WESTCODE SEMICONDUCTORS

TECHNICAL PUBLICATION
TP370C
ISSUE 1
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Inverter Grade Capsule Thyristor Type P370C

840amperes average: up to 800volts V_{RRM}

RATINGS Maximum values at 125°C Tj unless stated otherwise

RATING	CONDITIONS	SYMBOL	
Average on-state current	Half sine wave: 55°C heatsink temperature (double side cooled)	$I_{T(AV)}$	840A
	Half sine wave: 85°C heatsink temperature (single side cooled)	$I_{T(AV)}$	300A
RMS on-state current	25°C heatsink temperature, double side cooled	$I_{T(RMS)}$	1710A
Continuous on-state current	25°C heatsink temperature, double side cooled	I_T	1350A
Peak one-cycle surge (non-repetitive) on state current	8.3ms duration, 60% V_{RRM} re-applied	$I_{TSM(1)}$	12990A
	8.3ms duration, $V_R \leqslant$ 10 volts	$I_{TSM(2)}$	14280A
Maximum permissible surge energy	With 60% V_{RRM} re-applied, 8.3ms duration	I^2t	879790A^2s
	With 60% V_{RRM} re-applied, 3ms duration	I^2t	675000A^2s
Peak forward gate current	Anode positive with respect to cathode	I_{FGM}	20A
Peak forward gate voltage	Anode positive with respect to cathode	V_{FGM}	32V
Peak reverse gate voltage		V_{RGM}	5V
Average gate power		P_G	2W
Peak gate power	100μs pulse width	P_{GM}	120W
Rate of rise of off-state voltage	To 80% V_{DRM} gate open-circuit	dv/dt	200V/μs
Rate of rise of on-state current (repetitive)	Gate drive 20 volts, 20 ohms with $t_r \leqslant 1\mu s$, Anode voltage ⩾ 80%V_{DRM}	di/dt(1)	500A/μs
Rate of rise of on-state current (non-repetitive)	Gate drive 20 volts, 20 ohms with $t_r \leqslant 1\mu s$, Anode voltage ⩾ 80%V_{DRM}	di/dt(2)	1000A/μs
Operating temperature range		T_{hs}	-30, +125°C
Storage temperature range		T_{stg}	-40, +150°C

CHARACTERISTICS Maximum values at 125°C Tj unless stated otherwise

CHARACTERISTIC	CONDITIONS	SYMBOL	
Peak on-state voltage	At 1700A, I_{TM}	V_{TM}	1.68V
Forward conduction threshold voltage		V_O	1.2V
Forward conduction slope resistance		r	0.28mΩ
Repetitive peak off-state current	At V_{DRM}	I_{DRM}	75mA
Repetitive peak reverse current	At V_{RRM}	I_{RRM}	75mA
Maximum gate current required to fire all devices	At 25°C	I_{GT}	300mA
Maximum gate voltage required to fire all devices	At 25°C	V_{GT}	3V
Maximum gate voltage which will not trigger any device		V_{GD}	0.25V
Maximum latching current	Min. anode current which must be flowing to ensure that devices will not revert to the blocking state on removal of gate drive in not less than 10 microseconds at 25°C	I_L	400mA
Thermal resistance, junction to heatsink, for a device with a maximum forward volt drop characteristic	Double side cooled	$R_{th(j-hs)}$	0.047°C/W
	Single side cooled	$R_{th(j-hs)}$	0.094°C/W

VOLTAGE CODE →	H02	H04	H05	H06	H08			
Repetitive peak voltages V_{RRM} V_{DRM} Non-repetitive peak off-state voltage V_{DSM}	200	400	500	600	800			
Non-repetitive peak reverse blocking voltage V_{RSM}	300	500	600	700	900			

ORDERING INFORMATION (Please quote device code as explained below — 11 digits)

P 3 7 0 C	● ● ●	●	●	0
FIXED TYPE CODE	VOLTAGE CODE (see ratings)	dv/dt code to 80% V_{DRM} C = 20V/μs E = 100V/μs D = 50V/μs F = 200V/μs	Turn-off time J = 25μs L = 15μs K = 20μs	

Typical code P370CH08FJO = 800V_{RRM} 800V_{DRM} 200V/μs dv/dt to 80%V_{DRM} 25μs turn-off

