

THOMSON SEMICONDUCTORS

78C 07800 D
BTW 28 A 500 R → 800 R
 FAST SWITCHING THYRISTORS
 FOR PULSE OPERATION
 THYRISTORS RAPIDES POUR
 FONCTIONNEMENT EN IMPULSIONS

T-25-17

SCR designed for high frequency power switching applications.

- $V_{DRM} = V_{RRM}$ up to 800 V.
- Glass passivation.
- High stability and reliability.
- High di/dt and dv/dt ratings.

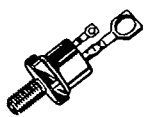
Thyristors conçus pour des applications de puissance hautes fréquences.

- $V_{DRM} = V_{RRM}$ jusqu'à 800 V.
- Pastilles glassivées.
- Grande stabilité des caractéristiques.
- di/dt et dv/dt élevés.

$I_T(RMS) = 35 \text{ A} / T_{case} = 75^\circ\text{C}$

V_{DRM}
 $500 \text{ V} \leq \quad = \quad \leq 800 \text{ V}$
 V_{RRM}
 $t_q \leq 20 \mu\text{s}$

Case : TO 48 metal (CB-267)
 Boîtier



ABSOLUTE RATINGS (LIMITING VALUES) VALEURS LIMITES ABSOLUES D'UTILISATION	Symbol	Value	Unit
RMS on-state current* <i>Courant efficace à l'état passant*</i>	$I_T(RMS)$	35 @ $T_{case} = 75^\circ\text{C}$	A
Mean on-state current* <i>Courant moyen à l'état passant*</i>	$I_T(AV)$	22,5 @ $T_{case} = 75^\circ\text{C}$	A
Non repetitive surge peak on-state current** <i>Courant non répétitif de surcharge crête accidentelle à l'état passant**</i>	I_{TSM} I_{TSM}	260 (t = 8,3 ms) 250 (t = 10 ms) @ $T_j \leq 125^\circ\text{C}$	A A
I^2t for fusing <i>Valeur de la constante I^2t</i>	I^2t	312,5 (t = 10 ms) @ $T_j \leq 125^\circ\text{C}$	A ² s
Critical rate of rise of on-state current*** <i>Vitesse critique de croissance du courant à l'état passant***</i>	di/dt	1000	A/ μs
Storage and operating junction temperatures <i>Températures extrêmes de stockage et de jonction en fonctionnement</i>	T_{stg} T_j	-40, + 150 -40, + 125	$^\circ\text{C}$ $^\circ\text{C}$

@ $T_j = 125^\circ\text{C}$	BTW 28 A 500 R	BTW 28 A 600 R	BTW 28 A 700 R	BTW 28 A 800 R
$V_{DRM} = V_{RRM}$ (V)	500	600	700	800

Thermal resistances <i>Résistances thermiques</i>	Symbol	Value	Unit
— Junction to case for D.C. <i>Jonction-boîtier en continu</i>	$R_{th(j-c)}$	0,93	$^\circ\text{C}/\text{W}$
— Contact (case to heatsink) <i>Contact (boîtier-radiateur)</i>	$R_{th(c-h)}$	0,40	$^\circ\text{C}/\text{W}$

* Single phase circuit, 180° conduction angle
 * Circuit monophasé, angle de conduction 180°

** Half sine wave
 ** Demi-onde sinusoïdale

*** Gate supply 20 V/20 Ω - $t_r \leq 0,1 \mu\text{s}$ - Half sine wave of 6,3 μs - $T_j = 125^\circ\text{C}$
 *** Générateur de gâchette Demi-sinusóide

September 1984 - 1/6

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GATE CHARACTERISTICS (Maximum values)
CARACTÉRISTIQUES DE GACHETTE (Valeurs maximales)

PGM = 60 W (t = 500 μs)
PG(AV) = 1 W

I_{FGM} = 10 A (t = 500 μs)
V_{FGM} = 15 V (t = 500 μs)

