WESTCODE SEMICONDUCTORS

Technical Publication
TN450C
Issue 3
July 1985

Convertor Grade Capsule Thyristor Type N450C

1080 amperes average: up to 2400 volts 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)	$I_{T(AV)}$	1080A
	Half sine wave, 85°C heatsink temperature (single side cooled)		454A
R.M.S. on-state current	25°C heatsink temperature, double side cooled	$I_{T(RMS)}$	2140A
Continuous on-state current	25°C heatsink temperature, double side cooled	I_T	1900A
Peak one-cycle surge (non-repetitive) on state current	10ms duration, 60% V_{RRM} re-applied	$I_{TSM(1)}$	16000A
	10ms duration, $V_R \leq$ 10 volts	$I_{TSM(2)}$	17600A
Maximum permissible surge energy	10ms duration, $V_R \leq$ 10 volts	I^2t (2)	1550000A²s
	3ms duration, $V_R \leq$ 10 volts	I^2t	1150000A²s
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)	Gate drive 20 volts, 20 ohms with $t_r \leq 1\mu$s. Anode voltage $\leq$ 80% V_{DRM}	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 Tj unless stated otherwise)

CHARACTERISTIC	CONDITIONS	SYMBOL	
Peak on-state voltage	At 2300A, I_{TM}	V_{TM}	1.9V
Forward conduction threshold voltage		V_O	1.03V
Forward conduction slope resistance		r	0.38mΩ
Repetitive peak off-state current	At V_{DRM}	I_{DRM}	100mA
Repetitive peak reverse current	At V_{RRM}	I_{RRM}	100mA
Maximum gate current required to fire all devices	V_A = 6V. I_A = 2A. at 25°C Tj	I_{GT}	300mA
Maximum gate voltage required to fire all devices		V_{GT}	3V
Maximum holding current		I_H	1A
Maximum gate voltage which will not trigger any device		V_{GD}	0.25V
Thermal resistance, junction to heatsink, for a device with a maximum forward volt drop characteristic	Double side cooled	$R_{th(j-hs)}$	0.03°C/W
	Single side cooled		0.06°C/W

VOLTAGE CODE		H14	H16	H18	H20	H22	H24		
Repetitive peak voltages Non-repetitive peak off-state voltage	V_{RRM} V_{DRM} V_{DSM}	1400	1600	1800	2000	2200	2400		
Non-repetitive peak reverse blocking voltage	V_{RSM}	1500	1700	1900	2100	2300	2500		

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

N 4 5 0 C	● ● ●	
	Voltage code (see ratings)	Typical code: N450CH24 = 2400 V_{RRM} 2400V_{DRM}, 200 V/μs. dv/dt to 80% V_{DRM}

* Other values of dv/dt may be available.

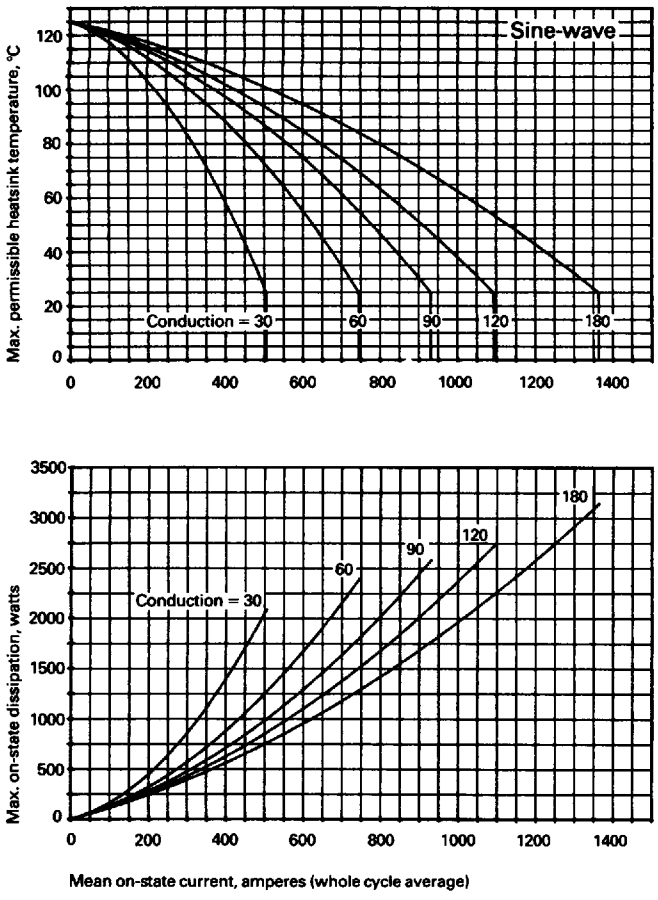


Figure 1 Dissipation and heatsink temperature v. current (Double side cooled)

