BT138

Silicon Controlled Rectifier

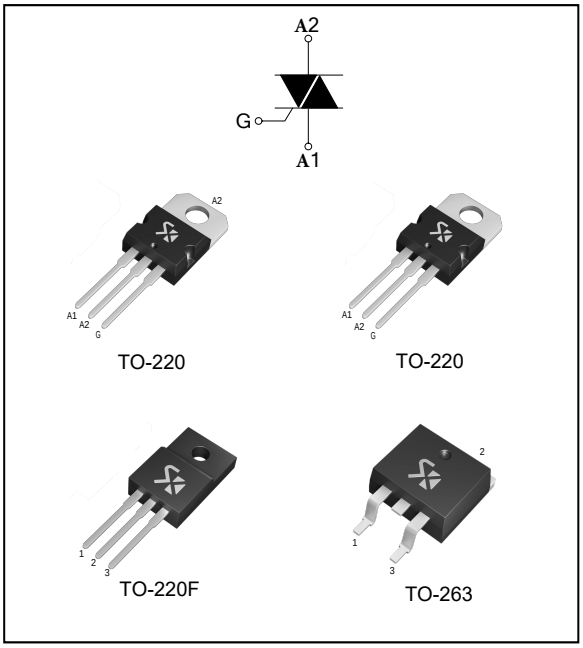
Features

· NPNPN four-layer silicon unidirectional device;

· With independent intellectual property rights of single-side grooving technology, table glass passivation process;

· Multilayer metallized electrode on the back;

· High blocking voltage and high temperature stability



Application

· Solid state relay;
· Phase-controlled circuit;
· Adjustable heating controller;
· Speed control controller;

■ ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER			RATINGS	UNIT
$I_{T(RMS)}$	RMS On-State Current	BTA BTB	Tc=80℃ Tc=90℃	12	A
I_{TSM}	Non Repetitive Surge Peak On-State Current	F=50HZ	t=20ms	120	A
I^2t	I^2t Value	tp=10ms		72	A^2S
di/dt	Critical Rate of Rise of On-State Current	Tj=125℃		50	A/us
V_{DRM}/V_{RRM}	Repetitive Peak Off-State Voltage	Tj=25℃		600/800	V
I_{GM}	Peak Gate Current	tp=20us	Tj=150℃	4	A
$P_{G(AV)}$	Average Gate Power Dissipation		Tj=150℃	10	W
Tstg Tj	Storage Junction Temperature Operating Junction Temperature			−40to+150 −40to+125	℃

■ Electrical characteristics (three quadrants)

PARAMETER	SYMBOL	TEST CONDITIONS	Quadrants		RATINGS	UNIT
Gate Trigger Current	I_{GT}	V_D=12V（DC） R_L=100Ω	Ⅰ Ⅱ Ⅲ	MAX	≦50	mA
Gate Trigger Voltage	V_{GT}			MAX	1.5	V
GateNon-Trigger Voltage	V_{GD}	Tj=150℃		MIN	0.2	V
HoldingCurrent	I_H	I_T=0.5A		MAX	60	mA
Latching Current	I_L	I_G=1.2I_{GT}		MAX	60 100	mA
Critical Rate of Rise of Off-State Voltage	dv/dt	V_D=2/3V_{DRM} Tj=150℃		MIN	500	V/us
Critical Rate of Rise of Off-State Voltage at Commutation	(dv/dt)c	Tj=150℃		MIN	8	V/us

■ Electrical characteristics (four quadrants)

