



WESTCODE SEMICONDUCTORS

Technical
Publication
TN086C
Issue 1
November 1980

Convertor Grade Capsule Thyristor Type N086C

195 amperes average: up to 1500 volts V_{RRM}

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

RATING	CONDITIONS	SYMBOL	
Average on-state current	Half sine wave $\left\{ \begin{array}{l} 55^\circ\text{C heatsink temperature} \\ \text{(double side cooled)} \\ 85^\circ\text{C heatsink temperature} \\ \text{(single side cooled)} \end{array} \right.$	$I_{T(AV)}$	195A 75A
R.M.S. on-state current	25°C heatsink temperature, double side cooled	$I_T (RMS)$	390A
Continuous on-state current	25°C heatsink temperature, double side cooled	I_T	320A
Peak one-cycle surge (non-repetitive) on state current	8.3ms duration $\left\{ \begin{array}{l} 60\% V_{RRM} \text{ re-applied} \\ V_R \leq 10 \text{ volts} \end{array} \right.$	$I_{TSM (1)}$ $I_{TSM (2)}$	1802A 2067A
Maximum permissible surge energy	With 60% V_{RRM} re-applied $\left\{ \begin{array}{l} 8.3\text{ms duration} \\ 3\text{ms duration} \end{array} \right.$	$I^2 t$	18430A ² s 14000A 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}	18V
Peak reverse gate voltage		V_{RGM}	5V
Average gate power		P_G	2W
Peak gate power	100µs. pulse width	P_{GM}	100W
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)	$\left\{ \begin{array}{l} \text{Gate drive 20 volts, 20 ohms with } t_r \leq 1\mu\text{s.} \\ \text{Anode voltage } > 80\% V_{DRM} \end{array} \right.$	$di/dt (1)$	500A/µs
Rate of rise of on-state current (non-repetitive)		$di/dt (2)$	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 400 A, I_{TM}	V_{TM}	2.49V
Forward conduction threshold voltage		V_O	1.57V
Forward conduction slope resistance		r	2.29mΩ
Repetitive peak off-state current	At V_{DRM}	I_{DRM}	20mA
Repetitive peak reverse current	At V_{RRM}	I_{RRM}	20mA
Maximum gate current required to fire all devices	At 25°C	I_{GT}	150mA
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 holding current		I_H	600mA
Thermal resistance, junction to heatsink for a device with a maximum forward volt drop characteristic	Double side cooled Single side cooled	$R_{th(j-hs)}$	0.135°C/W 0.270°C/W

VOLTAGE CODE		H02	H03	H04	H06	H08	H10	H12	H14	H15
Repetitive peak voltages	V_{RRM} V_{DRM}	200	300	400	600	800	1000	1200	1400	1500
Non-repetitive peak off-state voltage	V_{DSM}									
Non-repetitive peak reverse blocking voltage	V_{RSM}	300	400	500	700	900	1100	1300	1500	1600

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

N	0	8	6	C	●	●	●	
				Voltage code (see ratings)	Typical code: N086CH12 = 1200 V_{RRM} 1200 V_{DRM} , 200 V/µs. dv/dt to 80% V_{DRM}			

* Other values of dv/dt may be available.

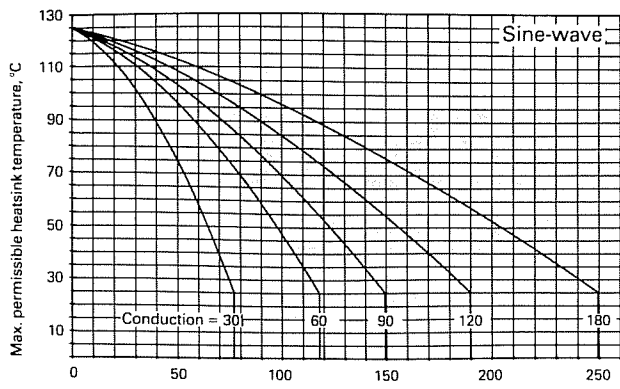


Figure 1 Dissipation and heatsink temperature v. current (Double side cooled)

