WESTCODE SEMICONDUCTORS

Technical Publication **TN105P/R**
Issue 2
July 1985

Convertor Grade Stud-Base Thyristor Type N105P/N105R

110 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. 90°C case temperature	$I_{T(AV)}$	110A
R.M.S on-state current		$I_{T(RMS)}$	175A
Continuous on-state current		I_T	175A
Peak one-cycle surge (non-repetitive) on-state current	10ms duration, 60% V_{RRM} re-applied	$I_{TSM(1)}$	2450A
	10ms duration, $V_R \leq$ 10 volts	$I_{TSM(2)}$	2695A
Maximum permissible surge energy	10ms duration, $V_R \leq$ 10 volts	I^2t (2)	36300A^2_s
	3ms duration, $V_R \leq$ 10 volts	I^2t	27000A^2_s
Peak forward gate current	Anode positive with respect to cathode	I_{FGM}	19A
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)	Gate drive 20 volts, 20 ohms with $t_r \leq 1\mu s$. Anode voltage $\leq$ 80% V_{DRM}	di/dt (1)	500A/μs
Rate of rise on on-state current (non-repetitive)		di/dt (2)	1000A/μs
Operating temperature range		T case	−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 377 A, I_{TM}	V_{TM}	1.57V
Forward conduction threshold voltage		V_O	0.9V
Forward conduction slope resistance		r	1.79mΩ
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	V_A = 6V, I_A = 2A at 25 °C T_j	I_{GT}	150mA
Maximum gate voltage required to fire all devices		V_{GT}	3V
Maximum holding current		I_H	600mA
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	$R_{th(j-c)}$	0.23°C/W
	120° rectangular wave		0.28°C/W
Thermal resistance case to heatsink		$R_{th(c-hs)}$	0.08°C/W

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

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

N 1 0 5 P	● ● ●	
	Voltage code (see ratings)	Typical code: N105PH12 = 1200 V_{RRM} 1200V_{DRM}, 200 V/μs. dv/dt to 80% V_{DRM}

* Other values of dv/dt may be available.

