

BTB04S-600XW

THREE-QUADRANT TRIAC



VOLTAGE: 600 Volts

CURRENT: 4 Amperes

Package: TO-252

Marking and Polarity

FEATURES

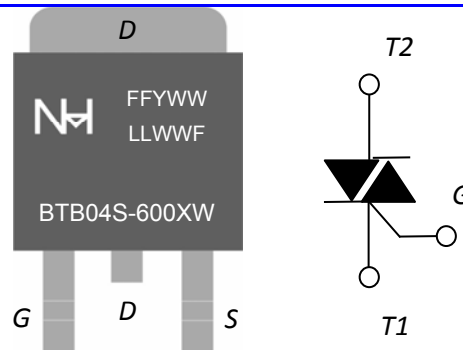
- Highly di/dt For High Reliability
- Low On-State Voltage For Low Power Consumption
- Ceramic Pad For Internal Insulation
- RoHS Compliant

TYPICAL APPLICATIONS

- Phase Control Operation Of Light Dimmers And Motor Speed Controllers
- ON/OFF Control Operation Of Heating Regulation And Induction Motor
- Weight: App. 0.321 Grams (0.01132 Ounce)

PRODUCT SUMMARY

Item	TW	SW	CW	BW	Unit
$I_{T(RMS)}$	4				A
V_{DRM}/V_{RRM} Min.	600				V
$I_{GT(I-II-III)}$ Max.	5	10	35	50	mA



Remark:

- ①. NH=Nihang Trademark
- ②. FF=Product Line Code,According To Actual Changes
YWW=Date Code,,According To Actual Changes
LLWWF=Inernal Code,,According To Actual Changes
- ③. BTB04S-600XW=Model,XW=TW,SW,CW,BW

Absolute Maximum Ratings (Ta=25℃ Unless otherwise specified)

Parameter	Test Conditions	Symbol	BTB04S-600XW	Unit
Repetitive Peak Off-State Voltage		V_{DRM}	600	V
Repetitive Peak Reverse Voltage		V_{RRM}	600	V
RMS On-State Current	$T_c \leq 80^\circ C$	$I_{T(RMS)}$	4	A
Non Repetitive Surge Peak On-State Current	$F = 50 \text{ Hz}, T_p = 20 \text{ ms}$	I_{TSM}	40	A
I^2T Value For Fusing	$T_p = 10 \text{ ms}$	I^2t	8	A
Critical Rate Of Rise Of On-State Current	$I_G = 2 \cdot I_{GT}, tr \leq 10 \text{ ns}$ $F = 100 \text{ Hz}, T_j = 125^\circ C$	di/dt	100	A/ μs
Peak Gate Current	$T_p = 20 \mu s, T_j = 125^\circ C$	I_{GM}	4.0	A
Average Gate Power Dissipation	$T_j = 125^\circ C$	$P_{G(AV)}$	0.5	W
Maximum Mounting Torque	M3 screw	T_{MM}	1.1	N.m

Thermal Characteristics (Ta=25℃ Unless otherwise specified)

Parameter	Symbol	BTB04S-600XW	Unit
Operating Junction Temperature Range	T_J	-40 to 125	℃
Storage Temperature Range	T_{STD}	-40 to 150	
Typical Thermal Resistance	$R_{\theta JA}$	60.0	℃/W
	$R_{\theta JC}$	4.0	

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Electrical Characteristics (Ta=25°C Unless otherwise specified)

