Complementary Power Darlingtons

For Isolated Package Applications

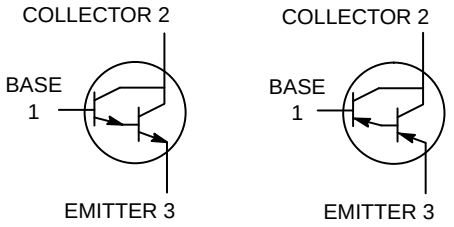
MJF6388 (NPN), MJF6668 (PNP)

Designed for general−purpose amplifiers and switching applications, where the mounting surface of the device is required to be electrically isolated from the heatsink or chassis.

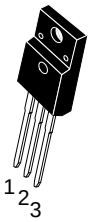
Features

- Isolated Overmold Package
- Electrically Similar to the Popular 2N6388, 2N6668, TIP102, and TIP107
- No Isolating Washers Required, Reduced System Cost
- High DC Current Gain
- High Isolation Voltage
- UL Recognized at 3500 VRMS: File #E69369
- These Devices are Pb−Free and are RoHS Compliant*

COMPLEMENTARY SILICON POWER DARLINGTONS 10 AMPERES 100 VOLTS, 40 WATTS

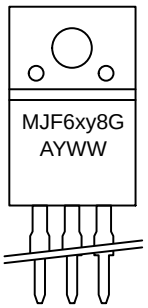


MJF6388 (NPN) **MJF6668 (PNP)**



TO−220 FULLPACK
CASE 221D
STYLE 2
UL RECOGNIZED

MARKING DIAGRAM



MJF6xy8 = Specific Device Code
x = 3 or 6
y = 6 or 8
G = Pb−Free Package
A = Assembly Location
Y = Year
WW = Work Week

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector−Emitter Voltage	V_{CEO}	100	Vdc
Collector−Base Voltage	V_{CB}	100	Vdc
Emitter−Base Voltage	V_{EB}	5.0	Vdc
RMS Isolation Voltage (Note 1) (t = 0.3 sec, R.H. 30%, T_A = 25 C) Per Figure 14	V_{ISOL}	4500	V
Collector Current − Continuous	I_C	10	Adc
Collector Current − Peak (Note 2)	I_{CM}	15	Adc
Base Current − Continuous	I_B	1.0	Adc
Total Power Dissipation (Note 3) @ T_C = 25 C Derate above 25 C	P_D	40 0.31	W W/ C
Total Power Dissipation @ T_A = 25 C Derate above 25 C	P_D	2.0 0.016	W W/ C
Operating and Storage Temperature Range	T_J, T_{stg}	−65 to +150	C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Proper strike and creepage distance must be provided.
2. Pulse Test: Pulse Width = 5.0 ms, Duty Cycle 10%.
3. 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.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction−to−Case (Note 4)	$R_{\theta JC}$	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

4. 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.

ORDERING INFORMATION

Device	Package	Shipping
MJF6388G	TO−220 FULLPACK (Pb−Free)	50 Units/Rail
MJF6668G	TO−220 FULLPACK (Pb−Free)	50 Units/Rail

*For additional information on our Pb−Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

ELECTRICAL CHARACTERISTICS (T_C = 25 C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector−Emitter Sustaining Voltage (Note 5) (I_C = 30 mAdc, I_B = 0)	$V_{CEO(sus)}$	100	–	Vdc
Collector Cutoff Current (V_{CE} = 80 Vdc, I_B = 0)	I_{CEO}	–	10	μAdc
Collector Cutoff Current (V_{CE} = 100 Vdc, $V_{EB(off)}$ = 1.5 Vdc) (V_{CE} = 100 Vdc, $V_{EB(off)}$ = 1.5 Vdc, T_C = 125 C)	I_{CEX}	– –	10 3.0	μAdc mAdc
Collector Cutoff Current (V_{CB}				

