

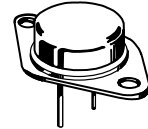
MJ802

High-Power NPN 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 PNP MJ4502

**30 AMPERE
POWER TRANSISTOR
NPN 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 @ $T_C = 25^\circ C$ Derate above $25^\circ C$ | P_D | 200 1.14 | Watts W/ $^\circ C$ |
| Operating and Storage Junction Temperature Range | T_J, T_{stg} | -65 to +200 | $^\circ C$ |

THERMAL CHARACTERISTICS

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

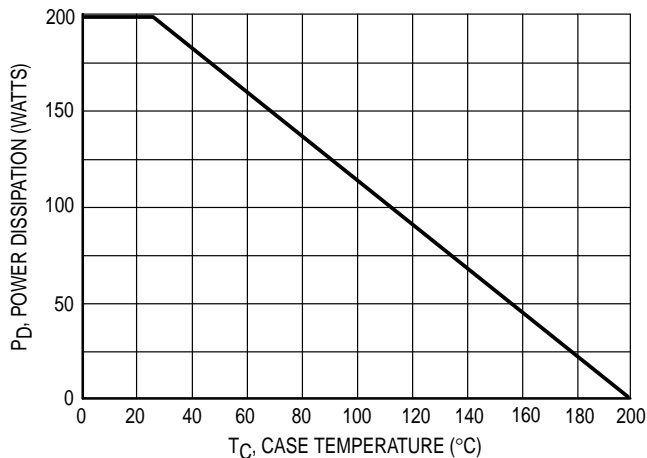


Figure 1. Power-Temperature Derating Curve

REV 7

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

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

ON CHARACTERISTICS⁽¹⁾

| | | | | |
|---|---------------|----|-----|-----|
| DC Current Gain ⁽¹⁾ ($I_C = 7.5\text{ Adc}$, $V_{CE} = 2.0\text{ Vdc}$) | 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 $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

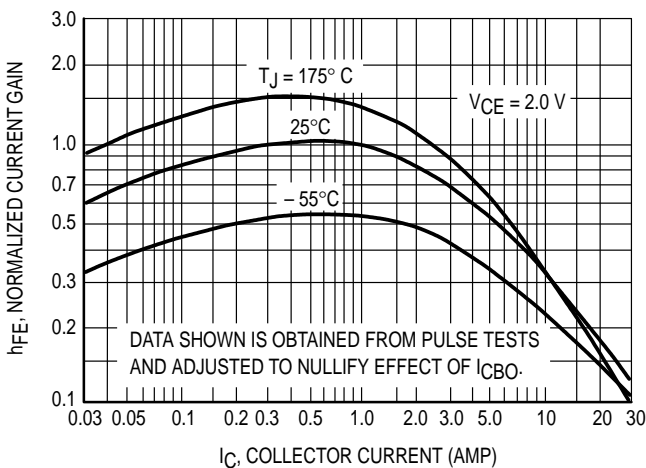


Figure 2. DC Current Gain

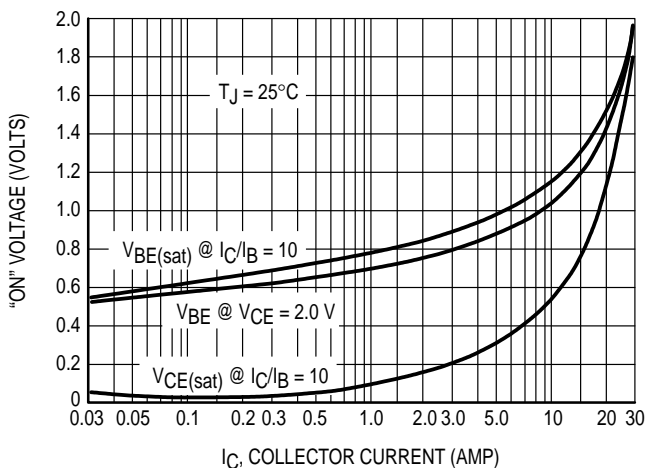


Figure 3. “On” Voltages

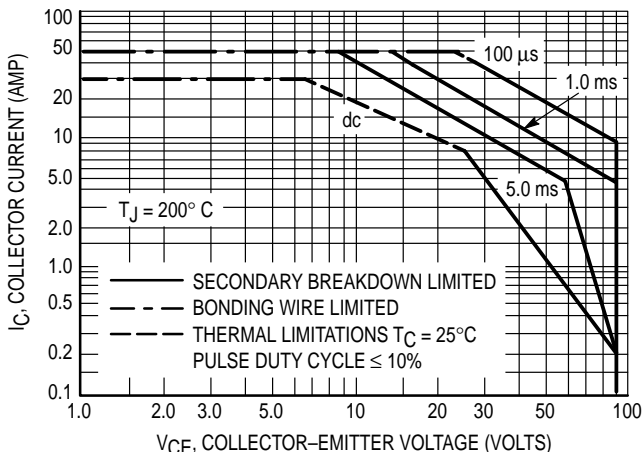
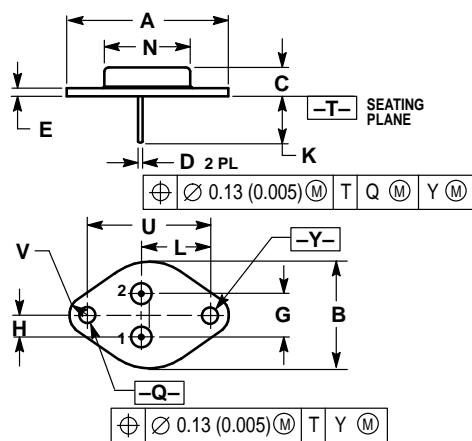


Figure 4. Active Region Safe Operating Area

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
 2: EMITTER
 CASE: COLLECTOR

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

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