MJF3055 (NPN), MJF2955 (PNP)

Complementary Silicon Power Transistors

Specifically designed for general purpose amplifier and switching applications.

- Isolated Overmold Package (1500 Volts RMS Min)
- Electrically Similar to the Popular MJE3055T and MJE2955T
- Collector−Emitter Sustaining Voltage − $V_{CEO(sus)}$ 90 Volts
- 10 Amperes Rated Collector Current
- No Isolating Washers Required
- Reduced System Cost
- UL Recognized, File #E69369, to 3500 V_{RMS} Isolation
- Epoxy Meets UL94, VO at 1/8″
- ESD Ratings: Machine Model, C; > 400 V
  Human Body Model, 3B; > 8000 V

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector−Emitter Sustaining Voltage	$V_{CEO(sus)}$	90	Vdc
Collector−Emitter Breakdown Voltage	V_{CES}	90	Vdc
Base−Emitter Voltage	V_{EBO}	5.0	Vdc
Collector Current − Continuous	I_C	10	Adc
Base Current − Continuous	I_B	6.0	Adc
RMS Isolation Voltage (Note 3) Test No. 1 Per Fig. 5 (for 1 sec, R.H. < 30%, Test No. 2 Per Fig. 6 T_A = 25°C) Test No. 3 Per Fig. 7	V_{ISOL}	 4500 3500 1500	V_{RMS}
Total Power Dissipation @ T_C = 25°C (Note 2) Derate above 25°C	P_D	30 0.25	Watts W/°C
Total Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	2.0 0.016	Watts W/°C
Operating and Storage Temperature Range	T_J, T_{stg}	−55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance − Junction to Case (Note 2)	$R_{\theta JC}$	4.0	°C/W
Thermal Resistance − Junction to Ambient	$R_{\theta JA}$	62.5	°C/W
Lead Temperature for Soldering Purposes	T_L	260	°C

1. Pulse Test: Pulse Width = 5.0 ms, Duty Cycle ≤ 10%.
2. Measurement made with thermocouple contacting the bottom insulated surface (in a location beneath the die), the devices mounted on a heatsink with thermal grease and a mounting torque of ≥ 6 in. lbs.
3. Proper strike and creepage distance must be provided.

ON Semiconductor®

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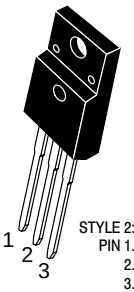
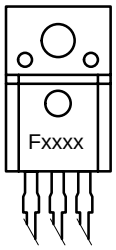
COMPLEMENTARY SILICON POWER TRANSISTORS 10 AMPERES 90 VOLTS 30 WATTS

MARKING DIAGRAM



TO−220 FULLPACK CASE 221D STYLE 2

STYLE 2:
PIN 1. BASE
2. COLLECTOR
3. EMITTER



Fxxxx = Specific Device Code
xxxx = 2955 or 3055

ORDERING INFORMATION

Device	Package	Shipping
MJF2955	TO−220 FULLPACK	50 Units/Rail
MJF3055	TO−220 FULLPACK	50 Units/Rail

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS (Note 4)				
Collector−Emitter Sustaining Voltage (I_C = 200 mAdc, I_B = 0)	$V_{CEO(sus)}$	90	−	Vdc
Collector Cutoff Current (V_{CE} = 90 Vdc, V_{BE} = 0)	I_{CES}	−	1.0	μAdc
Collector Cutoff Current (V_{CE} = 90 Vdc, I_E = 0)	I_{CBO}	−	1.0	μAdc
Emitter−Base Leakage (V_{EB} = 5.0 Vdc, I_C = 0)	I_{EBO}	−	1.0	μAdc
ON CHARACTERISTICS (Note 4)				
DC Current Gain (I_{CE} = 4.0 Adc, V_{CE} = 4.0 Vdc) (I_{CE} = 10 Adc, V_{CE} = 4.0 Vdc)	h_{FE}	20 5.0	100 −	−
Collector−Emitter Saturation Voltage (I_C = 4.0 Adc, I_B = 0.4 Adc) (I_C = 10 Adc, I_B = 3.3 Adc)	$V_{CE(sat)}$	 − −	 1.0 2.5	Vdc
Base−Emitter On Voltage (I_C = 4.0 Adc, V_{BE} = 4.0 Vdc)	$V_{BE(on)}$	−	1.5	Vdc
DYNAMIC CHARACTERISTICS				
Current−Gain−Bandwidth Product (V_{CE} = 10 Vdc, I_C = 0.5 Adc, f_{test} = 500 kHz)	f_T	2.0	−	MHz

