Ministry of Technology DLRD(T)

Valve Electronic CV6214

Specification MinTech/CV6214
Issue 1 dated January 1968
To be read in conjunction with K1001

SECURITY
Specification: Unclassified
Valve: Unclassified

TYPE OF VALVE: Pulse magnetron complete with permanent magnet. Tunable over 9000-9500 MHz

CATHODE: Indirectly Heated

PROTOTYPE: DDS457, YJ1090

MARKING
K1001/4

Additional Marking
Serial No.

ABSOLUTE, NON-SIMULTANEOUS RATINGS
(Not for inspection purposes)

		Min.	Max.	Notes
Peak Anode Voltage	(kV)		1.5	
Pulse Anode Current	(A)	0.7	1.1	
Mean Input Power	(W)		6.0	
Duty Cycle			0.004	
Pulse Duration	(μS)		2.0	
Pulse Repetition Frequency	(pps)		4000	
Rate of Rise of Voltage	(kV/μS)		10.0	
Load Mismatch (VSWR)			1.5	
Temperature of Anode Block	(°C)		100	B
Cathode Heating Time	(s)	30		A

TYPICAL OPERATING CONDITIONS

		Min.	Nom.	Max.	Notes
Heater Voltage	(Vrms)	4.5	5.0	5.5	
Heater Current	(A rms)		0.5		
Tuning Range	(MHz)	9000		9500	
RF Pulse Power Output	(W)	30	50		

DIMENSIONS
See drawing, page 5

CONNECTIONS
Heater/Cathode : Black lead
Heater : Red lead
Output : Via OSM 201 plug

MOUNTING POSITION
Any

COOLING
See Note B

NOMINAL WEIGHT
8oz.(0.23kg.)

PACKAGING
K1005

JOINT SERVICES CATALOGUE NO.
5960-99-037-5659

NOTES

A. The heater voltage must be applied at least 30 seconds before the application of anode voltage.

B. Sufficient cooling air must be supplied to ensure that the temperature of the anode block does not exceed 100°C.

TESTS

To be performed in addition to those applicable in K1001

Test Conditions (unless otherwise specified)

Heater Voltage	5.0	V
Mean Anode Current	1.8	mA
Pulse Duration	1.0	μS
Duty Cycle	0.002	
Rate of Rise of Voltage	10.0	kV/μS
Load V.S.W.R.	1.1 max.	

K1001 Ref.	Test	Test Conditions	AQL %	Insp. Level	Limits Min.	Limits Max.	Unit	Note
16.3.7	(a) Holding Period	No voltages	-	100%	7	-	days	
5.F.2.2.2	(b) Heater Current	Vf only(5V)	-	100%	0.45	0.60	A	1
5.F.1.1.2	(c) Pulse Voltage	f=9000 MHz	-	100%	1025	1350	V	
		f=9250 MHz	-	100%	1025	1350	V	
		f=9500 MHz	-	100%	1025	1350	V	
5.F.1.5	(d) Peak Power Output	f=9000 MHz	-	100%	30	100	W	2
		f=9250 MHz	-	100%	30	100	W	2
		f=9500 MHz	-	100%	30	100	W	2
5.F.1.9	(e) Frequency Pulling	f=9000 MHz	-	100%	-	3	MHz	3
		f=9500 MHz	-	100%	-	3	MHz	3
5.F.1.10	(f) Frequency Pushing	f=9250 MHz	-	100%	-	25	MHz/A	4
5.F.1.12	(g) Stability	f=9000 MHz	-	100%	-	0.25	%	6
		f=9250 MHz	-	100%	-	0.25	%	5,6
		f=9500 MHz	-	100%	-	0.25	%	6
	(h) Frequency Setting and Locking	f=9000 MHz	-	100%	-	±1	MHz	7
		f=9250 MHz	-	100%	-	±1	MHz	7
		f=9500 MHz	-	100%	-	±1	MHz	7
5.F.1.11	(j) R.F.Bandwidth	f=9000 MHz	-	100%	-	2.5	MHz	3
		f=9250 MHz	-	100%	-	2.5	MHz	3
		f=9500 MHz	-	100%	-	2.5	MHz	3
	(k) Minor Lobes	f=9000 MHz	-	100%	6	-	dB	3,8
		f=9250 MHz	-	100%	6	-	dB	3,8
		f=9500 MHz	-	100%	6	-	dB	3,8
	(l) Tuning Stability	f=9000 MHz	-	100%	25	-	W	9
		f=9250 MHz	-	100%	25	-	W	9
		f=9500 MHz	-	100%	25	-	W	9

