

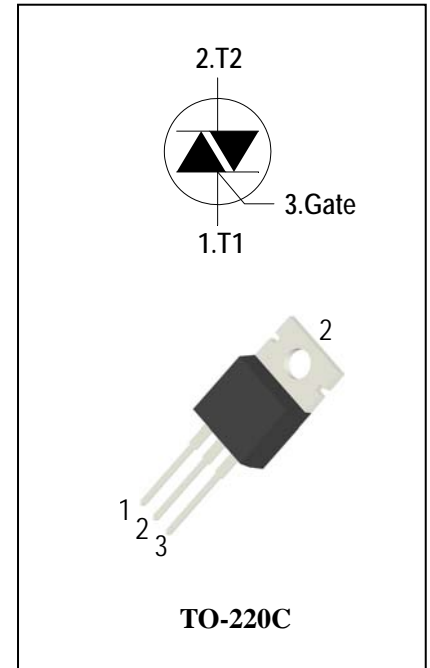
### 4Quadrants Triacs

#### General Description

High current density due to mesa technology .the BT139 triac series is suitable for general purpose AC switching. They can be used as an ON/OFF function in applications such as static relays, heating regulation, Rectifier-fed DC inductive loads e.g.DC motors and solenoids , motor speed controllers.

#### Features

- ◆ Repetitive Peak Off-State Voltage: 600Vand800V
- ◆ R.M.S On-State Current (  $I_{T(RMS)} = 16A$  )
- ◆ These Devices are Pb-Free and are RoHS Compliant



#### Absolute Maximum Ratings

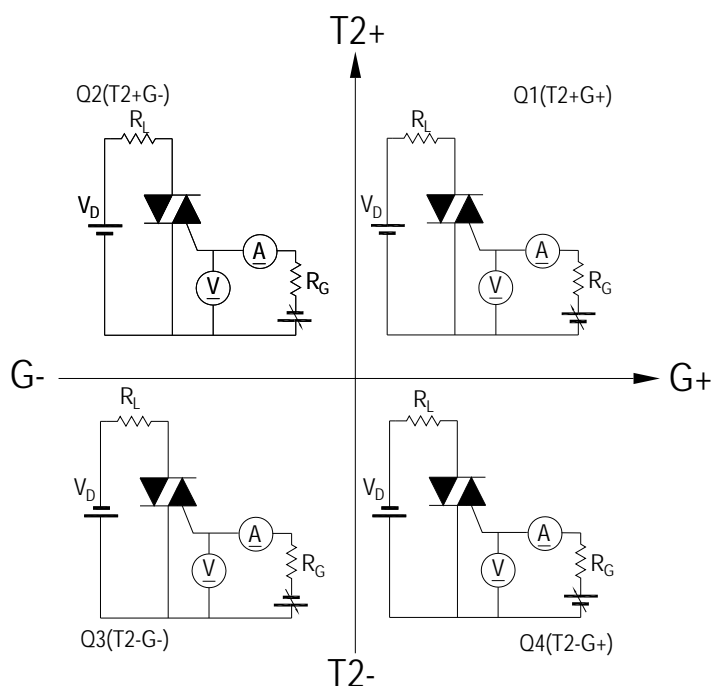
Symbol	Items	Conditions		Ratings	Unit
$V_{DRM}$ $V_{RRM}$	Repetitive Peak Off-State Voltage	$T_j = 25^{\circ}C$	BT139-600	600	V
			BT139-800	800	V
$I_{T(RMS)}$	R.M.S On-State Current	$T_C = 105^{\circ}C$		16	A
$I_{TSM}$	Surge On-State Current	$t_p=20ms(50Hz)/t_p=16.7ms(60Hz)$		160/168	A
$I^2t$	$I^2t$ for fusing	$t_p=10ms$		144	$A^2s$
$di/dt$	Critical rate of rise of on-state current	$F = 120\text{ Hz}$ $T_j = 125^{\circ}C$	Q1-Q2-Q3	50	$A/\mu s$
		$I_G = 2 \times I_{GT}$ , $t_r \leq 100\text{ ns}$	Q4	10	
$I_{GM}$	Peak Gate Current	$t_p = 20\text{ }\mu s$ $T_j = 125^{\circ}C$		2	A
$P_{G(AV)}$	Average Gate Power Dissipation( $T_j=125^{\circ}C$ )			0.5	W
$P_{GM}$	Peak Gate Power Dissipation( $t_p=20\mu s, T_j=125^{\circ}C$ )			5	W
$T_j$	Operating Junction Temperature			- 40 ~ 125	$^{\circ}C$
$T_{STG}$	Storage Temperature			- 40 ~ 150	$^{\circ}C$



