

MILITARY SPECIFICATION

CV 7599.

SEMICONDUCTOR DEVICE DIODE

Description:- This specification covers the detail requirements for microwave Silicon Switching Diodes Rod Mounted. The diodes are unencapsulated and not tested for moisture resistance and are in accordance with K1007, except as otherwise stated.

Mechanical Dimensions and Outlines:- See Fig.1 Page 10

Connections:- Green mark on Pigtail indicates Negative Polarity of Shank when forward bias is applied.

Absolute Maximum Ratings:-

RATING	$I_F$	$V_R$	$V_F$	P(AV)	$T_{stg}$	$T_{amb}$
UNIT	mA	V	V	W	°C	°C
MIN	-	-	-	-	-55	-40
MAX	75	-50	1.0	1.0	+150	+120
NOTES			A	D		

- Notes:
- A. At 25 mA.
  - B. The actual frequency band over which the diode operates will depend on the design of the mount used. With a single diode in a suitable mount, a switching ratio of greater than 15:1 in dBs may be obtained.
  - C. A typical switching time of 1 u sec. is obtained when switching over 10 dB range with diode set up in suitable holder.
  - D. 1 Watt dissipated in diode.
  - E. The resistance of the diode decreases continuously as the forward current increases.
  - F. Prototype VX4190

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## Primary Electrical Characteristics

Characteristic	V.S.W.R.		Admittance Phase Angle	
Unit	Ratio		Centimeters	
	V = 0	I = 25mA	Min.	0.30
	0.028	0.057	Max.	0.40

See Note 1 Page 9.

Reliability Assurance Requirements:- Under discussion.

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Requirements:      Marking.      The device shall be marked as K.1007 Section B.

Quality Assurance Provisions:

Destructive Tests.      The tests listed in Table 2 Group B Inspection, Sub-Group 3 is considered destructive.

Group C Inspection.      This inspection shall be conducted on the initial lot, and thereafter every ninety days or every fifth lot, whichever occurs first.

Preparation for Delivery:

Packaging for Delivery.      The device shall be packed according to K.1005 Issue 3 each device packed in individual Hermetically Sealed polythene bags.

Joint Services Catalogue Number:

CV. = 5960-99-037-3972

This specification has been prepared by and the Qualification Approval Authority is:-  
Ministry of Aviation, Royal Aircraft Establishment, Farnborough, Hants., England.

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TABLE 1. GROUP A 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> Visual and Mechanical Inspection	5.1	Excluding Physical Dimensions	0.65	I		-	-	
<u>SUB-GROUP 2</u> Reverse Current	8A.2.2	$V_R = -50V$	1.0	II	$I_R$	-	1.0	mA
Forward Voltage	8A.3.2	rf power = 0 $I_F = 25 \text{ mA}$	6.5	II	$V_F$	0.6	1.0	V
V.S.W.R. (1) and		$V = 0$ $f = 9375 \text{ Mc/s}$	1.0	II		-	0.028	
V.S.W.R. (2)		$I_F = 25 \text{ mA}$ $f = 9375 \text{ Mc/s}$	1.0	II		-	0.057	
Admittance Phase Angle		See Note 1 Page 2 See Note 1 Page 2	1.0	II	Phase Angle $\phi$	0.30	0.40	Cm
<u>SUB-GROUPS 3 and 4</u> Omitted								

TABLE 2. GROUP B INSPECTION

Examination or Test	K1007/NATO Ref.	TEST CONDITIONS		AQL %	Insp. Level	Symbol	LIMITS		Units
		SPECIFIC CONDITIONS					Min.	Max.	
<u>SUB GROUP 1</u> Physical Dimensions		See Drawing Fig. 1 Page 10		6.5	IA				
<u>SUB GROUP 2</u> Omitted									
<u>SUB GROUP 3</u> Vibration Fatigue	5.15.1	Non-operating.		6.5	IA				
<u>SUB GROUP 4</u> Torque		NOTE 2. Apply a shear force of 500 gm weight to the silicon wafer for 10 secs.		6.5	IA				

TABLE 2. GROUP B INSPECTION (Contd.)

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Symbol	LIMITS		Units
	K1007/NATO Ref.	SPECIFIC CONDITIONS				Min.	Max.	
<u>SUB GROUP 5</u> Omitted								
<u>SUB GROUP 6</u> Omitted								
<u>SUB GROUP 7</u> High Temperature Life (non-operating)	6.2		4.0	I				
High Temperature	6.2.1	T <sub>stg</sub> = + 150°C 150 hrs.						
<u>SUB GROUP 8</u> Operating Life	6.3.2.1	f = 50 c.p.s. I <sub>F</sub> = 75 mA (Peak) V <sub>R</sub> Peak = not less than 40 Volts 500 hours duration Temperature 25°C	10	IB				

TABLE 2. GROUP B INSPECTION (Contd.)