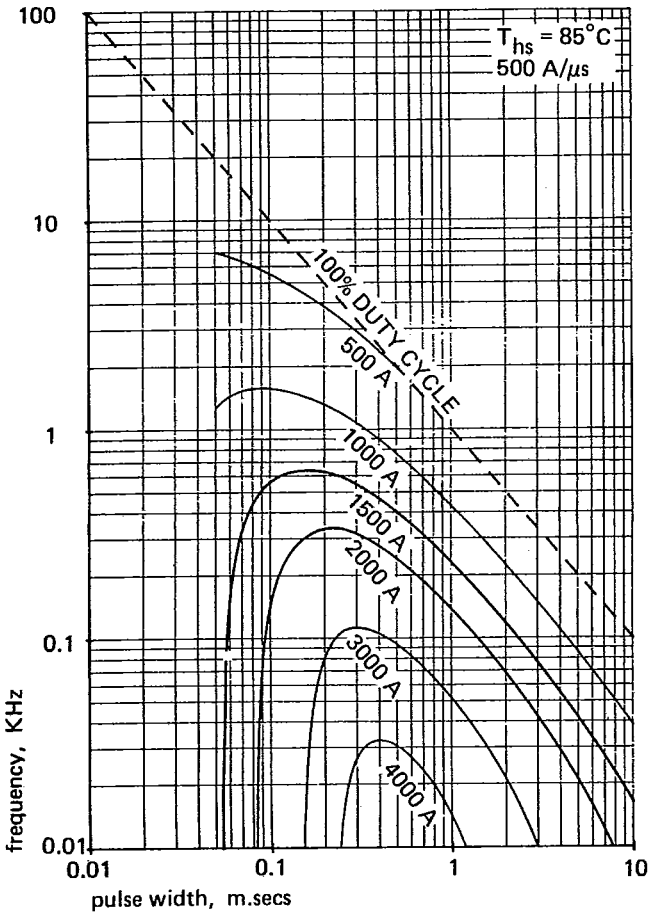


Figure 1 Frequency v. pulse width

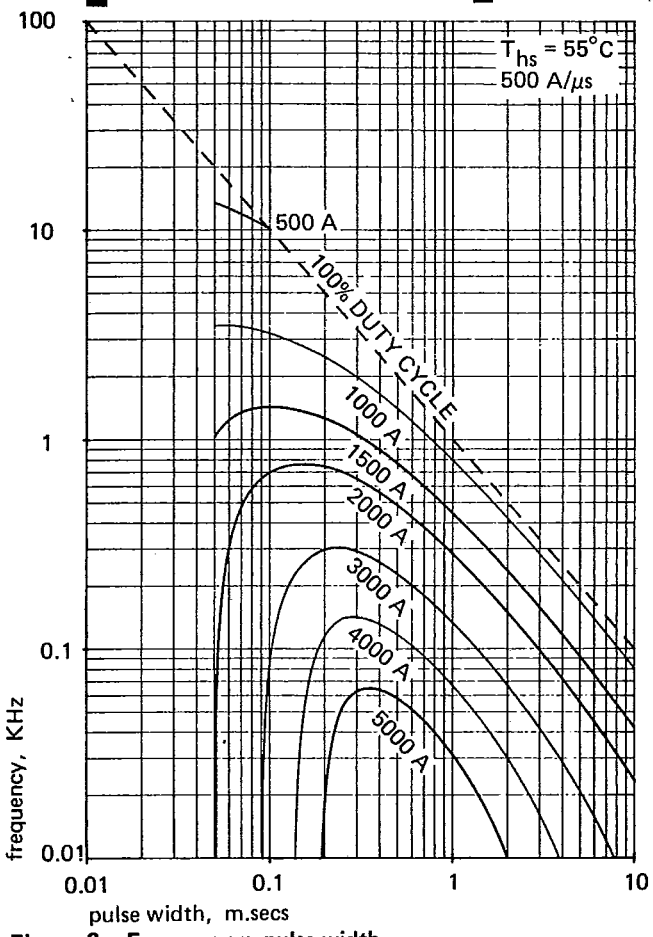


Figure 2 Frequency v. pulse width

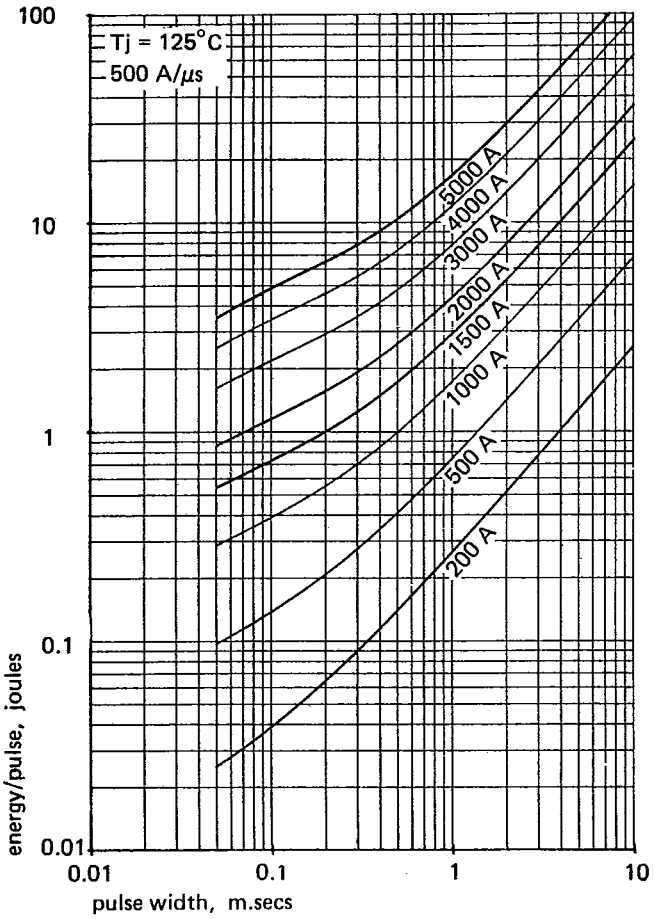


Figure 3 Energy/pulse v. pulse width

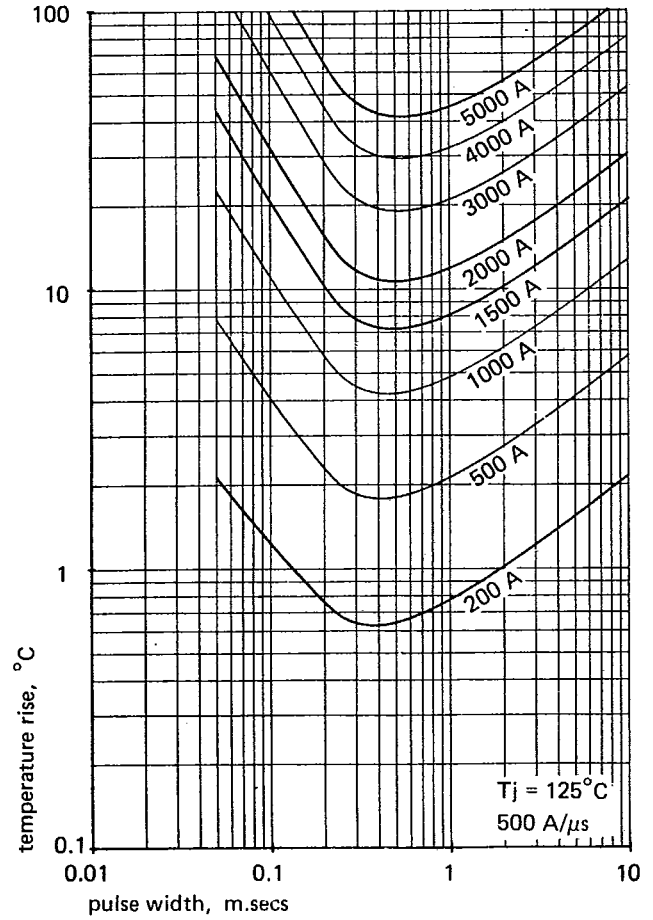