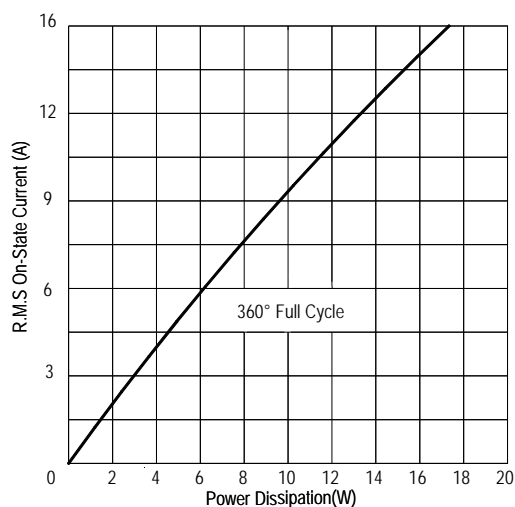
## Electrical Characteristics ( $T_j = 25^\circ\text{C}$ unless otherwise specified )

Symbol	Items		Conditions		BT139-600/800				Unit
					E	F	Blank	G	
$I_{\text{DRM}}$	Peak Forward Reverse Blocking Current		$V_{\text{DRM}} = V_{\text{RRM}}, T_{\text{j}} = 25^{\circ}\text{C}$	Max.	5				$\mu\text{A}$
$I_{\text{RRM}}$			$V_{\text{DRM}} = V_{\text{RRM}}, T_{\text{j}} = 125^{\circ}\text{C}$		1				$\text{mA}$
$V_{\text{TM}}$	Peak On-State Voltage		$I_{\text{TM}} = 17\text{A}, t_{\text{p}} = 380\text{ }\mu\text{s}$	Max.	1.55				$\text{V}$
$V_{\text{GD}}$	Q1-Q2-Q3-Q4	Non – Trigger Gate Voltage	$V_{\text{D}} = V_{\text{DRM}} \quad R_{\text{L}} = 3.3\text{ k}\Omega$ $T_{\text{j}} = 125^{\circ}\text{C}$	Min.	0.2				$\text{V}$
$V_{\text{GT}}$	Q1-Q2-Q3-Q4	GateTrigger Voltage	$V_{\text{D}} = 12\text{V} \quad , \quad R_{\text{L}} = 33\Omega$	Max.	1.3				$\text{V}$
$I_{\text{GT}}$	Q1-Q2-Q3	GateTrigger Current		Max.	10	25	35	50	$\text{mA}$
	Q4				25	70	70	100	
$I_{\text{H}}$	Q1-Q2-Q3-Q4	Holding Current	$I_{\text{T}} = 0.1\text{A}$	Max.	25	45	45	60	$\text{mA}$
$I_{\text{L}}$	Q1-Q3-Q4	Latching Current	$I_{\text{G}} = 1.2 I_{\text{GT}}$	Max.	30	40	40	60	$\text{mA}$
	Q2				40	60	60	90	
$dV/dt$	Critical Rate of Rise of Off-State Voltage		$V_{\text{D}} = 2/3V_{\text{DRM}} \quad \text{gate open}$ $T_{\text{j}} = 125^{\circ}\text{C}$	Min.	20	200	200	400	$\text{V}/\mu\text{s}$
$(dV/dt)_c$	Rate of Change of Commutating Current,		$(dI/dt)_c = -5.3\text{A/ms}$ $T_{\text{j}} = 125^{\circ}\text{C}$	Min.	2	5	5	10	$\text{V}/\mu\text{s}$
$R_{\text{th(j-c)}}$	Junction to case (AC)			Max.	1.4				$^{\circ}\text{C/W}$
$R_{\text{th(i-a)}}$	Junction to ambient			Max.	60				$^{\circ}\text{C/W}$

