

Features

- ◇ The LGE BT138, 12A III & IV quadrants series triacs, which can be operated in III & IV quadrants. As silicon bidirectional device, with NPNPN five-layer structure; singlesided trenching technology, mesa glass passivation process;
- ◇ multi-layer metallized electrode on the back side;
- ◇ High blocking voltage and high temperature stability.

Applications

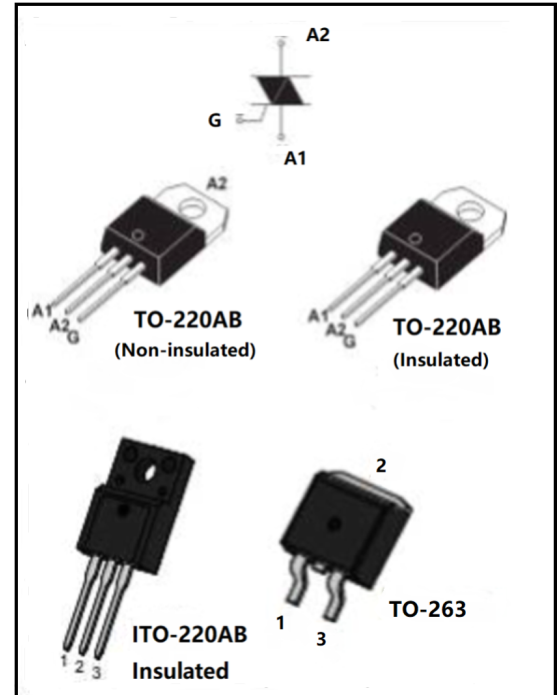
The LGE BT138 is suitable for inductive load switching operations, also can be used in ON/OFF function applications such as washing machine, induction motor starting circuits, vacuum cleaners, power tools and other motors such as speed control maker; heating regulation, solid state relay; phases control circuit; AC motor speed regulation, and so on.

Mechanical Data

- ◇ Moisture Sensitivity: MSL Level 1, per J-STD-020
- ◇ Terminals: Matte Tin Finish.
- ◇ Solderable per MIL-STD-202 Method 208
- ◇ Case Material: Molded Plastic;
- ◇ Molding compound meet UL Flammability Classification Rating 94V-0
- ◇ Case: JEDEC TO-220AB, ITO-220AB, TO-263

MAXIMUM RATING

Ratings at 25°C ambient temperature unless otherwise specified.



PARAMETER			SYMBOL	VALUE	UNITS
R.M.S. On-State Current	BT138	Tc=110℃	IT(RMS)	12	A
Non-Repetitive Surge Peak On-State Current(fFull Cycle,Tj initial=25℃)	F=50HZ	T=20ms	ITSM	120	A
	F=60HZ	T=16.7ms		115	
I ² t Value for Fusing	tp=10ms		I ² t	72	A ² s
Critical Rate of Rise of On-State Current IG=2×IGT, tr≤100ns	F=120HZ	Tj=125℃	di/dt	50	A/ μ s
Repetitive peak Off-State voltage		Tj=25℃	VDRM/VRRM	600/800	V
Non repetitive surge peak off-state voltage	tp=10ms	Tj=25℃	VDSM/VRSM	VDRM/VRRM+100	V
Peak Gate Current	tp=20μs	Tj=125℃	IGM	4	A
Average Gate Power Dissipation		Tj=125℃	PG(AV)	1	W
Typical Thermal Resistance (Junction to Ambient)	TO-220AB/ TO-263		RθJA	60	℃/W
	TO-220AB Insulated			45	
	TO-220F Insulated			60	
Typical Thermal Resistance(Junction to Case (AC))	TO-220AB/TO-263		RθJC	1.2	℃/W
	TO-220AB Insulated			2.1	
	TO-220F insulated			2.5	
Maximum Operating Junction temperature			TJ	-40~+125	℃
Storage temperature range			TSTG	-40~+150	℃

ELECTRICAL CHARACTERISTICS(III QUADRANTS)

