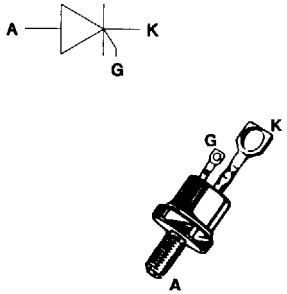
SGS-THOMSON MICROELECTRONICS

BTW 30

FAST SWITCHING SCR

FEATURES

- HIGH dI/dt AND dV/dt RATINGS
- tq : ≤ 12µs AND 20µs FOLLOWING V_{DRM}/V_{RRM}
- HIGH STABILITY AND RELIABILITY



TO 48
(Metal)

DESCRIPTION

The BTW30 Silicon Controlled Rectifier Family uses a high performance glass passivated technology.
This fast switching Silicon Controlled Rectifier Family is designed for high frequency power switching applications.

ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	RMS on-state current (180° conduction angle)	Tc=80°C	25	A
$I_{T(AV)}$	Average on-state current (180° conduction angle,single phase circuit)	Tc=80°C	16	A
I_{TSM}	Non repetitive surge peak on-state current (Tj initial = 25°C)	tp=8.3 ms	210	A
		tp=10 ms	200	
I^2t	I^2t value	tp=10 ms	200	A^2s
dI/dt	Critical rate of rise of on-state current Gate supply : I_G = 1 A di_G/dt = 10 A/µs		200	A/µs
Tstg Tj	Storage and operating junction temperature range		- 40 to + 150 - 40 to + 125	°C °C
Tl	Maximum lead temperature for soldering during 10 s at 4.5 mm from case		230	°C

Symbol	Parameter	BTW 30-				Unit
		600	800	1000	1200	
V_{DRM} V_{RRM}	Repetitive peak off-state voltage Tj = 125 °C	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	1.0	°C/W

GATE CHARACTERISTICS (maximum values)

$P_{G\ (AV)}$ = 1W P_{GM} = 40W (tp = 20 µs) I_{FGM} = 4A (tp = 20 µs) V_{FGM} = 16V (tp = 20 µs) V_{RGM} = 5 V.

ELECTRICAL CHARACTERISTICS

Symbol	Test Conditions				Value	Unit
I_{GT}	V_D=12V (DC) R_L=33Ω		Tj=25°C	MAX	200	mA
V_{GT}	V_D=12V (DC) R_L=33Ω		Tj=25°C	MAX	1.5	V
V_{GD}	V_D=V_{DRM} R_L=3.3kΩ		Tj= 125°C	MIN	0.2	V
tgt	V_D=V_{DRM} I_G = 500mA dI_G/dt = 3A/µs		Tj=25°C	TYP	1	µs
I_L	I_G= 1.2 I_{GT}		Tj=25°C	TYP	140	mA
I_H	I_T= 500mA gate open		Tj=25°C	TYP	70	mA
V_{TM}	ITM= 50A tp= 380µs		Tj=25°C	MAX	3	V
I_{DRM} I_{RRM}	V_{DRM} Rated V_{RRM} Rated		Tj=25°C	MAX	0.05	mA
			Tj= 100°C		6	
dV/dt	Linear slope up to V_D=67%V_{DRM} gate open		Tj= 125°C	MIN	200	V/µs
Tq	V_D=67%V_{DRM} I_{TM}= 50A V_R= 50V dI_{TM}/dt=10 A/µs dV_D/dt=50V/µs	V_{RRM}=600/800V	Tj= 125°C	MAX	12	µs
		V_{RRM}=1000/1200V			20	

SINUSOIDAL CURRENT PULSE DATA

Fig.1 : Energy per pulse for sinusoidal pulses.

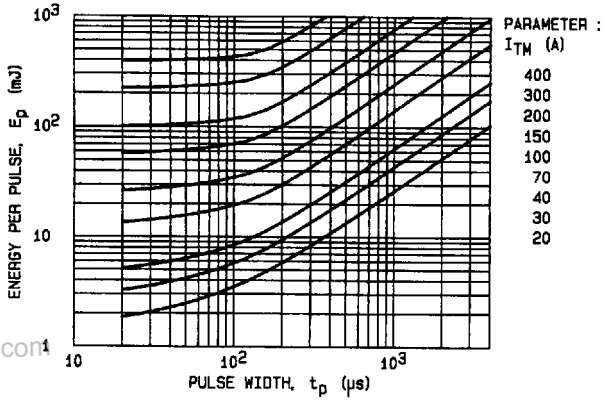


Fig.2 : Maximum allowable peak on-state current versus pulse width for Tc = 85 °C.