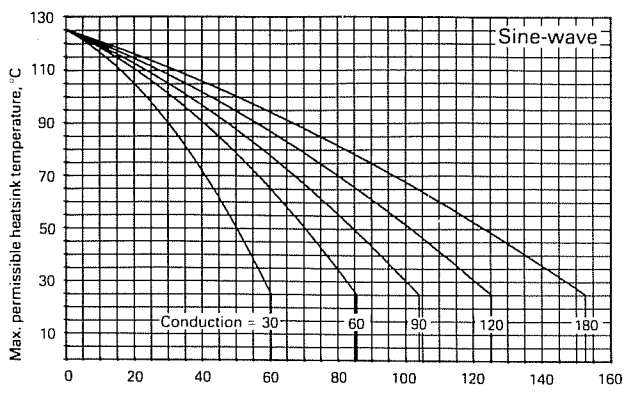


Figure 2 Dissipation and heatsink temperature v. current (Single side cooled)

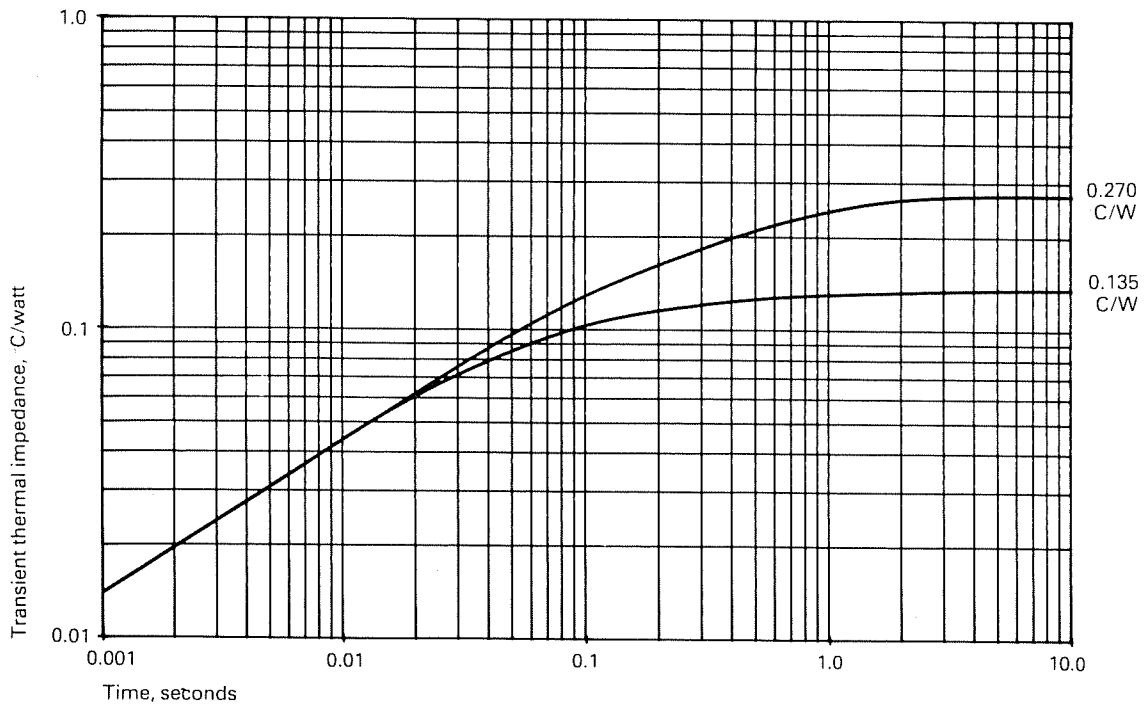
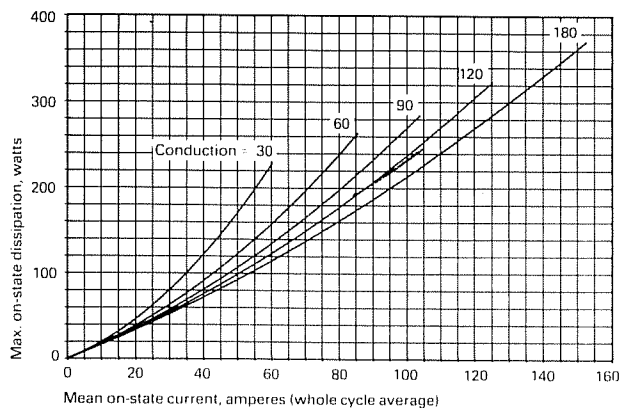
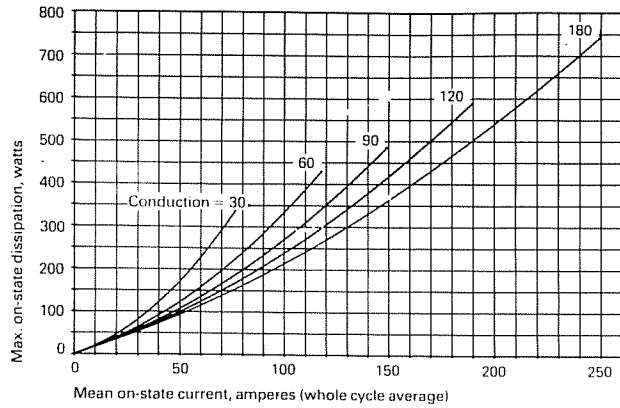


