MJ15020 - NPN
MJ15021 - PNP

Preferred Devices

Complementary Silicon Power Transistors

These transistors are designed for use as high frequency drivers in Audio Amplifiers.

Features

- 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
- Pb−Free Packages are Available*

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 Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	150 0.86	W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200	°C

THERMAL CHARACTERISTICS

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

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

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

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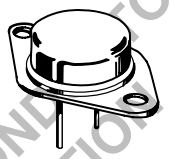
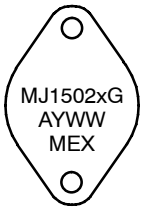
4.0 AMPERES COMPLEMENTARY SILICON-POWER TRANSISTORS 200 – 250 VOLTS, 150 WATTS



TO−204AA (TO−3)
CASE 1−07
STYLE 1

MARKING DIAGRAM



MJ1502x = Device Code
x = 0 or 1
G = Pb−Free Package
A = Assembly Location
Y = Year
WW = Work Week
MEX = Country of Origin

ORDERING INFORMATION

Device	Package	Shipping
MJ15020	TO−204	100 Units / Tray
MJ15020G	TO−204 (Pb−Free)	100 Units / Tray
MJ15021	TO−204	100 Units / Tray
MJ15021G	TO−204 (Pb−Free)	100 Units / Tray

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

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Sustaining Voltage (Note 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 (Note 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%

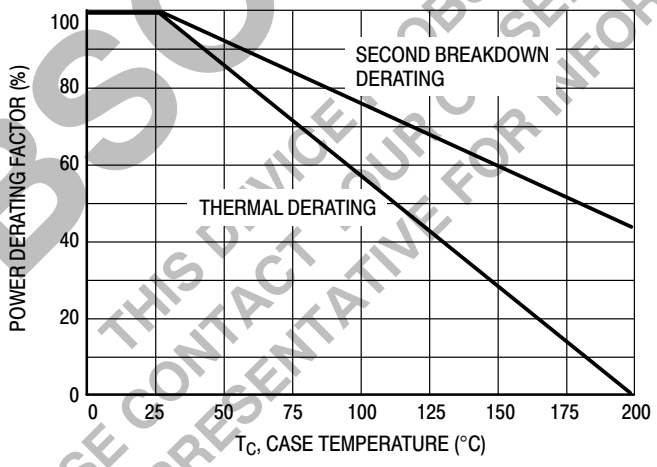


Figure 1. Power Derating

TYPICAL DYNAMIC CHARACTERISTICS

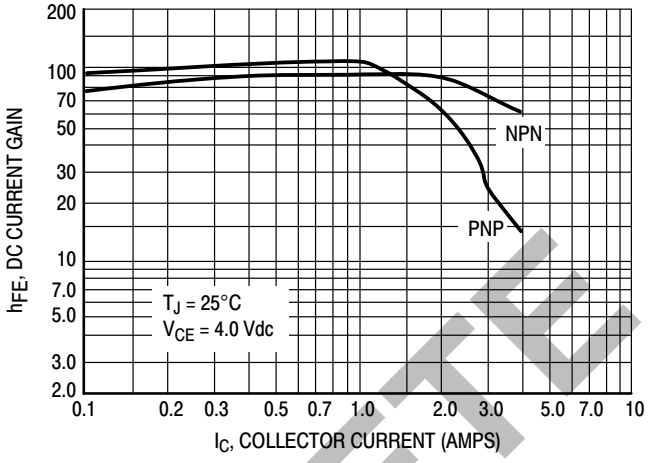


Figure 2. DC Current Gain

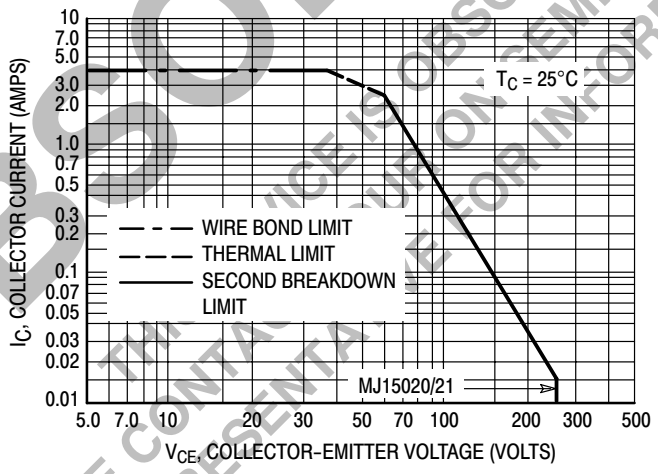
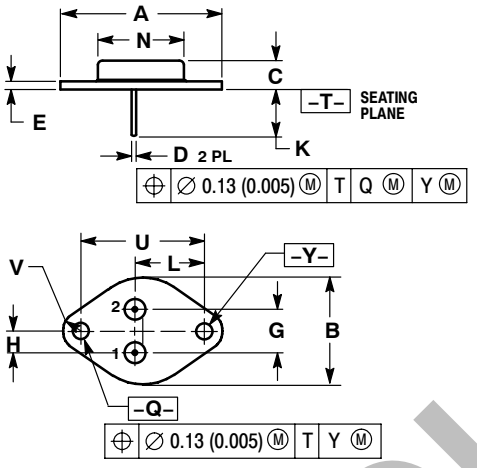


Figure 3. Maximum Rated Forward Biased Safe Operating Area

PACKAGE DIMENSIONS

TO–204 (TO–3)
CASE 1–07
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

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
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MJ15020/D