



WESTCODE SEMICONDUCTORS

Technical
Publication
TN018R

Issue 2
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Convertor Grade Stud-Base Thyristor Type N018R

21 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. 85°C case temperature	$I_{T(AV)}$	21A
R.M.S on-state current		$I_{T(RMS)}$	40A
Continuous on-state current		I_T	40A
Peak one-cycle surge (non-repetitive) on-state current	10ms duration, 60% V_{RRM} re-applied	$I_{TSM(1)}$	210A
	10ms duration, $V_R \leq 10$ volts	$I_{TSM(2)}$	240A
	10ms duration, $V_R \leq 10$ volts	$I_{\beta t(2)}$	290A ² s
Maximum permissible surge energy	3ms duration, $V_R \leq 10$ volts	$I_{\beta t}$	210A 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)	$T_{VJ} = 125^\circ C, I_G = 3 \times I_{GT}, dI_G/dt = 1A/\mu s$ Anode voltage $\leq 80\% V_{DRM}$	$di/dt(1)$	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 55 A, I_{TM}	V_{TM}	1.96V
Forward conduction threshold voltage		V_O	1.38V
Forward conduction slope resistance		r	10.3mΩ
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	$V_A = 6V, I_A = 500mA$ at 25°C T _j	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	$R_{th(j-c)}$	1°C/W
	120° rectangular wave		1.25°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	V_{RRM} V_{DRM}	200	400	600	800	1000	1200	1500	
Non-repetitive peak off-state voltage	V_{DSM}								
Non-repetitive peak reverse blocking voltage	V_{RSM}	300	500	700	900	1100	1300	1600	

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

N 0 1 8 R	● ● ●	
	Voltage code (see ratings)	Typical code: N018RH12 = 1200 V_{RRM} 1200 V_{DRM} , 200 V/µs, dv/dt to 80% V_{DRM}

