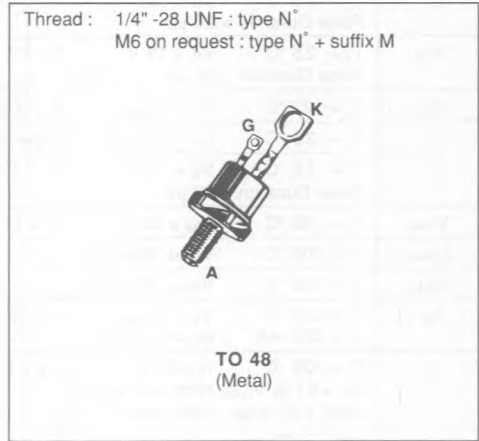


## FAST SWITCHING THYRISTORS

- GLASS PASSIVATED CHIP
- HIGH STABILITY AND RELIABILITY
- HIGH di/dt AND dv/dt RATINGS
- $t_q \leq 12\mu\text{s}$  FOR BTW30-600/800  
 $\leq 20\mu\text{s}$  FOR BTW30-1000/1200



### DESCRIPTION

SCR designed for high frequency power switching applications.

### ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit
$I_{T(RMS)}$	RMS on-state Current (1)	$T_C = 60\text{ }^\circ\text{C}$	25	A
$I_{T(AV)}$	Mean on-state Current (1)	$T_C = 60\text{ }^\circ\text{C}$	16	A
$I_{TSM}$	Non Repetitive Surge Peak on-state Current ( $T_j$ initial $\leq 125\text{ }^\circ\text{C}$ ) (2)	$t = 8.3\text{ ms}$	210	A
		$t = 10\text{ ms}$	200	
$I^2t$	$I^2t$ Value for Fusing	$t = 10\text{ ms}$	200	A <sup>2</sup> s
di/dt	Critical Rate of Rise of on-state Current (3)		200	A/ $\mu\text{s}$
$T_{stg}$ $T_i$	Storage and Operating Junction Temperature Range		- 40 to 150 - 40 to 125	$^\circ\text{C}$ $^\circ\text{C}$

Symbol	Parameter	BTW 30-				Unit
		600	800	1000	1200	
$V_{DRM}$ $V_{RRM}$	Repetitive Peak off-state Voltage (4)	600	800	1000	1200	V

(1) Single phase circuit, 180° conduction angle.

(2) Half sine wave.

(3)  $I_G = 1\text{ A}$      $di/dt = 1\text{ A}/\mu\text{s}$ .

(4)  $T_j = 125\text{ }^\circ\text{C}$ .

### THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction-case for D.C.	1.4	$^\circ\text{C}/\text{W}$
$R_{th(c-h)}$	Contact (case to heatsink)	0.4	$^\circ\text{C}/\text{W}$

**GATE CHARACTERISTICS** (maximum values)

$P_{GM} = 20 \text{ W}$  ( $t_p = 100 \mu\text{s}$ )

$I_{FGM} = 1 \text{ A}$  ( $t_p = 100 \mu\text{s}$ )

$V_{RGM} = 5 \text{ V}$

$P_{G(AV)} = 1 \text{ W}$

$V_{FGM} = 15 \text{ V}$  ( $t_p = 100 \mu\text{s}$ )