Figure 3 Junction to heatsink thermal impedance

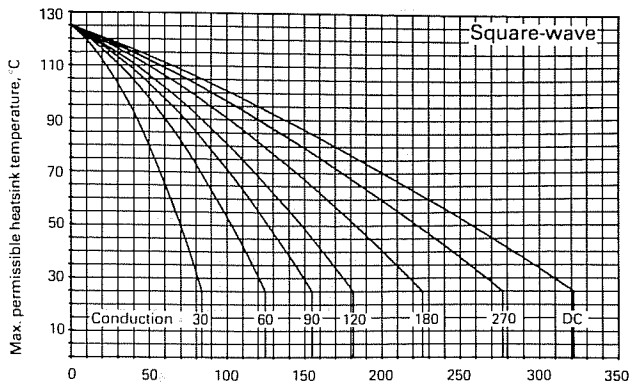


Figure 4 Dissipation and heatsink temperature v. current (Double side cooled)

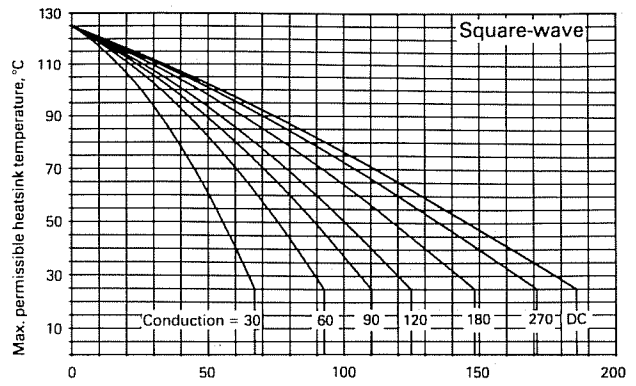
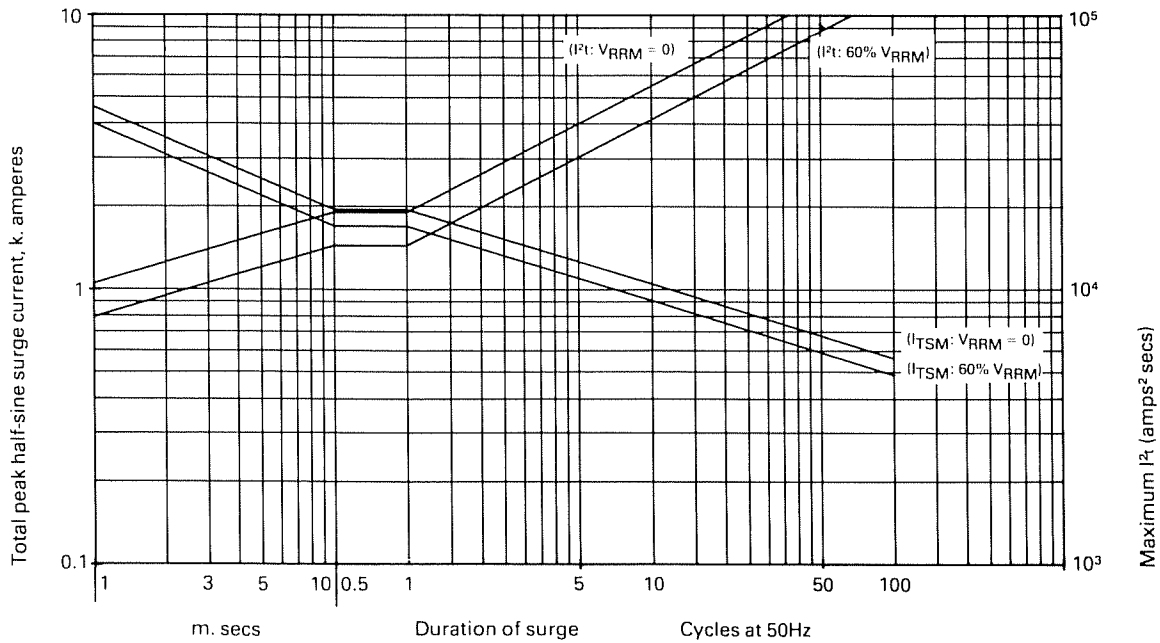
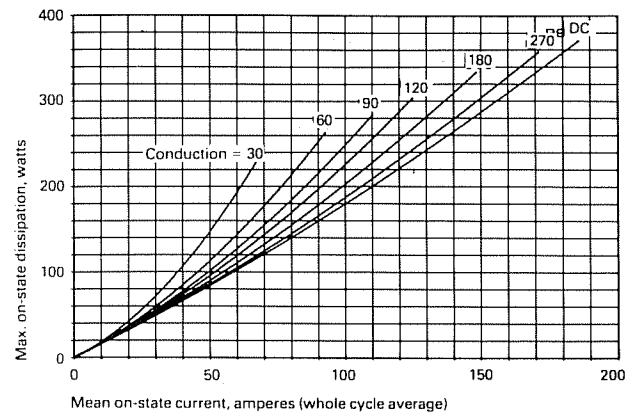
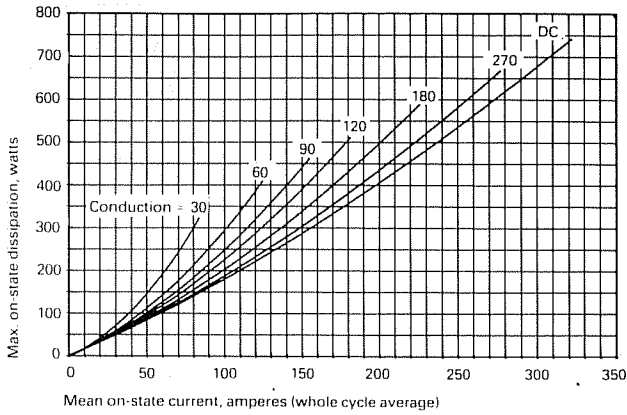


Figure 5 Dissipation and heatsink temperature v. current (Single side cooled)



**Figure 6 Max. non-repetitive surge current at initial junction temperature 125°C.
Note: This rating must not be interpreted as an intermittent rating**

