



# WESTCODE SEMICONDUCTORS

Technical  
Publication  
**TN280C**

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## Converter Grade Capsule Thyristor Type N280C

735 amperes average: up to 1400 volts  $V_{RRM}$

### Ratings (Maximum values at 125°C T<sub>j</sub> unless stated otherwise)

RATING	CONDITIONS	SYMBOL	
Average on-state current	Half sine wave	$I_{T(AV)}$	735 A
	$\left\{ \begin{array}{l} 55^\circ\text{C heatsink temperature} \\ \text{(double side cooled)} \\ 85^\circ\text{C heatsink temperature} \\ \text{(single side cooled)} \end{array} \right.$		290 A
R.M.S. on-state current	25°C heatsink temperature, double side cooled	$I_T(RMS)$	1470 A
Continuous on-state current	25°C heatsink temperature, double side cooled	$I_T$	1230 A
Peak one-cycle surge (non-repetitive) on state current	10ms duration, 60% $V_{RRM}$ re-applied	$I_{TSM(1)}$	7600 A
	10ms duration, $V_R \leq 10$ volts	$I_{TSM(2)}$	8360 A
Maximum permissible surge energy	10ms duration, $V_R \leq 10$ volts	$I^2t(2)$	349000 A <sup>2</sup> s
	3ms duration, $V_R \leq 10$ volts	$I^2t$	256000 A <sup>2</sup> s
Peak forward gate current	Anode positive with respect to cathode	$I_{FGM}$	20 A
Peak forward gate voltage	Anode positive with respect to cathode	$V_{FGM}$	18 V
Peak reverse gate voltage		$V_{RGM}$	5 V
Average gate power		$P_G$	2 W
Peak gate power	100μs. pulse width	$P_{GM}$	100 W
Rate of rise of off-state voltage	To 80% $V_{DRM}$ gate open-circuit	$dv/dt$	*200 V/μs
Rate of rise of on-state current (repetitive)	$\left\{ \begin{array}{l} \text{Gate drive 20 volts, 20 ohms with } t_r \leq 1\mu\text{s.} \\ \text{Anode voltage } \leq 80\% V_{DRM} \end{array} \right.$	$di/dt(1)$	500 A/μs
Rate of rise of on-state current (non-repetitive)		$di/dt(2)$	1000 A/μs
Operating temperature range		$T_{hs}$	-40 + 125°C
Storage temperature range		$T_{stg}$	-40 + 150°C

