WESTCODE SEMICONDUCTORS

Series
N320C/DHxx
Issue 3

Capsule Phase Control Thyristor

Consists of a diffused silicon element mounted in an hermetic ceramic cold welded capsule, and features an amplifying gate. Available in industry standard and thin housings.

Ratings	Unless otherwise indicated Tj = 125°C	**Maximum Limits**						**Units**
	Voltage Codes	**36**	**38**	**40**	**42**	**44**	**45**	
V_{DRM}	Repetitive peak off-state voltage	3600	3800	4000	4200	4400	4500	V
V_{DSM}	Non-repetitive peak off-state voltage	3600	3800	4000	4200	4400	4500	V
V_{RRM}	Repetitive peak reverse voltage	3600	3800	4000	4200	4400	4500	V
V_{RSM}	Non-repetitive peak reverse voltage	3700	3900	4100	4300	4500	4600	V

$I_{T(AV)}$	Average on-state current	Half sine wave: 55°C heatsink temperature (double side cooled)	880	A
		Half sine wave: 85°C heatsink temperature (single side cooled)	385	A
$I_{T(RMS)}$	R.M.S on-state current	25°C heatsink temperature, double side cooled	1725	A
I_T	Continuous on-state current	25°C heatsink temperature, double side cooled	1535	A
$I_{TSM(1)}$	Peak one-cycle surge	10ms duration, 60% V_{RRM} re-applied	7700	A
$I_{TSM(2)}$	Peak one-cycle surge	10ms duration, $V_R \leq 10$ volts	8470	A
$I^2t_{(2)}$	Maximum permissible surge energy	10ms duration, $V_R \leq 10$ volts	359×10^3	A^2s
		3ms duration, $V_R \leq 10$ volts	265×10^3	A^2s
I_{FGM}	Peak forward gate current	Anode positive with respect to cathode	7.5	A
V_{FGM}	Peak forward gate voltage	Anode positive with respect to cathode	10	V
V_{RGM}	Peak reverse gate voltage		5	V
P_G	Average gate power		4	W
P_{GM}	Peak gate power	100µs pulse width	30	W
dv/dt	Rate of rise of off-state voltage	Linear to 80% V_{DRM} gate open-circuit	*200	V/µs
di/dt $_{(1)}$	Rate of rise of on-state current (repetitive)	Gate drive 20 volts, 20 ohms with $t_r \leq 1$µs. Anode voltage $\leq$ 80% V_{DRM}	150	A/µs
di/dt $_{(2)}$	Rate of rise of on-state current (non-repetitive)		300	A/µs
Tj	Operating temperature range		−40 to +125	°C
T_{stg}	Storage temperature range		−40 to +150	°C

Characteristics	Unless otherwise indicated Tj = 125°C			
V_{TM}	Peak on-state voltage	I_{TM} = 1600 A	2.77	V
V_O	Forward conduction threshold voltage		0.92	V
r	Forward conduction slope resistance		1.30	mΩ
I_{DRM}	Repetitive peak off-state current	At V_{DRM}	100	mA
I_{RRM}	Repetitive peak reverse current	At V_{RRM}	100	mA
I_{GT}	Gate current required to fire all devices	At 25°C, V_A = 6 V, I_A = 2 A	300	mA
V_{GT}	Gate voltage required to fire all devices		3.0	V
I_H	Holding current		1.0	A
V_{GD}	Gate voltage which will not trigger any device		0.25	V
$R_{th\ (j\text{-}hs)}$	Thermal resistance, junction to heat sink	Double side cooled	0.024	K/W
		Single side cooled	0.048	K/W

Ordering Information (Please quote device code as explained below)

N320	• H	• •	* dv/dt Code for 80% V_{DRM}
Fixed Type Code	Outline Code Nominal Thickness CH - 26.8 DH - 21.0	Voltage Code (see ratings)	200V/µs – No Code 300V/µs – GOO 400V/µs – HOO 500V/µs – JOO 750V/µs – KOO 1000V/µs – LOO

Typical code: N320CH42LOO, 4200 V_{DRM} 4200 V_{RRM}, 1000V/µs dv/dt to 80% V_{DRM}, Thick Housing

Figure 1. Dissipation/Sink Temperature v. Mean Current.

