

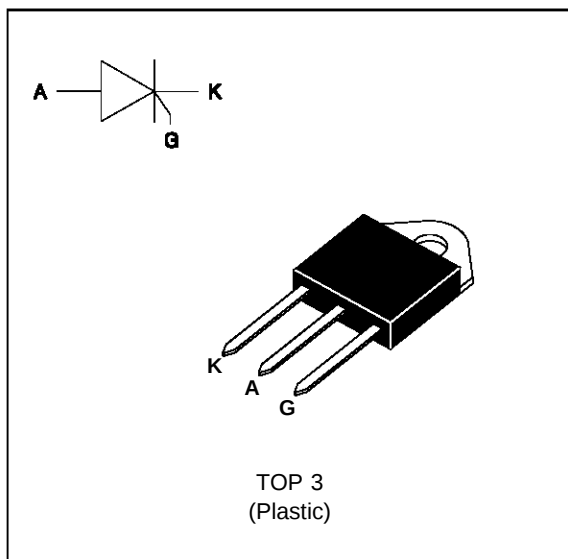
## FEATURES

- HIGH SURGE CAPABILITY
- HIGH ON-STATE CURRENT
- HIGH STABILITY AND RELIABILITY
- BTW 68 Serie :  
INSULATED VOLTAGE = 2500V<sub>(RMS)</sub>  
(UL RECOGNIZED : E81734)

## DESCRIPTION

The BTW 68 (N) Family of Silicon Controlled Rectifiers uses a high performance glass passivated technology.

This general purpose Family of Silicon Controlled Rectifiers is designed for power supplies up to 400Hz on resistive or inductive load.



## ABSOLUTE RATINGS (limiting values)

| Symbol                             | Parameter                                                                                                       |                    |                                              | Value                          | Unit             |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------|--------------------------------|------------------|
| I <sub>T(RMS)</sub>                | RMS on-state current<br>(180° conduction angle)                                                                 | BTW 68<br>BTW 68 N | T <sub>c</sub> =80°C<br>T <sub>c</sub> =85°C | 30<br>35                       | A                |
| I <sub>T(AV)</sub>                 | Average on-state current (180°<br>conduction angle, single phase circuit)                                       | BTW 68<br>BTW 68 N | T <sub>c</sub> =80°C<br>T <sub>c</sub> =85°C | 19<br>22                       | A                |
| I <sub>TSM</sub>                   | Non repetitive surge peak on-state current<br>( T <sub>j</sub> initial = 25°C )                                 |                    | tp=8.3 ms                                    | 420                            | A                |
|                                    |                                                                                                                 |                    | tp=10 ms                                     | 400                            |                  |
| I <sub>2t</sub>                    | I <sub>2t</sub> value                                                                                           |                    | tp=10 ms                                     | 800                            | A <sup>2</sup> s |
| di/dt                              | Critical rate of rise of on-state current<br>Gate supply : I <sub>G</sub> = 100 mA di <sub>G</sub> /dt = 1 A/μs |                    |                                              | 100                            | A/μs             |
| T <sub>stg</sub><br>T <sub>j</sub> | Storage and operating junction temperature range                                                                |                    |                                              | - 40 to + 150<br>- 40 to + 125 | °C<br>°C         |
| TI                                 | Maximum lead temperature for soldering during 10 s at 4.5 mm<br>from case                                       |                    |                                              | 230                            | °C               |

| Symbol                               | Parameter                                                    | BTW 68 |     | BTW 68 / BTW 68 N |     |      |      | Unit |
|--------------------------------------|--------------------------------------------------------------|--------|-----|-------------------|-----|------|------|------|
|                                      |                                                              | 200    | 400 | 600               | 800 | 1000 | 1200 |      |
| V <sub>DRM</sub><br>V <sub>RRM</sub> | Repetitive peak off-state voltage<br>T <sub>j</sub> = 125 °C | 200    | 400 | 600               | 800 | 1000 | 1200 | V    |

