

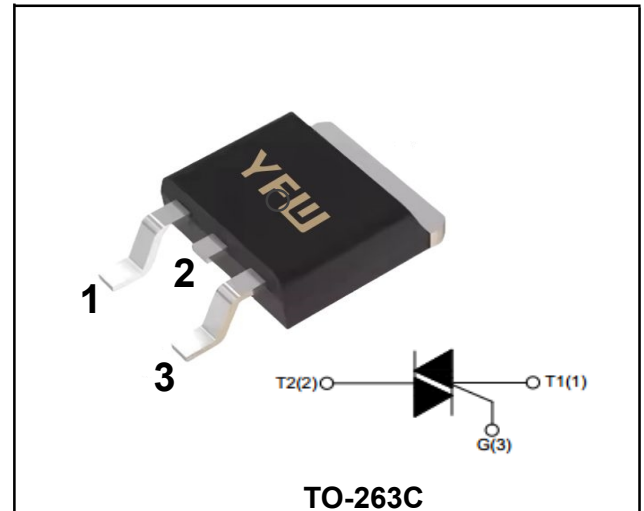
12A 4Quadrants TRIAC

Product Summary

Symbol	Value	Unit
IT(RMS)	12	A
V _{DRM} V _{R_{RM}}	600/800	V
V _{TM}	1.55	V

FEATURES

- ◆ Silicon bidirectional device with NPNPN five-layer structure
- ◆ P-type interdiffusion isolation structure
- ◆ Mesa glass passivation process
- ◆ High operating junction temperature
- ◆ Excellent commutation capability
- ◆ High dV/dt immunity
- ◆ High dI/dt immunity
- ◆ RoHS compliance



APPLICATIONS

- ◆ Heating controllers; speed controllers
- ◆ Household appliances including washing machines, mixers, coffee makers, power tools, vacuum cleaners, etc.

Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit	
Repetitive peak off-state voltage	V _{DRM}	600/800	V	
Repetitive peak reverse voltage	V _{R_{RM}}	600/800	V	
RMS on-state current	IT(RMS)	12	A	
Non repetitive surge peak on-state current (full cycle, F=50Hz)	I _{TSM}	95	A	
I ² t value for fusing (tp=10ms)	I ² t	45	A ² s	
Critical rate of rise of on-state current (IG =2 x GT)	dI/dt	I-II-III	50	A/μs
		IV	10	
Peak gate current	I _{GM}	2	A	
Gate peak power	I _{GM}	5	W	
Average gate power dissipation	P _{G(AV)}	0.5	W	
Junction Temperature	T _J	-40~+125	°C	
Storage Temperature	T _{STG}	-40 ~+150	°C	

Electrical characteristics (TA=25°C, unless otherwise noted)

Parameter	Symbol	Test Condition	Value			Unit	
			D	E	F		
Gate trigger current	I_{GT}	$V_D=12V$, $I_T=0.1A$, $T_j=25^\circ C$, Fig.6	I - II - III	≤ 5	≤ 10	≤ 25	mA
			IV	≤ 10	≤ 25	≤ 70	
Gate trigger voltage	V_{GT}	I - II - III - IV	≤ 1.3			V	
Gate non-trigger voltage	V_{GD}	$V_D=V_{DRM}$, $T_j=125^\circ C$	≥ 0.2			V	
Holding current	I_H	$V_D = 12V$, $I_{GT}=0.1A$, $T_j=25^\circ C$, Fig.6	I - II - III - IV	≤ 10	≤ 30	≤ 30	mA
latching current	I_L		I - III - IV	≤ 15	≤ 30	≤ 40	mA
			II	≤ 20	≤ 40	≤ 60	mA
Critical-rate of rise of commutation voltage	dV_D/dt	$V_D=67\%_{DRM}$, $T_j=125^\circ C$	≥ 10	≥ 20	≥ 50	V/us	

