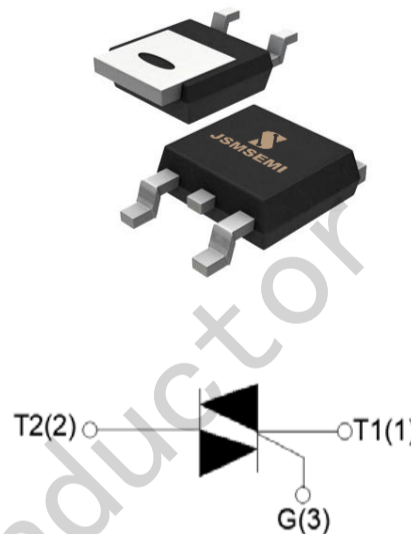


DESCRIPTION:

The BT138S-800 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.

MAIN FEATURES

Symbol	600D	600E	Unit
$I_{T(RMS)}$	12		A
V_{DRM}/V_{RRM}	600		V
$I_{GT\ I/II/III/IV}$	5/5/5/10	10/10/10/25	mA



ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Storage junction temperature range		T _{stg}	-40-150	℃
Operating junction temperature range		T _j	-40-125	℃
Repetitive peak off-state voltage (T _j =25℃)		V _{DRM}	600	V
Repetitive peak reverse voltage (T _j =25℃)		V _{RRM}	600	V
RMS on-state current (T _c ≤98℃)		I _{T(RMS)}	12	A
Non repetitive surge peak on-state current (full cycle , t _p =20ms , T _j =25℃)		I _{TSM}	95	A
Non repetitive surge peak on-state current (full cycle , t _p =16.6ms , T _j =25℃)			105	
I ² t value for fusing (t _p =10ms , T _j =25℃)		I ² t	45	A ² s
Critical rate of rise of on-state current (I _G =2×I _{GT} , f=100Hz , T _j =125℃)	I - II	di/dt	50	A/μs
	III-IV		20	
Peak gate current (t _p =20μs , T _j =125℃)		I _{GM}	4	A
Average gate power dissipation (T _j =125℃)		P _{G(AV)}	0.5	W
Peak gate power		P _{GM}	10	W
Peak pulse voltage (T _j =25℃; non-repetitive, off-state; FIG.8)		V _{pp}	3	kV

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

Symbol	Test Condition	Quadrant	Value	600D	600E	Unit
I _{GT}	V _D =12V R _L =33Ω	I - II -III	MAX.	5	10	mA
		IV		10	25	
V _{GT}		ALL	MAX.	1		V
V _{GD}	V _D =V _{DRM} T _j =125°C R _L =3.3KΩ	ALL	MIN.	0.2		V
I _L	I _G =1.2I _{GT}	I -III-IV	MAX.	15	25	mA
		II		20	35	
I _H	I _T =500mA		MAX.	10	25	mA
dV/dt	V _D =540V Gate Open T _j =125°C		MIN.	40	100	V/μs
(dV/dt) _c	(dI/dt) _c =5A/ms, T _j =110°C		MIN.	2	5	V/μs
t _{on}	I _G =20mA I _A =200mA I _R =20mA T _j =25°C		TYP.	3		μs
t _{off}				30		

STATIC CHARACTERISTICS

Symbol	Parameter		Value(MAX.)	Unit
V_{TM}	$I_{TM}=15\text{A}$ $t_p=380\mu\text{s}$	$T_J=25^{\circ}\text{C}$	1.6	V
V_{TO}	Threshold voltage	$T_J=125^{\circ}\text{C}$	0.8	V
R_D	Dynamic resistance	$T_J=125^{\circ}\text{C}$	41	m Ω
I_{DRM}	$V_D=V_{DRM}$ $V_R=V_{RRM}$	$T_J=25^{\circ}\text{C}$	5	μA
I_{RRM}		$T_J=125^{\circ}\text{C}$	0.5	mA

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	junction to case (AC)	3	$^{\circ}\text{C/W}$
$R_{th(j-a)}$	junction to ambient (AC)	100	$^{\circ}\text{C/W}$

