

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION CV7564 - 71

ISSUE NO.1 DATED 29.5.1964

AMENDMENT NO.1

Page 3. At the bottom of the page insert the following:-

This specification has been prepared by, and the
Qualification Approval Authority is:-

Ministry of Aviation, Royal Radar Establishment,
Malvern, Worcs., England.

Ministry of Aviation/RRE

October 1964

(229074)

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION CV7564-71

ISSUE 1 DATED 29TH MAY 1964

AMENDMENT NO. 2

Page 6. Immediately following "Reverse Current"
Insert "(1)".

Ministry of Aviation/R.R.E.

February 1965

NM.310276

MILITARY SPECIFICATION
CV 7564-71
SEMICONDUCTOR DEVICE, RECTIFIER DIODE

Description:- This Specification covers the detail requirements for a Silicon Power Rectifier Diode and is in accordance with K1007, Issue 3, except where otherwise stated.

Mechanical Dimensions and Outlines:- See drawing page 18

Connections:- Stud cathode CV 7564 to CV 7567
 Stud anode CV 7568 to CV 7571

Device	Rating	V_{RRM}	V_{RSM}	V_R	I_O	I_{FSM}	T_{STUD}	T_{STG}	Vib.	Shock	Mounting Torque
	Unit	V	V	V	A	A	°C	°C	g	g	(Lb.Ins.)
CV 7564	Min.							-65			190
CV 7568	Max.	200	275	160	250	4400	140	150	20	1500	250
CV 7565	Min.							-65			190
CV 7569	Max.	600	725	480	250	4400	140	150	20	1500	250
CV 7566	Min.							-65			190
CV 7570	Max.	800	950	650	250	4400	140	150	20	1500	250
CV 7567	Min.							-65			190
CV 7571	Max.	1000	1250	800	250	4400	140	150	20	1500	250
Notes		A	B	C	D	E				F	

- Notes:**
- A. Max. Peak a.c. voltage applied to diode
Also equals V_{RRM} .
 - B. Max. non-repetitive transient voltage not exceeding 5 mS in duration.
 - C. Max. d.c. blocking voltage.
 - D. See derating curve page 12
 - E. $T_{stud} = 40^{\circ}C$. See also curve on page 13 and 14.
 - F. For max. of 0.5 mS.
 - G. Commercial equivalent 70U and 70UR series.

19th May 1964
 (213512)

CV7564-71

Primary Electrical Characteristics

Characteristic		V_F	I_{RRM}	I_{RRM}
Unit		V	mA(peak)	mA(peak)
CV7564 CV7568	Max	1.15	42	60
CV7565 CV7569	Max	1.15	30	42
CV7566 CV7570	Max	1.15	30	38
CV7567 CV7571	Max	1.15	22	30
Conditions	T_{stud} °C	25	25	140
	I_F A	115		
	V_R V		V_{RWM}	V_{RWM}

Quality Assurance Provisions: Under discussion

Requirements:-

Marking The device shall be marked in accordance with K1007, Issue 3, Section B.1.3.4.

Quality Assurance Provisions:-

Destructive Tests

The tests listed in Table II, Group B Inspection, Sub-Group 2, 3 and 4 and in Table III, Group C Inspection, Sub-Group 2 are considered destructive.

Group C Inspection

Inspection shall be conducted on the initial lot and thereafter every 90 days or every fifth lot whichever occurs first.

Preparation of Delivery:-

Packaging:

The device shall be packed according to K1007, Section A.1.2 (c). Nuts and lock-washer to be packed with each device.

NATO Stock Number:-

CV7564 = 5960-99-037-3817
CV7565 = 5960-99-037-3818
CV7566 = 5960-99-037-3819
CV7567 = 5960-99-037-3820
CV7568 = 5960-99-037-3821
CV7569 = 5960-99-037-3822
CV7570 = 5960-99-037-3823
CV7571 = 5960-99-037-3824

TABLE 1 GROUP A INSPECTION

Examination or Test	K1007/NATO Ref.	TEST CONDITIONS		AQL %	Insp. Level	Sym-bol	LIMITS		Units
		Specific Conditions					Min.	Max.	
<u>SUB GROUP 1</u> Visual & Mechanical Inspection	5.1	Excluding physical dimensions		0.65	I				
<u>SUB-GROUP 2</u> Forward Voltage	8A.3.2	$I_F = 115 \text{ Amps}$ $T_{amb} = 25^\circ\text{C}$ Test to be completed within 5 secs. Diode stud to be maintained at 25°C .		0.65	II	V_F	-	1.15	V
Reverse Current (1)	8A.2.2	Oscillographic Method $T_{amb} = 25^\circ\text{C}$ V_R as column 2 (Peak s.c.) $V_R =$ CV7564 200V CV7565 600V CV7566 800V CV7567 1000V				I_{RRM}	-		mA(Peak) " " "
<u>SUB-GROUP 3</u> Reverse Current (2)	8A.2.2	Oscillographic Method $T_{stud} = 140^\circ\text{C}$ $V_R =$ CV7564 200V CV7565 600V CV7566 800V CV7567 1000V		2.5	I	I_{RRM}	-		mA(Peak) " " "

