Phase Control Thyristor Stud
Types N0180S#120 to N0180S#160

The data sheet on the subsequent pages of this document is a scanned copy of existing data for this product.
(Rating Report 86TR12 Issue 1)

This data reflects the old part number for this product which is: N105PH12-16.
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:
No reverse recovery data available

The following links will direct you to the appropriate outline drawings
Outline W16 – ½" ceramic stud + lug
Outline W17 – ½" ceramic stud

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.

Ordering Particulars

N0180	S#	♦♦	**0**
Fixed Type Code	SH – ½" ceramic stud SJ – ½" ceramic stud + lug	Voltage code V_{RRM}/100 12-16	Fixed Code
Typical Order Code: N0180SJ120, ½" ceramic stud + lug, 1200V V_{RRM}/V_{DRM}			

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QUALITY EVALUATION LABORATORY

Rating Report: 86TR12

Origin:

Date : 26th August, 1986

Pages : 13

Thyristor Types N105PH02-H15 & N105RH02-H15

Written: M.W. Dunlop. Checked: M.W.D Approved: B.L.H.

These thyristors have diffused silicon slices of 19 mm diameter mounted under spring pressure in stud base, top hat housings with or without a flexible lead. This Report supersedes Rating Report No. 79TR25 (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} = 90°C *	: 110A
I_T(rms) max.	: 175A
I_T d.c. max.	: 175A

I_{TSM} : t = 10ms half sinewave; T_J(initial) = 125°C: V_{RM} = 0.6V_{RRM}(MAX) : 2450A

I_{TSM} : t = 10ms half sinewave; T_J(initial) = 125°C: $V_{RM} \leq$ 10V: 2695A

I^2t : t = 10 ms; T_J(initial) = 125°C : V_{RM} = 0.6V_{RRM}(MAX)	: 30.0 x $10^3 A^2S$
I^2t :: t = 10 ms; T_J(initial) = 125°C : $V_{RM} \leq$ 10V	: 36.3 x $10^3 A^2S$
I^2t : t = 3 ms; T_J(initial) = 125°C : $V_{RM} \leq$ 10V	: 27.0 x $10^3 A^2S$
di/dt : (Repetitive) T_J = 125°C Gate: 20Ω Rise time 1µS	: 500A/uS
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

*Case temperature corresponding to current cut-off

Characteristics

(maximum values unless stated otherwise)

I_{GT} : T_J = 25°C)	: 150mA
I_H : T_J = 25°C) V_A = 6V ; I_A = 1A	: 600mA
V_{GT} : T_J = 25°C)	: 3V
V_O : T_J = 125°C	: 0.9V
r_T : T_J = 125°C	: 1.79mohms
V_{TM} : I_{TM} = 377A T_{VJ} = 125°C	: 1.57V
R_{th} (J/C)	: 0.23°C/W
dV/dt : Linear ramp to 0.8V_{DRM}(max). T_J = 125°C: Gate O/C; repetitive	: 200V/uS*
I_{DRM} : T_J = 125°C V_{DM} = V_{DRM}(max)	: 20mA
I_{RRM} : T_J = 125°C V_{RM} = V_{RRM}(max)	: 20mA
Q_{RR} : I_{TM} = 300A dI/dt 10 A/uS, 50% chord value	
V_{RM} : 50V T_{VJ} = 125°C	: 280uC Typical
tq : I_{TM} dI/dt A/uS; T_J = 125°C V_{RM} = 50V	:
dV/dt = 200V/uS to 0.8V_{DRM}	:
When specified, 20V/uS to 0.8V_{DRM} Typical	:
Outline drawings	: 101A231, 101A235
R_{th} (C-H.S.)	: 0.08°C/W
Mounting torque	: 1.45Kg.f-m
Outline (JEDEC NO.)	:

*Repetitive dv/dt

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

CONTENTS

Changes to 79TR25(Issue 2)

