

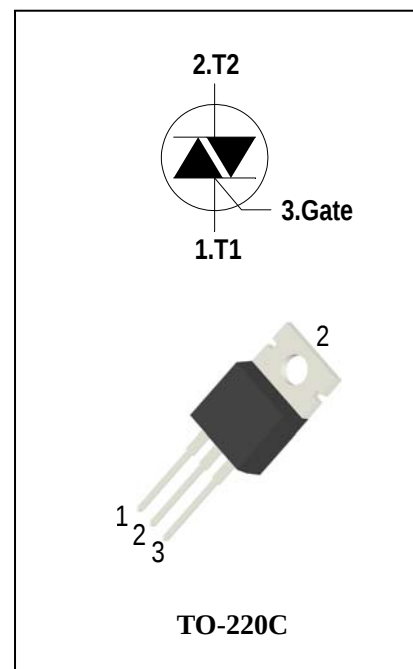
4Quadrants Triacs

General Description

High current density due to mesa technology .the BT138 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 ($I_{T(RMS)} = 12A$)
- ◆ 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	$T_j = 25^{\circ}C$	BT138-600	600	V
			BT138-800	800	V
$I_{T(RMS)}$	R.M.S On-State Current	$T_C = 105^{\circ}C$		12	A
I_{TSM}	Surge On-State Current	$t_p=20ms(50Hz)/t_p=16.7ms(60Hz)$		120/126	A
I^2t	I^2t for fusing	$t_p=10ms$		78	A^2s
di/dt	Critical rate of rise of on-state current	$F = 120\text{ Hz}$ $T_j = 125^{\circ}C$ $I_G = 2 \times I_{GT}$, $t_r \leq 100\text{ ns}$	Q1-Q2-Q3	50	A/ μs
			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		BT138-600/800				Unit
					D	E	F	G	
I_{DRM}	Peak Forward Reverse Blocking Current		$V_{\text{DRM}} = V_{\text{RRM}}, T_{\text{J}} = 25^{\circ}\text{C}$	Max.	5				μA
I_{RRM}			$V_{\text{DRM}} = V_{\text{RRM}}, T_{\text{J}} = 125^{\circ}\text{C}$		1				mA
V_{TM}	Peak On-State Voltage		$I_{\text{TM}} = 17\text{A}, t_{\text{p}} = 380\text{ }\mu\text{s}$	Max.	1.55				V
V_{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				V
V_{GT}	Q1-Q2-Q3-Q4	GateTrigger Voltage	$V_{\text{D}} = 12\text{V} \quad , \quad R_{\text{L}} = 33\Omega$	Max.	1.3				V
I_{GT}	Q1-Q2-Q3	GateTrigger Current		Max.	5	10	25	50	mA
	Q4				10	25	70	100	
I_{H}	Q1-Q2-Q3-Q4	Holding Current	$I_{\text{T}} = 0.1\text{A}$	Max.	10	25	30	60	mA
I_{L}	Q1-Q3-Q4	Latching Current	$I_{\text{G}} = 1.2 I_{\text{GT}}$	Max.	15	30	40	60	mA
	Q2				20	40	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.	10	20	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.	1	2	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				$^{\circ}\text{C/W}$

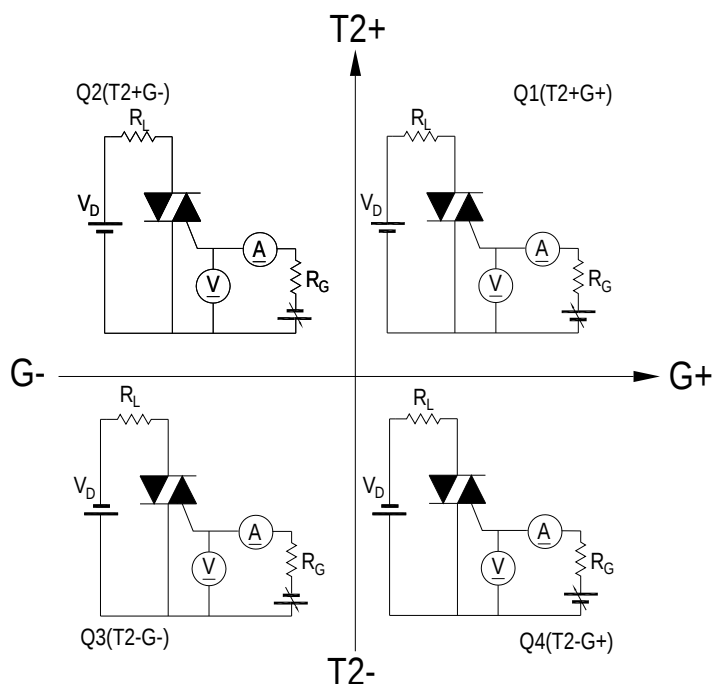
FIG.1: Triac quadrant are defined and the gate trigger test circuit

