

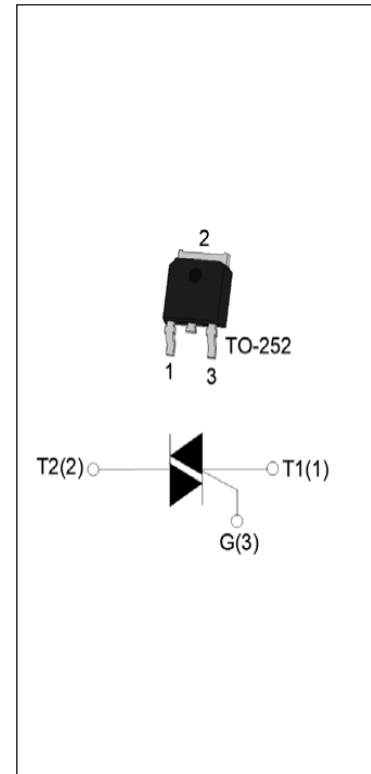
**BT138D-600F**
**MAIN FEATURES    4Q TRIAC**

Symbol	Value	Unit
$I_{T(RMS)}$	12	A
$V_{DRM}/V_{RRM}$	600	V
$I_{GT1/2/3}$	25/25/25/70	mA

**DESCRIPTION:**

The BT138D-600F 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.

Package TO-252 is RoHS compliant.


**ABSOLUTE MAXIMUM RATINGS**

Parameter	Symbol	Value	Unit
Storage junction temperature range	$T_{stg}$	-40-150	°C
Operating junction temperature range	$T_j$	-40-125	°C
Repetitive peak off-state voltage ( $T_j=25^\circ\text{C}$ )	$V_{DRM}$	600	V
Repetitive peak reverse voltage ( $T_j=25^\circ\text{C}$ )	$V_{RRM}$	600	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	$\text{A}^2\text{s}$
Critical rate of rise of on-state current ( $T_j=125^\circ\text{C}$ )	$di/dt$	50	$\text{A}/\mu\text{s}$
Peak gate current ( $t_p=20\mu\text{s}$ , $T_j=125^\circ\text{C}$ )	$I_{GM}$	4	A
Average gate power dissipation ( $T_j=125^\circ\text{C}$ )	$P_{G(AV)}$	10	W

**ELECTRICAL CHARACTERISTICS** ( $T_j=25^\circ\text{C}$  unless otherwise specified)

Symbol	Test Condition	Quadrant	Value		Unit
$I_{GT}$	$V_D=12\text{V}$ $R_L=100\Omega$	I - II - III	MAX.	25	mA
		IV		70	
$V_{GT}$		ALL	MAX.	1	V
$V_{GD}$	$V_D=V_{DRM}$ $T_j=125^\circ\text{C}$ $R_L=100\Omega$	ALL	MIN.	0.2	V
$I_L$	$I_G=1.2I_{GT}$	I - III - IV	MAX.	60	mA
		II		100	
$I_H$	$I_T=500\text{mA}$		MAX.	60	mA
$dV/dt$	$V_D=2/3V_{DRM}$ $T_j=125^\circ\text{C}$		MIN.	500	V/ $\mu\text{s}$
$(dI/dt)_c$	$T_j=125^\circ\text{C}$		MIN.	8	A/ms