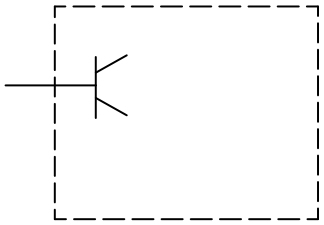


Figure 2. Switching Times Test Circuit

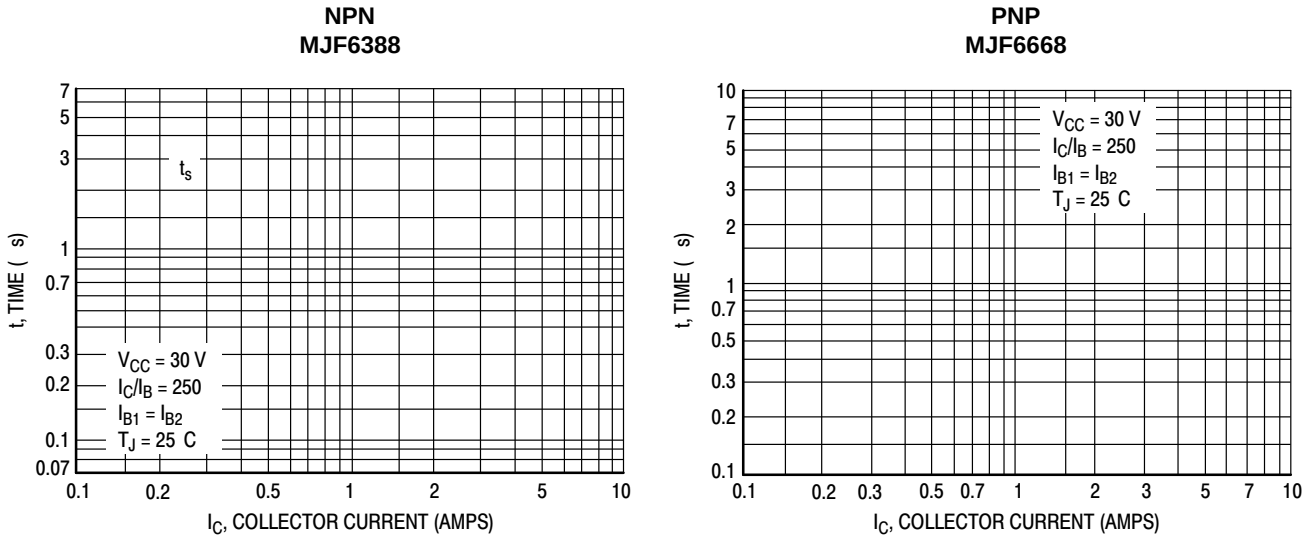


Figure 3. Typical Switching Times

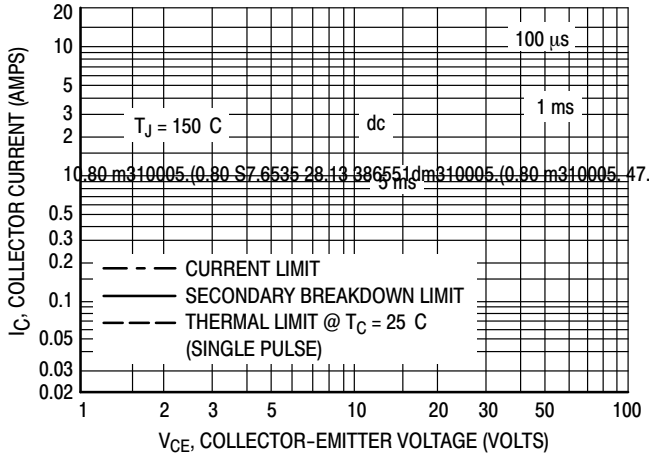
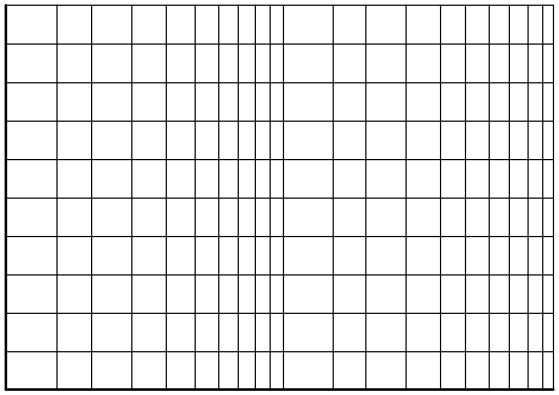


