

### 30 A SCRs

#### **Features**

On-state rms current: 30 ABlocking voltage: up to 1200 V

■ Gate current: 50 mA

■ UL 2500 V insulation (file ref E81734)

### **Description**

Available in a high power insulated package, the BTW68 series is suitable for applications where power handling and power dissipation are critical such as solid state relays, welding equipment and high power motor control.

Based on a clip assembly technology, this device offers a superior performance in surge current handling capabilities.

Thanks to the internal ceramic pad, the device provides high voltage insulation (2500  $V_{RMS)}$ ) and complies with UL standards (file ref: E81734).

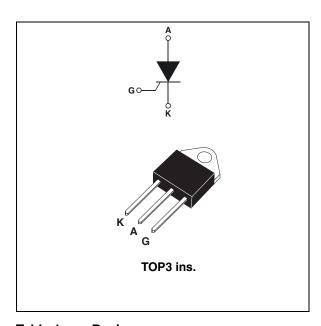


Table 1. Device summary

Symbol	Value	
I <sub>T(RMS)</sub>	30 A	
V <sub>DRM</sub> /V <sub>RRM</sub>	600 to 1200 V	
I <sub>GT</sub>	50 mA	

Characteristics BTW68

## 1 Characteristics

Table 2. Absolute maximum ratings (limiting values)

Symbol	Paramete	Value	Unit			
I <sub>T(RMS)</sub>	On-state current rms (180° conduction angle)		T <sub>c</sub> = 80 °C	30	Α	
IT <sub>(AV)</sub>	Average on-state current (180° condu	ction angle)	T <sub>c</sub> = 80 °C	19	Α	
	$\begin{array}{c c} \textbf{Non repetitive surge peak on-state} & t_p \\ \textbf{current} & t_p \end{array}$		T _ 25 °C	420	А	
ITSM			T <sub>j</sub> = 25 °C	400		
l <sup>2</sup> t	I <sup>2</sup> t Value for fusing		T <sub>j</sub> = 25 °C	800	A <sup>2</sup> s	
dl/dt	Critical rate of rise of on-state current $I_G = 2 \ x \ I_{GT}$ , $t_r \le 100 \ ns$	F = 60 Hz	T <sub>j</sub> = 125 °C	100	A/μs	
I <sub>GM</sub>	Peak gate current	t <sub>p</sub> = 20 μs	T <sub>j</sub> = 125 °C	8	Α	
P <sub>G(AV)</sub>	Average gate power dissipation $T_j = 125$ °C		1	W		
T <sub>stg</sub> T <sub>j</sub>	Storage junction temperature range Operating junction temperature range		- 40 to + 150 - 40 to + 125	°C		
V <sub>RGM</sub>	Maximum peak reverse gate voltage			5	V	

Table 3. Electrical characteristics ( $T_j = 25$  °C, unless otherwise specified)

Symbol	7	Value	Unit			
I <sub>GT</sub>	V = 12 V B = 22 O			MIN.	50	mA
V <sub>GT</sub>	$-V_D = 12 \text{ V}, R_L = 33 \Omega$			MAX.	1.5	V
V <sub>GD</sub>	$V_D = V_{DRM,} R_L = 3.3 \text{ k}\Omega$ $T_j = 125 \text{ °C}$			MIN.	0.2	V
t <sub>gt</sub>	$V_D = V_{DRM}$ , $I_G = 200$ mA, $dI_{G}/dt = 1.5$ A/ $\mu$ s			TYP.	2	μs
I <sub>H</sub>	I <sub>T</sub> = 500 mA, gate open			MAX.	75	mA
ΙL	$I_{G} = 1.2 \times I_{GT}$			TYP.	40	mA
dV/dt	V <sub>D</sub> = 67 % V <sub>DRM</sub>	V <sub>DRM</sub> = 800 V	T <sub>j</sub> = 125 °C	MIN.	500	V/µs
uv/ut	gate open	V <sub>DRM</sub> = 1000 V		IVIII V.	250	
$V_{TM}$	I <sub>TM</sub> = 60 A, t <sub>p</sub> = 380 μs			MAX.	2.1	V
I <sub>DRM</sub>	T <sub>j</sub> :		$T_j = 25 ^{\circ}\text{C}$ $T_i = 125 ^{\circ}\text{C}$	MAX.	20	μΑ
I <sub>RRM</sub>	I <sub>RRM</sub> V <sub>DRM</sub> = V <sub>RRM</sub>		T <sub>j</sub> = 125 °C	IVIAA.	6	mA
t <sub>q</sub>	$V_D = 67\% \ V_{DRM}, \ I_{TM} = 60 \ A, \ V_R = 75 \ V$ $dI_{TM}/dt = 30 \ A/\mu s, \ dV_D/dt = 20 \ V/\mu s$		T <sub>j</sub> = 125 °C	TYP.	100	μs

Table 4. Thermal resistance

Symbol	Parameter	Value	Unit
R <sub>th(j-c)</sub>	Junction to case (D.C.)	1.1	°C/W
R <sub>th(j-a)</sub>	Junction to ambient	50	°C/W