FIG.2: Maximum on-state power dissipation

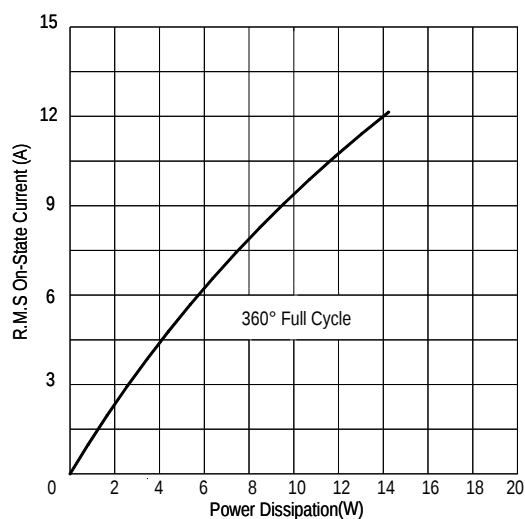


FIG.4: Maximum transient thermal impedance

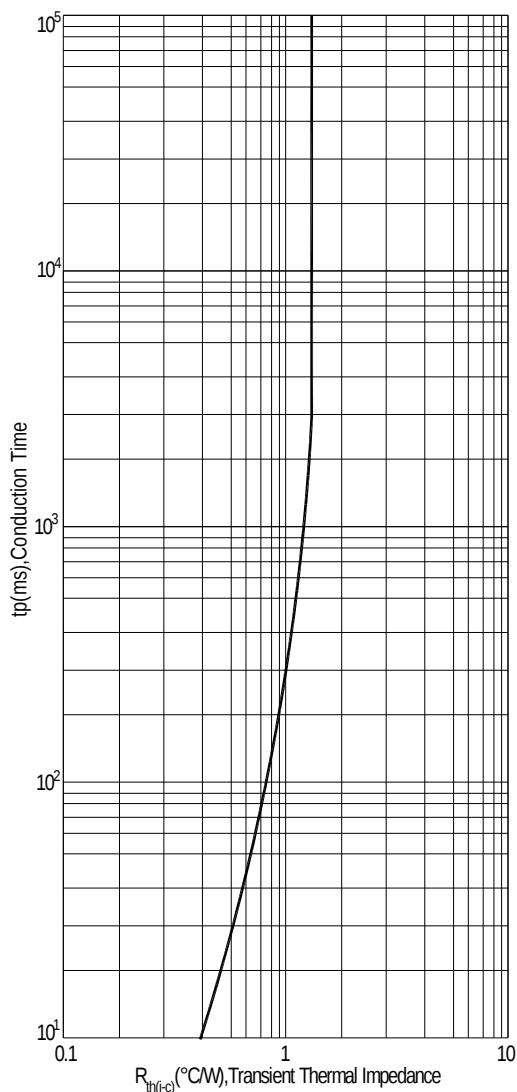


FIG.3: Typical RMS on-state current VS Allowable case Temperature

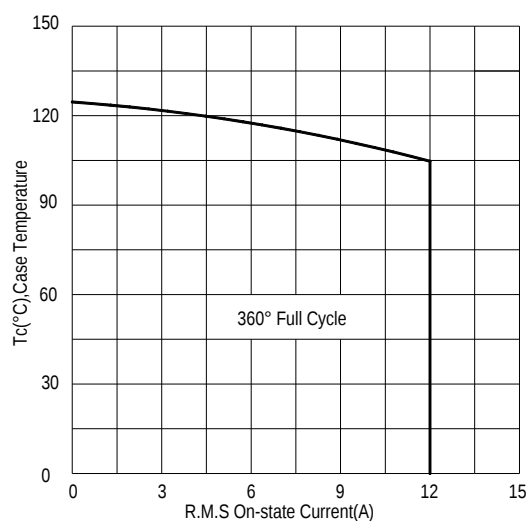


FIG.5: Rated surge on-state current (Non-Repetitive)