Sine-wave

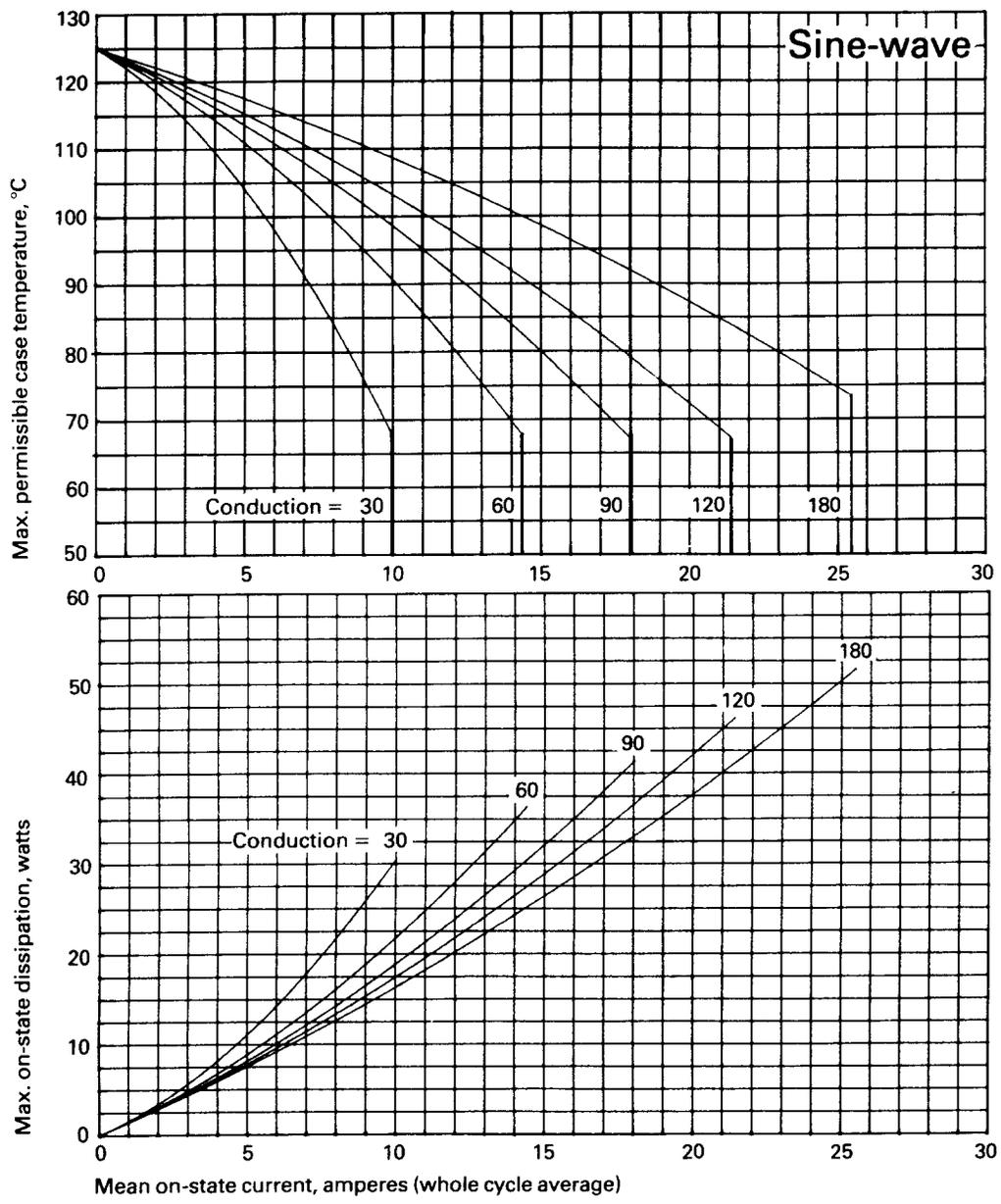


Figure 1 Dissipation and case temperature v. current

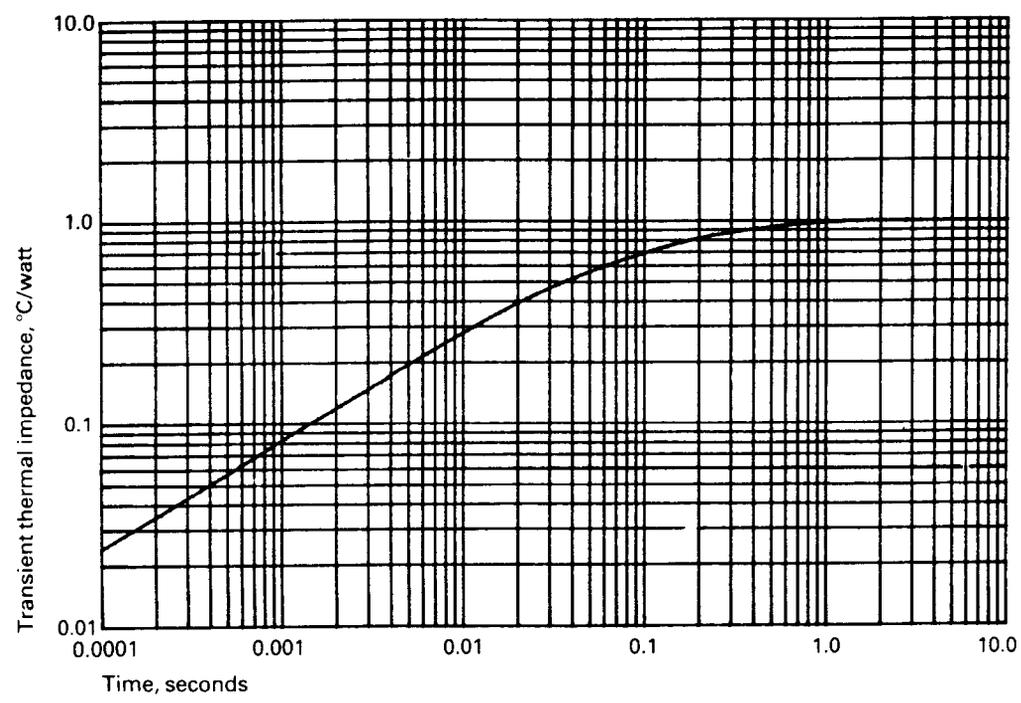


