



# BTW67 and BTW69 Series

STANDARD

50A SCRs

## MAIN FEATURES:

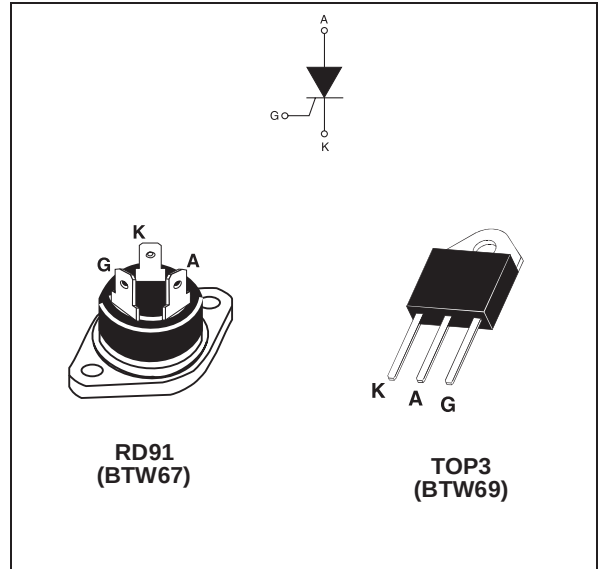
| Symbol            | Value       | Unit |
|-------------------|-------------|------|
| $I_{T(RMS)}$      | 50          | A    |
| $V_{DRM}/V_{RRM}$ | 600 to 1200 | V    |
| $I_{GT}$          | 80          | mA   |

## 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).



## ABSOLUTE RATINGS (limiting values)

| Symbol             | Parameter                                                                                     |                        |                           | Value                          | Unit                   |
|--------------------|-----------------------------------------------------------------------------------------------|------------------------|---------------------------|--------------------------------|------------------------|
| $I_{T(RMS)}$       | RMS on-state current<br>(180° conduction angle)                                               | RD91                   | $T_c = 70^\circ\text{C}$  | 50                             | A                      |
|                    |                                                                                               | TOP3 Ins.              | $T_c = 75^\circ\text{C}$  |                                |                        |
| $I_{T(AV)}$        | Average on-state current<br>(180° conduction angle)                                           | RD91                   | $T_c = 70^\circ\text{C}$  | 32                             | A                      |
|                    |                                                                                               | TOP3 Ins.              | $T_c = 75^\circ\text{C}$  |                                |                        |
| $I_{TSM}$          | Non repetitive surge peak on-state current                                                    | $t_p = 8.3 \text{ ms}$ | $T_j = 25^\circ\text{C}$  | 610                            | A                      |
|                    |                                                                                               | $t_p = 10 \text{ ms}$  |                           | 580                            |                        |
| $I^2t$             | $I^2t$ Value for fusing                                                                       |                        | $T_j = 25^\circ\text{C}$  | 1680                           | $\text{A}^2\text{s}$   |
| $di/dt$            | Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$ , $t_r \leq 100 \text{ ns}$ | $F = 60 \text{ Hz}$    | $T_j = 125^\circ\text{C}$ | 50                             | $\text{A}/\mu\text{s}$ |
| $I_{GM}$           | Peak gate current                                                                             | $t_p = 20 \mu\text{s}$ | $T_j = 125^\circ\text{C}$ | 8                              | A                      |
| $P_{G(AV)}$        | Average gate power dissipation                                                                |                        | $T_j = 125^\circ\text{C}$ | 1                              | W                      |
| $T_{stg}$<br>$T_j$ | Storage junction temperature range<br>Operating junction temperature range                    |                        |                           | - 40 to + 150<br>- 40 to + 125 | $^\circ\text{C}$       |
| $V_{RGM}$          | Maximum peak reverse gate voltage                                                             |                        |                           | 5                              | V                      |

