

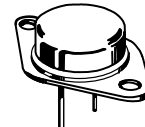
# MJ4502

## High-Power PNP Silicon Transistor

... for use as an output device in complementary audio amplifiers to 100-Watts music power per channel.

- High DC Current Gain —  $h_{FE} = 25-100$  @  $I_C = 7.5$  A
- Excellent Safe Operating Area
- Complement to the NPN MJ802

**30 AMPERE  
POWER TRANSISTOR  
PNP SILICON  
100 VOLTS  
200 WATTS**



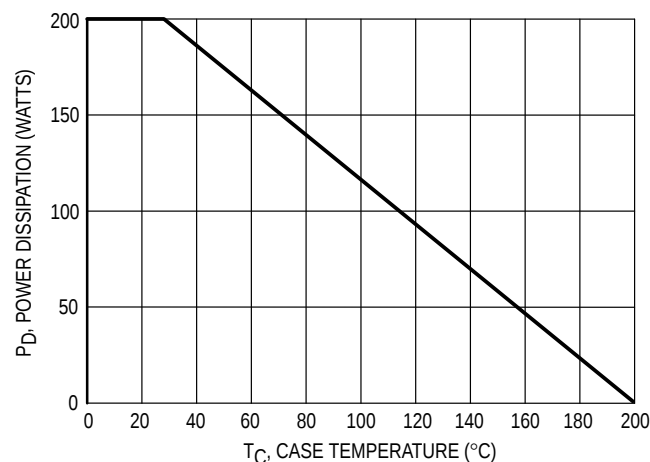
**CASE 1-07  
TO-204AA  
(TO-3)**

### MAXIMUM RATINGS

| Rating                                                                                 | Symbol         | Value       | Unit                         |
|----------------------------------------------------------------------------------------|----------------|-------------|------------------------------|
| Collector-Emitter Voltage                                                              | $V_{CER}$      | 100         | Vdc                          |
| Collector-Base Voltage                                                                 | $V_{CB}$       | 100         | Vdc                          |
| Collector-Emitter Voltage                                                              | $V_{CEO}$      | 90          | Vdc                          |
| Emitter-Base Voltage                                                                   | $V_{EB}$       | 4.0         | Vdc                          |
| Collector Current                                                                      | $I_C$          | 30          | Adc                          |
| Base Current                                                                           | $I_B$          | 7.5         | Adc                          |
| Total Device Dissipation @ $T_C = 25^\circ\text{C}$<br>Derate above $25^\circ\text{C}$ | $P_D$          | 200<br>1.14 | Watts<br>W/ $^\circ\text{C}$ |
| Operating and Storage Junction Temperature Range                                       | $T_J, T_{stg}$ | -65 to +200 | $^\circ\text{C}$             |

### MAXIMUM RATINGS

| Characteristic                       | Symbol        | Max   | Unit               |
|--------------------------------------|---------------|-------|--------------------|
| Thermal Resistance, Junction to Case | $\theta_{JC}$ | 0.875 | $^\circ\text{C/W}$ |



**Figure 1. Power-Temperature Derating Curve**

REV 7

ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

| Characteristic                                                                                                                                      | Symbol         | Min    | Max        | Unit |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------|------------|------|
| <b>OFF CHARACTERISTICS</b>                                                                                                                          |                |        |            |      |
| Collector–Emitter Breakdown Voltage <sup>(1)</sup> ( $I_C = 200\text{ mA}$ , $R_{BE} = 100\text{ Ohms}$ )                                           | $V_{(BR)CER}$  | 100    | —          | Vdc  |
| Collector–Emitter Sustaining Voltage <sup>(1)</sup> ( $I_C = 200\text{ mA}$ )                                                                       | $V_{CEO(sus)}$ | 90     | —          | Vdc  |
| Collector–Base Cutoff Current<br>( $V_{CB} = 100\text{ Vdc}$ , $I_E = 0$ )<br>( $V_{CB} = 100\text{ Vdc}$ , $I_E = 0$ , $T_C = 150^\circ\text{C}$ ) | $I_{CBO}$      | —<br>— | 1.0<br>5.0 | mAdc |
| Emitter–Base Cutoff Current ( $V_{BE} = 4.0\text{ Vdc}$ , $I_C = 0$ )                                                                               | $I_{EBO}$      | —      | 1.0        | mAdc |

**ON CHARACTERISTICS**

|                                                                                           |               |    |     |     |
|-------------------------------------------------------------------------------------------|---------------|----|-----|-----|
| DC Current Gain ( $I_C = 7.5\text{ Adc}$ , $V_{CE} = 2.0\text{ Vdc}$ )                    | $h_{FE}$      | 25 | 100 | —   |
| Base–Emitter “On” Voltage ( $I_C = 7.5\text{ Adc}$ , $V_{CE} = 2.0\text{ Vdc}$ )          | $V_{BE(on)}$  | —  | 1.3 | Vdc |
| Collector–Emitter Saturation Voltage ( $I_C = 7.5\text{ Adc}$ , $I_B = 0.75\text{ Adc}$ ) | $V_{CE(sat)}$ | —  | 0.8 | Vdc |
| Base–Emitter Saturation Voltage ( $I_C = 7.5\text{ Adc}$ , $I_B = 0.75\text{ Adc}$ )      | $V_{BE(sat)}$ | —  | 1.3 | Vdc |

**DYNAMIC CHARACTERISTICS**

|                                                                                                               |       |     |   |     |
|---------------------------------------------------------------------------------------------------------------|-------|-----|---|-----|
| Current Gain — Bandwidth Product ( $I_C = 1.0\text{ Adc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ MHz}$ ) | $f_T$ | 2.0 | — | MHz |
|---------------------------------------------------------------------------------------------------------------|-------|-----|---|-----|

