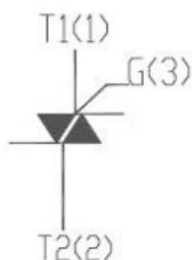


Features

- High current triac
- Low thermal resistance with clip bonding
- High commutation (4 quadrant) or very high commutation (3 quadrant) capability

VOLTAGE 600/800 V

CURRENT 12 A



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Conditions	Ratings	Unit
VDRM VRRM	Repetitive Peak Off-State Voltage	BT138-600	600	V
		BT138-800	800	V
IT(RMS)	R.M.S On-State Current	$T_c = 110^\circ\text{C}$	12	A
ITSM	Surge On-State Current	$t_p = 16.7\text{ms}/t_p = 10\text{ms}$	85/88	A
I^2t	I^2t for fusing	$T_p = 10\text{ms}$	40	A^2s
PG(AV)	Average Gate Power Dissipation	$T_j = 125^\circ\text{C}$	1	W
IGM	Peak Gate Current	$t_p = 20\mu\text{s}$ $T_j = 125^\circ\text{C}$	4	A
T_j	Operating Junction Temperature		$\sim 40 \sim 125$	$^\circ\text{C}$
TSTG	Storage Temperature		$\sim 40 \sim 150$	$^\circ\text{C}$

Electrical Characteristics (Tj=25°C unless otherwise specified)

Symbol	Parameter		Test Conditions	Value				Unit
				D	E	F	G	
IDRM	Repetitive Peak Off-State Current		Tj=25°C	≤5				uA
			Tj=125°C	≤1				mA
IRRM	Repetitive Peak Reverse Current		Tj=25°C	≤5				uA
			Tj=125°C	≤1				mA
VTM	Forward "on" voltage		IT=35A tp=380us	≤1.55				V
VGT	Gate trigger voltage		VD=12V ,RL=30Ω	≤1.5				V
di/dt	Critical-rate of rise of commutation current.	I,II,III	Tj=125°C ,IG=2XIGT,tr ≤100ns,F=100Hz	≥50				A /us
		IV		≥10				A /us
IGT	Gate trigger current	I,II,III	VD=12V RL=30Ω	≤5	≤10	≤25	≤50	mA
		IV		≤10	≤25	≤70	≤100	mA
IH	Holding current		IT=0.2A	≤10	≤25	≤30	≤60	mA
VGD	Gate non-trigger voltage	ALL	VD=VDRM TJ=125°C,RL=3.3KΩ	≥0.2				V
dv/dt	Critical-rate of rise of commutation voltage		TJ=125°C VD=2/3VDRM Gate	≥5	≥10	≥50	≥200	V/us
BT138WS(3 quadrants)								
di/dt	Critical-rate of rise of commutation current.	I,II,III	Tj=125°C ,IG=2XIGT,tr ≤100ns,F=100Hz	≥50				A /us
IGT	Gate trigger current	I,II,III	VD=12V RL=30Ω	D	E	F	G	mA
				≤5	≤10	≤25	≤50	