### Characteristics (Maximum values at 125°C T<sub>j</sub> unless stated otherwise)

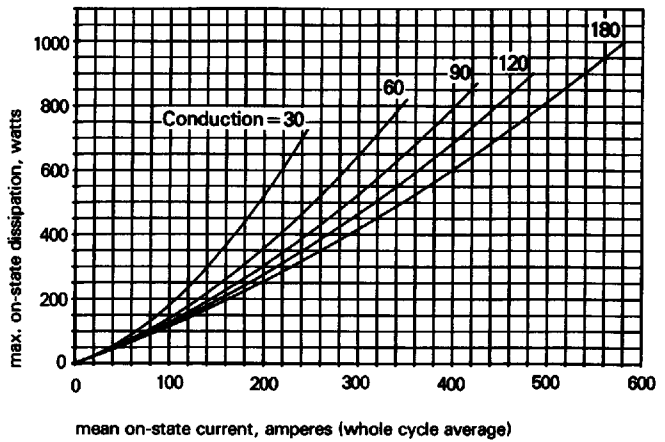
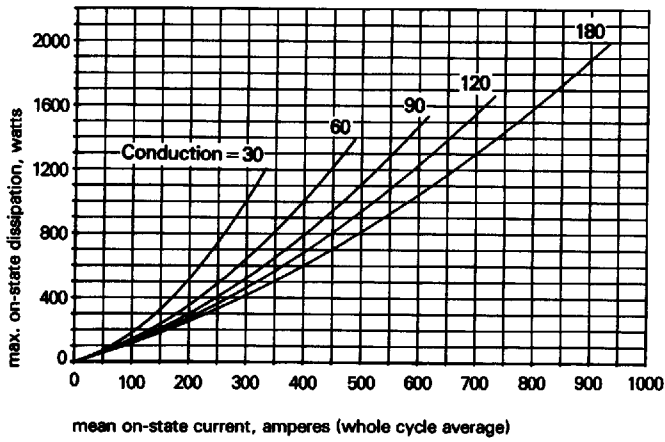
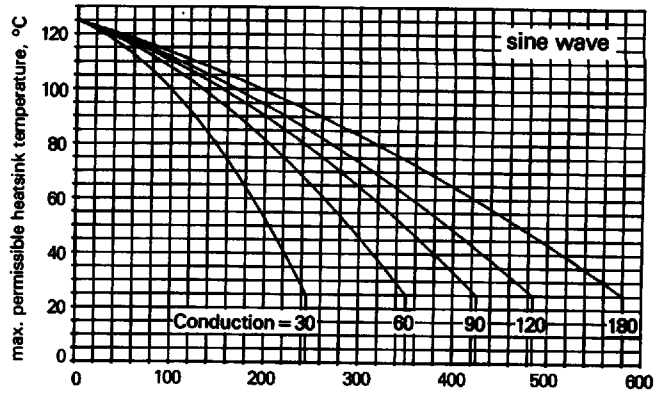
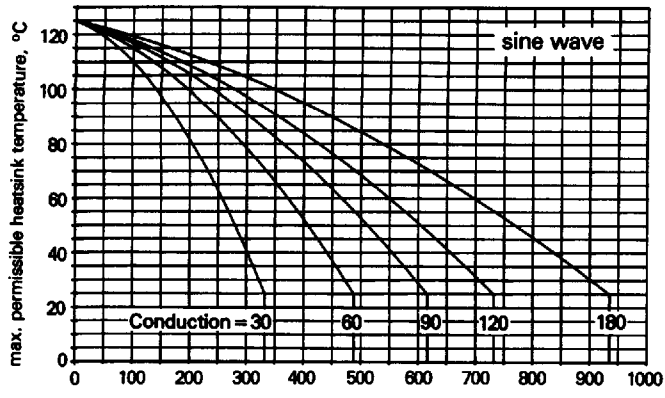
CHARACTERISTIC	CONDITIONS	SYMBOL	
Peak on-state voltage	At 1550 A, $I_{TM}$	$V_{TM}$	1.78 V
Forward conduction threshold voltage		$V_O$	1.03 V
Forward conduction slope resistance		$r$	0.483 mΩ
Repetitive peak off-state current	At $V_{DRM}$	$I_{DRM}$	40 mA
Repetitive peak reverse current	At $V_{RRM}$	$I_{RRM}$	40 mA
Maximum gate current required to fire all devices	$\left\{ \begin{array}{l} V_A = 6 \text{ V, } I_A = 1 \text{ A at } 25^\circ\text{C } T_j \end{array} \right.$	$I_{GT}$	150 mA
Maximum gate voltage required to fire all devices		$V_{GT}$	3 V
Maximum holding current		$I_H$	500 mA
Maximum gate voltage which will not trigger any device		$V_{GD}$	0.25 V
Thermal resistance, junction to heatsink, for a device with a maximum forward volt drop characteristic	Double side cooled	$R_{th(j-hs)}$	0.05°C/W
	Single side cooled		0.1°C/W

VOLTAGE CODE		H02	H04	H06	H08	H10	H12	H14		
Repetitive peak voltages	$V_{RRM}$ $V_{DRM}$	200	400	600	800	1000	1200	1400		
Non-repetitive peak off-state voltage	$V_{DSM}$									
Non-repetitive peak reverse blocking voltage	$V_{RSM}$	300	500	700	900	1100	1300	1500		