TABLE II GROUP B INSPECTION

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Sym- bol	LIMITS		Units
	K1007/NATO Ref.	Specific Conditions				Min.	Max.	
<u>SUB-GROUP 1</u> Physical Dimensions	5.1	In accordance with SO-42 See page 18	6.5	IC				
<u>SUB-GROUP 2</u> Temperature Cycling Moisture Resistance	5.5 5.3	-65°C to +150°C	6.5	IA				
<u>SUB-GROUP 3</u> Vibration Fatigue	5.15.1	20g : Non-operating	6.5	IA				
<u>SUB-GROUP 4</u> Torque	5.12	Non-operating	6.5	IC			250	lb.ins.
<u>SUB-GROUP 5, 6</u> Omitted								
<u>SUB-GROUP 7</u> High Temperature Life	6.2.1 6.6.1.2.2	Non-operating $T_{amb} = 150^{\circ}C$ $t = 1,000$ hours.						
<u>SUB-GROUP 8</u> Operation Life	6.3.3.2	$I_F = 250$ Amps, $T_{STUD} = 75^{\circ}C$ <u>OR</u> on derating curve at a current not less than 45 Amps.						
								Appendix A

TABLE II GROUP B INSPECTION (Cont'd)

Examination or Test	K1007/NAJO Ref.	TEST CONDITIONS		AQL %	Insp. Level	Sym- bol	LIMITS		Units
		Specific Conditions					Min.	Max.	
<u>Post Test End Points for Sub-Groups 2, 3, 7 and 8</u> Forward Voltage Reverse Current	8A.3.2	As for Group A				V_F	1.2	V	
	8A.2.2/2	As for Group A	V_R 200V			I_{RRM}	84	mA(Peak)	
			600V				60	"	
			800V				60	"	
			1,000V				44	"	

TABLE III GROUP C INSPECTION

Examination or Test	K1007/NATO Ref.	TEST CONDITIONS Specific Conditions	AQL %	Insp. Level	Sym- bol	LIMITS		Units
						Min.	Max.	
<u>SUB-GROUP 1</u>								
Omitted								
<u>SUB-GROUP 2</u>								
Shock	5.17	Non-operating. 5 blows in each of two directions Y_2 & X_1	6.5	10				
Constant Acceleration	5.14	Non-operating: In the Y_2 direction (along axis, stud outwards)	Note 1					
<u>Post Test End Points for Sub-group 2</u>		As for Post Test End Points for Group B Inspection						

Inspection Level

For lot sizes up to 200, at least one rectifier shall be taken from each lot and life tested for 1000 hours. For lot sizes 201 and over, at least two rectifiers shall be taken from each lot and life tested for 1000 hours.

Merit Life

Merit Life is defined as the ratio of the actual life hours for one or more rectifiers to the total life hours that would have occurred had there been no failures, expressed as a percentage:-

$$\text{Merit Life} = \frac{\text{Actual hours run}}{\text{Total possible hours}} \times 100\%$$

Classification of failures

Electrical inoperatives shall be the criterion of failure, and the life test positions shall be so arranged as to indicate a failure when it occurs. If a failure occurs, the number of hours run when the rectifier was last recorded as operating shall be taken as the actual life. At the end of the 1000 hour period the same sample shall pass the post test end point limits.

Procedure of continuous production

When 1000 hours have elapsed since the sample drawn from the first lot was placed on life test, there should be at least four additional samples undergoing life test, with various numbers of hours on test. The Merit Life shall be computed for the first five lots. If the Merit Life exceeds 90% the first lot is acceptable. When 1000 hours have elapsed since the sample from the second lot was placed on life test, the merit life shall be computed using the test results from the first five lots. If this exceeds 90% the second lot is acceptable. The acceptability of the third, fourth and fifth lots is determined from the first five lots.

If, when the sample from one of the first five lots have been life tested for 1000 hours, the computed Merit Life is 90% or less, the lot from which the sample was drawn shall be held in store. If when the sample from the subsequent lot has been life tested for 1000 hours, the computed Merit Life exceeds 90%, both lots shall be accepted. If the Merit Life is 90% or less, both lots shall be held. When the sample from the fifth lot has been life tested for 1000 hours, if the computed Merit Life for all five samples exceed 90% all lots being held shall be accepted. If the Merit Life is 90% or less, all lots being held shall be rejected.

When the sample from the sixth lot has been life tested for 1000 hours, the Merit Life shall be computed for the samples from lots 2 to 6. If this exceeds 90%, lot 6 shall be accepted: if it is 90% or less, lot 6 shall be rejected. A similar procedure shall apply for subsequent lots, the Merit Life being computed on the combined results of the completed life test of the lot under consideration and the previous consecutive lots.

When any sample has passed the prescribed life test period or has failed it shall be removed from test.

Reduced Duration

When five consecutive lots have been accepted without any of them having been held due to failure to meet the 90% merit life requirement, reduced duration life testing is applicable, and the Merit Life shall then be computed after the sample from a lot has been life tested for 240 hours. If when a sample from a given lot has been life tested for 240 hours the computed Merit Life is 90% or less, the lot shall be held in store and the life test of that sample and subsequent samples shall continue to 1000 hours, the Merit Life being computed after 1000 hours for each sample. Reduced duration testing shall be again applicable after five consecutive lots have been accepted.

Single lot or non-continuous production

If production is not continuous (see section 6.6) the above procedure cannot be used. In this case the manufacturer shall place at least five rectifiers on life test from a given lot. After 1000 hours the Merit Life for the sample shall be computed and if this exceeds 90% the lot shall be accepted. If it is 90% or less the lot shall be rejected.