p1: N105RH02-H15 added

V_{DWM}, V_{RWM} deleted

I_{FGM} increased to 20A

T_{HS} - operating range MIN decreased to -40°C

p2: JEDEC No. deleted

Note 1 deleted; replaced by note on dv/dt

p7: I_T - V_T, Z_{th-t} drawn on separate pages

Old p8: V_G - I_G re-drawn with I_{FGM} = 20A

Old p9: I_{gt} - V_{gt} : axes interchanged

New p13 N105R outline drawing added

Voltage Ratings

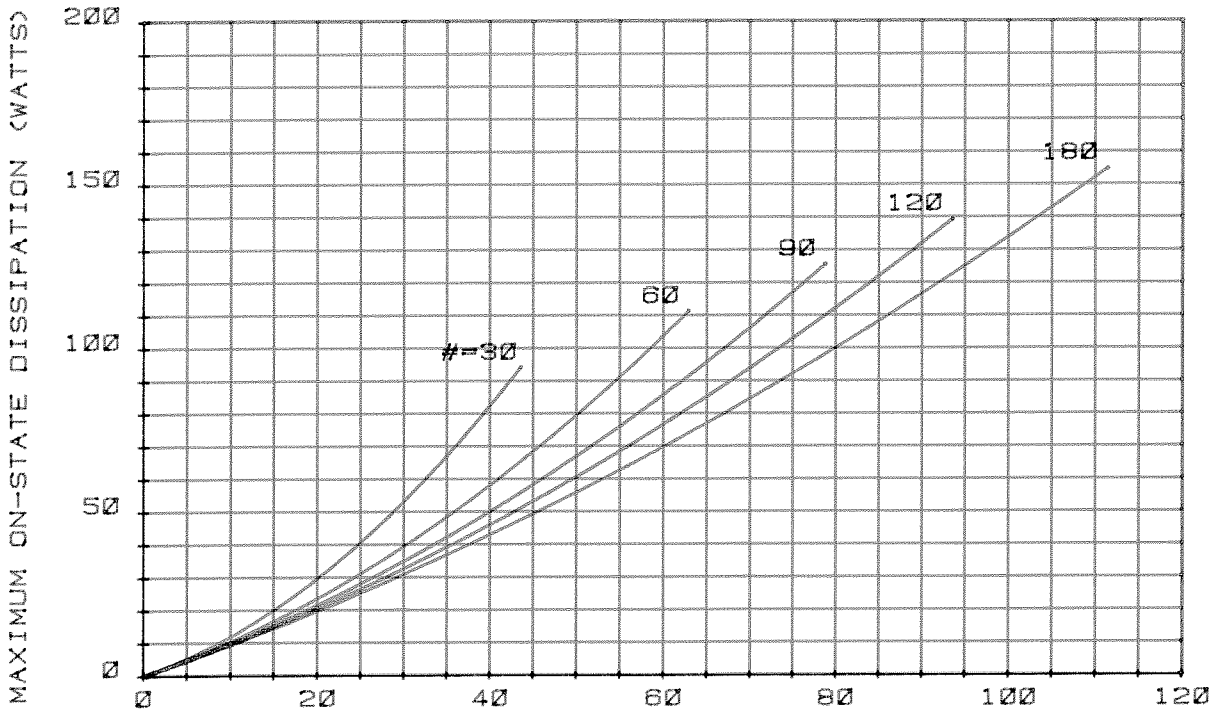
Voltage Grade 'H'	V_{DSM} V_{DRM} V_{RRM} V	V_{RSM} V	V_D V_R DC
02	200	300	140
03	300	400	210
04	400	500	260
06	600	700	420
08	800	900	560
10	1000	1100	700
12	1200	1300	810
14	1400	1500	930
15	1500	1600	980

