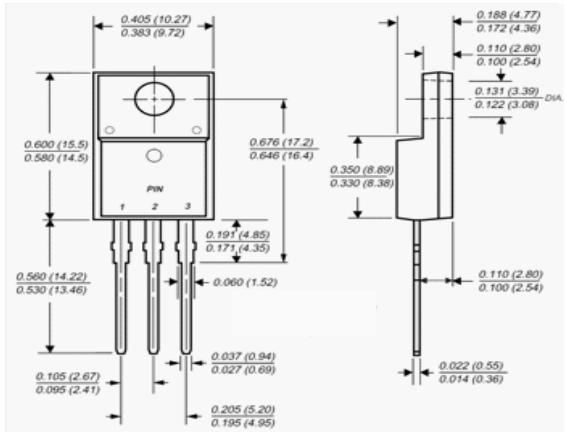
Bi-Directional Triode Thyristor

- High current density due to double mesa technology, SIPOS and Glass passivation .
  BT20F series triacs is suitable for general purpose AC switching. They can be used as an ON/OFF function is applications such as static relays, heating regulation,
  induction motor stating circuits or phase control operation light dimmers, motorspeed controllers.
- BT20F series are 3 Quadrants triacs,
  They are specially recommended for use on inductive loads.

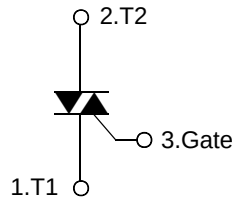
TO-220F



Features

- Blocking Voltage to 600~800 V
- On-State Current Rating of 20A RMS at 90℃
- Uniform Gate Trigger Currents in Three Quadrants
- High Immunity to dV/dt-1500V/us minimum at 125℃
- Minimizes Snubber Networks for Protection
- Industry Standard TO-220F Package
- High Commutating dI/dt- 4.0A/ms minimum at 125℃
- Internally Isolated (2500VRMS)
- These are Pb-Free Devices

Symbol



Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Storage junction temperature range		Tstg	-40 to +150	℃
Operating junction temperature range		Tj	-40 to + 125	℃
Repetitive Peak OFF-state Voltage	Tj=25℃	V_{DRM}	600 and 800	V
Repetitive Peak Reverse Voltage	Tj=25℃	V_{RRM}	600 and 800	V
Non repetitive surge peak off-state voltage	Tp=10ms,Tj=25℃	V_{DSM}	700 and 900	V
Non repetitive peak reverse voltage		V_{RSM}	700 and 900	V
RMS on-state current(full sine wave)	TC=90℃	IT(RMS)	20	A
	TC=70℃			
Non repetitive surge peak on-state current(full cycle,TJ=25℃)	f=60Hz,t=16.7ms	ITSM	210	A
	f=50Hz,t=20ms		200	
I^2t Value for fusing	Tp=10ms	I^2t	200	A^2s
Critical rate of rise of on-state current IG=2*IGT,tr≤100ns,f=120Hz,Tj=125℃		dI/dt	100	A/us
Peak gate current(tp=20us,Tj=125℃)		I_{GM}	4	A
Peak gate power dissipation(tp=20us,Tj=125℃)		P_{GM}	10	W
Average gate power dissipation(Tj=125℃)		PG(AV)	1	W

Electrical Characteristics (Tj=25℃,unless otherwise specified)

Symbol	Test Condition	Quadrant		Limit		Unit
				CW(C)	BW(B)	
I_{GT}	V_D=12V,R_L=33Ω	Ⅰ-Ⅱ-Ⅲ-Ⅳ	MAX	35	50	mA
V_{GT}		Ⅰ-Ⅱ-Ⅲ-Ⅳ	MAX	1.5		V
V_{GD}	V_D=V_{DRM} R_L=3.3KΩ Tj=125℃	Ⅰ-Ⅱ-Ⅲ-Ⅳ	MIN	0.2		V
IL	I_G=1.2I_{GT}	Ⅰ-Ⅲ-Ⅳ	MAX	50	70	mA
		Ⅱ	MAX	60	80	mA
IH	I_T=100mA		MAX	40	60	mA
Dv/dt	VD=67%VDRM gate open TJ=125℃		MIN	250	500	V/us
(Dv/dt)c	(dI/dt)c=8.8A/ms Tj=125℃		MIN	7	12.5	V/us