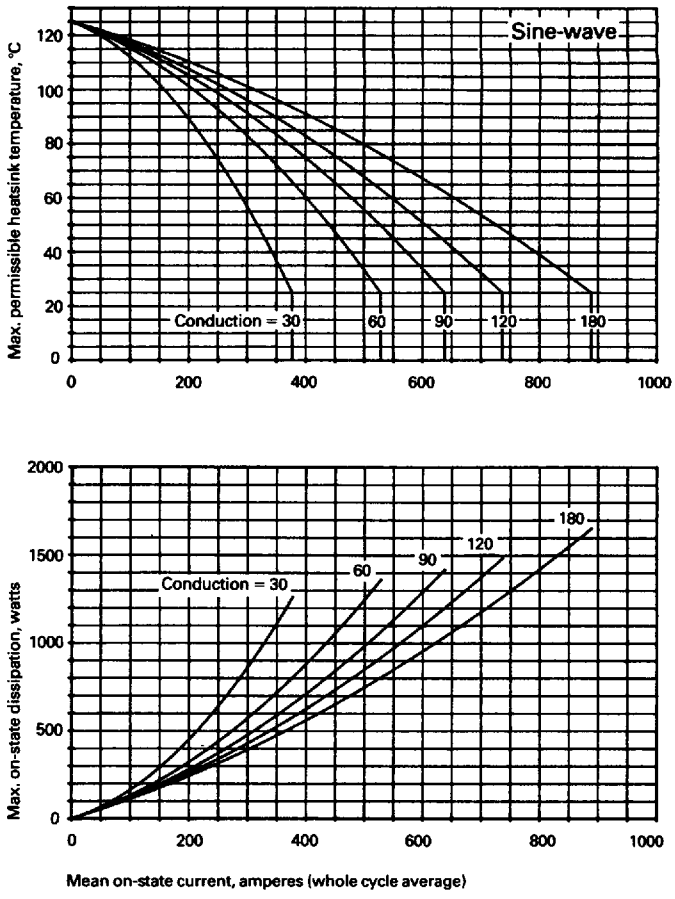


Figure 2 Dissipation and heatsink temperature v. current (Single side cooled)

