

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

## **BT138-800x-MS(220)**

**Product specification**

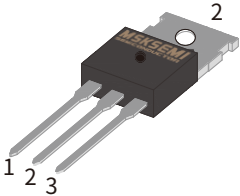
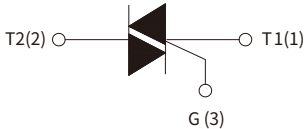

## FEATURES

- High current 12 A RMS current Triac
- Low thermal resistance
- High commutation or very high commutation capability

## APPLICATIONS

- General purpose motor control circuits
- Phase control operations in light dimmers and motor speed controllers
- Home appliances

## Reference News

TO-220	Schematic Symbol	MARKING
		

## ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value	Unit
Repetitive peak off-state voltage ( $T_j=25^{\circ}\text{C}$ )		$V_{\text{DRM}}$	800	V
Repetitive peak reverse voltage ( $T_j=25^{\circ}\text{C}$ )		$V_{\text{RRM}}$	800	V
RMS on-state current ( $T_c=105^{\circ}\text{C}$ )		$I_{\text{T(RMS)}}$	12	A
Non repetitive surge peak on-state current (full cycle, $F=50\text{Hz}$ )		$I_{\text{TSM}}$	95	
P <sub>t</sub> value for fusing ( $t_p=10\text{ms}$ )		$I^2t$	45	A <sup>2</sup> S
Critical rate of rise of on-state current ( $I_G=2 \cdot I_{\text{GT}}$ )	I - II-III	$di/dt$	50	A/ $\mu\text{s}$
	IV		10	
Peak gate current		$I_{\text{GM}}$	2	A
Average gate power dissipation		$P_{\text{G(AV)}}$	0.5	W
Peak gate power		$P_{\text{GM}}$	5	W
Operating junction temperature range		$T_j$	-40~+125	$^{\circ}\text{C}$
Storage junction temperature range		$T_{\text{STG}}$	-40~+150	

**ELECTRICAL CHARACTERISTICS** (T<sub>j</sub>=25℃ unless otherwise specified)

Symbol	Test Condition	Quadrant	Value				Unit
			D	E	F	G	
I <sub>GT</sub>	V <sub>D</sub> =12V,R <sub>L</sub> =33Ω	I - II-III	≤5	≤10	≤25	≤50	mA
		IV	≤10	≤25	≤70	≤100	
V <sub>GT</sub>		ALL	≤1.5				V
V <sub>GD</sub>	V <sub>D</sub> =V <sub>DRM</sub> , R <sub>L</sub> =3.3KΩ,T <sub>j</sub> =125℃	ALL	≥0.2				V
I <sub>H</sub>	I <sub>T</sub> =100mA		≤10	≤25	≤30	≤60	mA
I <sub>L</sub>	I <sub>G</sub> =1.2I <sub>GT</sub>	I - III- IV	≤15	≤30	≤40	≤60	
		II	≤20	≤40	≤80	≤90	
dV <sub>D</sub> /dt	V <sub>D</sub> =67%V <sub>DRM</sub> ,T <sub>j</sub> =125℃		≥20	≥50	≥50	≥200	V/μs
V <sub>TM</sub>	I <sub>TM</sub> =15A,tp=380μs		≤1.6				V
I <sub>DRM</sub>	V <sub>D</sub> =V <sub>DRM</sub> , V <sub>R</sub> =V <sub>RRM</sub>	T <sub>j</sub> =25℃	≤5				uA
I <sub>RRM</sub>		T <sub>j</sub> =125℃	≤1				mA

