



WESTCODE SEMICONDUCTORS

Technical
Publication
TN330C

Issue 2
June 1985

Converter Grade Capsule Thyristor Type N330C

690 amperes average: up to 2400 volts V_{RRM}

Ratings (Maximum values at 125°C T_j unless stated otherwise)

RATING	CONDITIONS	SYMBOL	
Average on-state current	Half sine wave $\left\{ \begin{array}{l} 55^\circ\text{C heatsink temperature} \\ \text{(double side cooled)} \\ 85^\circ\text{C heatsink temperature} \\ \text{(single side cooled)} \end{array} \right.$	$I_{T(AV)}$	690A 284A
R.M.S. on-state current	25°C heatsink temperature, double side cooled	$I_T(RMS)$	1369A
Continuous on-state current	25°C heatsink temperature, double side cooled	I_T	1200A
Peak one-cycle surge (non-repetitive) on state current	10ms duration, 60% V_{RRM} re-applied	$I_{TSM(1)}$	9200A
	10ms duration, $V_R \leq 10$ volts	$I_{TSM(2)}$	10100A
Maximum permissible surge energy	10ms duration, $V_R \leq 10$ volts	$I^2t(2)$	510000A ² s
	3ms duration, $V_R \leq 10$ volts	I^2t	377000A ² s
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}	22V
Peak reverse gate voltage		V_{RGM}	5V
Average gate power		P_G	4W
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)	$\left\{ \begin{array}{l} \text{Gate drive 20 volts, 20 ohms with } t_r \leq 1\mu\text{s.} \\ \text{Anode voltage } \leq 80\% V_{DRM} \end{array} \right.$	$di/dt(1)$	300A/μs
Rate of rise of on-state current (non-repetitive)		$di/dt(2)$	500A/μs
Operating temperature range		T_{hs}	-40 + 125°C
Storage temperature range		T_{stg}	-40 + 150°C

Characteristics (Maximum values at 125°C T_j unless stated otherwise)

CHARACTERISTIC	CONDITIONS	SYMBOL	
Peak on-state voltage	At 1700A, I_{TM}	V_{TM}	2.07V
Forward conduction threshold voltage		V_O	1.04V
Forward conduction slope resistance		r	0.606Ω
Repetitive peak off-state current	At V_{DRM}	I_{DRM}	60mA
Repetitive peak reverse current	At V_{RRM}	I_{RRM}	60mA
Maximum gate current required to fire all devices	$\left. \begin{array}{l} \text{Maximum gate voltage required to fire all devices} \\ \text{Maximum holding current} \\ \text{Maximum gate voltage which will not trigger} \\ \text{any device} \end{array} \right\} V_A = 6V, I_A = 2A \text{ at } 25^\circ\text{C } T_j$	I_{GT}	300mA
		V_{GT}	3V
		I_H	1A
Thermal resistance, junction to heatsink, for a device with a maximum forward volt drop characteristic	Double side cooled Single side cooled	V_{GD} $R_{th(j-hs)}$	0.25V 0.047°C/W 0.094°C/W

VOLTAGE CODE		H16	H18	H20	H22	H24				
Repetitive peak voltages	V_{RRM} V_{DRM}	1600	1800	2000	2200	2400				
Non-repetitive peak off-state voltage	V_{DSM}									
Non-repetitive peak reverse blocking voltage	V_{RSM}	1700	1900	2100	2300	2500				

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

N	3	3	0	C	●	●	●	Typical code: N330CH24 = 2400 V_{RRM} 2400 V_{DRM} , 200 V/μs. dv/dt to 80% V_{DRM}
				Voltage code (see ratings)				

* Other values of dv/dt may be available.