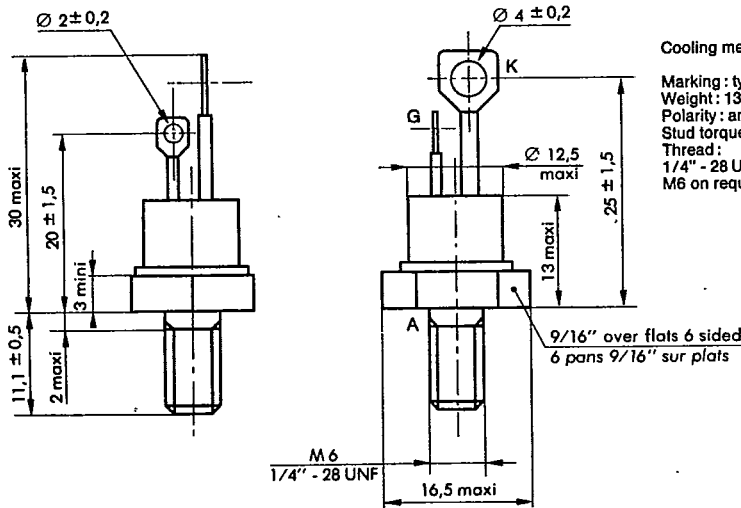
V_{RGM} = 5 V

ELECTRICAL CHARACTERISTICS
CARACTÉRISTIQUES ÉLECTRIQUES

Symbol	Value			Unit	Test conditions			
	min	typ	max					
I _{GT}			180	mA	T _J = 25 °C	V _D = 12 V	R _L = 33 Ω	t _p ≥ 20 μs
V _{GT}			3	V	T _J = 25 °C	V _D = 12 V	R _L = 33 Ω	t _p ≥ 20 μs
V _{GD}	0,25			V	T _J = 125 °C	V _D = V _{DRM}	R _L = 3,3 kΩ	
I _H		70		mA	T _J = 25 °C	I _T = 0,5 A	Gate open	
V _{TM}			2,05	V	T _J = 25 °C	I _{TM} = 25 A	t _p = 10 ms	
I _{DRM}			6	mA	T _J = 125 °C	V _{DRM} specified		
I _{RRM}			6	mA	T _J = 125 °C	V _{RRM} specified		
t _{gt}		1		μs	T _J = 25 °C I _G = 200 mA	I _T = 25 A di _G /dt = 1,5 A/μs	V _D = V _{DRM}	
t _q			20	μs	T _J = 120 °C di _R /dt = 50 A/μs	I _T = 100 A dv/dt = 200 V/μs	t _p (I _T) = 100 μs V _D = 0,67 V _{DRM}	V _R = 30 V Gate open
E _p			25	mJ	T _J = 25 °C I _G = 750 mA	I _T = 300 A t _p (I _G) = 3 μs	t _p (I _T) = 1,5 μs di _G /dt = 2 A/μs	V _{DRM} = 600 V
dv/dt*	200			V/μs	T _J = 120 °C	Linear slope up to 0,67 V _{DRM} specified		

* For higher guaranteed values, please consult us.

CASE DESCRIPTION
DESCRIPTION DU BOITIER



Cooling method: by conduction (method C)
Marking: type number
Weight: 13,5 ± 1 g
Polarity: anode to case
Stud torque: 3,5 m Nmin-3,8 m Nmax
Thread:
1/4" - 28 UNF : type N°
M6 on request: type N° + suffix M

TO 48 metal (CB-267)

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SINUSOIDAL CURRENT PULSE DATA

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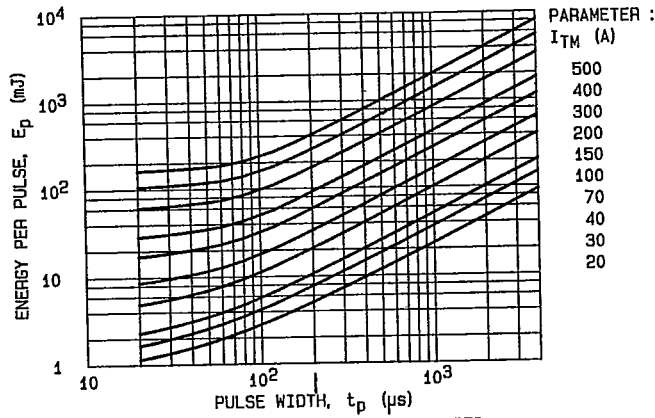


FIG.1 - ENERGY PER PULSE FOR SINUSOIDAL PULSES.