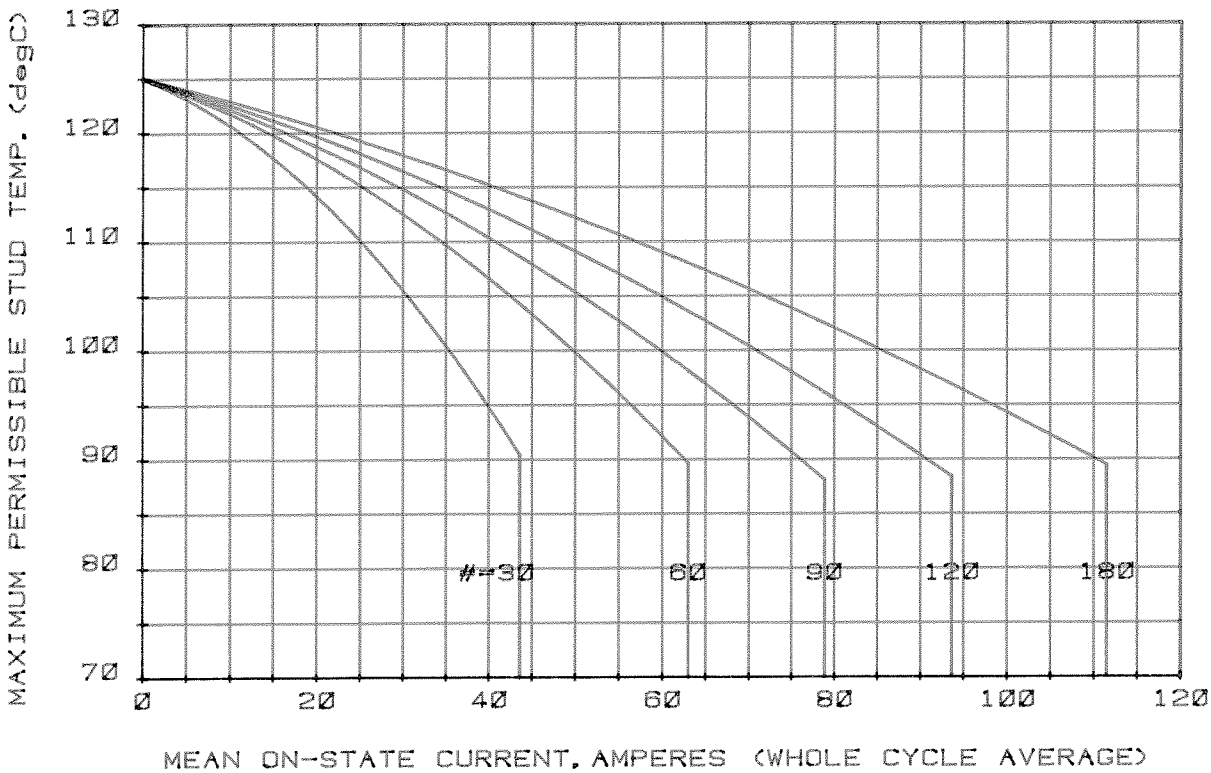
Extension of Voltage Grades

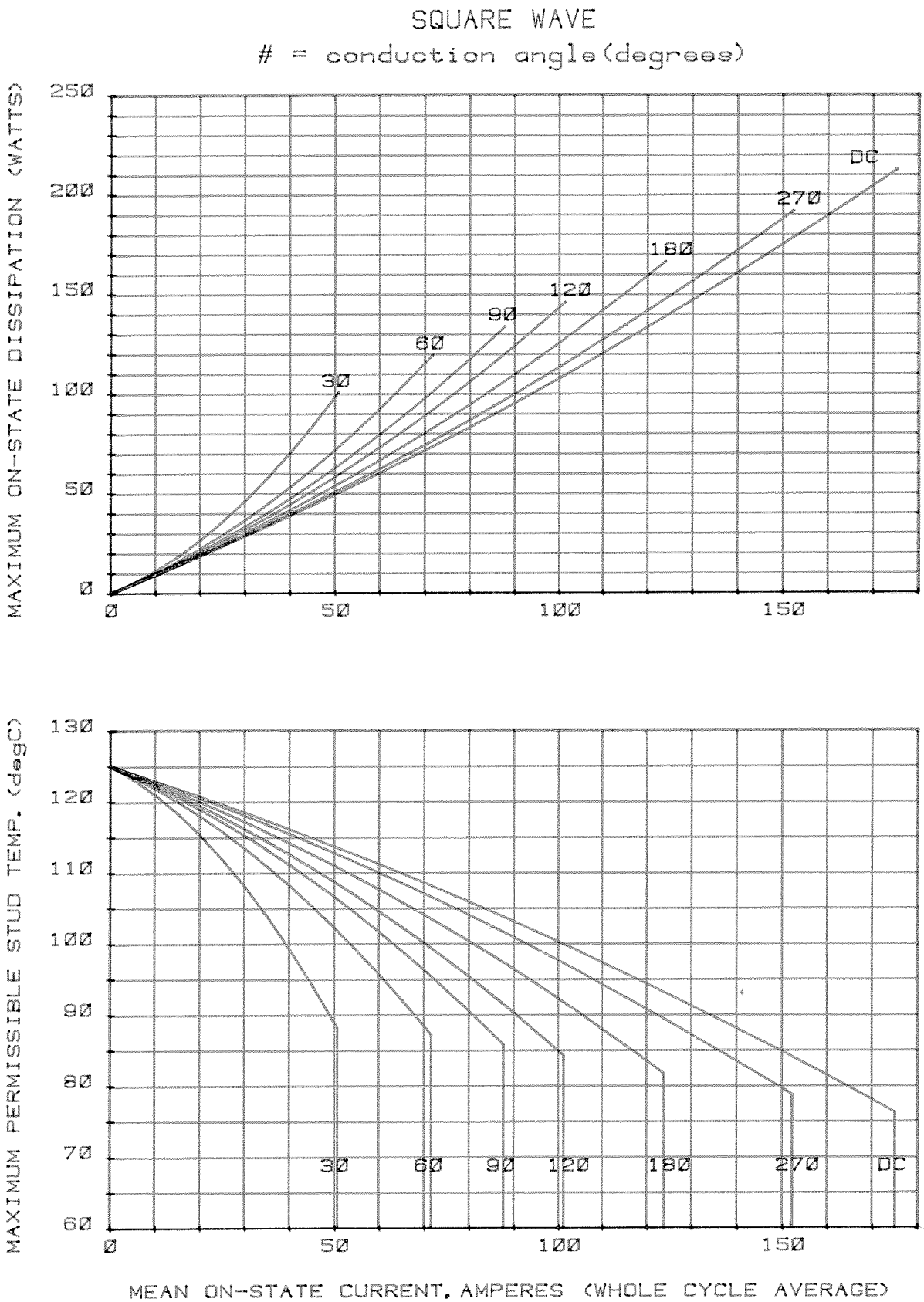
This report is applicable to other and higher voltage grades when supply has been agreed by Sales/Production.

