

# **BTW67 and BTW69 Series**

#### STANDARD

# 50A SCRs

#### **Table 1: Main Features**

Symbol	Value	Unit
I <sub>T(RMS)</sub>	50	А
V <sub>DRM</sub> /V <sub>RRM</sub>	600 to 1200	V
I <sub>GT</sub>	80	mA

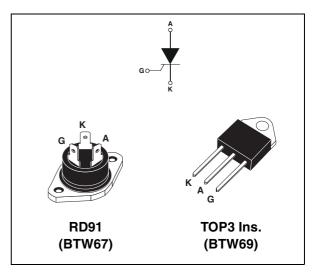
## DESCRIPTION

Available in high power packages, the **BTW67** / **BTW69** Series is suitable in applications where power handling and power dissipation are critical, such as solid state relays, welding equipment, high power motor control.

Based on a clip assembly technology, they offer a superior performance in surge current handling capabilities.

Thanks to their internal ceramic pad, they provide high voltage insulation ( $2500V_{RMS}$ ), complying with UL standards (file ref: E81734).

Table 3: Absolute	Ratings	(limiting values)
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#### Table 2: Order Codes

Part Numbers	Marking
BTW67-xxx	BTW67xxx
BTW69-xxxRG	BTW69xxx

Symbol	Parameter	Value	Unit			
I	RMS on-state current	RD91		= 70°C		
I <sub>T(RMS)</sub>	(180° conduction angle)	TOP3 Ins.	$T_c = 75^{\circ}C$	50	A	
IT	Average on-state current	RD91	$T_c = 70^{\circ}C$	32	А	
IT <sub>(AV)</sub>	(180° conduction angle)	TOP3 Ins.	$T_c = 75^{\circ}C$	52		
l-o.	Non repetitive surge peak on-state current	t <sub>p</sub> = 8.3 ms	T <sub>i</sub> = 25°C	610	А	
ITSM	Non repetitive surge peak on-state current	t <sub>p</sub> = 10 ms	1 <sub>j</sub> = 20 0	580	A	
l²t	$I^2$ t Value for fusing $T_j = 25^{\circ}C$			1680	A <sup>2</sup> s	
dl/dt	$\label{eq:GT} \left. \begin{array}{l} \mbox{Critical rate of rise of on-state current } I_G = 2 \\ x \ I_{GT} \ , \ t_r \leq 100 \ ns \end{array} \right  \ F = 60 \ Hz \ .$		T <sub>j</sub> = 125°C	50	A/µs	
I <sub>GM</sub>	Peak gate current $t_p = 20 \ \mu s$ $T_j = 125^{\circ}C$		8	А		
$P_{G(AV)}$	Average gate power dissipation $T_j = 125^{\circ}C$			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	

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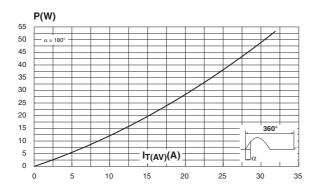
Symbol	Test Conditions		Value	Unit	
I <sub>GT</sub>			MIN.	8	mA
GI	$V_D = 12 V$ $R_L = 33 \Omega$		MAX.	80	
V <sub>GT</sub>			MAX.	1.3	V
$V_{GD}$	$V_D = V_{DRM}$ $R_L = 3.3 k\Omega$	T <sub>j</sub> = 125°C	MIN.	0.2	V
Ι <sub>Η</sub>	I <sub>T</sub> = 500 mA Gate open		MAX.	150	mA
١L	$I_{G} = 1.2 \times I_{GT}$		MAX.	200	mA
dV/dt	$V_D = 67 \% V_{DRM}$ Gate open $T_j = 125^{\circ}C$		MIN.	1000	V/µs
$V_{TM}$	$I_{TM} = 100 \text{ A}$ tp = 380 µs $T_j = 25^{\circ}\text{C}$		MAX.	1.9	V
V <sub>t0</sub>	Threshold voltage $T_j = 125^{\circ}C$		MAX.	1.0	V
R <sub>d</sub>	Dynamic resistance $T_j = 125^{\circ}C$		MAX.	8.5	mΩ
I <sub>DRM</sub>	V <sub>DBM</sub> = V <sub>BBM</sub>	T <sub>j</sub> = 25°C	MAX.	10	μA
I <sub>RRM</sub>	VDRM - VRRM	T <sub>j</sub> = 125°C		5	mA

# Tables 4: Electrical Characteristics ( $T_j = 25^{\circ}C$ , unless otherwise specified)

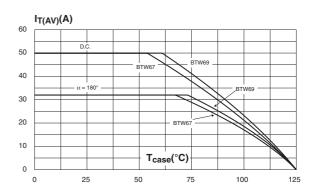
### Table 5: Thermal resistance

Symbol	Parameter		Value	Unit
Burn	lunction to page (D.C.)	RD91 (Insulated)	1.0	°C/W
R <sub>th(j-c)</sub>	Junction to case (D.C.)	TOP3 Insulated	0.9	- 0/10
R <sub>th(j-a)</sub>	Junction to ambient (D.C.)	TOP3 Insulated	50	°C/W

