

## 4Q TRIAC

**BT139-800E**



TO-220

**TO-220 Leaded  
Plastic Package  
RoHS compliant**

### FEATURE:

1. Direct triggering from low power drivers and logic ICs
2. High blocking voltage capability
3. Planar passivated for voltage ruggedness and reliability
4. Sensitive gate
5. Triggering in all four quadrants

### APPLICATIONS:

1. General purpose phase control
2. General purpose switching

### ABSOLUTE MAXIMUM RATINGS (Ta = 25 °C Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	VALUE	UNIT
Peak repetitive off-stage voltage	$V_{DRM}, V_{RRM}$		800	V
On-state RMS current	$I_{T(RMS)}$	$T_L < 66$	16	A
NON repetitive surge peak on-state	$I_{TSM}$	$T_p = 20ms, T_j = 25\text{ °C}$	140	A
Critical rate of rise on-state current	$di/dt (Q_{1-3})$	$I_{TM} = 20A, T_G = 0.2A$	50	A/ $\mu s$
Peak gate current	$I_{GM}$		2	A
Average gate power dissipation	$P_{G(AV)}$		0.5	W
Storage temperature range	$T_{stg}$		-40 to +150	°C
Operating junction temperature range	$T_j$		-40 to +125	°C



Continental Device India Pvt. Limited  
An IATF 16949, ISO9001 and ISO 14001 Certified Company



**ELECTRICAL CHARACTERISTICS at** ( $T_a = 25\text{ }^\circ\text{C}$  Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	VALUE	UNIT
Gate trigger current	$I_{GT}$	$V_D=12V, T2+G+$	10	mA
		$I_T=0.1A, T2+G-$	10	mA
		T2-G-	10	mA
		T2-G+	25	mA
Gate trigger voltage	$V_{GT}$	$V_D=12V, I_T=0.1A$	1.5	V
Hold current	$I_H$	$V_D=12V, I_T=0.1A$	60	mA
Critical rate of rise off-state voltage	$dV/dt$	$V_D=67\%V_{DRM}$	50	V/ $\mu$ s
On-state voltage	$V_{TM}$	$I_T=20A$	1.6	V
Off-state leakage current	$I_{DRM}$	$V_D = V_{DRM(max)}; T_j = 125\text{ }^\circ\text{C}$	0.5	mA
Thermal resistance	$R_{th(j-c)}$		1.7	$^\circ\text{C/W}$
	$R_{th(j-a)}$		60	

### TYPICAL CHERESTERISTIC CURVES

Fig 1: RMS on-state current as a function of mounting base temperature; maximum values