### Ordering Information (Please quote device code as explained below – 8 digits)

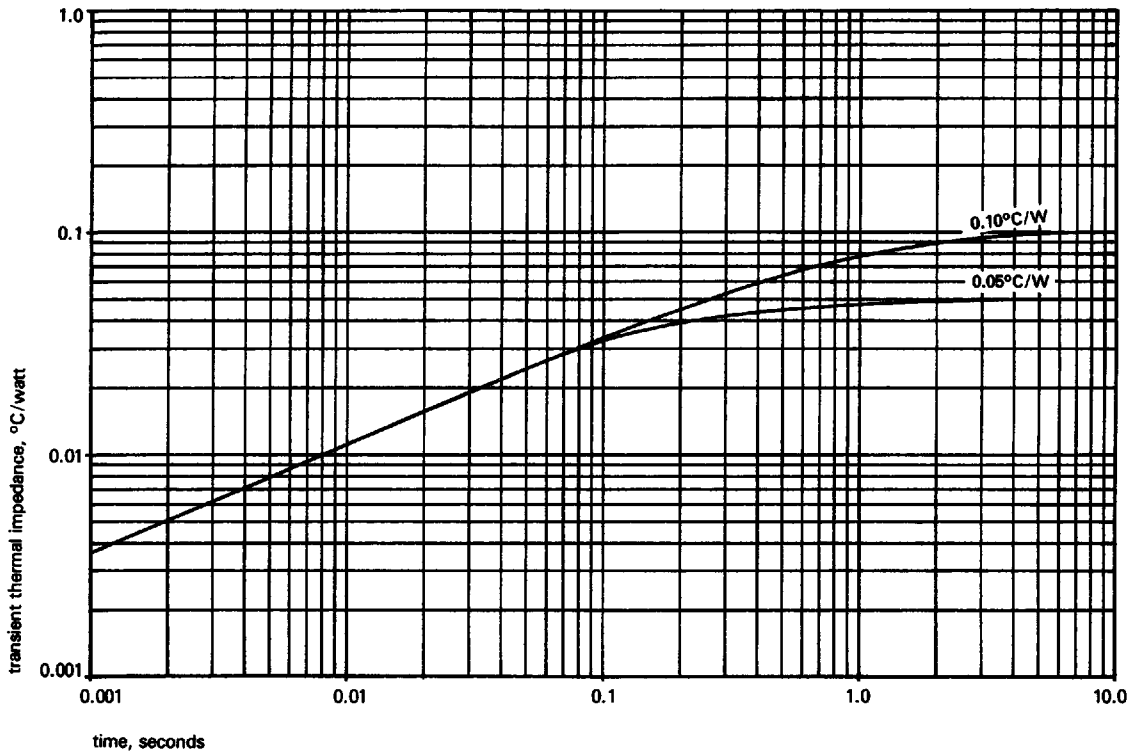
N 2 8 0 C	● ● ●	Typical code: N280CH12 = 1200 $V_{RRM}$ 1200 $V_{DRM}$ , 200 V/μs $dv/dt$ to 80% $V_{DRM}$
	Voltage code (see ratings)	

\* Other values of  $dv/dt$  may be available.



**Figure 1 Dissipation and heatsink temperature v. current (Double side cooled)**

**Figure 2 Dissipation and heatsink temperature v. current (Single side cooled)**



**Figure 3 Junction to heatsink thermal impedance**

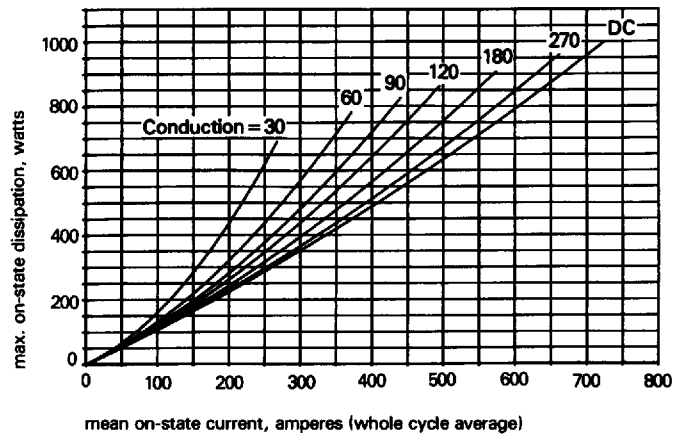
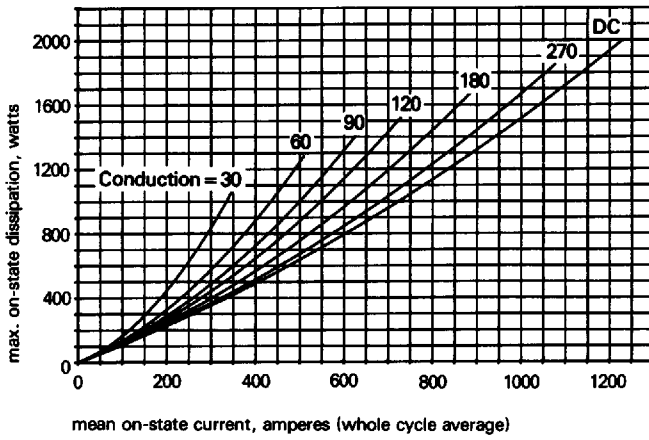
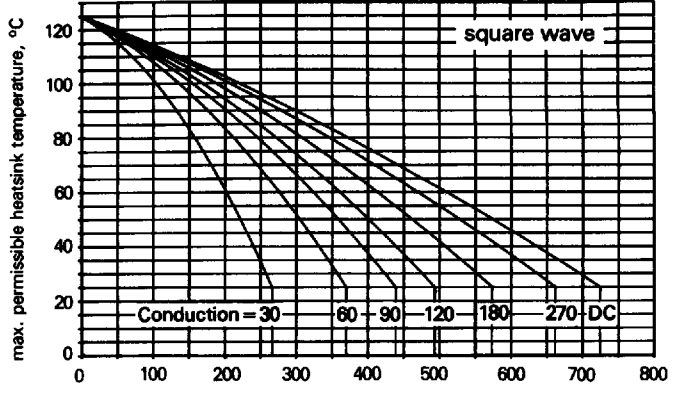
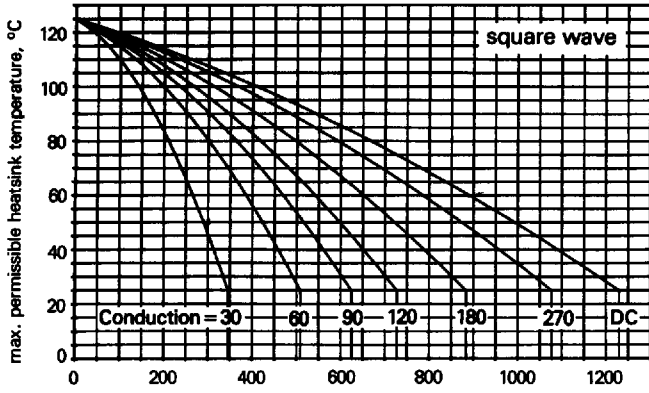


