MJ15003 (NPN), MJ15004 (PNP)

Complementary Silicon Power Transistors

The MJ15003 and MJ15004 are power transistors designed for high power audio, disk head positioners and other linear applications.

Features

- High Safe Operating Area
- For Low Distortion Complementary Designs
- High DC Current Gain
- These Devices are Pb-Free and are RoHS Compliant*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V _{CEO}	140	Vdc
Collector-Base Voltage	V _{CBO}	140	Vdc
Emitter-Base Voltage	V _{EBO}	5	Vdc
Collector Current - Continuous	Ic	20	Adc
Base Current - Continuous	I _B	5	Adc
Emitter Current – Continuous	ΙE	25	Adc
Total Power Dissipation @ T _C = 25°C Derate above 25°C	P _D	250 1.43	W W/°C
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-65 to +200	°C

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.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.70	°C/W
Maximum Lead Temperature for Soldering Purposes 1/16" from Case for ≤ 10 secs	TL	265	°C

1

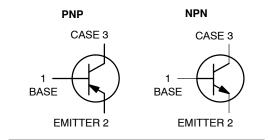


ON Semiconductor®

http://onsemi.com

20 AMPERE POWER TRANSISTORS COMPLEMENTARY SILICON 140 VOLTS, 250 WATTS

SCHEMATIC





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

MARKING DIAGRAM



MJ1500x = Device Code x = 3 or 4 G = Pb-Free Package

A = Location Code YY = Year WW = Work Week MEX = Country of Orgin

ORDERING INFORMATION

Device	Package	Shipping
MJ15003G	TO-204AA (Pb-Free)	100 Units/Tray
MJ15004G	TO-204AA (Pb-Free)	100 Units/Tray

^{*}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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ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Cumbal	Min	Mey	Limit
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector Emitter Sustaining Voltage (Note 1) $(I_C = 200 \text{ mAdc}, I_B = 0)$	V _{CEO(sus)}	140	_	Vdc
Collector Cutoff Current $(V_{CE} = 140 \text{ Vdc}, V_{BE(off)} = 1.5 \text{ Vdc})$ $(V_{CE} = 140 \text{ Vdc}, V_{BE(off)} = 1.5 \text{ Vdc}, T_{C} = 150^{\circ}\text{C})$	I _{CEX}	_ _	100 2	μAdc mAdc
Collector Cutoff Current (V _{CE} = 140 Vdc, I _B = 0)	I _{CEO}	-	250	μAdc
Emitter Cutoff Current (V _{EB} = 5 Vdc, I _C = 0)	I _{EBO}	-	100	μAdc
SECOND BREAKDOWN	·			
Second Breakdown Collector Current with Base Forward Biased $(V_{CE} = 50 \text{ Vdc}, t = 1 \text{ s (non repetitive)})$ $(V_{CE} = 100 \text{ Vdc}, t = 1 \text{ s (non repetitive)})$	I _{S/b}	5.0 1.0	_ _	Adc
ON CHARACTERISTICS		•		•
DC Current Gain (I _C = 5 Adc, V _{CE} = 2 Vdc)	h _{FE}	25	150	-
Collector Emitter Saturation Voltage $(I_C = 5 \text{ Adc}, I_B = 0.5 \text{ Adc})$	V _{CE(sat)}	-	1.0	Vdc
Base Emitter On Voltage (I _C = 5 Adc, V _{CE} = 2 Vdc)	V _{BE(on)}	_	2.0	Vdc
DYNAMIC CHARACTERISTICS	•		•	•
Current Gain — Bandwidth Product (I _C = 0.5 Adc, V _{CE} = 10 Vdc, f _{test} = 0.5 MHz)	f _T	2.0	_	MHz
Output Capacitance (V _{CB} = 10 Vdc, I _E = 0, f _{test} = 1 MHz)	c _{ob}	-	1000	pF

^{1.} Pulse Test: Pulse Width = 300 μ s, Duty Cycle \leq 2%.

TYPICAL CHARACTERISTICS MJ15003G (NPN)

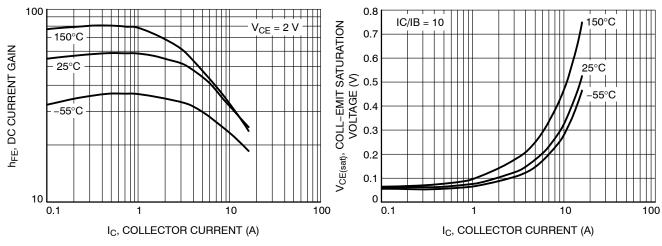


Figure 1. DC Current Gain

Figure 2. Collector–Emitter Saturation Voltage

MJ15003 (NPN), MJ15004 (PNP)

TYPICAL CHARACTERISTICS MJ15003G (NPN)

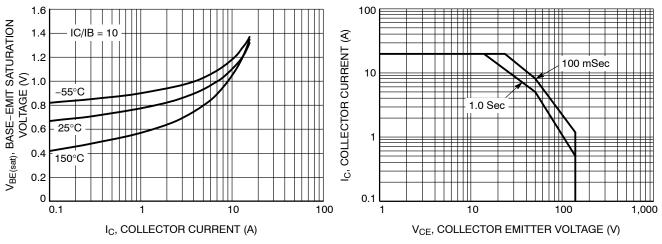


Figure 3. Base-Emitter Saturation Voltage

Figure 4. Safe Operating Area

TYPICAL CHARACTERISTICS MJ15004G (PNP)

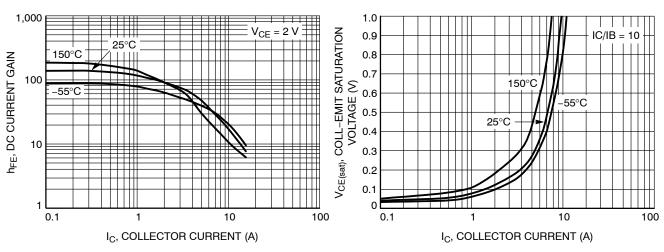


Figure 5. DC Current Gain

Figure 6. Collector-Emitter Saturation Voltage

100 mSec

100

1,000

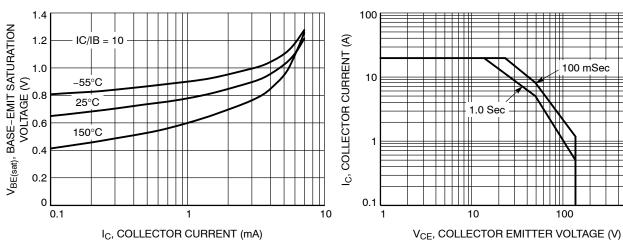


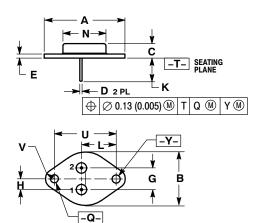
Figure 7. Base-Emitter Saturation Voltage

Figure 8. Safe Operating Area

MJ15003 (NPN), MJ15004 (PNP)

PACKAGE DIMENSIONS

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



⊕ Ø 0.13 (0.005) M T Y M

NOTES

- 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: INCH.
 ALL RULES AND NOTES ASSOCIATED WITH REFERENCED TO-204AA OUTLINE SHALL APPLY.

	INCHES MILLIMET			IETERS
DIM	MIN	MAX	MIN	MAX
Α	1.550 REF		39.37	REF
В		1.050		26.67
С	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	
Н	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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