TN105P

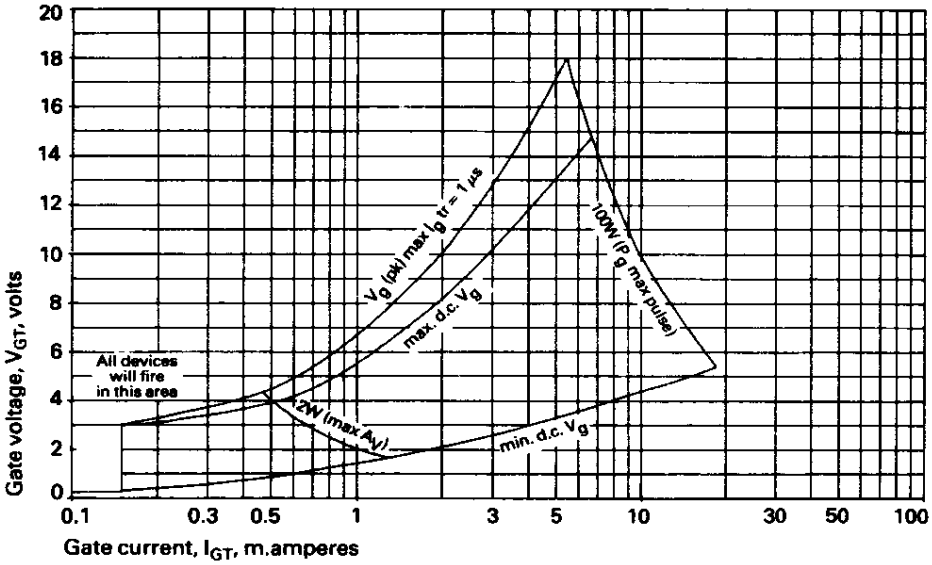


Figure 5 Gate characteristic at 25°C junction temperature

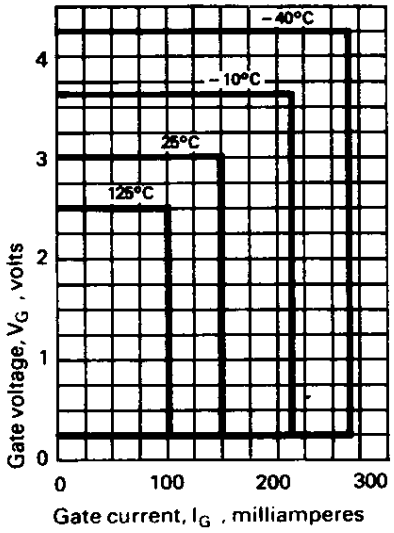


Figure 6 Gate triggering characteristics

Trigger points of all thyristors lie within the areas shown

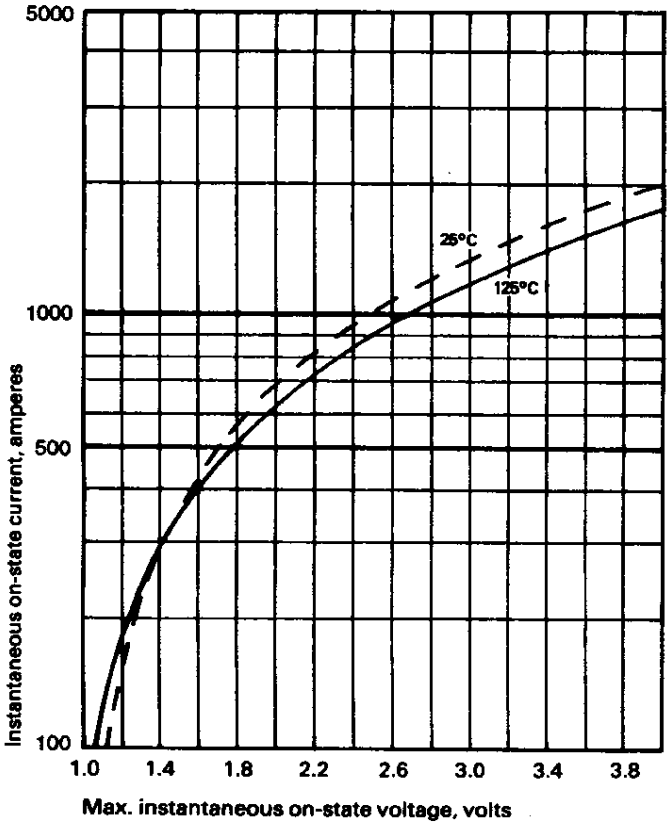
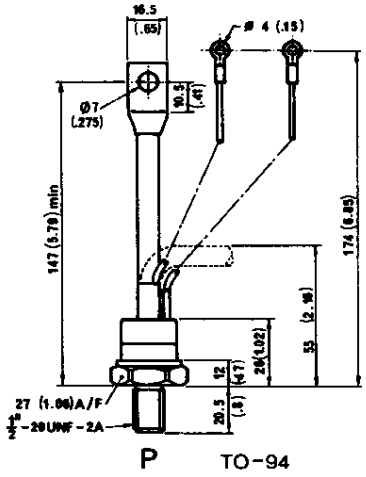
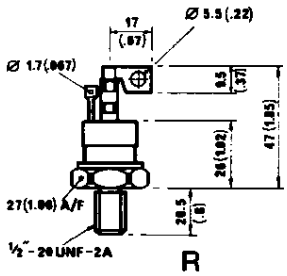


Figure 7 Limit on-state characteristic





dimensions in mm (inches)
Mounting Torque:
14 Nm (1.45 kgf-m)
Weight: P = 130 grams
R = 100 grams

