

# Phase Control Thyristor Stud

## Types N0290SX120 to N0290SX160

The data sheet on the subsequent pages of this document is a scanned copy of existing data for this product.  
(Rating Report 86TR10 Issue 1)

This data reflects the old part number for this product which is: N170PH02-15.  
This part number must **NOT** be used for ordering purposes – please use the ordering particulars detailed below.

The limitations of this data are as follows:  
Only SC outline drawing (W18) in datasheet  
No reverse recovery information available  
Device no longer available for grades 02 to 10 (200V to 1000V  $V_{RRM}/V_{DRM}$ )

The following links will direct you to the appropriate outline drawings  
[Outline W18](#) – ¾" Ceramic stud  
[Outline W25](#) – ¾" Ceramic stud removed

Where any information on the product matrix page differs from that in the following data,  
the product matrix must be considered correct

An electronic data sheet for this product is presently in preparation.

For further information on this product, please contact your local ASM or distributor.

Alternatively, please contact Westcode as detailed below.

<b>Ordering Particulars</b>			
N0290	SX	◆◆	0
Fixed Type Code	SC – ¾" Ceramic stud SD – ¾" Ceramic stud removed	Voltage code $V_{RRM}/100$ 12-16	Fixed Code
Typical Order Code: N0290SD140, ¾" Ceramic stud removed, 1400V $V_{RRM}/V_{DRM}$			

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

Devices with a suffix code (2-letter, 3-letter or letter/digit/letter combination) added to their generic code are not necessarily subject to the conditions and limits contained in this report.

QUALITY EVALUATION LABORATORY

Rating Report: 86TR10  
Origin:

Date : 3rd July, 1986  
Pages : 12

Thyristor Type N170PH02-H15

Written: *mhw-Durlop*      Checked: *mhw*      Approved: *[Signature]*

The thyristor consists of a diffused silicon slice of 24 mm diameter mounted under spring pressure in a stud base, top hat housing with flexible lead. This Report supersedes Rating Report No. 79TR26 (Issue 2)

Ratings

Voltage Grades	:	H02-H15
$V_{DSM}$	:	200-1500V
$V_{RSM}$	:	300-1600V
$V_{DRM}, V_{RRM}$	:	200-1500V
$I_T(AV)$ : Single phase : 50 Hz, 180° sinewave $T_{CASE} = 85^{\circ}C$	:	196A
$I_T(rms)$ max.	:	355A
$I_T$ d.c. max.	:	355A
$I_{TSM}$ : t = 10ms half sinewave; $T_J(\text{initial}) = 125^{\circ}C$ ; $V_{RM} = 0.6V_{RRM}(\text{MAX})$	:	4200A
$I_{TSM}$ : t = 10ms half sinewave; $T_J(\text{initial}) = 125^{\circ}C$ ; $V_{RM} \leq 10V$	:	4620A
$I^2t$ : t = 10 ms; $T_J(\text{initial}) = 125^{\circ}C$ ; $V_{RM} = 0.6V_{RRM}(\text{MAX})$	:	$88.2 \times 10^3 A^2S$
$I^2t$ : t = 10 ms; $T_J(\text{initial}) = 125^{\circ}C$ ; $V_{RM} \leq 10V$	:	$106.7 \times 10^3 A^2S$
$I^2t$ : t = 3 ms; $T_J(\text{initial}) = 125^{\circ}C$ ; $V_{RM} \leq 10V$	:	$79.4 \times 10^3 A^2S$
di/dt : (Repetitive) $T_J = 125^{\circ}C$ Gate: 20V 20 $\mu$ s Rise time 1 $\mu$ S	:	500A/ $\mu$ S
$I_{FGM}$ : Anode positive with respect to cathode	:	20A
$V_{FGM}$ : " " " " " "	:	18V
$V_{RGM}$ :	:	5V
$P_G(AV)$ :	:	2W
$P_{GM}$ :	:	100W
$V_{GD}$ :	:	0.25V
$T_C$ operating range	:	-40 to 125°C
$T_{stg}$ Non-operating	:	-40 to 150°C

Characteristics

(maximum values unless stated otherwise)

$I_{GT} : T_J = 25^{\circ}C$	)				: 150mA
$I_H : T_J = 25^{\circ}C$	)	$V_A = 6V$	; $I_A = 1A$		: 600mA
$V_{GT} : T_J = 25^{\circ}C$	)				: 3V
$V_G : T_J = 125^{\circ}C$					: 1.08V
$r_T : T_J = 125^{\circ}C$					: 1.3mohms
$V_{TM} : I_{TM} = 616A$		$T_{VJ} = 125^{\circ}C$			: 1.88V
$R_{th} (J/C)$					: 0.12°C/W
$dV/dt$	: Linear ramp to $0.8V_{DRM(max)}$ , $T_J = 125^{\circ}C$ : Gate O/C; repetitive				: 200V/μs*
$I_{DRM} : T_J = 125^{\circ}C$		$V_{DM} = V_{DRM(max)}$			: 20mA
$I_{RRM} : T_J = 125^{\circ}C$		$V_{RM} = V_{RRM(max)}$			: 20mA
$Q_{RR} : I_{TM} =$	$dI/dt$	A/μs, 50% chord value			
	$V_{RM} :$	$T_{VJ} = 125^{\circ}C$			:
$tq : I_{TM}$	$dI/dt$	A/μs; $T_J = 125^{\circ}C$	$V_{RM} = 50V$		:
	$dV/dt = 200V/μs$	to $0.8V_{DRM}$			:
	When specified, 20V/μs to $0.8V_{DRM}$	Typical			:
Outline drawing					: 101A225
$R_{th} (C-H.S.)$					: 0.04°C/W
Mounting torque					: 2.5 - 2.77Kg.m
Outline (JEDEC NO.)					:

\*Repetitive dv/dt

Higher dv/dt selections are available up to 1000V/μs on request.

