

2N2201  
2N2202  
2N2203  
2N2204

## TRANSISTOR, POWER AMPLIFIER

### I. General Description

This device is an NPN, silicon, triode power transistor designed primarily for amplifier applications.

### II. Mechanical Data

#### A. Outline

Per outline drawing

#### B. Terminal Designations

<u>Terminal</u>	<u>Element</u>
1	Emitter
2	Base
3	Collector
Case	Connected to collector

#### C. Handling Precautions

None

#### D. Mounting Positions

Any

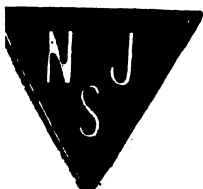
### III. Maximum Ratings

#### A. Temperature

1. Storage temperature range,  $T_{stg}$  -65 to 175°C
2. Operating case temperature range,  $T_C$  -65 to 175°C
3. Lead temperature 1/16"  $\pm$  1/32" from case for 10 sec. 260°C

#### B. Voltage, 25°C Case Temperature

1. Collector-base voltage,  $V_{CBO}$  120 V
2. Emitter-base voltage,  $V_{EBO}$  10 V
3. Collector-emitter voltage,  $V_{CEO}$  100 V



Type No. 2N2201  
 2N2202  
 2N2203  
 2N2204

C. Current

1. Continuous collector current
2. Continuous base current

1 a

500 ma

2N2202, 2203

D. Power

2N2201      2N2204

Continuous power dissipation at or below 25°C case temp.

15 w      15 w

100°C case

10 w      10 w

25°C ambient

2 w      1 w

Derating factor

Above 25°C case 66.7      66.7mw/°C

Above 100°C case 133      133 mw/°C

Above 25°C ambient 13.3      6.67mw/°C

IV. Electrical Characteristics, 25°C Case Temperature

	<u>Min.</u>	<u>Max.</u>
1. Collector cutoff current, $I_{CEX}$ $V_{CE}=120V, V_{BE}=-1.5V, T_C=150^\circ C$		250 $\mu a$
2. Collector cutoff current, $I_{CEX}$ $V_{CE}=120V, V_{BE}=1.5V$		10 $\mu a$
3. Collector cutoff current, $I_{CBO}$ $V_{CB} = 120V$		50 $\mu a$
4. Collector cutoff current, $I_{CBO}$ $V_{CB}=30V, T_C=150^\circ C$		200 $\mu a$
5. Emitter cutoff current, $I_{EBO}$ $V_{EB} = 10V$		250 $\mu a$
6. Collector cutoff current, $I_{CEO}$ $I_B=0, V_{CE}=60V$		10 $\mu a$
7. Collector-emitter open base sustain voltage, $V_{CEO(SUS)}$ * $I_B=0, I_C=16ma$	100	V
8. Collector-emitter breakdown voltage, base open, $BV_{CEO}$ * $I_B=0, I_C=250 \mu a$	100	V
9. DC forward current transfer ratio, $h_{FE}$ * $I_C=200ma, V_{CE}= 6.8V$	25	90
10. DC forward current transfer ratio, $h_{FE}$ * $I_C=10ma, V_{CE}=6.8V$	10	
11. DC forward current transfer ratio, $h_{FE}$ * $I_C=1 amp, V_{CE}=10V$	10	

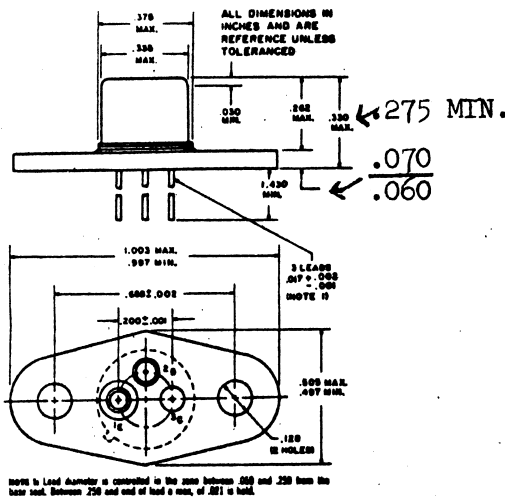
Type No. 2N2201  
 2N2202  
 2N2203  
 2N2204