Figure 4 Temperature rise v. pulse width

2

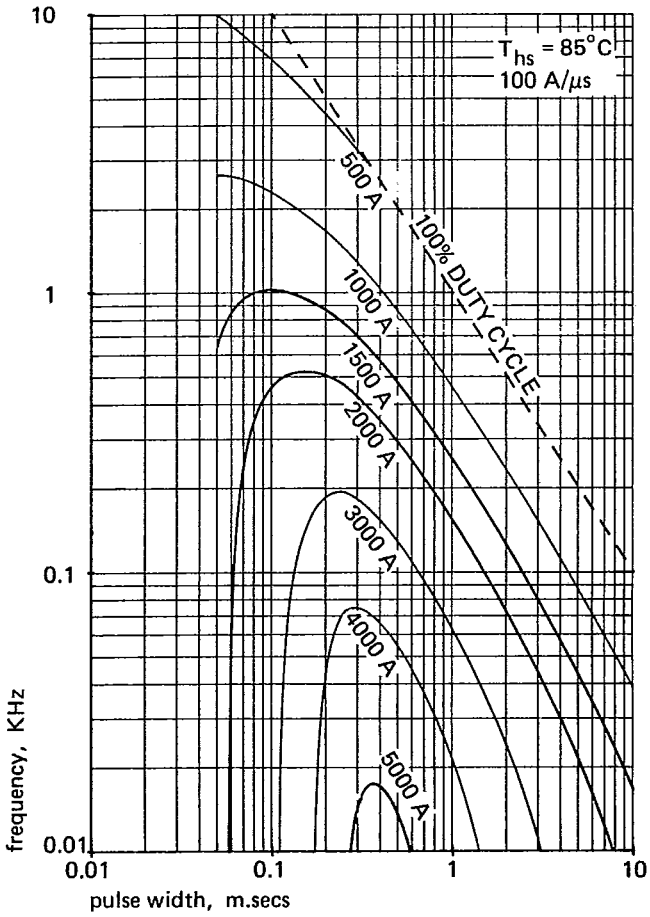


Figure 5 Frequency v. pulse width

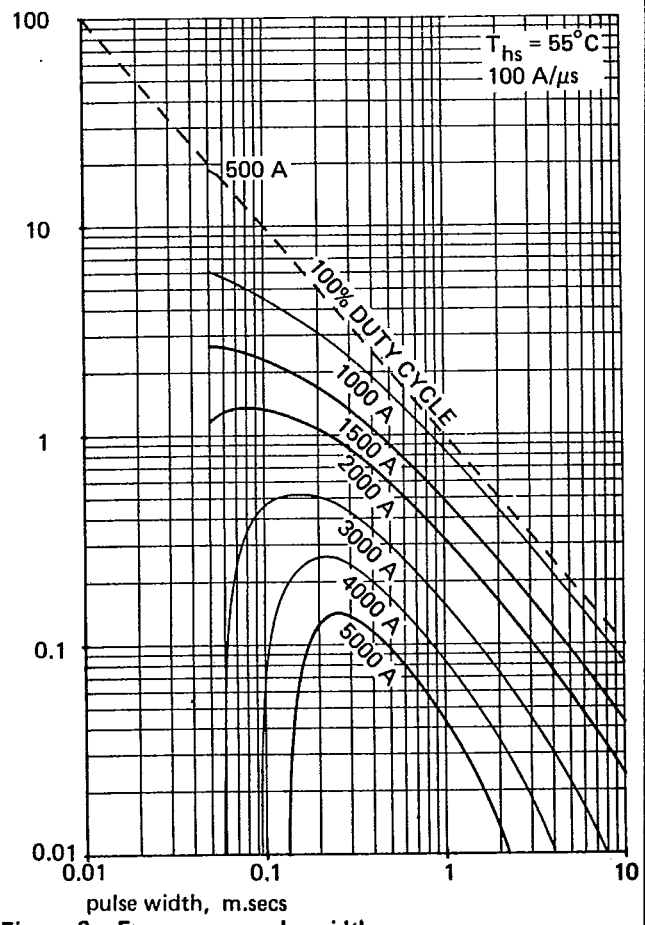


Figure 6 Frequency v. pulse width

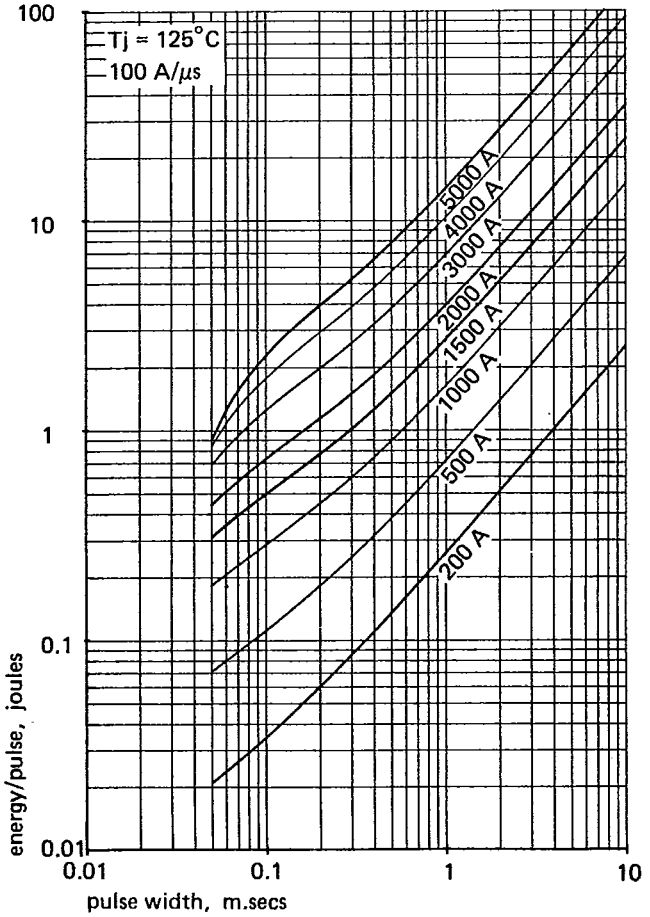


