

**VOLTAGE 600/800 V**  
**CURRENT 25.0 A**

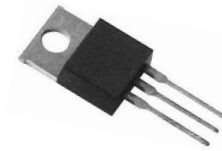
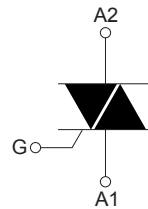
## FEATURES

- NPNPN 5-layer Structure TRIACs
- Mesa Glass Passivated Technology
- Multi Layers Metal Electrodes
- High Junction Temperature
- Good Commutation Performance
- High dV/dt and dI/dt
- Insulating Voltage=2500V<sub>(RMS)</sub>

## APPLICATION

- Heater Control
- Motor Speed Controller
- Mixer

GK XXX  
BAT24 XXXXX



TO-220AB

## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

### Maximum ratings ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test condition	Value	Unit	
$V_{\text{DRM}}/ V_{\text{RRM}}$	Repetitive peak off-state voltage	$T_j=25^\circ\text{C}$	BTA24-600(C/B)W	600	V
			BTA24-800(C/B)W	800	V
$I_{\text{T(RMS)}}$	RMS on-state current	TO-220AK( $T_c \leq 75^\circ\text{C}$ ), Fig. 1,2	25	A	
$I_{\text{TSM}}$	Non repetitive surge peak on-state current	Full sine wave, $T_j(\text{init})=25^\circ\text{C}$ , $t_p=20\text{ms}$ ; Fig. 3,5	250	A	
$I^2t$	$I^2t$ value	$t_p=10\text{ms}$	340	$\text{A}^2\text{s}$	
$di_{\text{T}}/dt$	Critical rate of rise of on-state current	$I_G=2 \cdot I_{\text{GT}}$ , $t_r \leq 10\text{ns}$ , $F=120\text{Hz}$ , $T_j=125^\circ\text{C}$	I - II - III	50	$\text{A}/\mu\text{s}$
$I_{\text{GM}}$	Peak gate current	$t_p=20\mu\text{s}$ , $T_j=125^\circ\text{C}$	4	A	
$P_{\text{G(AV)}}$	Average gate power	$T_j=125^\circ\text{C}$	1	W	
$T_{\text{STG}}$	Storage temperature		-40~+150	$^\circ\text{C}$	
$T_j$	Operating junction temperature		-40~+125		

**Electrical Characteristics** (T<sub>j</sub>=25°C unless otherwise specified)

Symbol	Parameter	Test condition	Value		Unit	
			CW	BW		
I <sub>GT</sub>	Gate trigger current	V <sub>D</sub> =12V, R <sub>L</sub> =33Ω, I - II - III	≤35	≤50	mA	
V <sub>GT</sub>	Gate trigger voltage	T <sub>j</sub> =25°C, Fig. 6 I - II - III	≤1.3		V	
V <sub>GD</sub>	Non-triggering gate voltage	V <sub>D</sub> =V <sub>DRM</sub> , T <sub>j</sub> =125°C	≥0.2		V	
I <sub>H</sub>	Holding current	I <sub>T</sub> =500mA, Fig. 6	≤50	≤75	mA	
I <sub>L</sub>	Latching current	I <sub>G</sub> =1.2I <sub>GT</sub> , Fig. 6	I - III	≤60	≤80	mA
			II	≤80	≤90	mA
dV <sub>D</sub> /dt	Critical rate of rise of off-state	V <sub>D</sub> =67%V <sub>DRM</sub> , Gate Open T <sub>j</sub> =125°C	≥500	≥1000	V/μs	
V <sub>TM</sub>	On-state Voltage	I <sub>TM</sub> =35A, t <sub>p</sub> =380μs, Fig. 4	≤1.55		V	
I <sub>DRM</sub> / I <sub>RPM</sub>	Repetitive peak off-state current	V <sub>D</sub> =V <sub>DRM</sub> /V <sub>RPM</sub> , T <sub>j</sub> =25°C	≤5	≤5	μA	
		V <sub>D</sub> =V <sub>DRM</sub> /V <sub>RPM</sub> , T <sub>j</sub> =125°C	≤2.0	≤2.0	mA	

**THERMAL RESISTANCES**

Symbol	Parameter	Value	Unit
R <sub>th</sub> (j-c)	Junction to case (AC)	TO-220AK	1.7 °C/W
R <sub>th</sub> (j-a)	Junction to ambient	TO-220AK	60 °C/W

**RATING AND CHARACTERISTIC CURVES**

FIG.1: Maximum power dissipation versus RMS on-state current (full cycle)

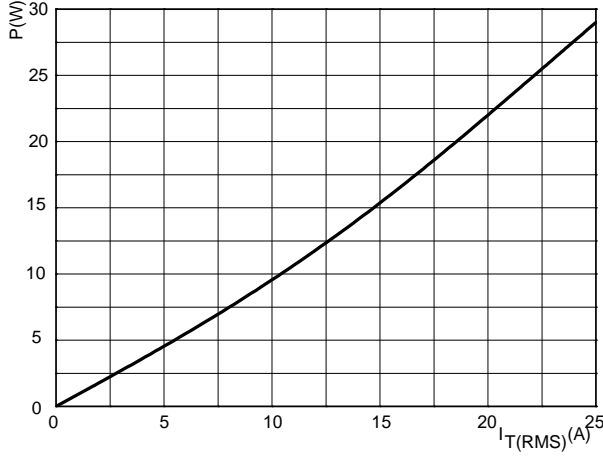


FIG.2: RMS on-state current versus case temperature (full cycle)