Figure 2 Junction to case thermal impedance

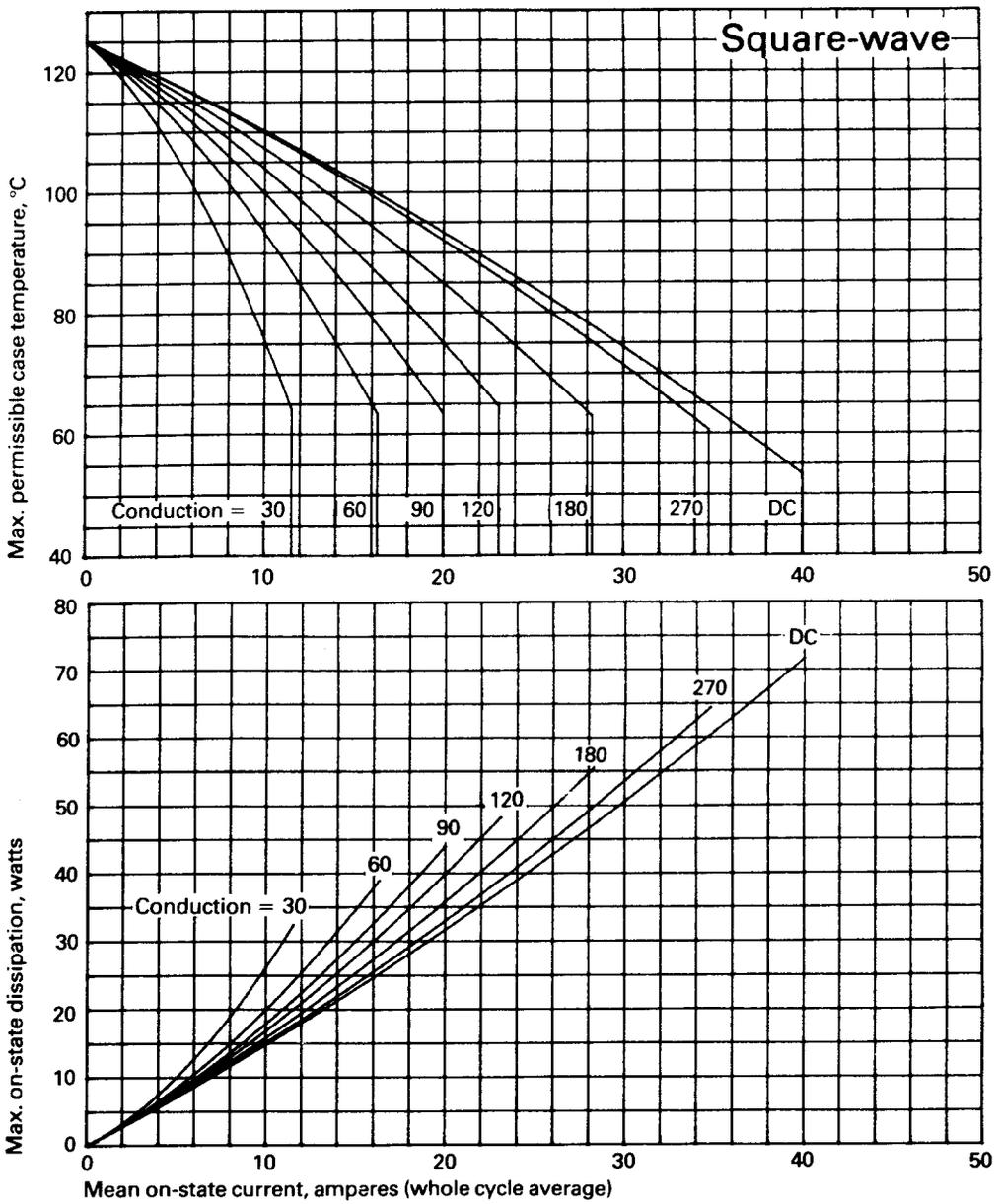


Figure 3 Dissipation and case temperature v. current

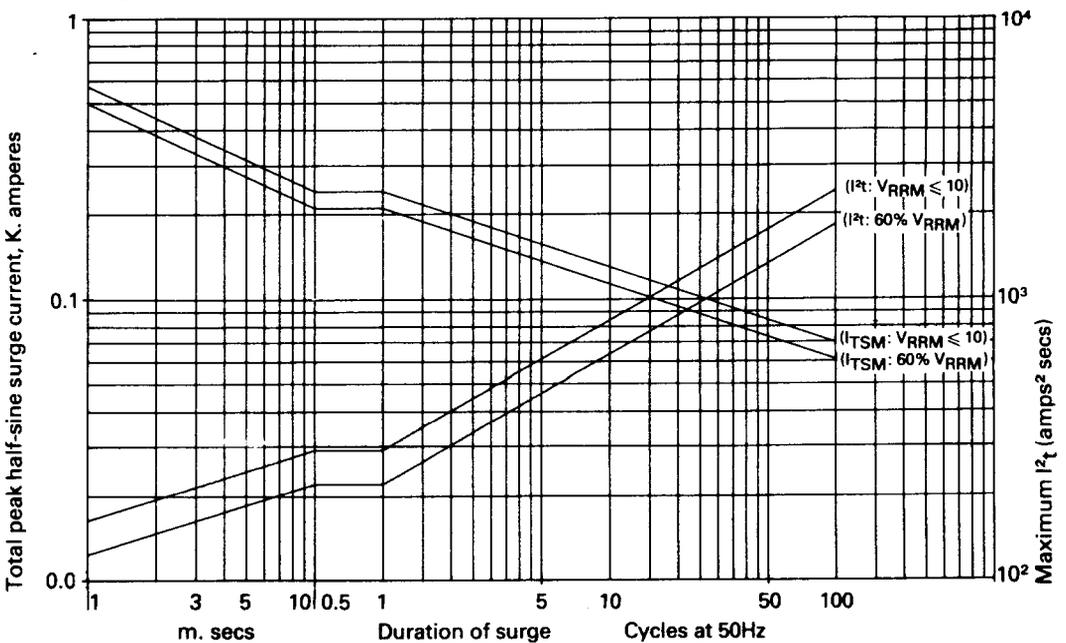


Figure 4 Max. non-repetitive surge current at initial junction temperature 125°C.

(gate may temporarily lose control of firing angle)