Figure 7 Energy/pulse v. pulse width

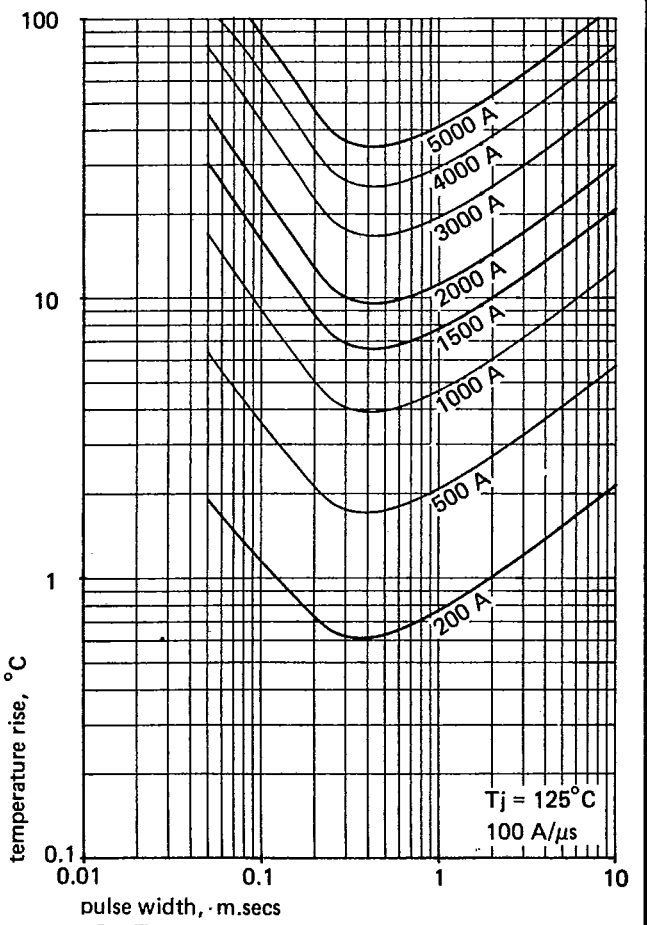


Figure 8 Temperature rise v. pulse width

T-25-19

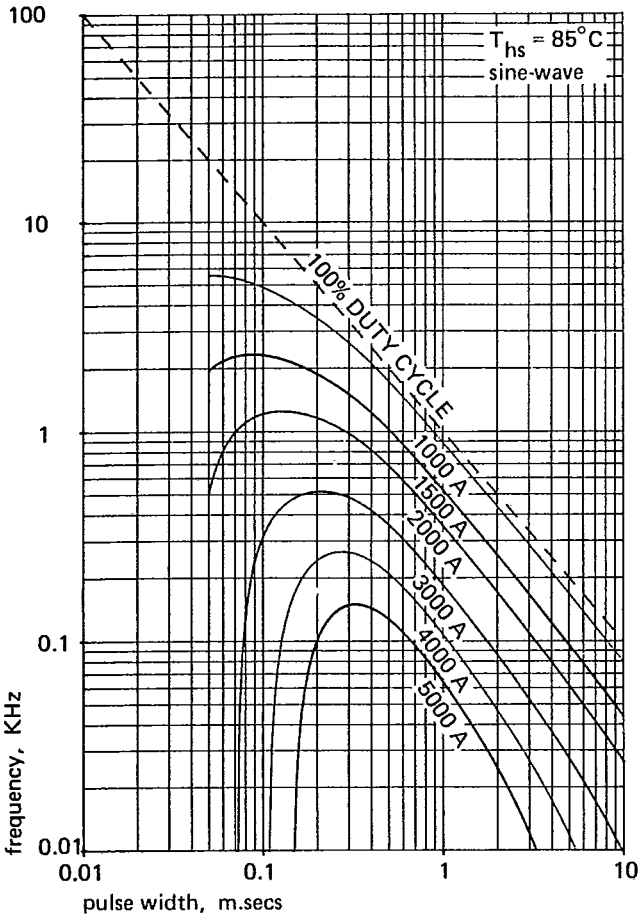


Figure 9 Frequency v. pulse width

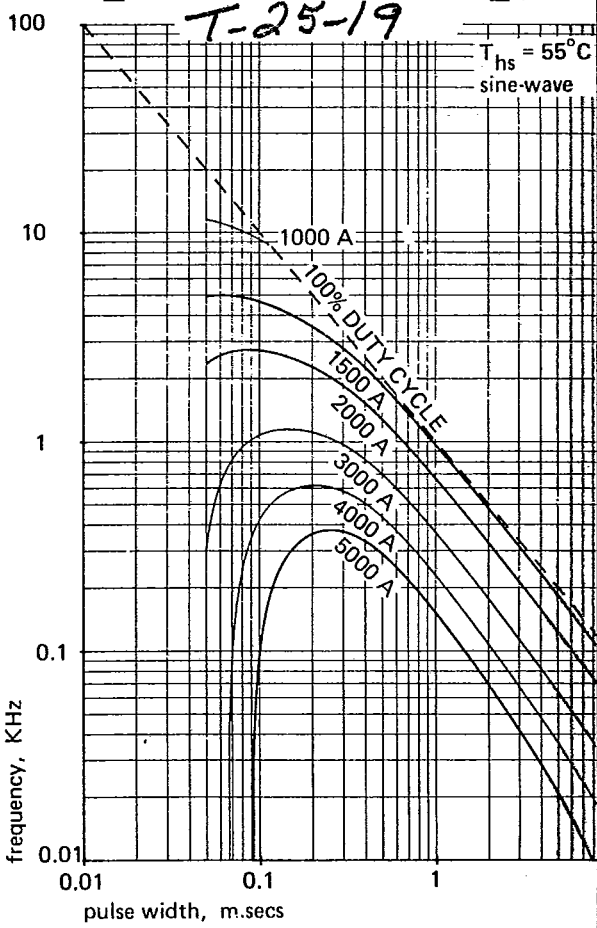