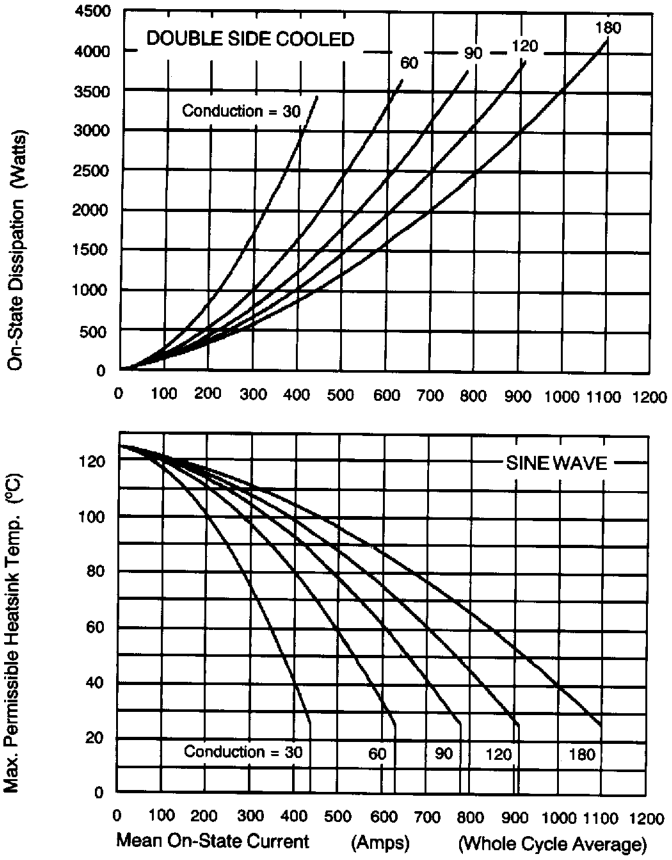


Figure 2. Dissipation/Sink Temperature v. Mean Current.

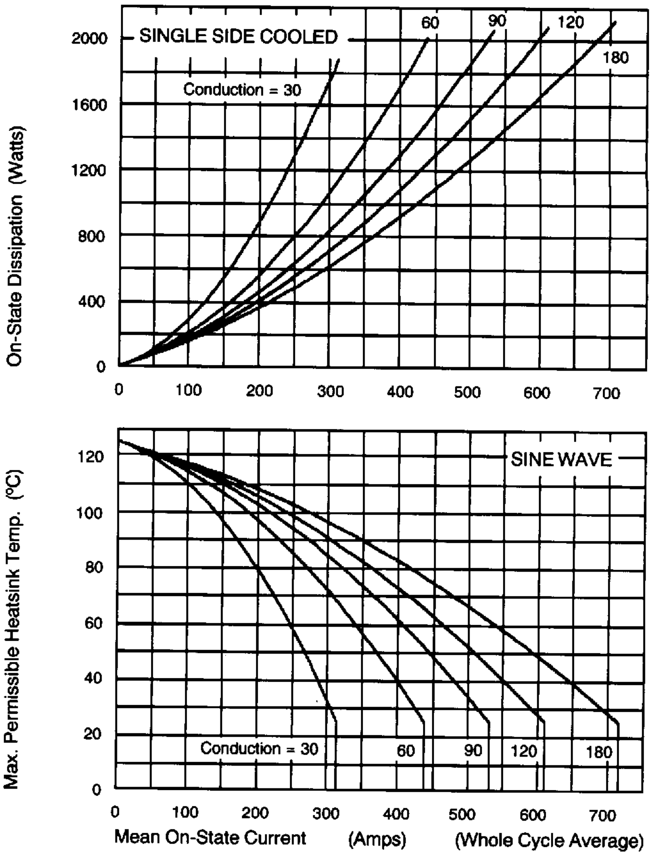


Figure 3. Junction to Sink Transient Thermal Impedance.