Figure 4 Dissipation and heatsink temperature v. current (Double side cooled)

Figure 5 Dissipation and heatsink temperature v. current (Single side cooled)

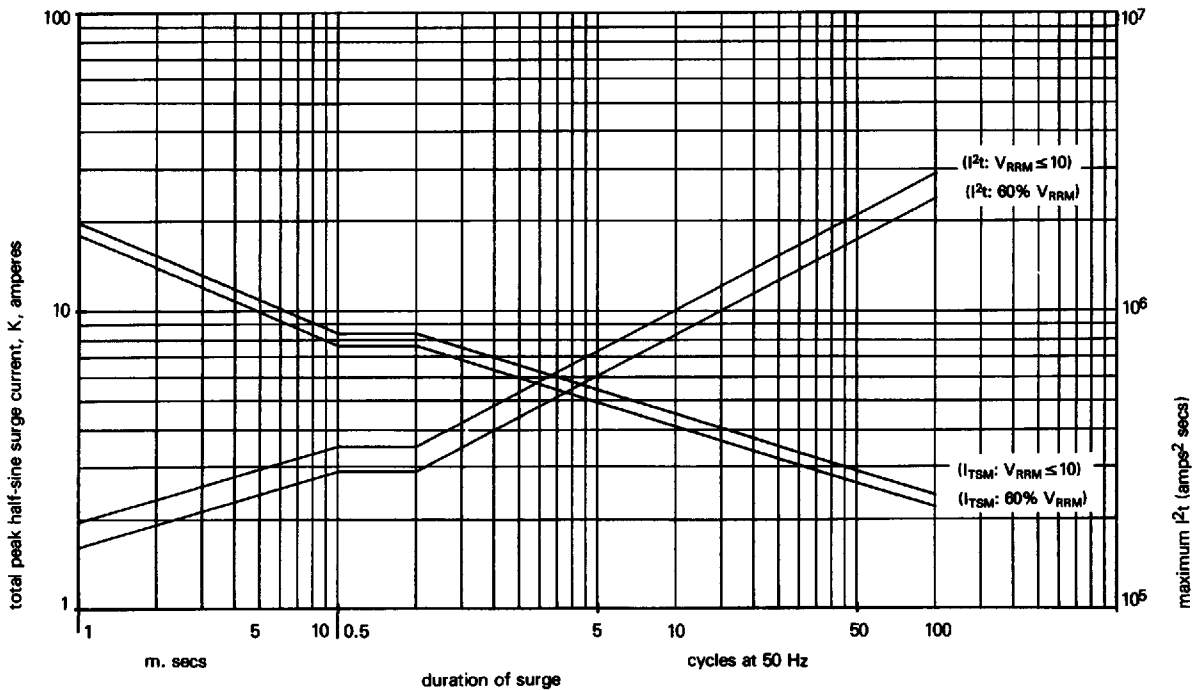
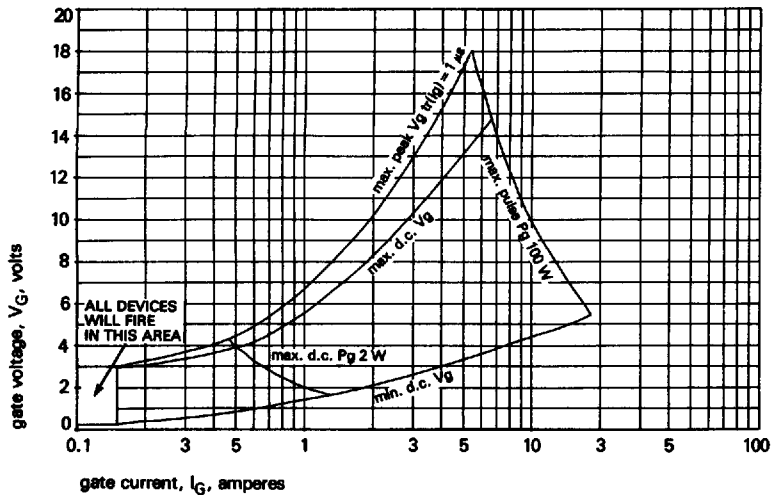
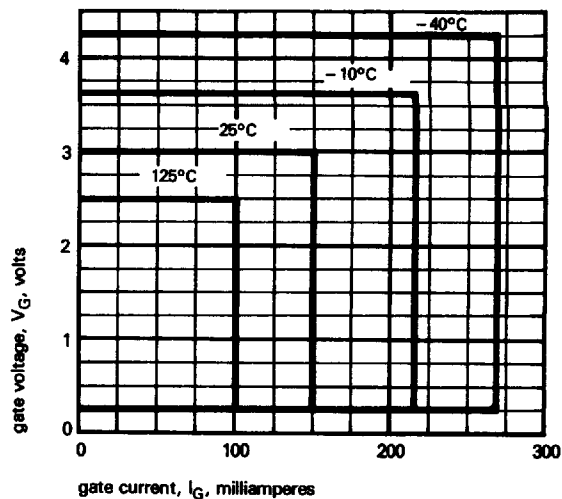


