Continental Device India Pvt. Limited

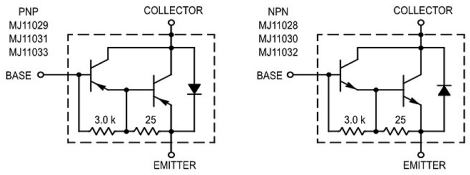
An IATF 16949, ISO9001 and ISO 14001 Certified Company

High Current Complimentary Darlington Silicon Power Transistors

50 AMPERES, 60~120 VOLTS,300 WATTS

TO-3

MJ11028



NPN	PNP
MJ11028	MJ11029
MJ11030	MJ11031
MJ11032	MJ11033

TO-3
Metal Can Package
RoHS compliant

FEATURES:

1. High DC Current Gain-h_{FE} = 1000 (Min) @ I_C = 25 Adc
   h_{FE} = 400 (Min) @ I_C= 50 Adc
2. Curves to 100 A (Pulsed)
3. Diode Protection to Rated I_C
4. Monolithic Construction with Built–In Base–Emitter Shunt Resistor
5. Junction Temperature to +200º C

APPLICATIONS: For use as output devices in complementary general purpose amplifier applications.

ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Rating	Symbol	MJ11028 MJ11029	MJ11030 MJ11031	MJ11032 MJ11033	Unit
Collector–Emitter Voltage	V_{CEO}	60	90	120	Vdc
Collector–Base Voltage	V_{CB}	60	90	120	Vdc
Emitter–Base Voltage	V_{EB}	5			Vdc
Collector Current — Continuous Peak	I_C I_{CM}	50 100			Adc
Base Current — Continuous	I_B	2			Adc
Total Power Dissipation @ T_C = 25°C Derate above 25°C @ T_C = 100°C	P_D	300 1.71			Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−55 to +200			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Maximum Lead Temperature for Soldering Purposes for ≤ 10 seconds	T_L	275	°C
Thermal Resistance Junction to Case	R_{JC}	0.584	°C

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ELECTRICAL CHARACTERISTICS (T_A=25 ° C unless otherwise specified)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector–Emitter Breakdown Voltage (1) (I_C = 1 00 mAdc, I_B = 0)	MJ11028, MJ11029	$V_{(BR)CEO}$	60	—	Vdc
	MJ11030, MJ11031		90	—	
	MJ11032, MJ11033		120	—	
Collector–Emitter Leakage Current		I_{CER}			mAdc
(V_{CE} = 60 Vdc, R_{BE} = 1 k ohm)	MJ11028, MJ11029		—	2	
(V_{CE} = 90 Vdc, R_{BE} = 1 k ohm)	MJ11030, MJ11031		—	2	
(V_{CE} = 120 Vdc, R_{BE} = 1 k ohm)	MJ11032, MJ11033		—	2	
(V_{CE} = 60 Vdc, R_{BE} = 1 k ohm, T_C = 150°C)	MJ11028, MJ11029		—	10	
(V_{CE} = 90 Vdc, R_{BE} = 1 k ohm, T_C = 150°C)	MJ11030, MJ11031		—	10	
(V_{CE} = 120 Vdc, R_{BE} = 1 k ohm, T_C = 150°C)	MJ11032, MJ11033		—	10	
Emitter Cutoff Current (V_{BE} = 5 Vdc, I_C = 0)		I_{EBO}	—	5	mAdc
Collector–Emitter Leakage Current (V_{CE} = 50 Vdc, I_B = 0)		I_{CEO}	—	2	mAdc
ON CHARACTERISTICS (1)					
DC Current Gain		h_{FE}			—
(I_C = 25 Adc, V_{CE} = 5 Vdc)			1 k	18 k	
(I_C = 50 Adc, V_{CE} = 5 Vdc)			400	—	
Collector–Emitter Saturation Voltage		$V_{CE(sat)}$			Vdc
(I_C = 25 Adc, I_B = 250 mAdc)			—	2.5	
(I_C = 50 Adc, I_B = 500 mAdc)			—	3.5	
Base–Emitter Saturation Voltage		$V_{BE(sat)}$			Vdc
(I_C = 25 Adc, I_B = 200 mAdc)			—	3.0	
(I_C = 50 Adc, I_B = 300 mAdc)			—	4.5	

(1) Pulse Test: Pulse Width ≤ 300 s, Duty Cycle ≤ 2.0%.

