

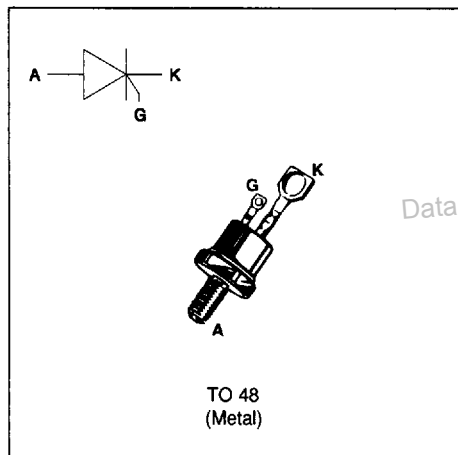
**FEATURES**

- HIGH SURGE CAPABILITY
- HIGH ON-STATE CURRENT
- HIGH STABILITY AND RELIABILITY

**DESCRIPTION**

The BTW 39 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
$I_{T(RMS)}$	RMS on-state current (180° conduction angle)	$T_c = 75^\circ\text{C}$	25	A
$I_{T(AV)}$	Average on-state current (180° conduction angle, single phase circuit)	$T_c = 75^\circ\text{C}$	16	A
$I_{TSM}$	Non repetitive surge peak on-state current ( $T_j$ initial = $25^\circ\text{C}$ )	$t_p = 8.3\text{ ms}$	210	A
		$t_p = 10\text{ ms}$	200	
$i_2t$	$i_2t$ value	$t_p = 10\text{ ms}$	200	$\text{A}^2\text{s}$
$di/dt$	Critical rate of rise of on-state current Gate supply : $I_G = 800\text{ mA}$ $di_G/dt = 1\text{ A}/\mu\text{s}$		100	$\text{A}/\mu\text{s}$
$T_{stg}$ $T_j$	Storage and operating junction temperature range		- 40 to + 150 - 40 to + 125	$^\circ\text{C}$ $^\circ\text{C}$
$T_I$	Maximum lead temperature for soldering during 10 s at 4.5 mm from case		230	$^\circ\text{C}$

Symbol	Parameter	BTW 39-							Unit
		100	200	400	600	800	1000	1200	
$V_{DRM}$ $V_{RRM}$	Repetitive peak off-state voltage $T_j = 125^\circ\text{C}$	100	200	400	600	800	1000	1200	V

**THERMAL RESISTANCES**

Symbol	Parameter	Value	Unit
Rth (c-h)	Contact (case to heatsink)	0.4	°C/W
Rth (j-c) DC	Junction to case for DC	1.5	°C/W

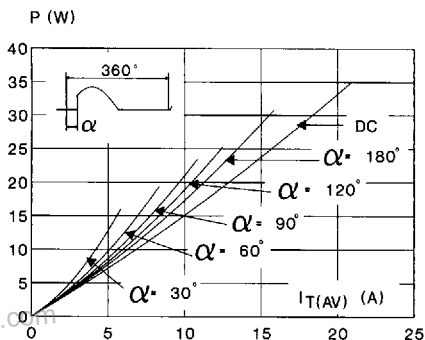
**GATE CHARACTERISTICS** (maximum values)

$P_G (AV) = 1W$   $P_{GM} = 40W$  ( $t_p = 20 \mu s$ )  $I_{FGM} = 8A$  ( $t_p = 20 \mu s$ )  $V_{FGM} = 16V$  ( $t_p = 20 \mu s$ )  $V_{RGM} = 5V$ .

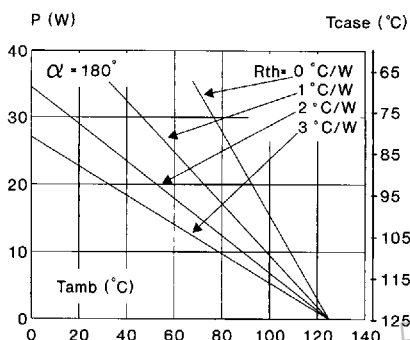
**ELECTRICAL CHARACTERISTICS**

Symbol	Test Conditions			Value	Unit
I <sub>GT</sub>	V <sub>D</sub> =12V (DC) R <sub>L</sub> =33Ω	T <sub>j</sub> =25°C	MAX	80	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
t <sub>gt</sub>	V <sub>D</sub> =V <sub>DRM</sub> I <sub>G</sub> = 200mA 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	80	mA
I <sub>H</sub>	I <sub>T</sub> = 500mA gate open	T <sub>j</sub> =25°C	TYP	50	mA
V <sub>TM</sub>	I <sub>TM</sub> = 50A t <sub>p</sub> = 380μs	T <sub>j</sub> =25°C	MAX	2.2	V
I <sub>DRM</sub> I <sub>RRM</sub>	V <sub>DRM</sub> Rated V <sub>RRM</sub> Rated	T <sub>j</sub> =25°C	MAX	0.02	mA
		T <sub>j</sub> = 125°C		5	
dV/dt	Linear slope up to V <sub>D</sub> =67%V <sub>DRM</sub> gate open	T <sub>j</sub> = 125°C	MIN	200	V/μs
T <sub>q</sub>	V <sub>D</sub> =67%V <sub>DRM</sub> I <sub>TM</sub> = 50A V <sub>R</sub> = 50V dI <sub>TM</sub> /dt=30 A/μs dV <sub>D</sub> /dt= 20V/μs	T <sub>j</sub> = 125°C	TYP	100	μs

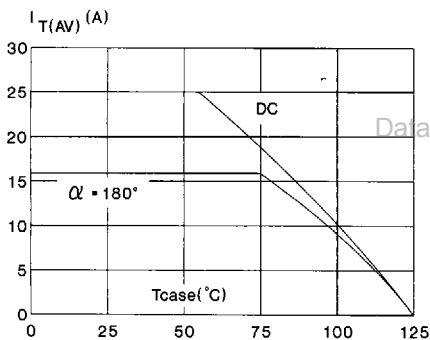
**Fig.1 :** Maximum average power dissipation versus average on-state current.



