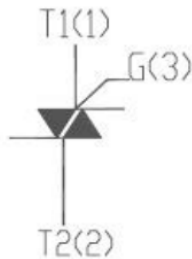




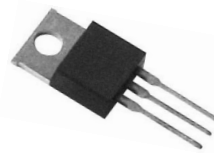
### Features

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

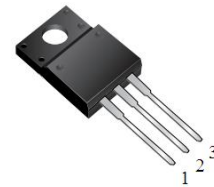


VOLTAGE RANGE 600/800 Volts

CURRENT 12 Ampere



TO-220AB



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## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

**ELECTRICAL CHARACTERISTICS (T<sub>j</sub> = 25°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 <sub>c</sub> =110°C	12	A
ITSM	Surge On-State Current	tp=16.7ms/tp=10ms	115/120	A
I <sup>2</sup> t	I <sup>2</sup> t for fusing	T <sub>p</sub> =10ms	70	A <sup>2</sup> s
PG(AV)	Average Gate Power Dissipation	T <sub>j</sub> =125°C	1	W
IGM	Peak Gate Current	tp=20us T <sub>j</sub> =125°C	4	A
T <sub>j</sub>	Operating Junction Temperature		~40~125	°C
TSTG	Storage Temperature		~40~150	°C

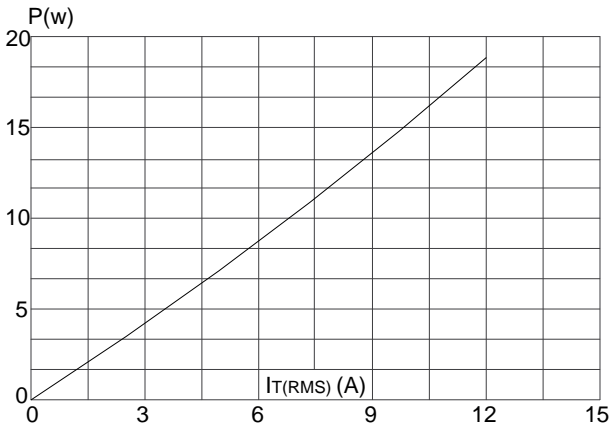
# BT138

## Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

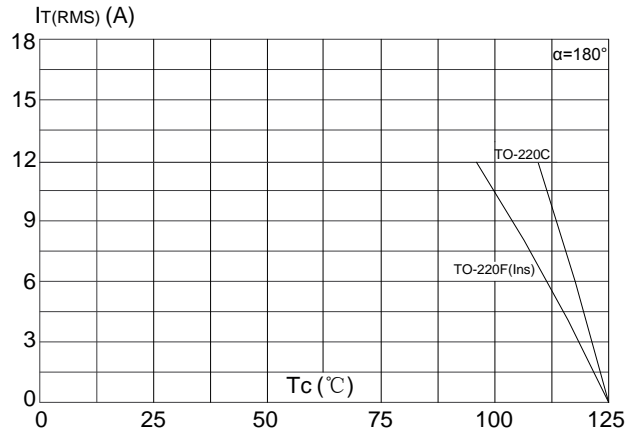
Symbol	Parameter	Test Conditions	Value				Unit
			D	E	F	G	
IDRM	Repetitive Peak Off-State Current	T <sub>J</sub> =25°C	≤5				uA
		T <sub>J</sub> =125°C	≤1				mA
IRRM	Repetitive Peak Reverse Current	T <sub>J</sub> =25°C	≤5				uA
		T <sub>J</sub> =125°C	≤1				mA
VTM	Forward "on" voltage	I <sub>T</sub> =35A t <sub>p</sub> =380us	≤1.55				V
VGT	Gate trigger voltage	V <sub>D</sub> =12V ,R <sub>L</sub> =30Ω	≤1.5				V
di/dt	Critical-rate of rise of commutation current.	I,II,III T <sub>J</sub> =125°C ,I <sub>G</sub> =2XIGT,tr ≤100ns,F=100Hz	≥50				A /us
		IV	≥10				A /us
IGT	Gate trigger current	I,II,III V <sub>D</sub> =12V R <sub>L</sub> =30Ω	≤5	≤10	≤25	≤50	mA
			IV	≤10	≤25	≤70	≤100
IH	Holding current	I <sub>T</sub> =0.2A	≤10	≤25	≤30	≤60	mA
VGD	Gate non-trigger voltage	ALL V <sub>D</sub> =V <sub>DRM</sub> T <sub>J</sub> =125°C,R <sub>L</sub> =3.3KΩ	≥0.2				V
dv/dt	Critical-rate of rise of commutation voltage	T <sub>J</sub> =125°C V <sub>D</sub> =2/3V <sub>DRM</sub> Gate	≥5	≥10	≥50	≥200	V/us
<b>BT138W(3 quadrants)</b>							
di/dt	Critical-rate of rise of commutation current.	I,II,III T <sub>J</sub> =125°C ,I <sub>G</sub> =2XIGT,tr ≤100ns,F=100Hz	≥50				A /us
IGT	Gate trigger current	I,II,III V <sub>D</sub> =12V R <sub>L</sub> =30Ω	D	E	F	G	mA
			≤5	≤10	≤25	≤50	