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

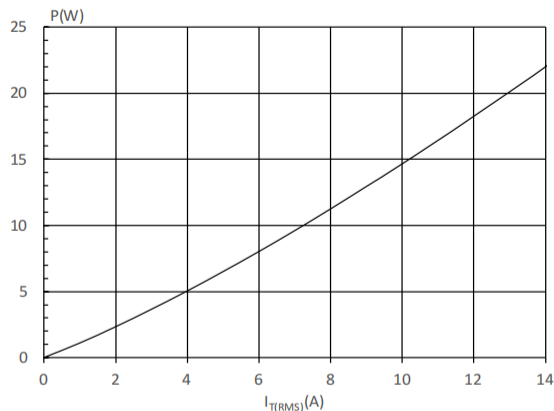


FIG.3: RMS on-state current versus ambient temperature (printed circuit board FR4,copper thickness:35 μ m)(full cycle)

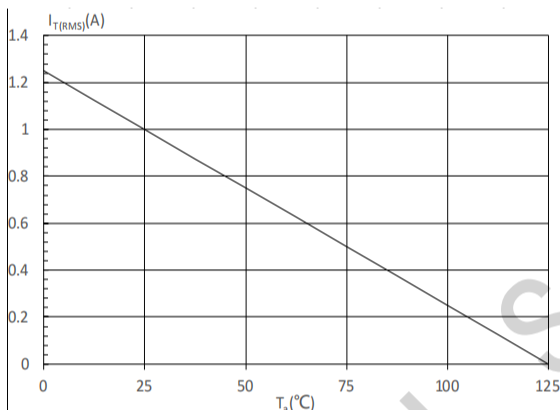


FIG.5: On-state characteristics

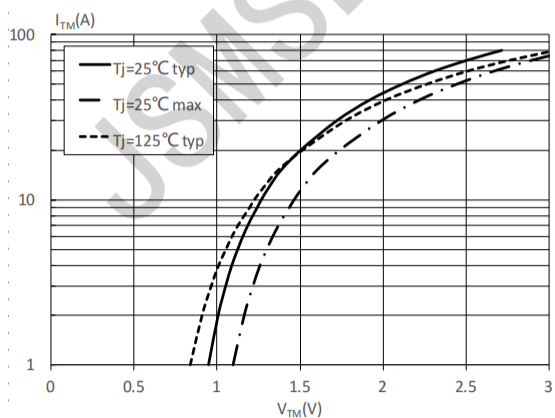


FIG.2: RMS on-state current versus case temperature

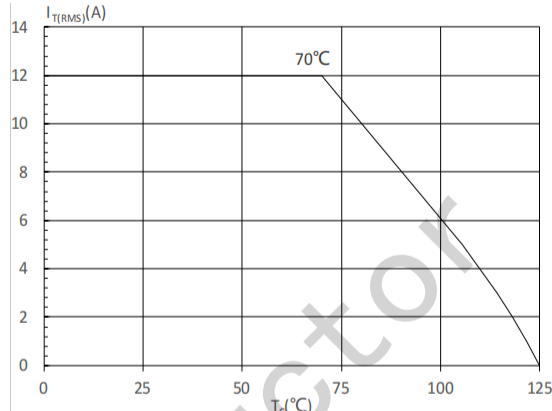


FIG.4: Surge peak on-state current versus number of cycles

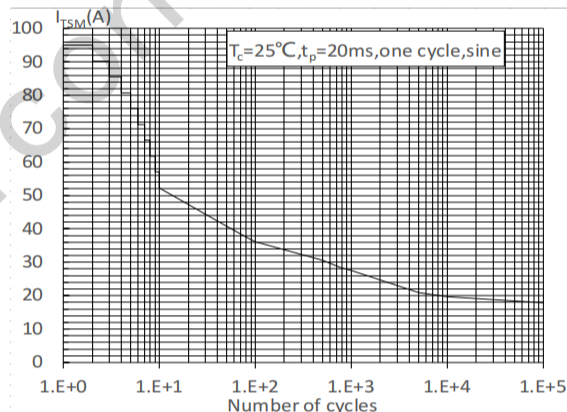


FIG.6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20ms$, and corresponding value of I^2t (I - II: $di/dt < 50A/\mu s$; III-IV: $di/dt < 20A/\mu s$)

