

Complementary Silicon Power Transistors

The MJ15011 and MJ15012 are PowerBase power transistors designed for high-power audio, disk head positioners, and other linear applications. These devices can also be used in power switching circuits such as relay or solenoid drivers, dc-to-dc converters or inverters.

- High Safe Operating Area (100% Tested)
1.2 A @ 100 V
- Completely Characterized for Linear Operation
- High DC Current Gain and Low Saturation Voltage
 $h_{FE} = 20$ (Min) @ 2 A, 2 V
 $V_{CE(sat)} = 2.5$ V (Max) @ $I_C = 4$ A, $I_B = 0.4$ A
- For Low Distortion Complementary Designs

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	250	Vdc
Collector–Emitter Voltage	V_{CEX}	250	Vdc
Emitter–Base Voltage	V_{EB}	5	Vdc
Collector Current — Continuous	I_C	10	Adc
— Peak (1)	I_{CM}	15	
Base Current — Continuous	I_B	2	Adc
— Peak (1)	I_{BM}	5	
Emitter Current — Continuous	I_E	12	Adc
— Peak (1)	I_{EM}	20	
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	200 1.14	Watts W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$

THERMAL CHARACTERISTICS

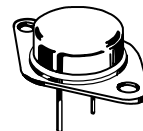
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.875	$^\circ\text{C}/\text{W}$
Maximum Lead Temperature for Soldering Purposes	T_L	265	$^\circ\text{C}$

(1) Pulse Test: Pulse Width = 5 ms, Duty Cycle $\leq 10\%$.

NPN
MJ15011*
PNP
MJ15012*

*ON Semiconductor Preferred Device

10 AMPERE
COMPLEMENTARY
POWER TRANSISTORS
250 VOLTS
200 WATTS



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

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

MJ15011 MJ15012

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage (1) ($I_C = 100\text{ mA}$)	$V_{(BR)CEO}$	250	—	Vdc
Collector Cutoff Current ($V_{CE} = 200\text{ Vdc}$)	I_{CEO}	—	1	mAdc
Collector Cutoff Current ($V_{CE} = 250\text{ Vdc}$, $V_{BE(off)} = 15\text{ Vdc}$)	I_{CEX}	—	500	μAdc
Emitter Cutoff Current ($V_{BE} = 5\text{ Vdc}$)	I_{EBO}	—	500	μAdc

ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 2\text{ Adc}$, $V_{CE} = 2\text{ Vdc}$) ($I_C = 4\text{ Adc}$, $V_{CE} = 2\text{ Vdc}$)	h_{FE}	20 5	100 —	—
Collector–Emitter Saturation Voltage ($I_C = 2\text{ Adc}$, $I_B = 0.2\text{ Adc}$) ($I_C = 4\text{ Adc}$, $I_B = 0.4\text{ Adc}$)	$V_{CE(sat)}$	— —	0.8 2.5	Vdc
Base–Emitter On Voltage ($I_C = 4\text{ Adc}$, $V_{CE} = 2\text{ Vdc}$)	$V_{BE(on)}$	—	2	Vdc

DYNAMIC CHARACTERISTICS

Output Capacitance ($V_{CB} = 10\text{ Vdc}$, $f = 1\text{ MHz}$)	C_{ob}	—	750	pF
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SECOND BREAKDOWN

Second Breakdown Collector Current with Base Forward Biased ($V_{CE} = 40\text{ Vdc}$, $t = 0.5\text{ s}$) ($V_{CE} = 100\text{ Vdc}$, $t = 0.5\text{ s}$)	$I_{S/b}$	5 1.4	— —	Adc
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(1) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2\%$.

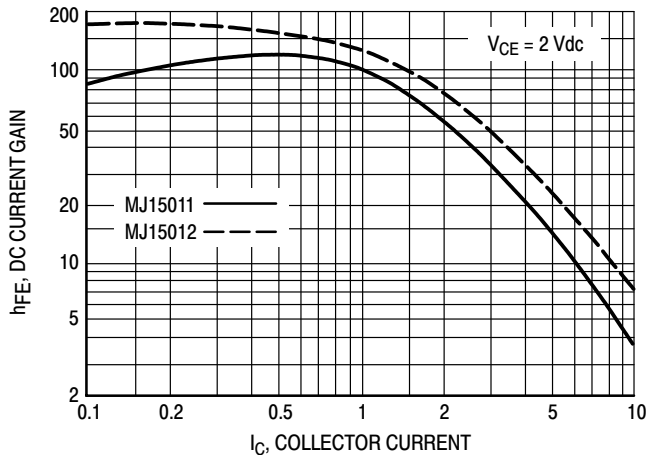


Figure 1. DC Current Gain

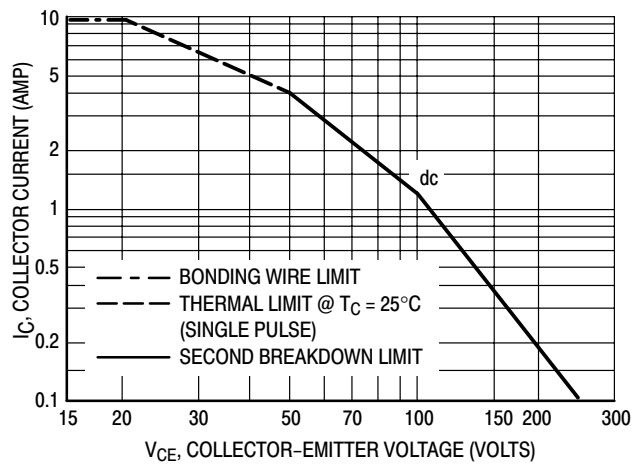
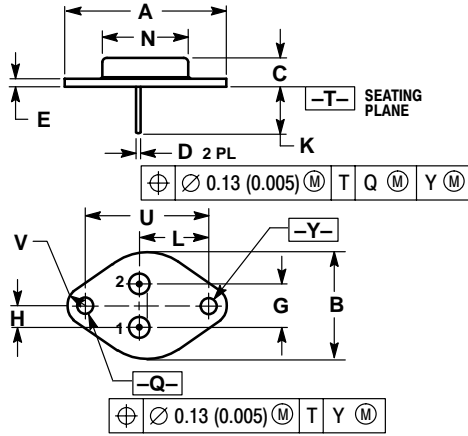


Figure 2. Active Region Safe Operating Area

MJ15011 MJ15012

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.

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
 - EMITTER
- CASE: COLLECTOR

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