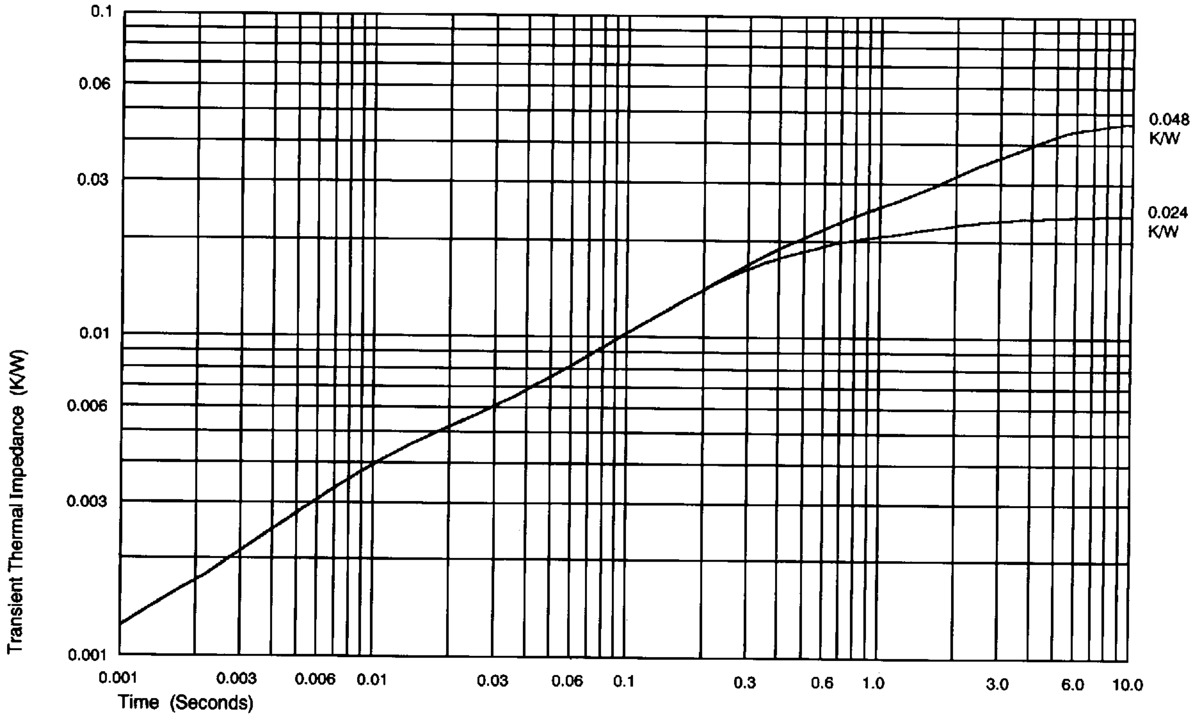


Figure 4. Dissipation/Sink Temperature v. Mean Current.