Examination or Test	TEST CONDITIONS		AQI %	Insp. Level	Symbol	LIMITS		Units
	K1007/NATO Ref.	SPECIFIC CONDITIONS				Min.	Max.	
End Points for SUB- GROUPS 3, 4, 7, 8								
Reverse Current	5A.2.2	As in GROUP A Inspection SUB GROUP 2.			$I_F$	-	1.0	mA
Forward Voltage	5A.3.2	As in GROUP A Inspection SUB GROUP 2.			$V_F$	-	1.0	V

TABLE 3. GROUP C INSPECTION

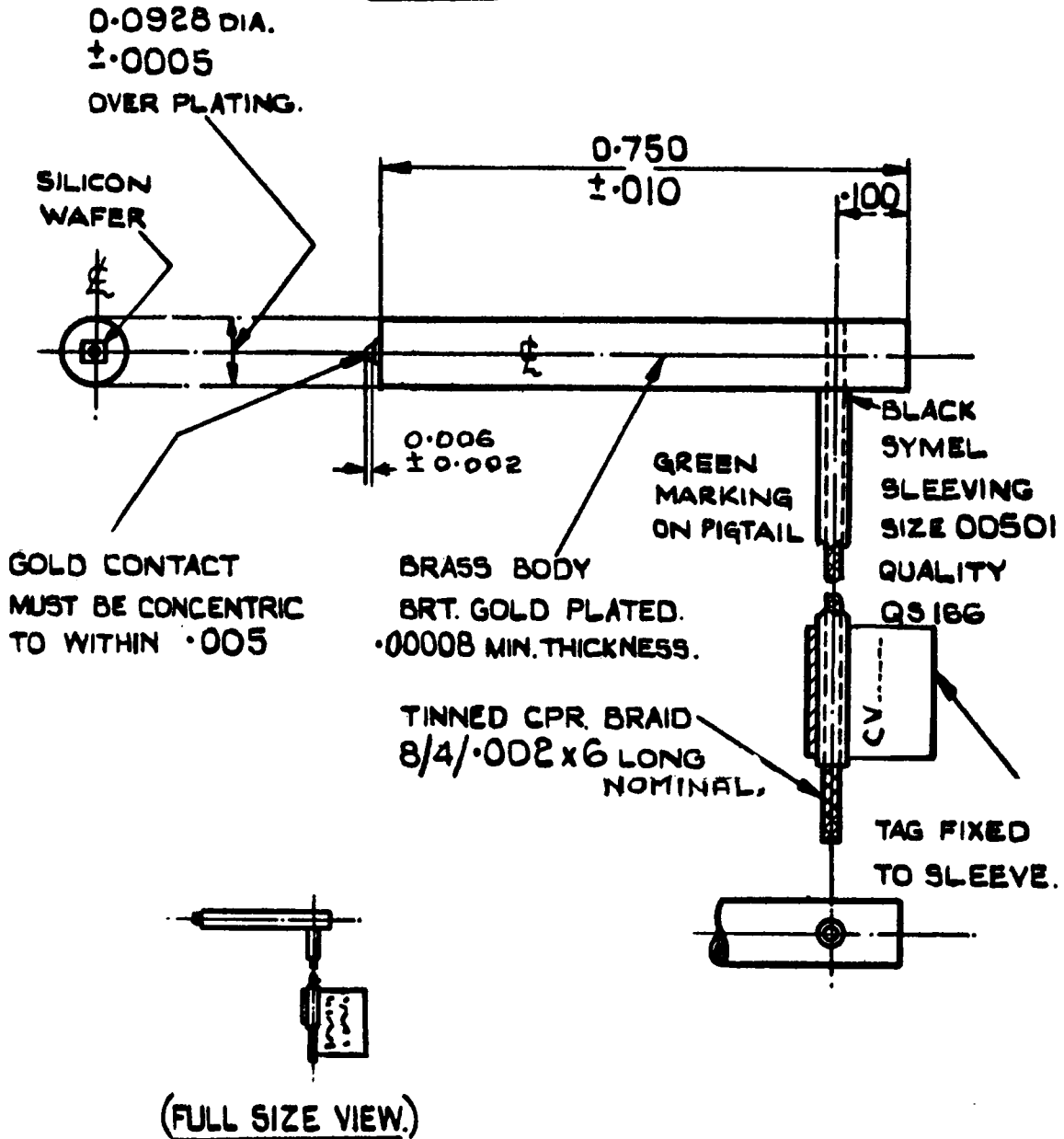
Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Symbol	LIMITS		Units
	K1007/NATO Ref.	SPECIFIC CONDITIONS				Min.	Max.	
<u>SUB GROUPS 1 &amp; 2</u> Omitted								



