

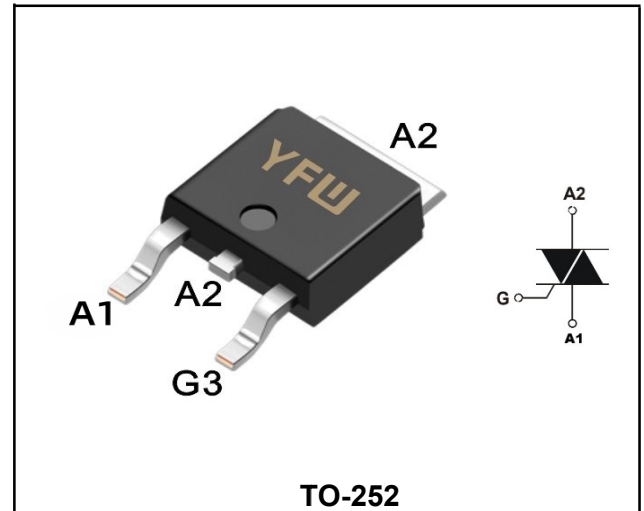
12A 3Quadrants TRIACs

Product Summary

Symbol	Value	Unit
$I_{T(RMS)}$	12	A
$V_{DRM} V_{RRM}$	600/800	V
V_{TM}	1.55	V

DESCRIPTION:

The BT138D triac is suitable for general purpose AC switching. It can be used as an ON/OFF function in applications such as heating regulation, induction motor starting circuits, for phase control operation in light dimmers, motor speed controllers. BT138D snubberless triac is especially recommended for use on inductive loads. It can be driven directly through the MCU I/O port. From A2 terminals to external heatsink. Package TO-252 is RoHS compliant.



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Repetitive peak off-state voltage($T_j=25^{\circ}\text{C}$)	V_{DRM}	600/800	V
Repetitive peak reverse voltage($T_j=25^{\circ}\text{C}$)	V_{RRM}	600/800	V
RMS on-state current($T_c \leq 90^{\circ}\text{C}$)	$I_{T(RMS)}$	12	A
Non repetitive surge peak on-state current(full cycle , $t_p=10\text{ms}$, $T_j=25^{\circ}\text{C}$)	I_{TSM}	120	A
I^2t value for fusing ($t_p=10\text{ms}$, $T_j=25^{\circ}\text{C}$)	I^2t	72	A^2S
Critical rate of rise of on-state current ($T_j=125^{\circ}\text{C}$)	di_T/dt	50	$\text{A}/\mu\text{s}$
Peak gate current	I_{GM}	4	A
Average gate power dissipation	$P_{G(AV)}$	10	W
Operating junction temperature range	T_J	$-40 \sim +125$	$^{\circ}\text{C}$
Storage junction temperature range	T_{STG}	$-40 \sim +150$	$^{\circ}\text{C}$

Electrical characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Value			Unit
			min	typ	max	
Gate trigger current	I_{GT}	$V_D = 12\text{V}$ $R_L = 100\Omega$	-	-	35	mA
Gate trigger voltage	V_{GT}					
Non-triggering gate voltage	V_{GD}	$V_D = V_{DRM}$, $R_L = 100\Omega$ $T_J = 125^{\circ}\text{C}$	0.2	-	-	V
Latching current	I_L	$I_G = 1.2I_{GT}$	I - III	-	60	mA
			II	-	100	mA
Holding current	I_H	$I_T = 500\text{mA}$	-	-	60	mA
Critical-rate of rise of commutation voltage	dV_D/dt	$V_D = 2/3 V_{DRM}$ $T_J = 125^{\circ}\text{C}$	500	-	-	V/ μs