BTW68 Characteristics

Figure 1. Maximum average power dissipation versus average on-state current

Figure 2. Correlation between maximum average power dissipation and maximum allowable temperature

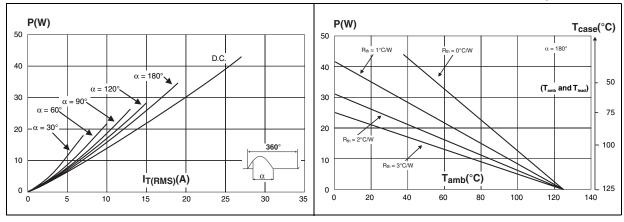


Figure 3. Average on-state current versus case Figure 4. temperature

Relative variation of thermal impedance versus pulse duration

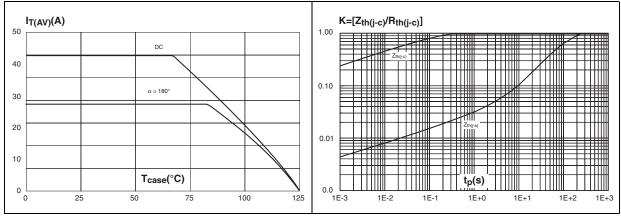
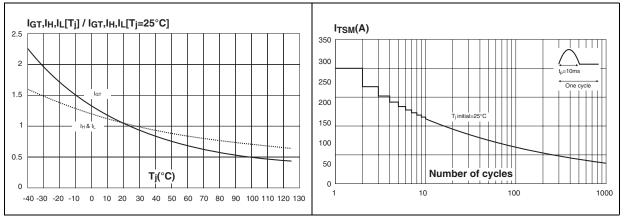


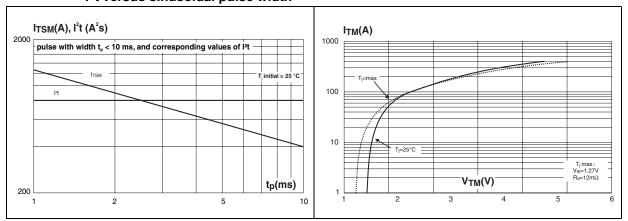
Figure 5. Relative variation of gate trigger current versus junction temperature

Figure 6. Surge peak on-state current versus number of cycles



Characteristics BTW68

Figure 7. Non repetitive surge peak on-state Figure 8. On-state characteristics current and corresponding value of l<sup>2</sup>t versus sinusoidal pulse width



## 2 Ordering information scheme

Figure 9. Ordering information scheme

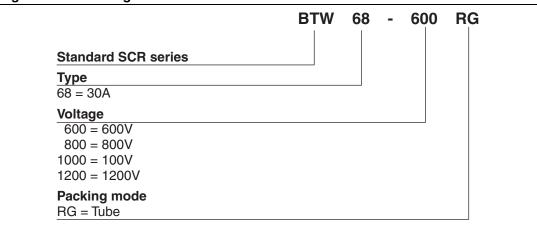


Table 5. Product Selector

Part numbers		Voltag	e (xxx)		Sensitivity	Package	
	600 V	800 V	1000 V	1200 V			
BTW68-600RG	Х						
BTW68-800RG		Х			50 mA	TOP3 Ins.	
BTW68-1000RG			Х		30 IIIA	TOF5 IIIS.	
BTW68-1200RG				Х			

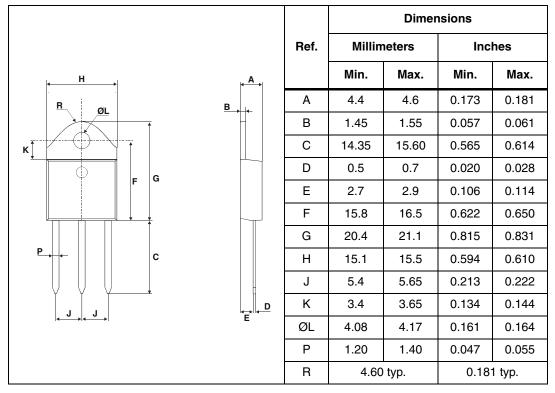
Package information BTW68

## 3 Package information

- Epoxy meets UL94,V0
- Lead-free packages

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: <a href="https://www.st.com">www.st.com</a>. ECOPACK<sup>®</sup> is an ST trademark.

Table 6. TOP3 ins. dimensions



# 4 Ordering information

Table 7. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
BTW68-600RG	BTW68-600				
BTW68-800RG	BTW68-800	TOP3 ins.	4.5 g	30	Tube
BTW68-1000RG	BTW68-1000	101 5 1115.	4.5 g	30	Tube
BTW68-1200RG	BTW68-1200				

## 5 Revision history

Table 8. Document revision history

Date	Revision	Changes
Mar-1995	1	Initial release.
13-Feb-2006	2	TOP3 Insulated delivery mode changed from bulk to tube. ECOPACK statement added.
29-Jul-2010	3	Deleted part number BTW68-200RG. Updated <i>Table 2</i> , <i>Figure 7</i> and alpha angle in <i>Figure 1</i> .

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