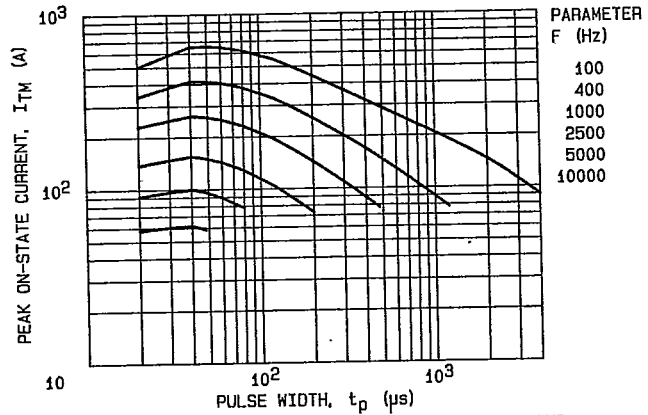


FIG.2 - MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VERSUS PULSE WIDTH FOR $T_c = 85^\circ\text{C}$.

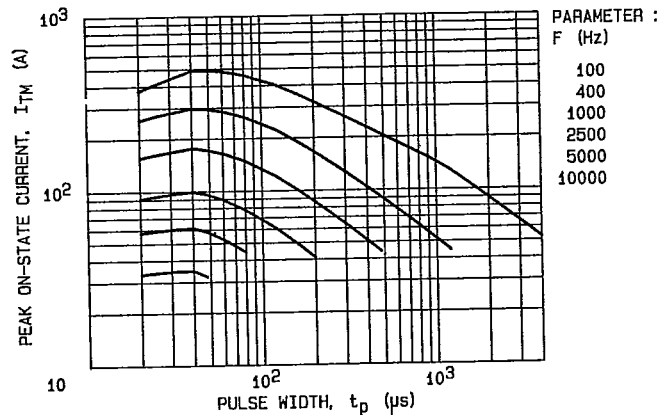
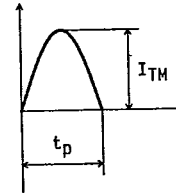


FIG.3 - MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VERSUS PULSE WIDTH FOR $T_c = 80^\circ\text{C}$.

NOTES :

1. $V_D = V_R = 400$ Volts.
2. R.C Snubber, $C = 22$ nF,
 $R = 33 \Omega$.

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TRAPEZOIDAL CURRENT PULSE DATA

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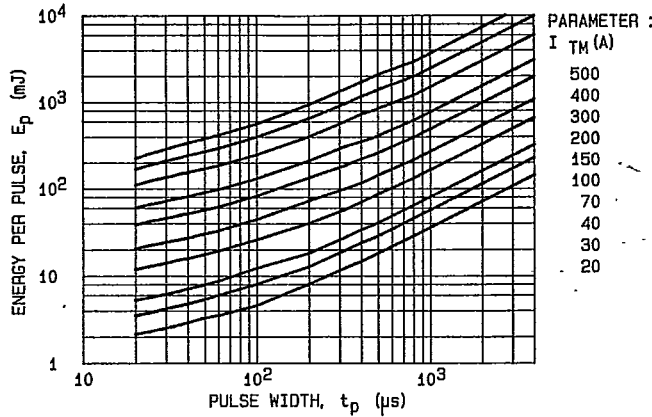


FIG.4 - ENERGY PER PULSE FOR TRAPEZOIDAL PULSES.