Figure 10 Frequency v. pulse width

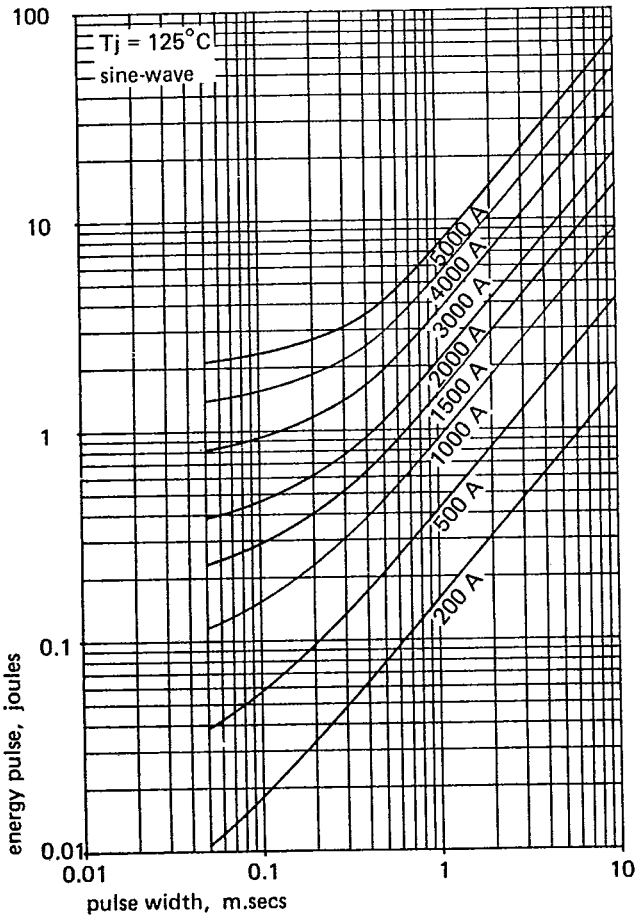


Figure 11 Energy/pulse v. pulse width

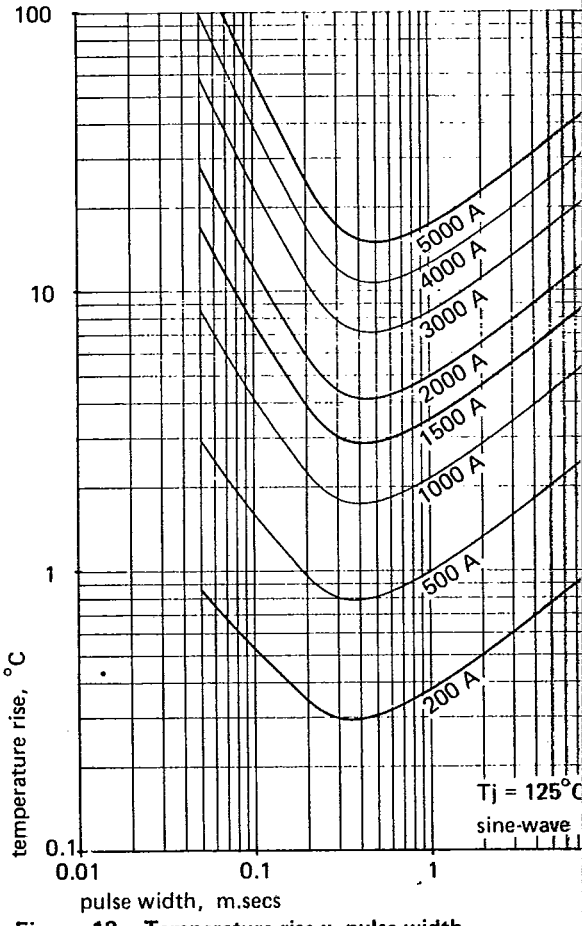


Figure 12 Temperature rise v. pulse width

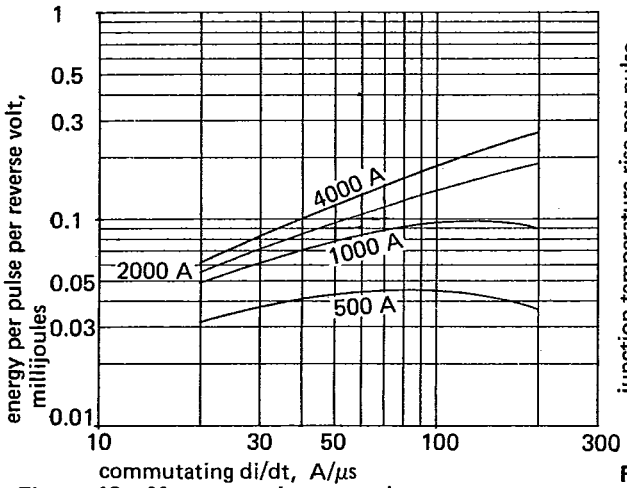