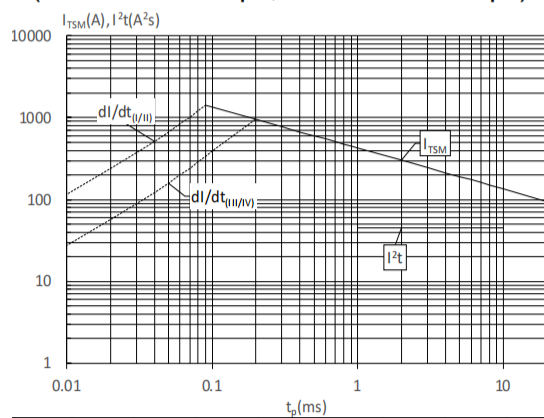


FIG.7: Relative variations of gate trigger current, holding current and latching current versus junction temperature

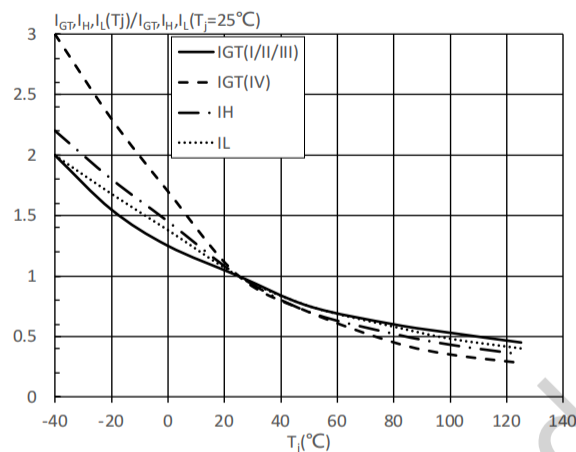
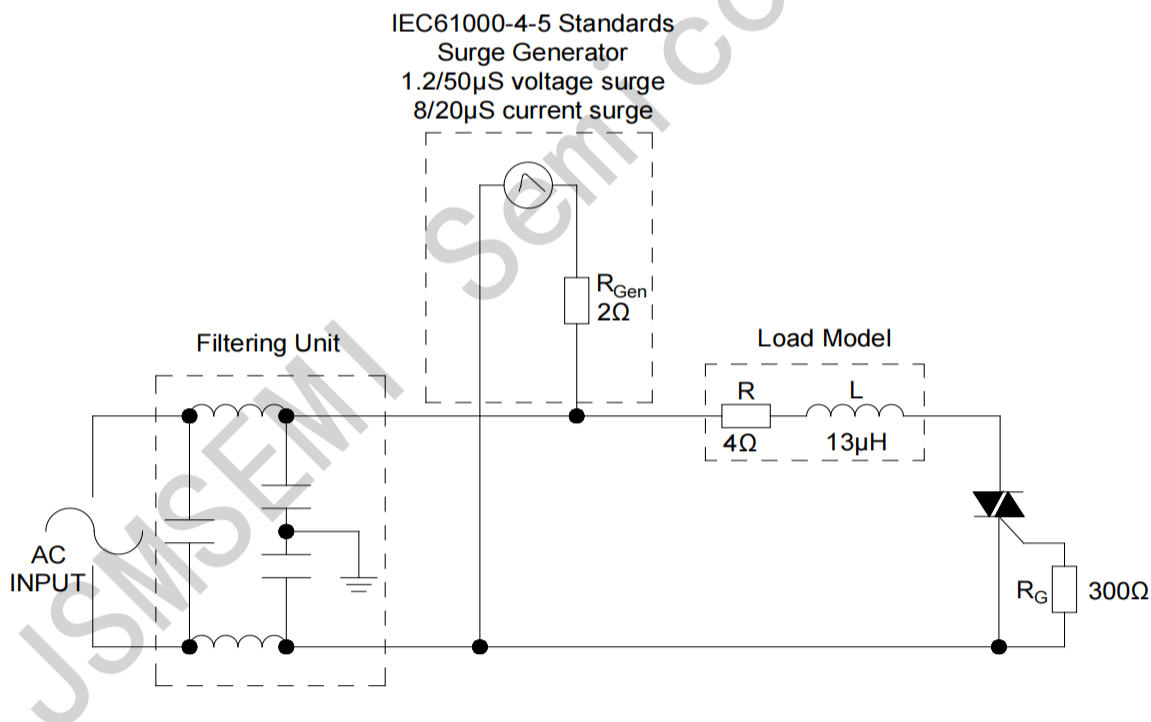