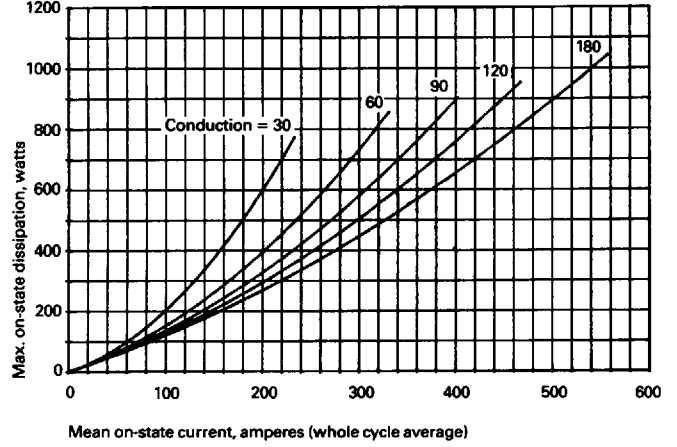
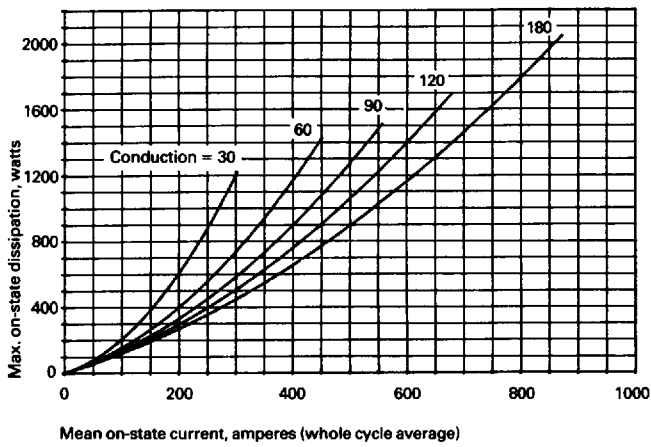
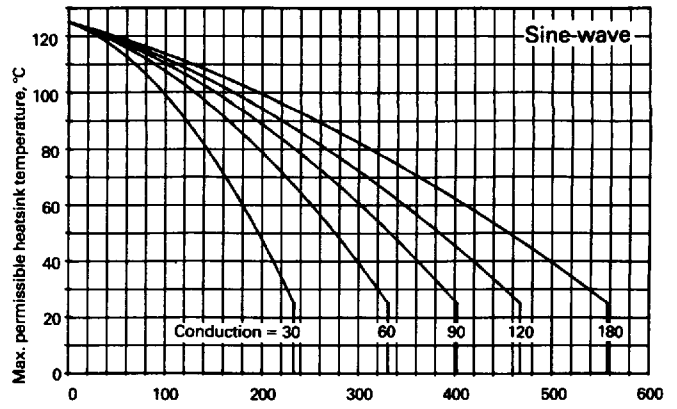
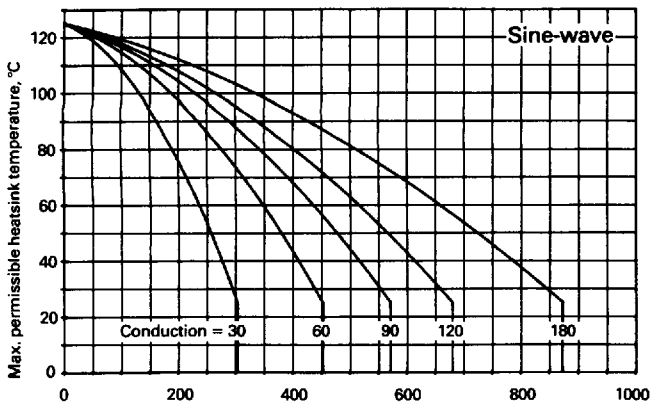


Figure 1 Dissipation and heatsink temperature v. current (Double side cooled)