**THERMAL RESISTANCES**

| Symbol       | Parameter               |          | Value | Unit |
|--------------|-------------------------|----------|-------|------|
| Rth (j-a)    | Junction to ambient     |          | 50    | °C/W |
| Rth (j-c) DC | Junction to case for DC | BTW 68   | 1.1   | °C/W |
|              |                         | BTW 68 N | 0.8   |      |

**GATE CHARACTERISTICS** (maximum values)

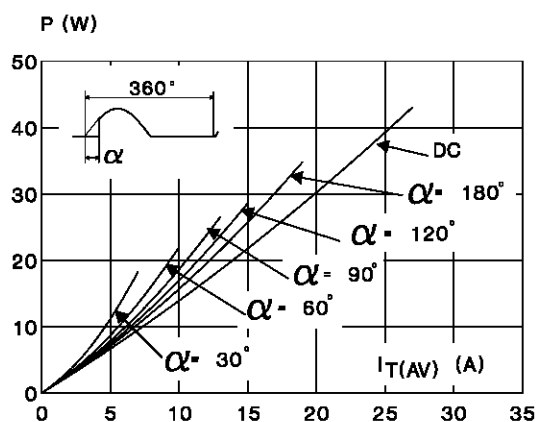
$P_G$  (AV) = 1W     $P_{GM}$  = 40W (tp = 20  $\mu$ s)     $I_{FGM}$  = 8A (tp = 20  $\mu$ s)     $V_{RGM}$  = 5 V.

**ELECTRICAL CHARACTERISTICS**

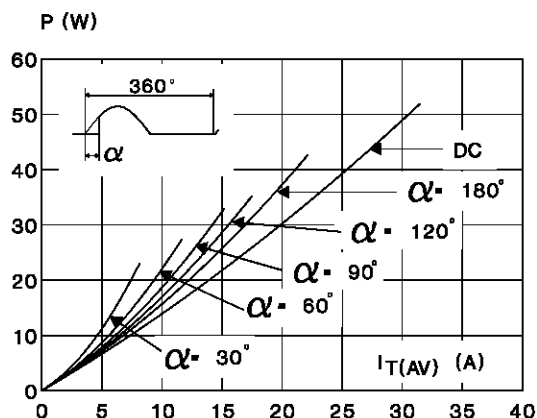
| Symbol                               | Test Conditions                                                                                                                            |                                                     |                        |      | Value      |          | Unit |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|------------------------|------|------------|----------|------|
|                                      |                                                                                                                                            |                                                     |                        |      | BTW 68     | BTW 68 N |      |
| I <sub>GT</sub>                      | V <sub>D</sub> =12V (DC) R <sub>L</sub> =33Ω                                                                                               | T <sub>j</sub> =25°C                                | MAX                    | 50   |            | mA       |      |
| V <sub>GT</sub>                      | V <sub>D</sub> =12V (DC) R <sub>L</sub> =33Ω                                                                                               | T <sub>j</sub> =25°C                                | MAX                    | 1.5  |            | V        |      |
| V <sub>GD</sub>                      | V <sub>D</sub> =V <sub>DRM</sub> R <sub>L</sub> =3.3kΩ                                                                                     | T <sub>j</sub> = 125°C                              | MIN                    | 0.2  |            | V        |      |
| tgt                                  | V <sub>D</sub> =V <sub>DRM</sub> I <sub>G</sub> = 200mA<br>dI <sub>G</sub> /dt = 1.5A/μs                                                   | T <sub>j</sub> =25°C                                | TYP                    | 2    |            | μs       |      |
| I <sub>L</sub>                       | I <sub>G</sub> = 1.2 I <sub>GT</sub>                                                                                                       | T <sub>j</sub> =25°C                                | TYP                    | 40   |            | mA       |      |
| I <sub>H</sub>                       | I <sub>T</sub> = 500mA gate open                                                                                                           | T <sub>j</sub> =25°C                                | MAX                    | 75   |            | mA       |      |
| V <sub>TM</sub>                      | BTW 68 I <sub>TM</sub> = 60A<br>BTW 68 N I <sub>TM</sub> = 70A tp= 380μs                                                                   | T <sub>j</sub> =25°C                                | MAX                    | 2.1  | 2.2        | V        |      |
| I <sub>DRM</sub><br>I <sub>RRM</sub> | V <sub>DRM</sub> Rated<br>V <sub>RRM</sub> Rated                                                                                           | T <sub>j</sub> =25°C                                | MAX                    | 0.02 |            | mA       |      |
|                                      |                                                                                                                                            | T <sub>j</sub> = 125°C                              |                        | 6    |            |          |      |
| dV/dt                                | Linear slope up to<br>V <sub>D</sub> =67%V <sub>DRM</sub><br>gate open                                                                     | V <sub>DRM</sub> ≤ 800V<br>V <sub>DRM</sub> ≥ 1000V | T <sub>j</sub> = 125°C | MIN  | 500<br>250 | V/μs     |      |
| tq                                   | V <sub>D</sub> =67%V <sub>DRM</sub> I <sub>TM</sub> = 60A V <sub>R</sub> = 75V<br>dI <sub>TM</sub> /dt=30 A/μs dV <sub>D</sub> /dt= 20V/μs | T <sub>j</sub> = 125°C                              | TYP                    | 100  |            | μs       |      |

