

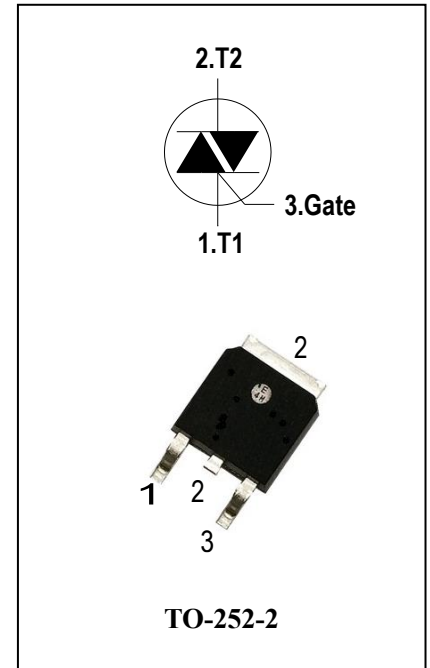
4Quadrants Triacs

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, High power motor controls e.g. washing machines and vacuum cleaners, Rectifier-fed DC inductive loads e.g. DC motors and solenoids , motor speed controllers.

Features

- ◆ Repetitive Peak Off-State Voltage: 600V/800V
- ◆ R.M.S On-State Current ($I_{T(RMS)}=12A$)
- ◆ High Commutation dv/dt
- ◆ 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	$T_j = 25^{\circ}C$	BT138-600E	600	V
			BT138-800E	800	
$I_{T(RMS)}$	R.M.S On-State Current	$T_C = 100^{\circ}C$		12	A
I_{TSM}	Surge On-State Current	tp=20ms(50Hz)		95	A
I^2t	I^2t for fusing	tp=10ms		45	A ² s
dl/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	tp = 20 μs $T_j = 125^{\circ}C$		2	A
$P_{G(AV)}$	Average Gate Power Dissipation($T_j=125^{\circ}C$)			0.5	W
P_{GM}	Peak Gate Power Dissipation(tp=20us, $T_j=125^{\circ}C$)			5	W
T_j	Operating Junction Temperature			- 40 ~ 125	°C
T_{STG}	Storage Temperature			- 40 ~ 150	°C



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

Symbol	Items		Conditions		BT138				Unit
					D	E	F	G	
I_{DRM}	Peak Forward Reverse Blocking Current		$V_{DRM} = V_{RRM}, T_j = 25^\circ\text{C}$	Max.	5				μA
I_{RRM}			$V_{DRM} = V_{RRM}, T_j = 125^\circ\text{C}$		1				mA
V_{TM}	Peak On-State Voltage		$I_{TM} = 15\text{A}, t_p = 380 \mu\text{s}$	Max.	1.55				V
V_{GD}	Q1-Q2-Q3-Q4	Non-Trigger Gate Voltage	$V_D = V_{DRM} \quad R_L = 3.3 \text{ k}\Omega$ $T_j = 125^\circ\text{C}$	Min.	0.2				V
V_{GT}	Q1-Q2-Q3-Q4	Gate Trigger Voltage	$V_D = 12\text{V}, R_L = 33\Omega$	Max.	1.5				V
I_{GT}	Q1-Q2-Q3-Q4	Gate Trigger Current		Max.	5 10	10 25	25 70	35 100	mA
I_H	Q1-Q2-Q3-Q4	Holding Current	$I_T = 0.1\text{A}$	Max.	10	25	30	40	mA
I_L	Q1-Q3-Q4 Q2	Latching Current	$I_G = 1.2 I_{GT}$	Max.	15 20	30 40	40 80	50 85	mA
dV/dt	Critical Rate of Rise of Off-State Voltage		$V_D = 2/3 V_{DRM}$ gate open $T_j = 125^\circ\text{C}$	Min.	20	50	100	200	$\text{V}/\mu\text{s}$
$(dV/dt)_c$	Rate of Change of Commutating Current,		$(dI/dt)_c = -5.3\text{A/ms}$ $T_j = 125^\circ\text{C}$	Min.	0.5	1	5	5.5	$\text{V}/\mu\text{s}$
$R_{th(j-c)}$	Junction to case (AC)			Max.	1.7				$^\circ\text{C}/\text{W}$
$R_{th(j-a)}$	Junction to ambient			Max.	60				$^\circ\text{C}/\text{W}$