PARAMETER	TEST CONDITIONS	SYMBOL	VALUES				UNITS
				SW	CW	BW	
Gate Trigger Current	VD=12V,RL=100 Ω	IGT	MAX	10	35	50	mA
Gate Trigger Voltage	(I II IIIquadrant)	VGT	MAX	1.3			V
Gate Non-Trigger Voltage	Tj=125°C (I II IIIquadrant)	VGD	MIN	0.2			V
Holding Current IT=0.5A		IH	MAX	10	40	60	mA
Latching Current IG=1.2IGT	I III quadrant	IL	MAX	30	50	70	mA
	II quadrant		MAX	40	60	80	
Critical Rate of Rise of Off-State Voltage VD=2/3VDRM,Tj=125°C		dv/dt	MIN	200	500	1000	V/ μ s
Critical Rate of Rise of Off-State Voltage at Commutation, Tj=125°C		(dv/dt)c	MIN	8			V/ μ s

ELECTRICAL CHARACTERISTICS(IV QUADRANTS)

PARAMETER	TEST CONDITIONS		SYMBOL	VALUE					UNITS
					D	E	F	G	
Gate Trigger Current	VD=12V,RL=100 Ω (I II IIIIV quadrant)	I II III	IGT	MAX	5	10	25	50	mA
		IV		MAX	10	25	70	100	
Gate Trigger Voltage		All	VGT	MAX	1.3			V	
Gate Non-Trigger Voltage	Tj=125°C (I II IIIquadrant)		VGD	MIN	0.2			V	
Holding Current IT=0.5A			IH	MAX	10	20	40	60	mA
Latching Current =1.2IGT	I III IVquadrant		IL	MAX	10	30	50	70	mA
	II quadrant			MAX	20	40	70	100	
Critical Rate of Rise of Off-State Voltage VD=2/3VDRM,Tj=125°C			dv/dt	MIN	20	50	100	200	V/ μ s
Critical Rate of Rise of Off-State Voltage at Commutation, Tj=125°C			(dv/dt)c	MIN	10			V/ μ s	

STATIC CHARACTERISTICS

PARAMETER	TEST CONDITIONS	SYMBOL		VALUE	UNITS
Peak On-State Voltage	ITM=32A,Tj=25°C	V _{TM}	MAX	1.60	V
Threshold Voltage	Tj=125°C	V _{TO}	MAX	0.87	V
Dynamic Resistance	Tj=125°C	R _d	MAX	36.6	m Ω
Repetitive Peak Off-Statte Curren V _{DRM} =V _{R_{RM}}	Tj=25°C	I _{DRM}	MAX	5	μ A
	Tj=125°C	I _{RRM}	MAX	1	mA