RATING AND CHARACTERISTIC CURVES

FIG.6:Maximum power dissipation versus RMS on-state current

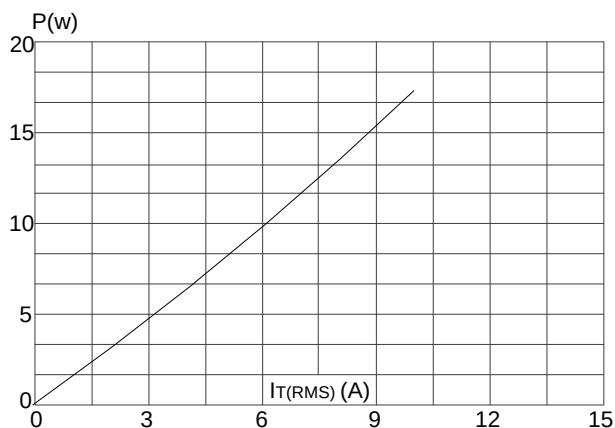


FIG.6:RMS on-state current versus case temperature

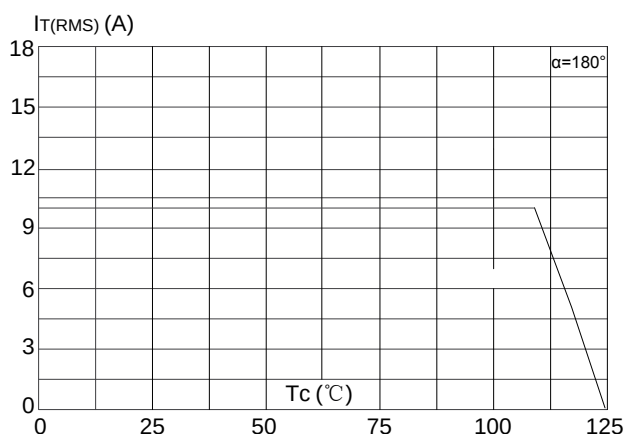


FIG.6:Surge peak on-state current versus number of cycles

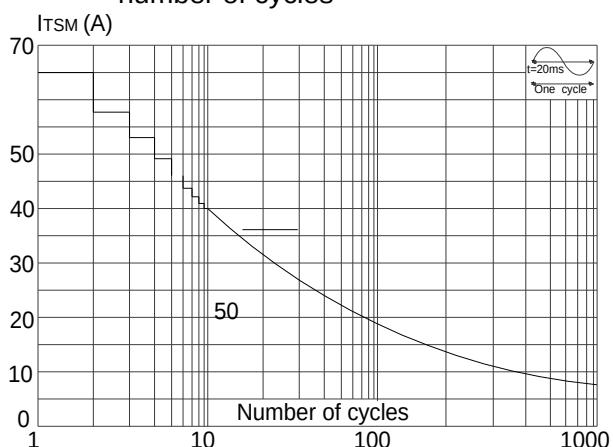


FIG.6:On-state characteristics (maximum values)

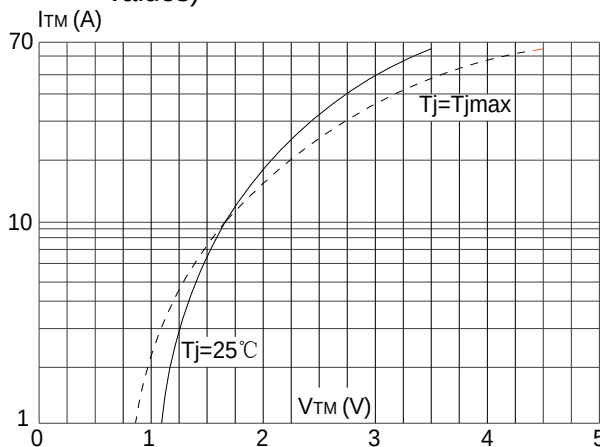


FIG.6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20\text{ms}$, and corresponding value of $I^2 t$ ($di/dt < 100\text{A}/\mu\text{s}$)

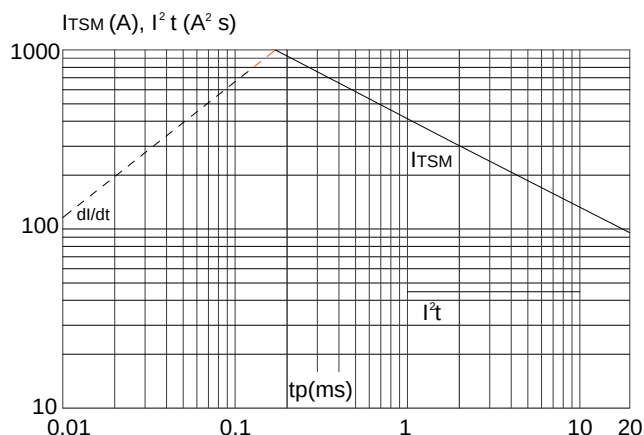
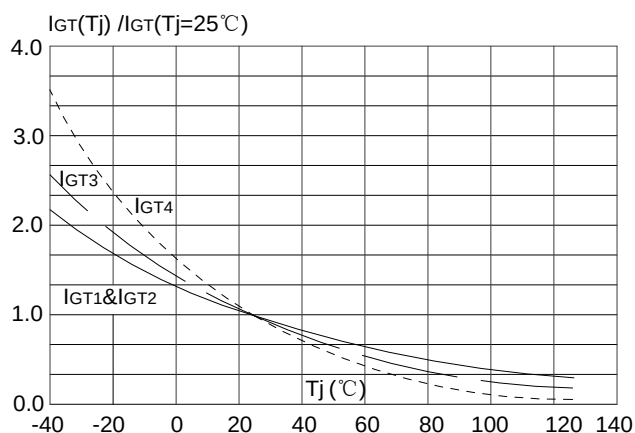