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Changes to 79TR26 (Issue 2)

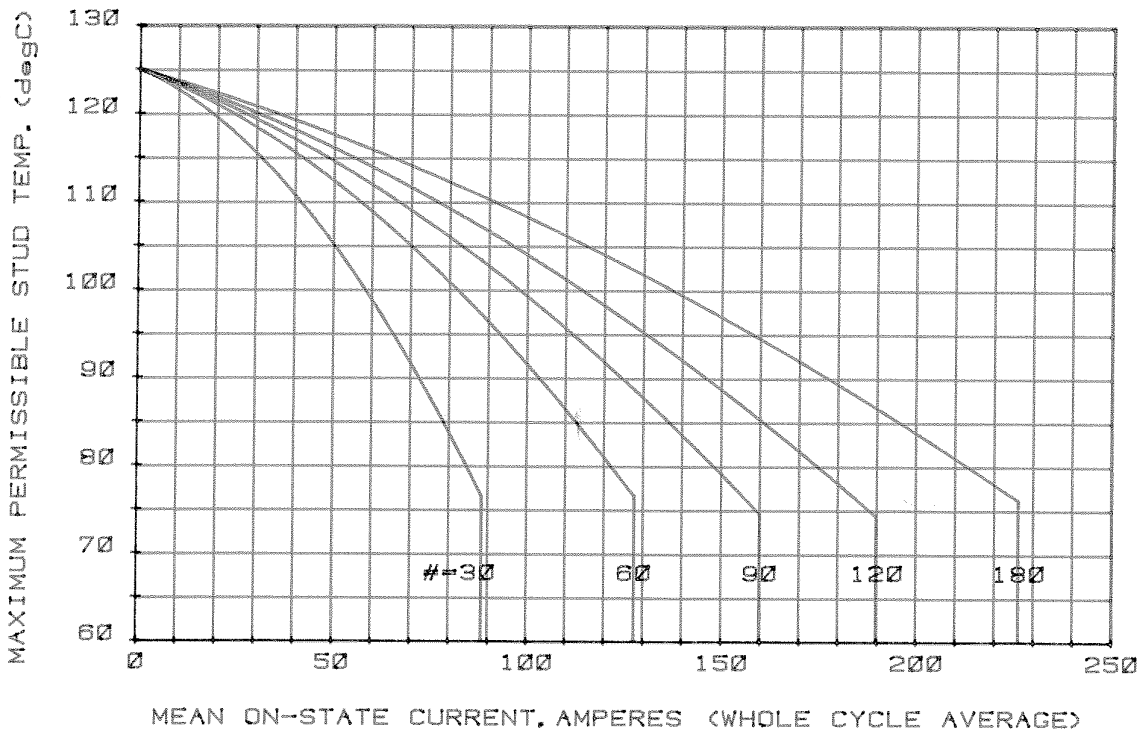
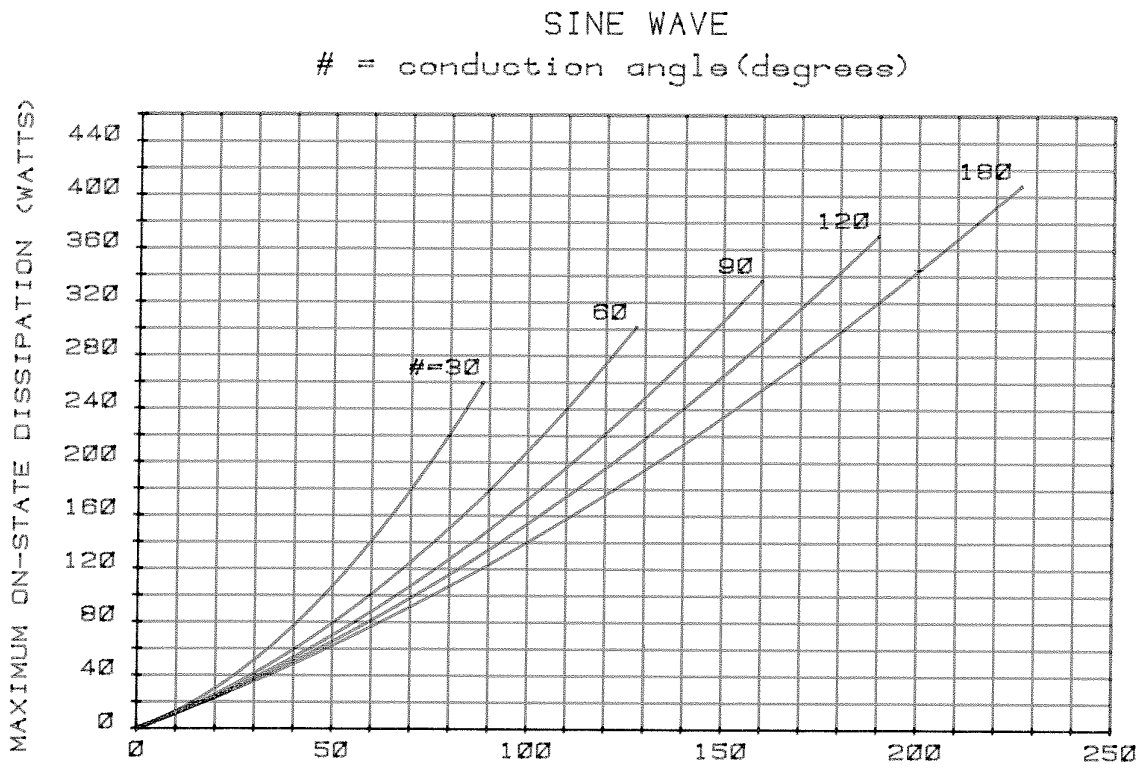
- p1:  $V_{DWM}$ ,  $V_{RWM}$  deleted  
 $I_{FGM}$  increased to 20A  
 $T_{HS}$  operating range MIN decreased to  $-40^{\circ}\text{C}$
- p2:  $I_L$  (=200mA) changed to  $I_H$  at 6V,  $1A = 600\text{mA}$   
Note 1 deleted; replaced by  $dV/dt$  note.
- p7:  $I_T - V_T$ ,  $Z_{th-t}$  now on separate pages
- New p9:  $V_G - I_G$  :  $I_{FGM}$  increased to 20A
- New p10:  $I_{GT} - V_{GT}$  : axes interchanged

