT
Collector-Base Breakdown Voltage 2N2192, A, B, 2N2194, A, B 2N2193, A, B 2N2195, A, B	BV_{CBO}	$I_C = 100 \mu\text{A}, I_E = 0$	60 80 45		Volts
Emitter-Base Breakdown Voltage 2N2192, A, B, 2N2194, A, B 2N2193, A, B 2N2195, A, B	BV_{EBO}	$I_E = 100 \mu\text{A}, I_C = 0$	5 8 5		Volts
Collector-Emitter Sustaining Voltage 2N2192, A, B, 2N2194, A, B 2N2193, A, B 2N2195, A, B	$V_{CEO(sus)}^*$	$I_C = 25 \text{ mA (pulsed)}, I_B = 0$	40 50 25		Volts
Collector Saturation Voltage 2N2192 thru 2N2195 2N2192A thru 2N2195A 2N2192B thru 2N2195B	$V_{CE(sat)}$	$I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$		0.35 0.25 0.18	Volts
Base Saturation Voltage	$V_{BE(sat)}$	$I_C = 150 \text{ mA}, I_B = 15 \text{ mA}$		1.3	Volts
Collector-Base Cutoff Current 2N2192, A, B, 2N2194, A, B 2N2195, A, B 2N2192, A, B, 2N2194, A, B 2N2195, A, B 2N2193, A, B 2N2193, A, B	I_{CBO}	$V_{CB} = 30 \text{ V}, I_E = 0$ $V_{CB} = 30 \text{ V}, I_E = 0, T_A = 150^\circ\text{C}$ $V_{CB} = 60 \text{ V}, I_E = 0$ $V_{CB} = 60 \text{ V}, I_E = 0, T_A = 150^\circ\text{C}$.010 .100 15 25 50 .010 25	μA
Emitter-Base Cutoff Current 2N2192, A, B, 2N2194, A, B 2N2195, A, B 2N2193, A, B	I_{EBO}	$V_{EB} = 3 \text{ V}, I_C = 0$ $V_{EB} = 5 \text{ V}, I_C = 0$.050 .100 .050	μA



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CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	MAX.	UNIT
DC Pulse Current Gain 2N2192, A, B, 2N2193, A, B 2N2192, A, B, 2N2193, A, B 2N2194, A, B 2N2192, A, B, 2N2193, A, B 2N2194, A, B 2N2195, A, B 2N2192, A, B, 2N2193, A, B 2N2194, A, B 2N2195, A, B 2N2192, A, B, 2N2193, A, B 2N2194, A, B 2N2195, A, B 2N2192, A, B, 2N2193, A, B 2N2194, A, B 2N2195, A, B 2N2192, A, B, 2N2193, A, B	h_{FE}^*	$I_C = 0.1 \text{ mA}, V_{CE} = 10 \text{ V}$ $I_C = 10 \text{ mA}, V_{CE} = 10 \text{ V}$ $I_C = 10 \text{ mA}, V_{CE} = 10 \text{ V},$ $T_A = -55^\circ\text{C}$ $I_C = 150 \text{ mA}, V_{CE} = 10 \text{ V}$ $I_C = 150 \text{ mA}, V_{CE} = 1.0 \text{ V}$ $I_C = 500 \text{ mA}, V_{CE} = 10 \text{ V}$ $I_C = 1.0 \text{ A}, V_{CE} = 10 \text{ V}$	15 75 30 15 35 20 100 40 20 20 70 30 15 10 35 20 12 15	300 120 60	
Rise Time	t_r			70	nsec
Fall Time	t_f	2N2192-94, 2N2192A-94A, 2N2192B-94B (See Figure 1)		50	nsec
Storage Time	t_s			150	nsec
High Frequency Current Gain	$ h_{fe} $	$I_C = 50 \text{ mA}, V_{CE} = 10 \text{ V}, f = 20 \text{ MHz}$	2.5		
Output Capacitance	C_{ob}	$V_{CB} = 10 \text{ V}, I_E = 0, f = 1.0 \text{ MHz}$		20	pf

* Pulse Test: Pulse Width $\leq 300 \mu\text{sec}$; Duty Cycle $\leq 2\%$.

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Figure 1