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature



RATING AND CHARACTERISTIC CURVES

FIG.7: Relative variations of holding current versus junction temperature

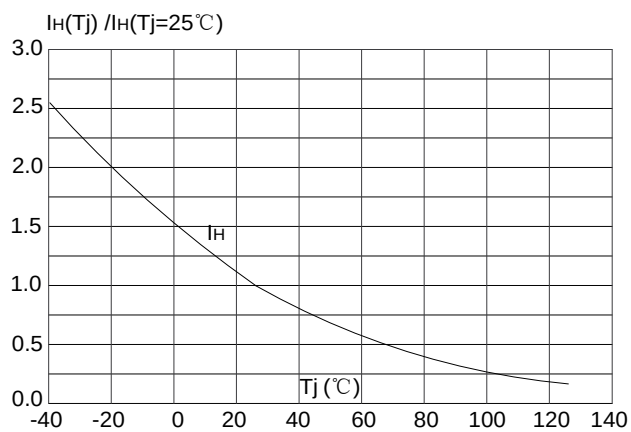
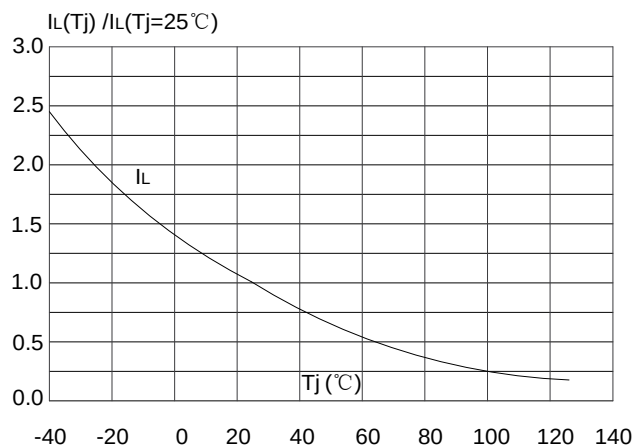
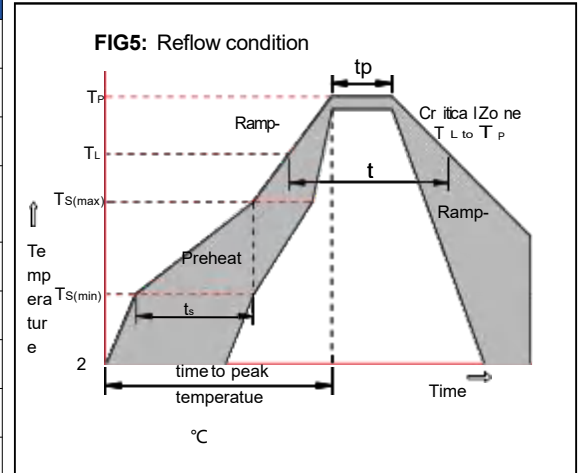