# Figure 1: Maximum average power dissipation versus average on-state current



# Figure 2: Average and D.C. on-state current versus case temperature



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# Figure 3: Relative variation of thermal impedance versus pulse duration

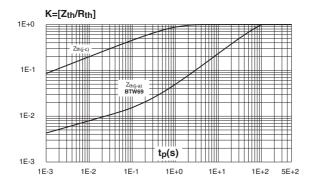


Figure 5: Surge peak on-state current versus number of cycles

Figure 4: Relative variation of gate trigger current, holding current and latching current versus junction temperature

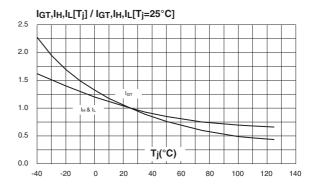


Figure 6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp < 10 ms, and corresponding values of l<sup>2</sup>t

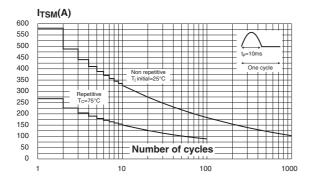
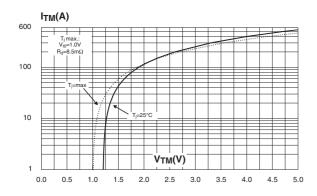
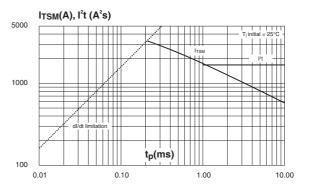


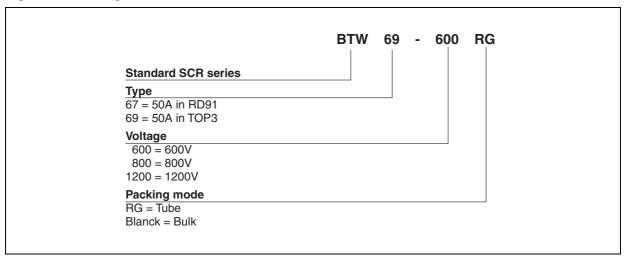
Figure 7: On-state characteristics (maximum values)



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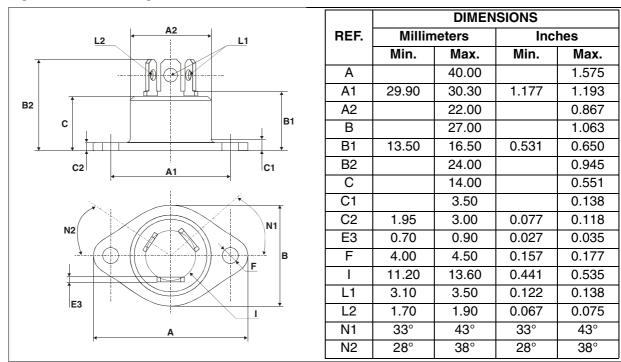
### Figure 8: Ordering Information Scheme



### **Table 6: Product Selector**

Part Numbers	Voltage (xxx) Sensitivity				Package
Fait Numbers	600 V	800 V	1200 V	Sensitivity	Fackage
BTW67-xxx	Х	Х	Х	80 mA	RD91
BTW69-xxx	Х	Х	Х	80 mA	TOP3 Ins.

### Figure 9: RD91 Package Mechanical Data



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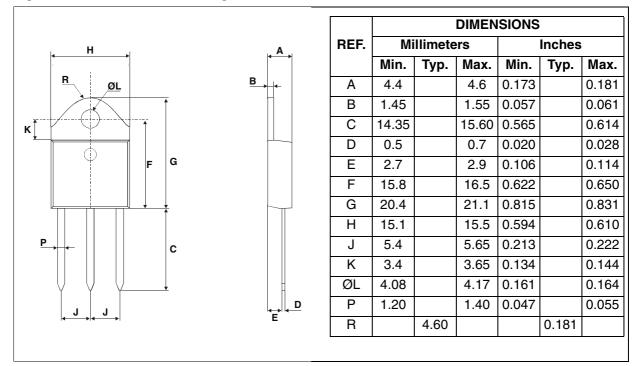


Figure 10: TOP3 Insulated Package Mechanical Data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: <u>www.st.com</u>.

## **Table 7: Ordering Information**

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
BTW67-xxx	BTW67xxx	RD91	20 g	25	Bulk
BTW69-xxxRG	BTW69xxx	TOP3 Ins.	4.5 g	30	Tube

Note: xxx = voltage

### **Table 8: Revision History**

Date	Revision	Description of Changes
Apr-2001	4A	Last update.
13-Feb-2006	5	TOP3 Insulated delivery mode changed from bulk to tube. ECOPACK statement added.

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