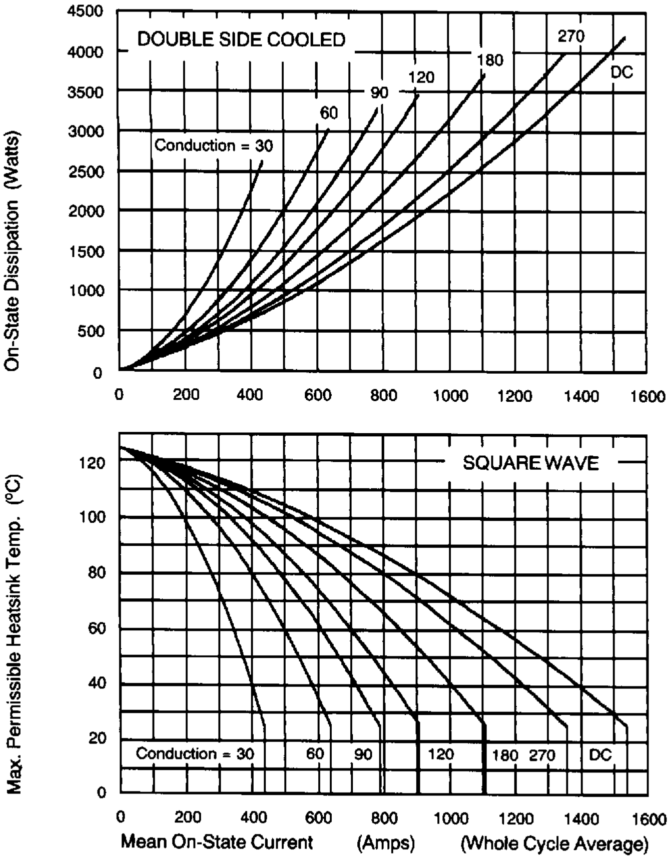


Figure 5. Dissipation/Sink Temperature v. Mean Current.

