

# High-Power NPN Silicon Transistor

## MJ802

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

### Features

- High DC Current Gain –  $h_{FE} = 25-100 @ I_C = 7.5 \text{ A}$
- Excellent Safe Operating Area
- Complement to the PNP MJ4502
- Pb-Free Package is Available\*

### MAXIMUM RATINGS

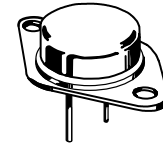
Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CE}$	100	Vdc
Collector-Base Voltage	$V_{CB}$	100	Vdc
Collector-Emitter Voltage	$V_{CEO}$	90	Vdc
Emitter-Base Voltage	$V_{EB}$	4.0	Vdc
Collector Current	$I_C$	30	Adc
Base Current	$I_B$	7.5	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate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

### THERMAL CHARACTERISTICS

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

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

30 AMPERE  
POWER TRANSISTOR  
NPN SILICON  
100 VOLTS – 200 WATTS



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

### MARKING DIAGRAM



MJ802 = Device Code  
G = Pb-Free Package  
A = Assembly Location  
YY = Year  
WW = Work Week  
MEX = Country of Origin

### ORDERING INFORMATION

Device	Package	Shipping†
MJ802G	TO-204 (Pb-Free)	100 Units / Tray

### DISCONTINUED (Note 1)

MJ802	TO-204	100 Units / Tray
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†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, [BRD8011/D](http://BRD8011/D).

1. **DISCONTINUED:** This device is not recommended for new design. Please contact your **onsemi** representative for information. The most current information on this device may be available on [www.onsemi.com](http://www.onsemi.com).

\*For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

# MJ802

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

Characteristic	Symbol	Min	Max	Unit
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### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ( $I_C = 200\text{ mA}$ , $R_{BE} = 100\ \Omega$ )	$BV_{CER}$	100	–	Vdc
Collector-Emitter Sustaining Voltage (Note 2) ( $I_C = 200\text{ mA}$ )	$V_{CEO(sus)}$	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	mA
Emitter-Base Cutoff Current ( $V_{BE} = 4.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	–	1.0	mA

### ON CHARACTERISTICS<sup>(1)</sup>

DC Current Gain (Note 2) ( $I_C = 7.5\text{ A}$ , $V_{CE} = 2.0\text{ Vdc}$ )	$h_{FE}$	25	100	–
Base-Emitter “On” Voltage ( $I_C = 7.5\text{ A}$ , $V_{CE} = 2.0\text{ Vdc}$ )	$V_{BE(on)}$	–	1.3	Vdc
Collector-Emitter Saturation Voltage ( $I_C = 7.5\text{ A}$ , $I_B = 0.75\text{ A}$ )	$V_{CE(sat)}$	–	0.8	Vdc
Base-Emitter Saturation Voltage ( $I_C = 7.5\text{ A}$ , $I_B = 0.75\text{ A}$ )	$V_{BE(sat)}$	–	1.3	Vdc

### DYNAMIC CHARACTERISTICS

Current Gain – Bandwidth Product ( $I_C = 1.0\text{ A}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ MHz}$ )	$f_T$	2.0	–	MHz
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2. Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