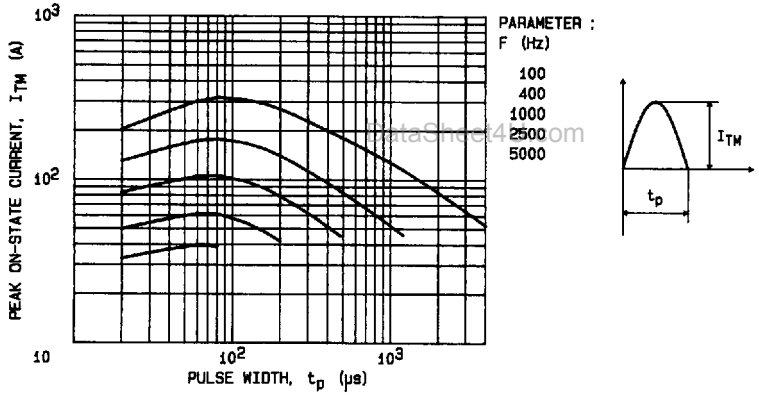
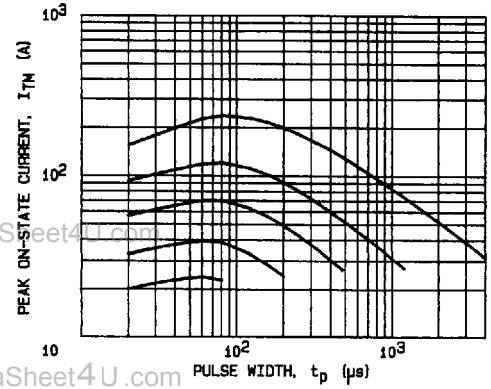


Fig.3 : Maximum allowable peak on-state current versus pulse width for Tc = 90 °C.



NOTES :

1. $V_D = V_R = 600$ Volts.
2. R.C Snubber, C = 0.1 µF, R = 33 Ω.

TRAPEZOIDAL CURRENT PULSE DATA

Fig.4 : Energy per pulse for trapezoidal pulses.

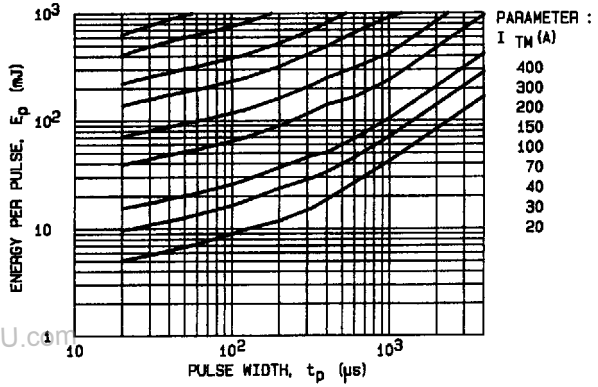
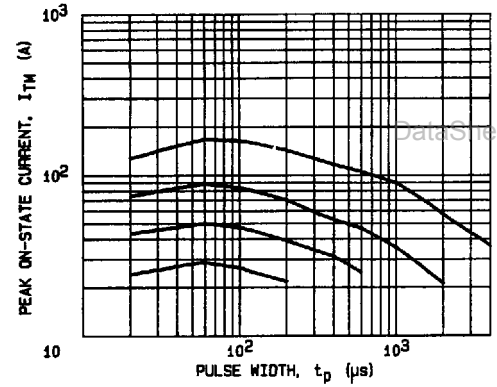


Fig.5 : Maximum allowable peak on-state current versus pulse width for Tc = 85 °C.



di/dt = 100 A/µs

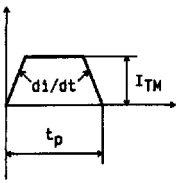
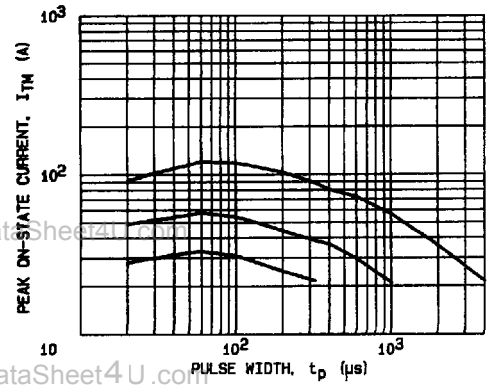


Fig.6 : Maximum allowable peak on-state current versus pulse width for Tc = 90 °C.



NOTES :

1. $V_D = V_R = 600$ Volts.
2. R.C Snubber, C = 0.1 µF, R = 33 Ω .

Fig.7 : Non repetitive surge peak on-state current versus number of cycles.