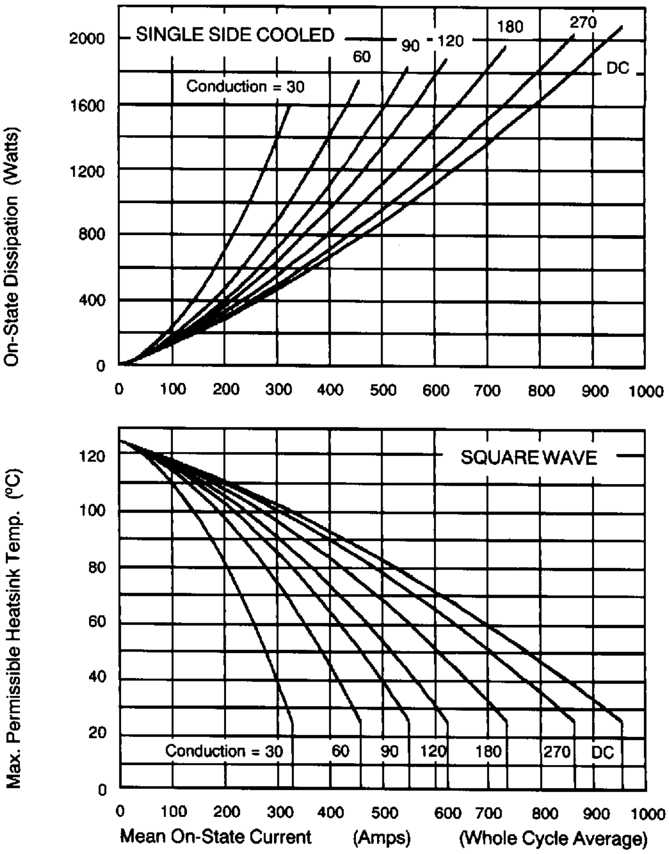
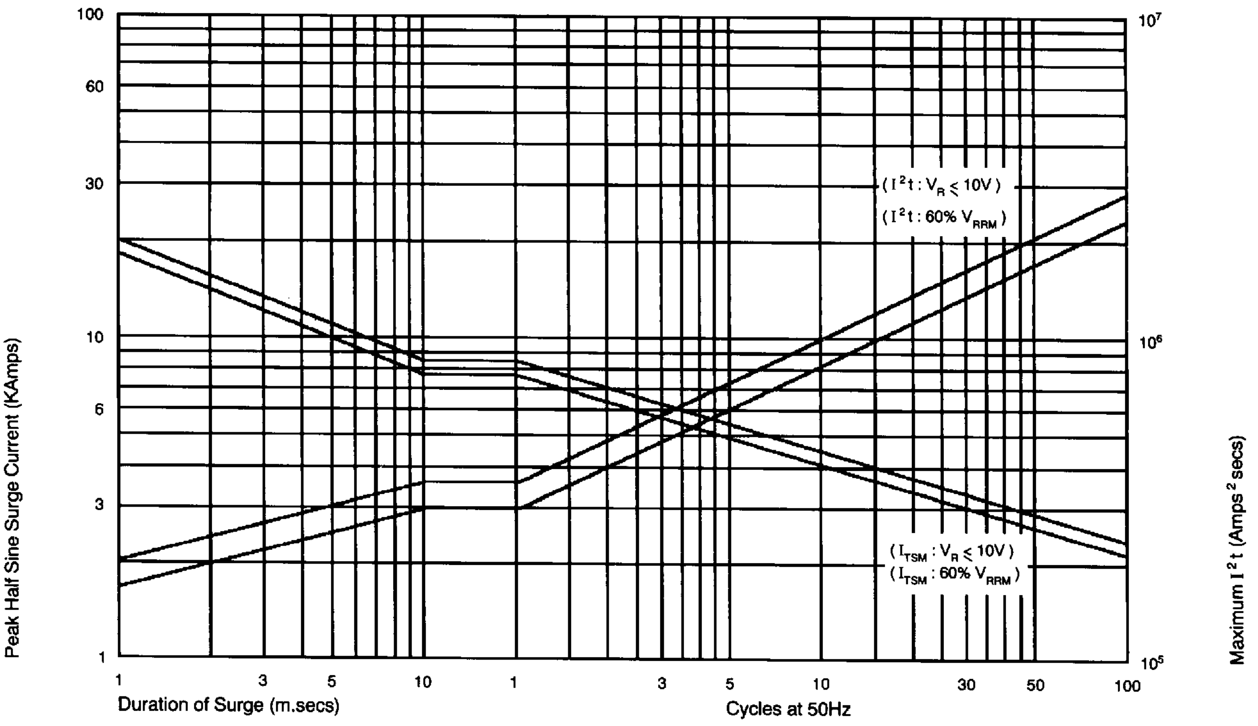