PARAMETER	SYMBOL	TEST CONDITIONS	Quadrants		RATINGS		UNIT
Gate Trigger Current	I_{GT}	V_D=12V R_L=100 Ω	Ⅰ Ⅱ Ⅲ Ⅳ	MAX	Ⅰ Ⅱ Ⅲ	Ⅳ	mA
					≦50	≦120	
Gate Trigger Voltage	V_{GT}			MAX	1.5		V
GateNon-Trigger Voltage	V_{GD}	Tj=125℃		MIN	0.2		V
HoldingCurrent	I_H	I_T=0.5A		MAX	60		mA
Latching Current	I_L	I_G=1.2I_{GT}		MAX	60 100		mA
Critical Rate of Rise of Off-State Voltage	dv/dt	V_D=2/3V_{DRM} Tj=125℃		MIN	500		V/us
Critical Rate of Rise of Off-State Voltage at Commutation	(dv/dt)c	Tj=125℃		MIN	10		V/us

■ Static parameters

SYMBOL	PARAMETER			RATINGS	UNIT
V_{TM}	Peak On-State Voltage	Tj=25℃ ITM=24A	MAX	1.40	V
V_{T0}	Threshold voltage	Tj=150℃	MAX	0.86	V
Rd	Resistance	Tj=150℃	MAX	36.6	mΩ
I_{DRM} I_{RRM}	Repetitive Peak Off-State Current	Tj=25℃ Tj=150℃	MAX	5	uA
				1	mA
$R_{th(j-c)}$	Junction to Case (DC)	BTA		2.05	℃/W
		BTB		1.25	

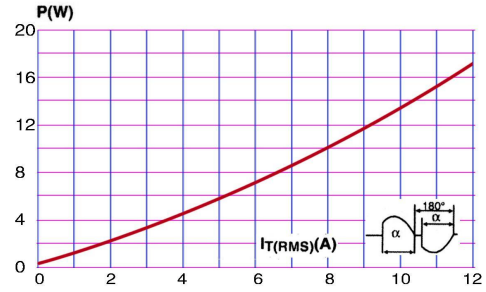


FIG.1: Maximum power dissipation versus RMS on-state current(180℃)

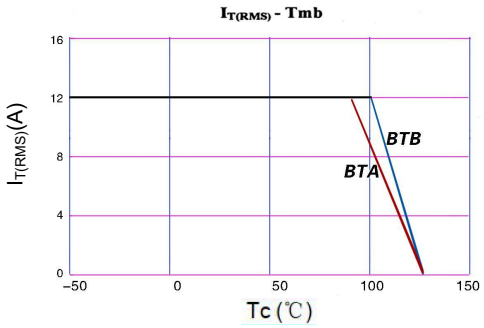


FIG.2: RMS on-state current versus case temperature

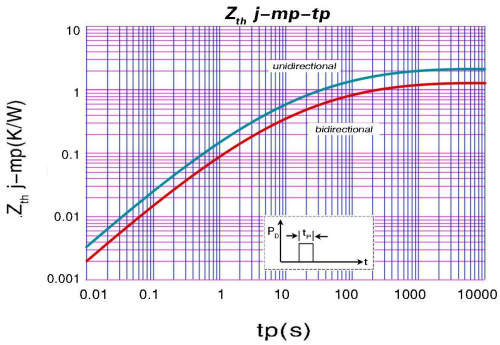


FIG.3: Transient thermal resistance diagram

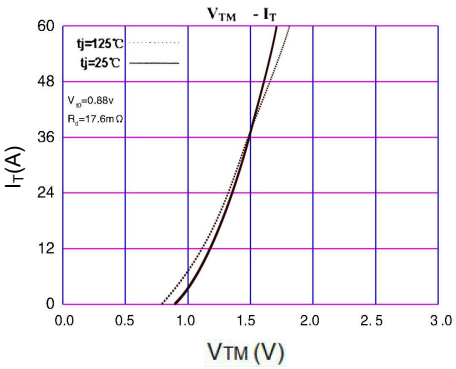


FIG.4: On-state characteristics (maximum values)