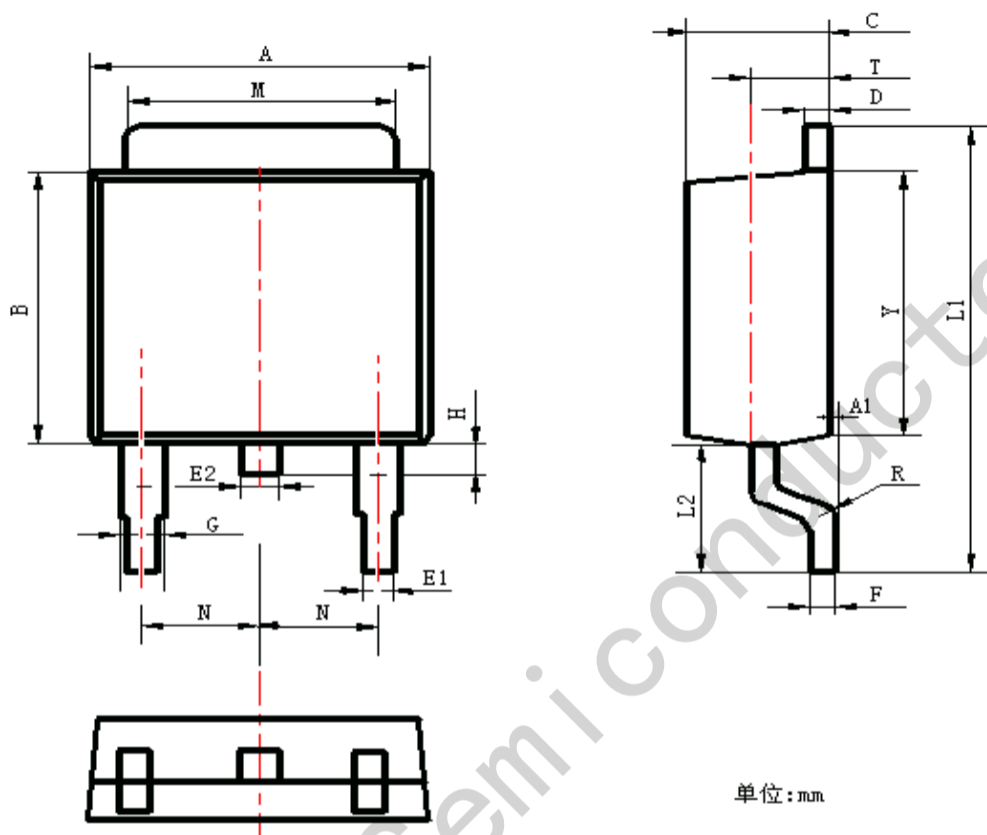
FIG.8: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



ORDERING INFORMATION

Order code	Voltage V_{DRM}/V_{RRM} (V)	IGT(mA)		Package	Base qty. (pcs)	Delivery mode
		I - II - III	IV			
BT138S-600D	600	5	10	TO-252	2,500	Tape & Reel
BT138S-600E		10	25			

PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	6.30	6.90	0.248	0.272
A1	0.00	0.16	0.000	0.006
B	5.70	6.30	0.224	0.248
C	2.10	2.50	0.083	0.098
D	0.30	0.70	0.012	0.028
E1	0.60	0.90	0.024	0.035
E2	0.70	1.00	0.028	0.039
F	0.30	0.60	0.012	0.024
G	0.70	1.20	0.028	0.047
L1	9.60	10.50	0.378	0.413
L2	2.70	3.10	0.106	0.122
H	0.40	1.00	0.016	0.039
M	5.10	5.50	0.201	0.217
N	2.09	2.49	0.082	0.098
R	0.30		0.012	
T	1.40	1.60	0.055	0.063
Y	5.10	6.30	0.201	0.248