**THERMAL RESISTANCES**

Symbol	Parameter	Value	Unit
R <sub>th(j-c)</sub>	Junction to case(AC)	1.4	℃/W

## PARAMETER CHARACTERISTIC CURVE

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

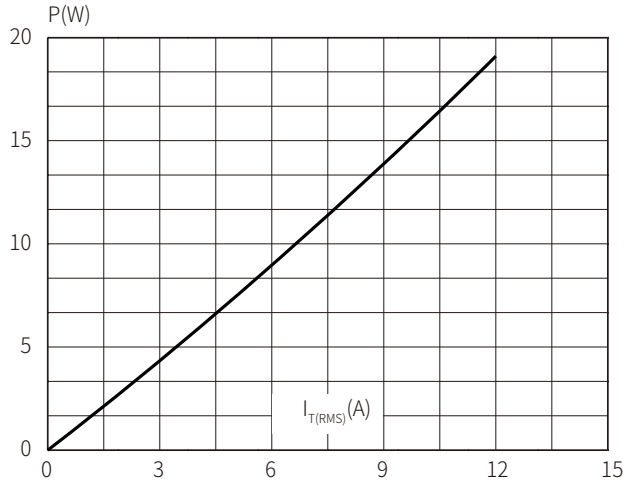


FIG.2: RMS on-state current versus case temperature

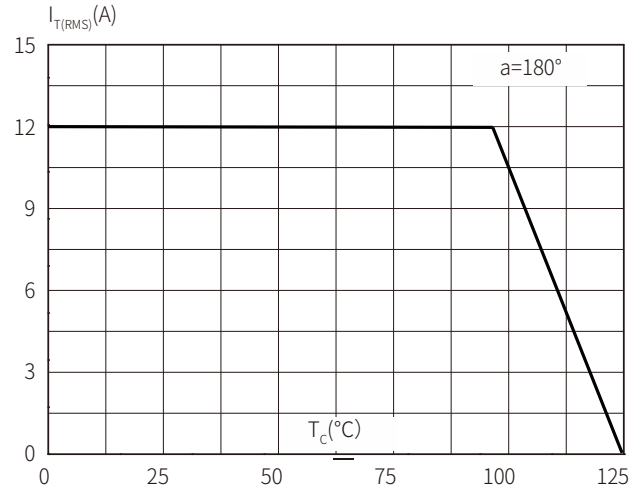


FIG.3: Surge peak on-state current versus number of cycles

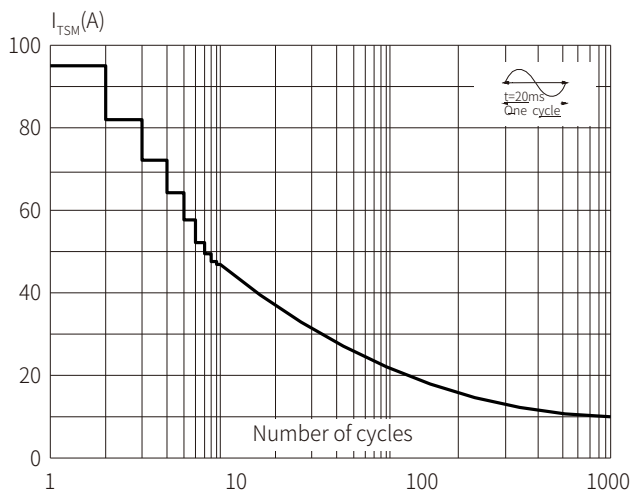
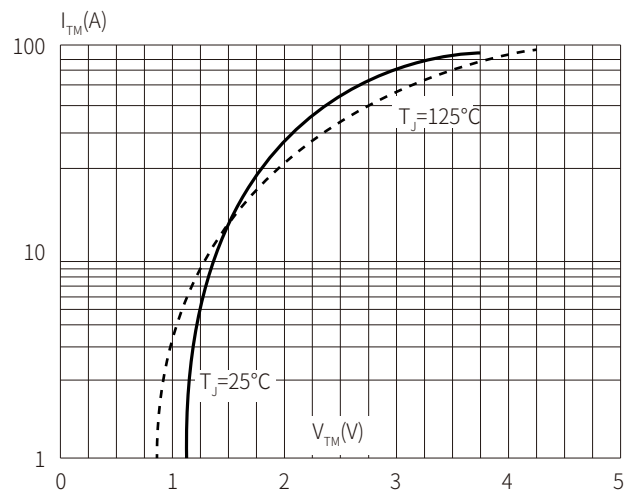
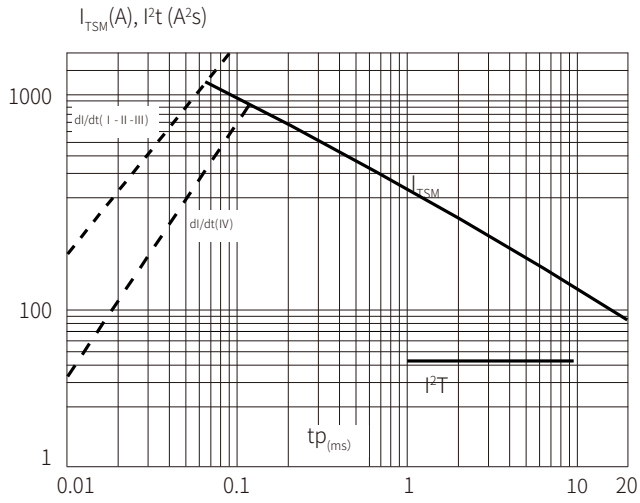


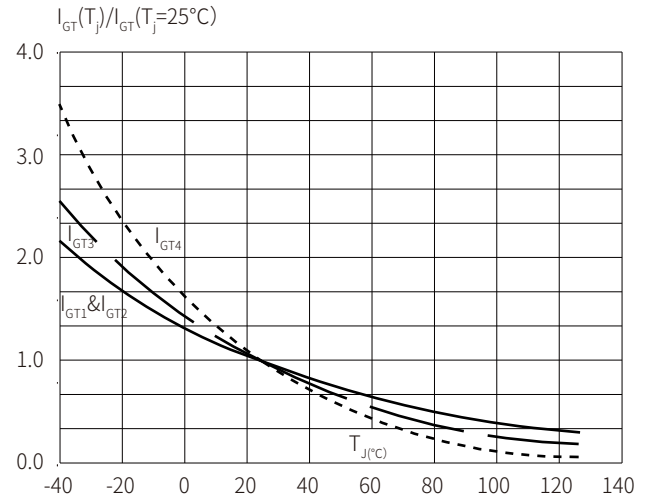
FIG.4 On-state characteristics (maximum values)