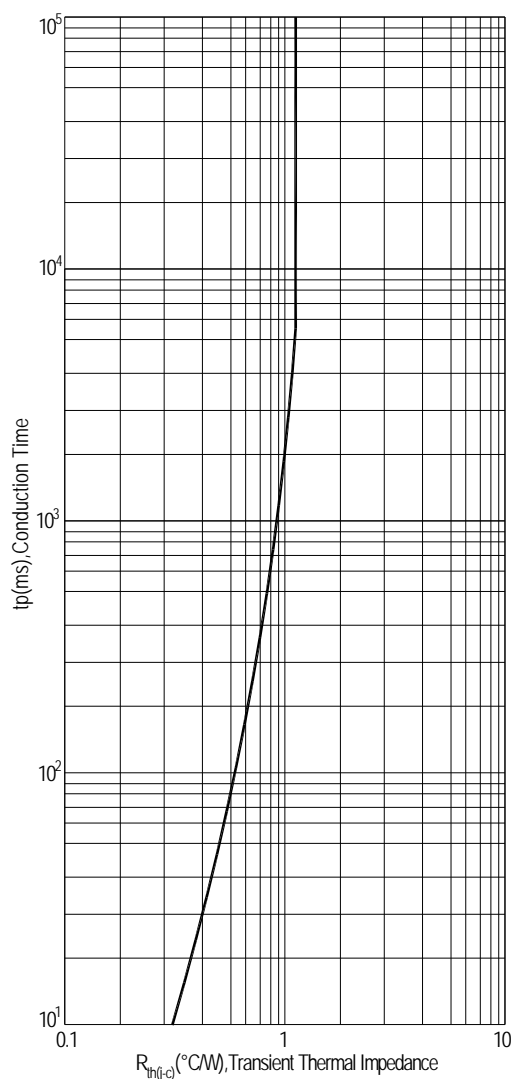
FIG.1: Triac quadrant are defined and the gate trigger test circuit



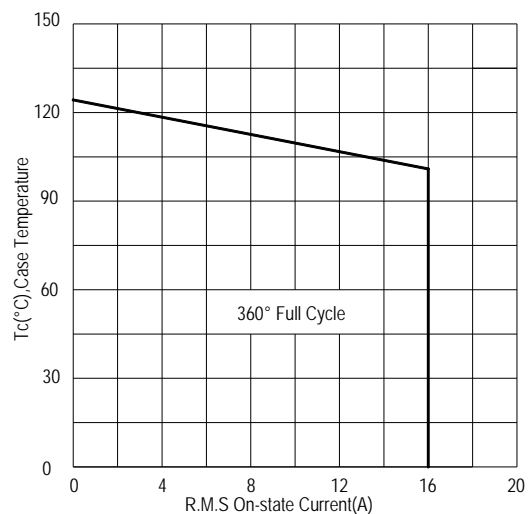
**FIG.2: Maximum on-state power dissipation**



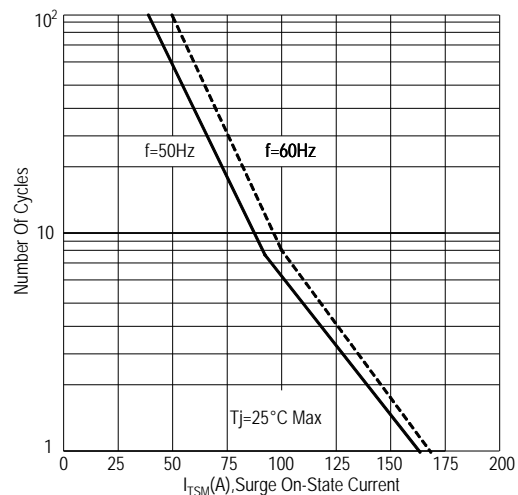
**FIG.4: Maximum transient thermal impedance**



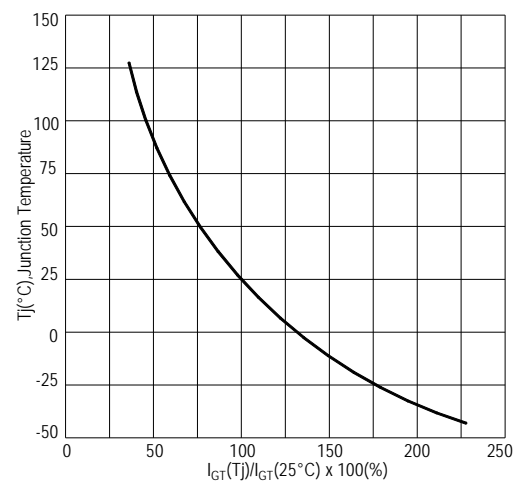
**FIG.3: Typical RMS on-state current VS Allowable case Temperature**