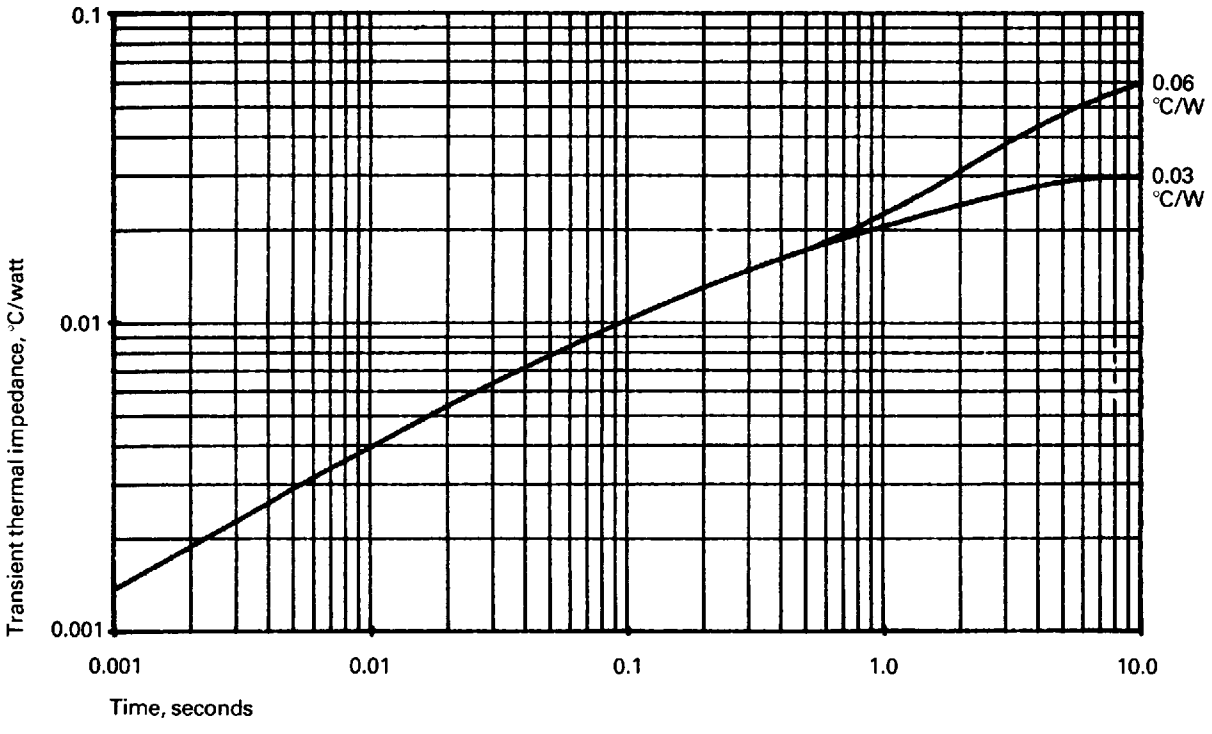


Figure 3 Junction to heatsink thermal impedance

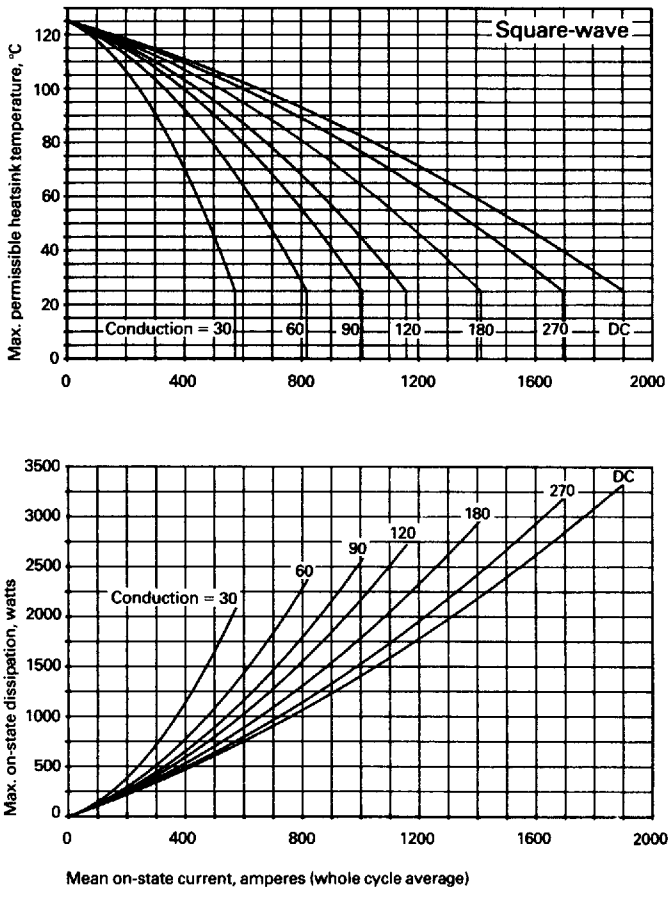


Figure 4 Dissipation and heatsink temperature v. current (Double side cooled)