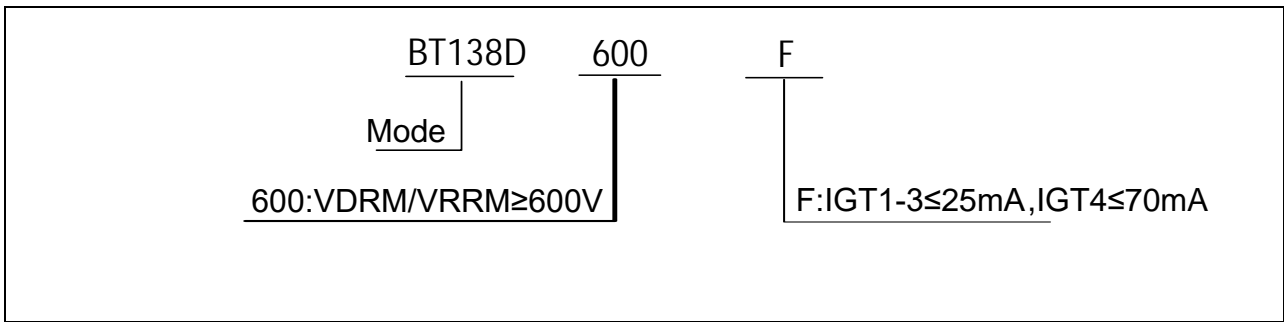
**STATIC CHARACTERISTICS**

Symbol	Parameter		Value(MAX.)	Unit
$V_{TM}$	$I_{TM}=32\text{A}$	$T_j=25^\circ\text{C}$	1.50	V
$V_{TO}$	Threshold voltage	$T_j=125^\circ\text{C}$	0.86	V
$R_D$	Dynamic resistance	$T_j=125^\circ\text{C}$	36.6	m $\Omega$
$I_{DRM}$	$V_D=V_{DRM}$ $V_R=V_{RRM}$	$T_j=25^\circ\text{C}$	5	$\mu\text{A}$
$I_{RRM}$		$T_j=125^\circ\text{C}$	1	mA

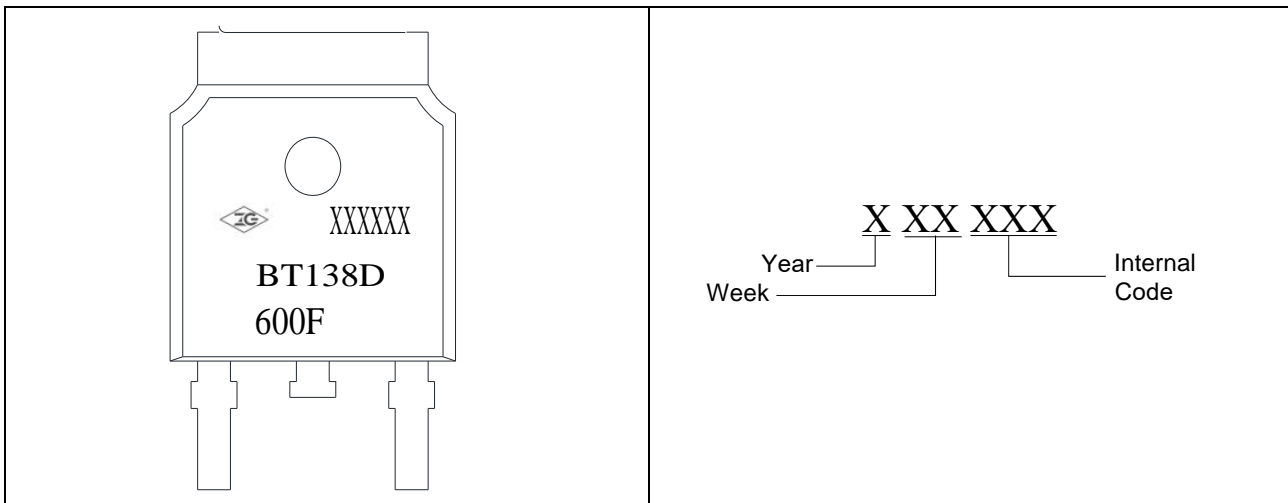
**THERMAL RESISTANCES**

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	junction to case (AC)	1.25	$^\circ\text{C}/\text{W}$

**ORDERING INFORMATION**



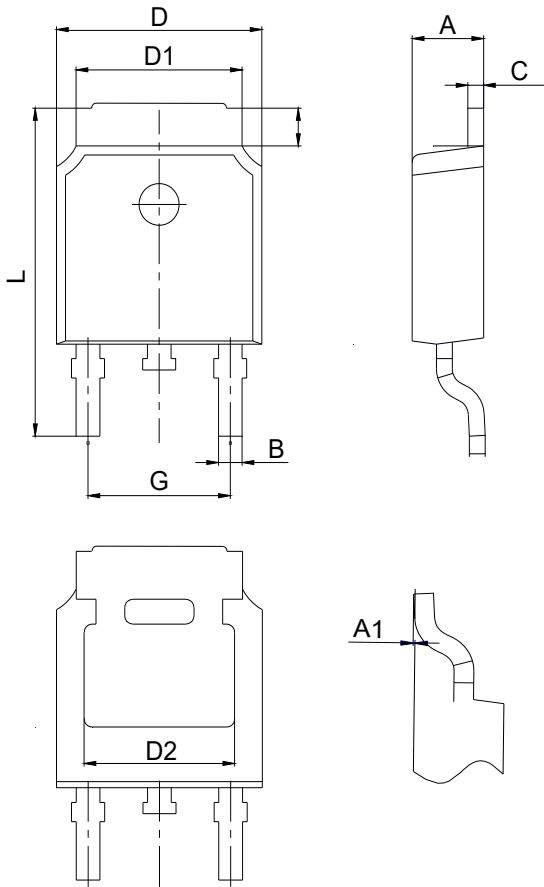
**MARKING**



**ORDERING INFORMATION**

Order code	Voltage V <sub>DRM</sub> /V <sub>RPM</sub> (V)	IGT(mA)		Package	Base qty. (pcs)	Delivery mode
		I - II - III	IV			
BT138D-600F	600	25	70	TO-252	2500	Tube