Voltage Ratings

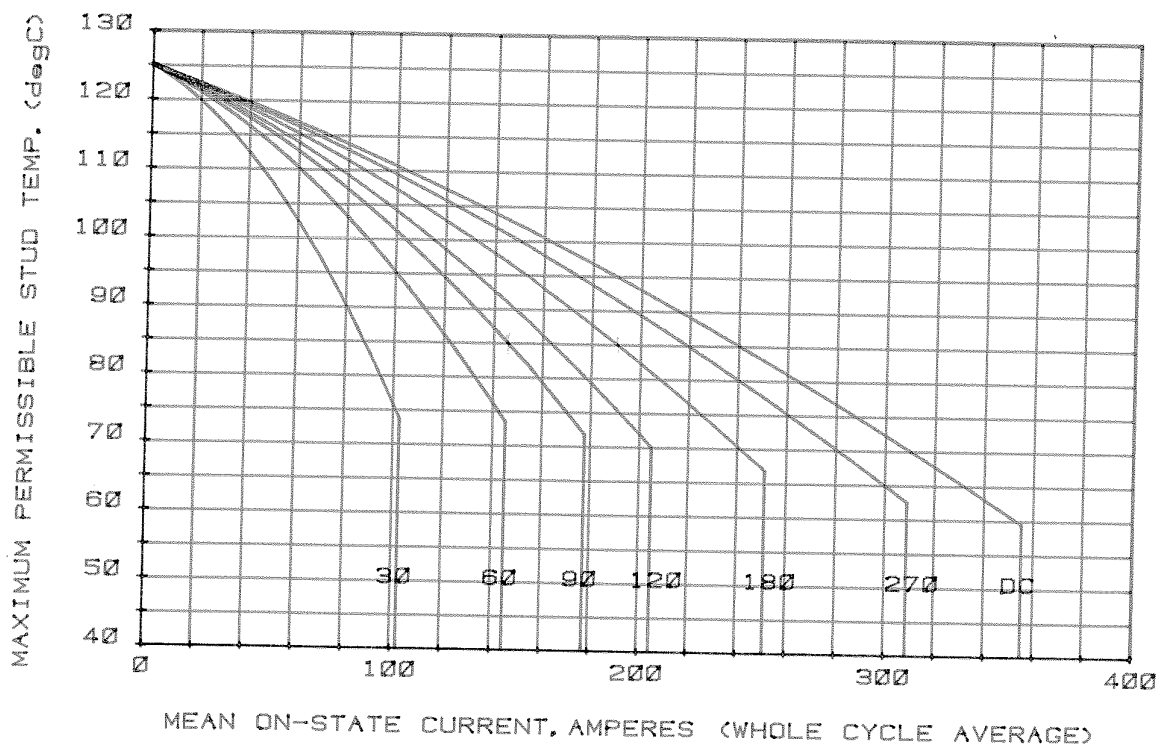
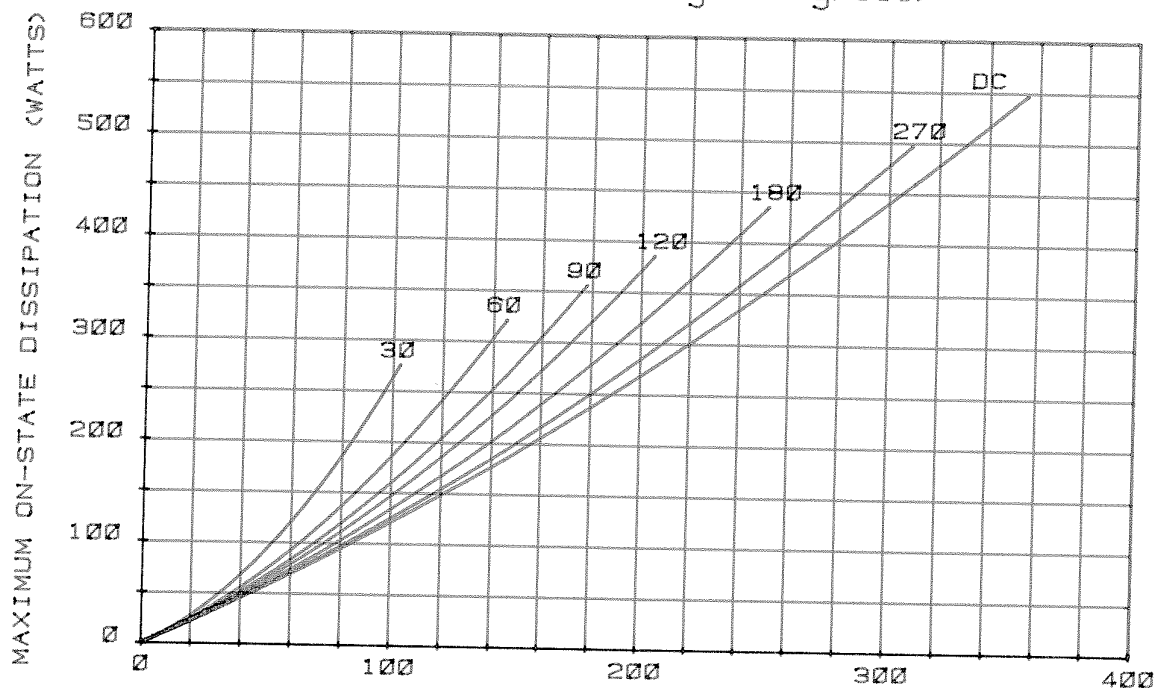
Voltage Grade	$V_{DSM}$ $V_{DRM}$ $V_{RRM}$	$V_{RSM}$	$V_D$ $V_R$
'H'	V	V	DC
02	200	300	140
03	300	400	210
04	400	500	260
06	600	700	420
08	800	900	560
10	1000	1100	700
12	1200	1300	810
14	1400	1500	930
15	1500	1600	980