## BTW67 and BTW69 Series

### ELECTRICAL CHARACTERISTICS (T<sub>j</sub> = 25°C, unless otherwise specified)

| Symbol                               | Test Conditions                                           |                        |      | Value | Unit |
|--------------------------------------|-----------------------------------------------------------|------------------------|------|-------|------|
| I <sub>GT</sub>                      | V <sub>D</sub> = 12 V      R <sub>L</sub> = 33 Ω          |                        | MIN. | 8     | mA   |
|                                      |                                                           |                        | MAX. | 80    |      |
| V <sub>GT</sub>                      |                                                           |                        | MAX. | 1.3   | V    |
| V <sub>GD</sub>                      | V <sub>D</sub> = V <sub>DRM</sub> R <sub>L</sub> = 3.3 kΩ | T <sub>j</sub> = 125°C | MIN. | 0.2   | V    |
| I <sub>H</sub>                       | I <sub>T</sub> = 500 mA   Gate open                       |                        | MAX. | 150   | mA   |
| I <sub>L</sub>                       | I <sub>G</sub> = 1.2 I <sub>GT</sub>                      |                        | MAX. | 200   | mA   |
| dV/dt                                | V <sub>D</sub> = 67 % V <sub>DRM</sub> Gate open          | T <sub>j</sub> = 125°C | MIN. | 1000  | V/μs |
| V <sub>TM</sub>                      | I <sub>TM</sub> = 100 A   t <sub>p</sub> = 380 μs         | T <sub>j</sub> = 25°C  | MAX. | 1.9   | V    |
| V <sub>t0</sub>                      | Threshold voltage                                         | T <sub>j</sub> = 125°C | MAX. | 1.0   | V    |
| R <sub>d</sub>                       | Dynamic resistance                                        | T <sub>j</sub> = 125°C | MAX. | 8.5   | mΩ   |
| I <sub>DRM</sub><br>I <sub>RRM</sub> | V <sub>DRM</sub> = V <sub>RRM</sub>                       | T <sub>j</sub> = 25°C  | MAX. | 10    | μA   |
|                                      |                                                           | T <sub>j</sub> = 125°C |      | 5     | mA   |

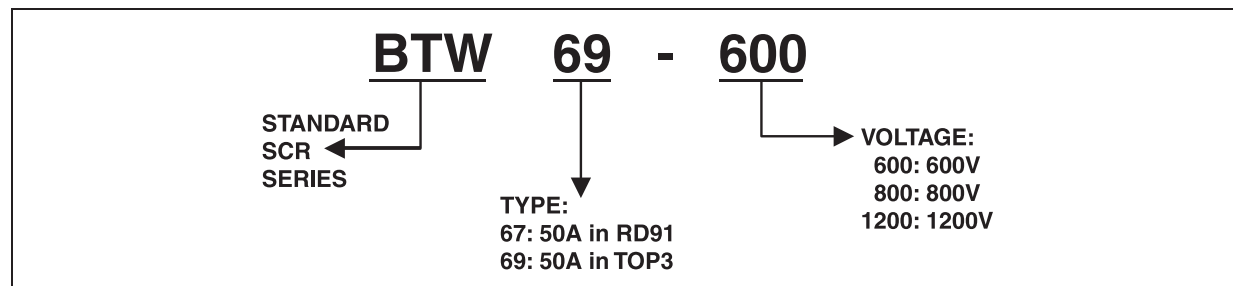
### THERMAL RESISTANCES

| Symbol               | Parameter             |                  | Value | Unit |
|----------------------|-----------------------|------------------|-------|------|
| R <sub>th(j-c)</sub> | Junction to case (DC) | RD91 (Insulated) | 1.0   | °C/W |
|                      |                       | TOP3 Insulated   | 0.9   |      |
| R <sub>th(j-a)</sub> | Junction to ambient   | TOP3 Insulated   | 50    | °C/W |

### PRODUCT SELECTOR

| Part Number | Voltage (xxx) |       |        | Sensitivity | Package   |
|-------------|---------------|-------|--------|-------------|-----------|
|             | 600 V         | 800 V | 1200 V |             |           |
| BTW67-xxx   | X             | X     | X      | 80 mA       | RD91      |
| BTW69-xxx   | X             | X     | X      | 80 mA       | TOP3 Ins. |