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

TN018R

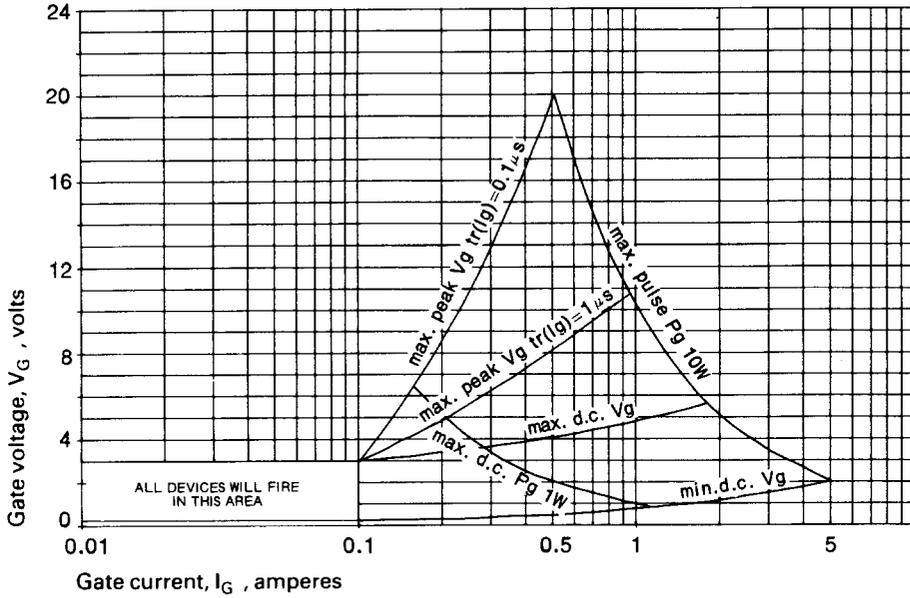


Figure 5 Gate characteristic at 25°C junction temperature

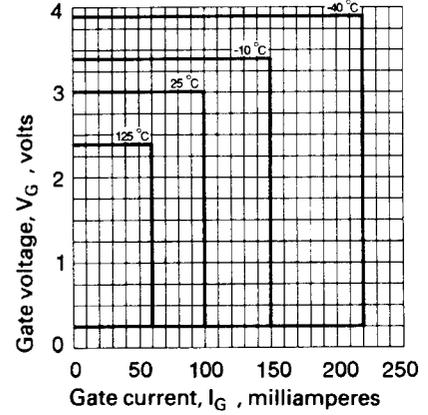


Figure 6 Gate triggering characteristics

Trigger points of all thyristors lie within the areas shown

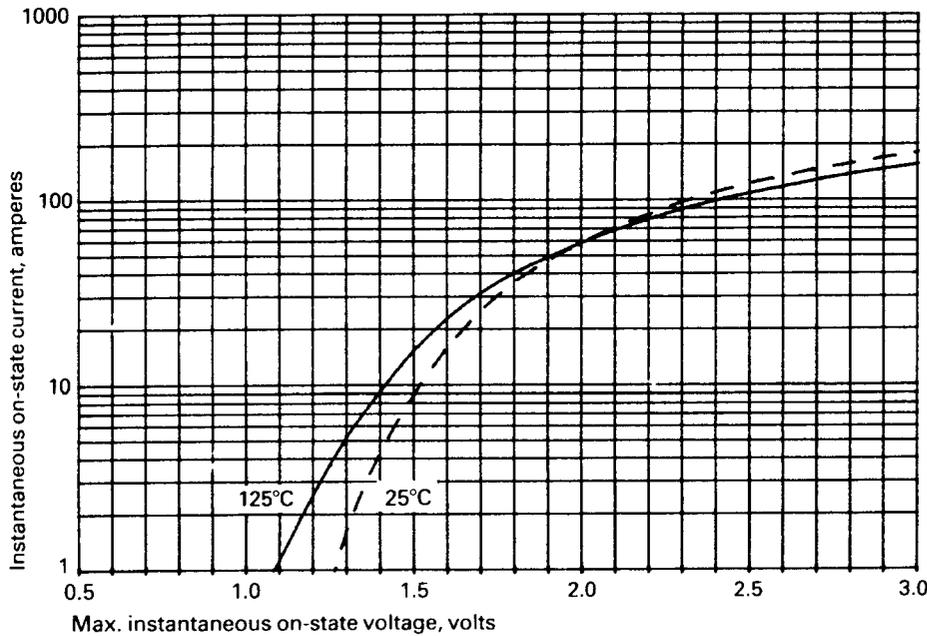
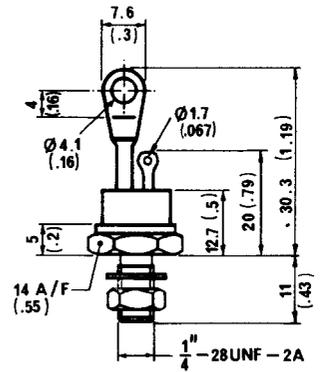


Figure 7 Limit on-state characteristic



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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