Parameter	Test Conditions	Symbol	Quadrants	Value				Unit
				TW	SW	CW	BW	
Gate Trigger Current	VD=12V, IT=0.1A	I_{GT}	I - II - III	≤5	≤10	≤35	≤50	mA
Gate Trigger Voltage	VD=12V, IT=0.1A	V_{GT}	I - II - III	≤ 1				V
Holding Current	IT=100mA	I_H		≤10	≤15	≤35	≤60	mA
Latching Current	IG=1.2*IGT	I_L	I - III	≤10	≤20	≤50	≤70	mA
			II	≤15	≤35	≤60	≤80	
Rise Of Off- State Voltage	VD=2/3*VDRM, Gate open, Tj =150°C	dv/dt		≥150	≥300	≥1500	≥2000	V/us
Peak On-State Voltage	IT= 4 A, Tj =25°C	V_{TM}		≤ 1.65				V
Peak Repetitive Forward Blocking Current	$V_D=V_{DRM}$, Tj =25°C	I_{DRM}		≤ 5.0				uA
	$V_D=V_{DRM}$, Tj =125°C			≤ 0.2				mA
Peak Repetitive Reverse Blocking Current	$V_R=V_{RRM}$, Tj =25°C	I_{RRM}		≤ 5.0				uA
	$V_R=V_{RRM}$, Tj =125°C			≤ 0.2				mA

Model and identification instructions

BT	0	4	S	-	600	xW
Product Type BT=TRIAC						
Insulation Spec.: A=Insulation B=No insulation						
IT(RMS) Spec.: 4 = 4A						
Package Spec.: S TO-252						
"-"=Connector constant						
VDRM/VRRM Spec. 600 = 600V						
IGT Spec. TW:IGT I -III≤5mA SW:IGT I -III≤10mA CW:IGT I -III≤35mA BW:IGT I -III≤50mA						

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Typical Characteristics Curves