Figure 6. Non-Repetitive Surge Current at Initial Junction Temperature 125°C.



(Gate may temporarily lose control of firing angle.)

Figure 7. Gate Characteristics at 25°C Junction Temperature.

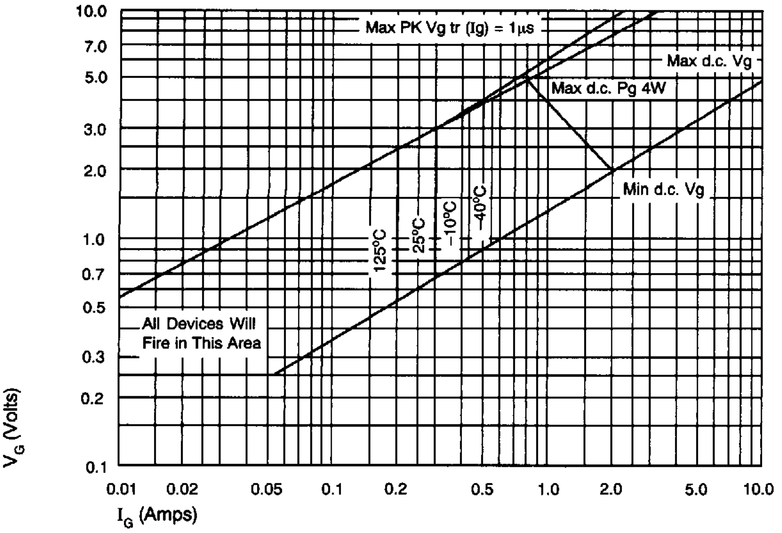
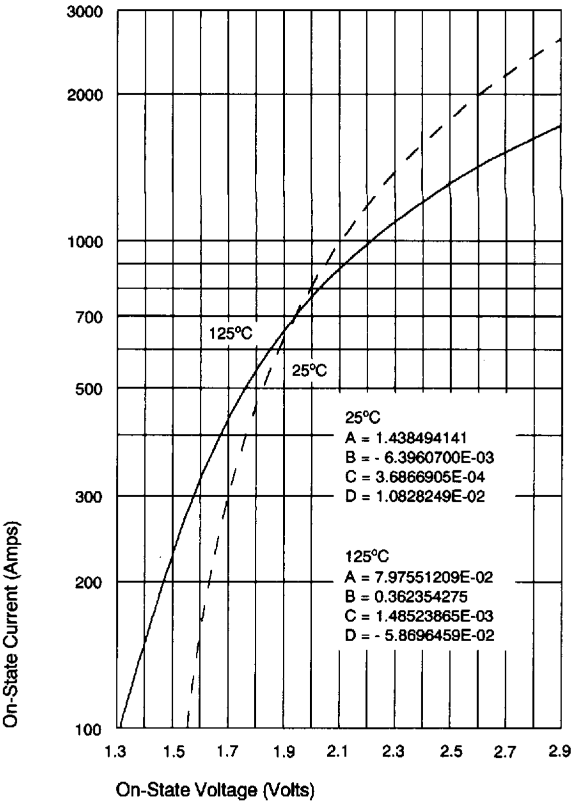
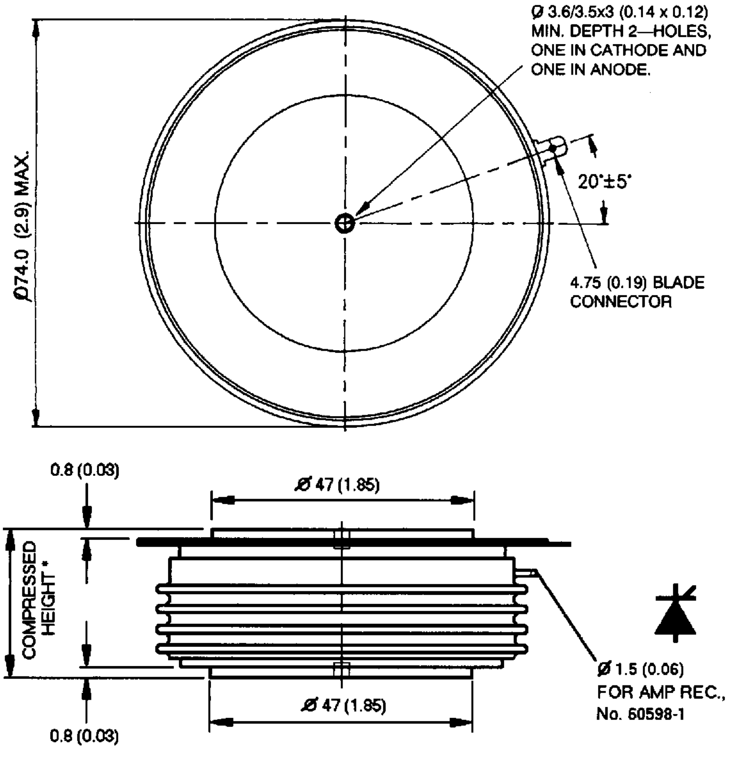


Figure 8. Peak On-State Characteristic at 125°C.



Forward Volt-Drop Calculations:

$V_T = A + B\ln I_T + CI_T + D\sqrt{I_T}$



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

* For CH : 27.7/25.9 (1.09/1.02)
DH : 21.0±0.5 (0.83±0.02)

Standard gate leads, 300mm long, available on request.

HAWKER SIDDELEY
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4

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