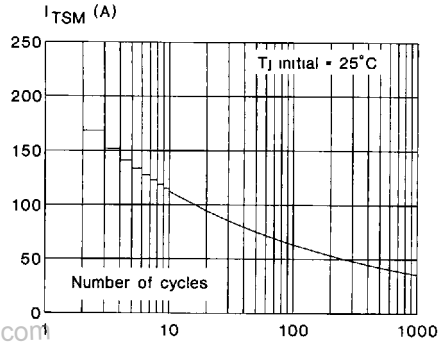


Fig.8 : Transient thermal impedance junction to ambient.

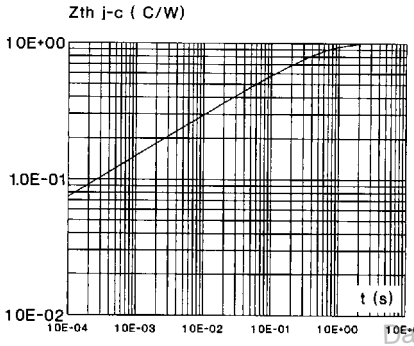


Fig.9 : Relative variation of gate trigger current and holding current versus junction temperature.

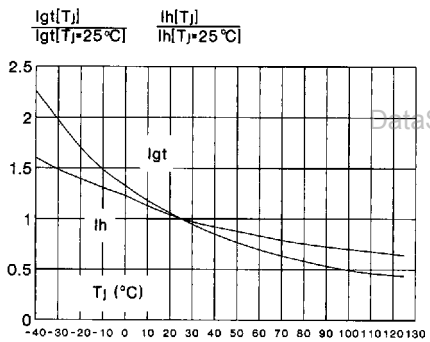


Fig.10 : Non repetitive surge peak on-state current for a sinusoidal pulse with width : t ≤ 10 ms, and corresponding value of I^2t.

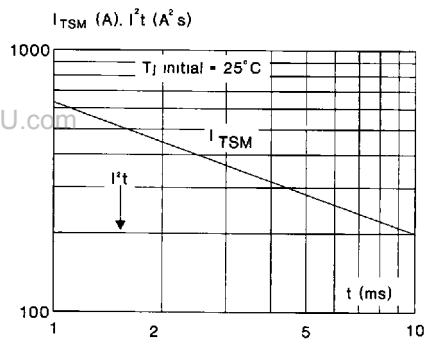
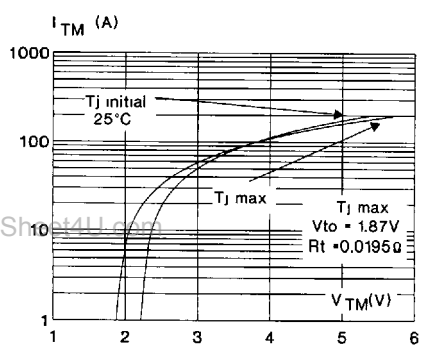
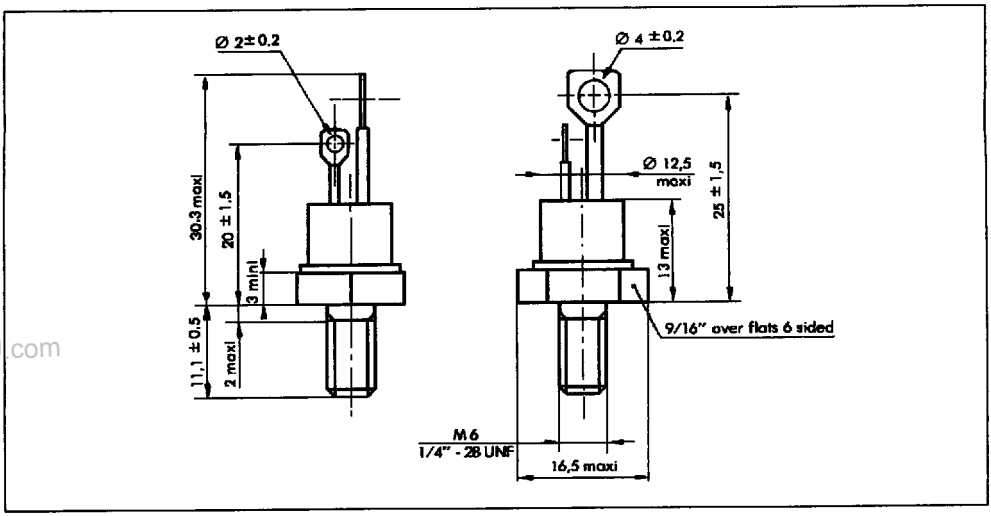


Fig11 : On-state characteristics (maximum values).



PACKAGE MECHANICAL DATA (in millimeters)

TO 48 Metal



Cooling method : A
Marking : type number
Weight : 13.5 g
Polarity : Anode (or A2) to case
Stud torque : 3.5 mΛN min / 3.8 mΛN max