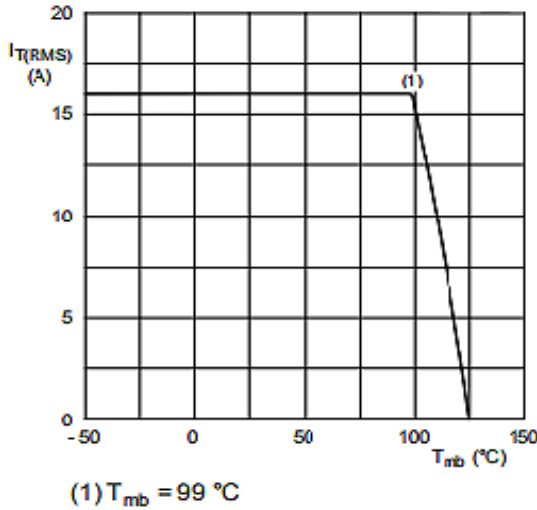


Fig 2: RMS on-state current as a function of surge duration; maximum values

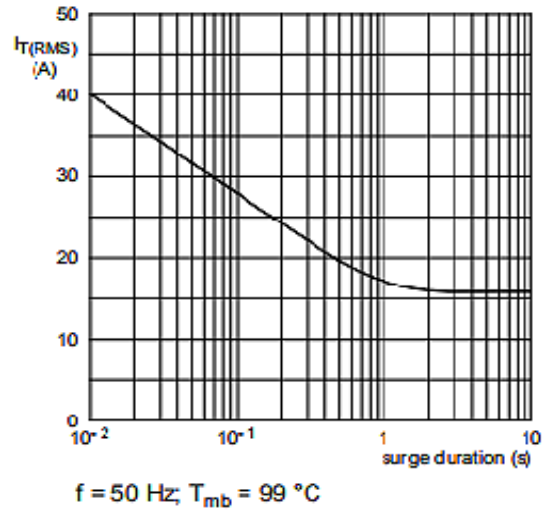
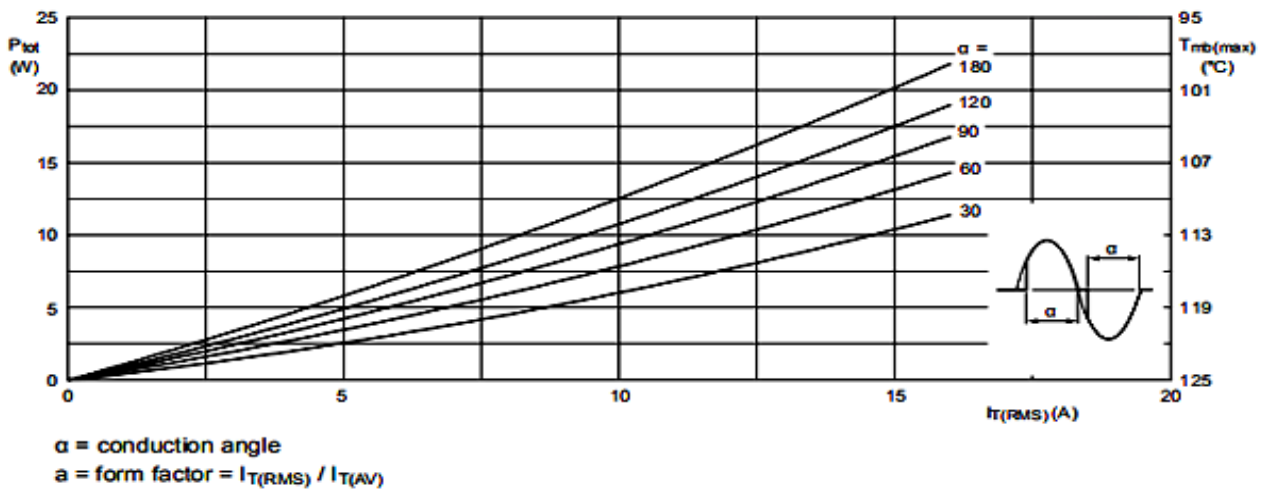


Fig 3: Total power dissipation as a function of RMS on-state current; maximum values



## TYPICAL CHERESTERISTIC CURVES

Fig 4: Non-repetitive peak on-state current as a function of the number of sinusoidal current cycles; maximum values

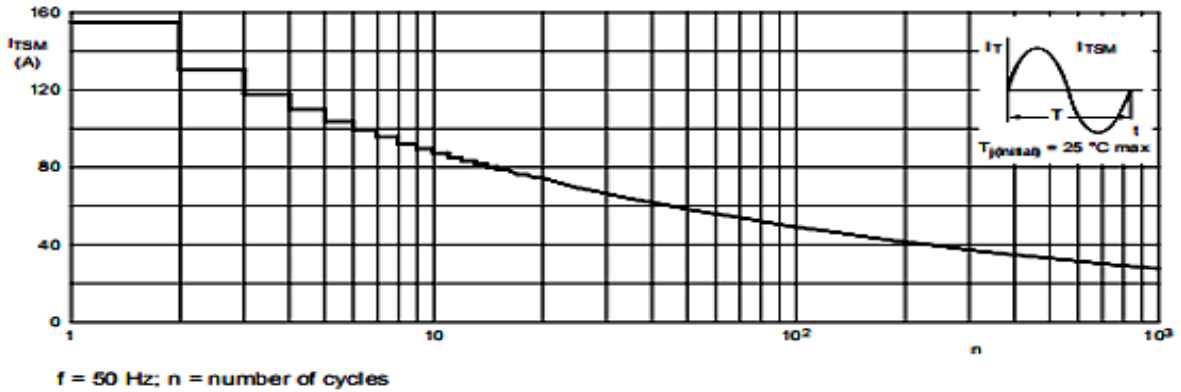


Fig 5: Non-repetitive peak on-state current as a function of pulse width; maximum values