	Min.	Max.
12. DC forward current transfer ratio, $h_{FE}^*$ $I_C=200\text{ma}, V_{CE}=10\text{V}$	30	90
13. Collector-emitter saturation voltage, $V_{CE}(\text{SAT})^*$ $I_C=200\text{ma}, I_B=40\text{ma}$	1.7	V
14. Base-emitter voltage, $V_{BE}^*$ $I_C=200\text{ma}, V_{CE}=6.8\text{V}$	2.0	V
15. Base-emitter voltage, $V_{BE}^*$ $I_C=200\text{ma}, V_{CE}=10\text{V}$	1.5	V
16. DC Input impedance, $h_{IE}^*$ $V_{CE}=10\text{V}, I_B=8\text{ma}$	200	$\Omega$

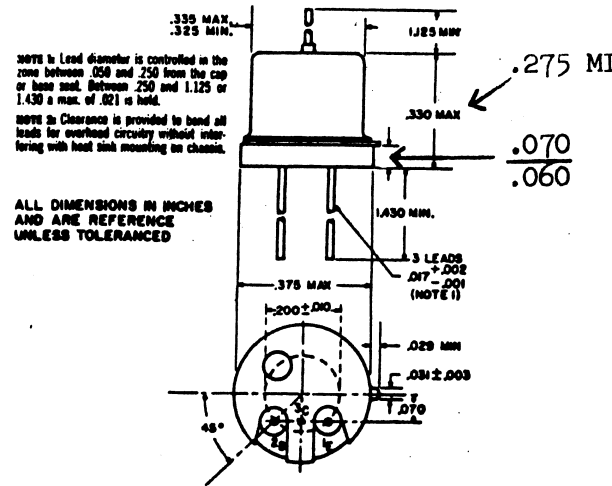
B. Dynamic

1. Magnitude of common emitter forward current transfer ratio, $ h_{fe} $ $f=1\text{mc}, I_C=30\text{ma}, V_{CE}=30\text{V}$	10
2. Common base output capacitance, $C_{ob}$ $f=1\text{mc}, I_C=30\text{ma}, V_{CB}=30\text{V}$	75 pf
3. Common emitter small-signal short-circuit forward current transfer ratio, $h_{fe}$ $I_C=50\text{ma}, V_{CE}=30\text{V}, f=1\text{kc}$	30

\* Pulsed measurement at 2% duty cycle, 300  $\mu\text{sec}$  pulse width.



2N2201



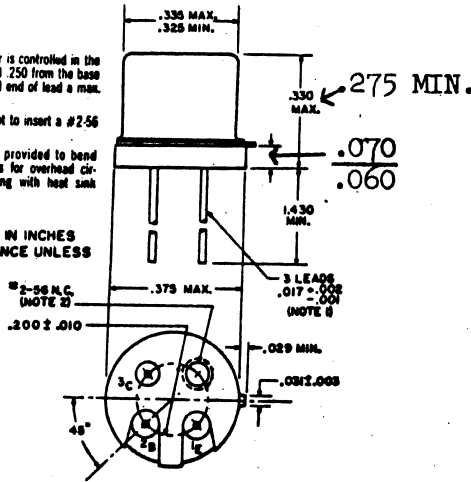
2N2202

NOTE 1: Lead diameter is controlled in the zone between .050 and .250 from the base seat. Between .250 and end of lead a max. .021 is held.

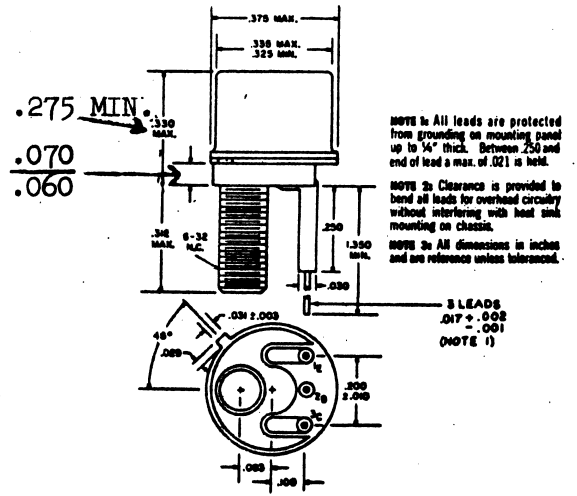
NOTE 2: Do not attempt to insert a #2-56 stud in excess of .045.

NOTE 3: Clearance is provided to bend base and emitter leads for overhead circuitry without interfering with heat sink mounting on chassis.

ALL DIMENSIONS IN INCHES AND ARE REFERENCE UNLESS TOLERANCED



2N2203



NOTE 1: All leads are protected from grounding on mounting panel up to  $1/4"$  thick. Between .250 and end of lead a max. of .021 is held.

NOTE 2: Clearance is provided to bend all leads for overhead circuitry without interfering with heat sink mounting on chassis.

NOTE 3: All dimensions in inches and are reference unless toleranced.

2N2204