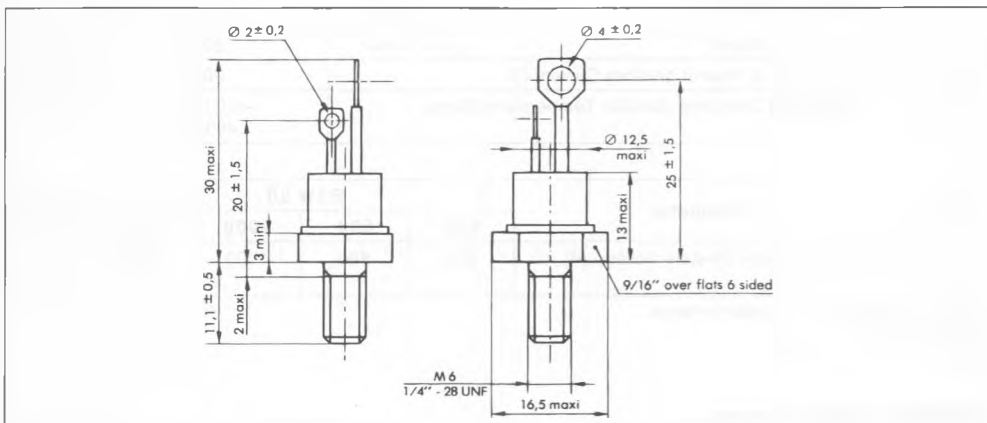
**ELECTRICAL CHARACTERISTICS**

Symbol	Test Conditions	Min.	Typ.	Max.	Unit
$I_{GT}$	$T_j = 25 \text{ }^\circ\text{C}$ $V_D = 12 \text{ V}$ $R_L = 33 \text{ } \Omega$ Pulse Duration > 20 $\mu\text{s}$			200	mA
$V_{GT}$	$T_j = 25 \text{ }^\circ\text{C}$ $V_D = 12 \text{ V}$ $R_L = 33 \text{ } \Omega$ Pulse Duration > 20 $\mu\text{s}$			1.5	V
$V_{GO}$	$T_j = 125 \text{ }^\circ\text{C}$ $V_D = V_{DRM}$ $R = 3.3 \text{ k}\Omega$	0.2			V
$I_H$	$T_j = 25 \text{ }^\circ\text{C}$ $I_T = 500 \text{ mA}$ Gate Open		70		mA
$I_L$	$T_j = 25 \text{ }^\circ\text{C}$ $V_D = 12 \text{ V}$ $I_G = 400 \text{ mA}$ Pulse Duration > 20 $\mu\text{s}$		140		mA
$V_{TM}$	$T_j = 25 \text{ }^\circ\text{C}$ $I_{TM} = 50 \text{ A}$ $t_p = 10 \text{ ms}$			3	V
$I_{DRM}$	$T_j = 100 \text{ }^\circ\text{C}$ $V_{DRM}$ Specified			6	mA
$I_{RRM}$	$T_j = 100 \text{ }^\circ\text{C}$ $V_{RRM}$ Specified			6	mA
$t_{gt}$	$T_j = 25 \text{ }^\circ\text{C}$ $V_D = V_{DRM}$ $I_T = 50 \text{ A}$ $I_G = 500 \text{ mA}$ $di_G/dt = 5 \text{ A}/\mu\text{s}$		1		$\mu\text{s}$
$t_g$	$T_j = 125 \text{ }^\circ\text{C}$ $I_T = 50 \text{ A}$ $V_R = 50 \text{ V}$ $V_D = 67 \% V_{DRM}$ $di/dt = 10 \text{ A}/\mu\text{s}$ $dv/dt = 50 \text{ V}/\mu\text{s}$ Gate Open	BTW 30-600/800	12		$\mu\text{s}$
		BTW 30-1000/1200	20		
$dv/dt^*$	$T_j = 125 \text{ }^\circ\text{C}$ Gate Open Linear Slope up to $V_D = 67 \% V_{DRM}$	200			V/ $\mu\text{s}$

\* For higher guaranteed values, please consult us.

**PACKAGE MECHANICAL DATA**

TO 48 Metal



Cooling method : by conduction (method C)  
 Marking : type number  
 Weight : 13.5 + 1 g  
 Polarity : anode to case  
 Stud torque : 3.5 mAN min - 3.8 mAN max.