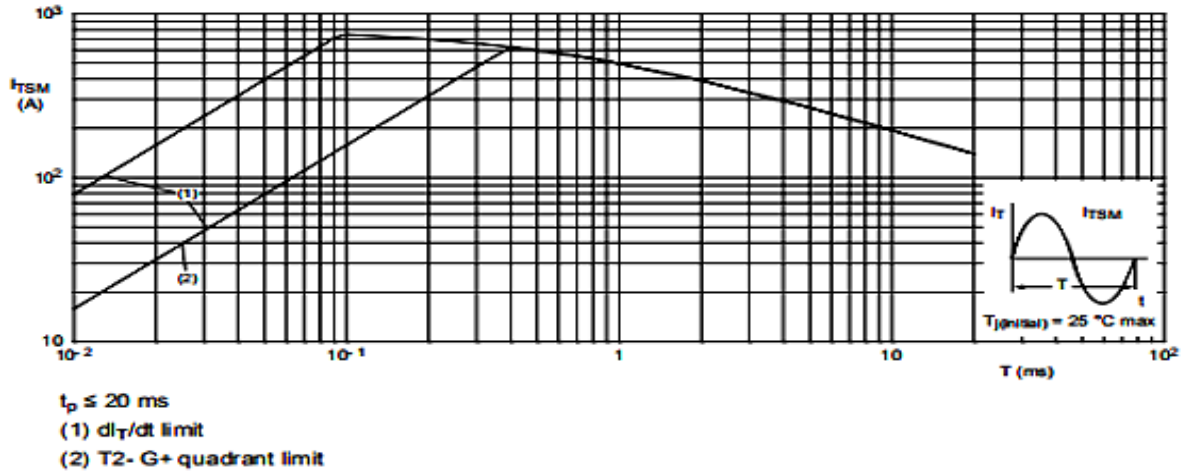
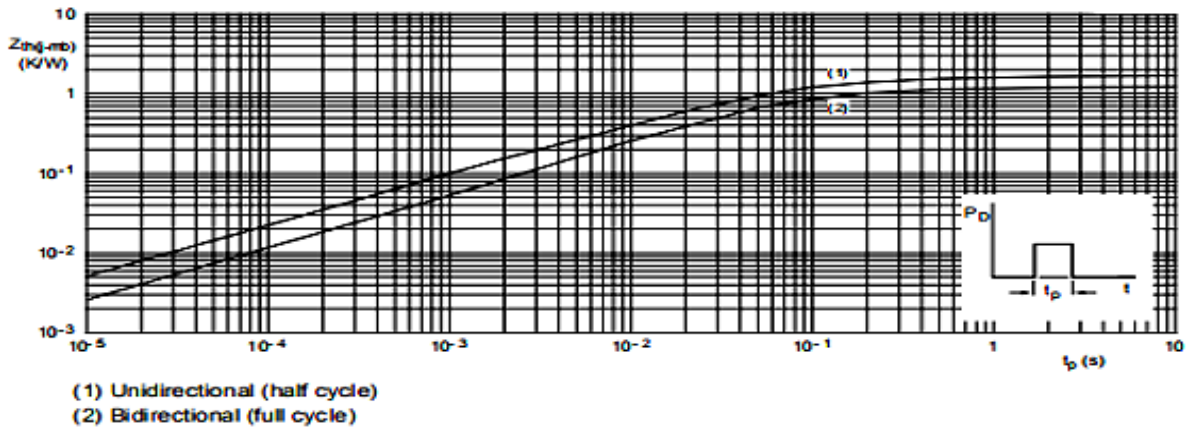


Fig 6: Transient thermal impedance from junction to mounting base as a function of pulse width