| Package                   | $I_{T(RMS)}$ | $V_{DRM} / V_{RRM}$ | Sensitivity Specification |
|---------------------------|--------------|---------------------|---------------------------|
|                           | A            | V                   | BTW                       |
| BTW 68<br>(Insulated)     | 30           | 200                 | X                         |
|                           |              | 400                 | X                         |
|                           |              | 600                 | X                         |
|                           |              | 800                 | X                         |
|                           |              | 1000                | X                         |
|                           |              | 1200                | X                         |
| BTW 68 N<br>(Uninsulated) | 35           | 600                 | X                         |
|                           |              | 800                 | X                         |
|                           |              | 1000                | X                         |
|                           |              | 1200                | X                         |

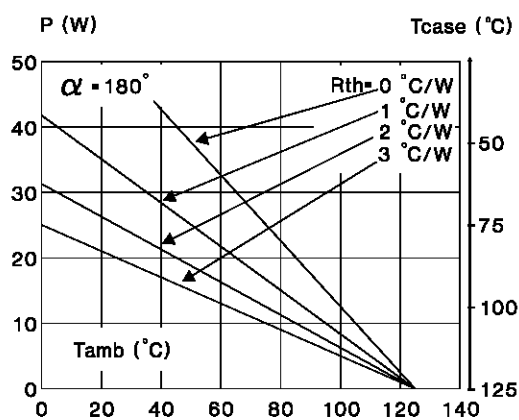
**Fig.1** : Maximum average power dissipation versus average on-state current (BTW 68).



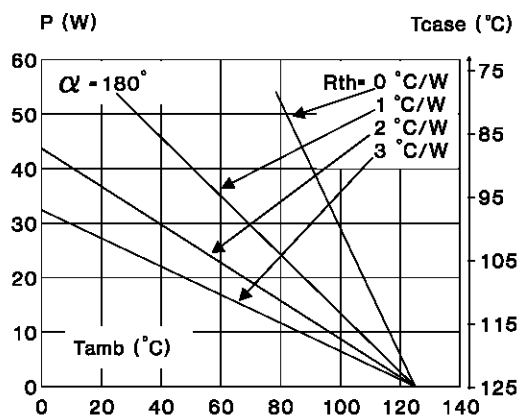
**Fig.3** : Maximum average power dissipation versus average on-state current (BTW 68 N).



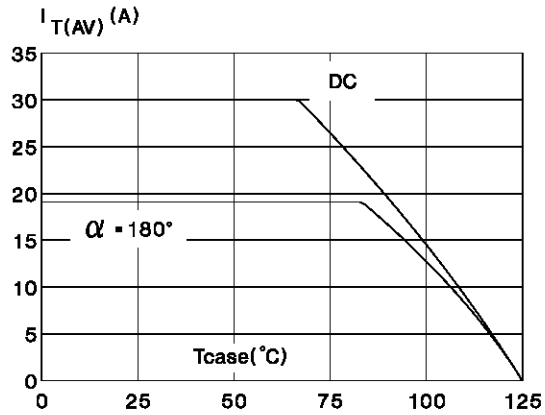
**Fig.2** : Correlation between maximum average power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (BTW 68).