Figure 13 Max. energy loss per pulse per reverse volt at 125°C junction temperature
Sine-wave on-state current

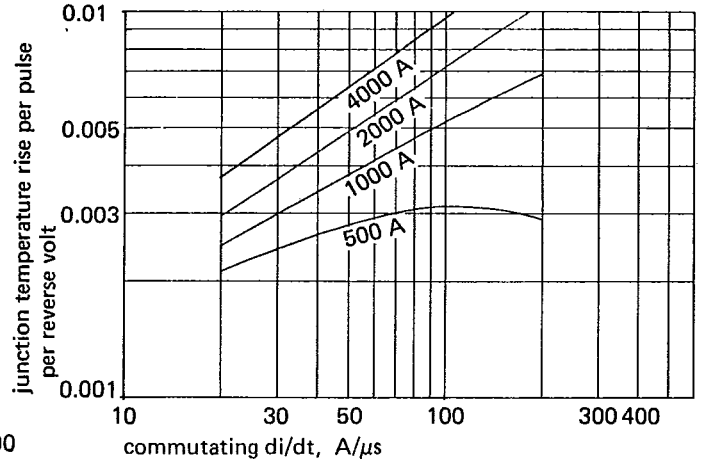


Figure 14 Max. junction temperature rise per pulse per reverse volt at 125°C junction temperature
Sine-wave on-state current