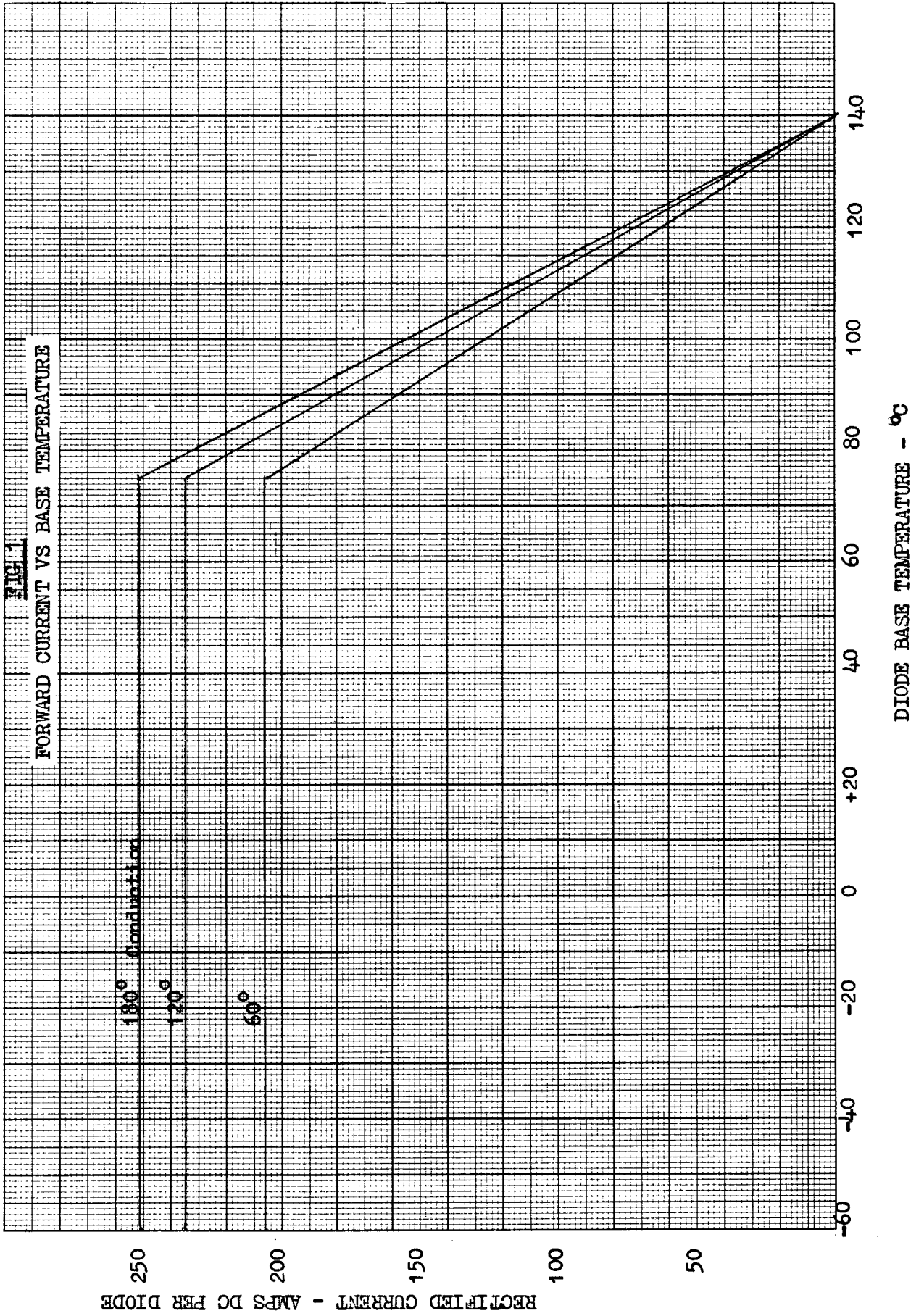
If production is continuous, (section 6.6), but an interval of more than one week occurs between any two lots at the start of a production run, either the manufacturer shall place additional rectifiers on life test from one or more lots, or lots shall be held in store for a period after the sample has completed 1000 hours of life test, so that the Merit Life is computed from the results of life test on not less than five rectifiers before a determination of acceptability is made.

Additional samples

The manufacturer may place on life test any number of additional samples from each lot, provided the minimum requirement of 1, 2 or 5 as the case may be is met. In addition, after the life test has started for any lot, the manufacturer may add an additional quantity to the initial life test sample, but this may be done once only for any life test lot.

NOTES

1. For lot sizes up to 200, at least two rectifiers shall be taken from each lot. For lot sizes 201 and over, at least four rectifiers shall be taken from each lot. At the end of the test the sample shall pass the post test end point limits.