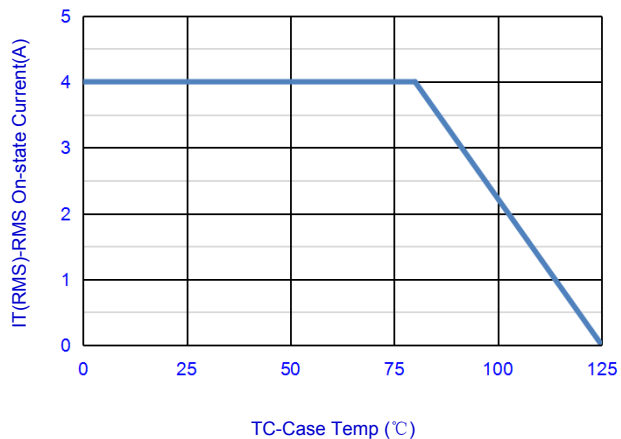


Fig.1-RMS on-state current vs. case temperature

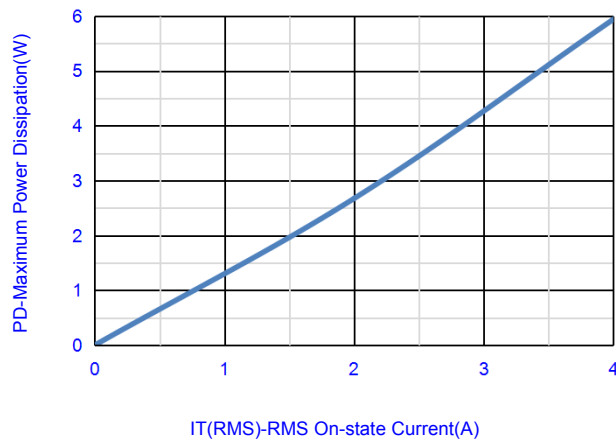


Fig.2- Maximum Power Dissipation Vs. on-state current

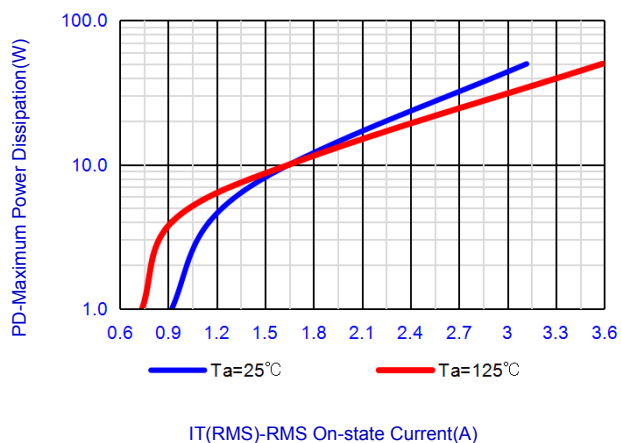


Fig.3- Maximum Power Dissipation Vs. on-state current

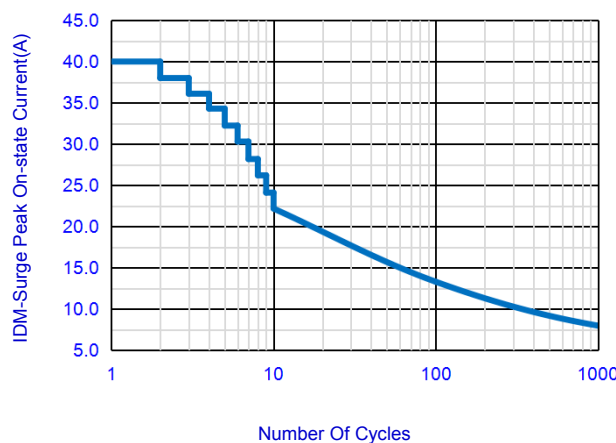


Fig.4- Surge Peak On-state Current Vs. Number Cycles

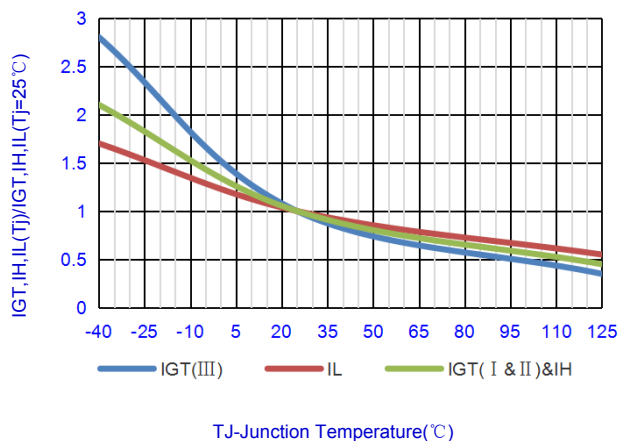


Fig.5- Relative Variation Of Gate Trigger Current , Holding Current And Latching Current Versus Junction Temperature (Typical Value)

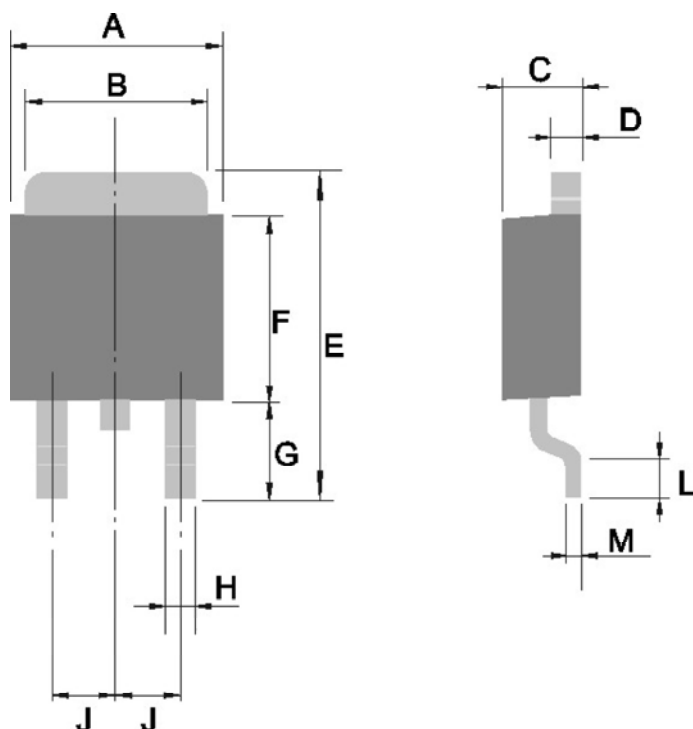
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OUTLINE DRAWINGS