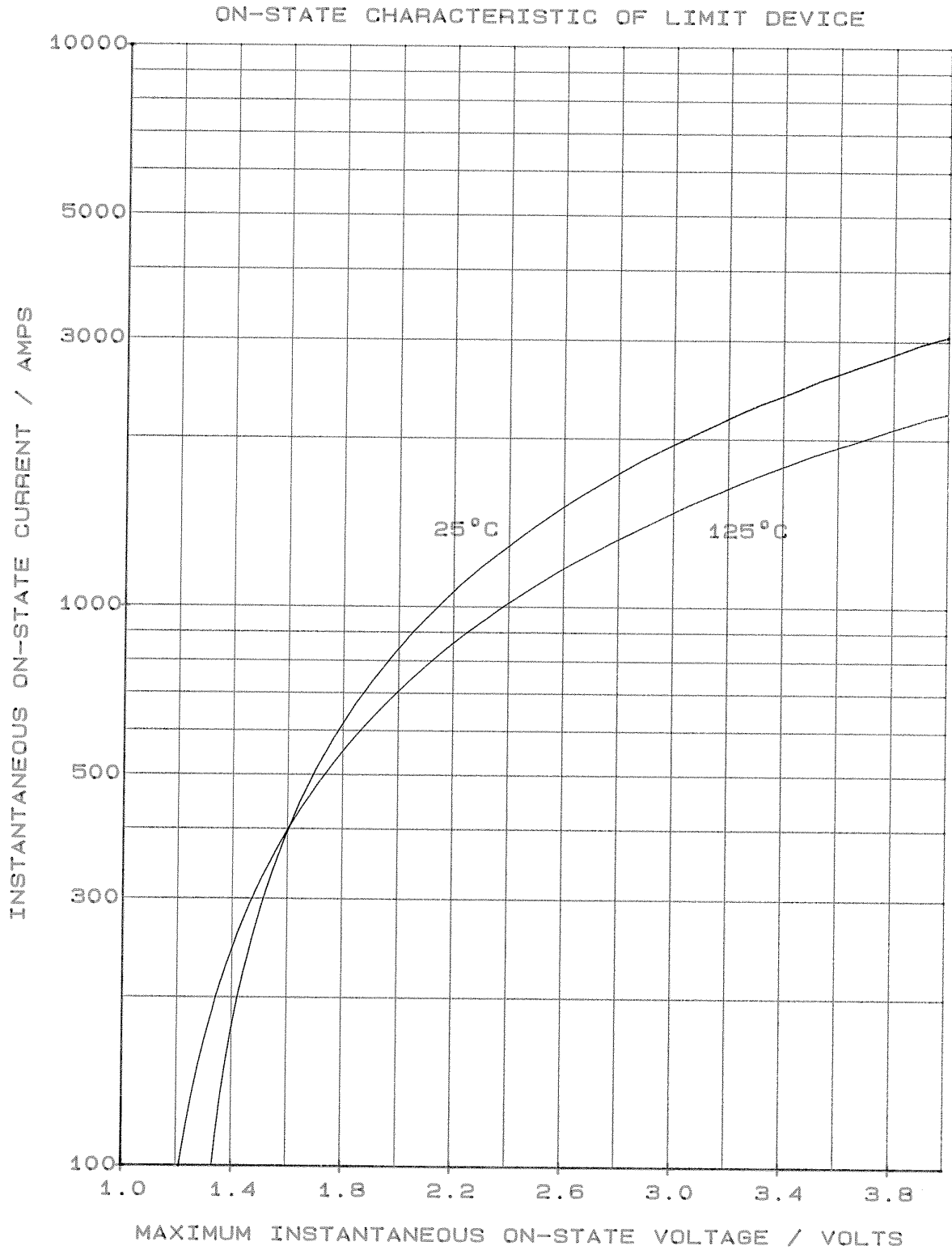
Extension of Voltage Grades

This report is applicable to other and higher voltage grades when supply has been agreed by Sales/Production.

