

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) (for 1 sec, R.H. < 30%, $T_A = 25^\circ\text{C}$)	V_{ISOL}	4500 3500 1500	V_{RMS}
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ (Note 2) Derate above 25°C	P_D	30 0.25	Watts $W/^\circ\text{C}$
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	2.0 0.016	Watts $W/^\circ\text{C}$
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

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

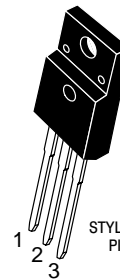
1. Pulse Test: Pulse Width = 5.0 ms, Duty Cycle $\leq 10\%$.
2. Measurement made with thermocouple contacting the bottom insulated surface (in a location beneath the die), the devices mounted on a heatsink with thermal grease and a mounting torque of ≥ 6 in. lbs.
3. Proper strike and creepage distance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



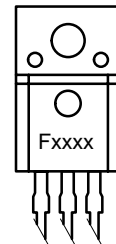
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COMPLEMENTARY SILICON POWER TRANSISTORS 10 AMPERES 90 VOLTS 30 WATTS

MARKING DIAGRAM



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

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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS (Note 4)

Collector–Emitter Sustaining Voltage ($I_C = 200\text{ mA}$, $I_B = 0$)	$V_{CEO(sus)}$	90	–	Vdc
Collector Cutoff Current ($V_{CE} = 90\text{ Vdc}$, $V_{BE} = 0$)	I_{CES}	–	1.0	μA
Collector Cutoff Current ($V_{CE} = 90\text{ Vdc}$, $I_E = 0$)	I_{CBO}	–	1.0	μA
Emitter–Base Leakage ($V_{EB} = 5.0\text{ Vdc}$, $I_C = 0$)	I_{EBO}	–	1.0	μA

ON CHARACTERISTICS (Note 4)

DC Current Gain ($I_{CE} = 4.0\text{ A}$, $V_{CE} = 4.0\text{ Vdc}$) ($I_{CE} = 10\text{ A}$, $V_{CE} = 4.0\text{ Vdc}$)	h_{FE}	20 5.0	100 –	–
Collector–Emitter Saturation Voltage ($I_C = 4.0\text{ A}$, $I_B = 0.4\text{ A}$) ($I_C = 10\text{ A}$, $I_B = 3.3\text{ A}$)	$V_{CE(sat)}$	– –	1.0 2.5	Vdc
Base–Emitter On Voltage ($I_C = 4.0\text{ A}$, $V_{BE} = 4.0\text{ Vdc}$)	$V_{BE(on)}$	–	1.5	Vdc

DYNAMIC CHARACTERISTICS

Current–Gain–Bandwidth Product ($V_{CE} = 10\text{ Vdc}$, $I_C = 0.5\text{ A}$, $f_{test} = 500\text{ kHz}$)	f_T	2.0	–	MHz
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4. Pulse Test: Pulse Width = 5.0 ms, Duty Cycle \leq 10%.

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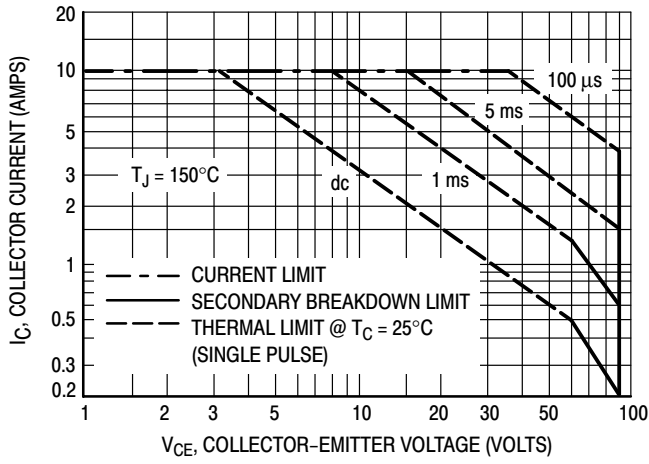


