



# BTW67 and BTW69 Series

STANDARD

50A SCRs

## MAIN FEATURES:

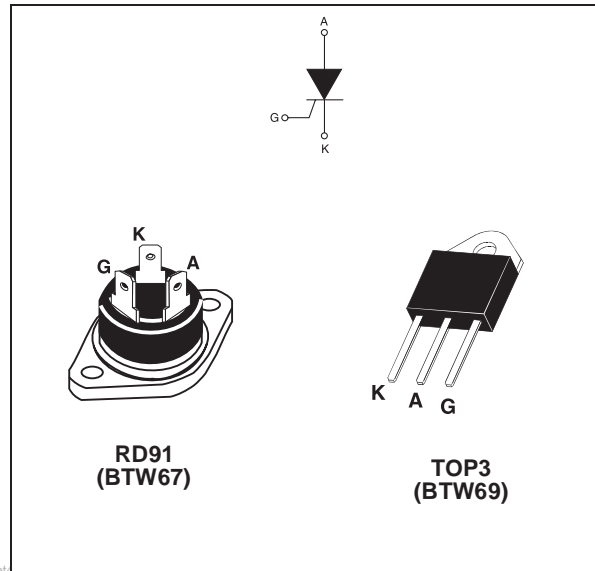
| Symbol            | Value       | Unit |
|-------------------|-------------|------|
| $I_{T(RMS)}$      | 50          | A    |
| $V_{DRM}/V_{RRM}$ | 600 to 1200 | V    |
| $I_{GT}$          | 80          | mA   |

## 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 (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 (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                      |

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### 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   |                        | MAX.                   | 1.0  | V    |    |
| R <sub>d</sub>                       | Dynamic resistance  |                        | 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 |

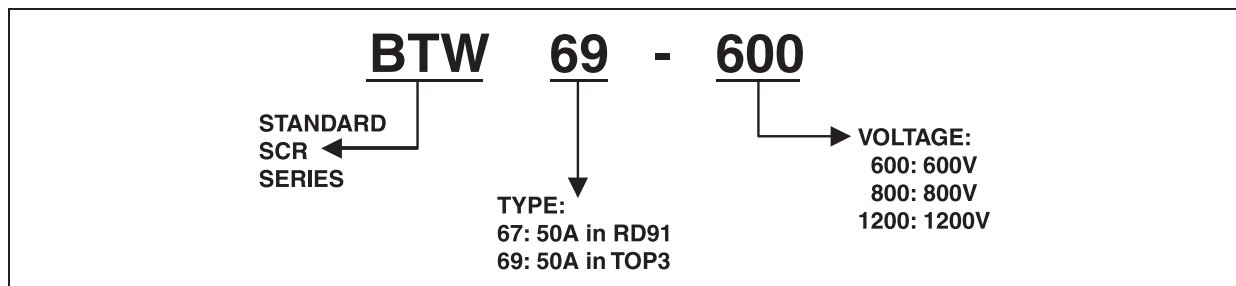
### THERMAL RESISTANCES

| 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

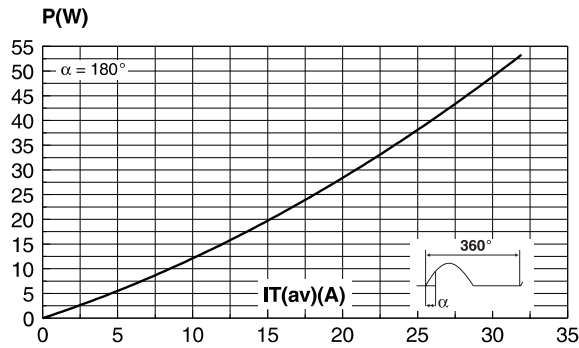


### OTHER INFORMATION

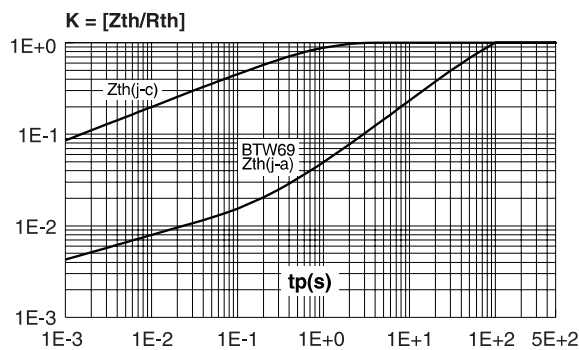
| Part Number | Marking  | Weight | Base Quantity | Packing mode |
|-------------|----------|--------|---------------|--------------|
| BTW67-xxx   | BTW67xxx | 20.0 g | 25            | Bulk         |
| BTW69-xxx   | BTW69xxx | 4.5 g  | 120           | Bulk         |