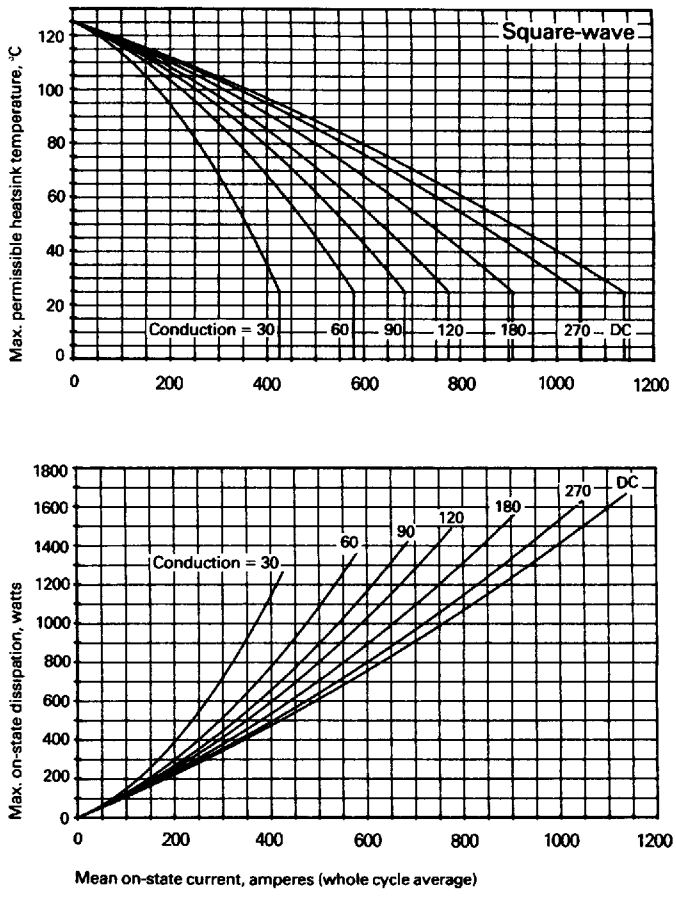


Figure 5 Dissipation and heatsink temperature v. current (Single side cooled)

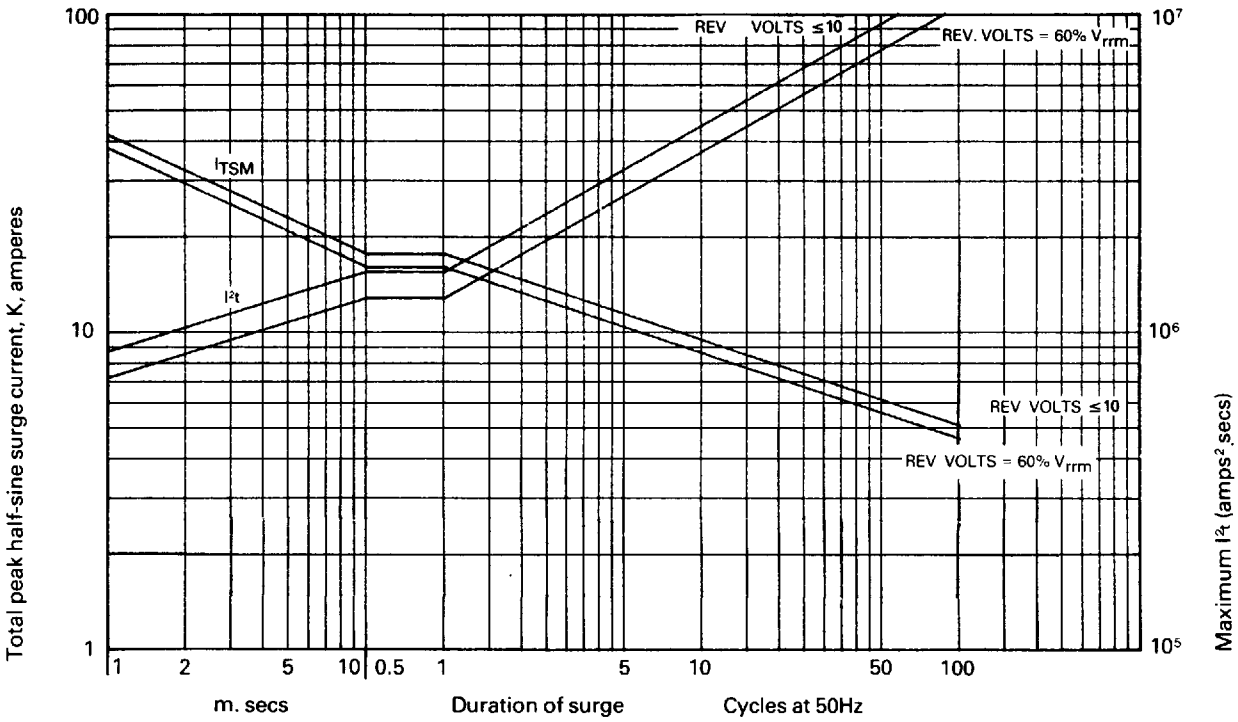


Figure 6 Max. non-repetitive surge current at initial junction temperature 125°C.