(1)Pulse Test: Pulse Width  $\leq 300\text{ }\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

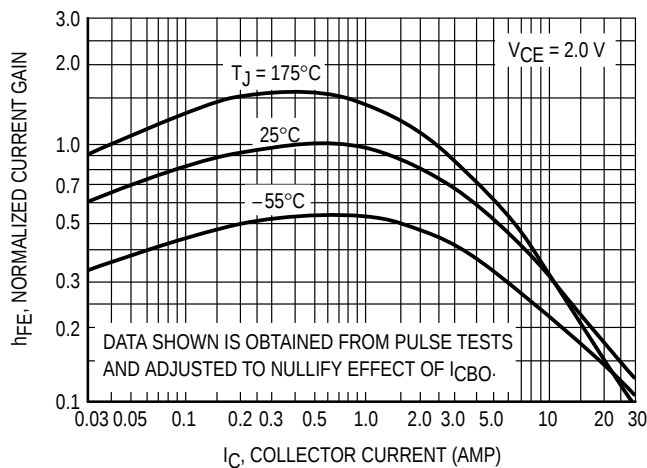


Figure 2. DC Current Gain

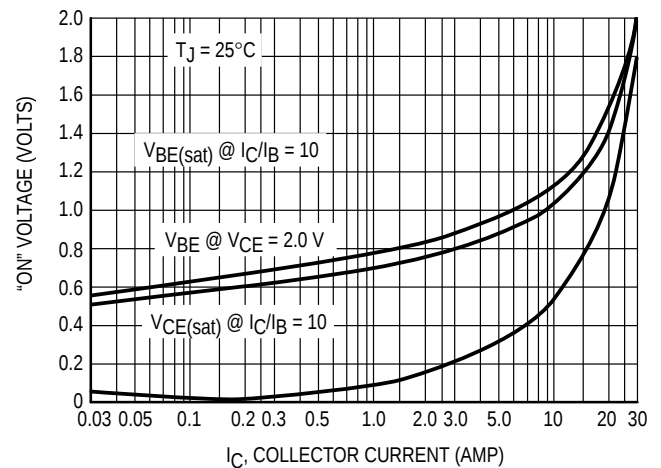


Figure 3. “On” Voltages

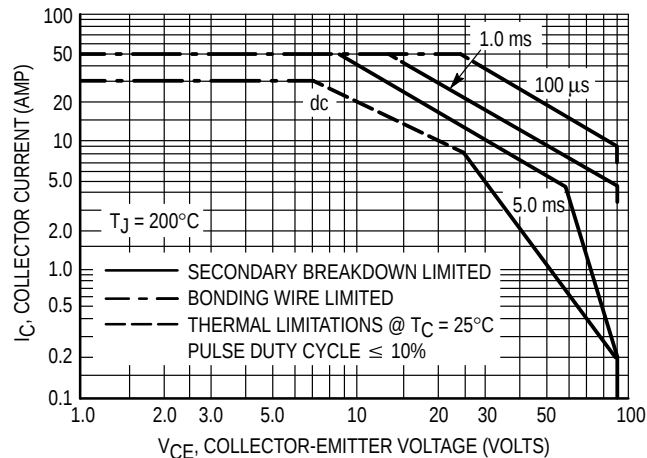
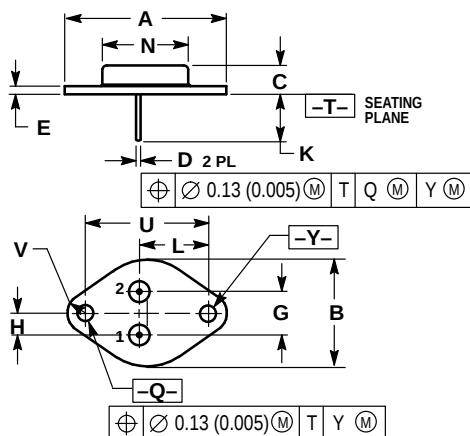


Figure 4. Active Region Safe Operating Area

The Safe Operating Area Curves indicate  $I_C - V_{CE}$  limits below which the device will not enter secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a catastrophic failure. To insure operation below the maximum  $T_J$ , power–temperature derating must be observed for both steady state and pulse power conditions.

## PACKAGE DIMENSIONS



## NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. ALL RULES AND NOTES ASSOCIATED WITH REFERENCED TO-204AA OUTLINE SHALL APPLY.

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 1.550 REF |       | 39.37 REF   |       |
| B   | —         | 1.050 | —           | 26.67 |
| C   | 0.250     | 0.335 | 6.35        | 8.51  |
| D   | 0.038     | 0.043 | 0.97        | 1.09  |
| E   | 0.055     | 0.070 | 1.40        | 1.77  |
| G   | 0.430 BSC |       | 10.92 BSC   |       |
| H   | 0.215 BSC |       | 5.46 BSC    |       |
| K   | 0.440     | 0.480 | 11.18       | 12.19 |
| L   | 0.665 BSC |       | 16.89 BSC   |       |
| N   | —         | 0.830 | —           | 21.08 |
| Q   | 0.151     | 0.165 | 3.84        | 4.19  |
| U   | 1.187 BSC |       | 30.15 BSC   |       |
| V   | 0.131     | 0.188 | 3.33        | 4.77  |

## STYLE 1:

- PIN 1: BASE
  - EMITTER
- CASE: COLLECTOR

**CASE 1-07**  
**TO-204AA (TO-3)**  
**ISSUE Z**

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