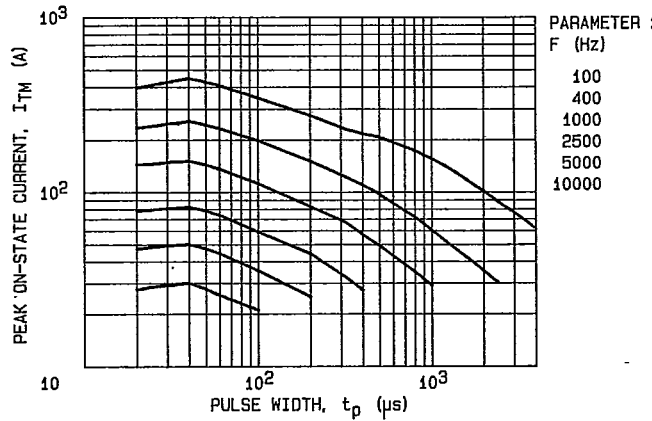


FIG.5 - MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VERSUS PULSE WIDTH FOR T_c = 85 °C.

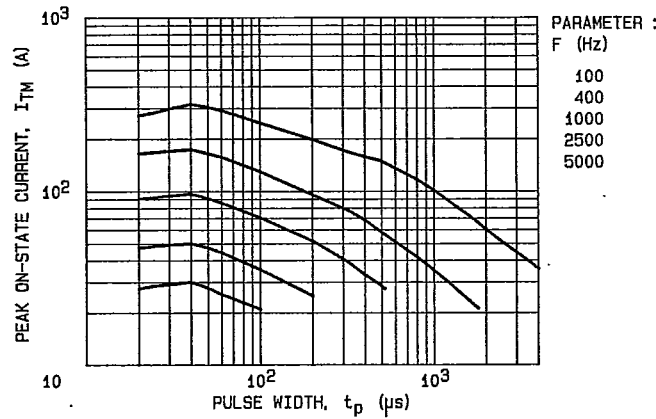
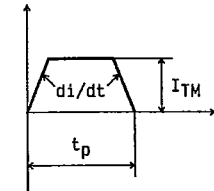


FIG.8 - MAXIMUM ALLOWABLE PEAK ON-STATE CURRENT VERSUS PULSE WIDTH FOR T_c = 80 °C.

$di/dt = 100 \text{ A}/\mu\text{s}$



NOTES :

1. V_D = V_R = 400 Volts.
2. R.C Snubber, C = 22 nF,
R = 33 Ω.

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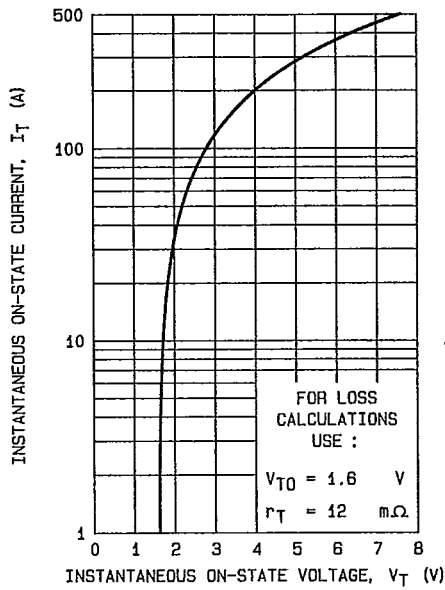


FIG.7 - MAXIMUM ON-STATE CONDUCTION CHARACTERISTIC ($T_J = 125^\circ\text{C}$).

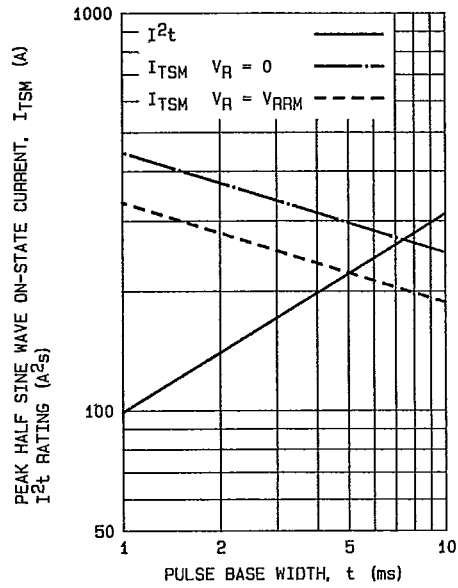


FIG.8 - NON REPETITIVE SUB-CYCLE SURGE ON-STATE CURRENT AND I^2t RATING (INITIAL $T_J = 125^\circ\text{C}$).