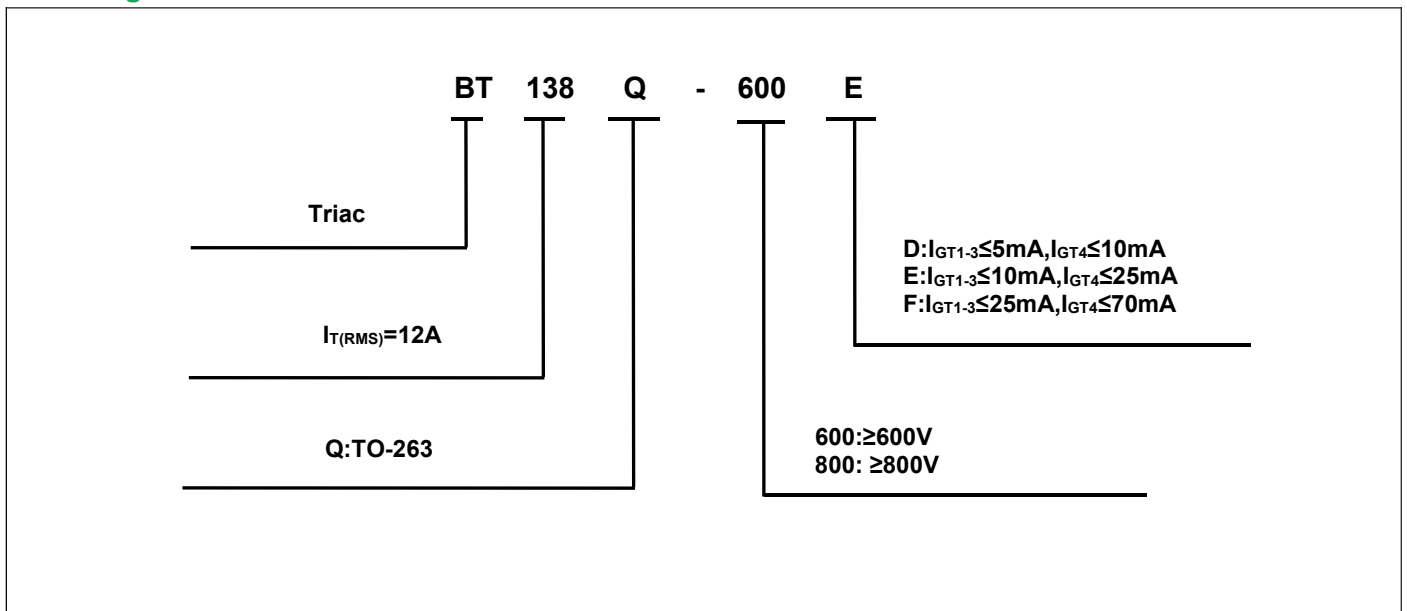
STATIC CHARACTERISTICS

Forward "on" voltage	V_{TM}	$I_{TM}=15A$, $t_p=380us$, Fig.4	≤ 1.55			V	
Repetitive Peak Off-State Current	I_{DRM}	$V_D=V_{DRM}$ $V_R=V_{RRM}$	$T_j=25^\circ C$	≤ 10	≤ 10	≤ 10	uA
Repetitive Peak Reverse Current	I_{RRM}		$T_j=125^\circ C$	≤ 1	≤ 1	≤ 1	mA

THERMAL RESISTANCES

Thermal resistance	$R_{th(j-c)}$	Junction to case(AC)	TYP.	1.4	°C/W
	$R_{th(j-a)}$	Junction to ambient $S=1\text{ cm}^2$	TYP.	45	°C/W