SINUSOIDAL CURRENT PULSE DATA

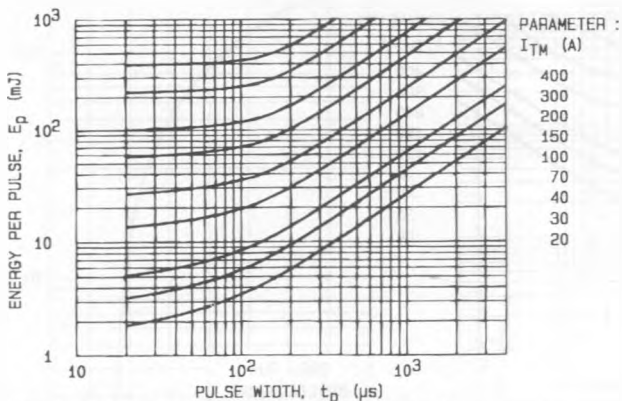


FIG.1 - ENERGY PER PULSE FOR SINUSOIDAL PULSES.

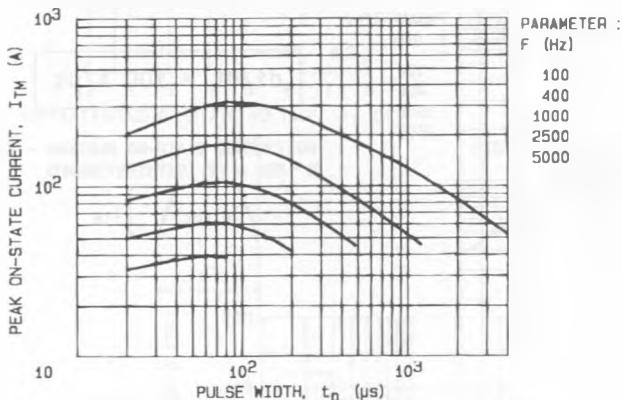


FIG.2 - MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VERSUS PULSE WIDTH FOR  $T_c = 85^\circ\text{C}$ .

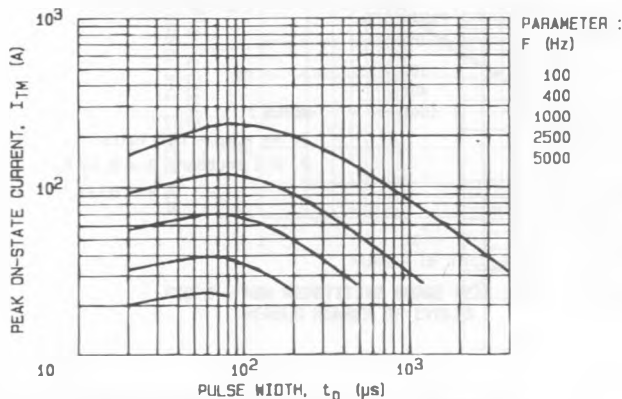
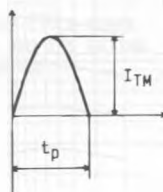


FIG.3 - MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VERSUS PULSE WIDTH FOR  $T_c = 90^\circ\text{C}$ .

NOTES :

1.  $V_D = V_R = 600$  Volts.
2. R.C Snubber,  $C = 0.1 \mu\text{F}$ ,  
 $R = 33 \Omega$ .

TRAPEZOIDAL CURRENT PULSE DATA

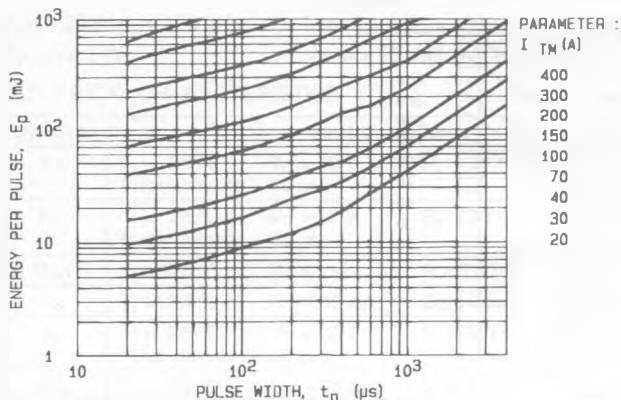


FIG. 4 - ENERGY PER PULSE FOR TRAPEZOIDAL PULSES.

