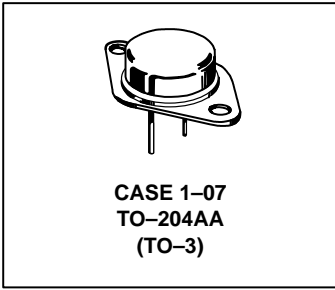


**MJ15015, MJ15016**  
**(See 2N3055A)**

**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.

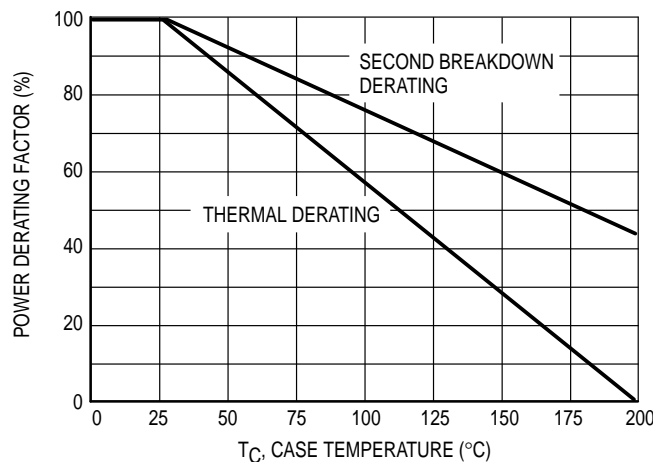
- High Gain Complementary Silicon Power Transistors
- Safe Operating Area 100% Tested  
50 V, 3.0 A, 1.0 Sec.
- Excellent Frequency Response —  $f_T = 20$  MHz min.

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Sustaining Voltage (1) ( $I_C = 100\text{ mAdc}$ , $I_B = 0$ )	$V_{CEO(sus)}$	200 250	— —	Vdc
Collector Cutoff Current ( $V_{CE} = 150\text{ Vdc}$ , $I_B = 0$ ) ( $V_{CE} = 200\text{ Vdc}$ , $I_B = 0$ )	$I_{CEO}$	— —	500 500	$\mu\text{Adc}$
Emitter Cutoff Current ( $V_{EB} = 7.0\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	—	500	$\mu\text{Adc}$

## SECOND BREAKDOWN

Second Breakdown Collector Current with Base Forward–Biased ( $V_{CE} = 50\text{ Vdc}$ , $t = 0.5\text{ s}$ (non–repetitive))	$I_{S/b}$	3.0	—	Adc
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## ON CHARACTERISTICS (1)

DC Current Gain ( $I_C = 1.0\text{ Adc}$ , $V_{CE} = 4.0\text{ V}$ ) ( $I_C = 3.0\text{ Adc}$ , $V_{CE} = 4.0\text{ V}$ )	$h_{FE}$	30 10	— —	
Collector–Emitter Saturation Voltage ( $I_C = 1.0\text{ Adc}$ , $I_B = 0.1\text{ Adc}$ )	$V_{CE(sat)}$	—	1.0	Vdc
Base–Emitter on Voltage ( $I_C = 1.0\text{ Adc}$ , $V_{CE} = 4.0\text{ Vdc}$ )	$V_{BE(on)}$	—	2.0	Vdc

## DYNAMIC CHARACTERISTICS

Current–Gain — Bandwidth Product ( $I_C = 0.5\text{ Adc}$ , $V_{CE} = 10\text{ Vdc}$ , $f_{test} = 1.0\text{ MHz}$ )	$f_T$	20	—	MHz
Output Capacitance ( $V_{CB} = 10\text{ Vdc}$ , $I_E = 0$ , $F_{test} = 1.0\text{ MHz}$ )	$C_{ob}$	—	500	pF

(1) Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$

## TYPICAL DYNAMIC CHARACTERISTICS

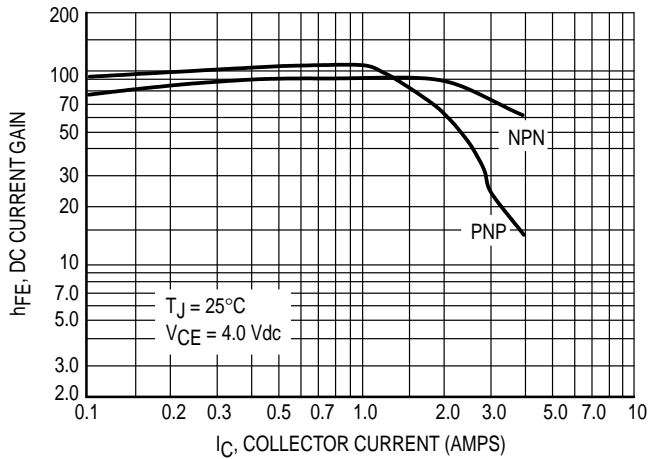


Figure 2. DC Current Gain

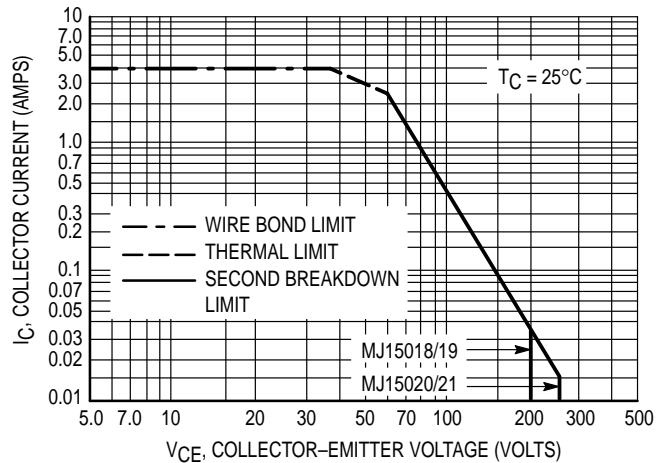
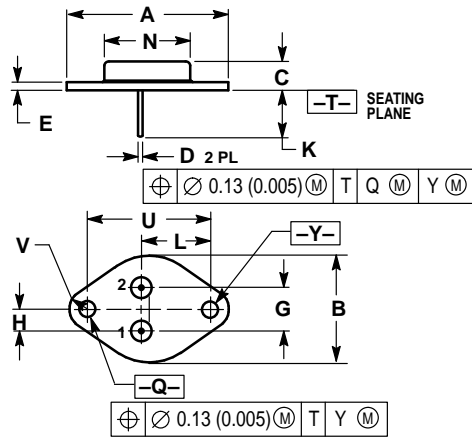


Figure 3. Maximum Rated Forward Biased Safe Operating Area

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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