### ORDERING INFORMATION

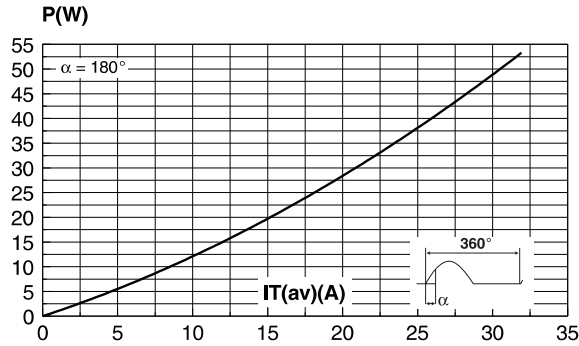


### OTHER INFORMATION

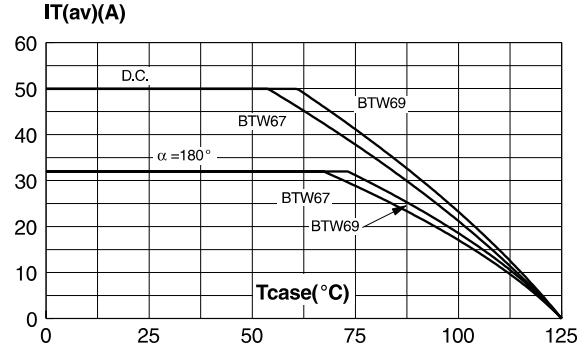
| Part Number | Marking  | Weight | Base Quantity | Packing mode |
|-------------|----------|--------|---------------|--------------|
| BTW67-xxx   | BTW67xxx | 20.0 g | 25            | Bulk         |
| BTW69-xxx   | BTW69xxx | 4.5 g  | 120           | Bulk         |

Note: xxx = voltage

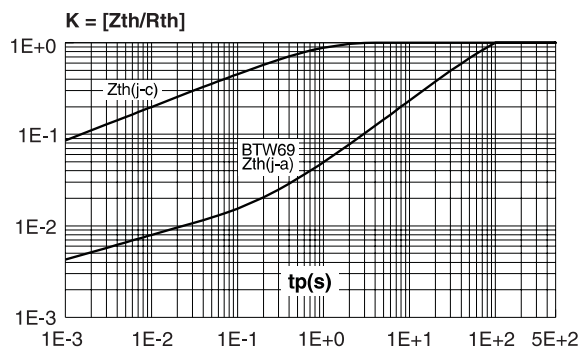
**Fig. 1:** Maximum average power dissipation versus average on-state current.



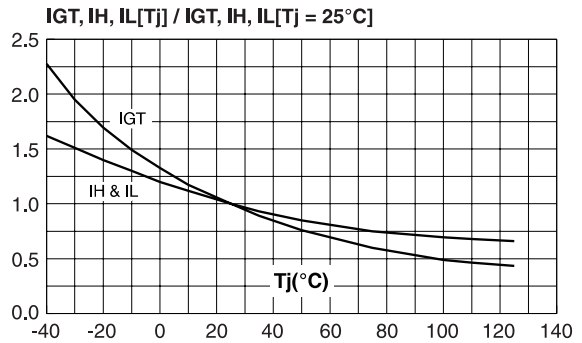
**Fig. 2:** Average and D.C. on-state current versus case temperature.



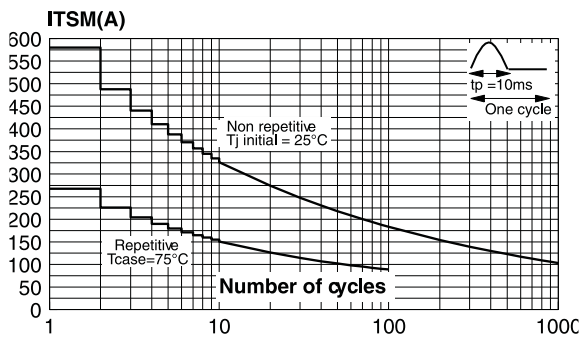
**Fig. 3:** Relative variation of thermal impedance versus pulse duration.



