Complementary Silicon Power Transistors

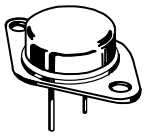
NPN
MJ15020*
PNP
MJ15021*

*ON Semiconductor Preferred Device

. . . 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.

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



CASE 1–07
TO–204AA
(TO–3)

MAXIMUM RATINGS

Rating	Symbol	MJ15020 MJ15021	Unit
Collector–Emitter Voltage	V_{CEO}	250	Vdc
Collector–Base Voltage	V_{CBO}	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°C Derate above 25°C	P_D	150 0.86	Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–65 to +200	°C

THERMAL CHARACTERISTICS

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

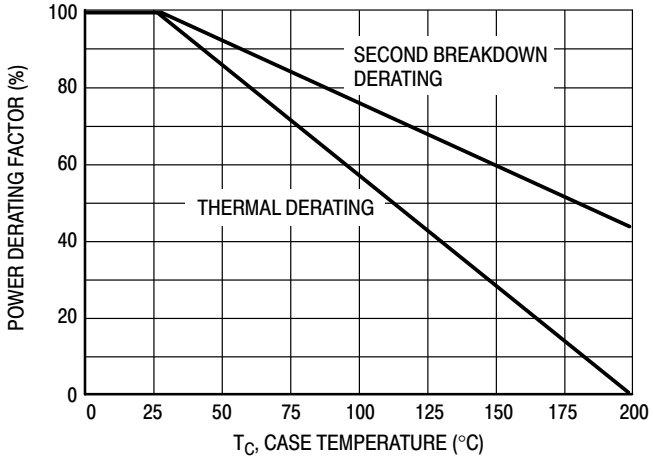


Figure 1. Power Derating

Preferred devices are ON Semiconductor recommended choices for future use and best overall value.

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ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Sustaining Voltage (1) (I_C = 100 mAdc, I_B = 0) MJ15020, MJ15021	$V_{CEO(sus)}$	250	—	Vdc
Collector Cutoff Current (V_{CE} = 200 Vdc, I_B = 0) MJ15020, MJ15021	I_{CEO}	—	500	μAdc
Emitter Cutoff Current (V_{EB} = 7.0 Vdc, I_C = 0)	I_{EBO}	—	500	μAdc
SECOND BREAKDOWN				
Second Breakdown Collector Current with Base Forward–Biased (V_{CE} = 50 Vdc, t = 0.5 s (non–repetitive)	$I_{S/b}$	3.0	—	Adc
ON CHARACTERISTICS (1)				
DC Current Gain (I_C = 1.0 Adc, V_{CE} = 4.0 V) (I_C = 3.0 Adc, V_{CE} = 4.0 V)	h_{FE}	30 10	— —	
Collector–Emitter Saturation Voltage (I_C = 1.0 Adc, I_B = 0.1 Adc)	$V_{CE(sat)}$	—	1.0	Vdc
Base–Emitter on Voltage (I_C = 1.0 Adc, V_{CE} = 4.0 Vdc)	$V_{BE(on)}$	—	2.0	Vdc
DYNAMIC CHARACTERISTICS				
Current–Gain — Bandwidth Product (I_C = 0.5 Adc, V_{CE} = 10 Vdc, f_{test} = 1.0 MHz)	f_T	20	—	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, F_{test} = 1.0 MHz)	C_{ob}	—	500	pF

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

TYPICAL DYNAMIC CHARACTERISTICS

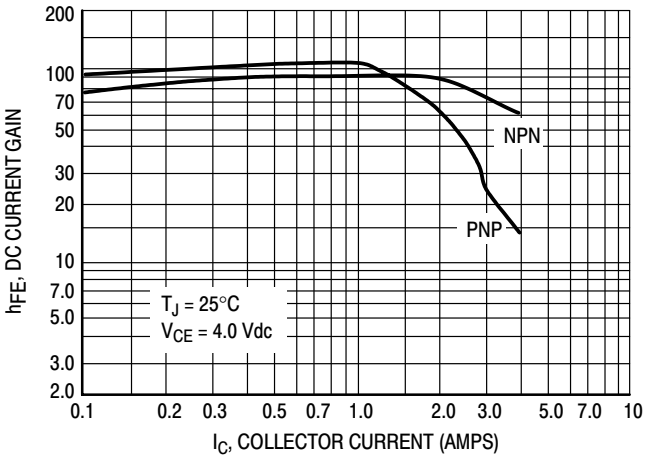


Figure 2. DC Current Gain

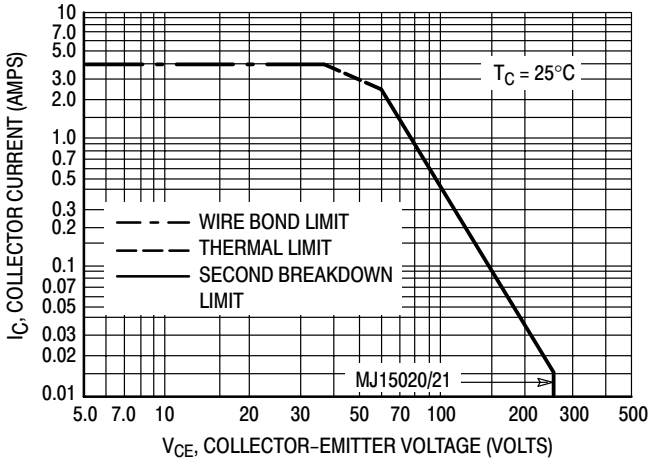
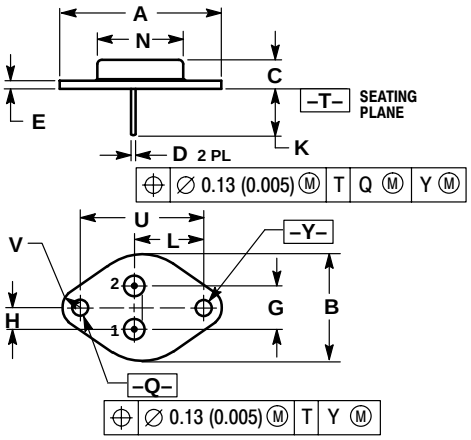


Figure 3. Maximum Rated Forward Biased Safe Operating Area

PACKAGE DIMENSIONS

CASE 1–07
TO–204AA (TO–3)
ISSUE Z



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.

	INCHES		MILLIMETERS	
DIM	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

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