



WESTCODE SEMICONDUCTORS



Technical
Publication
TN029R

Issue 2
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Converter Grade Stud-Base Thyristor Type N029R

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

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

RATING	CONDITIONS	SYMBOL	
Average on-state current	Half sine wave. 96°C case temperature	$I_{T(AV)}$	30A
R.M.S on-state current		$I_{T(RMS)}$	48A
Continuous on-state current		I_T	48A
Peak one-cycle surge (non-repetitive) on-state current	10ms duration, 60% V_{RRM} re-applied	$I_{TSM(1)}$	500A
	10ms duration, $V_R \leq 10$ volts	$I_{TSM(2)}$	575A
Maximum permissible surge energy	10ms duration, $V_R \leq 10$ volts	$I^2t(2)$	1653A ² s
	3ms duration, $V_R \leq 10$ volts	I^2t	1174A ² s
Peak forward gate current	Anode positive with respect to cathode	I_{FGM}	5A
Peak forward gate voltage	Anode positive with respect to cathode	V_{FGM}	20V
Peak reverse gate voltage		V_{RGM}	5V
Average gate power		P_G	1W
Peak gate power	100µs pulse width	P_{GM}	20W
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)	$\left. \begin{array}{l} T_{VJ} = 125^\circ\text{C}, I_G = 3 \times I_{GT}, dI_G/dt = 1\text{A}/\mu\text{s} \\ \text{Anode voltage} \leq 80\% V_{DRM} \end{array} \right\}$	$di/dt(1)$	200A/µs
Rate of rise on on-state current (non-repetitive)		$di/dt(2)$	400A/µs
Operating temperature range		T case	-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 94 A, I_{TM}	V_{TM}	1.93V
Forward conduction threshold voltage		V_O	1.17V
Forward conduction slope resistance		r	8.1mΩ
Repetitive peak off-state current	At V_{DRM}	I_{DRM}	5mA
Repetitive peak reverse current	At V_{RRM}	I_{RRM}	5mA
Maximum gate current required to fire all devices	$\left. \begin{array}{l} V_A = 6\text{V}, I_A = 500\text{mA at } 25^\circ\text{C } T_j \end{array} \right\}$	I_{GT}	100mA
Maximum gate voltage required to fire all devices		V_{GT}	3V
Maximum holding current		I_H	160mA
Maximum gate voltage which will not trigger any device		V_{GD}	0.25V
Thermal resistance, junction to case for a device with a maximum forward volt drop characteristic	DC and 180° sine wave	$R_{th(j-c)}$	0.55°C/W
	120° rectangular wave		0.69°C/W
Thermal resistance case to heatsink		$R_{th(c-hs)}$	0.1°C/W

VOLTAGE CODE	H02	H04	H06	H08	H10	H12	H15	
Repetitive peak voltages	200	400	600	800	1000	1200	1500	
Non-repetitive peak off-state voltage								
Non-repetitive peak reverse blocking voltage	300	500	700	900	1100	1300	1600	

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

N 0 2 9 R	● ● ●	Typical code: N029RH12 = 1200 V_{RRM} 1200 V_{DRM} , 200 V/µs. dv/dt to 80% V_{DRM}
	Voltage code (see ratings)	