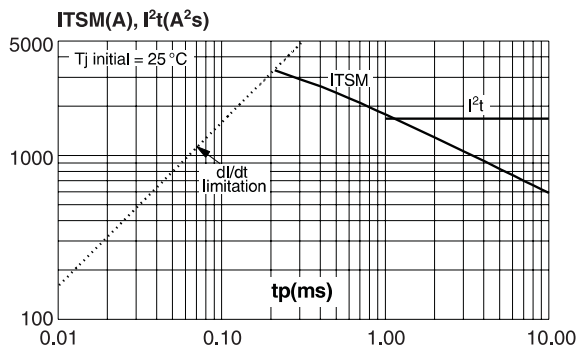
**Fig. 4:** Relative variation of gate trigger current, holding current and latching current versus junction temperature.



**Fig. 5:** Surge peak on-state current versus number of cycles.

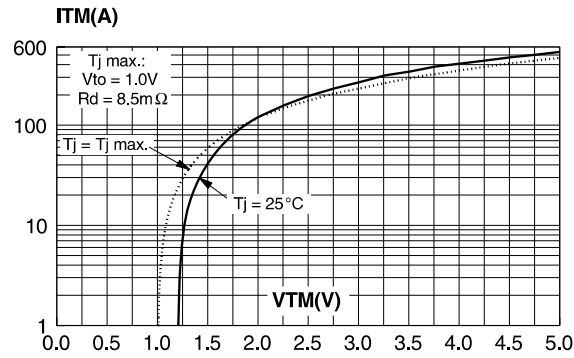


**Fig. 6:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10ms$ , and corresponding value of  $I^2t$ .



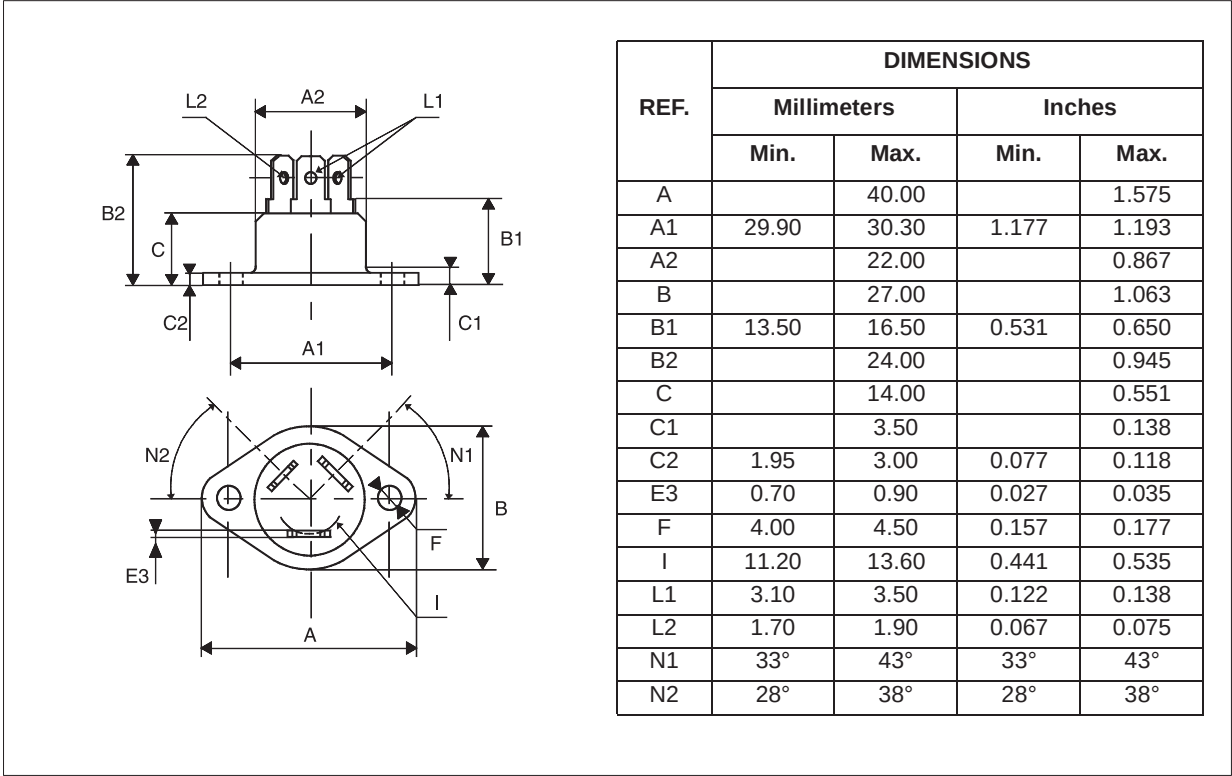
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**Fig. 7:** On-state characteristics (maximum values).