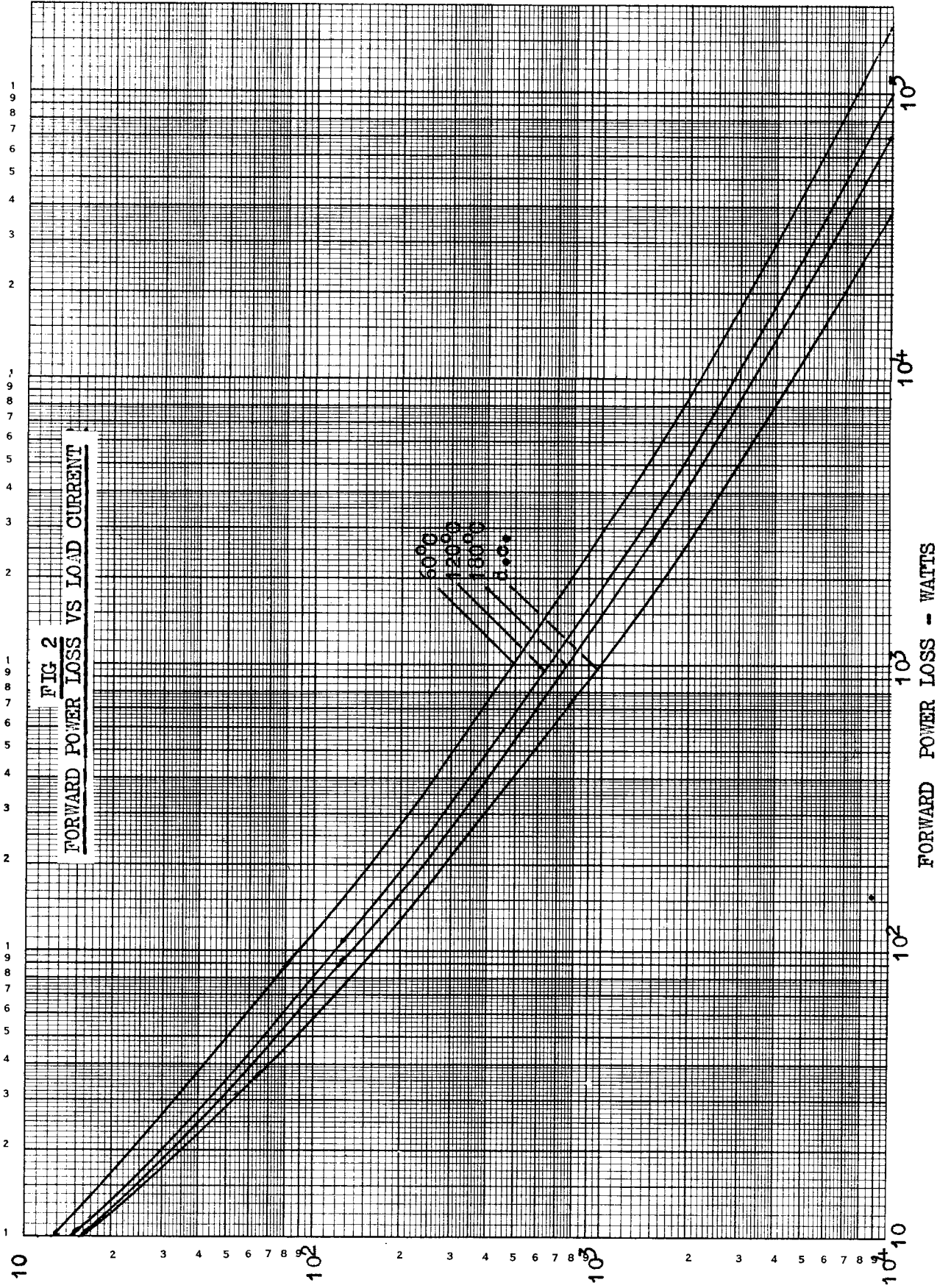
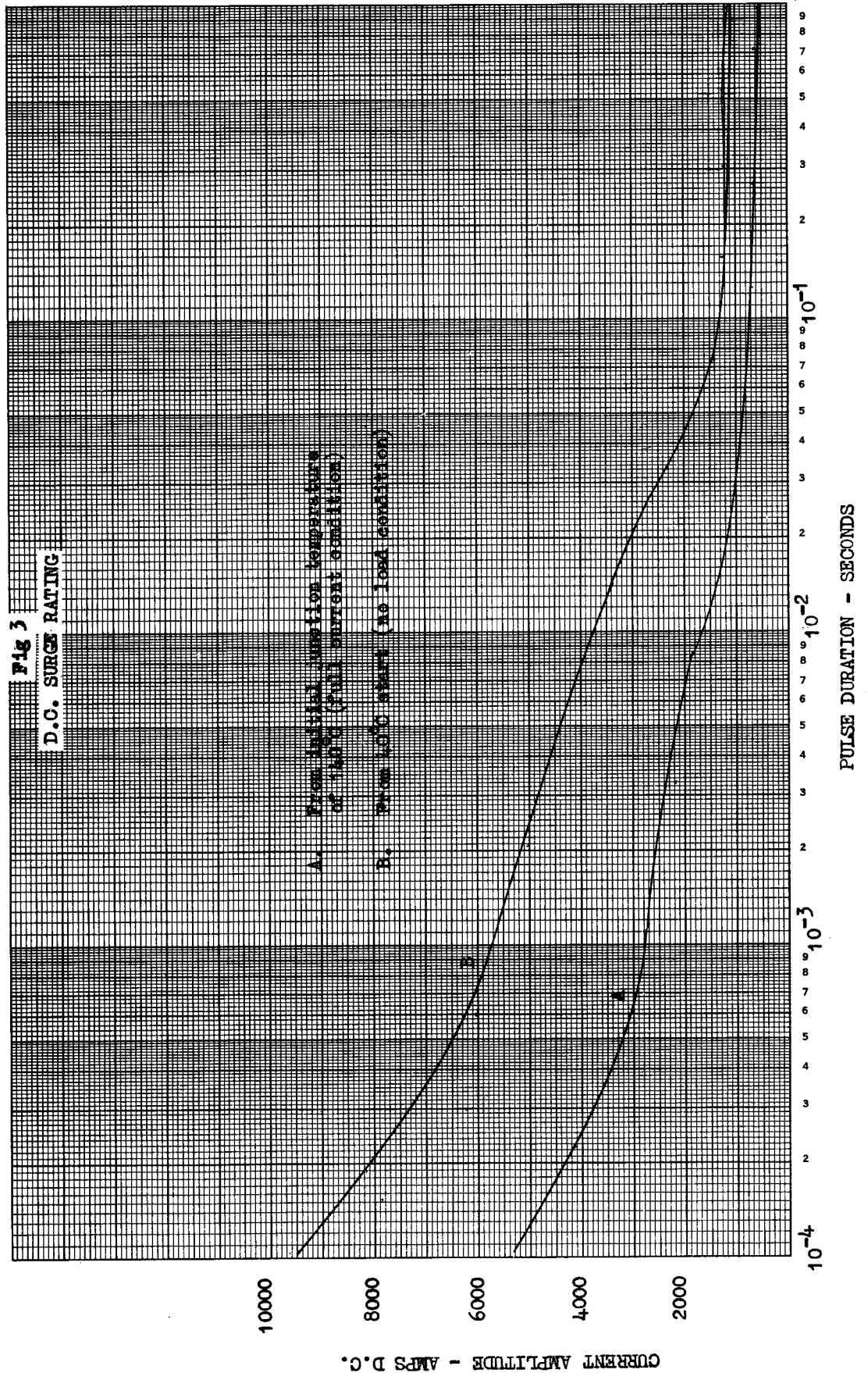