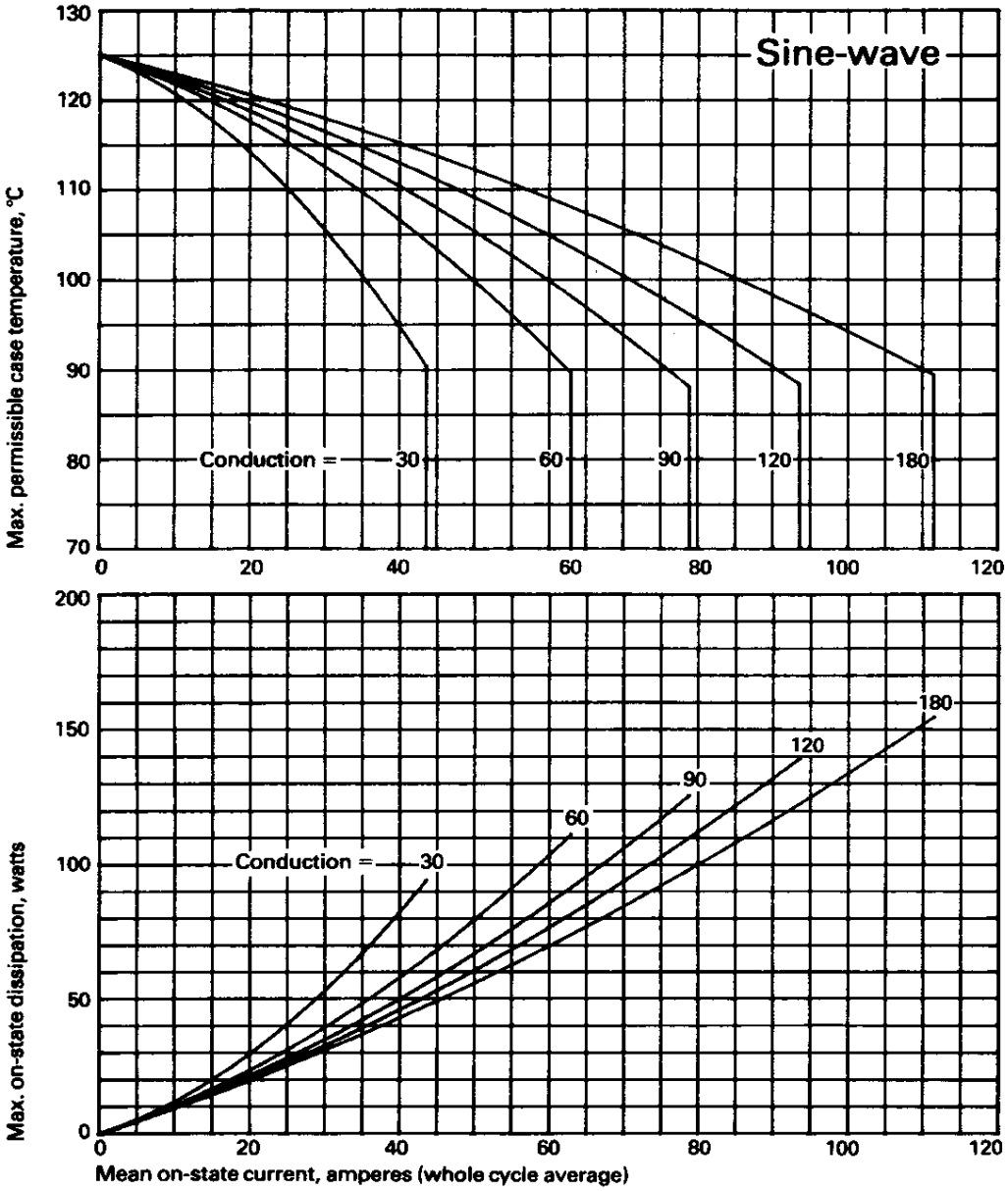


Figure 1 Dissipation and case temperature v. current

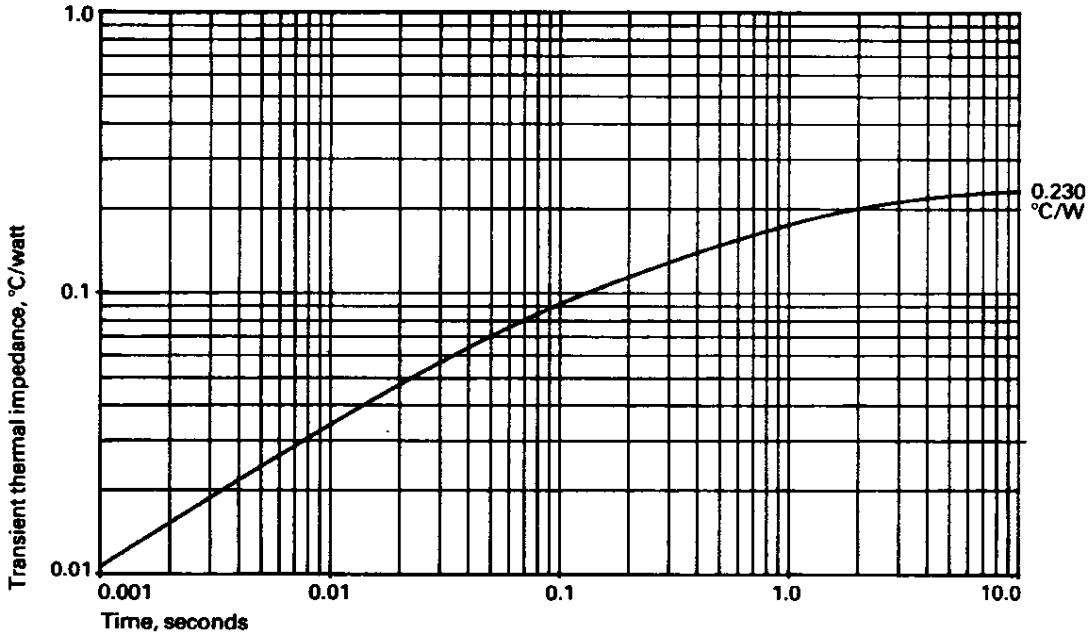


Figure 2 Junction to case thermal impedance