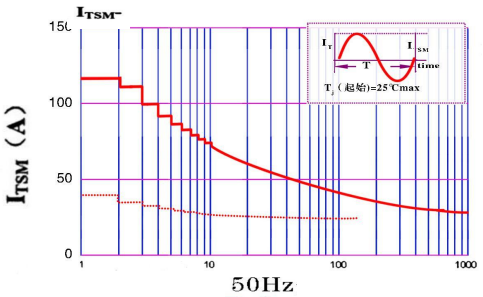


FIG.5: Surge peak on-state current versus number of cycles

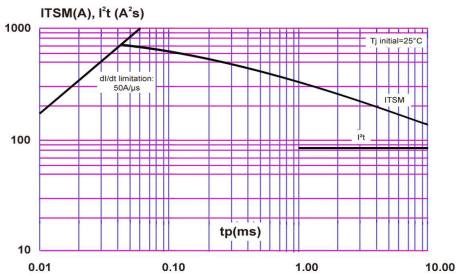


FIG.6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<20ms, and corresponging value of I^2t.

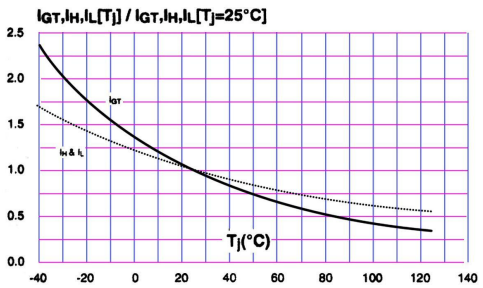


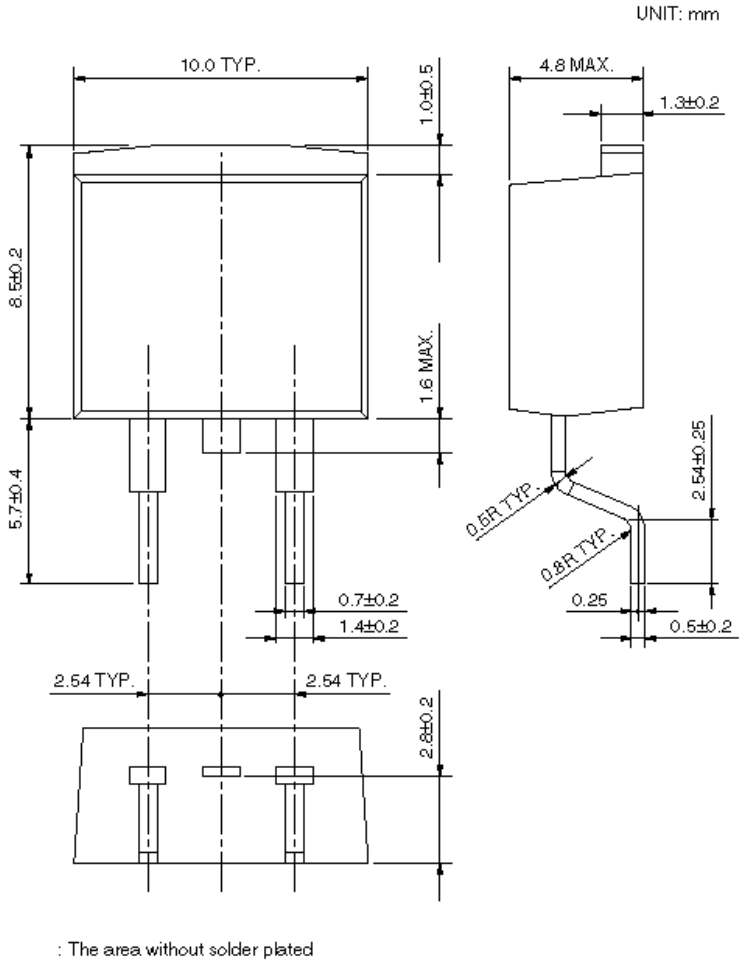
FIG.7: Relative variations of gate trigger current,holding current and latching current versus junction temperature