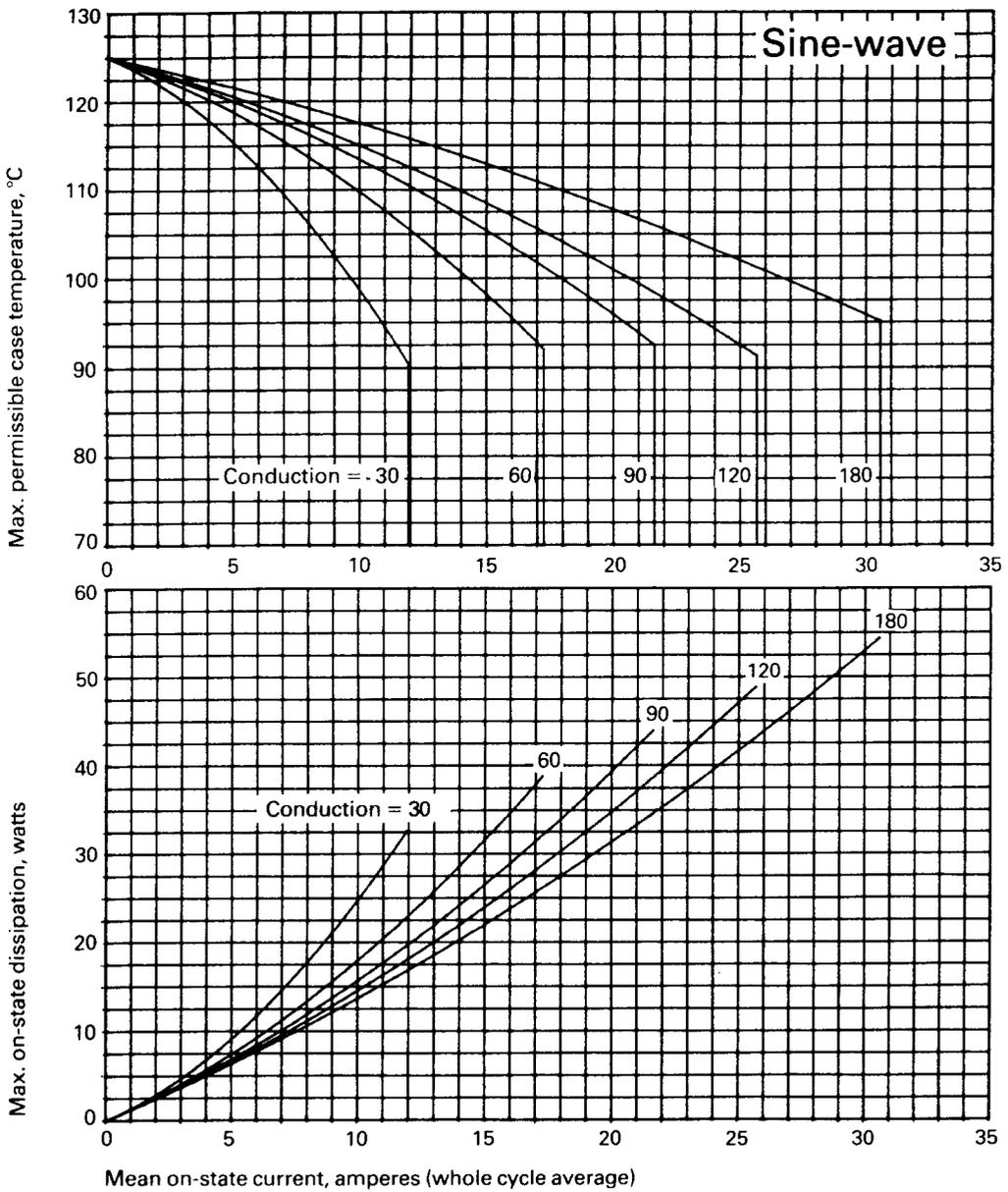


Figure 1 Dissipation and case temperature v. current

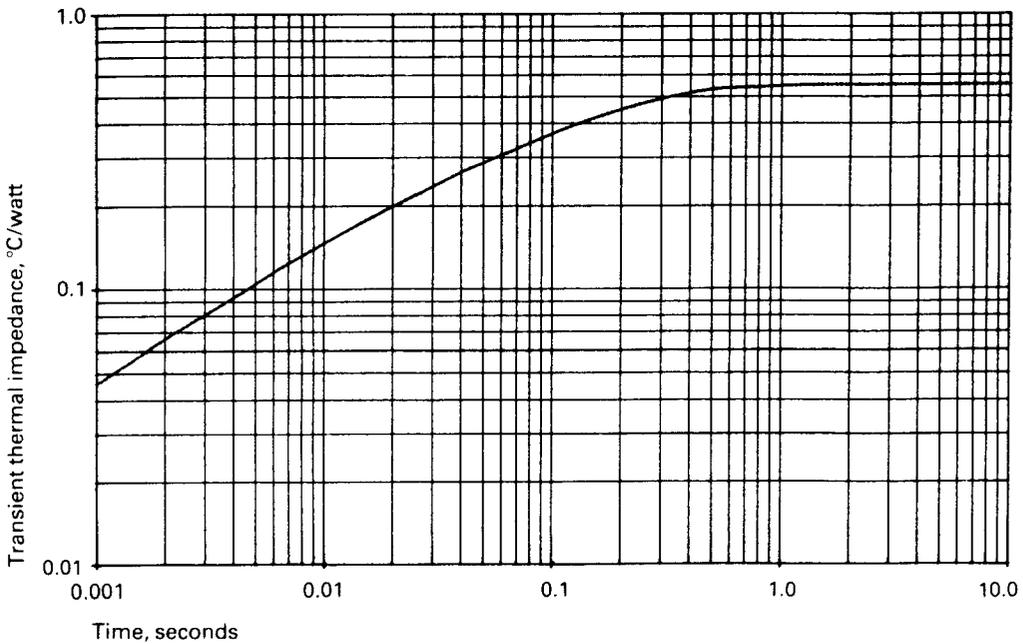