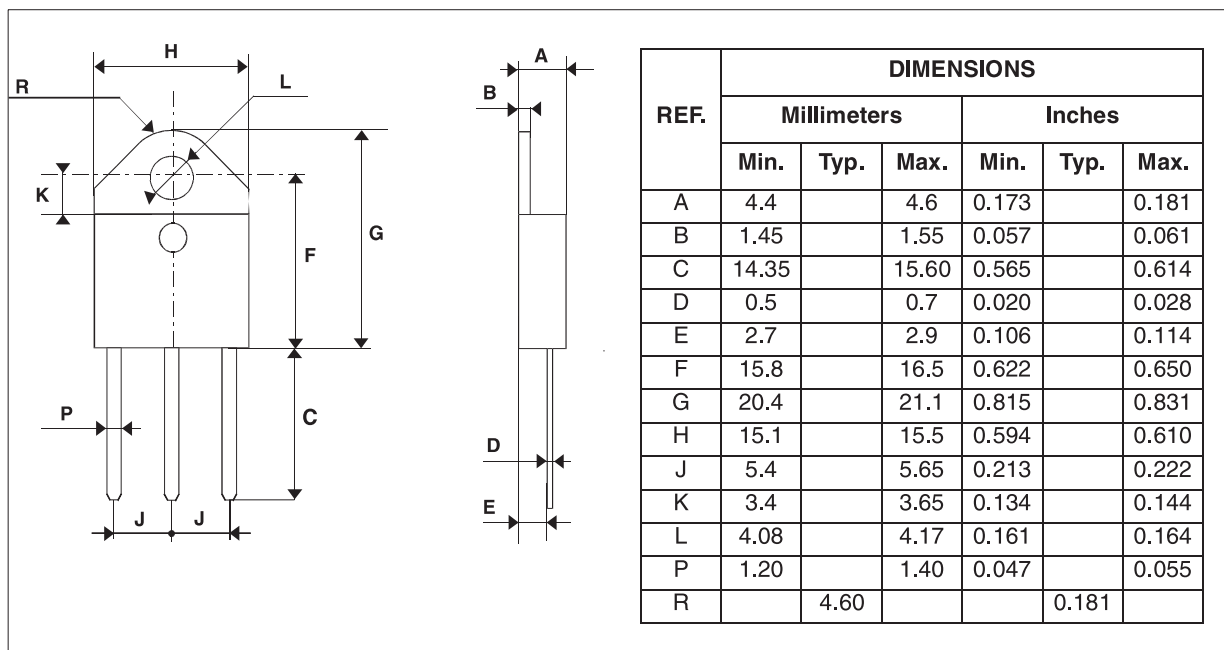
## PACKAGE MECHANICAL DATA

RD91 (Plastic)



## PACKAGE MECHANICAL DATA

TOP3 Ins.(Plastic)



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