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

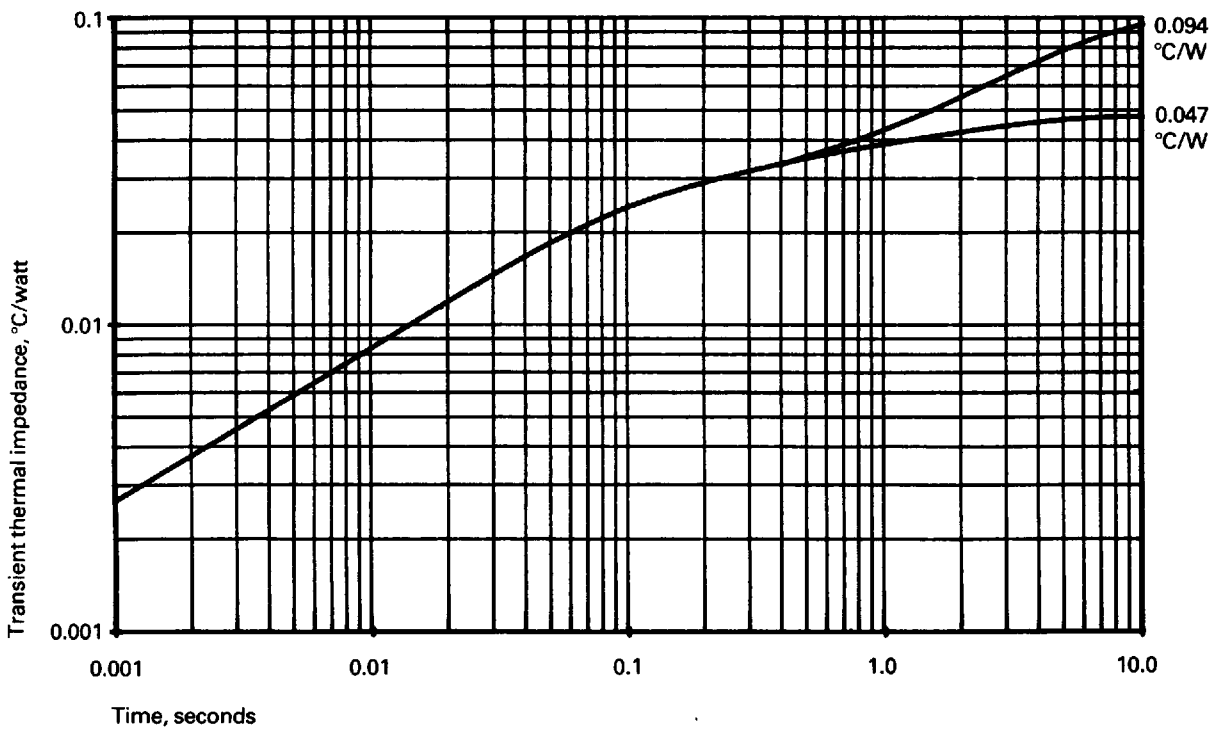


Figure 3 Junction to heatsink thermal impedance

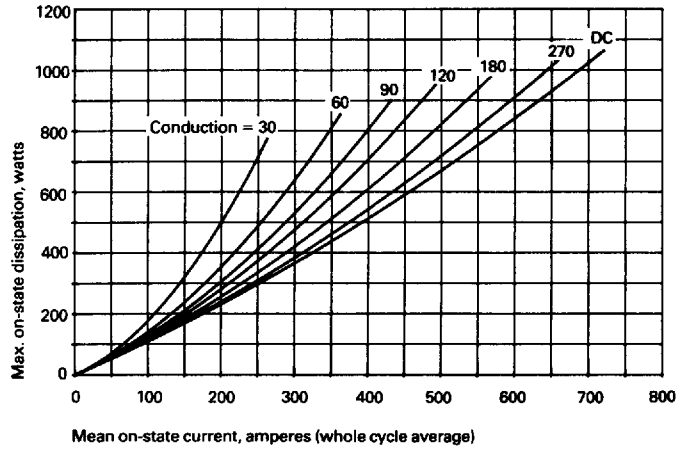
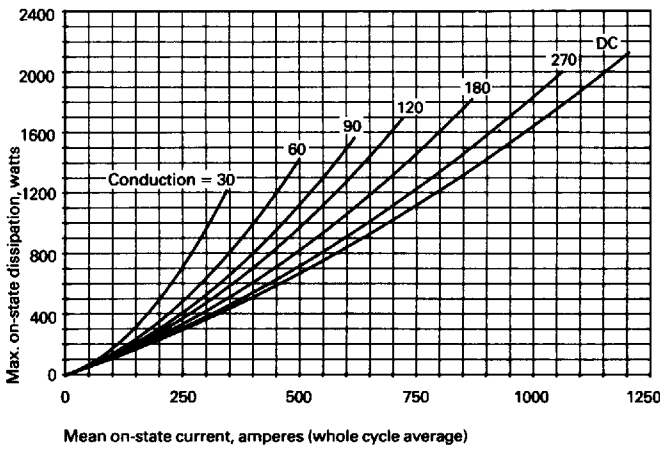
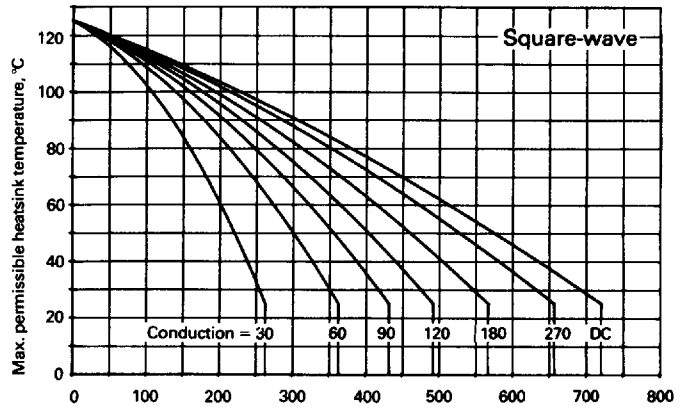
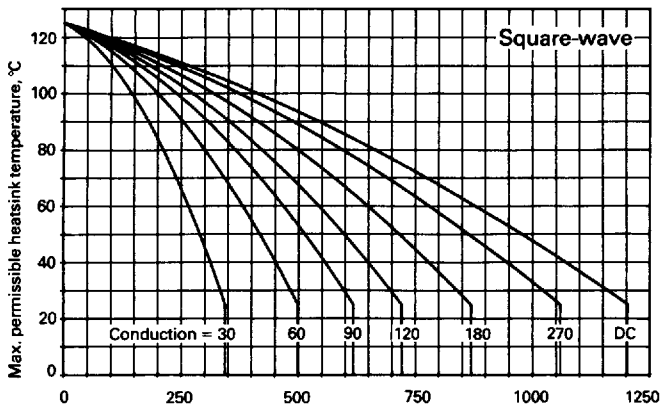