4. Pulse Test: Pulse Width = 5.0 ms, Duty Cycle ≤ 10%.

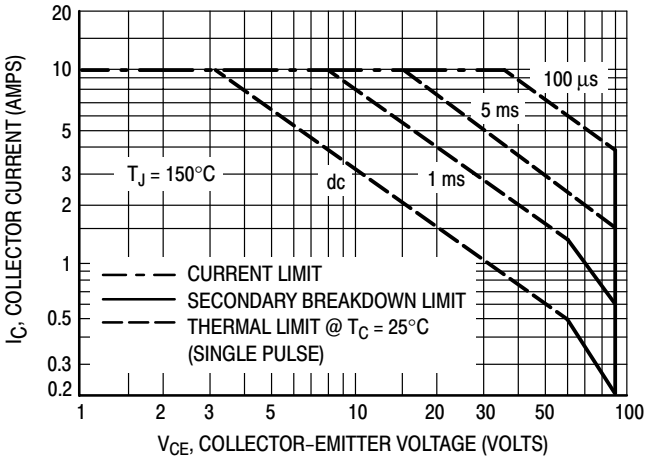


Figure 1. Maximum Forward Bias Safe Operating Area

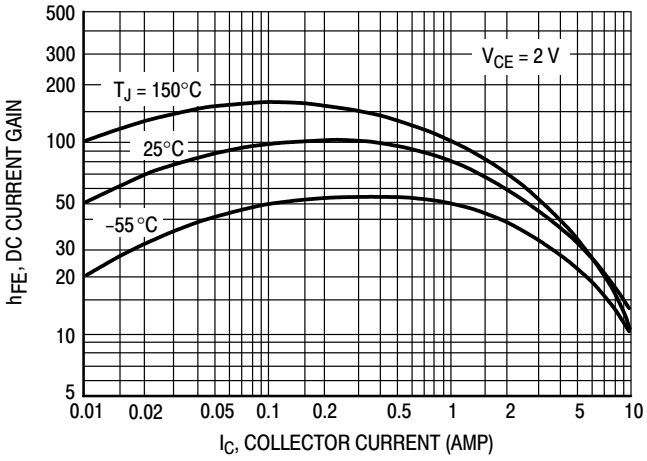


Figure 2. DC Current Gain

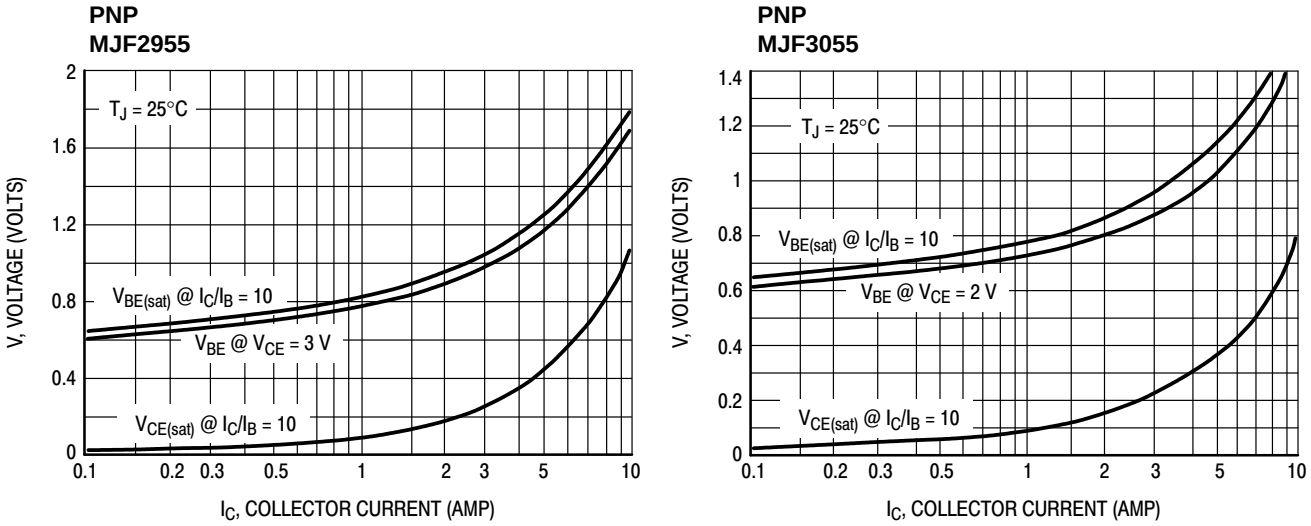


Figure 3. “On” Voltages

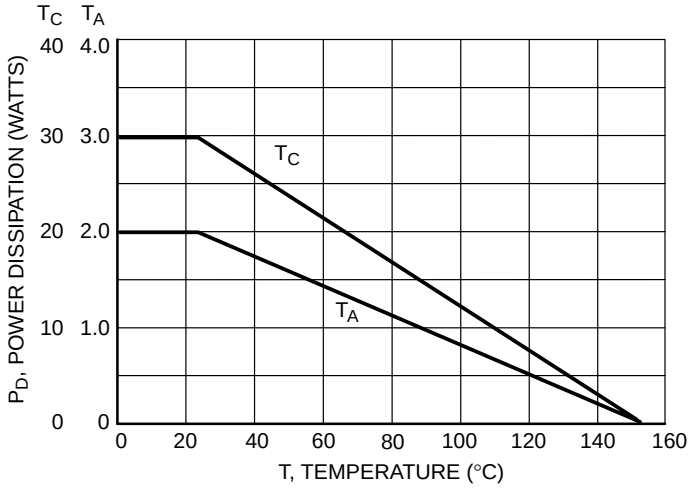


Figure 4. Power Derating

TEST CONDITIONS FOR ISOLATION TESTS*

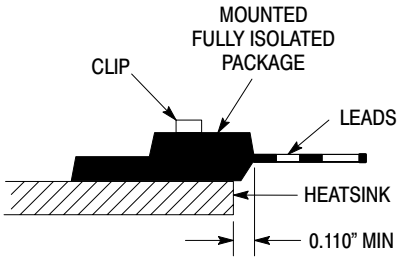


Figure 5. Clip Mounting Position for Isolation Test Number 1

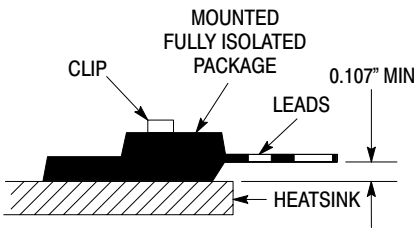


Figure 6. Clip Mounting Position for Isolation Test Number 2

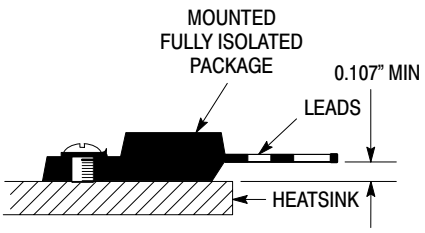


Figure 7. Screw Mounting Position for Isolation Test Number 3

*Measurement made between leads and heatsink with all leads shorted together

MOUNTING INFORMATION

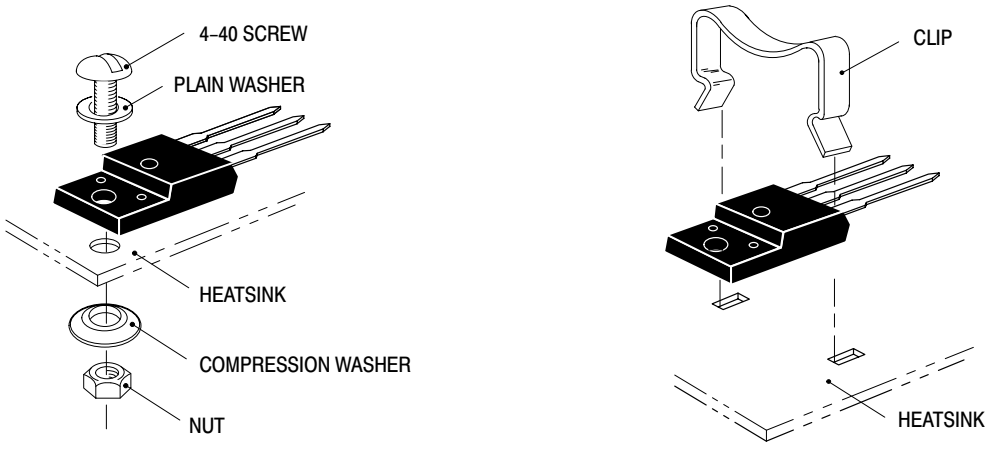


Figure 8. Typical Mounting Techniques*