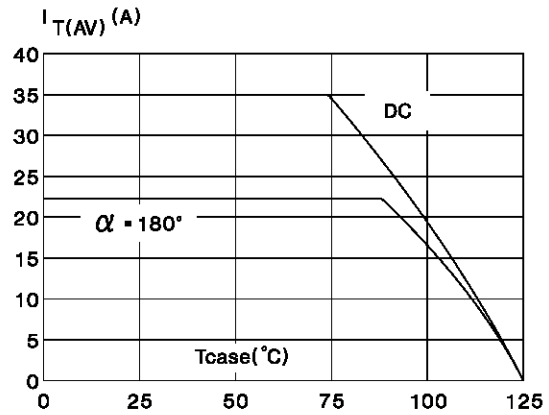
**Fig.4** : Correlation between maximum average power dissipation and maximum allowable temperatures ( $T_{amb}$  and  $T_{case}$ ) for different thermal resistances heatsink + contact (BTW 68 N).



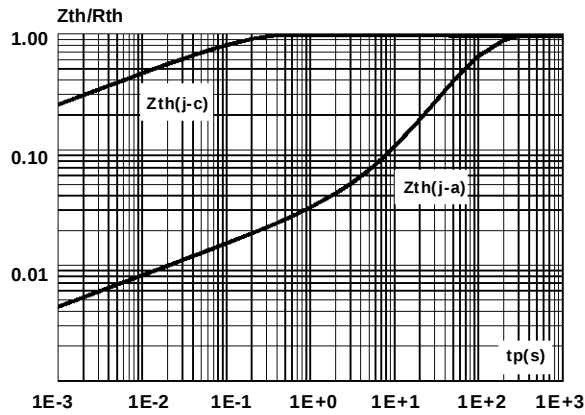
**Fig.5** : Average on-state current versus case temperature (BTW 68).



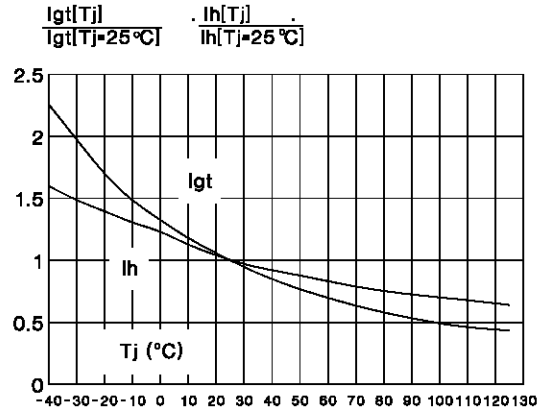
**Fig.6** : Average on-state current versus case temperature (BTW 68 N).



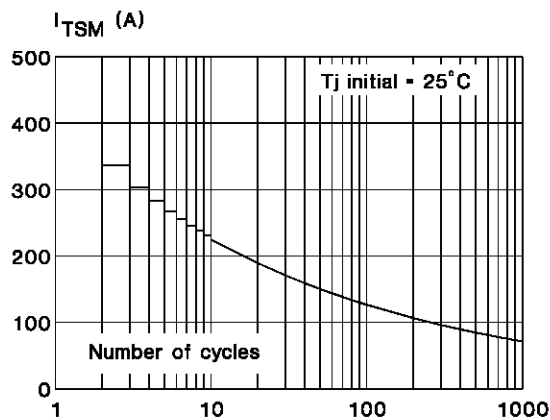
**Fig.7** : Relative variation of thermal impedance versus pulse duration.