Figure 4 Dissipation and heatsink temperature v. current (Double side cooled)

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

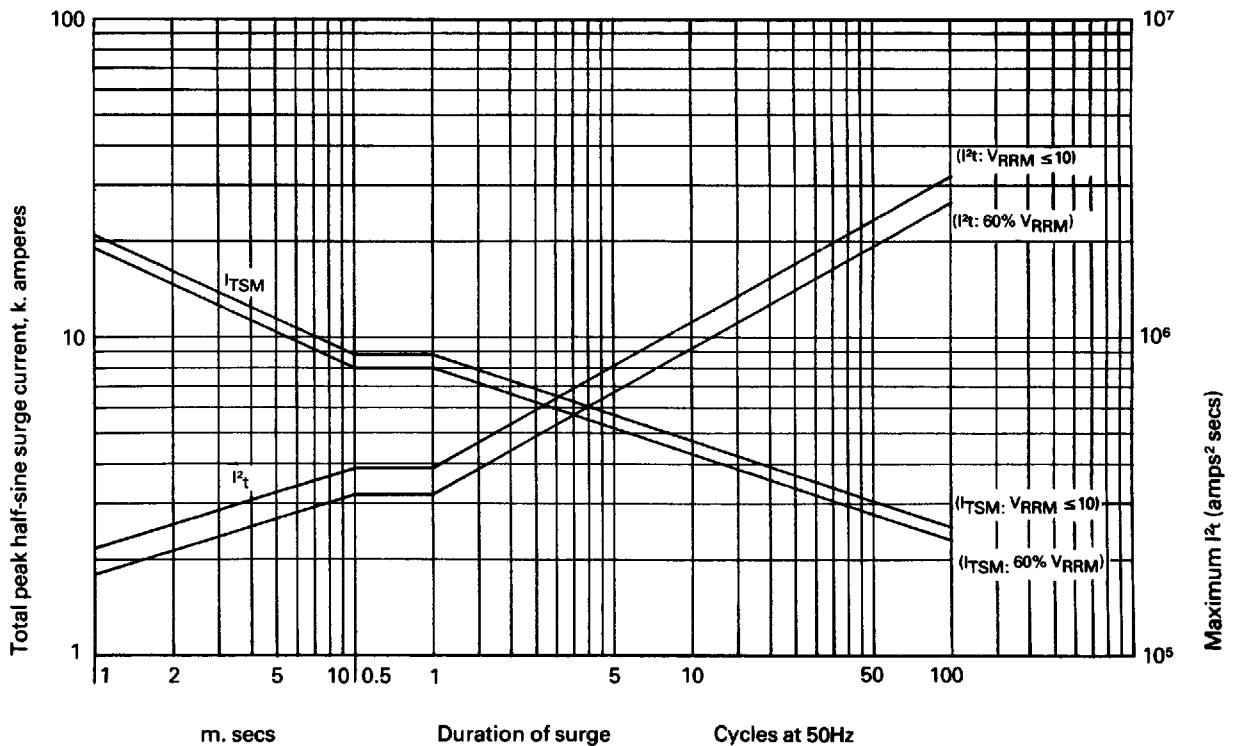


Figure 6 Max. non-repetitive surge current at initial junction temperature 125°C.