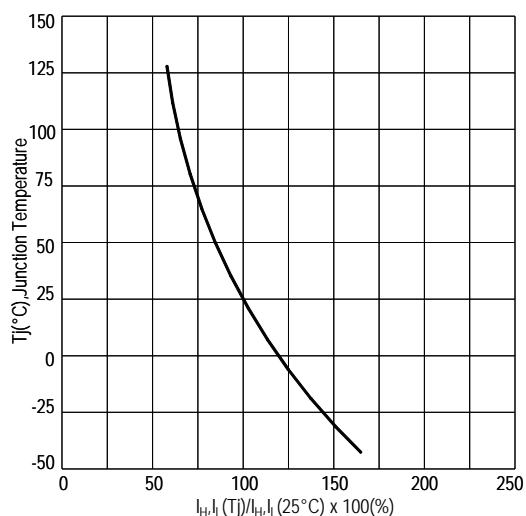
**FIG.5: Rated surge on-state current ( Non-Repetitive)**



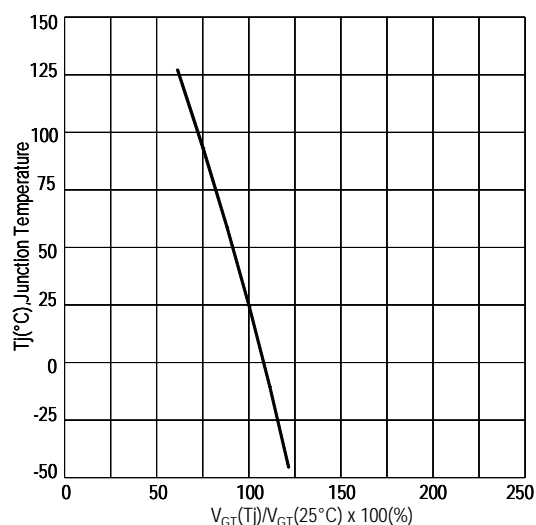
**FIG.6: Gate trigger current VS Junction temperature**



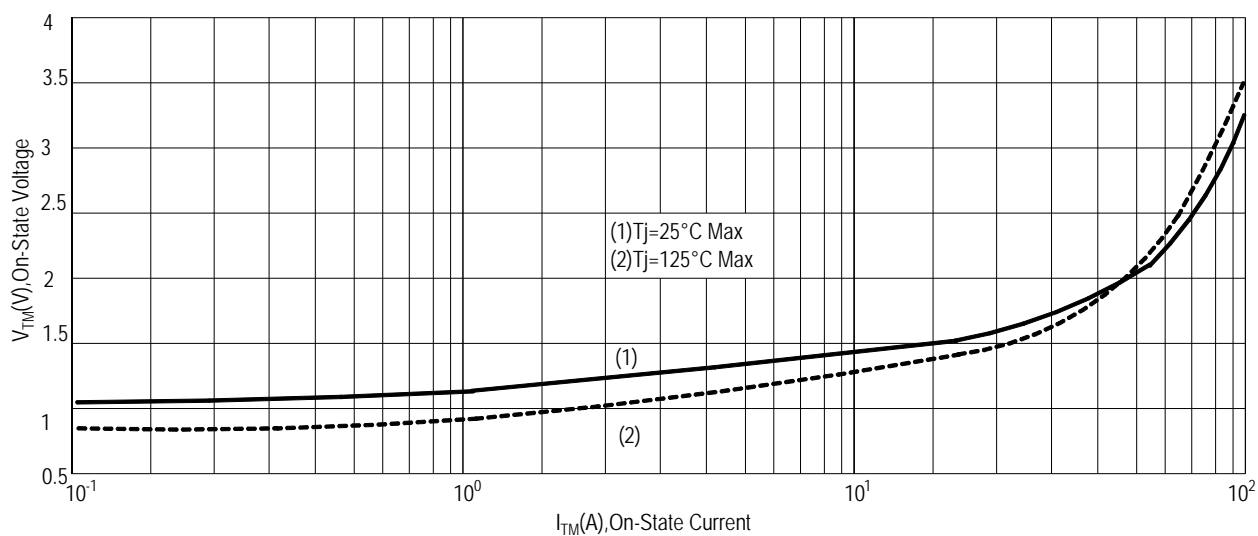
**FIG.7: Holding current and Latching current VS Junction temperature**