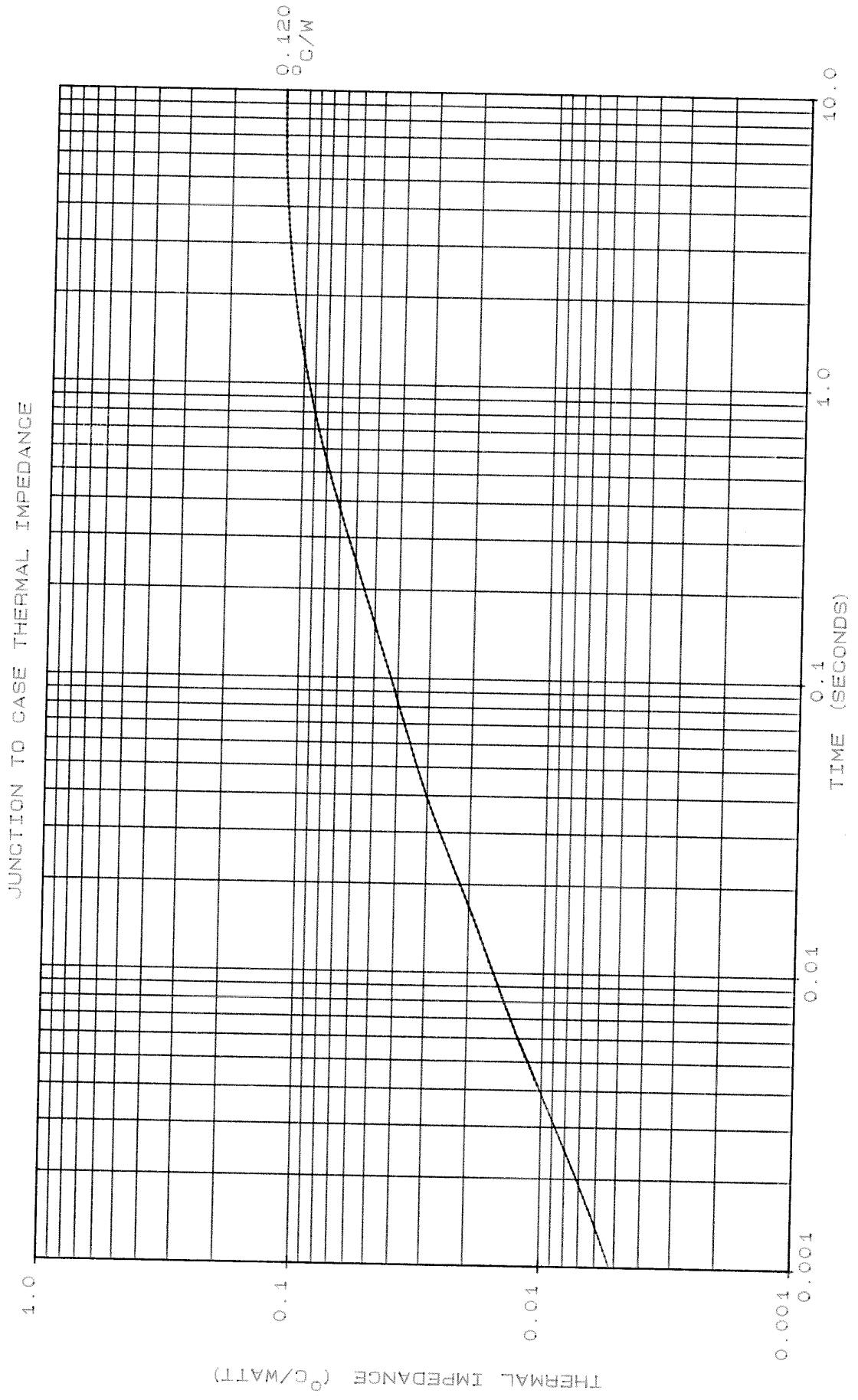


### SQUARE WAVE # = conduction angle (degrees)

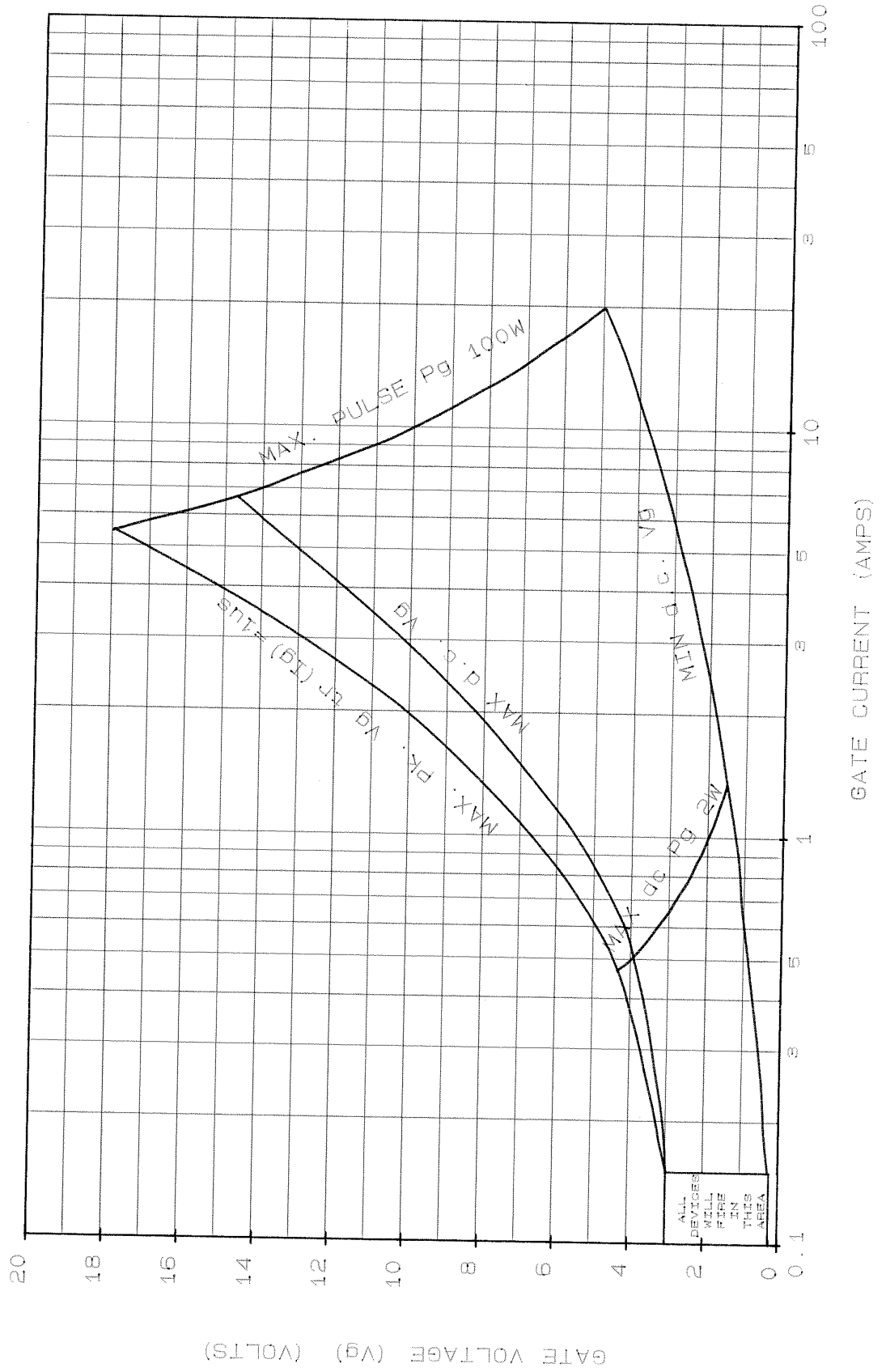




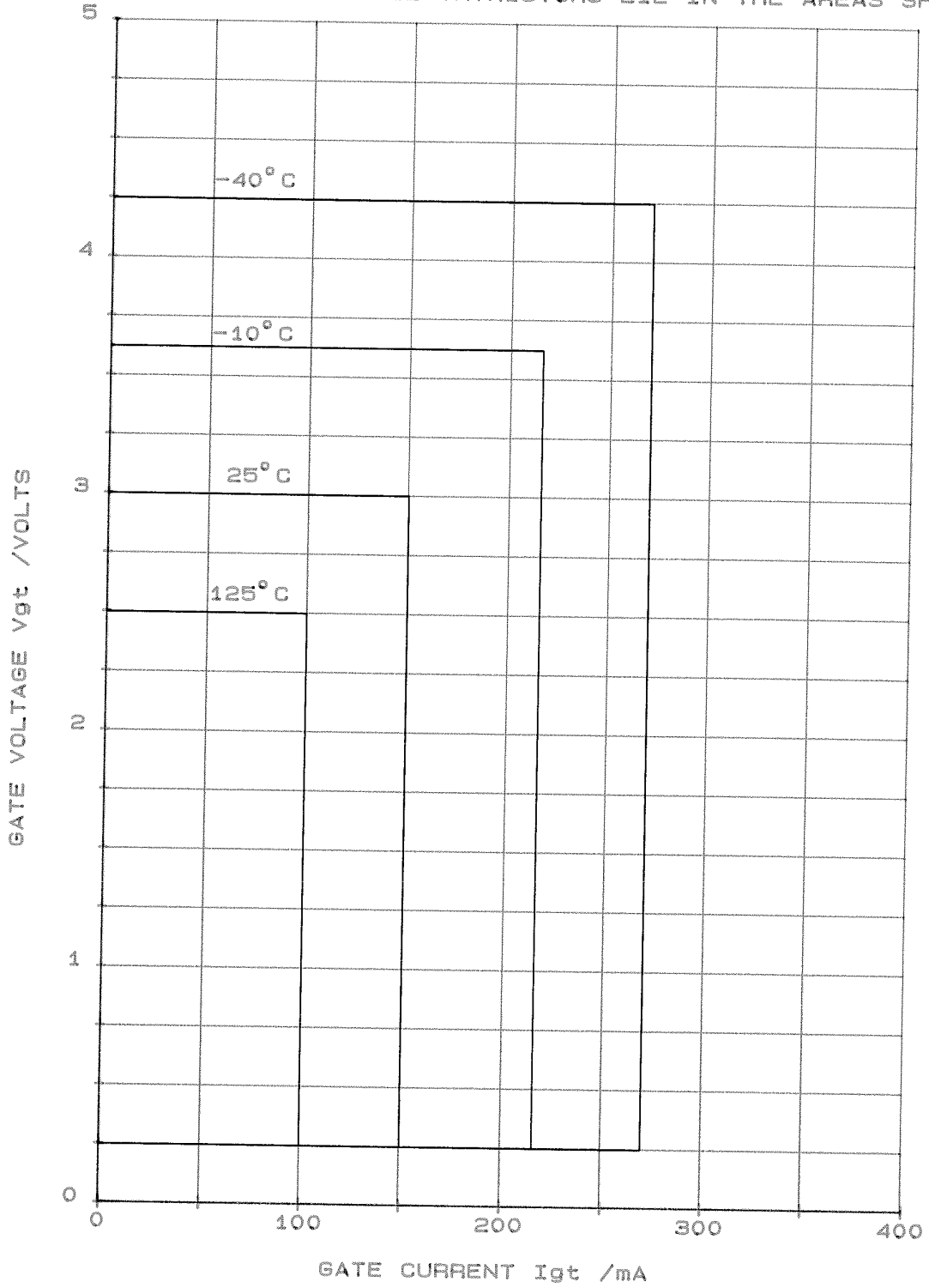