RATING AND CHARACTERISTICS CURVES

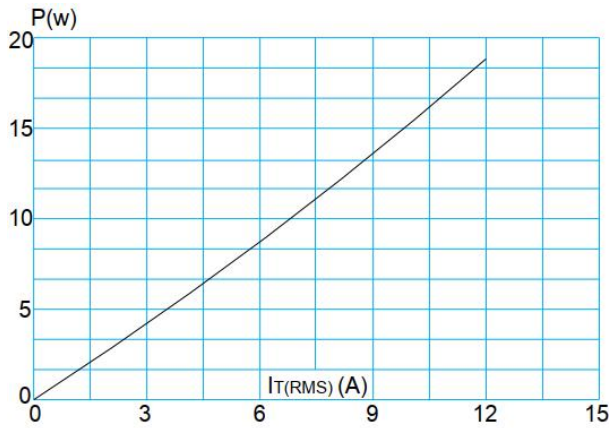


FIG.1: Maximum power dissipation versus RMS on-state current

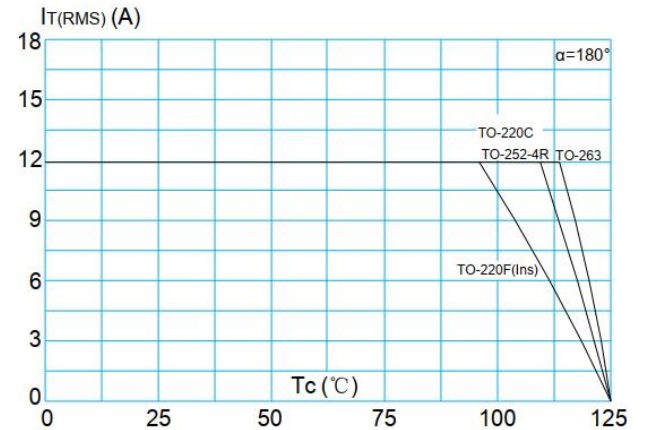


FIG.2: RMS on-state current versus case temperature

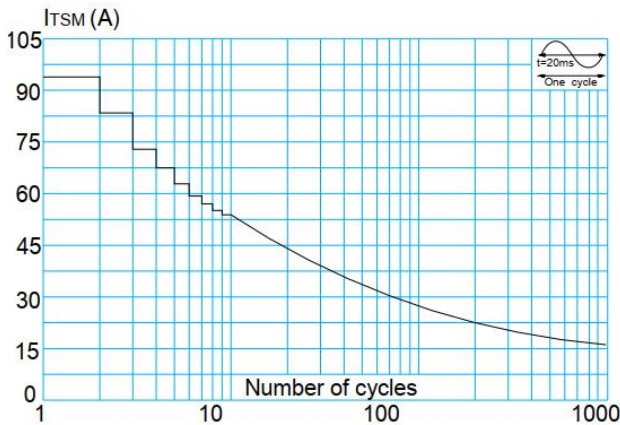


FIG.3: Surge peak on-state current versus number of cycles

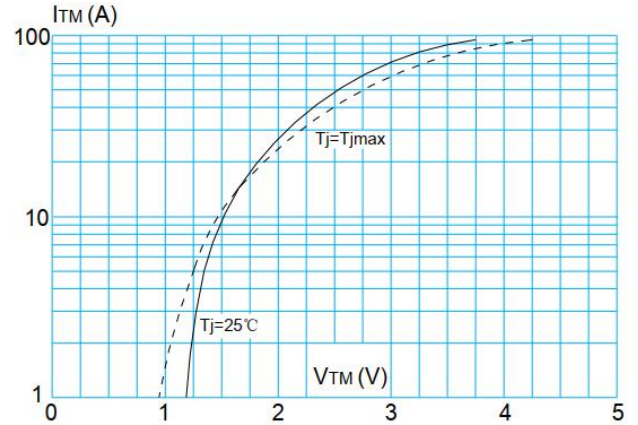


FIG.4: On-state characteristics (maximum values)

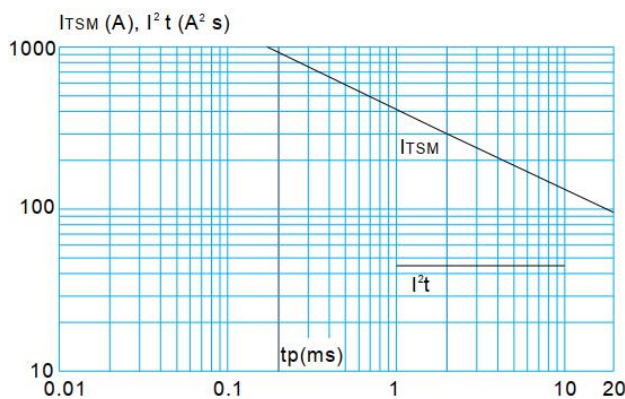


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 20\text{ms}$, and corresponding value of I^2t (I - II -III: $dI/dt < 50\text{A}/\mu\text{s}$; IV: $dI/dt < 10\text{A}/\mu\text{s}$)