Figure 1. Maximum Forward Bias Safe Operating Area

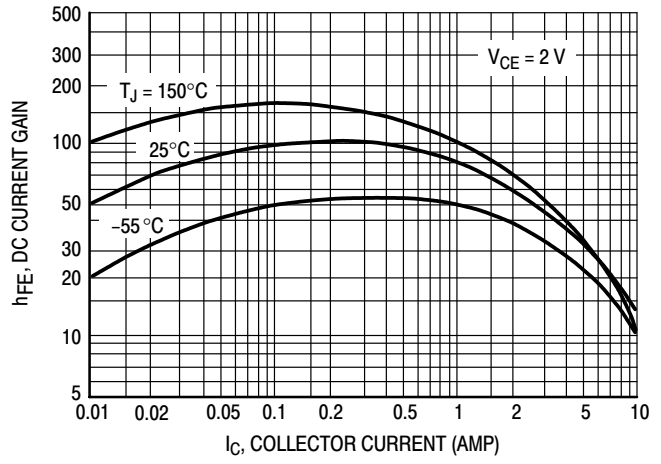


Figure 2. DC Current Gain

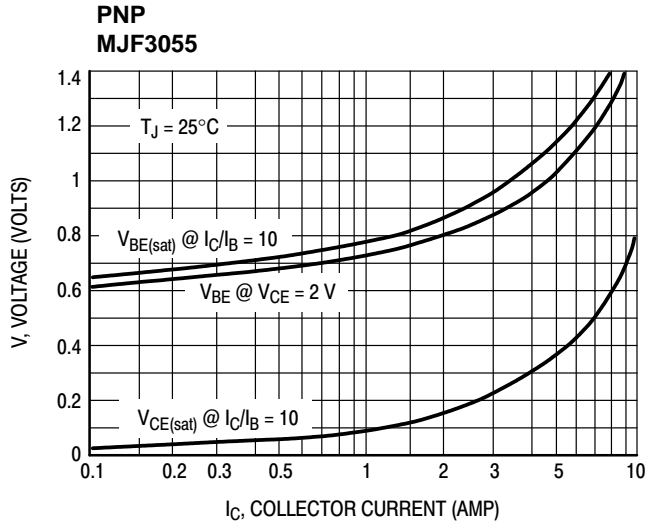
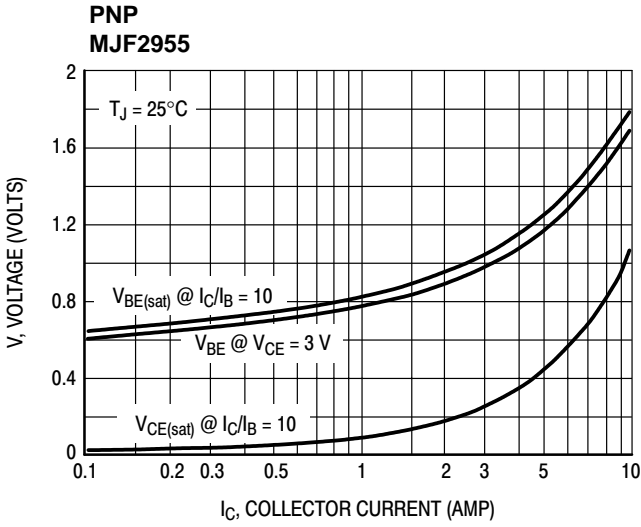


Figure 3. "On" Voltages

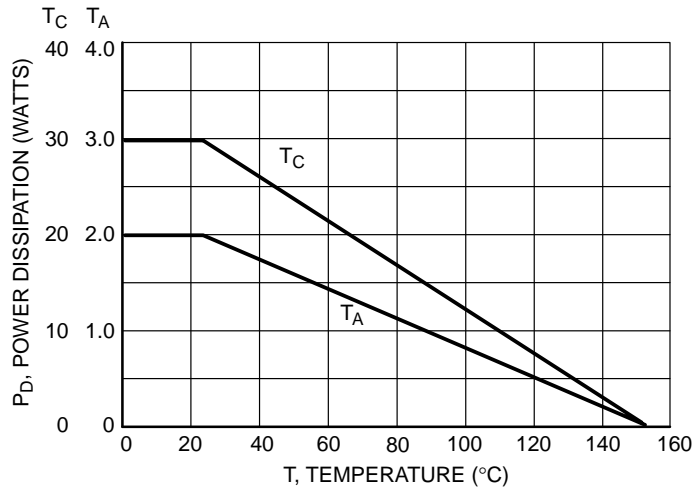


Figure 4. Power Derating

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TEST CONDITIONS FOR ISOLATION TESTS*