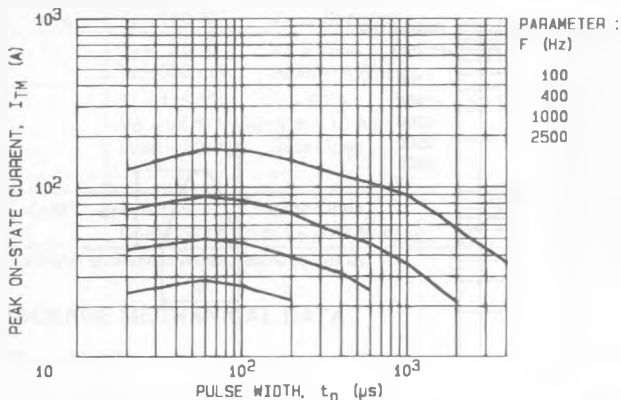


FIG. 5 - MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VERSUS PULSE WIDTH FOR T<sub>j</sub> = 85 °C.

di/dt = 100 A/μs

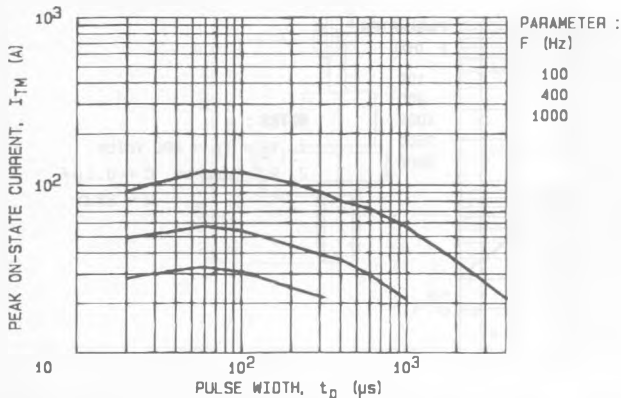
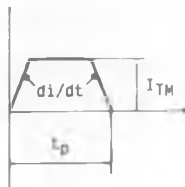


FIG. 8 - MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VERSUS PULSE WIDTH FOR T<sub>c</sub> = 80 °C.

NOTES :

1. V<sub>D</sub> = V<sub>R</sub> = 600 Volts.
2. R.C Snubber, C = 0.1 μF.  
R = 33 Ω .

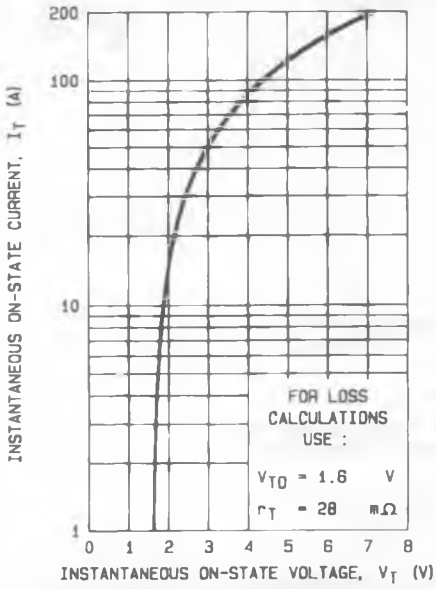


FIG.7 - MAXIMUM ON-STATE CONDUCTION CHARACTERISTIC ( $T_J = 125^\circ\text{C}$ ).

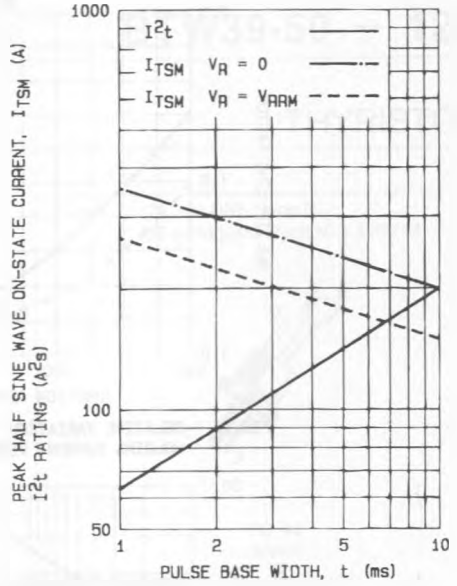


FIG.8 - NON REPETITIVE SUB-CYCLE SURGE ON-STATE CURRENT AND  $I^2t$  RATING (INITIAL  $T_J = 125^\circ\text{C}$ ).

