MILITARY SPECIFICATION

CV 7374.

SEMICONDUCTOR DEVICE DIODE

Description:- This specification covers the detail requirements for Silicon, Broadband Low Level Detector Crystals for J Band, and is in accordance with specification K1007 Issue 3, except as otherwise stated.

Mechanical Dimensions and Outlines:- See Fig. 1. Page 11.
Construction, Coaxial Shielded.

Connections:- The Pin is the Cathode.

Absolute Maximum Ratings:-

RATING	Tamb	Tstg	SHOCK	VIBRATION
UNIT	°C	°C	g	g
MIN.	-55	-55	-	-
MAX.	+70	+70	500	10

Note : A.Protype. VX.4188

CV 7374

Primary Electrical Characteristics

	Characteristic	Forward Resistance	Back Resistance	Z_V	Figure or Merit	V.S.W.R.
	Unit	OHMS	K OHMS	OHMS	-	-
	Min.	-	20	600	50	0.2
	Max.	250	-	850	-	-
Conditions	$T_{ambient}$ (°C)	20	20	20	20	20
	V_f (V)	0.5	-	-	-	-
	V_R (V)	-	0.5	-	-	-
	Input	-	-	1mV Max	-	5 µW max
	Frequency (Gc/s)	-	-	-	15	11.5 - 18.0

Reliability Assurance Requirements:- Under discussion

REQUIREMENTS

Marking The device shall be marked as K1007 Section B

QUALITY ASSURANCE PROVISIONS

Destructive Tests The tests listed in Table 2. Group B Inspection Sub-Groups 2, 3 and 4 and Table 3, Group C Inspection Sub-Group 1 are considered destructive.

PREPARATION FOR DELIVERY

Packaging for Delivery The device shall be packed according to K1007 Issue 3 Section A, 1.2(c). A.I.S. Carton Size

JOINT SERVICES CATALOGUE NUMBER

CV.7374 = 5960-99-037-

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

Ministry of Aviation, Royal Aircraft Establishment, Farnborough, Hants, England.

TABLE 1. GROUP A INSPECTION

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Symbol	LIMITS		Units
	K1007/ . NATO Ref.	SPECIFIC CONDITIONS				Min.	Max,	
SUB-GROUP 1			0.65	II				
Visual and Mechanical	5.1	Excluding Physical Dimensions						
SUB-GROUP 2								
Figure of Merit		Forward Bias 50 uA ± 1 uA		100%				
		f = 15.0 Gc/s ± 0.1%			M	50	-	-
		NOTES 1, 2 and 3						
Reverse Current		Vr = -0.5 Volt		100%	Ir	-	25	µA
Voltage Standing Wave Ratio		Power Level 5 µW Max. Forward Bias 50 µA ± 1 uA		100%				
		NOTE 3 Relative to 1/64 mho.						
		f(1) = 12.5 Gc/s ± 0.1%		100%		0.2	-	
		f(2) = 15.0 Gc/s ± 0.1%		100%		0.2	-	
		f(3) = 17.5 Gc/s ± 0.1%		100%		0.2	-	

TABLE 1. GROUP A INSPECTION (Contd.)

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Symbol	LIMITS		Units
	K1007/ NATO Ref.	SPECIFIC CONDITIONS				Min.	Max.	
Video Resistance	8.B.4.1	Input = 1mV Max. (D.C. or A.C. RMS)	2.5	I	R_V	600	850	OHMS
Forward Current		Vf = 0.5 Volt	2.5	I	I_F	2	-	mA
SUB-GROUPS 3 and 4 OMITTED								

CV7374

TABLE 2 GROUP B INSPECTION

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Symbol	LIMITS		Units
	K1007/ NATO Ref.	SPECIFIC CONDITIONS				Min.	Max.	
SUB-GROUP 1			6.5	I_A				
Physical Dimensions	5.1	To Drawing Fig. 1 Page 11						
SUB-GROUP 2			4.0	I_A				
Temperature Cycling	5.5.	T = -55°C to + 70°C 5 cycles						
Moisture Resistance	5.3.1.2	Duration 7 days Temperature = + 35°C ± 2°C						
SUB-GROUP 3			4.0	I_A				
Vibration Fatigue	5.15.1	Non-operating Max. Peak Acceleration - 10g						
SUB-GROUP 4			6.5	I_A				
Tension Test	5.11	Weight 2 lb. Duration 10 Secs						
SUB-GROUP 5 OMITTED								
SUB-GROUP 6 OMITTED								
SUB-GROUP 7			6.5					
High and low temp. (Non-operating)	6.2							
High Temperature	6.2.1	T.Stg. = 70°C Duration 150 hrs.		I				
Low Temperature	6.2.2	T.Stg. = -55°C Duration 150 hrs.		I				

TABLE 2 GROUP B INSPECTION (Contd.)