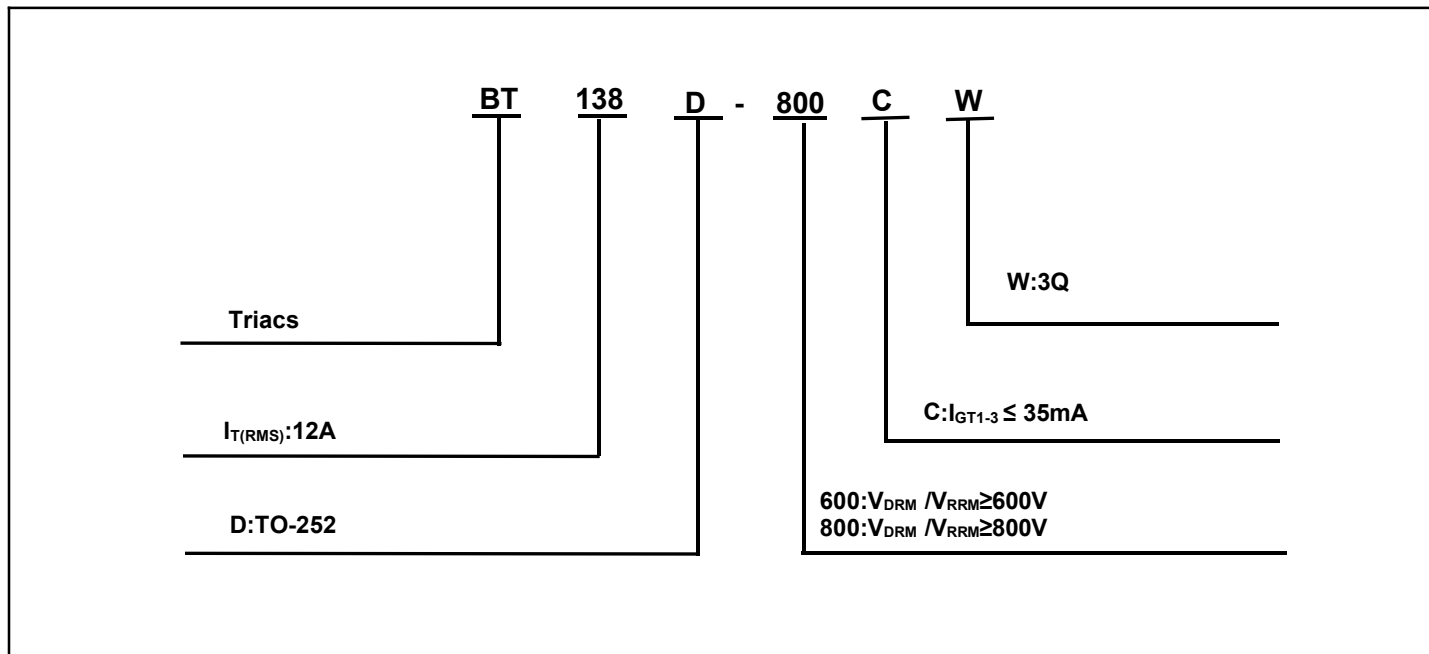
STATIC CHARACTERISTICS

On-state Voltage	V_{TM}	$I_{TM} = 17\text{A}$ $t_p = 380\mu\text{s}$	$T_J = 25^{\circ}\text{C}$	-	-	1.55	V
Repetitive Peak Off-State Current	I_{DRM}	$V_D = V_{DRM}$ $V_R = V_{RRM}$	$T_J = 25^{\circ}\text{C}$	-	-	5	μA
Repetitive Peak Reverse Current	I_{RRM}		$T_J = 125^{\circ}\text{C}$	-	-	1	mA

THERMAL RESISTANCES

Thermal resistance	$R_{th(j-c)}$	Junction to case(AC)	TYP.	1.25	$^{\circ}\text{C/W}$
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Ordering Information



Typical Characteristics

FIG.1: Maximum power dissipation versus RMS on-state current (full cycle)

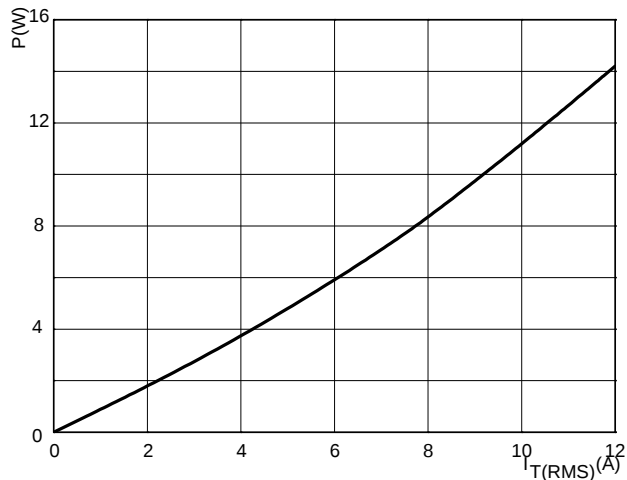


FIG.2: RMS on-state current versus case temperature (full cycle)