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

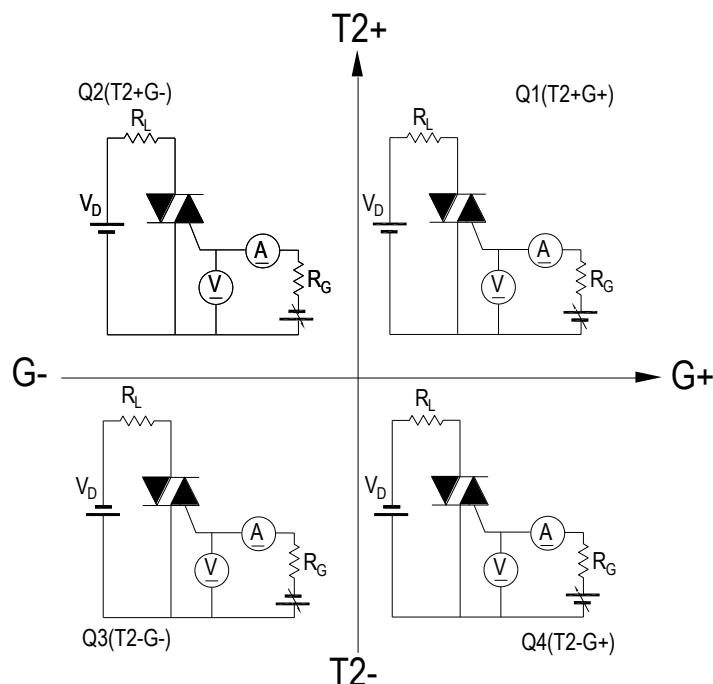


FIG.2: Maximum on-state power dissipation

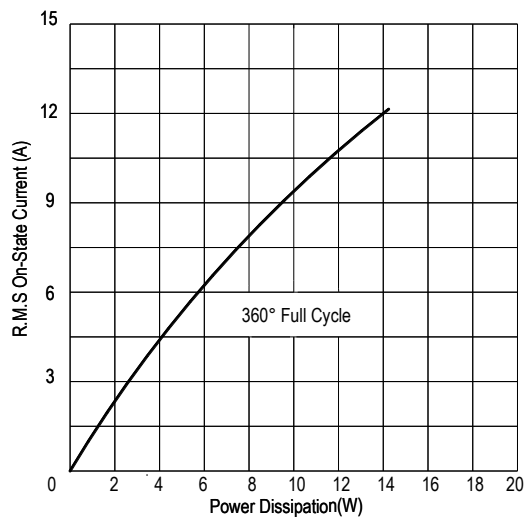


FIG.4: Maximum transient thermal impedance

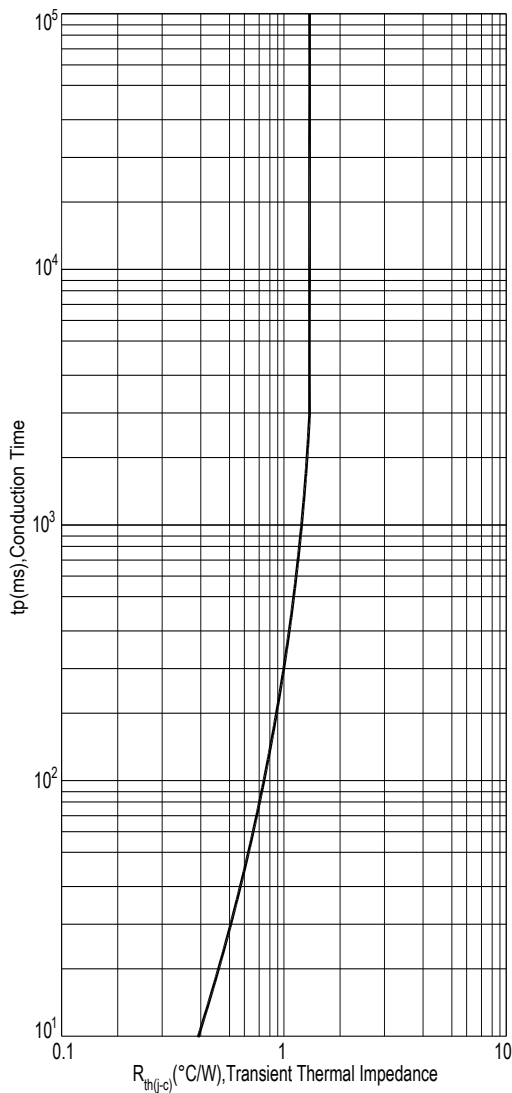


FIG.3: Typical RMS on-state current VS Allowable case Temperature

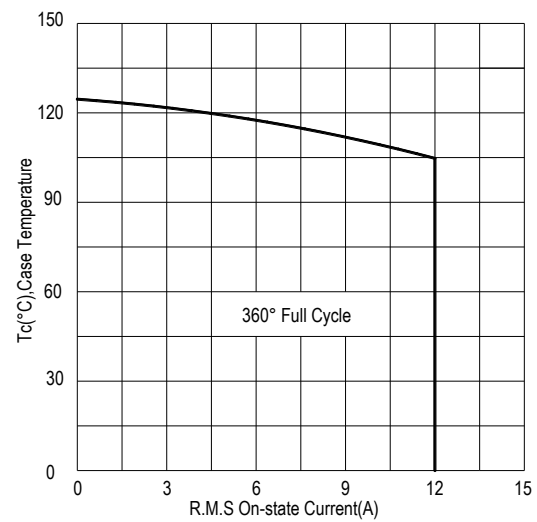


FIG.5: Rated surge on-state current (Non-Repetitive)