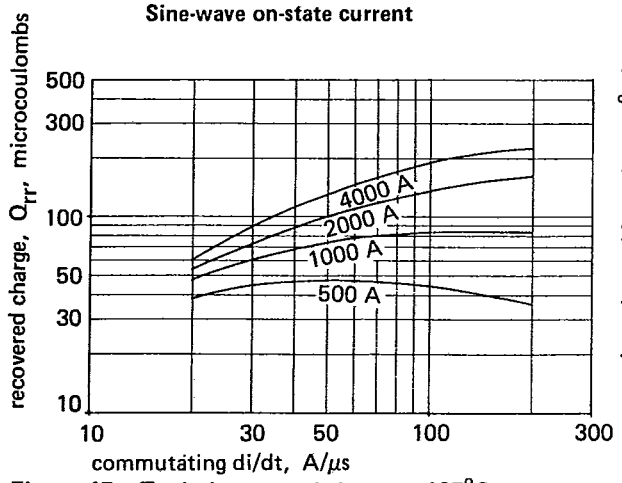


Figure 15 Typical recovered charge at 125°C junction temperature
Sine-wave on-state current

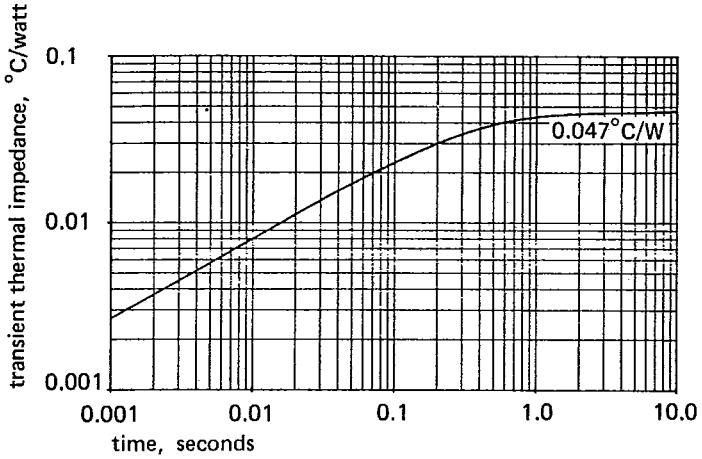


Figure 16 Junction to heatsink transient thermal impedance

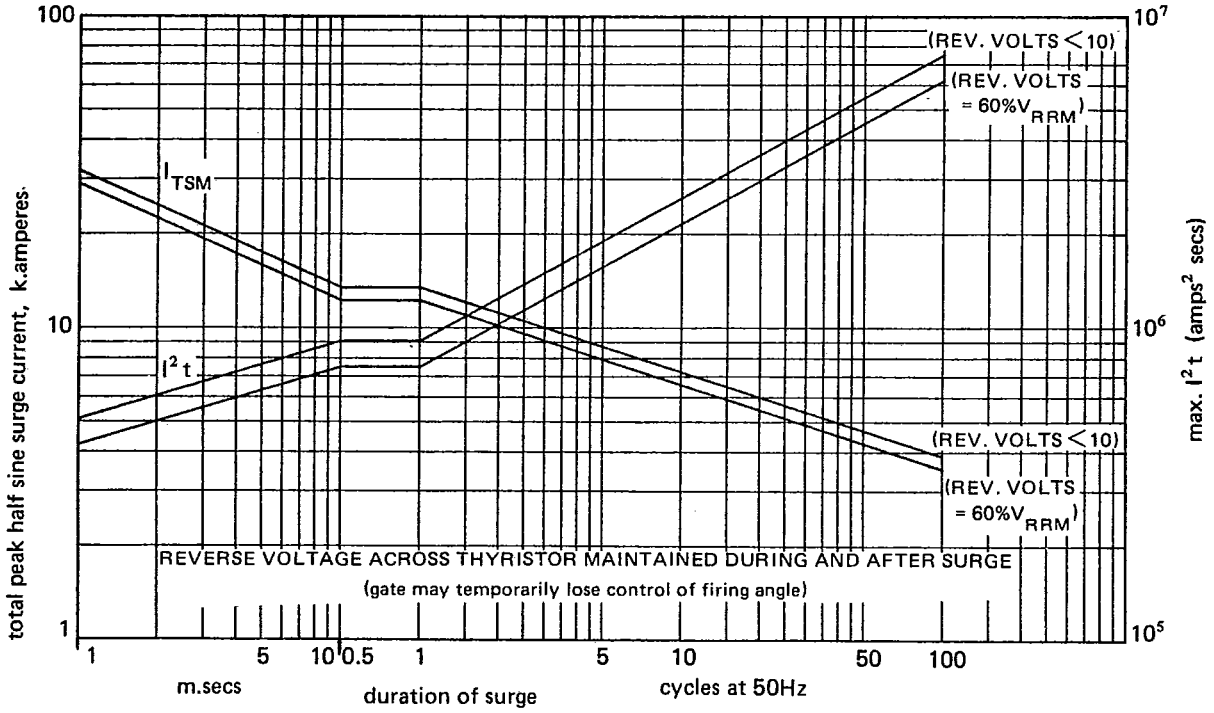


Figure 17 Max. non-repetitive surge current at initial junction temperature 125°C
Note: This rating must not be interpreted as an intermittent rating