(gate may temporarily lose control of firing angle)

Note: This rating must not be interpreted as an intermittent rating

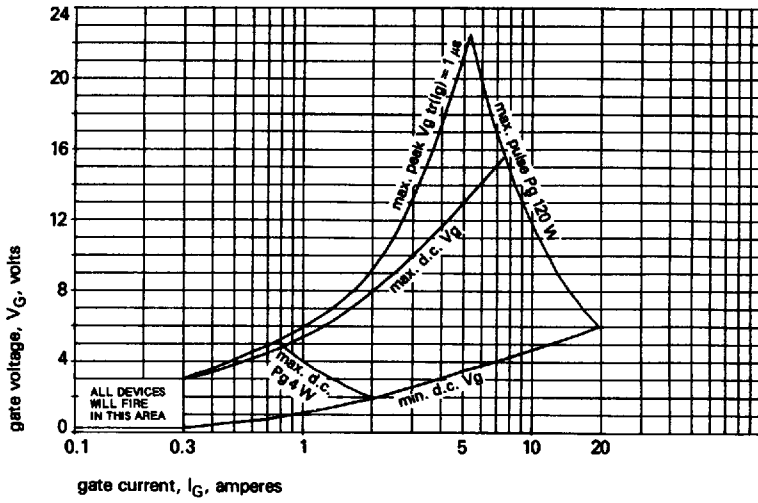


Figure 7 Gate characteristics at 25°C junction temperature

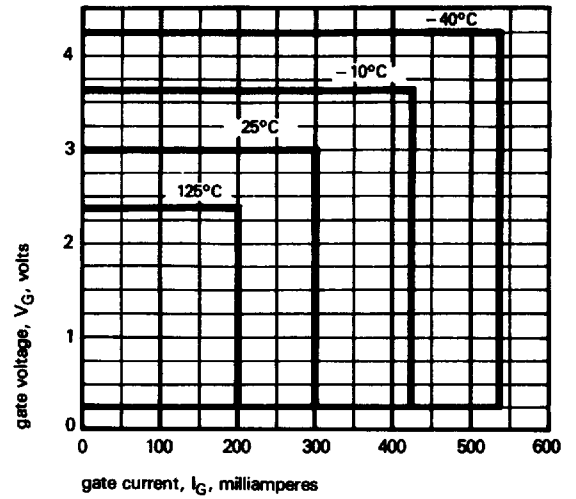


Figure 8 Gate triggering characteristics
Trigger points of all thyristors lie within the areas shown

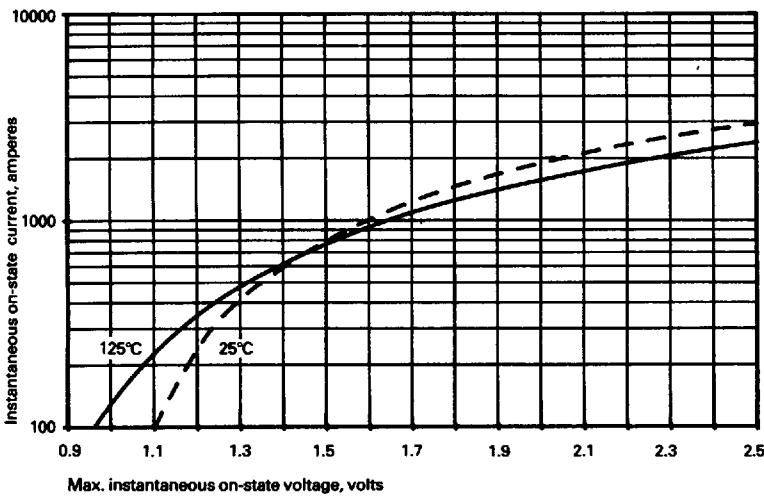
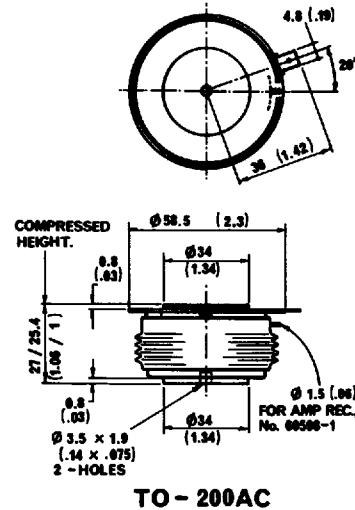


Figure 9 Limit on-state characteristic



Dimensions in mm (inches)
Mounting force: 1000-2000 Kgf
Weight: 340 grams

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

WESTCODE SEMICONDUCTORS LTD.

P.O. Box 57 Chippenham Wiltshire SN15 1JL England
Telephone Chippenham (0249) 654141 Telex 44751

HAWKER SIDDELEY

Westinghouse Brake and Signal Co. Ltd.