TYPICAL CHARACTERISTICS CURVES

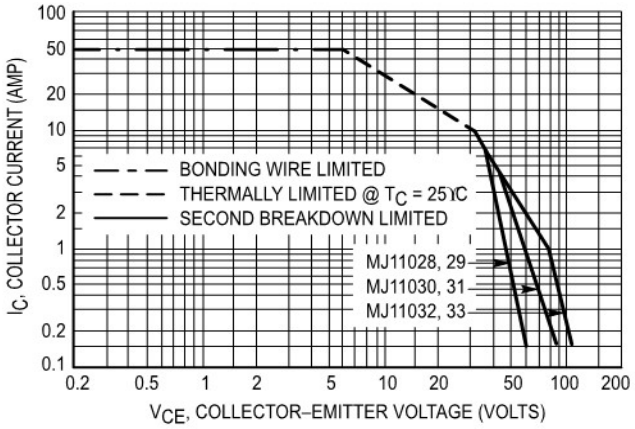


Figure 2. DC Safe Operating Area

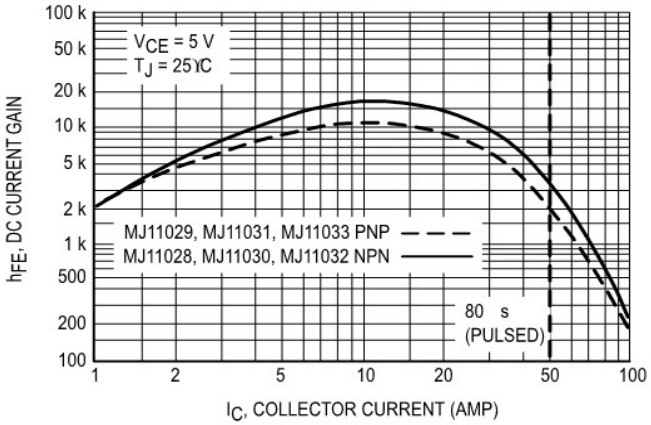


Figure 3. DC Current Gain

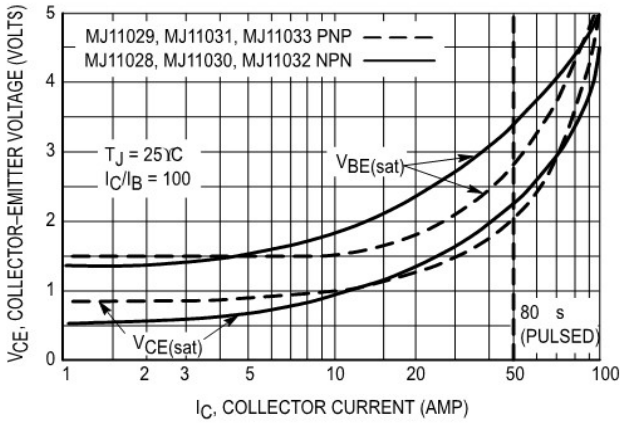
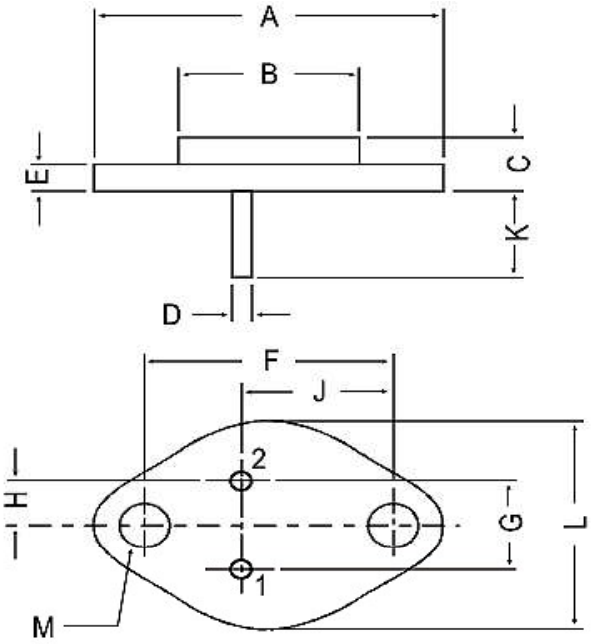