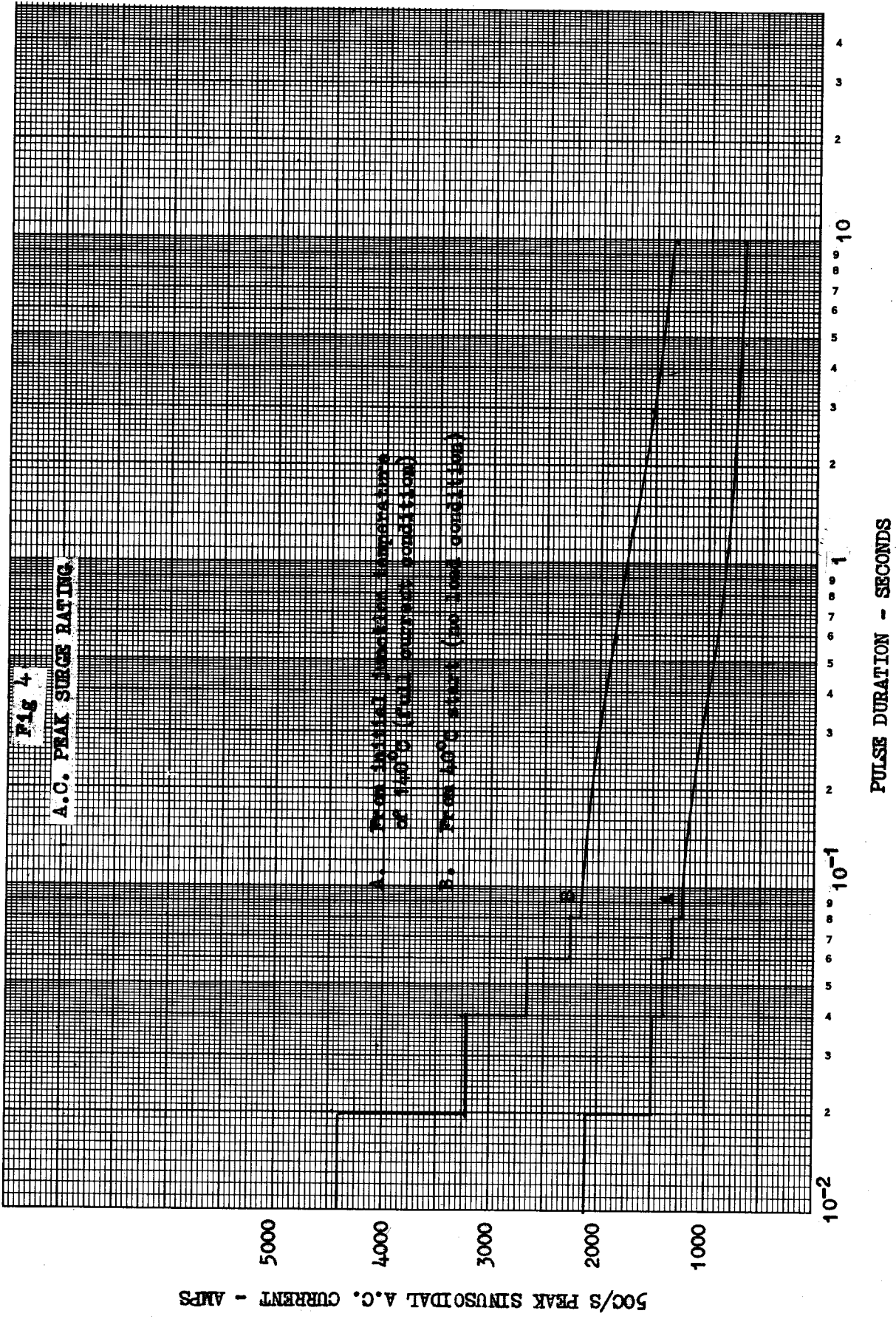