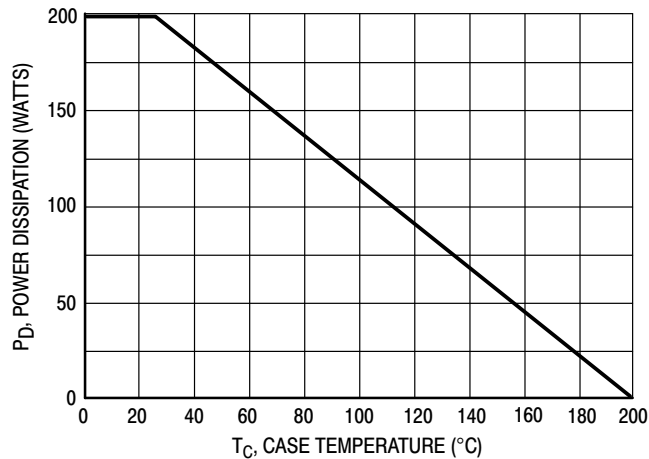


Figure 1. Power-Temperature Derating Curve

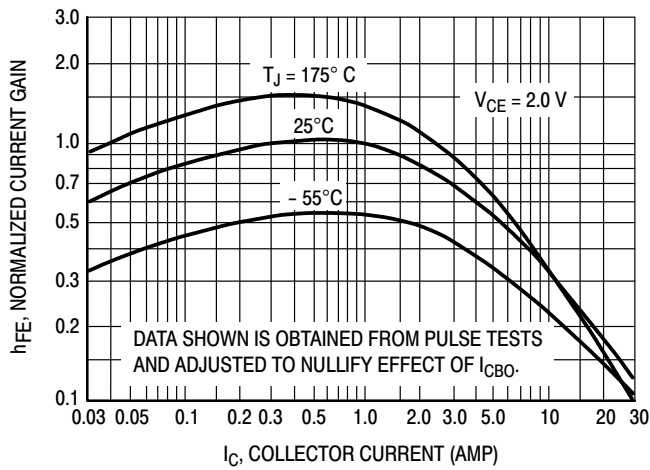


Figure 2. DC Current Gain

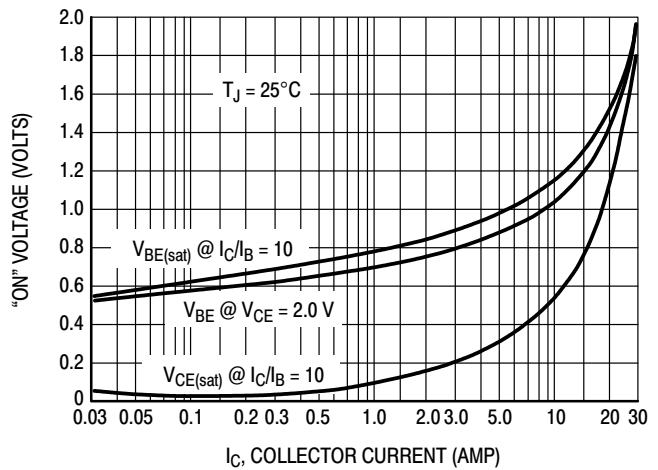


Figure 3. "On" Voltages

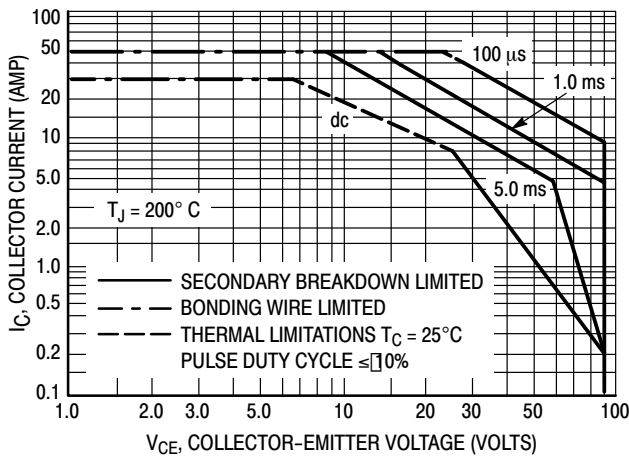
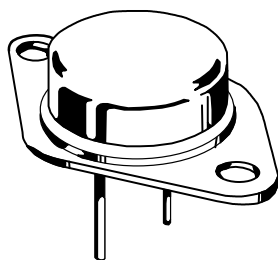


Figure 4. Active Region Safe Operating Area

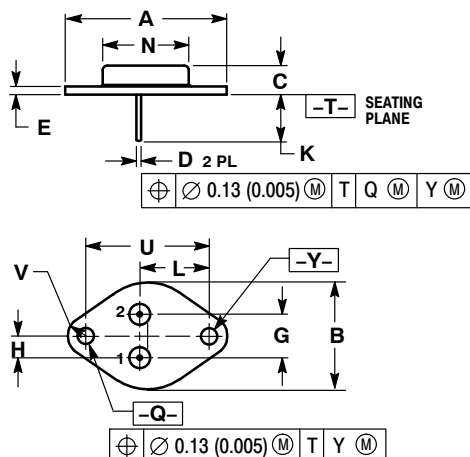
The Safe Operating Area Curves indicate  $I_C - V_{CE}$  limits below which the device will not enter secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a catastrophic failure. To insure operation below the maximum  $T_J$ , power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



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

DATE 10 MAR 2000

SCALE 1:1



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

STYLE 2:  
PIN 1. BASE  
2. COLLECTOR  
CASE: EMITTER

STYLE 3:  
PIN 1. GATE  
2. SOURCE  
CASE: DRAIN

STYLE 4:  
PIN 1. GROUND  
2. INPUT  
CASE: OUTPUT

STYLE 5:  
PIN 1. CATHODE  
2. EXTERNAL TRIP/DELAY  
CASE: ANODE

STYLE 6:  
PIN 1. GATE  
2. EMITTER  
CASE: COLLECTOR

STYLE 7:  
PIN 1. ANODE  
2. OPEN  
CASE: CATHODE

STYLE 8:  
PIN 1. CATHODE #1  
2. CATHODE #2  
CASE: ANODE

STYLE 9:  
PIN 1. ANODE #1  
2. ANODE #2  
CASE: CATHODE

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