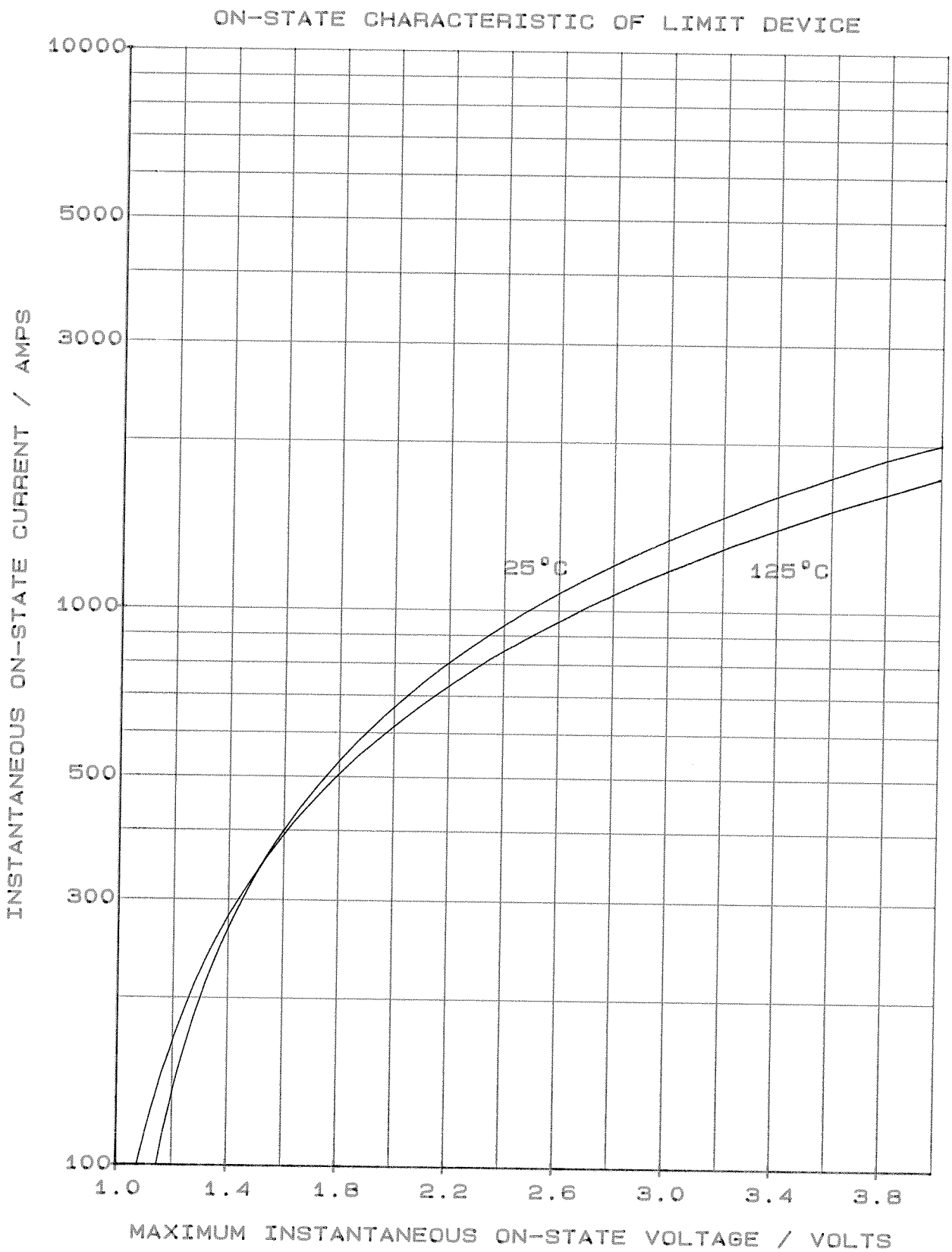
SINE WAVE

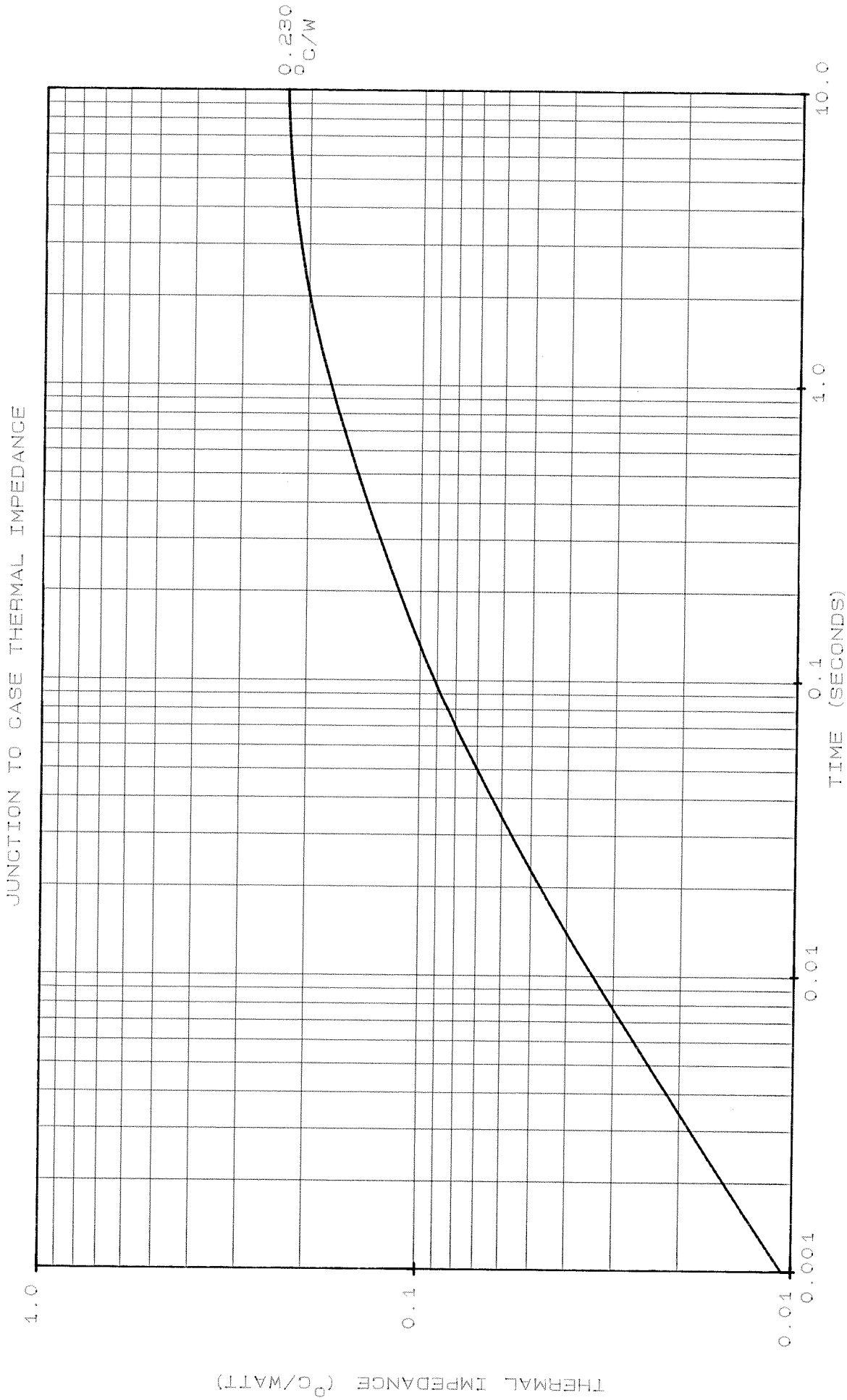
= conduction angle(degrees)