Static Characteristics

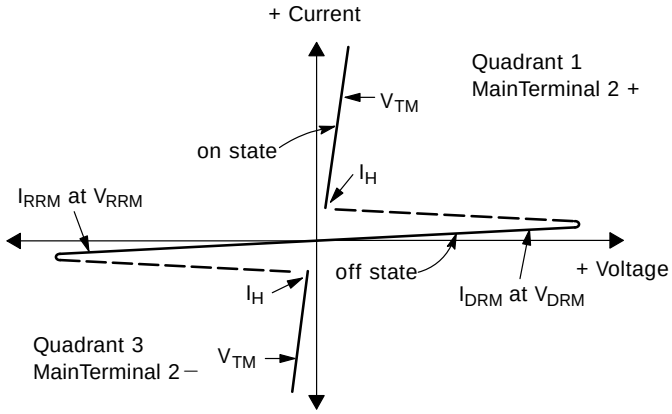
Symbol	Parameter		Value(MAX)	Unit
V_{TM}	ITM=28A,tp=380us	Tj=25℃	1.55	V
I_{DRM}	VD=V_{DRM} VR=V_{RRM}	Tj=25℃	5	uA
I_{RRM}		Tj=125℃	2.5	mA

Thermal Resistances

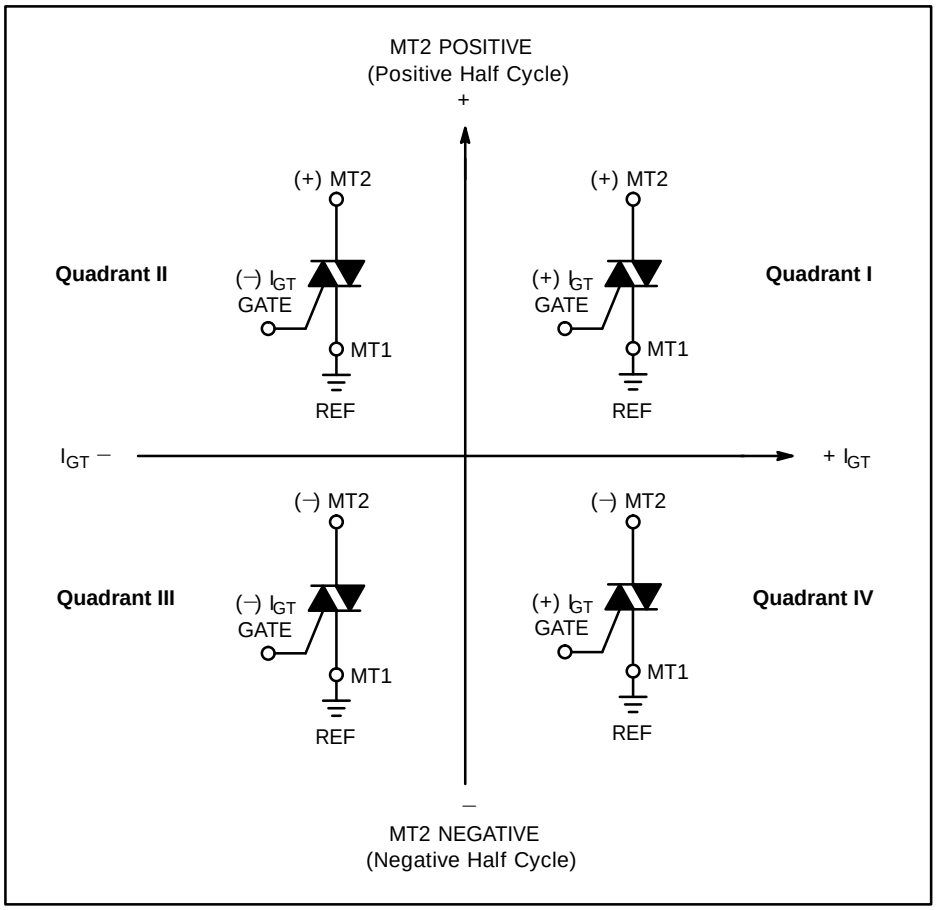
Symbol	Parameter	Value	Unit
Rth(J-C)	Junction to case(AC)	2.1	℃/W