Note: xxx = voltage

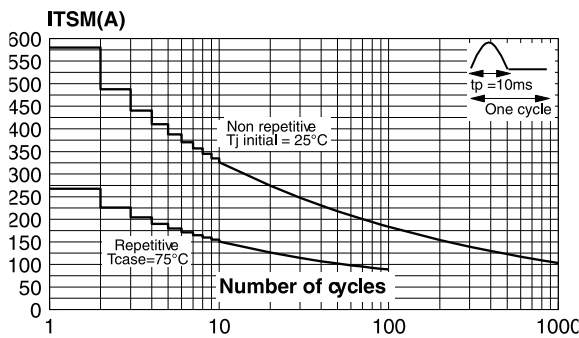
**Fig. 1:** Maximum average power dissipation versus average on-state current.



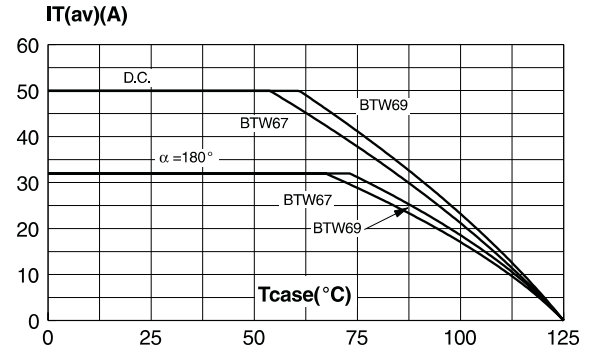
**Fig. 3:** Relative variation of thermal impedance versus pulse duration.



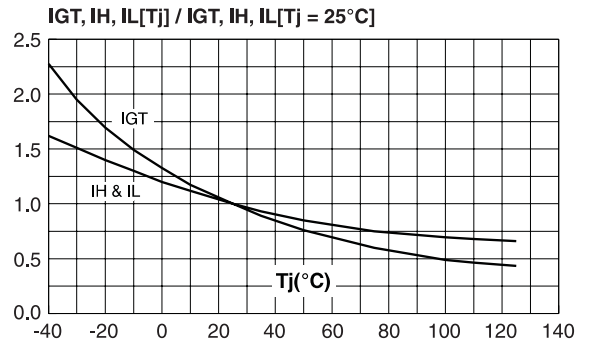
**Fig. 5:** Surge peak on-state current versus number of cycles.



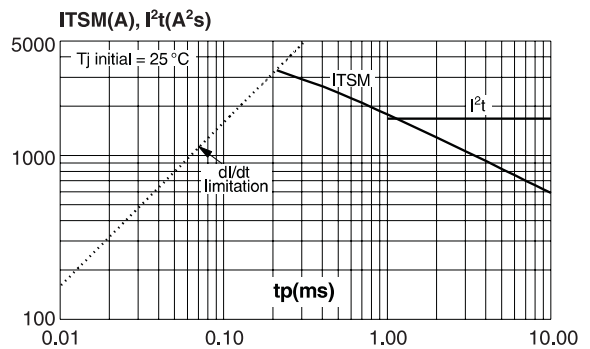
**Fig. 2:** Average and D.C. on-state current versus case temperature.