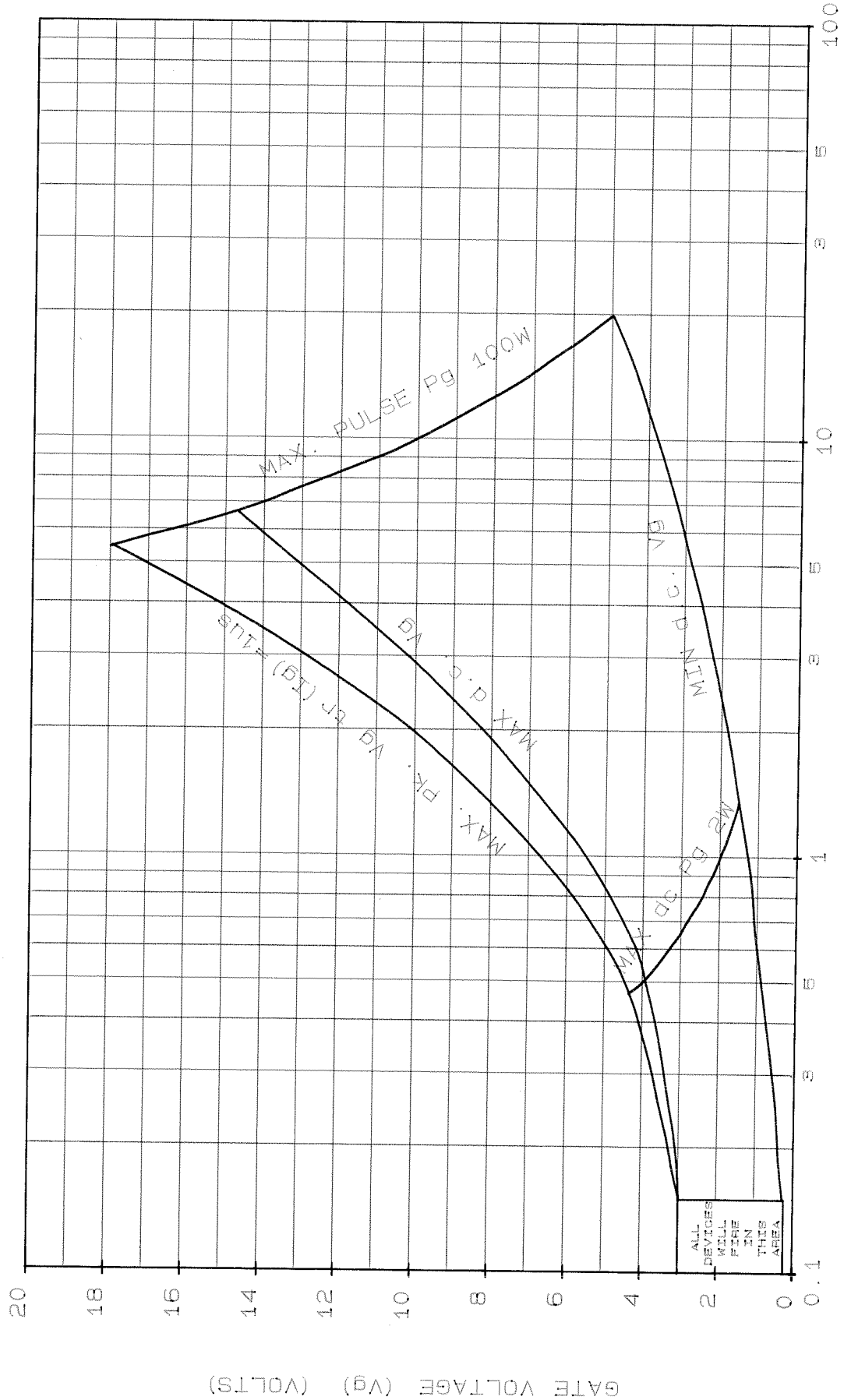



SQUARE WAVE
= conduction angle(degrees)
MAXIMUM ON-STATE DISSIPATION (WATTS)
250
200
150
100
50
0
0
50
100
150
30
60
90
120
180
270
DC
MAXIMUM PERMISSIBLE STUD TEMP. (degC)
130
120
110
100
90
80
70
60
0
50
100
150
30
60
90
120
180
270
DC
MEAN ON-STATE CURRENT, AMPERES (WHOLE CYCLE AVERAGE)