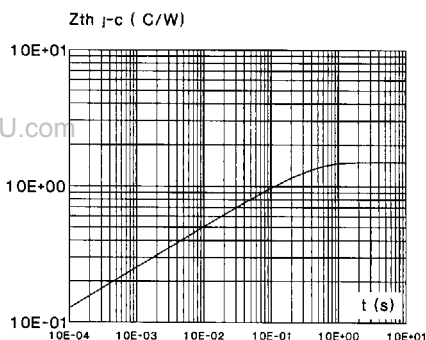
**Fig.2 :** Correlation between maximum average power dissipation and maximum allowable temperatures (Tamb and Tcase) for different thermal resistances heatsink + contact.



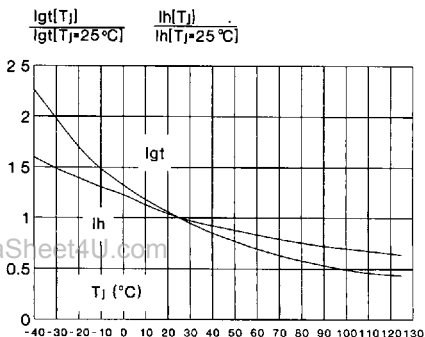
**Fig.3 :** Average on-state current versus case temperature.



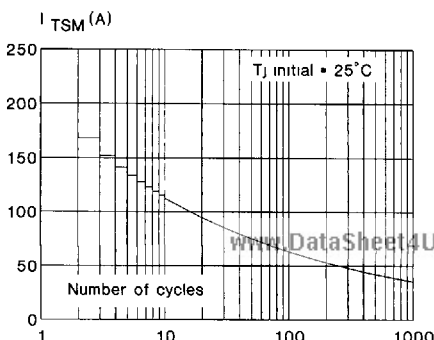
**Fig.4 :** Thermal transient impedance junction to ambient versus pulse duration.



**Fig.5 :** Relative variation of gate trigger current versus junction temperature.

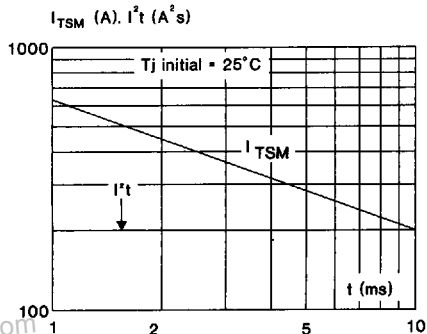


**Fig.6 :** Non repetitive surge peak on-state current versus number of cycles.

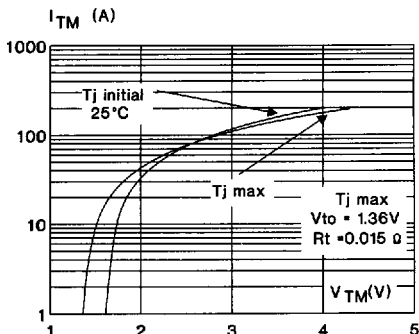


**BTW 39**

**Fig.7** : Non repetitive surge peak on-state current for a sinusoidal pulse with width :  $t \leq 10$  ms, and corresponding value of  $I^2t$ .



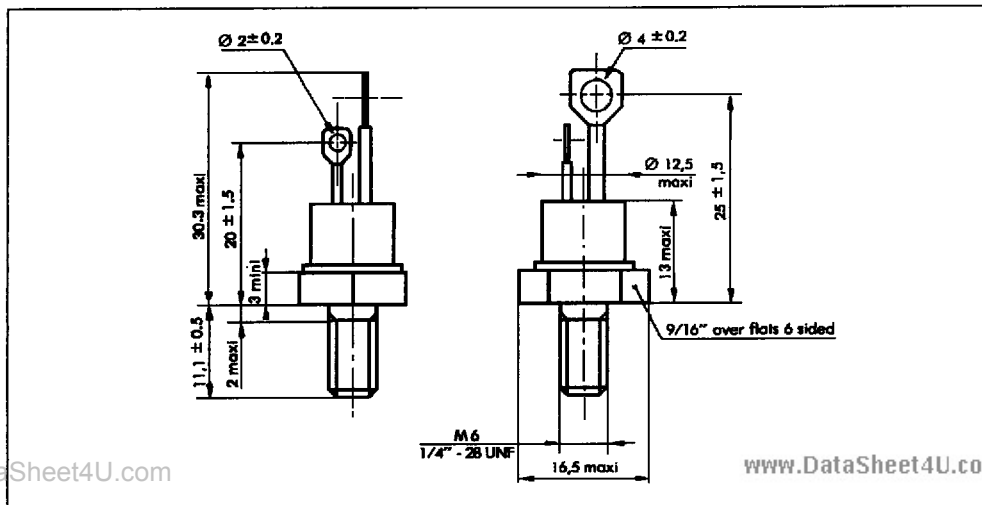
**Fig.8** : On-state characteristics (maximum values).



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**PACKAGE MECHANICAL DATA** (in millimeters)

TO 48 Metal



Cooling method : A

Marking : type number

Weight : 13.5 g

Polarity : Anade (or A2) to case

Stud torque : 3.5 mAN min / 3.8 mAN max

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