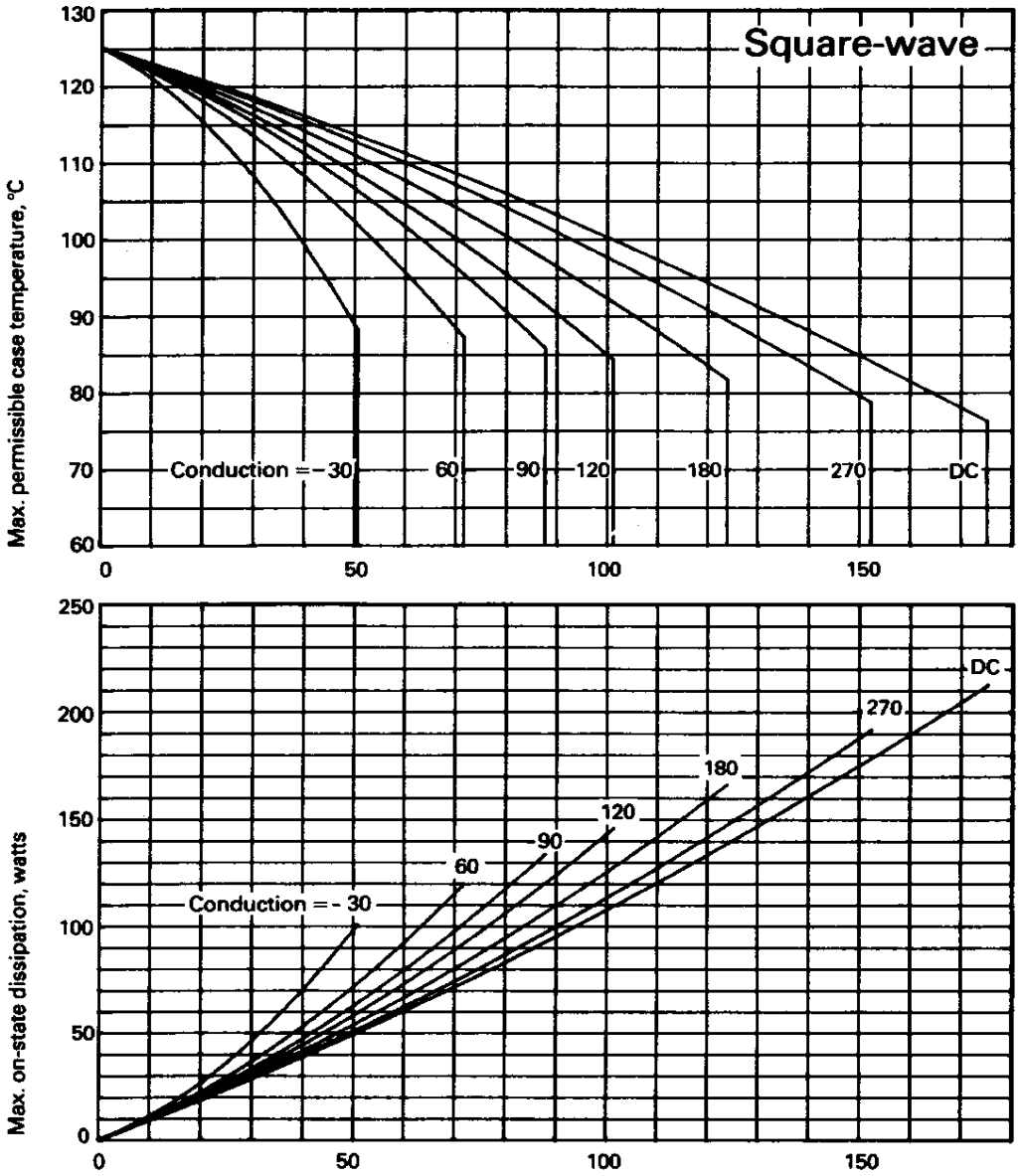


Figure 3 Dissipation and case temperature v. current

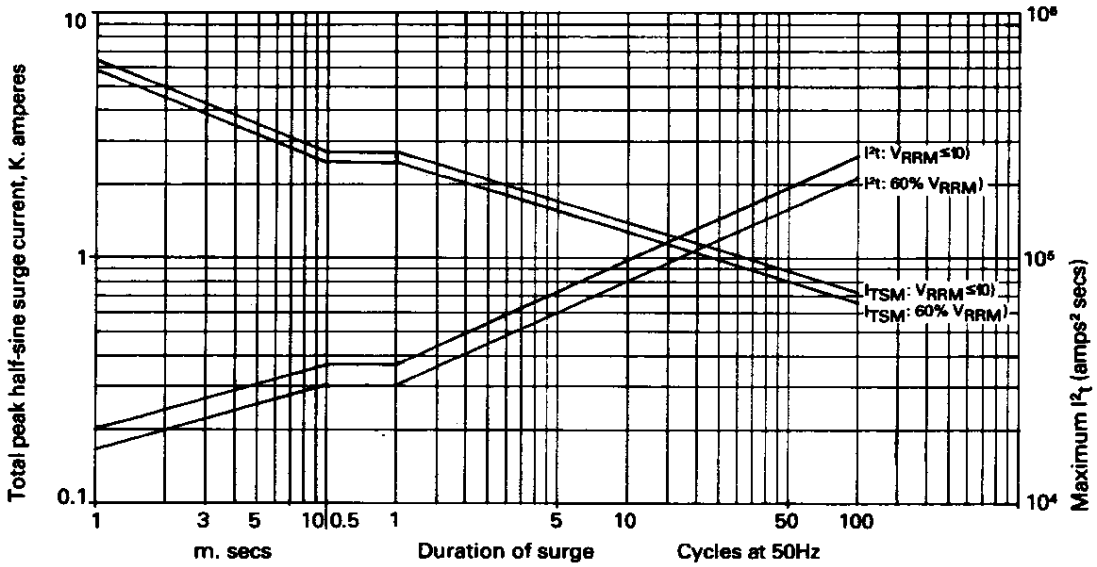


Figure 4 Max. non-repetitive surge current at initial junction temperature 125°C.
(gate may temporarily lose control of firing angle)
Note: This rating must not be interpreted as an intermittent rating