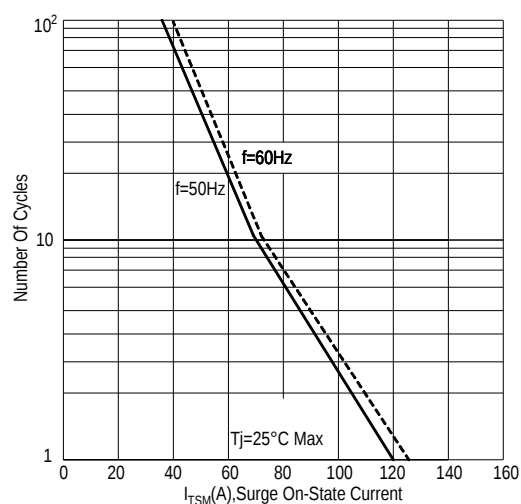


FIG.6: Gate trigger current VS Junction temperature

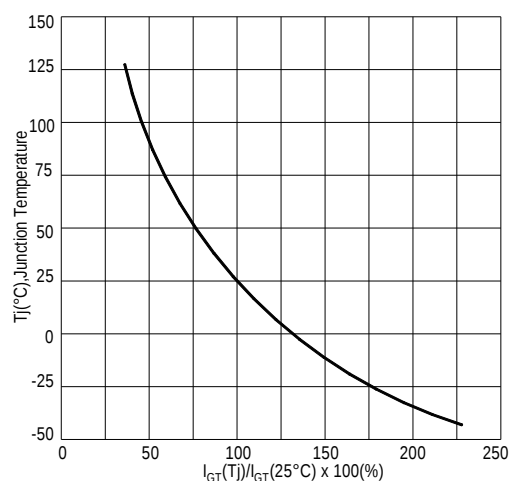


FIG.7:Holding current and Latching current VS Junction temperature

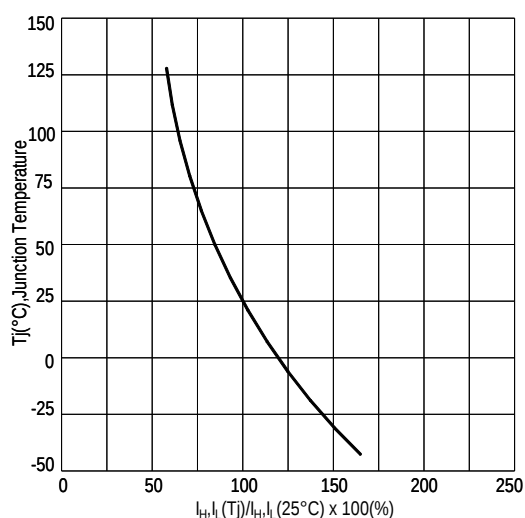


FIG.8: Gate trigger voltage VS Junction temperature

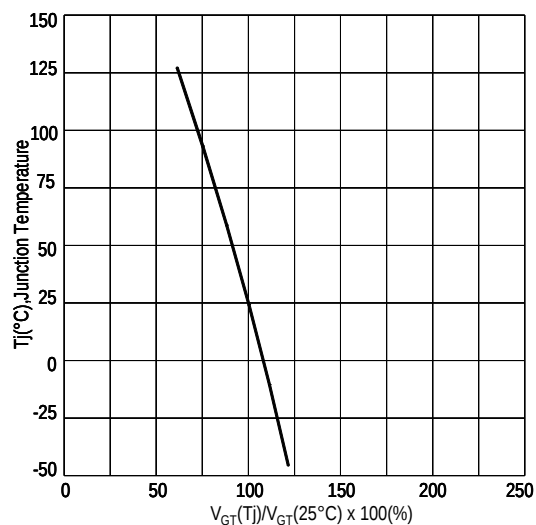
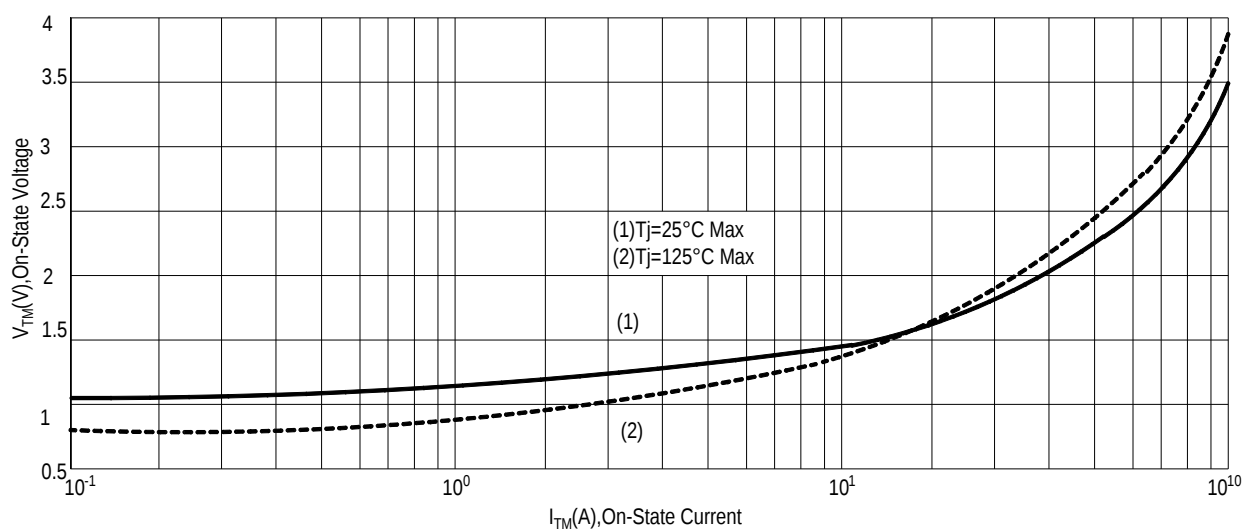
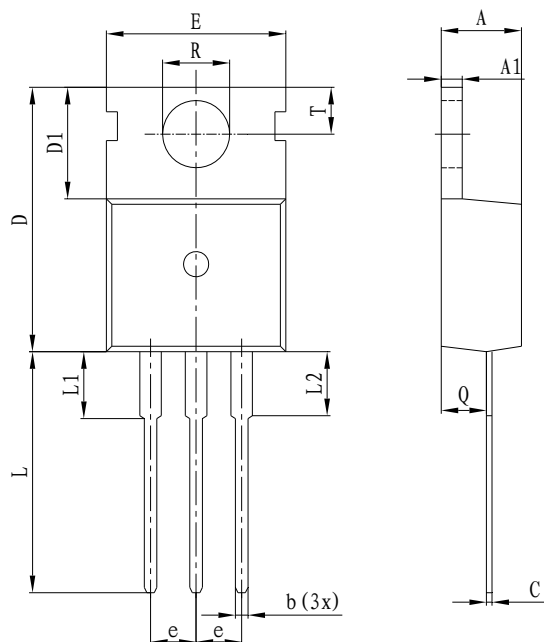