Figure 6 Max. non-repetitive surge current at initial junction temperature 125°C.  
 (gate may temporarily lose control of firing angle)  
 Note: This rating must not be interpreted as an intermittent rating

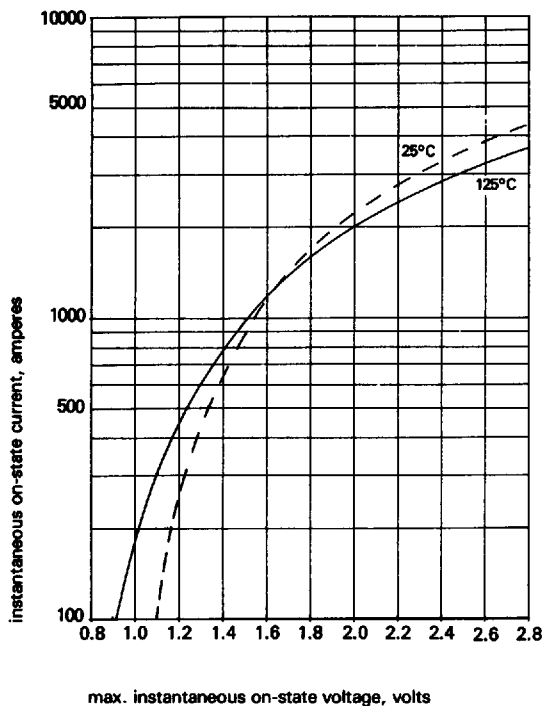
**TN280C**



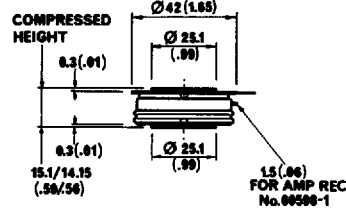
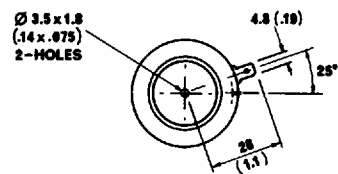
**Figure 7** Gate characteristics at 25°C junction temperature



**Figure 8** Gate triggering characteristics  
Trigger points of all thyristors lie within the areas shown



**Figure 9** Limit on-state characteristic



TO - 200AB

Dimensions in mm (inches)  
Mounting force: 530-1000 Kgf  
Weight: 90 grams

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

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