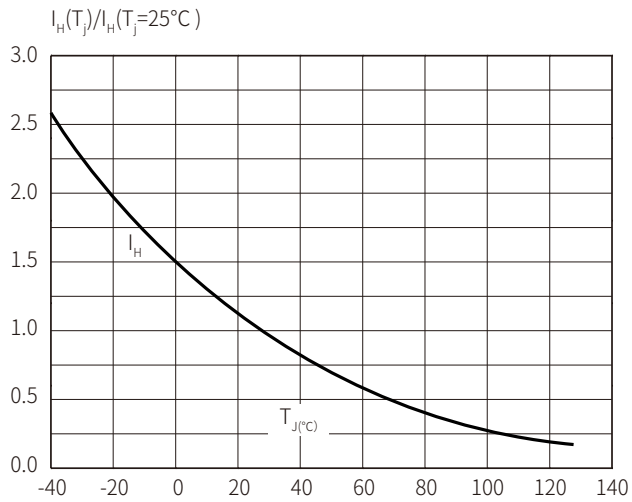
**FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 20\text{ms}$  and corresponding value of  $I^2t$  ( I - II - III:  $di/dt < 50\text{A}/\mu\text{s}$ ; IV:  $di/dt < 10\text{A}/\mu\text{s}$ )**



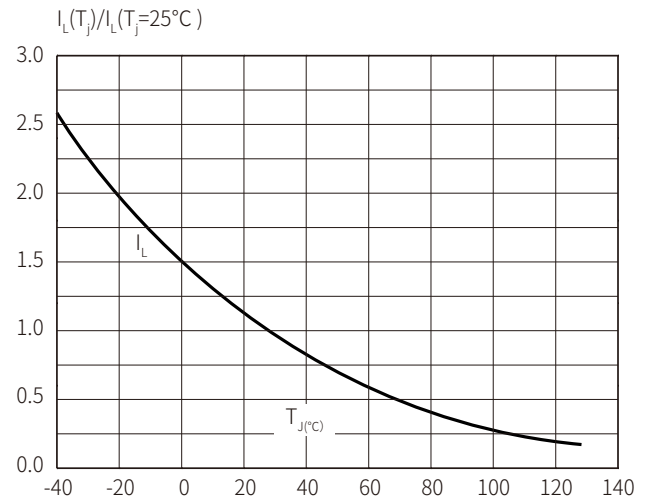
**FIG.6 Relative variations of gate trigger current versus junction temperature**



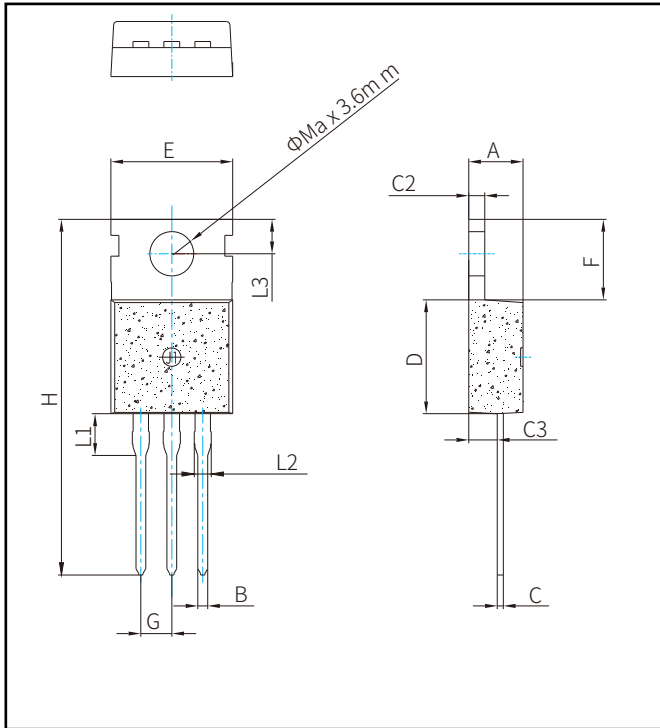
**FIG.7 Relative variations of holding current versus junction temperature**



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



## TO-220 PACKAGE MECHANICAL DATA



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.70	0.169		0.185
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.23		1.32	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.80		10.0	0.346		0.394
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		30.0	1.102		1.181
L1		3.65			0.144	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
Φ		3.6			0.142	

## Order information

P/N	PKG	QTY
BT138-800D-MS(220)	TO-220	1000PCS
BT138-800E-MS(220)	TO-220	1000PCS
BT138-800F-MS(220)	TO-220	1000PCS
BT138-800G-MS(220)	TO-220	1000PCS

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