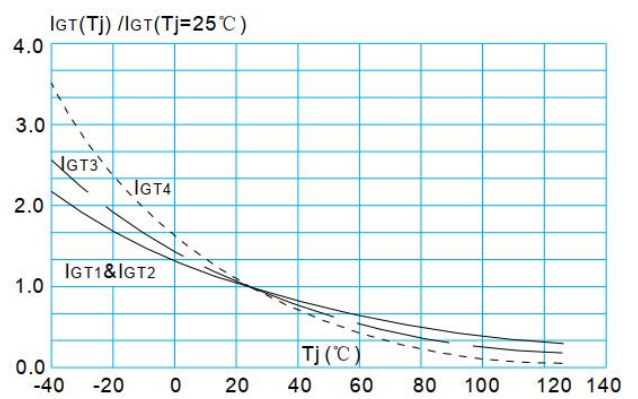


FIG.6: Relative variations of gate trigger current versus junction temperature

RATING AND CHARACTERISTICS CURVES

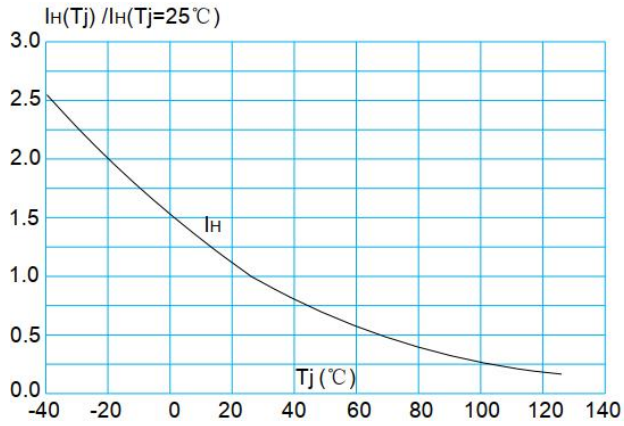


FIG.7: Relative variations of holding current versus junction temperature

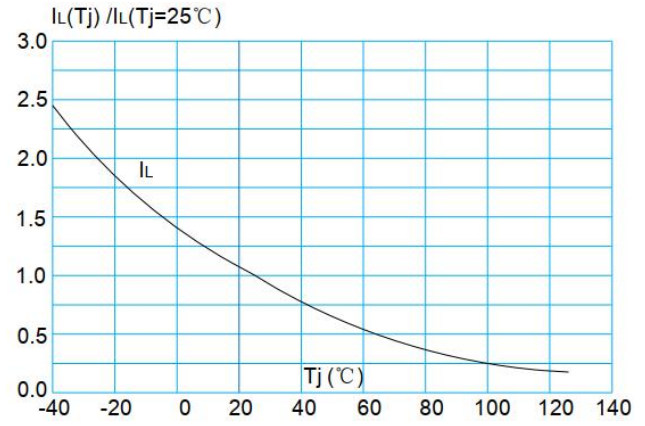
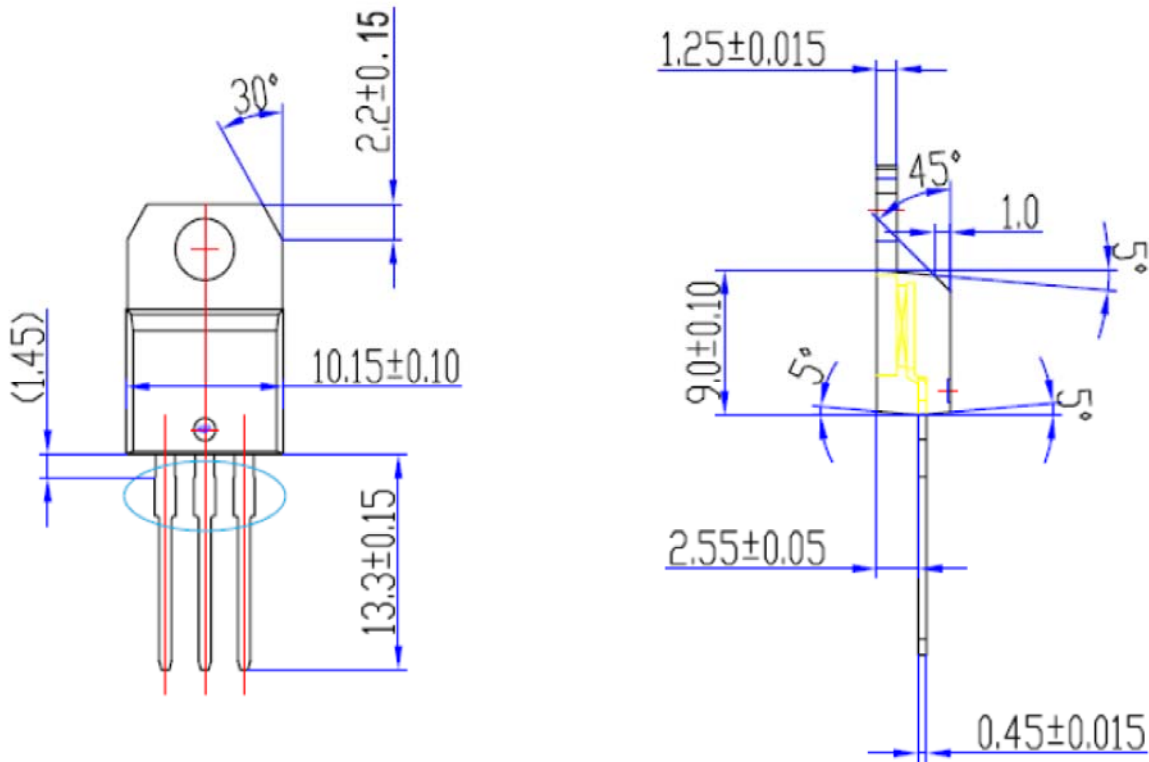