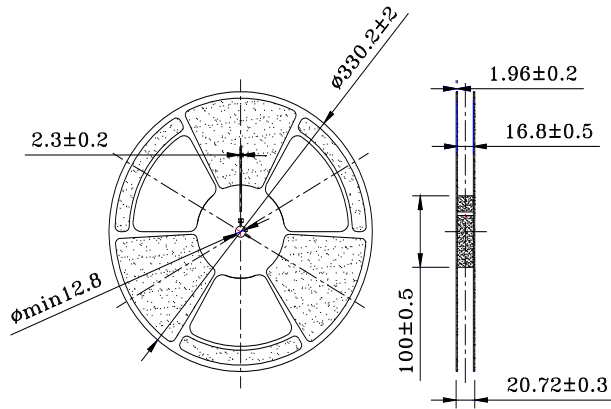
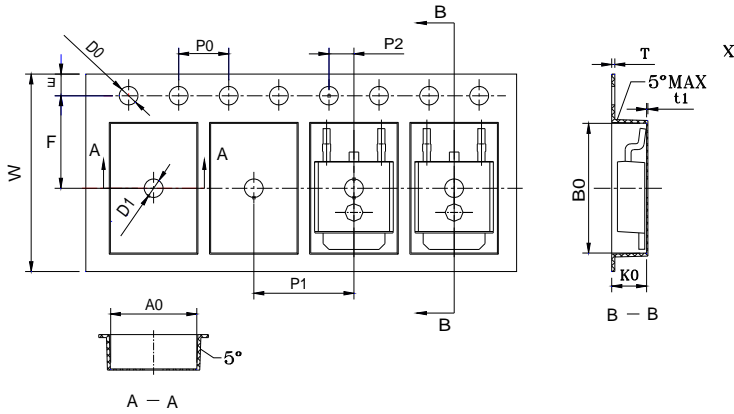
PACKAGE MECHANICAL DATA



TO-252

Ref.	Dimensions		
	Millimeters		
	Min.	Typ.	Max.
A	2.200	/	2.400
A1	/	/	0.127
B	0.635	/	0.770
C	0.460	/	0.580
D	5.100	/	5.460
D1	6.000	/	6.200
D2	4.830REF		
G	12.000	12.100	12.200
L	0.600	/	1.000

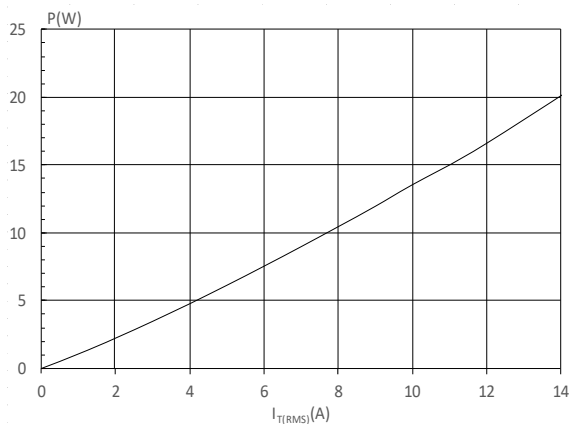
DELIVERY MODE



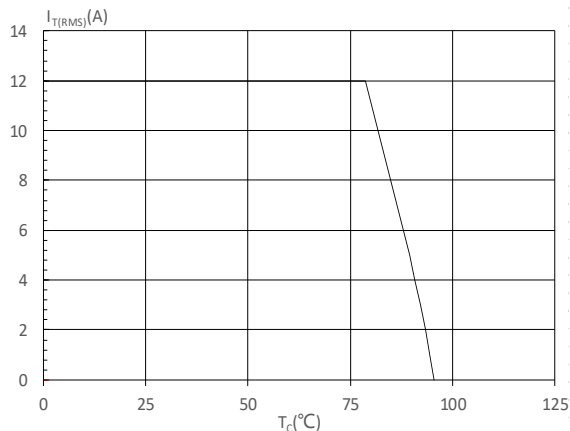
Ref.	Dimensions		
	Millimeters		
	Min.	Typ.	Max.
W	15.90	16.00	16.10
E	1.65	1.75	1.85
F	7.40	7.50	7.60
D0	1.50	1.55	1.60
D1	1.50	/	/
P0	3.90	4.00	4.10
P1	7.90	8.00	8.10
P2	1.90	2.00	2.10
10P0	39.8	40.00	40.20
A0	6.80	6.90	7.00
B0	10.40	10.50	10.60
K0	2.60	2.70	2.80
T	0.25	0.30	0.35
t1	0.10	/	/