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

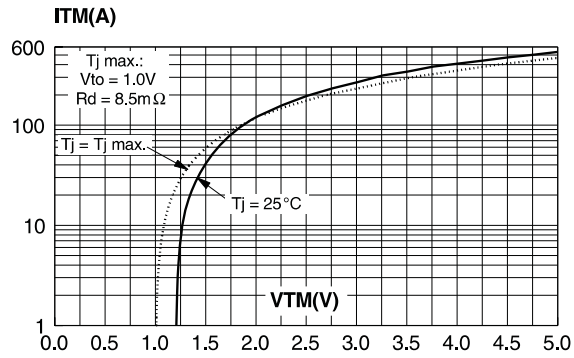


**Fig. 6:** Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $I^2t$ .



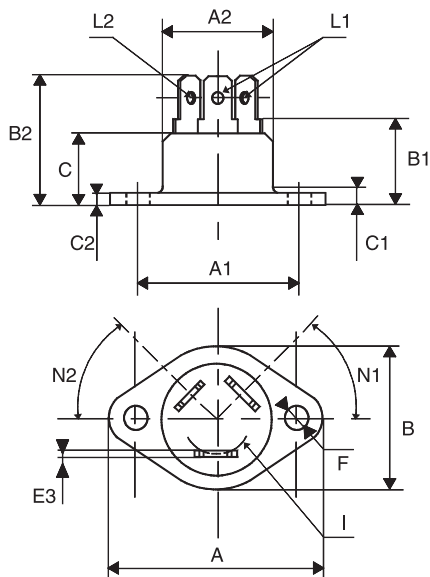
## BTW67 and BTW69 Series

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



## PACKAGE MECHANICAL DATA

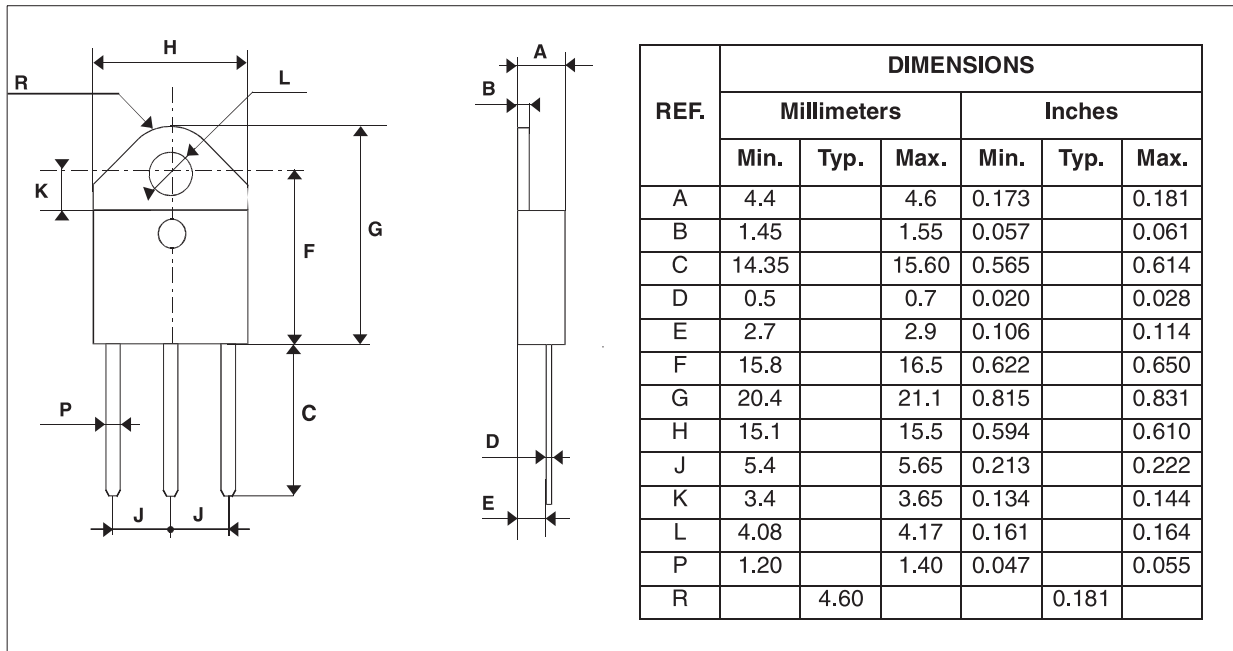
RD91 (Plastic)



| REF. | DIMENSIONS  |       |        |       |
|------|-------------|-------|--------|-------|
|      | Millimeters |       | Inches |       |
|      | Min.        | Max.  | Min.   | Max.  |
| A    |             | 40.00 |        | 1.575 |
| A1   | 29.90       | 30.30 | 1.177  | 1.193 |
| A2   |             | 22.00 |        | 0.867 |
| B    |             | 27.00 |        | 1.063 |
| B1   | 13.50       | 16.50 | 0.531  | 0.650 |
| B2   |             | 24.00 |        | 0.945 |
| C    |             | 14.00 |        | 0.551 |
| C1   |             | 3.50  |        | 0.138 |
| C2   | 1.95        | 3.00  | 0.077  | 0.118 |
| E3   | 0.70        | 0.90  | 0.027  | 0.035 |
| F    | 4.00        | 4.50  | 0.157  | 0.177 |
| I    | 11.20       | 13.60 | 0.441  | 0.535 |
| L1   | 3.10        | 3.50  | 0.122  | 0.138 |
| L2   | 1.70        | 1.90  | 0.067  | 0.075 |
| N1   | 33°         | 43°   | 33°    | 43°   |
| N2   | 28°         | 38°   | 28°    | 38°   |

**PACKAGE MECHANICAL DATA**

TOP3 Ins.(Plastic)



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