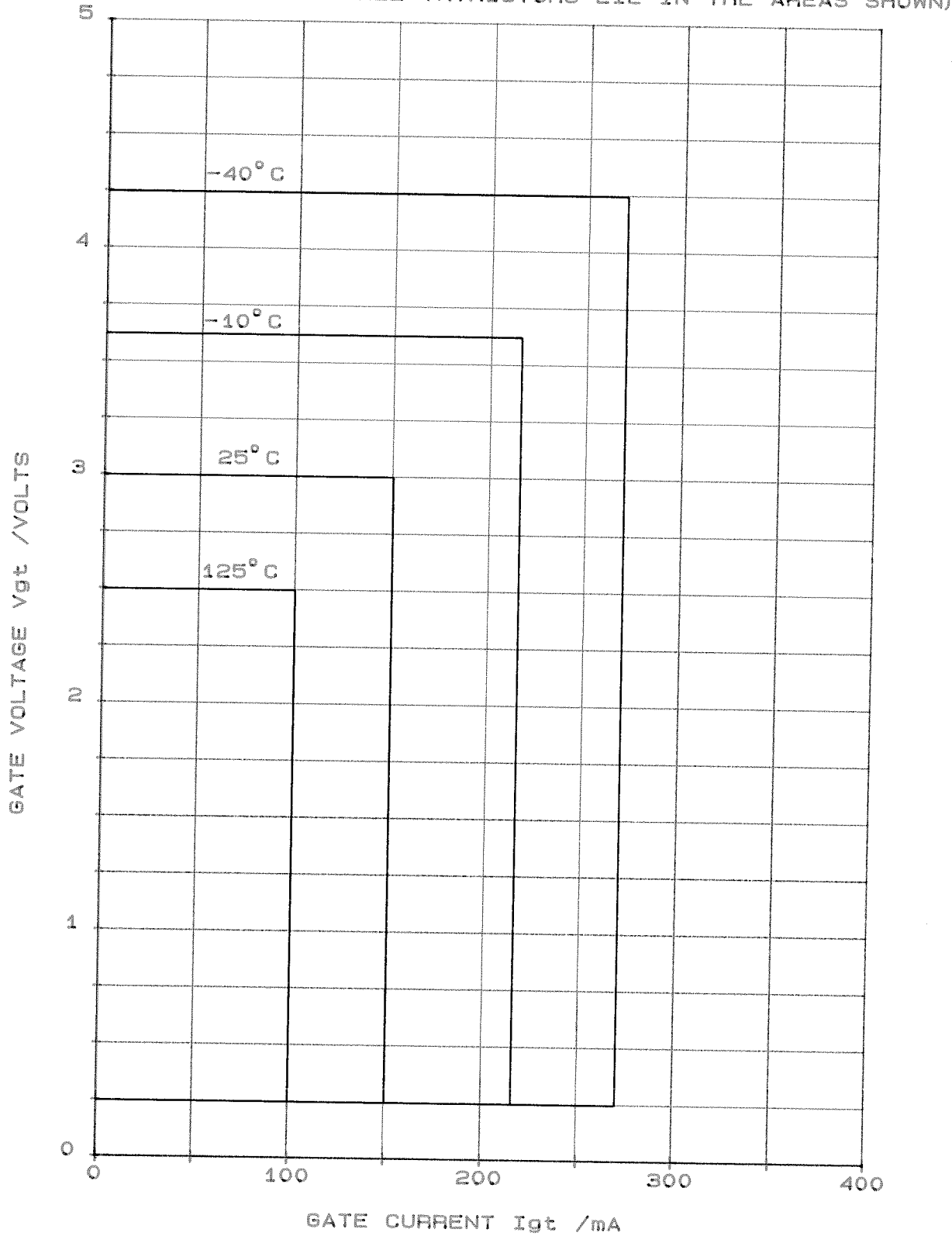

ON-STATE CHARACTERISTIC OF LIMIT DEVICE
INSTANTANEOUS ON-STATE CURRENT / AMPS
10000
5000
3000
1000
500
300
100
25°C
125°C
1.0
1.4
1.8
2.2
2.6
3.0
3.4
3.8
MAXIMUM INSTANTANEOUS ON-STATE VOLTAGE / VOLTS

