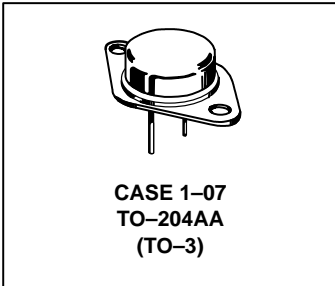


**MJ15015, MJ15016**  
**(See 2N3055A)**

**NPN**  
**MJ15018**  
**MJ15020\***  
**PNP**  
**MJ15019**  
**MJ15021\***

\*Motorola Preferred Device

**4.0 AMPERES**  
**COMPLEMENTARY**  
**SILICON**  
**POWER TRANSISTORS**  
**200 AND 250 VOLTS**  
**150 WATTS**



## Advance Information

# Complementary Silicon Power Transistors

... designed for use as high frequency drivers in Audio Amplifiers.

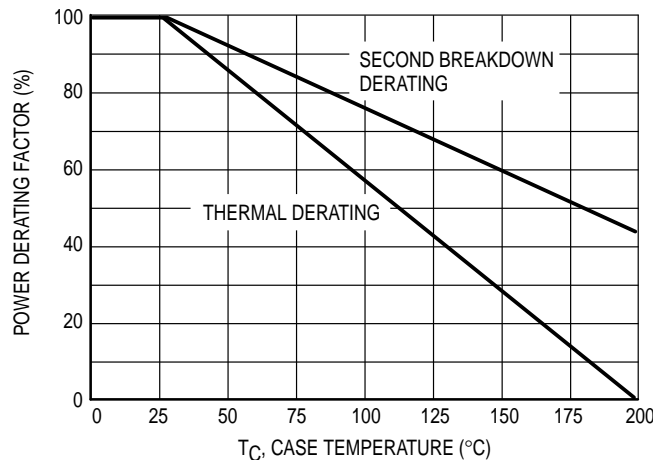
- High Gain Complementary Silicon Power Transistors
- Safe Operating Area 100% Tested  
50 V, 3.0 A, 1.0 Sec.
- Excellent Frequency Response —  $f_T = 20$  MHz min.

### MAXIMUM RATINGS

Rating	Symbol	MJ15018 MJ15019	MJ15020 MJ15021	Unit
Collector-Emitter Voltage	$V_{CEO}$	200	250	Vdc
Collector-Base Voltage	$V_{CBO}$	200	250	Vdc
Emitter-Base Voltage	$V_{EBO}$	7.0		Vdc
Collector Current — Continuous	$I_C$	4.0		Adc
Base Current — Continuous	$I_B$	2.0		Adc
Emitter Current — Continuous	$I_E$	6.0		Adc
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	150 0.86		Watts W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200		$^\circ\text{C}$

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.17	$^\circ\text{C/W}$



**Figure 1. Power Derating**

This document contains information on a new product. Specifications and information herein are subject to change without notice.

**Preferred** devices are Motorola recommended choices for future use and best overall value.

# MJ15018 MJ15020 MJ15019 MJ15021

## ELECTRICAL CHARACTERISTICS (T<sub>C</sub> = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Sustaining Voltage (1) (I <sub>C</sub> = 100 mA <sub>dc</sub> , I <sub>B</sub> = 0)	V <sub>CEO(sus)</sub>	200 250	— —	V <sub>dc</sub>
Collector Cutoff Current (V <sub>CE</sub> = 150 V <sub>dc</sub> , I <sub>B</sub> = 0) (V <sub>CE</sub> = 200 V <sub>dc</sub> , I <sub>B</sub> = 0)	I <sub>CEO</sub>	— —	500 500	μA <sub>dc</sub>
Emitter Cutoff Current (V <sub>EB</sub> = 7.0 V <sub>dc</sub> , I <sub>C</sub> = 0)	I <sub>EBO</sub>	—	500	μA <sub>dc</sub>

### SECOND BREAKDOWN

Second Breakdown Collector Current with Base Forward–Biased (V <sub>CE</sub> = 50 V <sub>dc</sub> , t = 0.5 s (non–repetitive))	I <sub>S/b</sub>	3.0	—	A <sub>dc</sub>
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### ON CHARACTERISTICS (1)