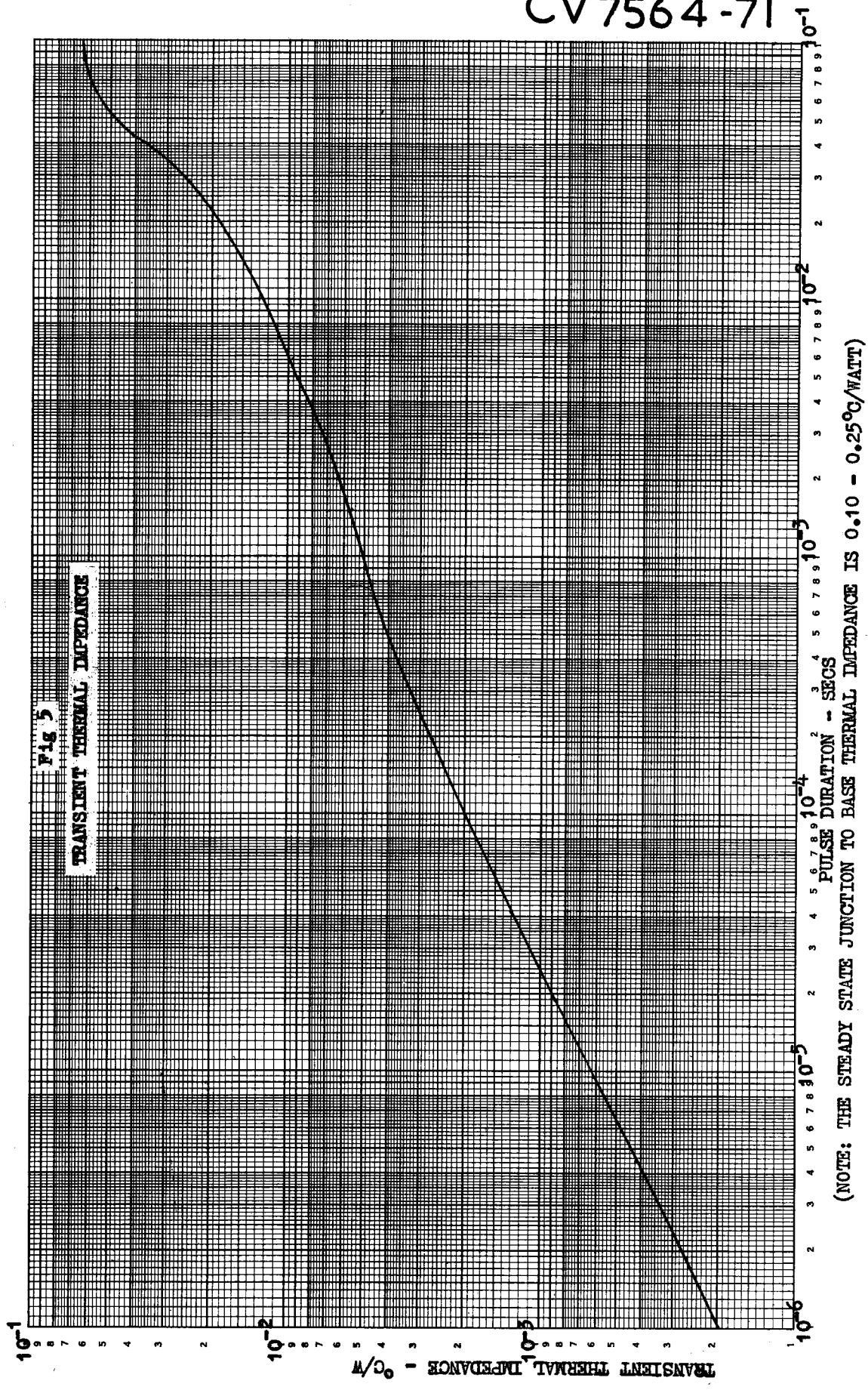
FIG 2
FORWARD POWER LOSS VS LOAD CURRENT