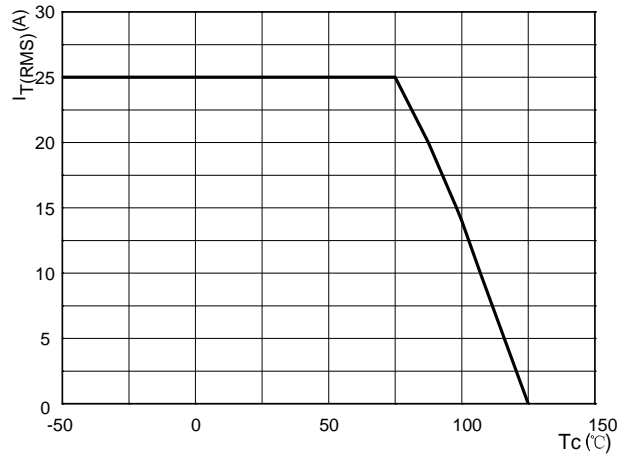


FIG.3: Surge peak on-state current versus number of cycles

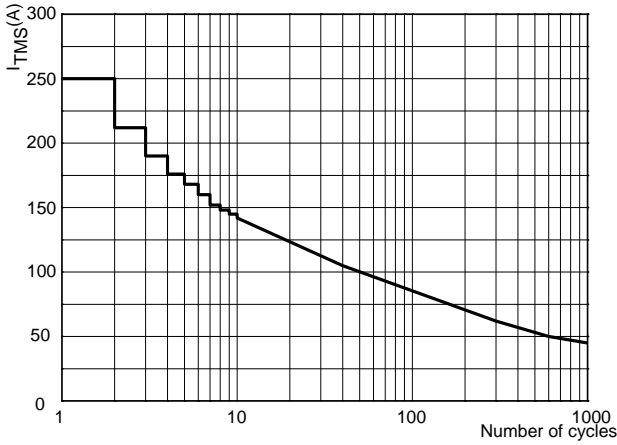


FIG.4: On-state characteristics (maximum values)

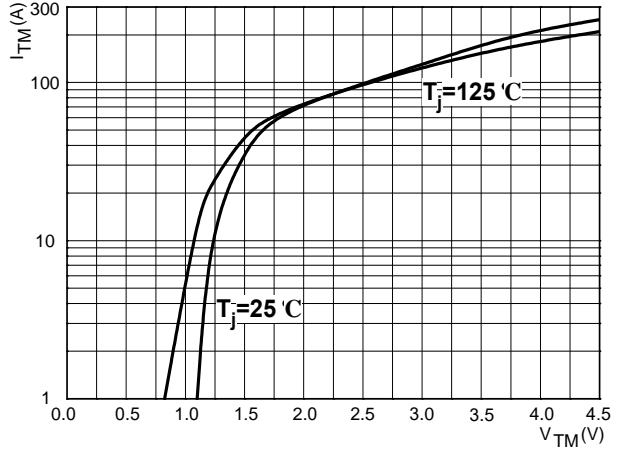


FIG.5: Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$

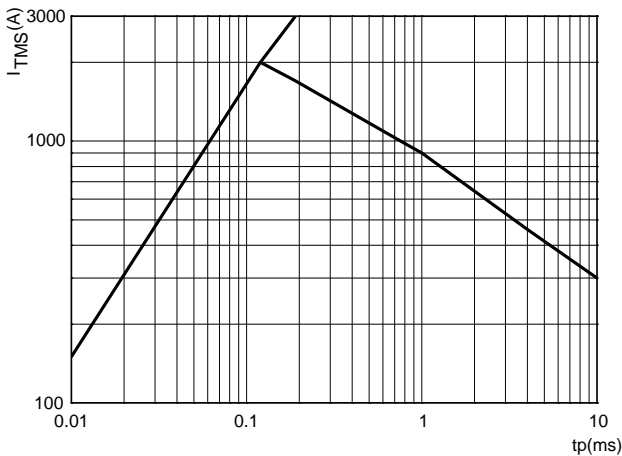
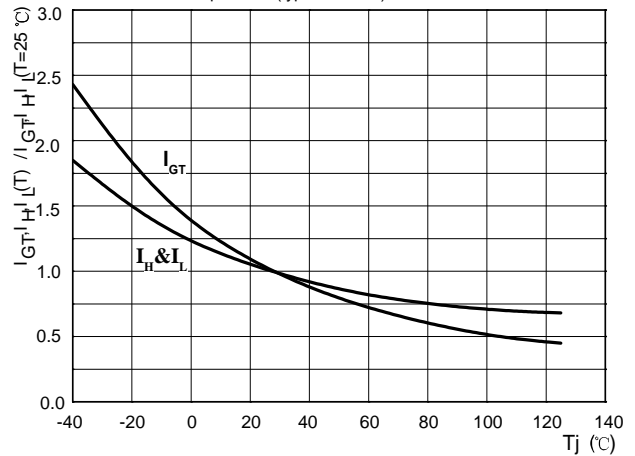


FIG.6: Relative variations of gate trigger current, holding current and latching current versus junction temperature (typical values)



Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	+150°C
	-Temperature Max( $T_{s(max)}$ )	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp ( $T_L$ ) to peak)		3°C/sec. Max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature( $T_L$ )(Liquid us)	+217°C
	-Temperature( $t_L$ )	60-150 secs.
Peak Temp ( $T_p$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp ( $t_p$ )		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp ( $T_p$ )		8 min. Max
Do not exceed		+260°C



Package Dimensions & Suggested Pad Layout

**TO-220AB**