DC Current Gain (I <sub>C</sub> = 1.0 A <sub>dc</sub> , V <sub>CE</sub> = 4.0 V) (I <sub>C</sub> = 3.0 A <sub>dc</sub> , V <sub>CE</sub> = 4.0 V)	h <sub>FE</sub>	30 10	— —	
Collector–Emitter Saturation Voltage (I <sub>C</sub> = 1.0 A <sub>dc</sub> , I <sub>B</sub> = 0.1 A <sub>dc</sub> )	V <sub>CE(sat)</sub>	—	1.0	V <sub>dc</sub>
Base–Emitter on Voltage (I <sub>C</sub> = 1.0 A <sub>dc</sub> , V <sub>CE</sub> = 4.0 V <sub>dc</sub> )	V <sub>BE(on)</sub>	—	2.0	V <sub>dc</sub>

### DYNAMIC CHARACTERISTICS

Current–Gain — Bandwidth Product (I <sub>C</sub> = 0.5 A <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> , f <sub>test</sub> = 1.0 MHz)	f <sub>T</sub>	20	—	MHz
Output Capacitance (V <sub>CB</sub> = 10 V <sub>dc</sub> , I <sub>E</sub> = 0, F <sub>test</sub> = 1.0 MHz)	C <sub>ob</sub>	—	500	pF

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%

## TYPICAL DYNAMIC CHARACTERISTICS

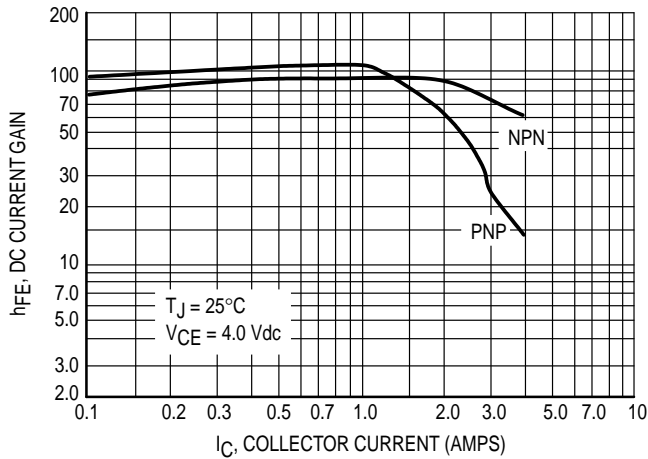


Figure 2. DC Current Gain

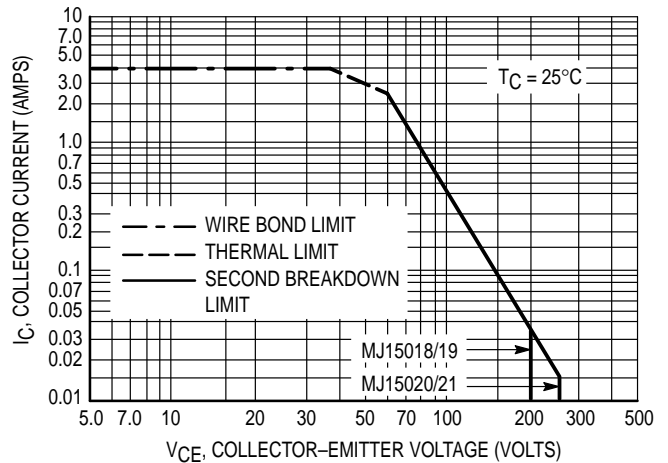
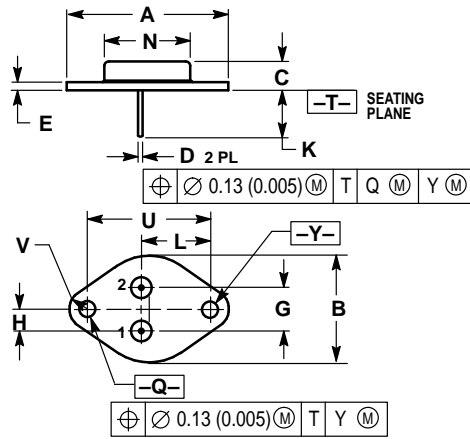


Figure 3. Maximum Rated Forward Biased Safe Operating Area

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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