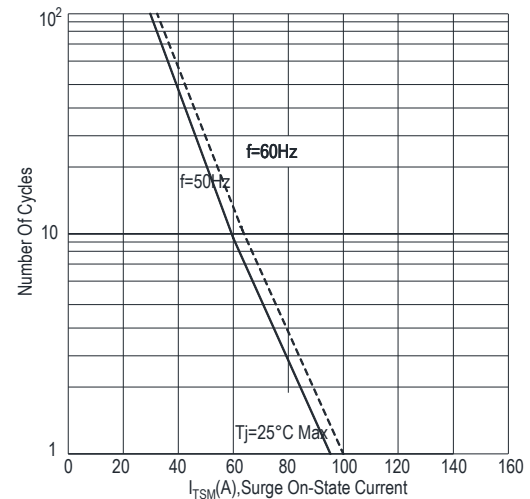


FIG.6: Gate trigger current VS Junction temperature

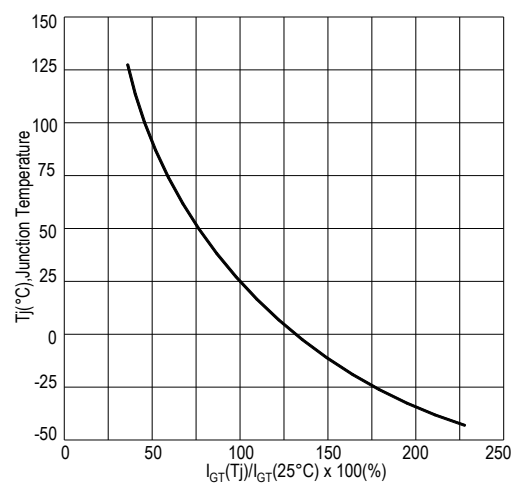


FIG.7:Holding current and Latching current VS Junction temperature

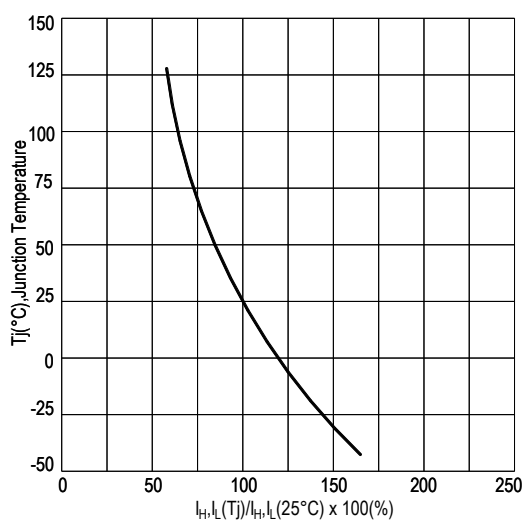


FIG.8:Gate trigger voltage VS Junction temperature

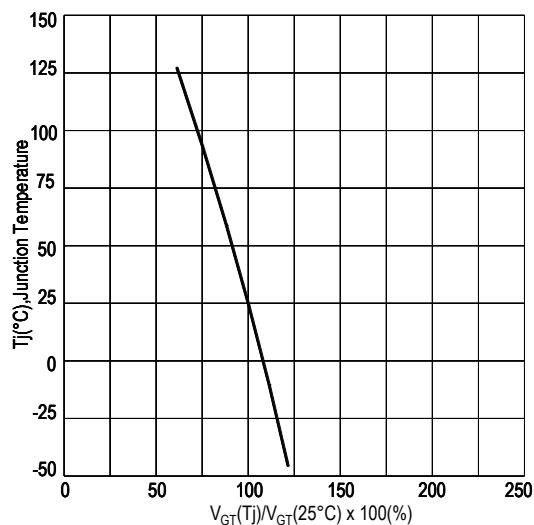
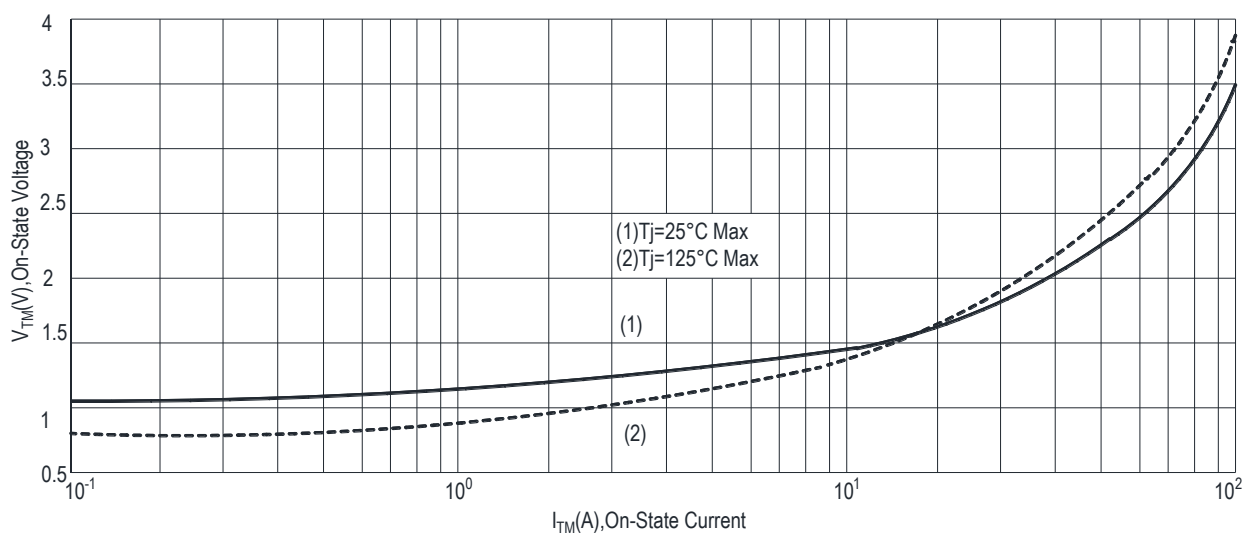
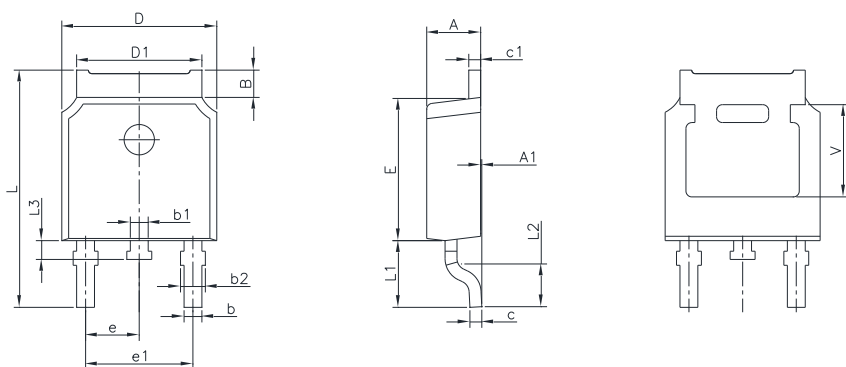


FIG.9: On-state characteristics(Max)



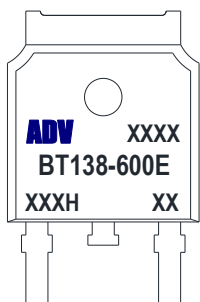
PACKAGE MECHANICAL DATA

TO-252-2 Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2100	2.500	0.083	0.098
A1	0.000	0.127	0.000	0.005
B	1.070	1.220	0.042	0.048
b	0.660	0.860	0.026	0.034
b1	0.720	0.850	0.028	0.033
c	0.400	0.620	0.016	0.024
c1	0.440	0.620	0.017	0.024
D	6.350	6.800	0.250	0.268
D1	5.180	5.480	0.202	0.216
E	5.900	6.300	0.232	0.248
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	10.70	0.374	0.421
L1	2.550	2.900	0.100	0.114
L2	1.350	1.780	0.053	0.070
L3	0.600	0.900	0.024	0.035
V	3.950 REF.		0.155 REF.	

Making Diagram



ADV: Logo
 BT138-600E: Part number
 X: Internal control code
 H: Halogen Free

Ordering information

Part number	Package	Marking	Packing	Quantity
BT138-600E	TO-252-2	BT138-600E	Tube	80pcs
			Embossed tape	2500pcs
BT138-800E	TO-252-2	BT138-800E	Tube	80pcs
			Embossed tape	2500pcs

Note: Gate Trigger Current Sensitivity and type D=5mA, E=10mA, F=25mA, G=50mA

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