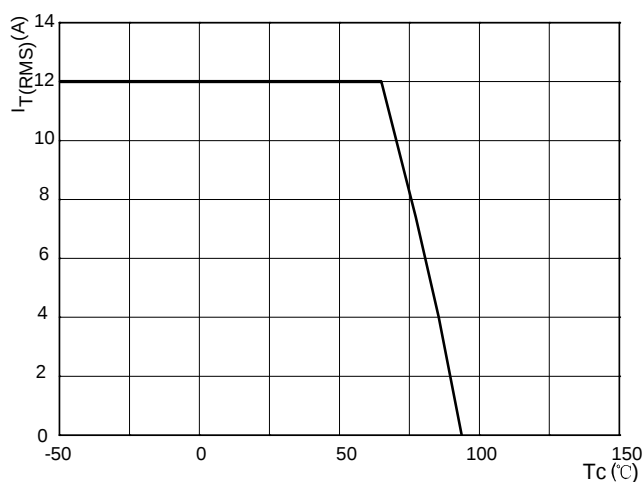


FIG.3: Surge peak on-state current versus number of cycles

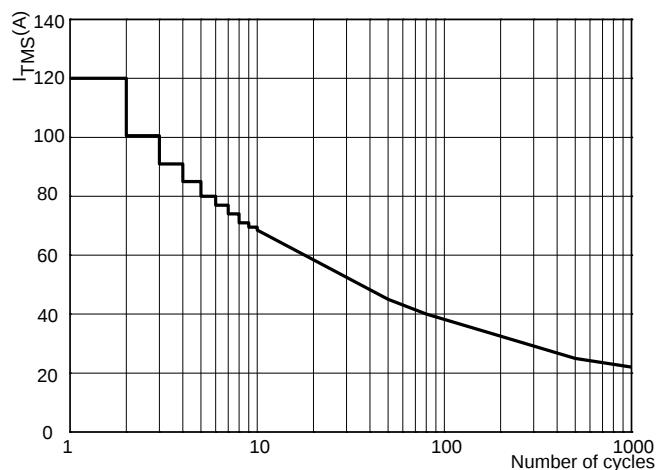


FIG.4: On-state characteristics (maximum values)