TO-252

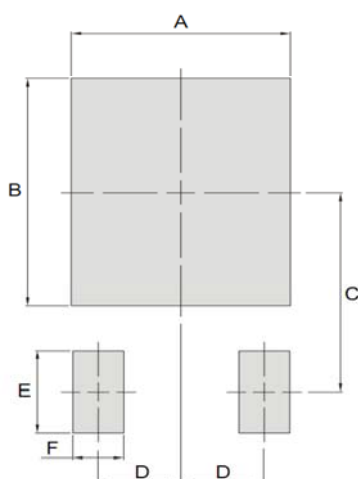


OUTLINE DIMENSIONS

Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.100	-	7.100	0.240	-	0.280
B	4.800	-	5.800	0.189	-	0.228
C	1.950	-	2.550	0.077	-	0.100
D	0.350	-	0.750	0.014	-	0.030
E	9.250	-	10.750	0.364	-	0.423
F	5.600	-	6.600	0.220	-	0.260
G	2.500	-	3.100	0.098	-	0.122
H	0.650	-	1.050	0.026	-	0.041
J	2.100	-	2.500	0.083	-	0.098
L	1.000	-	1.400	0.039	-	0.055
M	0.350	-	0.750	0.014	-	0.030

OUTLINE DRAWINGS

TO-252



OUTLINE DIMENSIONS

Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	6.09	-	-	0.24	-
B	-	7.57	-	-	0.298	-
C	-	6.64	-	-	0.261	-
D	-	2.3	-	-	0.091	-
E	-	2.76	-	-	0.109	-
F	-	1.42	-	-	0.056	-

PACKING INFORMATION

Package Code	Package Method	Inner Box Size L×W×H(mm)	Quantity (Pcs/Inner Box)	Outer Carton Size L×W×H(mm)	Quantity (Pcs/Carton)
TO-252	Tape Reel	340×340×50	5000	360x360x260	25000

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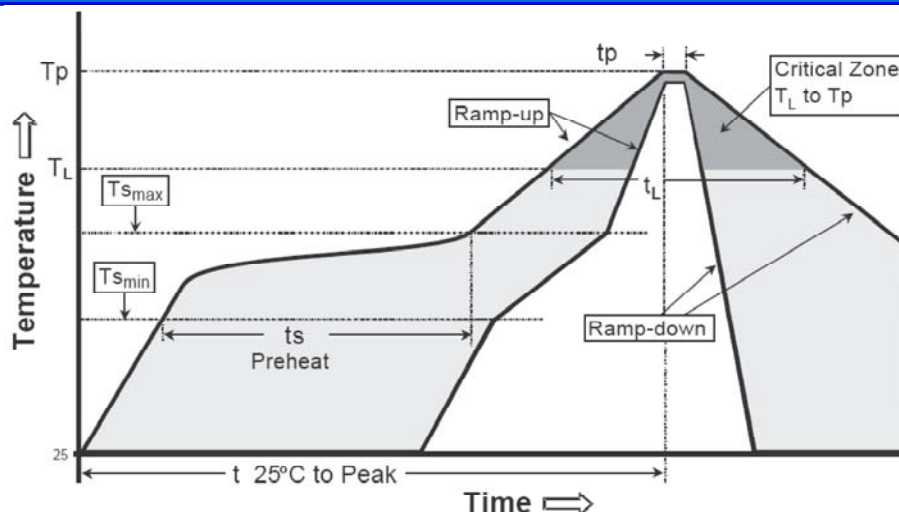
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Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat -Temperature Min(TS min) -Temperature Max(TS max) -Time(ts min to ts max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (TL) - Time (tL)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

Note : All temperatures refer to topside of the package, measured on the package body surface.

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