PACKAGE	OUTLINE	REEL (PCS)	PER CARTON (PCS)
TO-252	TAPING	2,500	5,000

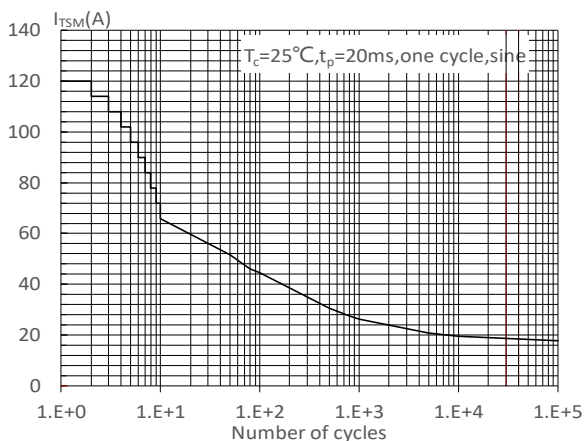
**FIG.1** Maximum power dissipation versus RMS on-state current



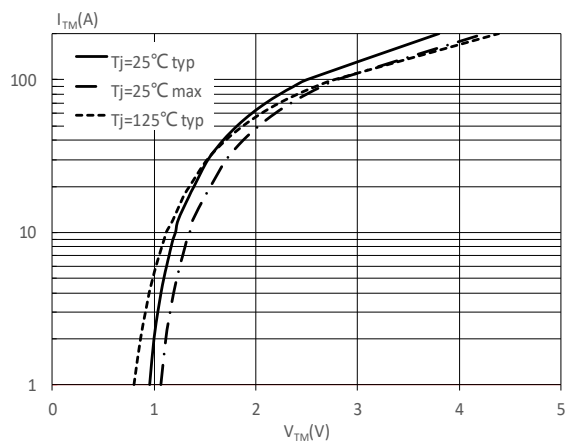
**FIG.2:** RMS on-state current versus case temperature



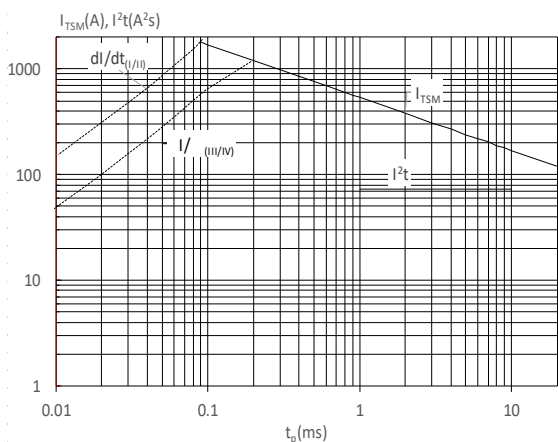
**FIG.3:** Surge peak on-state current versus number of cycles



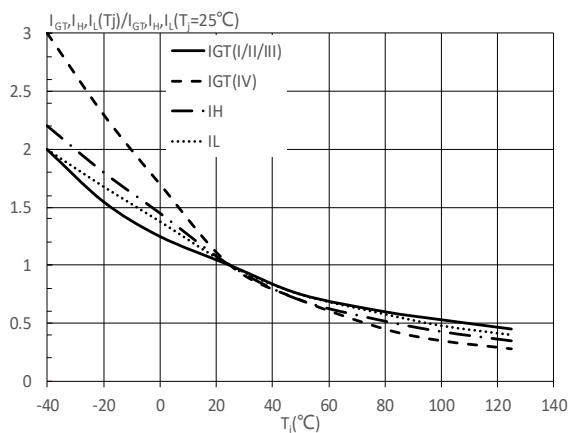
**FIG.4:** On-state characteristics



**FIG.5:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$ , and corresponding value of  $I^2t$  ( I - II :  $di/dt < 80\text{A}/\mu\text{s}$ ; III-IV :  $di/dt < 40\text{A}/\mu\text{s}$ )



**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature



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