**Fig.8** : Relative variation of gate trigger current versus junction temperature.



**Fig.9** : Non repetitive surge peak on-state current versus number of cycles.



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

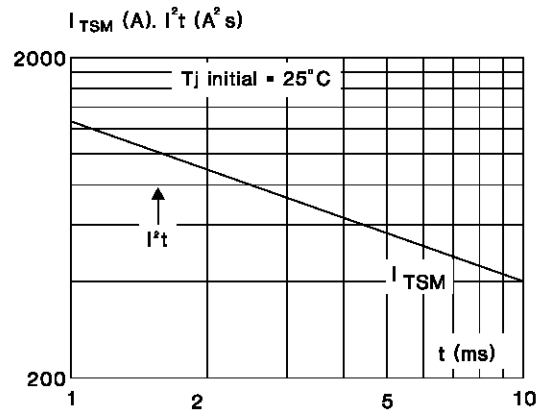
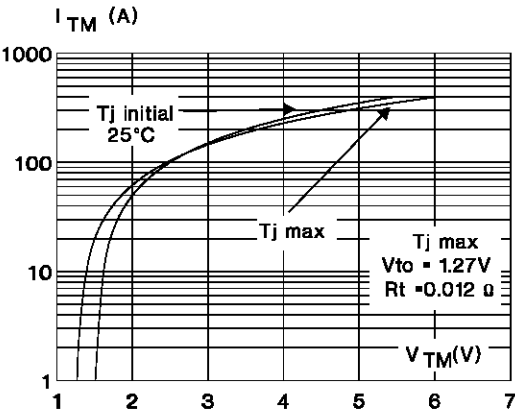
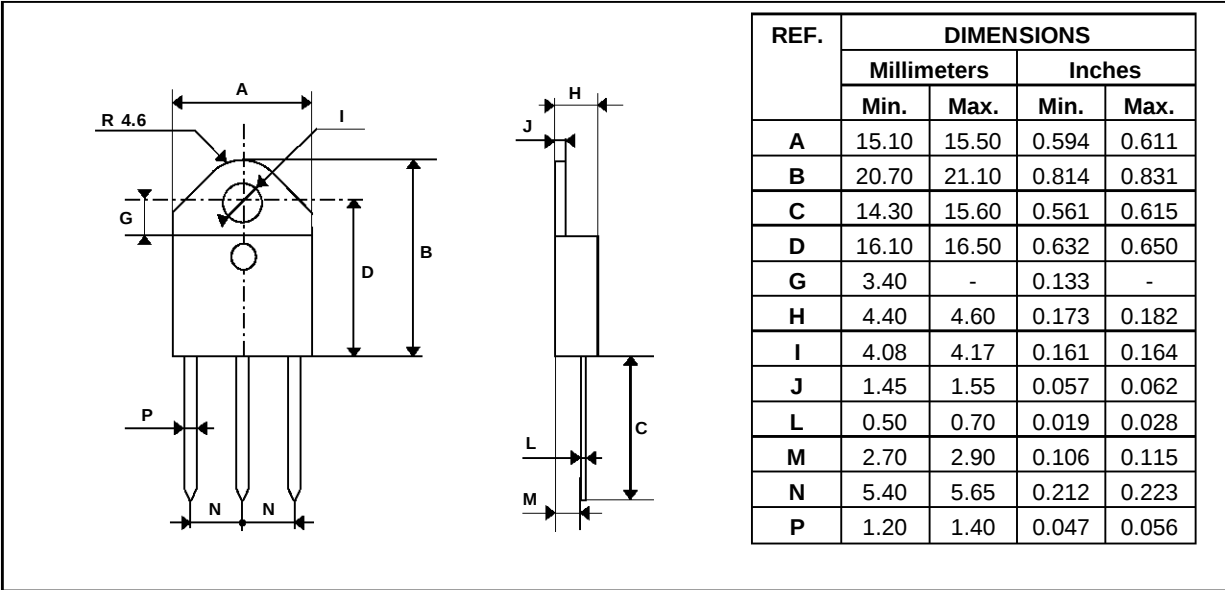


Fig11 : On-state characteristics (maximum values).



PACKAGE MECHANICAL DATA

TOP 3 Plastic



Cooling method : C  
Marking : type number  
Weight : 4.7 g

Recommended torque value : 0.8 m.N.  
Maximum torque value : 1 m.N.

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