Figure 2 Junction to case thermal impedance

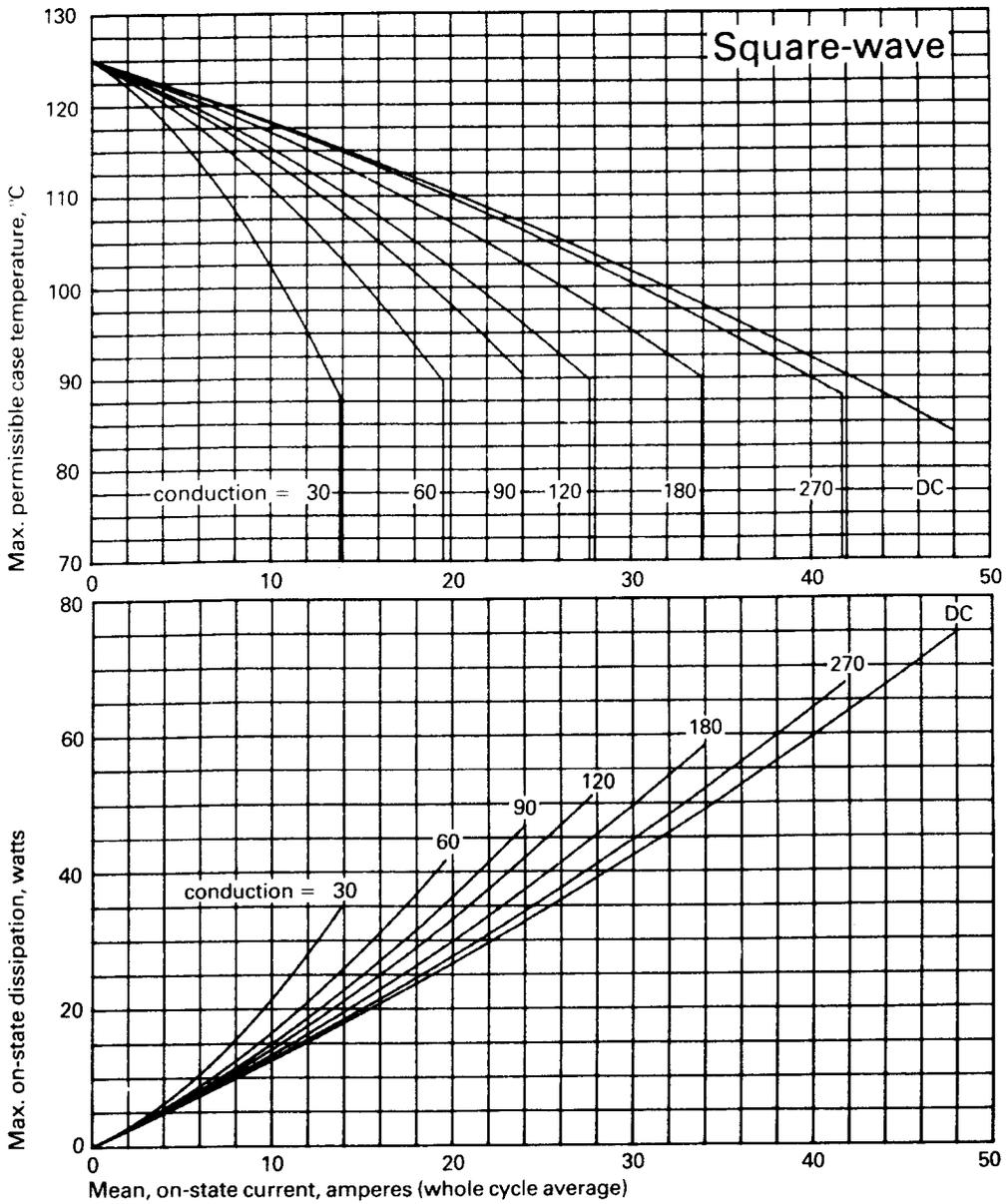


Figure 3 Dissipation and case temperature v. current

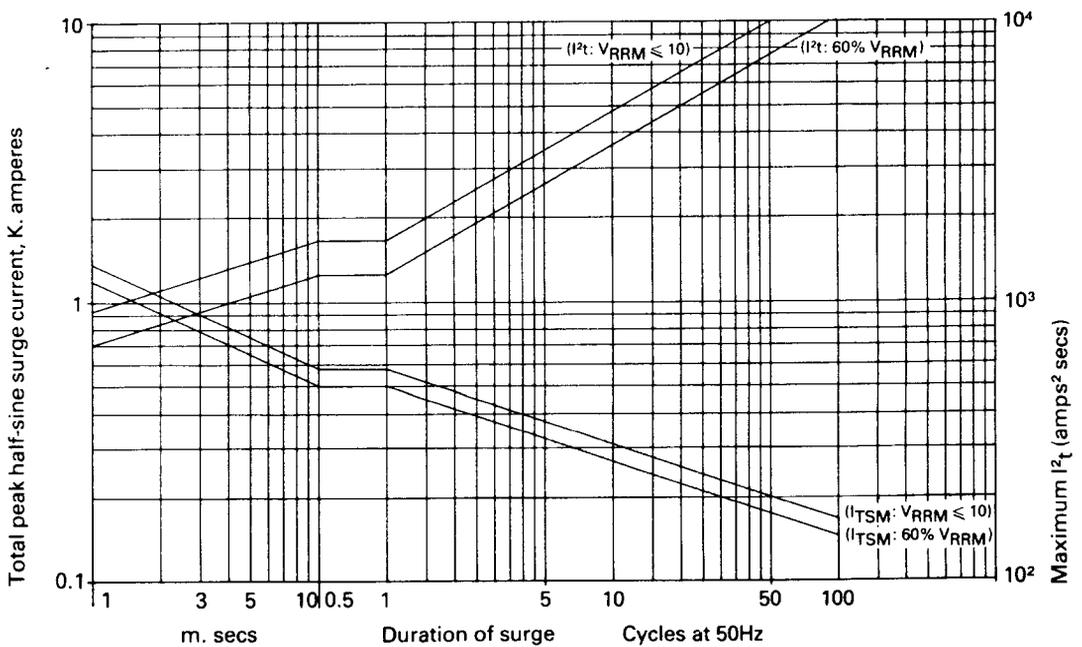


Figure 4 Max. non-repetitive surge current at initial junction temperature 125°C.

(gate may temporarily lose control of firing angle)