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Symbol	LIMITS		Units
	K1007/ NATO Ref.	SPECIFIC CONDITIONS				Min.	Max.	
SUB-GROUP 8 OMITTED								
END POINTS FOR SUB-GROUPS 2, 3, 4 & 7.								
Reverse Current		As in Group A Inspection Sub Group 2	6.5		I_R	-	40	µA
Figure of Merit		As in Group A Inspection Sub Group 2	6.5		M	40	-	

TABLE 3 GROUP C INSPECTION

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Symbol	LIMITS		Units
	K1007 NATO Ref.	SPECIFIC CONDITIONS				Min.	Max.	
SUB-GROUP 1				I_B				
Burnout		R.F. Peak Power = 40 mW min. f = 9375 Mc/s ± 100 Mc/s tp = 1 u Sec. ± 0.1 μ sec. p.r.f. = 1000 ± 100 p.p.s Duration = 1 hour						
END POINT FOR SUB-GROUP 1			6.5					
Change in Figure of Merit		As in Group A Inspection Sub Group 2			Δ M	-40	+60	%

TABLE 3 GROUP C INSPECTION (Contd.)

Examination or Test	TEST CONDITIONS		AQL %	Insp. Level	Symbol	LIMITS		Units
	K1007 NATO Ref.	SPECIFIC CONDITIONS				Min.	Max.	
SUB-GROUP 2								
Shock	5.17	Maximum Acceleration = 500g		QA				
END POINTS FOR SUB-GROUP 2			6.5					
Reverse Current	-	As in Group A Inspection Sub Group 2			I_R	-	40	µA
Figure of Merit	-	As in Group A Inspection Sub Group 2			M	40	-	-

CV 7374.

NOTES

1. The valves shall be tested in a holder matched to 0.94 - 0.51 j relative to 1/64 mho.

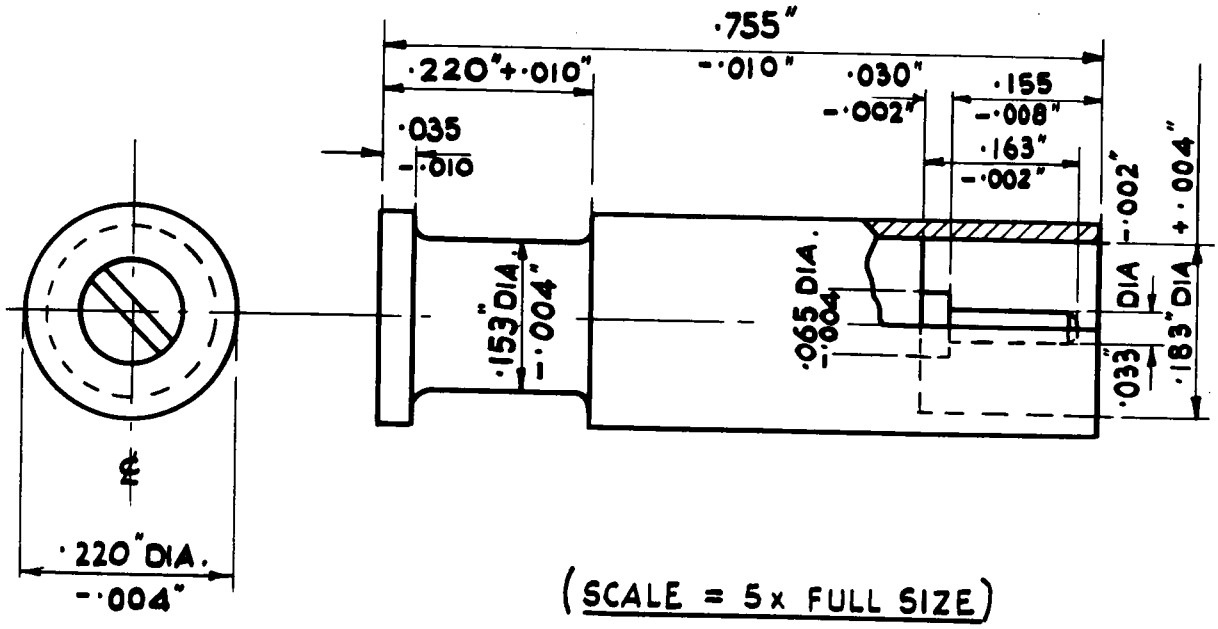
2. The figure of merit of biassed detectors shall be calculated from the results of comparison measurements of the tangential sensitivities of the biassed detectors and unbiassed detectors in the same approved apparatus.

   The figure of merit of the unbiassed detector is to be taken as the product of current sensitivity expressed in microamps per microwatt, and the square root of video resistance in ohms.

   The current sensitivity is defined as the d.c. open-circuit voltage (mV/μW) developed across the valve at an input level between 1 and 5 μW c.w. divided by the video resistance (ohms). The open circuit voltage may be obtained by a backing off method, using a variable battery supply of low impedance which is adjusted to give zero current through the valve.

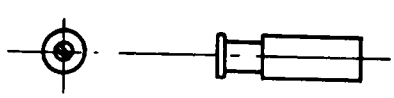
3. The bias current shall be obtained from a supply having a minimum source resistance of 50 K .

FIG. 1



(SCALE = 5 x FULL SIZE)

NOTE :- THIS CRYSTAL VALVE WILL FIT SAME HOLDER AS 1N26 AND 1N78



ACTUAL SIZE.

L

R