Figure 4. Maximum Forward Bias Safe Operating Area

NPN
MJF6388



PNP
MJF6668

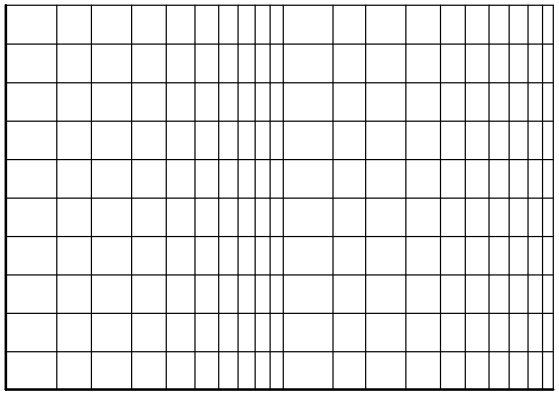
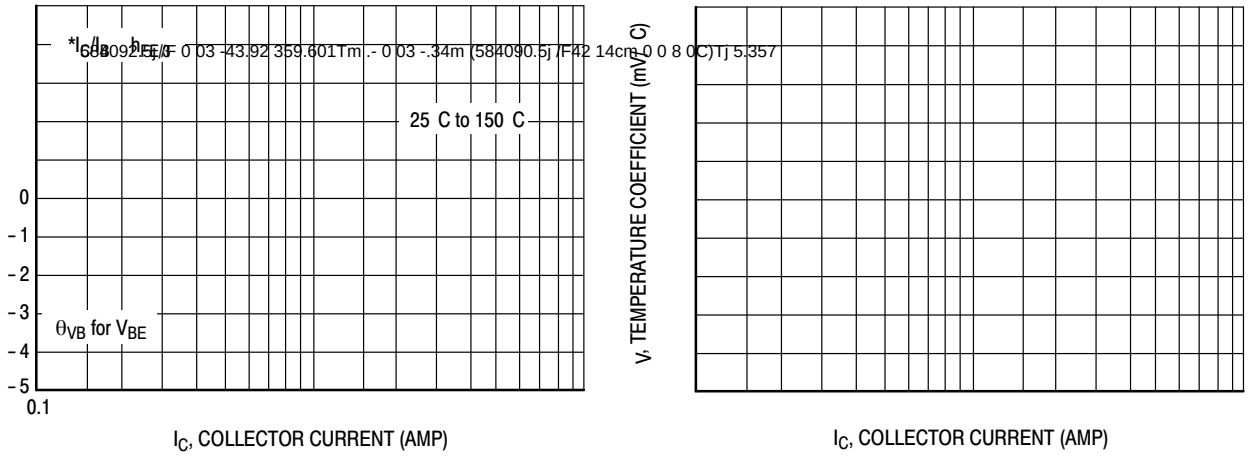
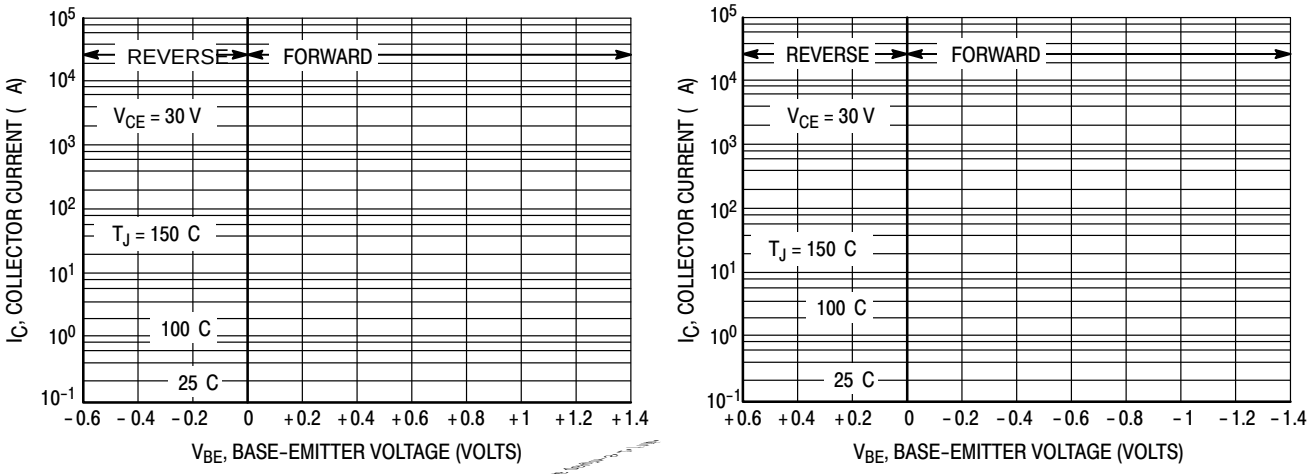