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

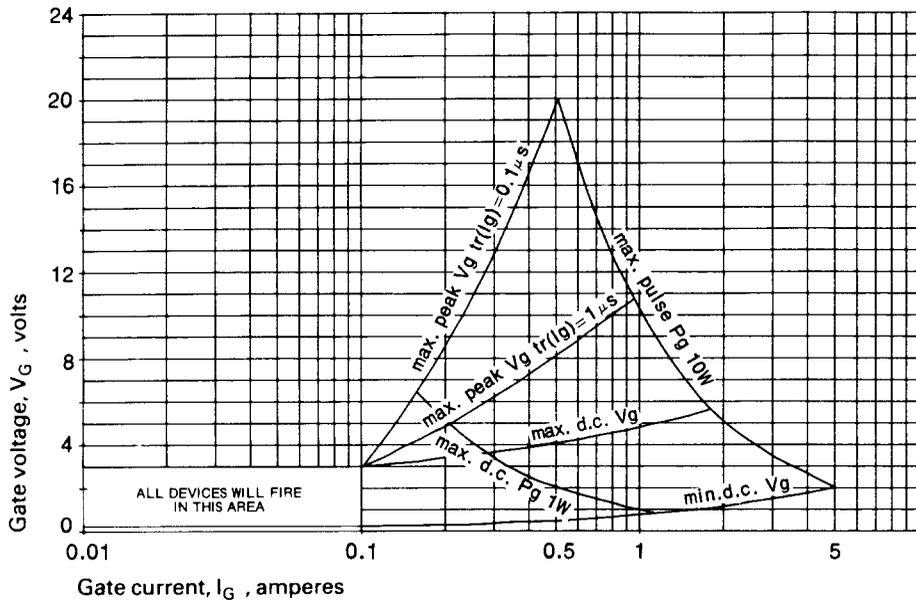


Figure 5 Gate characteristic at 25°C junction temperature

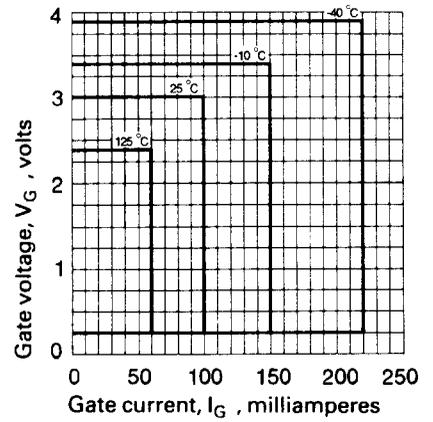


Figure 6 Gate triggering characteristics

Trigger points of all thyristors lie within the areas shown

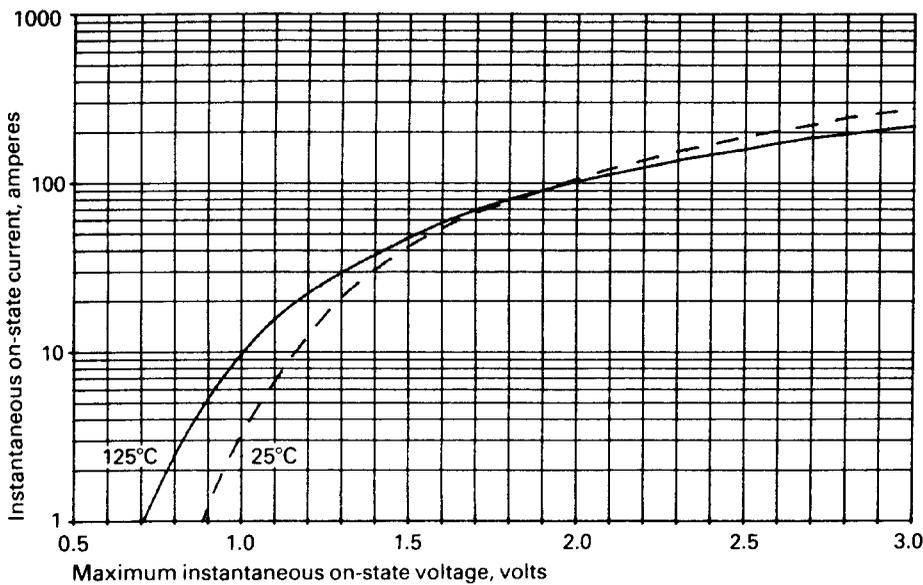
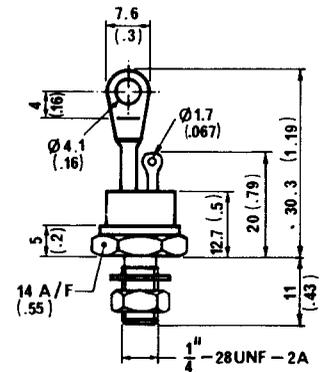


Figure 7 Limit on-state characteristic



Conforms to TO-48

dimensions in mm (inches)

Mounting torque: 0.41 – 0.48 KgM
threads not to be lubricated

Weight: 10 grams

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

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