NOTES

- NOTES 1. The diode is measured in a 66 ohm co-axial line with the contacting surface to the diode at a distance of one half wave length in front of a short-circuit termination. The diode stick is supported by a polythene sleeve 1.5 cm. long 0.337 O/D 0.055 cm wall thickness with equal lengths (0.75 cm) over the co-axial inner and the diode stick. The short circuit min. phase position is taken with a plain brass rod 0.093" diameter 0.75" long and the open circuit min. phase position with the unbiased diode. (See Drawing Page 11 Fig.2).  
The diodes are spring loaded to 100 grammes during measurements.
- The test limits of the V.S.W.R. minima measured at 9375 Mc/s are 0.31 and 0.39 cm, the specification limits becoming 0.30 and 0.40 cm. Diodes which exhibit V.S.W.R. minima within the above limits have a capacitance of  $0.3 \text{ pf} \pm 0.05 \text{ pf}$  and an inductance in series of approx. 0.15 nh.
2. Vibration measurements to be performed in an approved diode holder.

**FIG. 1**



ALL DIMENSIONS IN INCHES  
UNLESS OTHERWISE STATED.

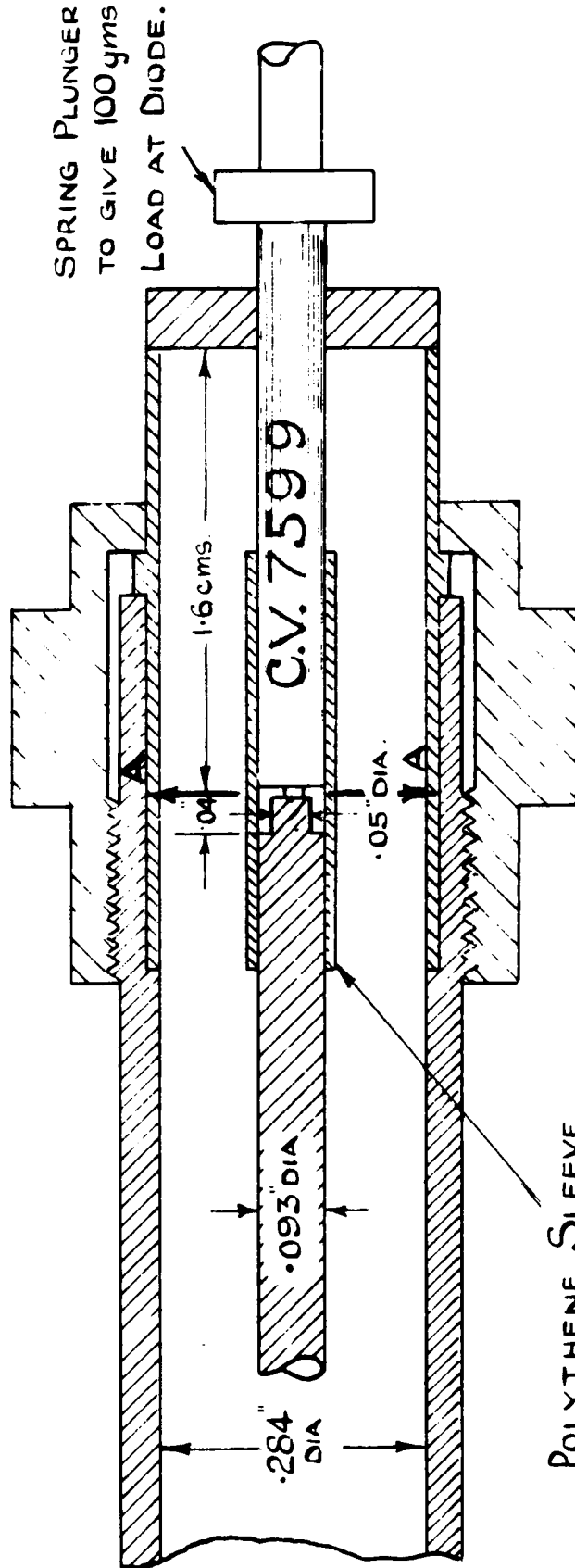


FIG 2.