FIG.8: Relative variations of latching current versus junction temperature



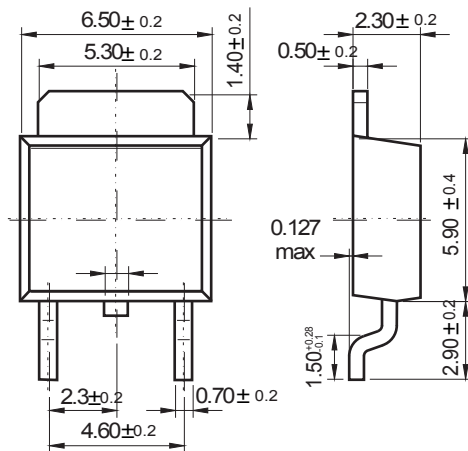
Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150 °C
	-Temperature Max($T_{s(max)}$)	+200 °C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3 °C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3 °C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217 °C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5) °C
Time within 5 °C of actual Peak Temp (t_P)		30 secs. Max
Ramp-down Rate		6 °C/sec. Max
Time 25 °C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260 °C

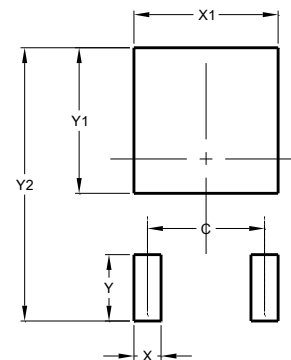


Package Dimensions & Suggested Pad Layout

TO-252

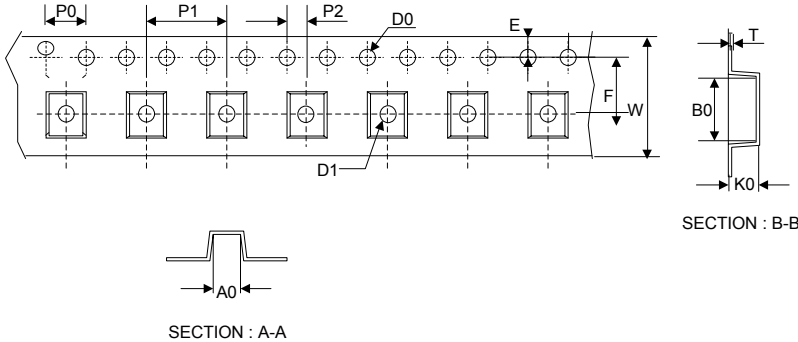
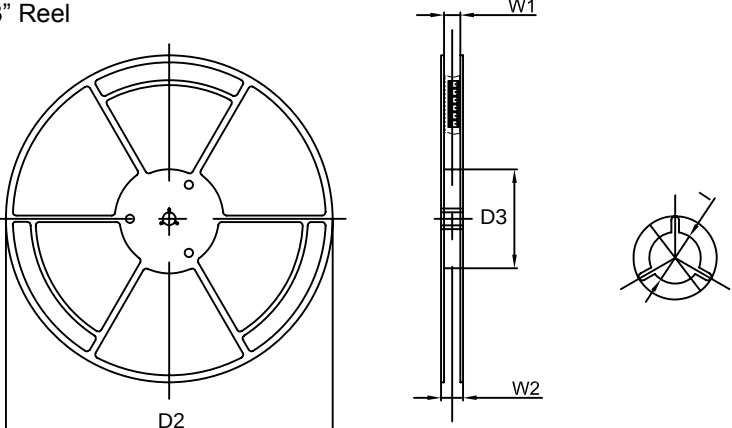


Dimensions in inches and (millimeters)



Dimensions	Value (in mm)
C	4.55
X	1.50
X1	5.80
Y	2.70
Y1	6.00
Y2	10.90

Tape & reel specification

Tape		Symbol	Dimension (mm)
		P0	4.00±0.20
		P1	8.00±0.20
		P2	2.00±0.20
		D0	1.55±0.15
		D1	1.55±0.20
		E	1.75±0.20
		F	7.50±0.20
		W	16.00±0.20
		A0	7.10±0.20
		B0	10.50±0.20
		K0	2.70±0.20
		T	0.30±0.10
		D2	330.0±5.0
		D3	100.0±4.0
13" Reel		W1	20.0±5.0
		W2	25.0±5.0
		I	13.0±2.0
		Quantity: 2500PCS	