Ordering Information



Typical Characteristics

FIG.1 Max. Power vs RMS Current Curve

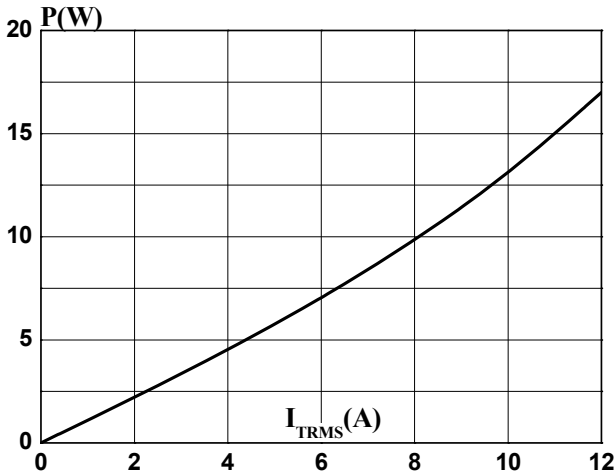


FIG.2: RMS Current vs Case Temperature Characteristic Curve

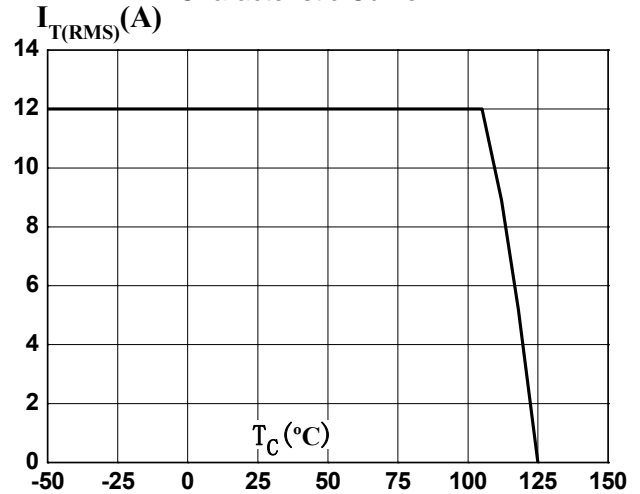


FIG.3: Peak Surge Current vs Number of Cycles Graph

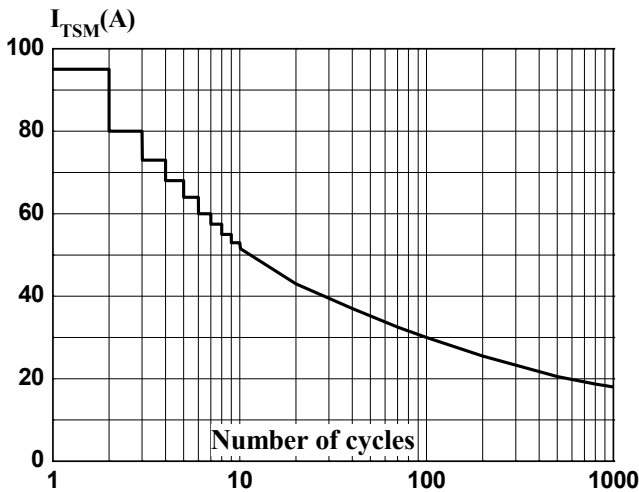


FIG.4: Output Characteristic Graph (Maximum Value Graph)

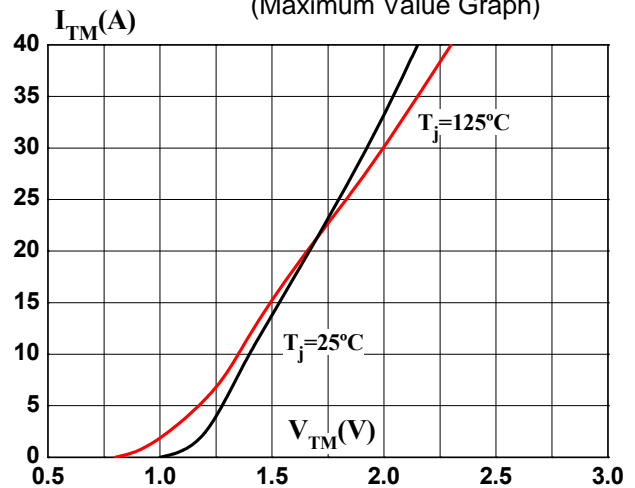


FIG.5: Non-repetitive Peak Surge Current vs Sine Wave Pulse Width Characteristic Curve