**FIG.8: Gate trigger voltage VS Junction temperature**

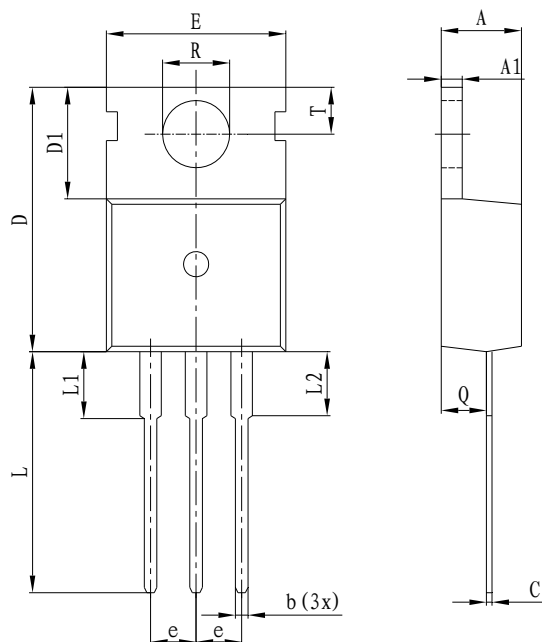


**FIG.9: On-state characteristics(Max)**



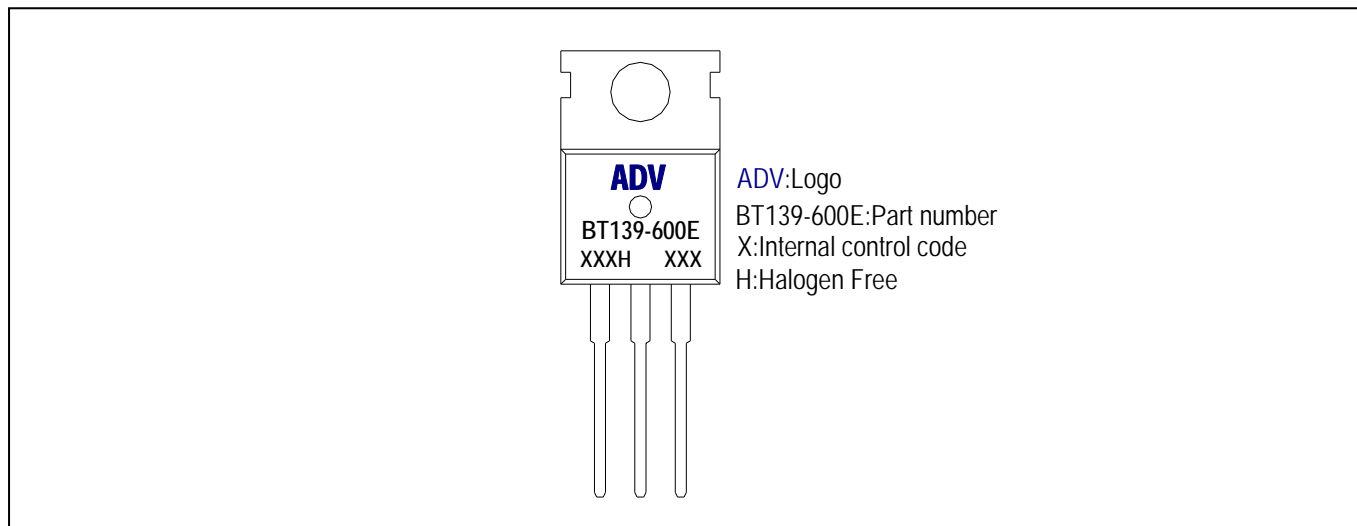
### PACKAGE MECHANICAL DATA

#### TO-220C Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
e	2.54 TYP		0.099TYP	
A	4.10	4.70	0.161	0.185
A1	1.25	1.40	0.049	0.055
b	0.60	0.90	0.023	0.035
C	0.40	0.70	0.016	0.027
D	15.20	16.00	0.598	0.630
D1	5.90	6.60	0.232	0.259
E	9.70	10.30	0.382	0.405
L	12.80	15.00	0.504	0.590
L1	2.79	3.30	0.110	0.130
R	3.50	3.80	0.138	0.149
T	2.70	3.00	0.106	0.118
Q	2.20	2.60	0.086	0.102
L2		3.00		0.118

### Making Diagram



### Ordering information

Part number	Package	Marking	Packing	Quantity
BT139-600#	TO-220C	BT139-600#	Tube	50pcs
BT139-800#	TO-220C	BT139-800#	Tube	50pcs

Note:# = Gate Trigger Current Sensitivity and type

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