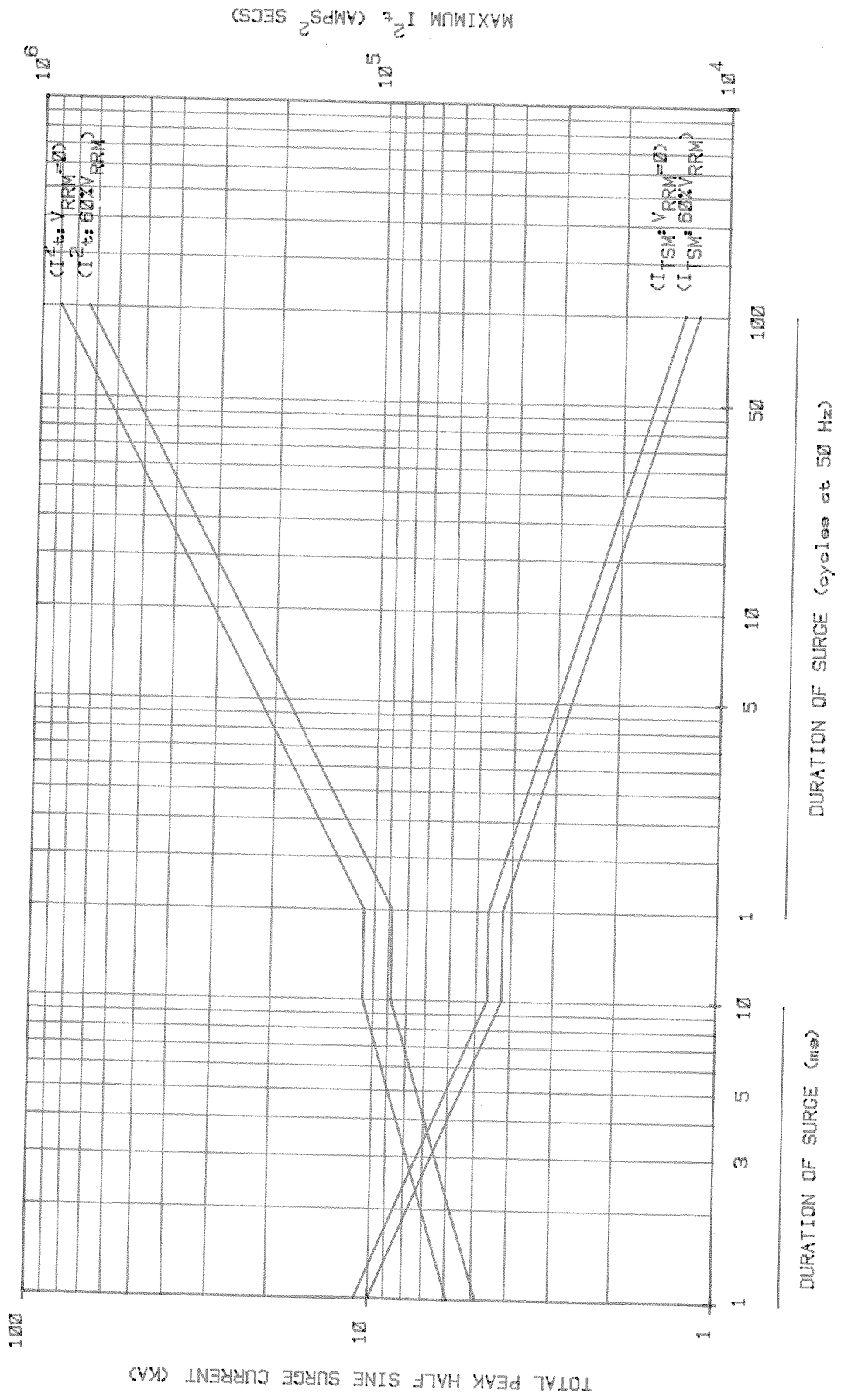
GATE CHARACTERISTICS AT 25°C JUNCTION TEMPERATURE



GATE TRIGGERING CHARACTERISTICS  
(TRIGGER POINTS OF ALL THYRISTORS LIE IN THE AREAS SHOWN)



MAXIMUM NON REPETITIVE SURGE CURRENT AT INITIAL JUNCTION TEMPERATURE 125°C  
 (GATE MAY TEMPORARILY LOSE CONTROL OF CONDUCTION ANGLE)