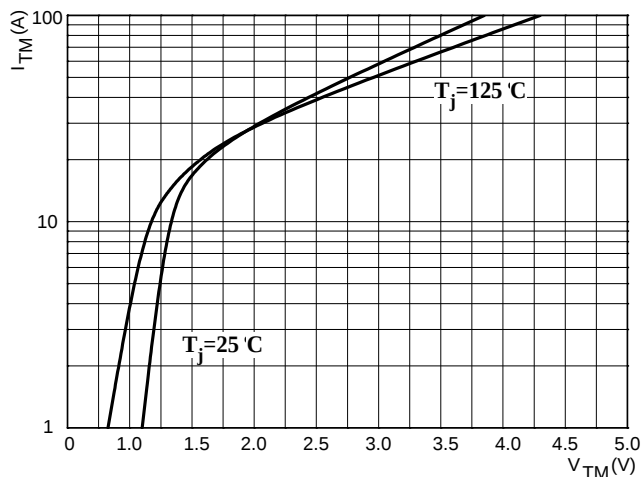


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10ms$

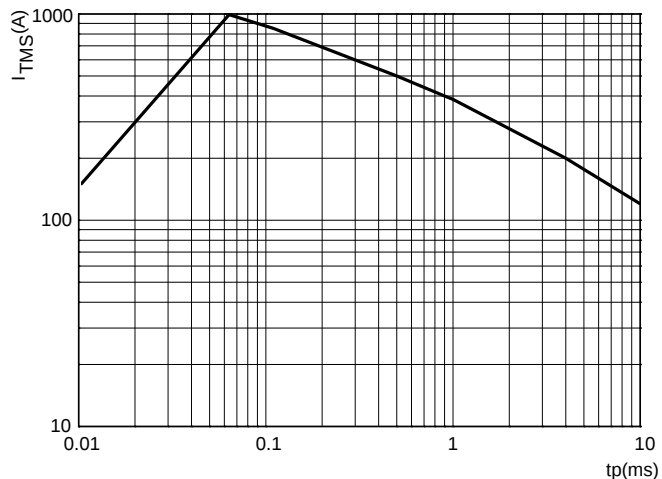
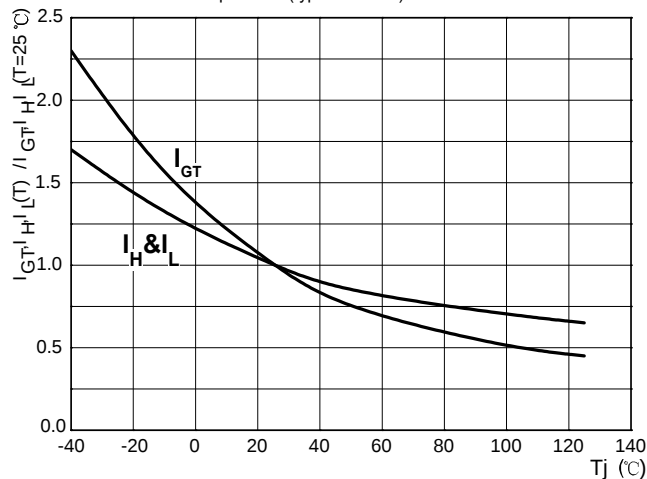
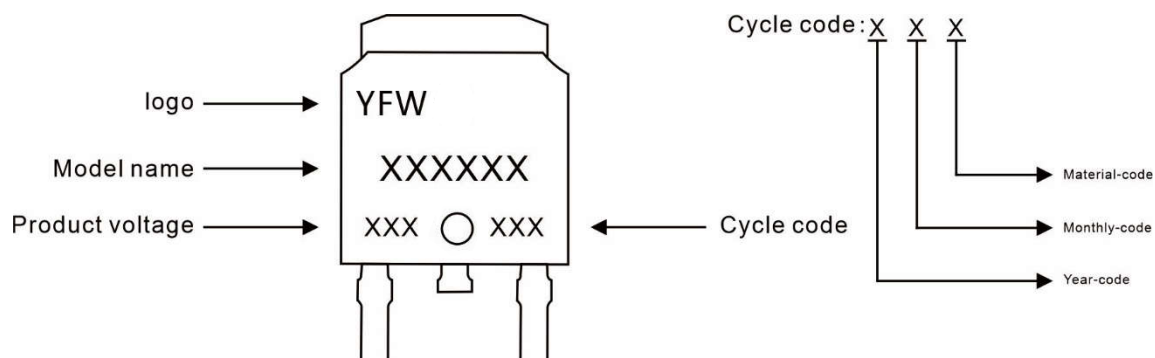


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature (typical values)



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
BT138D	TO-252	0.011oz(0.32g)	3000pcs/reel	6000pcs/box 30000pcs/Carton

Package Dimensions

TO-252

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.50	0.087	0.098
A1	0.00	0.12	0.000	0.005
A2	2.20	2.40	0.087	0.094
B	0.95	1.55	0.037	0.061
b	0.50	0.80	0.020	0.031
b1	0.60	0.90	0.024	0.035
c	0.40	0.60	0.016	0.024
c1	0.40	0.60	0.016	0.024
D	6.35	6.65	0.250	0.262
D1	5.20	5.40	0.205	0.213
E	5.80	6.40	0.228	0.252
e	2.20	2.40	0.087	0.094
e1	4.40	4.80	0.173	0.189
L	10.00	11.00	0.393	0.433
L1	2.70	3.50	0.106	0.138
L2	1.40	1.80	0.055	0.071
L3	0.90	1.50	0.035	0.059

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