TN086C

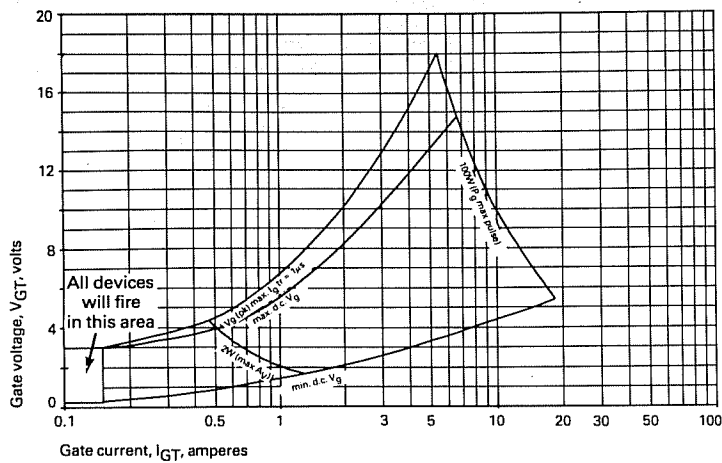


Figure 7 Gate characteristic at 25°C junction temperature

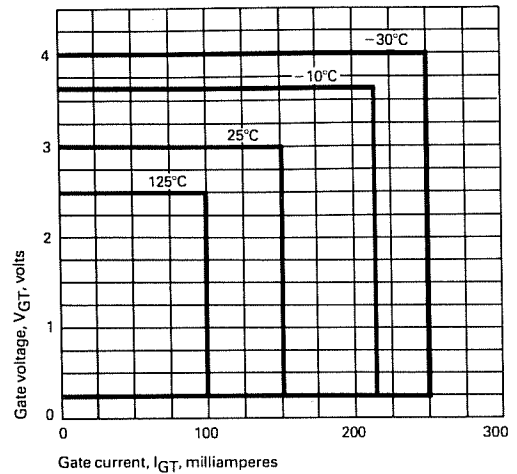


Figure 8 Gate triggering characteristics

Trigger points of all thyristors lie within the areas shown

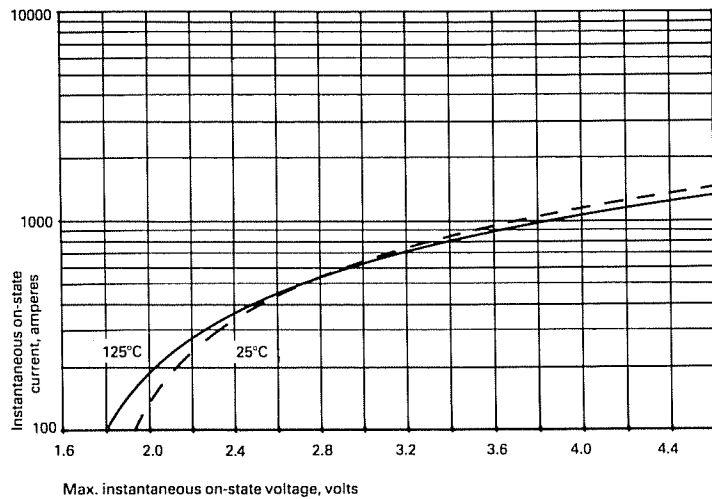
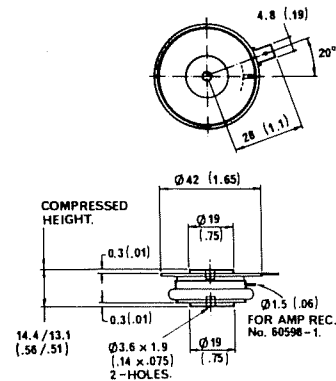


Figure 9 Limit on-state current at 125°C



TO - 200AB
 dimensions in mm (inches)
 Mounting force: 330-550Kg
 Weight: 70 grams

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

WESTCODE SEMICONDUCTORS

0-02 Fair Lawn Avenue, Fair Lawn, New Jersey 07410
 Telephone: (201) 791-3020 • Telex: 130389

HAWKER SIDDELEY
Westinghouse Brake and Signal Co. Ltd.