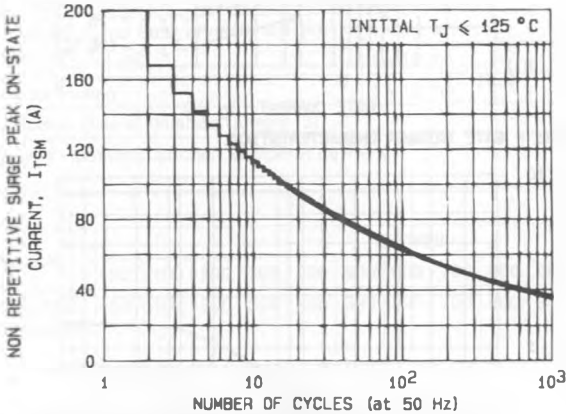


FIG.9 - NON REPETITIVE SURGE PEAK ON-STATE CURRENT VERSUS NUMBER OF CYCLES.

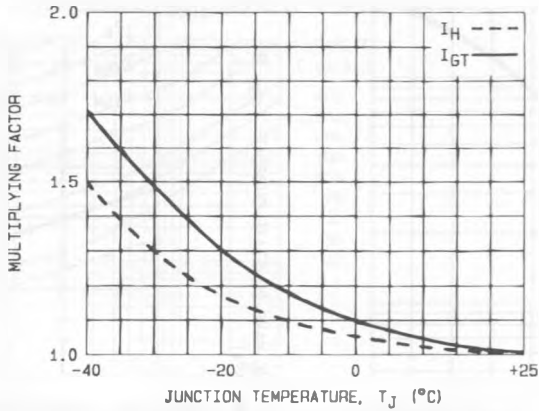


FIG.10 - RELATIVE VARIATION OF GATE TRIGGER CURRENT AND HOLDING CURRENT VERSUS JUNCTION TEMPERATURE.

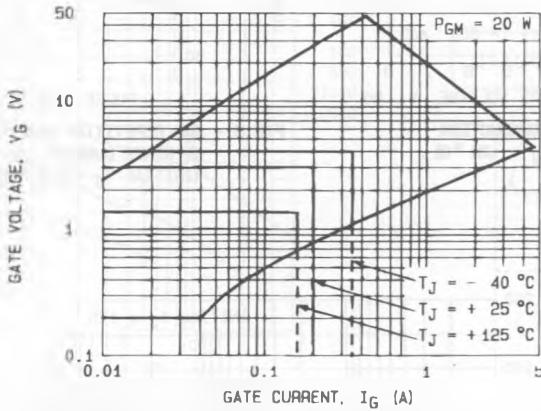


FIG.11 - GATE TRIGGER CHARACTERISTICS.

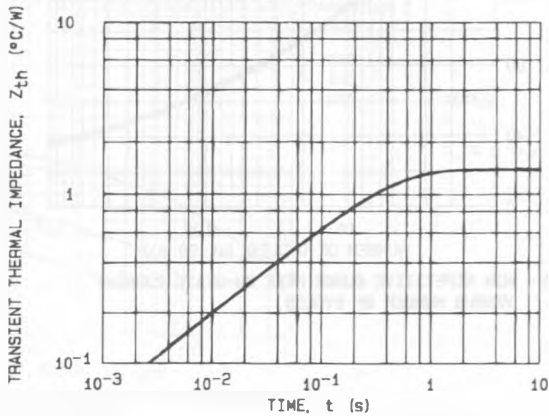


FIG.12 - TRANSIENT THERMAL IMPEDANCE JUNCTION TO CASE.