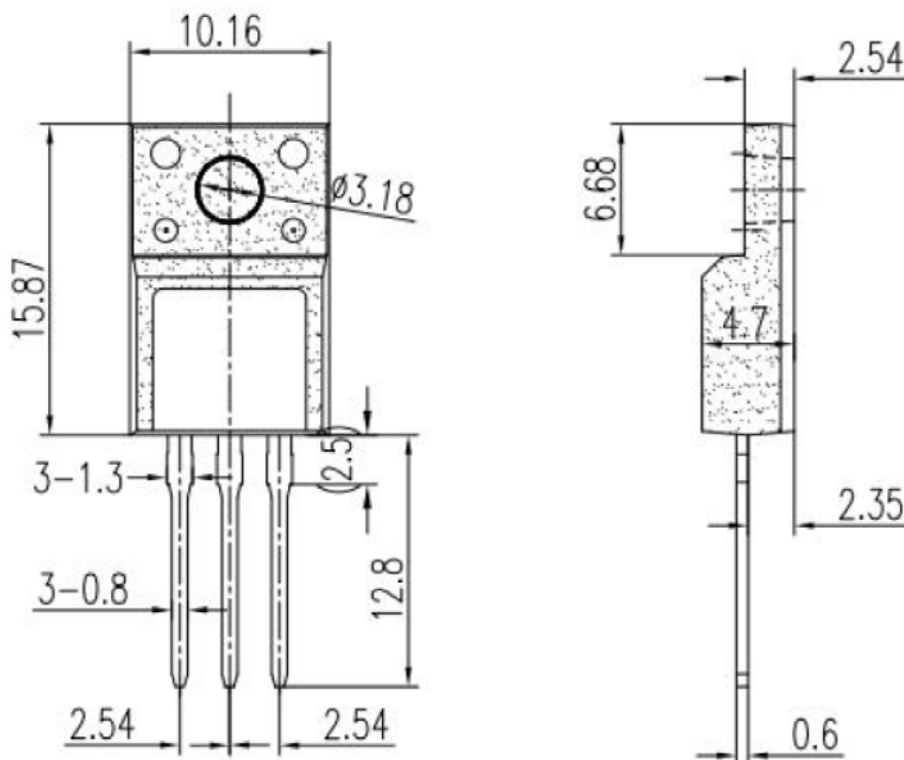
FIG.8: Relative variations of latching current versus junction temperature

PACKAGE OUTLINE DIMENSIONS

TO-220AB units:mm

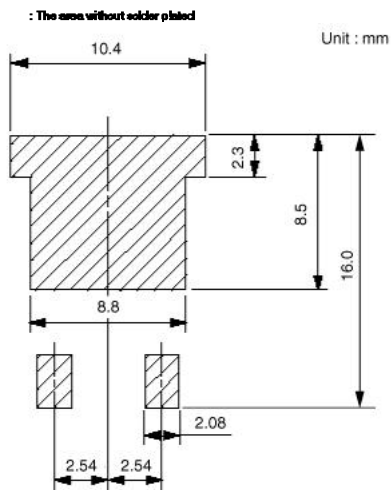
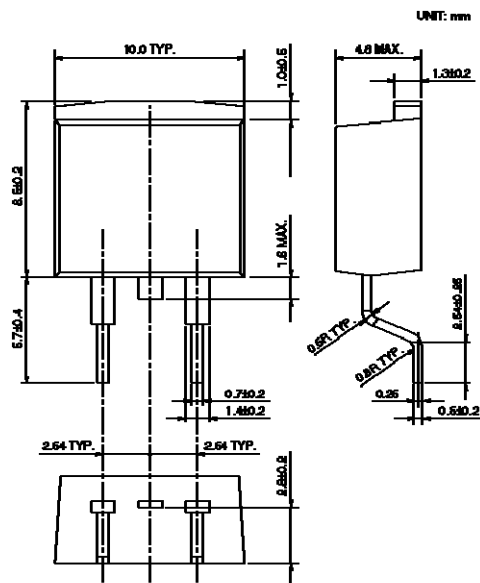


ITO-220AB units:mm(± 0.10)



PACKAGE OUTLINE DIMENSIONS

TO-263 units:mm(± 0.10)



ORDERING INFORMATION