PACKAGE OUTLINE

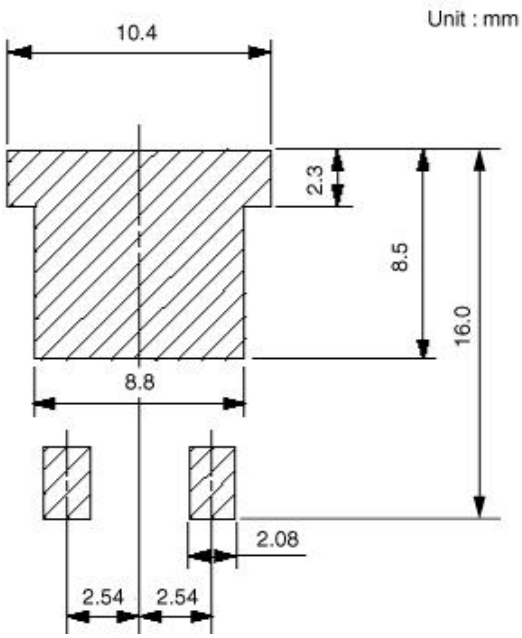
Plastic surface mounted package;

TO-263

●**Unit：mm(±0.1)**



: The area without solder plated

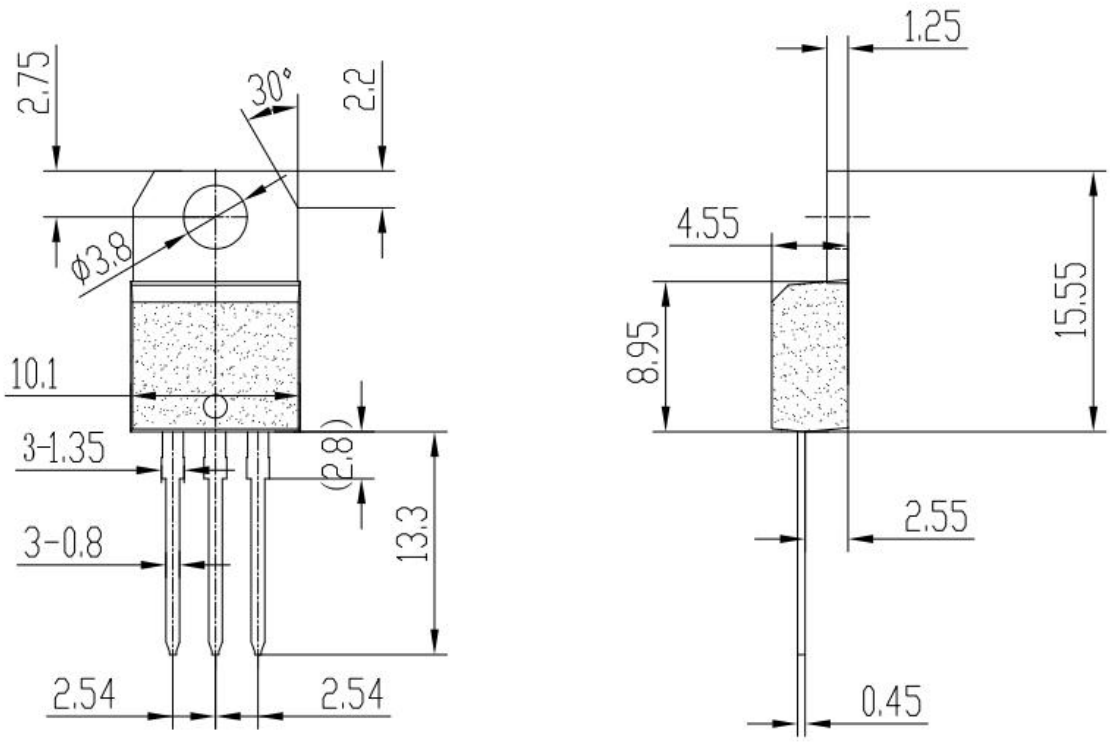


PACKAGE OUTLINE

Plastic surface mounted package;