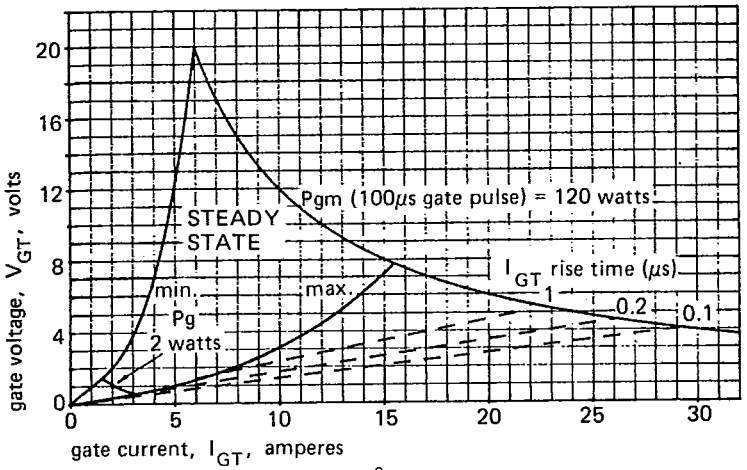


Figure 18 Gate characteristic at 25°C junction temperature

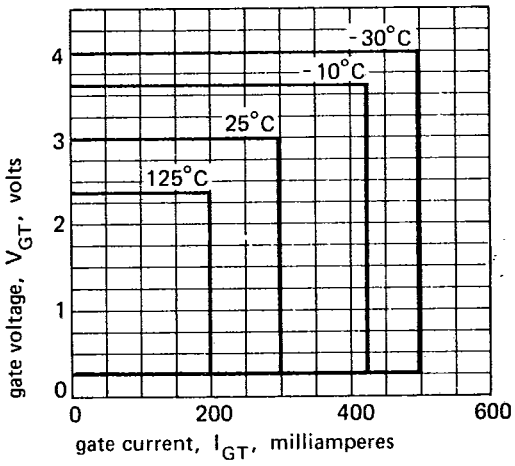


Figure 19 Gate triggering characteristics

Trigger points of all thyristors lie within the areas shown

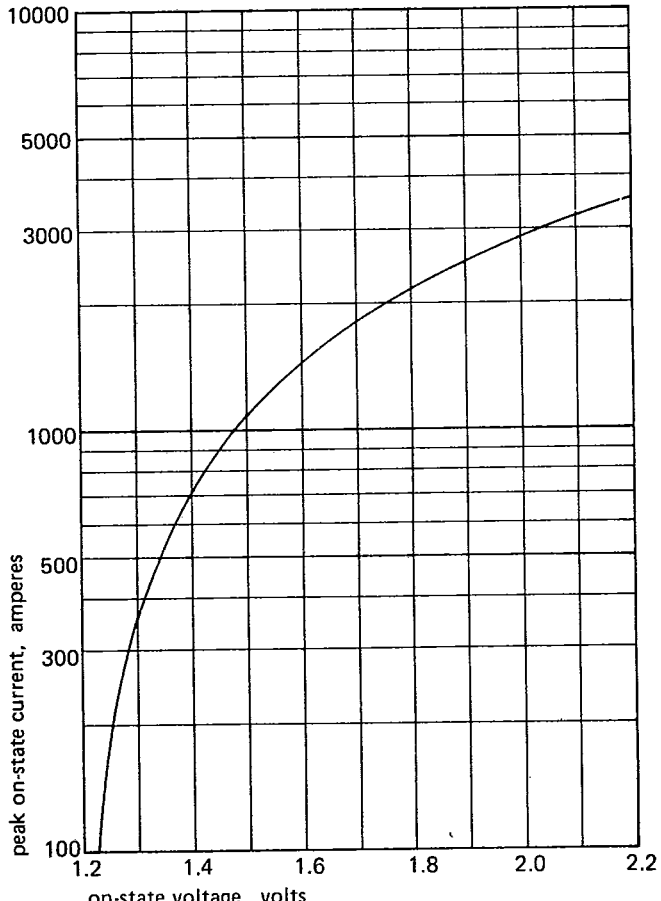
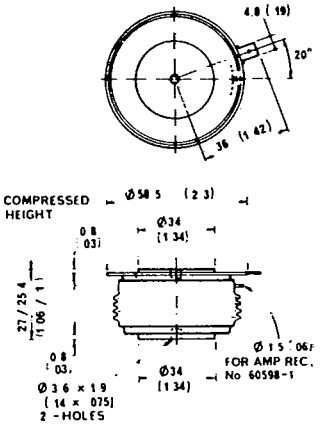


Figure 20 Limit on-state current at 125°C



TO - 200AC

Dimensions in mm (inches)

Mounting Force: 1000 – 2000 Kg

Weight: 340 grams

In the interest of product improvement, Westcode reserves the right to change specifications at any time without notice.

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