Laboratory tests on a limited number of samples indicate, when using the screw and compression washer mounting technique, a screw torque of 6 to 8 in · lbs is sufficient to provide maximum power dissipation capability. The compression washer helps to maintain a constant pressure on the package over time and during large temperature excursions.

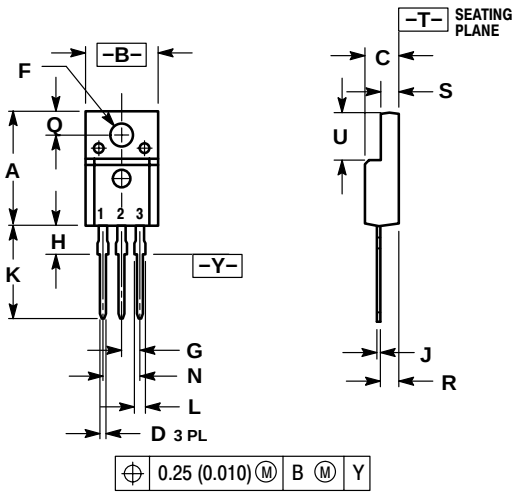
Destructive laboratory tests show that using a hex head 4−40 screw, without washers, and applying a torque in excess of 20 in · lbs will cause the plastic to crack around the mounting hole, resulting in a loss of isolation capability.

Additional tests on slotted 4−40 screws indicate that the screw slot fails between 15 to 20 in · lbs without adversely affecting the package. However, in order to positively ensure the package integrity of the fully isolated device, ON Semiconductor does not recommend exceeding 10 in · lbs of mounting torque under any mounting conditions.

** For more information about mounting power semiconductors see Application Note AN1040.

PACKAGE DIMENSIONS

TO−220 FULLPAK
CASE 221D−03
ISSUE G



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH
3. 221D−01 THRU 221D−02 OBSOLETE, NEW STANDARD 221D−03.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.625	0.635	15.88	16.12
B	0.408	0.418	10.37	10.63
C	0.180	0.190	4.57	4.83
D	0.026	0.031	0.65	0.78
F	0.116	0.119	2.95	3.02
G	0.100 BSC		2.54 BSC	
H	0.125	0.135	3.18	3.43
J	0.018	0.025	0.45	0.63
K	0.530	0.540	13.47	13.73
L	0.048	0.053	1.23	1.36
N	0.200 BSC		5.08 BSC	
Q	0.124	0.128	3.15	3.25
R	0.099	0.103	2.51	2.62
S	0.101	0.113	2.57	2.87
U	0.238	0.258	6.06	6.56

STYLE 2:
PIN 1. BASE
2. COLLECTOR
3. EMITTER

PUBLICATION ORDERING INFORMATION

Literature Fulfillment:
Literature Distribution Center for ON Semiconductor
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ON Semiconductor Website: http://onsemi.com

For additional information, please contact your local
Sales Representative.

MJF3055/D