FIG.9: On-state characteristics(Max)



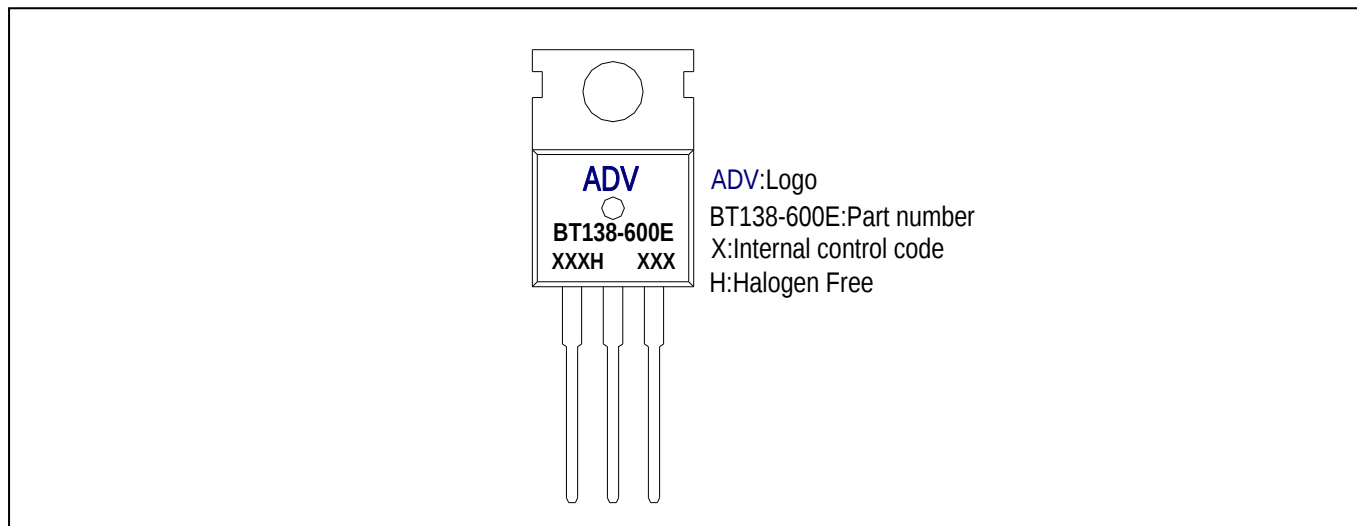
PACKAGE MECHANICAL DATA

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
BT138-600#	TO-220C	BT138-600#	Tube	50pcs
BT138-800#	TO-220C	BT138-800#	Tube	50pcs

Note: # = Gate Trigger Current Sensitivity and type

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