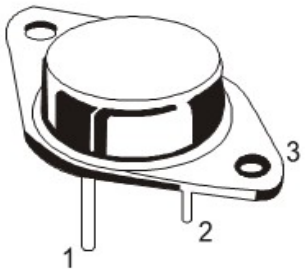
Figure 4. "On" Voltage

Package Details



All dimensions in mm.

DIM	MIN.	MAX.
A	—	39.37
B	—	22.22
C	6.35	8.50
D	0.96	1.09
E	—	1.77
F	29.90	30.40
G	10.69	11.18
H	5.20	5.72
J	16.64	17.15
K	11.15	12.25
L	—	26.67
M	3.84	4.19



PIN CONFIGURATION
1. BASE
2. EMITTER
3. COLLECTOR

Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-3	100 pcs/pkt	1.3 kg/100 pcs	12.5" x 8" x 1.8"	0.1K	17" x 11.5" x 21"	2K	27.5 kgs

Recommended Product Storage Environment for Discrete Semiconductor Devices

This storage environment assumes that the Diodes and transistors are packed properly inside the original packing supplied by CDIL.

- Temperature 5 °C to 30 °C
- Humidity between 40 to 70 %RH
- Air should be clean.
- Avoid harmful gas or dust.
- Avoid outdoor exposure or storage in areas subject to rain or water spraying .
- Avoid storage in areas subject to corrosive gas or dust. Product shall not be stored in areas exposed to direct sunlight.
- Avoid rapid change of temperature.
- Avoid condensation.
- Mechanical stress such as vibration and impact shall be avoided.
- The product shall not be placed directly on the floor.
- The product shall be stored on a plane area. They should not be turned upside down. They should not be placed against the wall.

Shelf Life of CDIL Products

The shelf life of products is the period from product manufacture to shipment to customers. The product can be unconditionally shipped within this period. The period is defined as 2 years.
If products are stored longer than the shelf life of 2 years the products shall be subjected to quality check as per CDIL quality procedure.
The products are further warranted for another one year after the date of shipment subject to the above conditions in CDIL original packing.

Floor Life of CDIL Products and MSL Level

When the products are opened from the original packing, the floor life will start.
For this, the following JEDEC table may be referred:

JEDEC MSL Level		
Level	**Time**	**Condition**
1	Unlimited	≤30 °C / 85% RH
2	1 Year	≤30 °C / 60% RH
2a	4 Weeks	≤30 °C / 60% RH
3	168 Hours	≤30 °C / 60% RH
4	72 Hours	≤30 °C / 60% RH
5	48 Hours	≤30 °C / 60% RH
5a	24 Hours	≤30 °C / 60% RH
6	Time on Label(TOL)	≤30 °C / 60% RH

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Customer Notes

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

The product information and the selection guides facilitate selection of the CDIL's Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review our Data Sheet(s) so as to confirm that the Device(s) meet functionality parameters for your application. The information furnished in the Data Sheet and on the CDIL Web Site/CD are believed to be accurate and reliable. CDIL however, does not assume responsibility for inaccuracies or incomplete information. Furthermore, CDIL does not assume liability whatsoever, arising out of the application or use of any CDIL product; neither does it convey any license under its patent rights nor rights of others. These products are not designed for use in life saving/support appliances or systems. CDIL customers selling these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and CDIL will not be responsible for any damages resulting from such sale(s).
CDIL strives for continuous improvement and reserves the right to change the specifications of its products without prior notice.

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