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K1001 Ref.	Test	Test Conditions	AQL %	Insp. Level	Limits Min.	Limits Max.	Unit	Note
	(m) Temperature Coefficient	f=9250 MHz Body Temp. 60-100°C	-	Note 10	-	0.1	MHz/°C	10,11
	(n) Vibration	f=9250 MHz	-	Note 10	-	3	MHz	10,12
	(p) Acceleration	f=9250 MHz	-	Q.A.	-	0.5	MHz	13
	(q) Life	f=9250 MHz t=250 hours	-	Note 14				14
	Life Test End Point Power Output	As for test d f=9250 MHz	-	-	20	-	W	

NOTES

1. The heater current is to be read 45 seconds after the application of the heater voltage.
2. The power output may be measured as mean power output using limits of 60mW min and 200mW max.
3. For this test the V.S.W.R. shall be 1.5:1, varied through all phases.
4. Frequency pushing is defined as the average frequency change per amp. when the peak anode current is changed directly from 0.85A to 0.95A, precautions being taken to avoid thermal effects.
5. For this test the anode voltage is to be applied not more than 30 seconds after the application of heater voltage.
6. The number of missing pulses during a five minute operation period shall not exceed the specified limit. A pulse is considered to be missing if the R.F. energy is less than 70% of its normal energy level within the spectrum envelope. Alternatively, there shall be no double trace on the current pulse or the spectrum shall show no signs of instability when viewed on an R.F. spectrum analyser.
7. The tuning and locking mechanism shall be such as to allow the frequency to be set and locked to within 1 MHz of the specified frequency.
8. The ratio of the height of the minor lobes to that of the main lobe shall not be less than the specified value.
9. The magnetron shall be modulated at 9250 MHz according to the normal test conditions. With no changes to the modulator the magnetron shall be tuned over the range 9000 to 9500 MHz. The power output shall not be less than 25 watts over the whole range. In addition the spectrum shall be displayed on a spectrum analyser and at all frequencies in the range, the stability, bandwidth and minor lobes shall satisfy the limits of tests g, j and k.

NOTES
continued

10. Every twentieth valve is to be subjected to this test. If a failure occurs, another valve from the same production batch is to be tested, and if this is satisfactory, delivery shall continue but the defective valve shall be rejected and the Approval Authority shall be informed. If the second valve also fails, the next twenty valves shall be measured. If not more than one defective occurs in this series of twenty, inspection shall revert to every twentieth valve. If more than one defective occurs in the series, 100% inspection shall continue until a series of twenty with not more than one defective is obtained.

11. Temperature coefficient shall be measured in 10°C steps over the specified range. The slope of the plot of frequency against temperature in each of these steps shall not exceed the specified limit.

12. The valves shall be vibrated successively in three mutually perpendicular directions while being operated under the normal test conditions. In each direction there shall be one sweep through the range of vibrating frequency as specified below.

    (a) Constant amplitude of 0.08 inches (2.0mm) total excursion over the frequency range 10 to 55Hz.

    (b) Constant acceleration of 12g over the frequency range 55 to 2000 Hz.