### TYPICAL CHARACTERISTIC CURVES

Fig 7: Normalized gate trigger current as a function of junction temperature

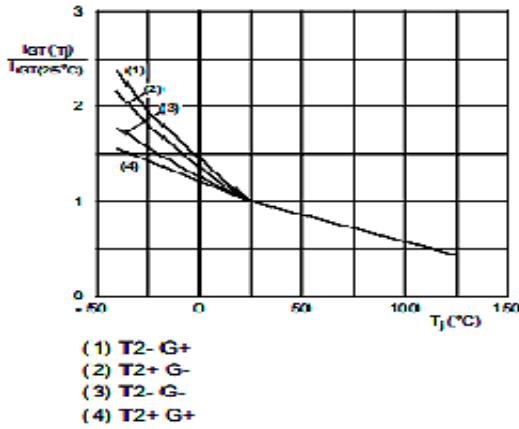


Fig 8: Normalized latching current as a function of junction temperature

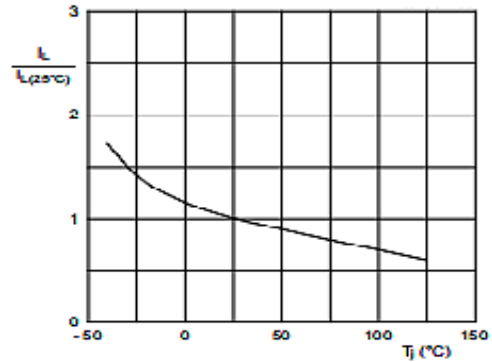


Fig 9: Normalized holding current as a function of junction temperature

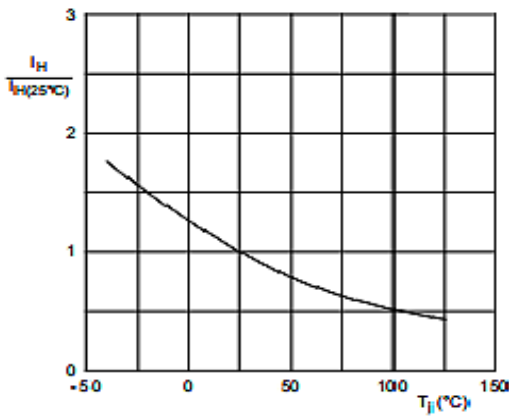
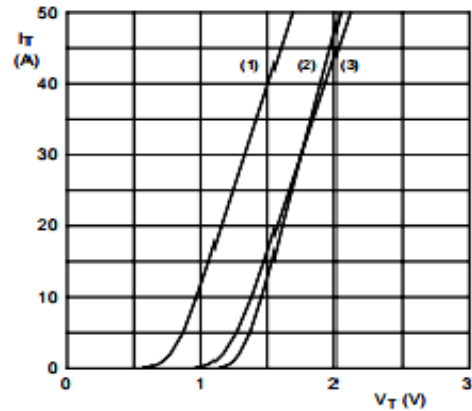


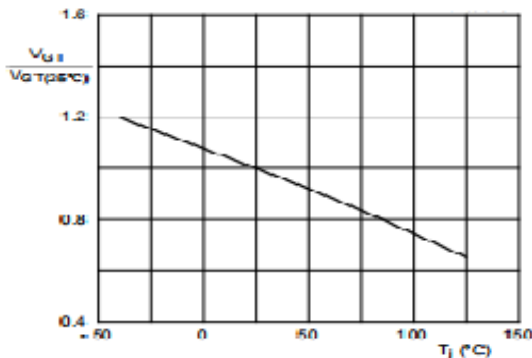
Fig 10: On-state current as a function of on-state voltage



$V_o = 1.195 \text{ V}; R_o = 0.018 \Omega$

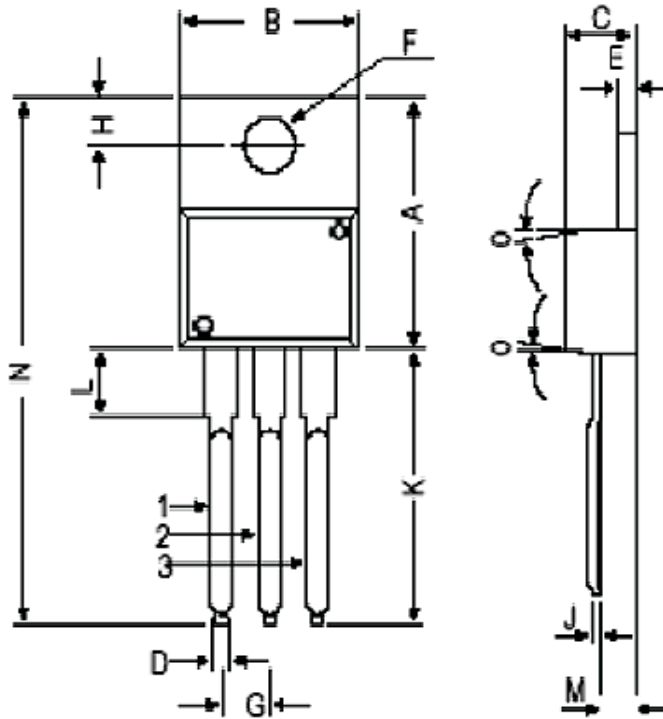
- (1)  $T_j = 125^\circ\text{C}$ ; typical values
- (2)  $T_j = 125^\circ\text{C}$ ; maximum values
- (3)  $T_j = 25^\circ\text{C}$ ; maximum values