## RATING AND CHARACTERISTIC CURVES (BT138)

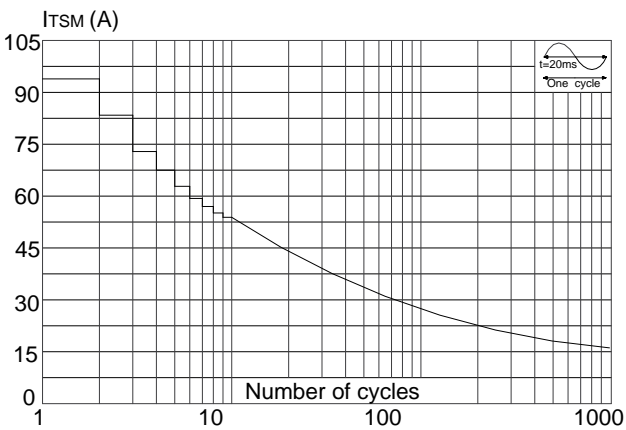
**FIG.6:** Maximum power dissipation versus RMS on-state current



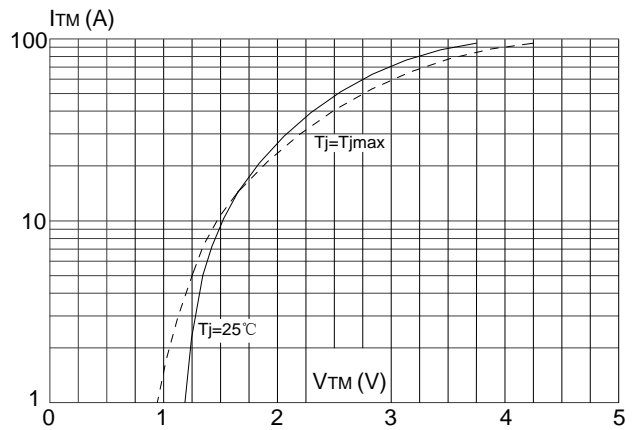
**FIG.6:** RMS on-state current versus case temperature



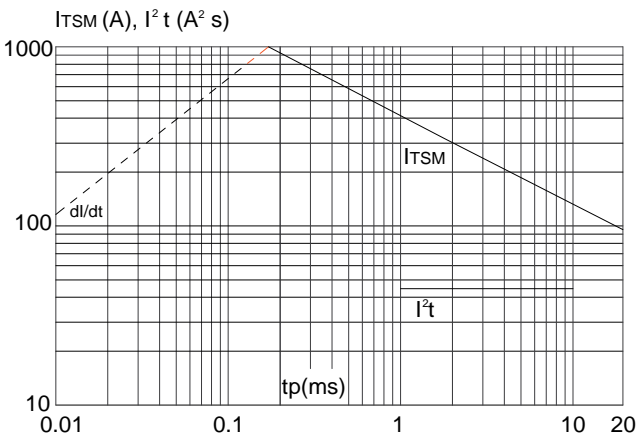
**FIG.6:** Surge peak on-state current versus number of cycles



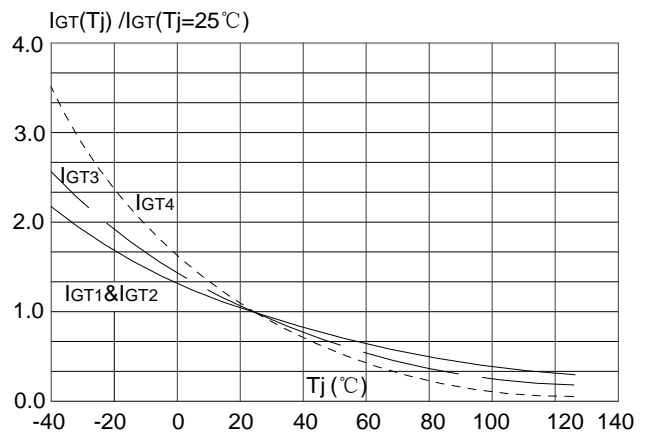
**FIG.6:** On-state characteristics (maximum values)