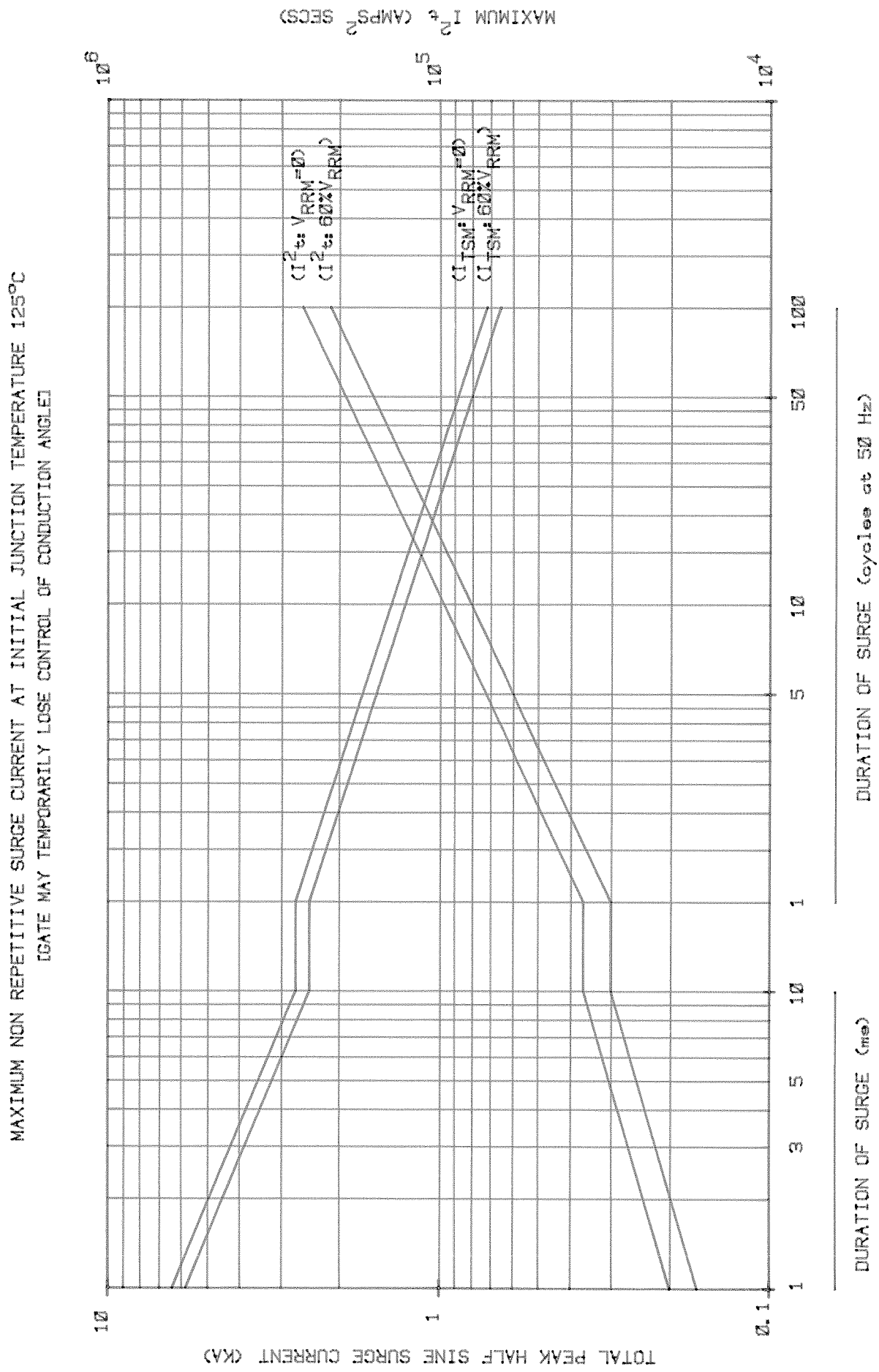

JUNCTION TO CASE THERMAL IMPEDANCE
0.230 °C/W
THERMAL IMPEDANCE (°C/WATT)
1.0
0.1
0.01
0.001
0.01
0.1
1.0
10.0
TIME (SECONDS)

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)
MAXIMUM I²t (AMPS² SECS)
10⁶
10⁵
10⁴
(I²t: VRRM=0)
(I²t: 60%VRRM)
(ITSM: VRRM=0)
(ITSM: 60%VRRM)
TOTAL PEAK HALF SINE SURGE CURRENT (KA)
10
1
0.1
1
3
5
10
1
5
10
50
100
DURATION OF SURGE (ms)
DURATION OF SURGE (cycles at 50 Hz)

SCALE	1/1
DRN	
CHKD	
APPD	
	A3
S	NI

INTERNATIONAL OUTLINE No.

WEIGHT.

FINISH. BRIGHT NICKEL PLATE.

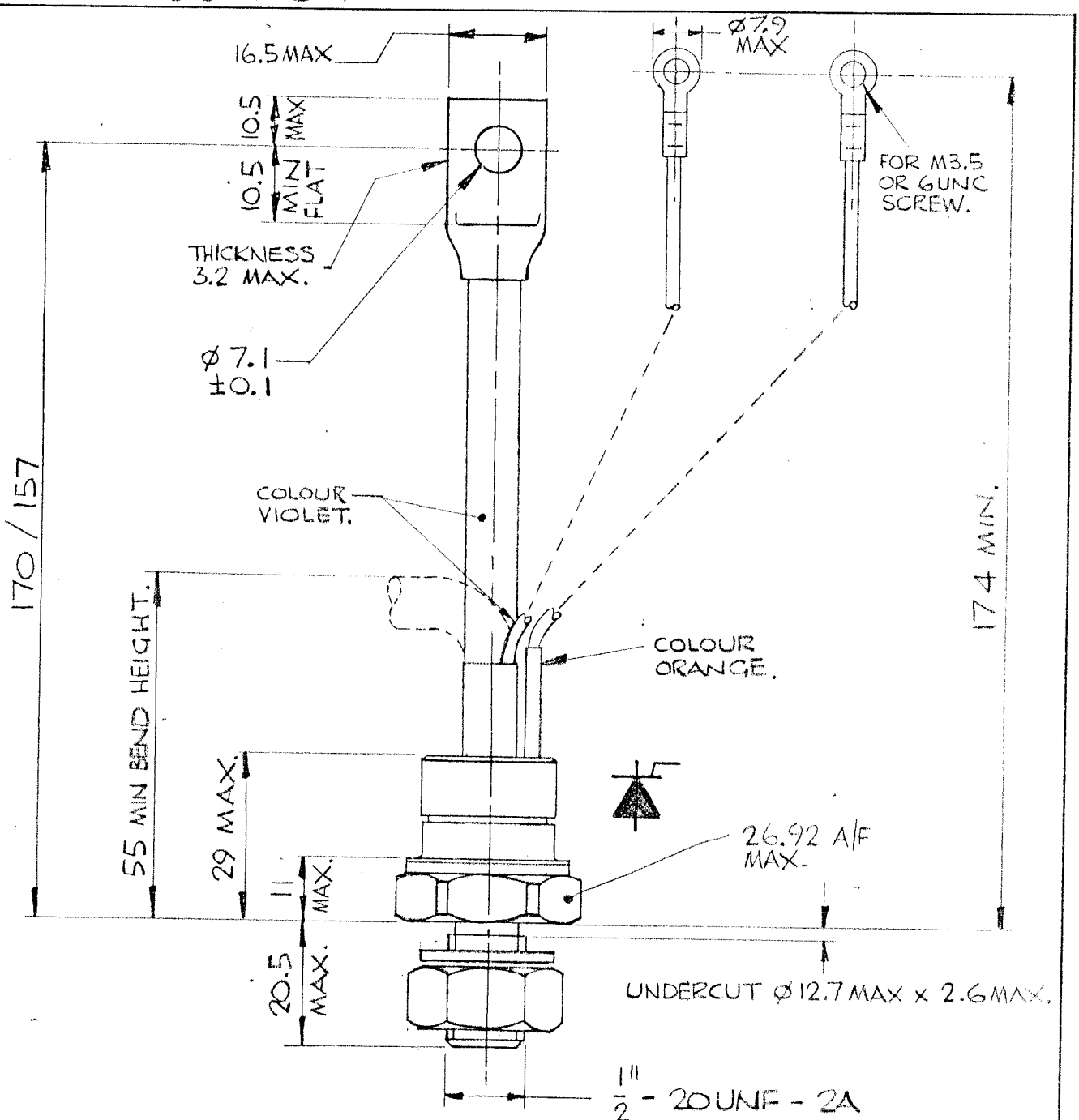
DEVICE MARKING INCLUDES MONOGRAM, TYPE No., SPEC. No. AND POLARITY SYMBOL.