Fig 11: Normalized gate trigger voltage as a function of junction temperature



## PACKAGE DETAILS

### TO-220 Leaded Plastic Package

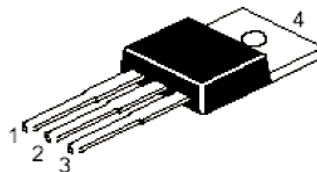


DIM	MIN	MAX
A	14.42	16.51
B	9.63	10.67
C	3.56	4.83
D	--	0.90
E	1.15	1.50
F	3.53	4.10
G	2.29	2.79
H	2.54	3.43
J	0.36	0.61
K	12.70	14.73
L	2.80	6.35
M	2.00	2.92
N	--	31.24
O	7 DEG	

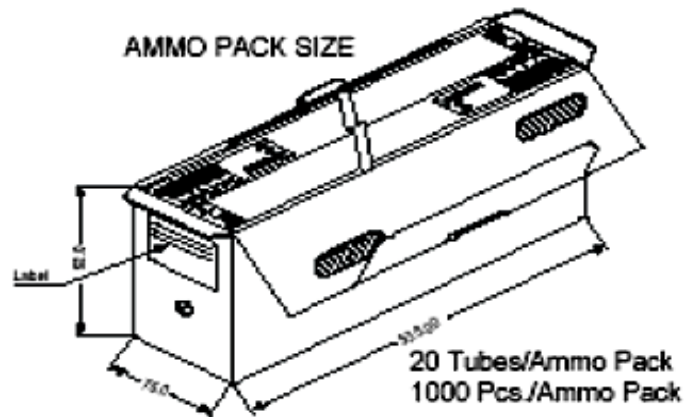
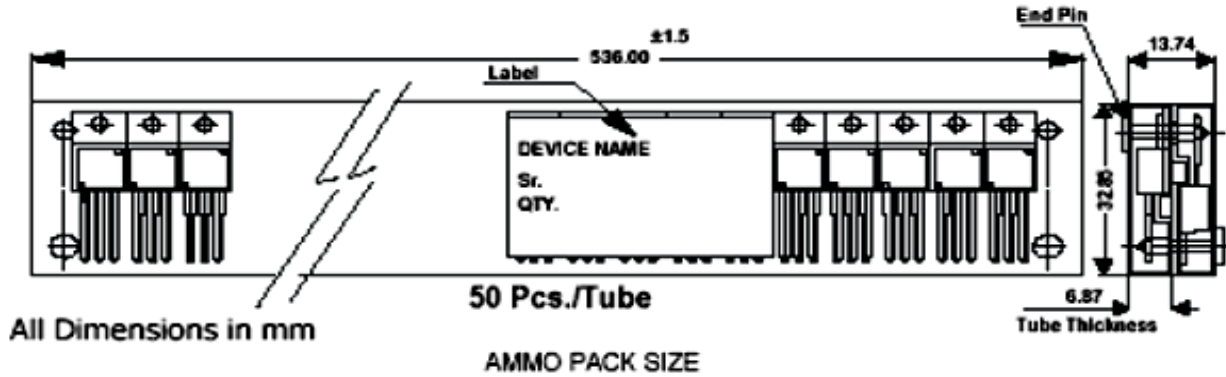
All dimension are in mm

### PIN CONFIGURATION

1. MAIN TERMINAL 1
2. 4. MAIN TERMINAL 2
3. GATE



### TO-220 TUBE PACKING



### Packing Detail

PACKAGE	STANDARD PACK		INNER CARTON BOX		OUTER CARTON BOX		
	Details	Net Weight/Qty	Size	Qty	Size	Qty	Gr Wt
TO-220	200 pcs/polybag	396 gm/200 pcs	3' x 7.5" x 7.5"	1.0K	17' x 15' x 13.5"	16.0K	36 kgs
	50 pcs/tube	120 gm/50 pcs	3.5' x 3.7' x 21.5"	1.0K	19' x 19' x 19"	10.0K	29 kgs



Continental Device India Pvt. Limited  
 An IATF 16949, ISO9001 and ISO 14001 Certified Company



## 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





Continental Device India Pvt. Limited

An IATF 16949, ISO9001 and ISO 14001 Certified Company



## 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.



CDIL is a registered trademark of

**Continental Device India Pvt. Limited**

C-120 Naraina Industrial Area, New Delhi 110 028, India.

Telephone +91-11-2579 6150, 4141 1112 Fax +91-11-2579 5290, 4141 1119

email@cdil.com www.cdil.com

CIN No. U32109DL1964PTC004291