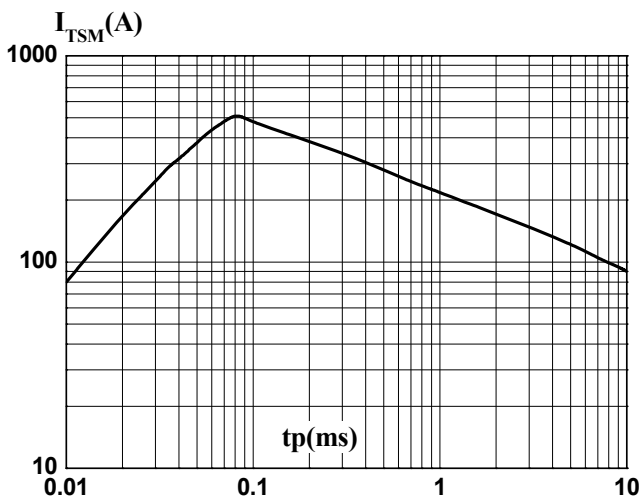
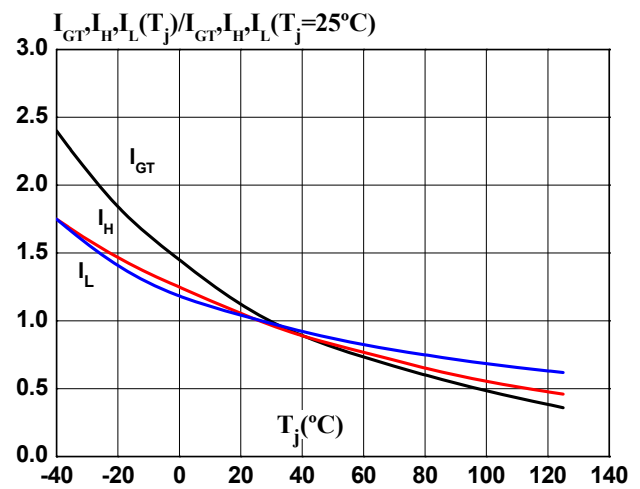
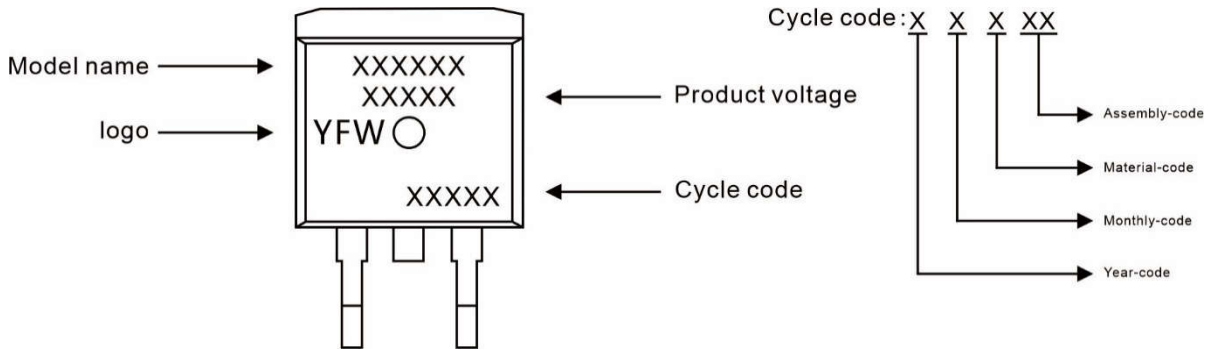


FIG.6: Gate Trigger Current, Holding Current, Latching Current vs Junction Temperature Curve



Marking Diagram



Ordering information

Model name	Package	Unit Weight	Base Quantity	Packing Quantity
BT138Q	TO-263C	0.04oz(1.16g)	800pcs/reel	1600pcs/box 8000pcs/Carton

Package Dimensions

TO-263C

Dim	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.70	0.169	0.185
A1	0.00	0.15	0.000	0.006
A2	4.30	4.55	0.169	0.179
B	1.10	1.50	0.043	0.059
b	0.70	0.90	0.028	0.035
b1	1.20	1.50	0.047	0.059
c	0.30	0.60	0.012	0.024
c1	1.17	1.37	0.046	0.054
D	9.90	10.40	0.390	0.409
E	8.50	8.90	0.335	0.350
e	2.44	2.64	0.096	0.104
e1	4.88	5.28	0.192	0.208
L	15.00	15.30	0.591	0.602
L1	5.20	5.40	0.205	0.213
L2	2.40	2.60	0.094	0.102
L3	1.60	1.80	0.063	0.071

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