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

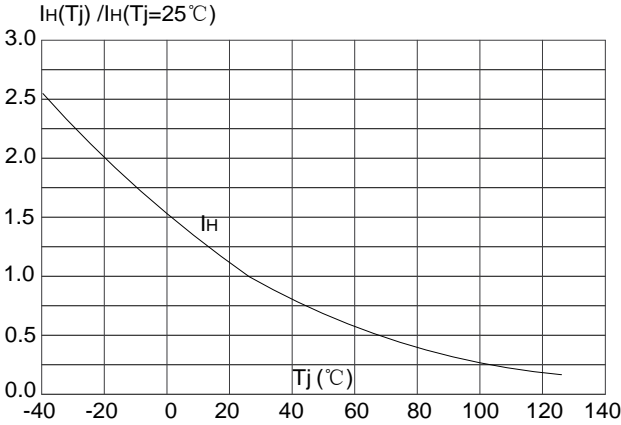


**FIG.6:** Relative variations of gate trigger current, holding current and latching current versus junction temperature

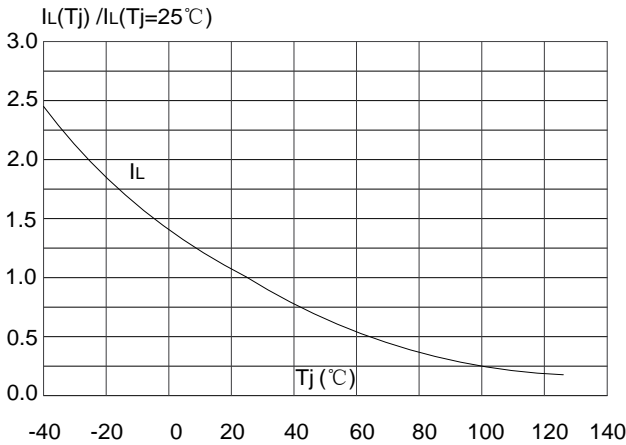


RATING AND CHARACTERISTIC CURVES (BT138)

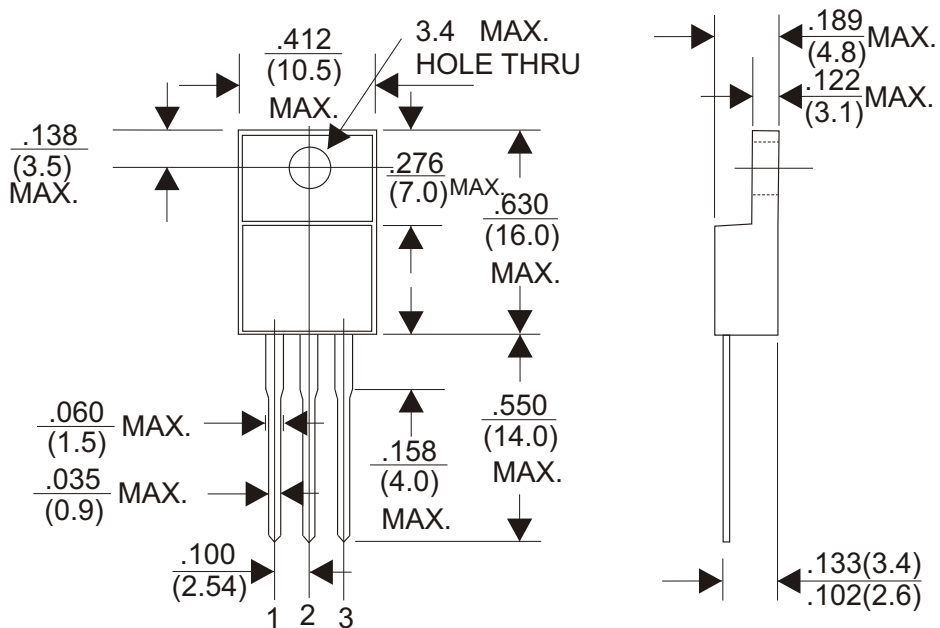
**FIG.7:** Relative variations of holding current versus junction temperature



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



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