AVERAGE CURRENT PER DIODE OVER FULL CYCLE - AMPS



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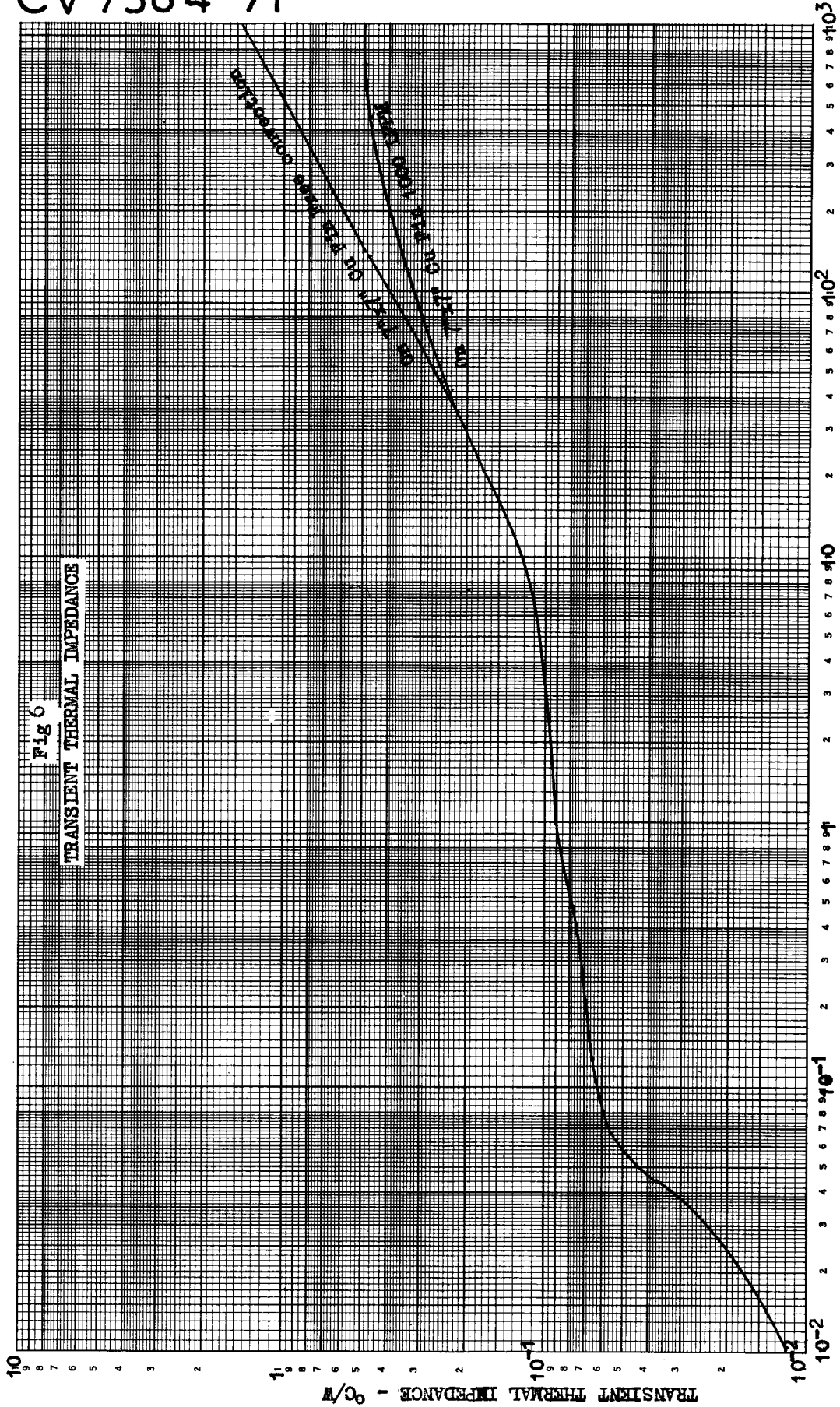
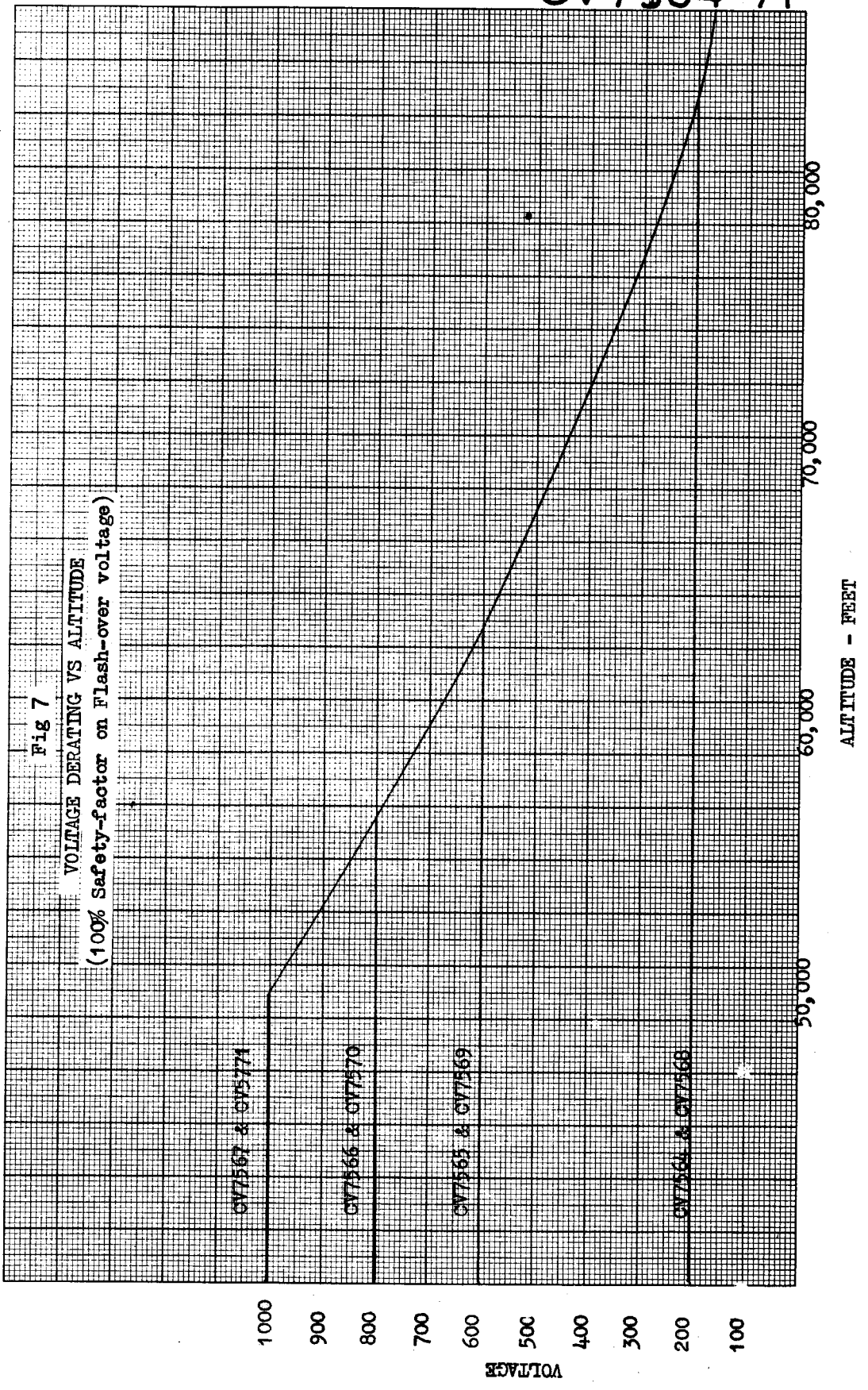


