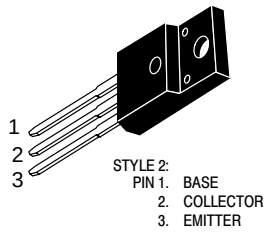
Complementary Silicon Power Transistors

. . . 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

NPN
MJF3055
PNP
MJF2955

COMPLEMENTARY SILICON POWER TRANSISTORS
10 AMPERES
90 VOLTS
30 WATTS



CASE 221D–02
TO–220 TYPE

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	Vdc
Collector Current — Continuous	I_C	10	Adc
Base Current — Continuous	I_B	6	Adc
RMS Isolation Voltage (3) Test No. 1 Per Fig. 4 (for 1 sec, R.H. < 30%, Test No. 2 Per Fig. 5 T_A = 25°C) Test No. 3 Per Fig. 6	V_{ISOL}	4500 3500 1500	V_{RMS}
Total Power Dissipation @ T_C = 25°C (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 0.016	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 (2)	$R_{\theta JC}$	4	°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 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.

April, 2002 – Rev. 3
Publication Order Number:
MJF3055/D

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS (1)				
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	μAdc
Collector Cutoff Current (V_{CE} = 90 Vdc, I_E = 0)	I_{CBO}	—	1	μAdc
Emitter–Base Leakage (V_{EB} = 5 Vdc, I_C = 0)	I_{EBO}	—	1	μAdc
ON CHARACTERISTICS (1)				
DC Current Gain (I_{CE} = 4 Adc, V_{CE} = 4 Vdc) (I_{CE} = 10 Adc, V_{CE} = 4 Vdc)	h_{FE}	20 5	100 —	—
Collector–Emitter Saturation Voltage (I_C = 4 Adc, I_B = 0.4 Adc) (I_C = 10 Adc, I_B = 3.3 Adc)	$V_{CE(sat)}$	 — —	 1 2.5	Vdc
Base–Emitter On Voltage (I_C = 4 Adc, V_{BE} = 4 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	—	MHz