Figure 11. Typical “On” Voltages5 515.22d07 1. Tm4 cm 0 0 m61.625 0 lSQ 548 cm 0 0/T1





TEST CONDITION FOR ISOLATION TEST*

FULLY ISOLATED PACKAGE

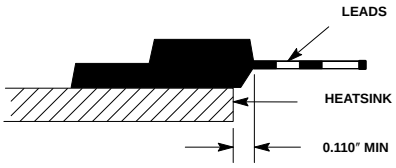


Figure 14. Mounting Position

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

4−40 SCREW

CLIP

PLAIN WASHER

HEATSINK

COMPRESSION WASHER

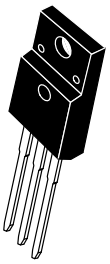
NUT

HEATSINK

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.

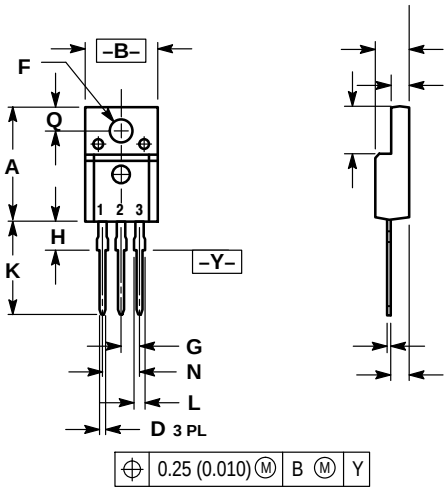
Destructive laboratory tests show that using a hex head 4−40 screw, without washers, and applying a torque in excess of 20 in · lbs will cause the plastic to crack around the mounting hole, resulting in a loss of isolation capability.

Additional tests on slotted 4−40 screws indicate that the screw slot fails between 15 to 20 in · lbs without adversely affecting the package.



TO−220 FULLPAK
CASE 221D−03
ISSUE K

DATE 27 FEB 2009



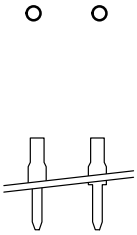
DIM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	0.617	0.635	15.67	16.12
B	0.392	0.419	9.96	10.63
C	0.177	0.193	4.50	4.90
D	0.024	0.039	0.60	1.00
F	0.116	0.129	2.95	3.28
G	0.100 BSC		2.54 BSC	
H	0.118	0.135	3.00	3.43
C				

STYLE 1:
PIN 1. GATE
2. DRAIN
3. SOURCE

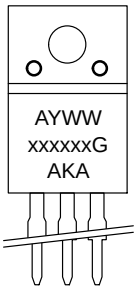
STYLE 2:
PIN 1. BASE
2. COLLECTOR
3. EMITTER

STYLE 3:
PIN 1. ANODE
2. CATHODE
3. ANODE

STYLE 4:
PIN 1. CATHODE
2. ANODE
3. CATHODE



Bipolar



Rectifier

A	= Assembly Location
Y	= Year
WW	= Work Week
xxxxxx	= Device Code
G	= Pb−Free Package
AKA	= Polarity Designator

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DESCRIPTION:	**TO−220 FULLPAK**		**PAGE 1 OF 1**