Fig 6

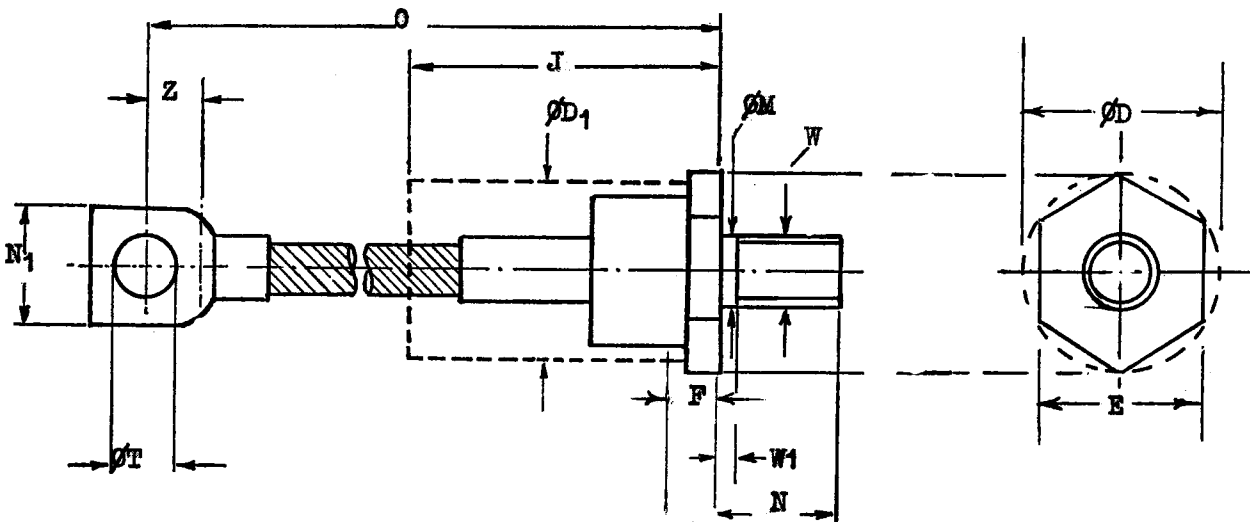
TRANSIENT THERMAL IMPEDANCE

(NOTE: THE STEADY STATE JUNCTION TO BASE THERMAL IMPEDANCE IS $0.10 - 0.25 \text{ } ^\circ\text{C/WATT}$)



CV 7564-71

FIG 8
OUTLINE DRAWING



ORIGINAL INCH DIMENSIONS

Ref	Millimetres			Inches			Notes
	Min	Nom	Max	Min	Nom	Max	
ØD	-	-	36.83	-	-	1.450	
ØD1	-	-	-	-	-	-	1,2
F	6.35	-	-	0.250	-	-	
J	-	-	82.5	-	-	3.25	1,3
ØM	-	-	-	-	-	-	4
N1	-	-	22.60	-	-	0.890	5
W	20.15	-	21.03	0.793	-	0.828	
W1	-	-	3.96	-	-	0.156	
O	122	-	162	4.8	-	6.4	
ØT	6.0	-	10.1	0.265	-	0.400	
Z	9.53	-	-	0.375	-	-	6

- Notes:
1. The device with exception of the hexagon, thread and flexible lead, lies within the cylinder of diameter D1 and length J.
 2. Diameter D1 must not be greater than the actual across flats dimension of the hexagon used.
 3. J is the seated height with the lead bent at right angles.
 4. Diameter M refers to zone N1. The maximum value should not exceed the outside diameter of the thread.
 6. Minimum flat