(gate may temporarily lose control of firing angle)
Note: This rating must not be interpreted as an intermittent rating

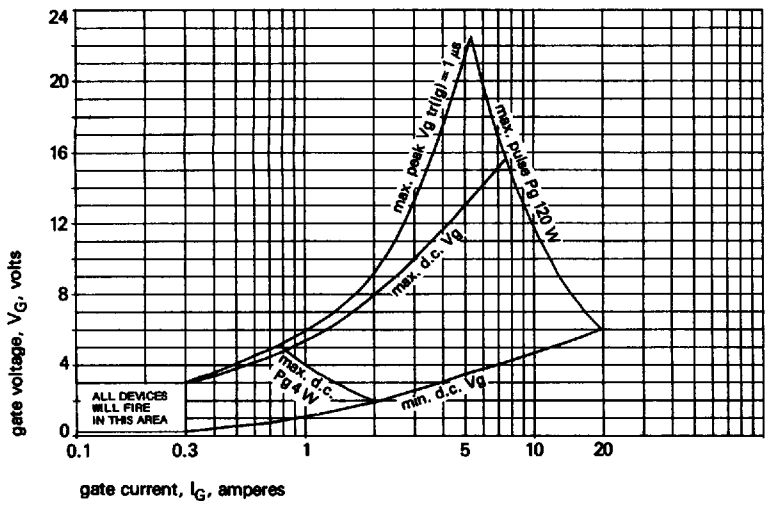


Figure 7 Gate characteristics at 25°C junction temperature

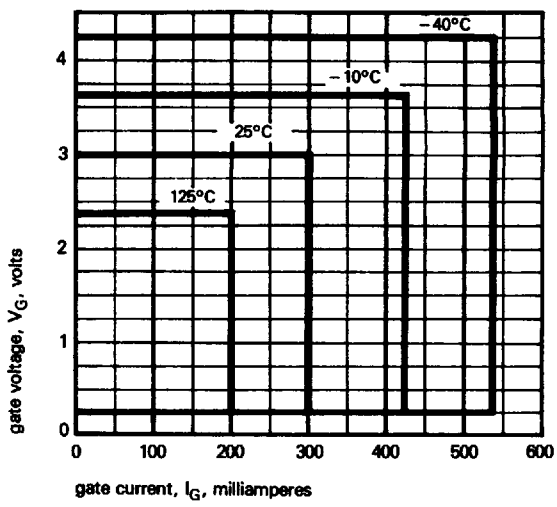


Figure 8 Gate triggering characteristics
Trigger points of all thyristors lie within the areas shown

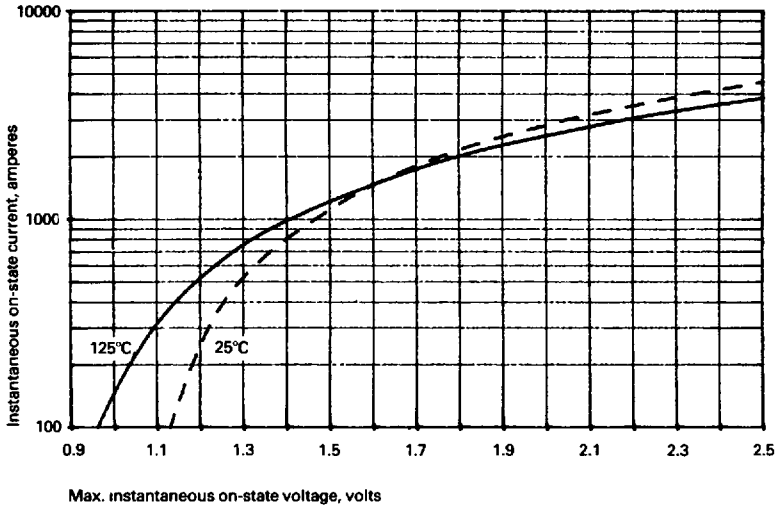
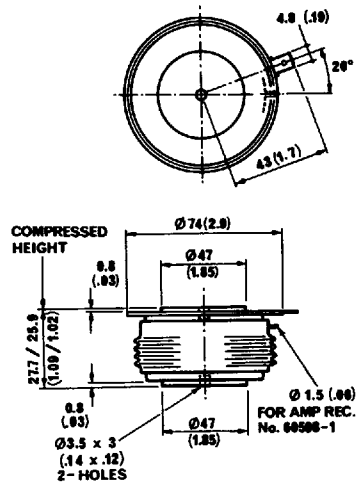


Figure 9 Limit on-state characteristic



Dimensions in mm (inches)
Mounting force: 1900–2600 Kgf
Weight: 510 grams

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

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