Voltage Current Characteristic of Triacs (Bidirectional Device)

Symbol	Parameter
V_{DRM}	Peak Repetitive Forward Off State Voltage
I_{DRM}	Peak Forward Blocking Current
V_{RRM}	Peak Repetitive Reverse Off State Voltage
I_{RRM}	Peak Reverse Blocking Current
V_{TM}	Maximum On State Voltage
I_H	Holding Current



Quadrant Definitions for a Triac



All polarities are referenced to MT1.
With in–phase signals (using standard AC lines) quadrants I and III are used.

Fig. 1: Maximum RMS power dissipation versus RMS on-state current (F = 50Hz).(Curves are cut off by (dI/dt)c limitation)

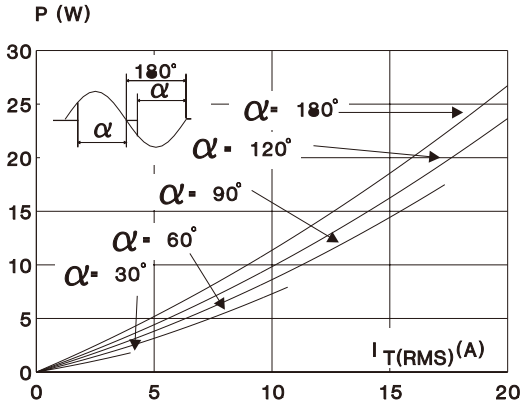


Fig. 2: Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact (BTA).

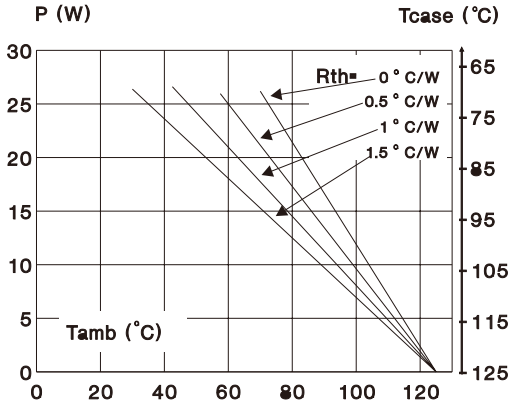


Fig. 3: Correlation between maximum RMS power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact (BTB).

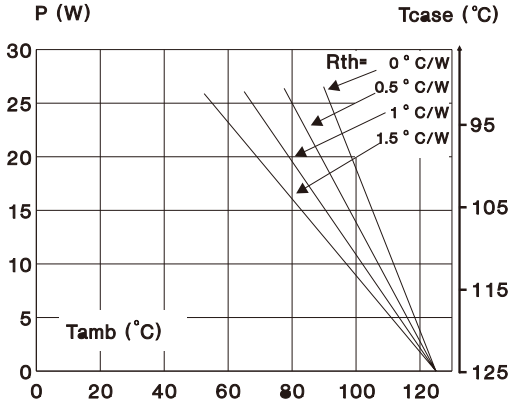


Fig. 4: RMS on-state current versus case temperature.