TOTAL PEAK HALF SINE SURGE CURRENT (KA)

MAXIMUM  $I^2t$  (AMPS<sup>2</sup> SECS)

DURATION OF SURGE (cycles at 50 Hz)

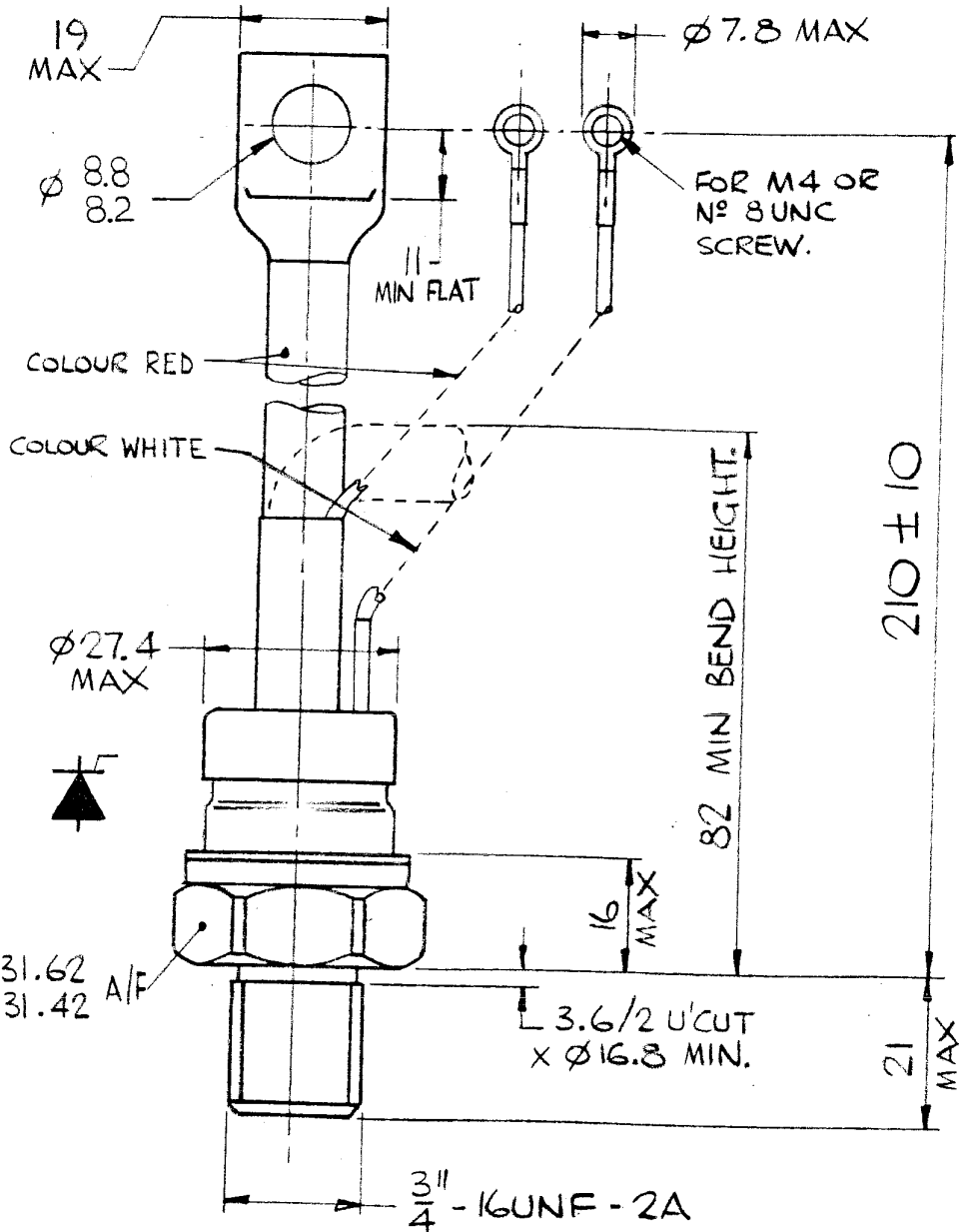
SCALE	1/1
DRN	1/1
CHKD	
APPD	
A	
S	NI

INTERNATIONAL OUTLINE No.  
 WEIGHT. 280 GRAMS APPX.  
 FINISH. BRIGHT NICKEL PLATE.  
 DEVICE MARKING INCLUDES MONOGRAM, TYPE No., SPEC.  
 No. AND POLARITY SYMBOL.  
 DEVICE MOUNTING: MOUNTING TORQUE  
 27-24.5 Nm (2.77-2.5 kgf-m).  
 THREAD MUST NOT BE LUBRICATED.

TYPE NUMBER	
N170P	P200P
N195P	P202P
N275P	P204P
	P205P
	P214P
	P215P
	P270P

NOTES.

G.A. DRG. No. 103A162



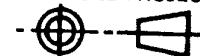
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DIMNS. IN MILLIMETRES

DRG. No.

101A225

ISS	REVISIONS
1	19.9.78
2	17.11.78 M670 TYPE N° ADDED
3	$\phi$ 8.8/8.2 HOLE WAS 10.7/10.2
4	17.12.79 M817 19 WAS 21.4
5	27.11.84 M1218 FIN WAS ET.
6	10.10.88 RED & WHITE WERE VIOLET & ORANGE