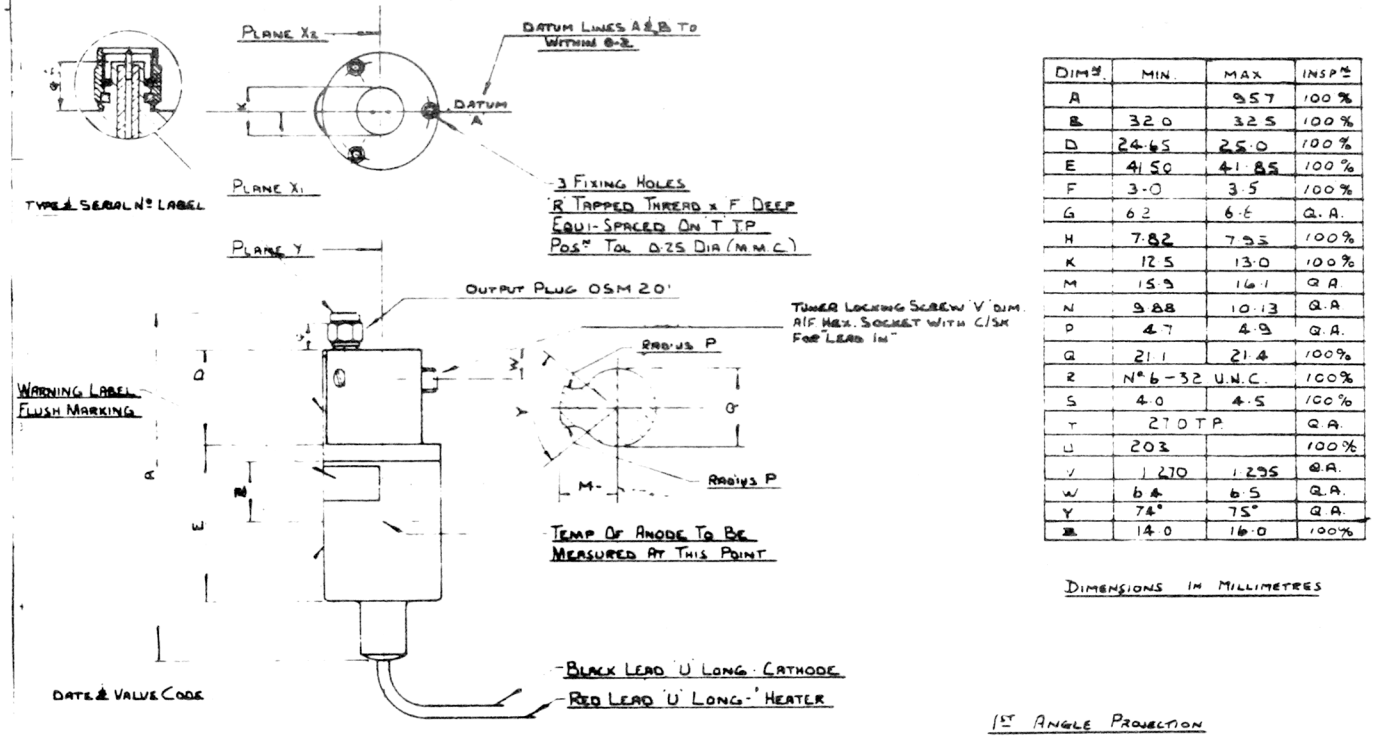
    The rate of change of frequency of vibration shall be four octaves per minute.

    The frequency deviation during the vibration shall not exceed the specified limit.

13. The valve is to be subjected to a sustained acceleration of 50g for at least 30 seconds in each of three mutually perpendicular directions, one of which shall be parallel to the longest dimension of the emitting surface of the cathode. During acceleration only the heater voltage is to be applied.

    The valve frequency shall be measured under normal operating conditions at the end of the test. Any permanent frequency drift shall not exceed the specified limit.

14. Every fiftieth valve shall be life tested. If the valve satisfies the requirements deliveries shall continue. If the valve fails to meet the requirements the action to be taken shall be discussed with the Approval Authority.



DIMN	MIN.	MAX	INSPN
A		9·57	100 %
B	32·0	32·5	100 %
D	24·65	25·0	100 %
E	41·50	41·85	100 %
F	3·0	3·5	100 %
G	6·2	6·6	Q.A.
H	7·82	7·93	100 %
K	12·5	13·0	100 %
M	15·9	16·1	Q.A.
N	9·88	10·13	Q.A.
P	4·7	4·9	Q.A.
Q	21·1	21·4	100 %
R	Nº 6-32 U.N.C.		100 %
S	4·0	4·5	100 %
T	27·0 T.P.		Q.A.
U	203		100 %
V	1·270	1·295	Q.A.
W	6·4	6·5	Q.A.
Y	74°	75°	Q.A.
Z	14·0	16·0	100 %

DIMENSIONS IN MILLIMETRES

1ST ANGLE PROJECTION

DRAWN IN ACCORDANCE WITH B.S 308 1953

VALVE OUTLINE AND DIMENSIONS

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