DEVICE MOUNTING: DEVICE WILL BE SUPPLIED WITH A 1/2"-20UNF-2B HEX NUT AND A 1/2" FAN DISC WASHER. MOUNTING TORQUE 14Nm (1.45 kgf-m). DO NOT LUBRICATE THREADS.

NOTES.

TYPE NUMBER	
N086P	P070P
N105P	P086P
	P105P
	P100P
	P105P
	P100P

G.A. DRG. No. 103A164



WESTINGHOUSE BRAKE AND SIGNAL CO. LTD.
CHIPPENHAM, WILTSHIRE, SN15 1JD, ENGLAND.

WESTCODE ® SEMICONDUCTORS

THIRD ANGLE PROJECTION

DIMNS. IN MILLIMETRES

DRG. No. 101A231

ISS	REVISIONS
1	15.5.79 P 337
2	M852 17.4.80 170/157 WAS 147 MIN. JEDEC TO94 DELETED.
3	27.11.84 MI218 FIN WAS ET.

SCALE	1/1
DRN	
CHKD	
APPD	
	A
S	NI

INTERNATIONAL OUTLINE No.

WEIGHT. 100 GRAMS.

FINISH. BRIGHT NICKEL PLATE

DEVICE MARKING INCLUDES MONOGRAM, TYPE No., SPEC. No. AND POLARITY SYMBOL.

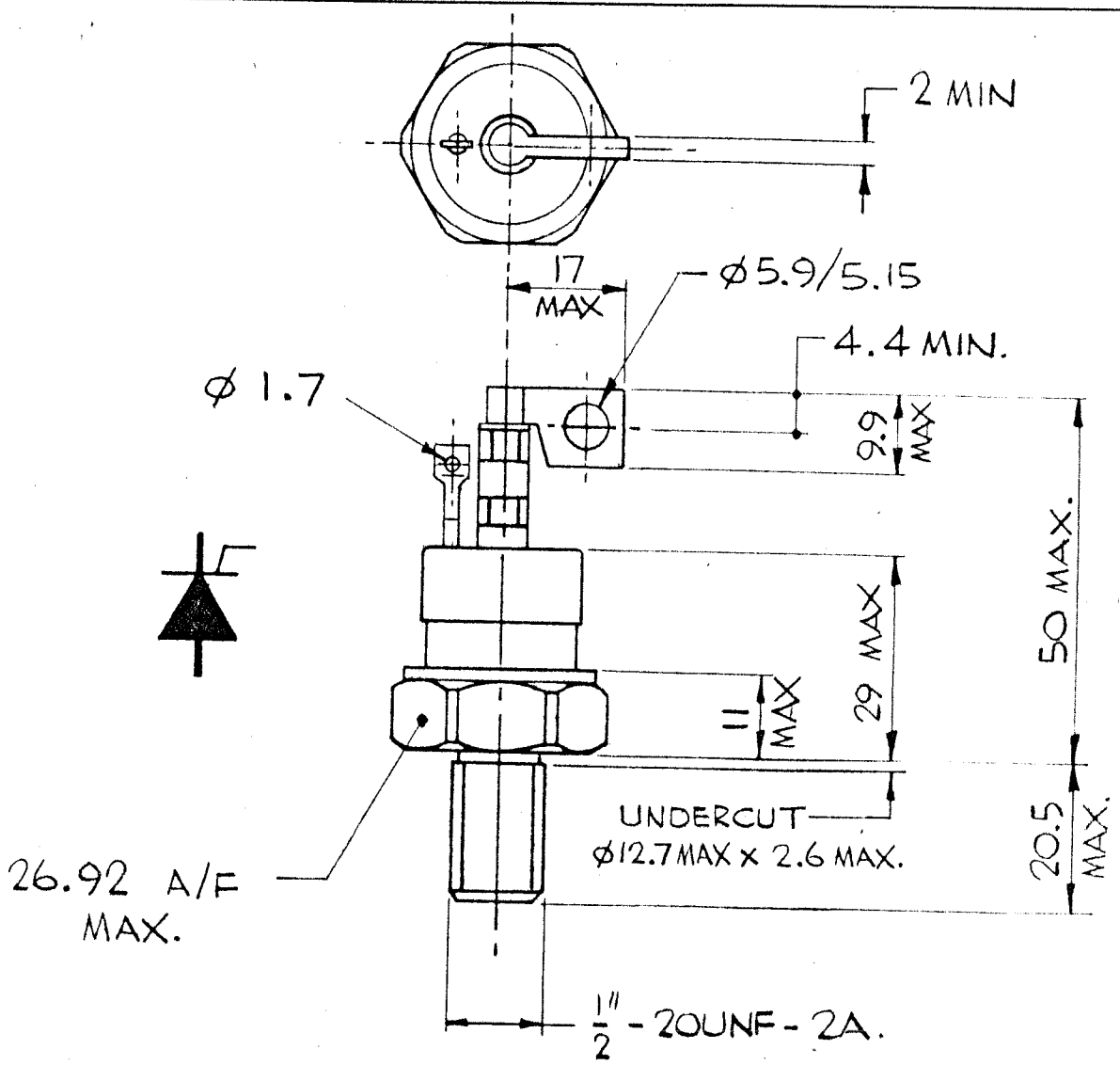
DEVICE MOUNTING: MOUNTING TORQUE 14Nm (1.45kgf m). DO NOT LUBRICATE THREADS.

NOTES.

TYPE NUMBER

N105R
N086R

G.A. DRG. No. 103A169



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CHIPPENHAM, WILTSHIRE, SN15 1JD, ENGLAND.

WESTCODE ® SEMICONDUCTORS

THIRD ANGLE PROJECTION

DIMNS. IN MILLIMETRES

DRG. No. 101A235

ISS	REVISIONS
1	10.3.80 P351
2	27.11.84 M1218 FIN WAS ET