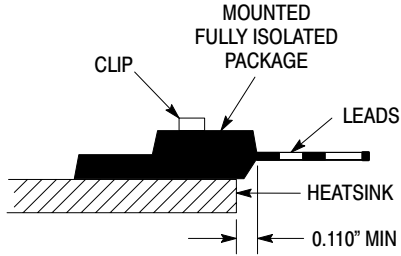


Figure 5. Clip Mounting Position for Isolation Test Number 1

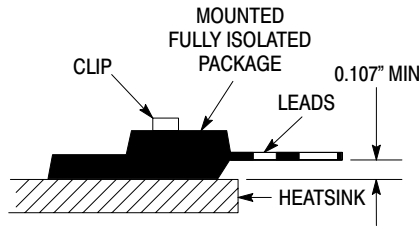


Figure 6. Clip Mounting Position for Isolation Test Number 2

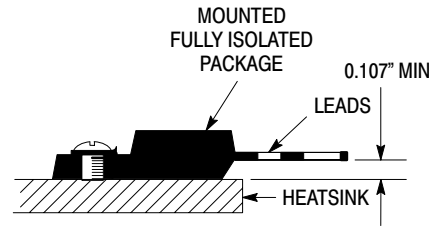


Figure 7. Screw Mounting Position for Isolation Test Number 3

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

MOUNTING INFORMATION

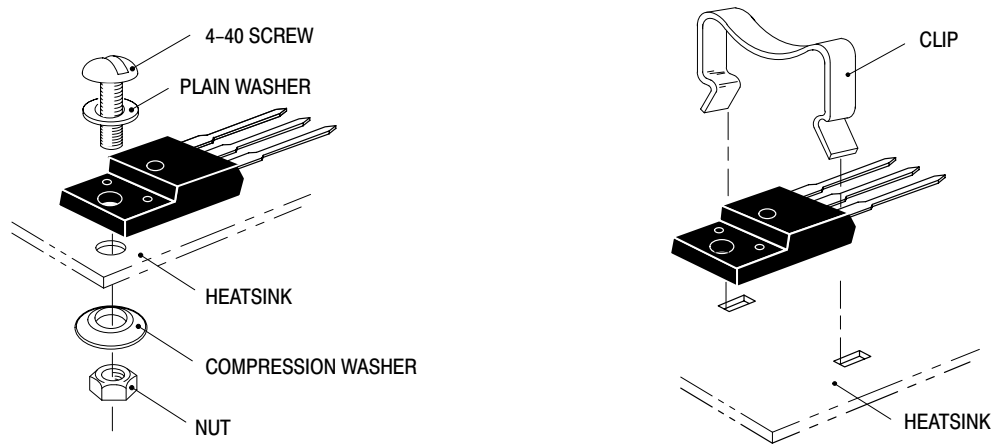


Figure 8. Typical Mounting Techniques*

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.

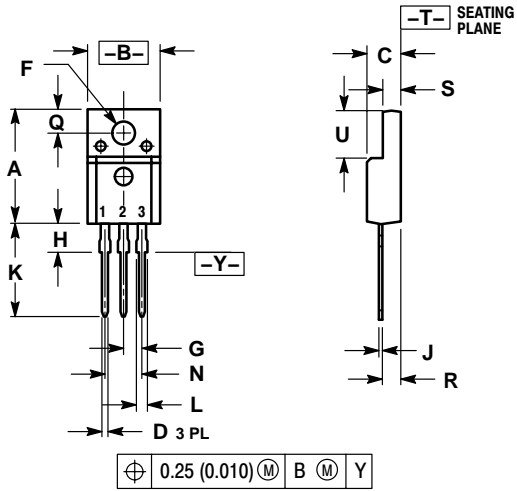
Additional tests on slotted 4–40 screws indicate that the screw slot fails between 15 to 20 in · lbs without adversely affecting the package. However, in order to positively ensure the package integrity of the fully isolated device, ON Semiconductor does not recommend exceeding 10 in · lbs of mounting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

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

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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.

DIM	INCHES		MILLIMETERS	
	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

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