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

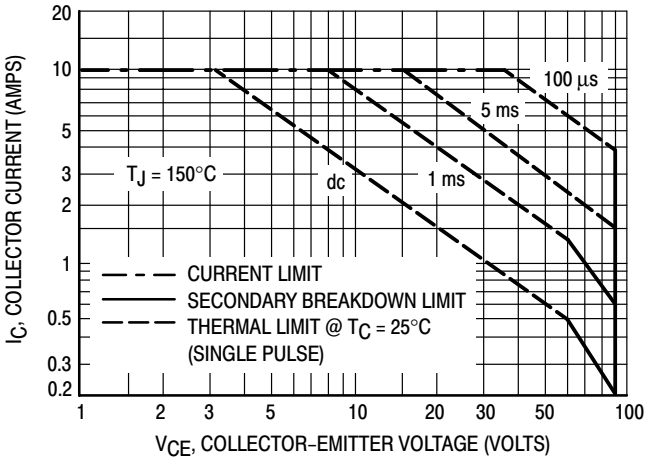


Figure 1. Maximum Forward Bias Safe Operating Area

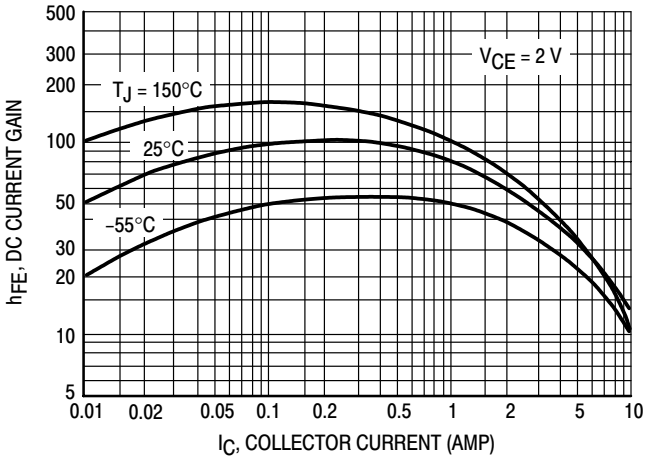


Figure 2. DC Current Gain

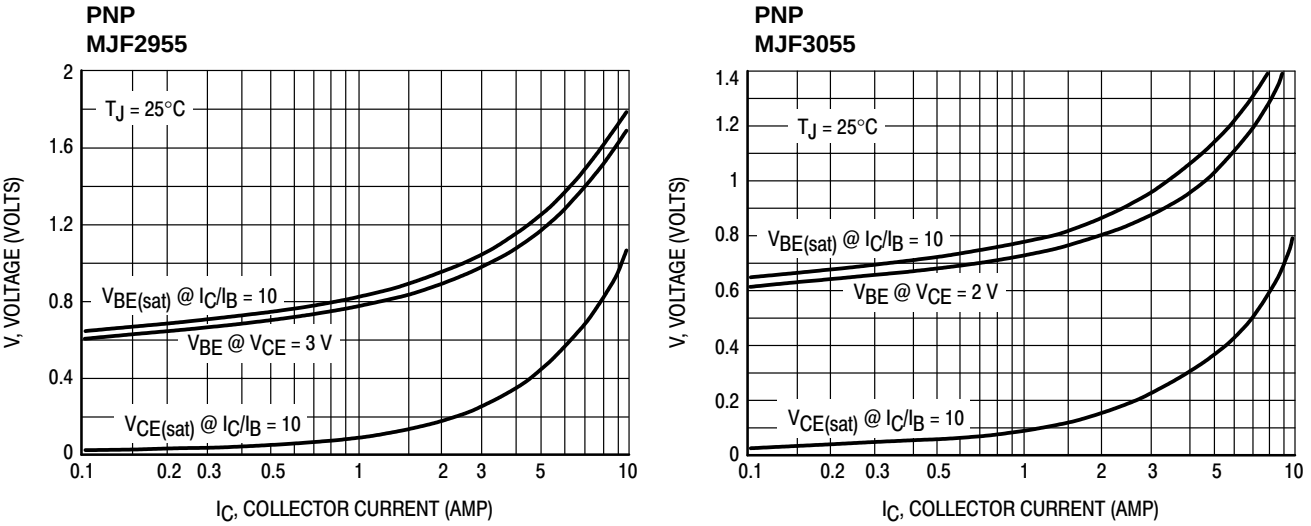


Figure 3. “On” Voltages

TEST CONDITIONS FOR ISOLATION TESTS*

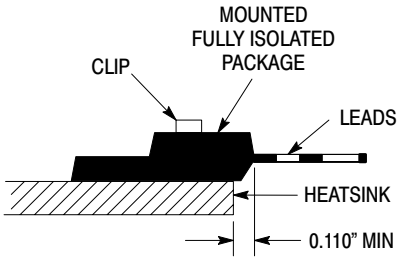


Figure 4. Clip Mounting Position for Isolation Test Number 1

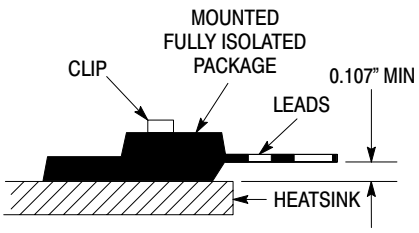


Figure 5. Clip Mounting Position for Isolation Test Number 2

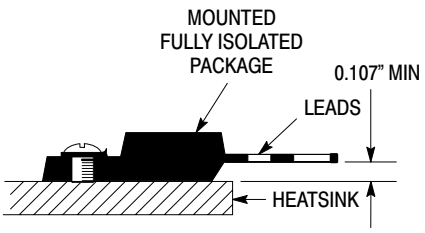


Figure 6. Screw Mounting Position for Isolation Test Number 3

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

MOUNTING INFORMATION

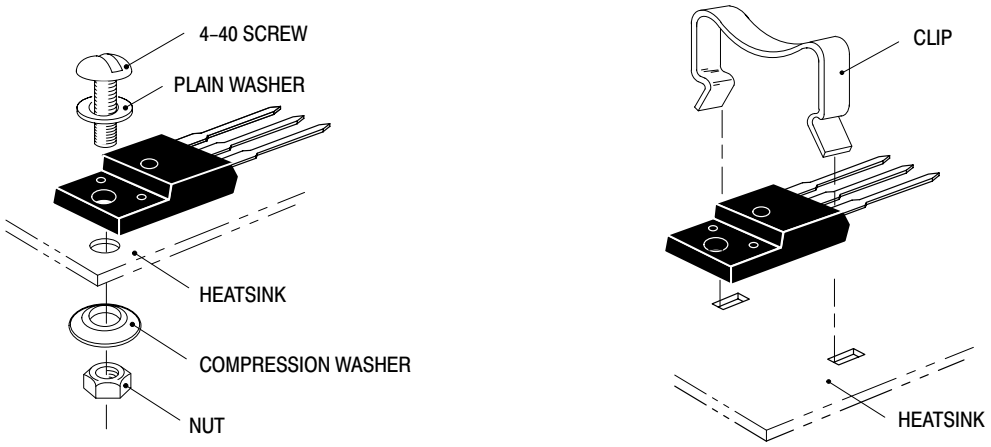


Figure 7. Typical Mounting Techniques*

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

CASE 221D–02
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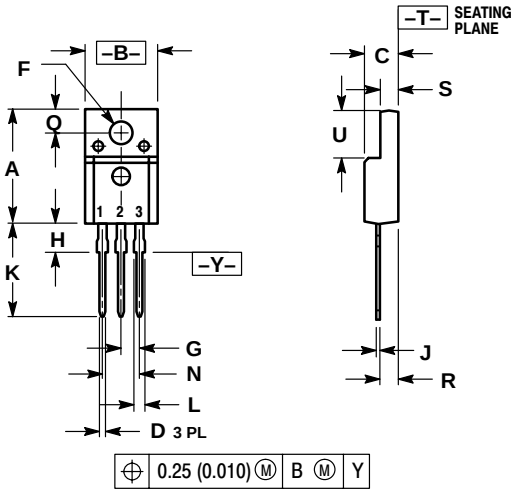
ISSUE D



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.621	0.629	15.78	15.97
B	0.394	0.402	10.01	10.21
C	0.181	0.189	4.60	4.80
D	0.026	0.034	0.67	0.86
F	0.121	0.129	3.08	3.27
G	0.100 BSC		2.54 BSC	
H	0.123	0.129	3.13	3.27
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.14	1.52
N	0.200 BSC		5.08 BSC	
Q	0.126	0.134	3.21	3.40
R	0.107	0.111	2.72	2.81
S	0.096	0.104	2.44	2.64
U	0.259	0.267	6.58	6.78

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

Notes

Notes

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