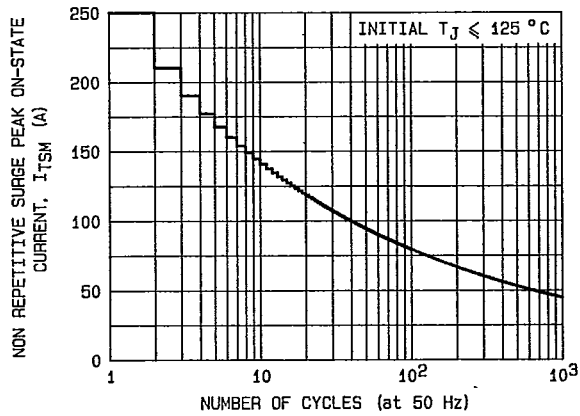


FIG.9 - NON REPETITIVE SURGE PEAK ON-STATE CURRENT VERSUS NUMBER OF CYCLES.

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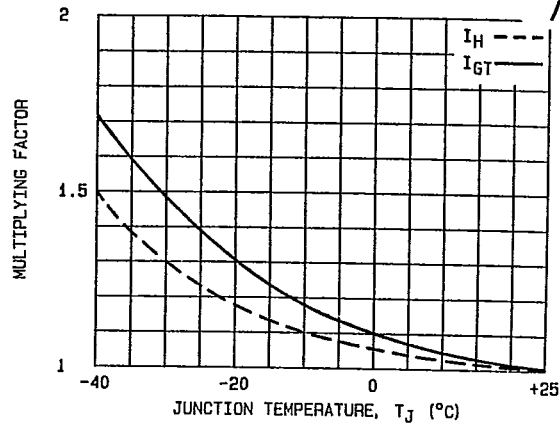


FIG.10 - RELATIVE VARIATION OF GATE TRIGGER CURRENT AND HOLDING CURRENT VERSUS JUNCTION TEMPERATURE.

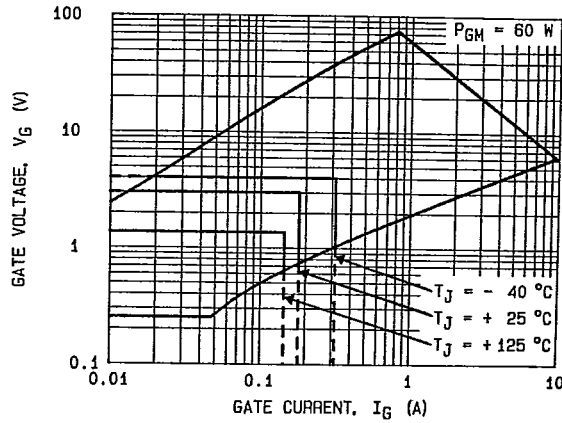


FIG.11 - GATE TRIGGER CHARACTERISTICS.

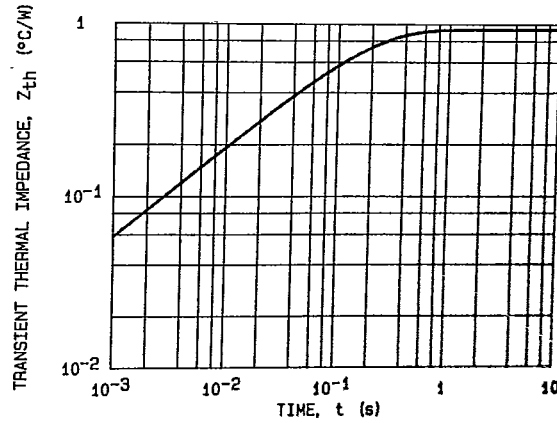


FIG.12 - TRANSIENT THERMAL IMPEDANCE JUNCTION TO CASE.