TO-220

●**Unit：mm(±0.1)**

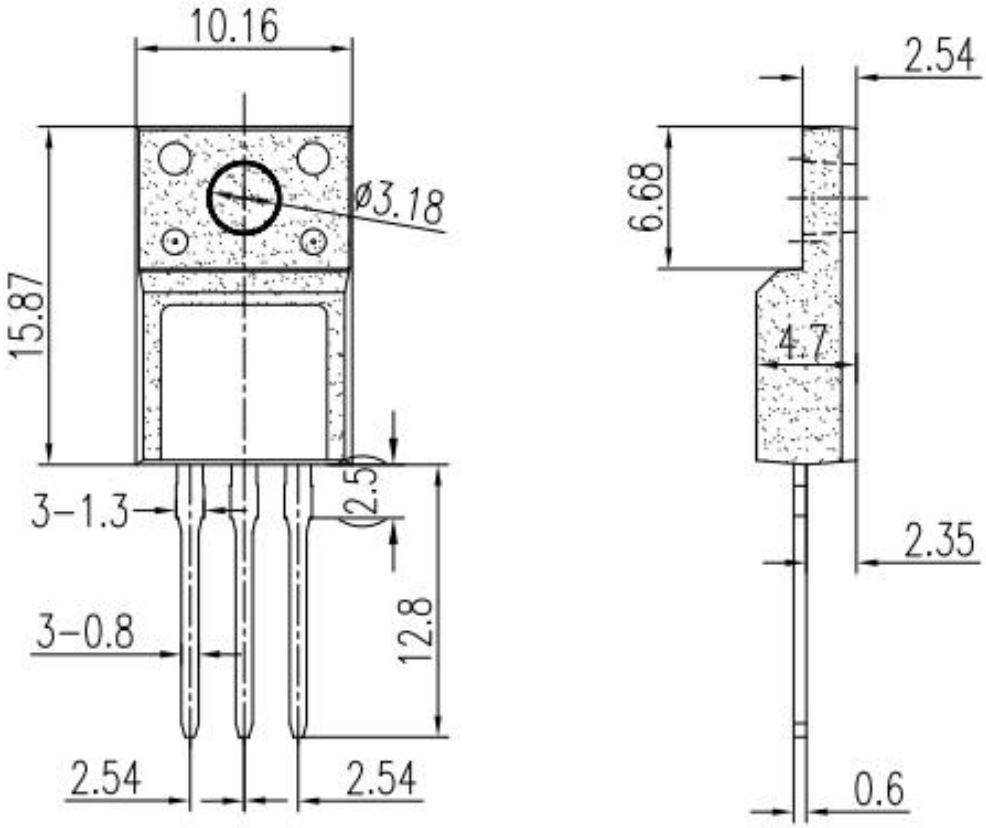


PACKAGE OUTLINE

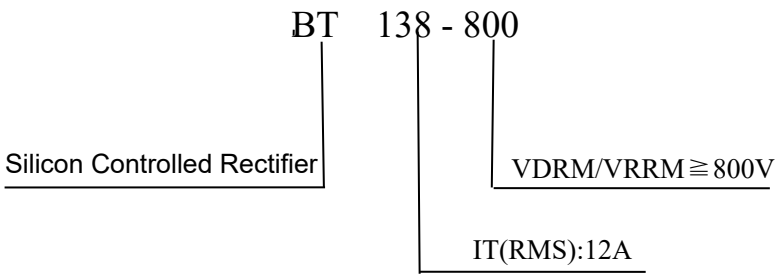
Plastic surface mounted package;

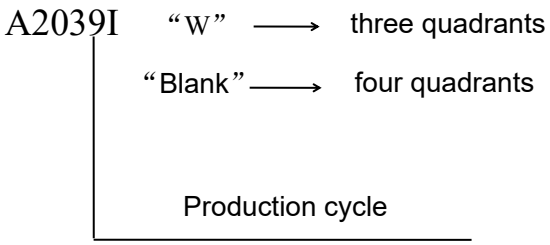
TO-220F

●**Unit：mm(±0.1)**



●Product marking comments：





XXXXX_____ Production batch number