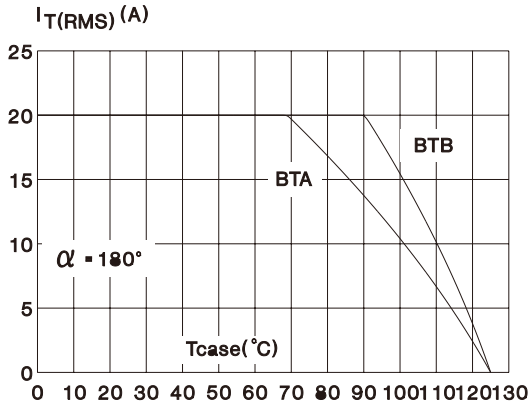


Fig. 5: Relative variation of thermal impedance versus pulse duration.

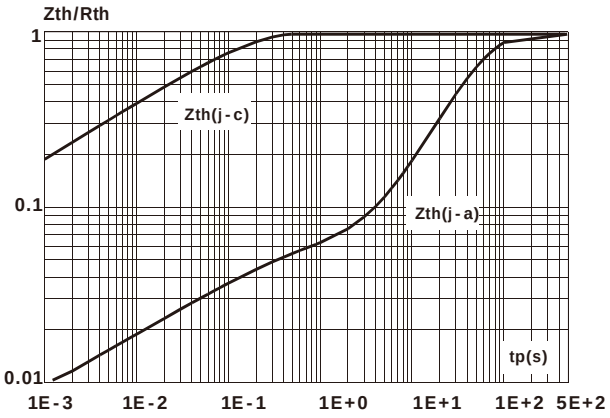


Fig. 6: Relative variation of gate trigger current and holding current versus junction temperature.

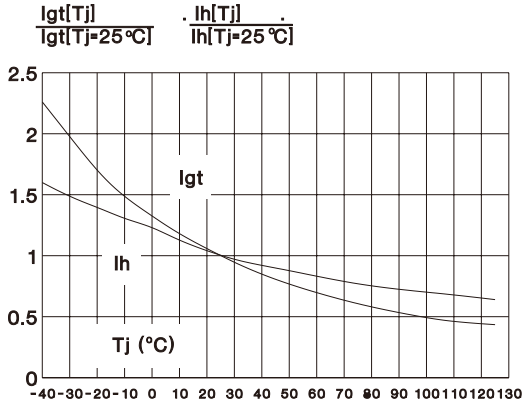


Fig. 7: Non repetitive surge peak on-state current versus number of cycles.

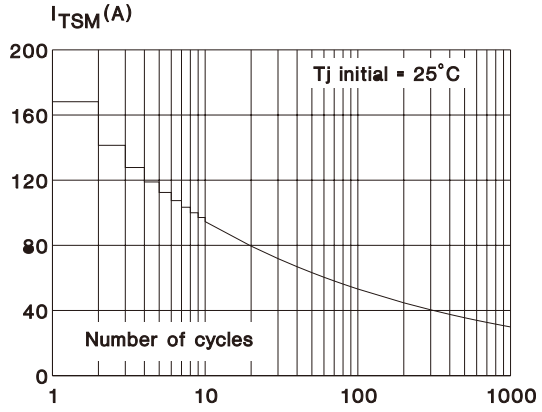


Fig. 8: Non repetitive surge peak on-state current for a sinusoidal pulse with width: t≤10ms, and corresponding value of I^2t.

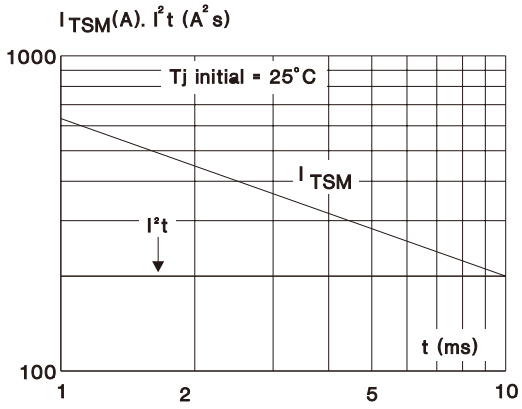


Fig. 9: On-state characteristics (maximum values).