MINISTRY OF TECHNOLOGY - DLRD/RRE

VALVE ELECTRONIC **CV6194**

Specification Min. Tech./CV6194 Issue 1, Dated July 1967 To be read in conjunction with K1001	SECURITY Specification: Unclassified Valve: Unclassified

TYPE OF VALVE Velocity Modulated Oscillator
CATHODE Indirectly Heated
PROTOTYPE RVTS 0050, K391

RATINGS AND CHARACTERISTICS

(Absolute, non-simultaneous and not for Inspectorate)

			Note
Heater Voltage	(V)	6.3	
Heater Current	(A)	0.58	
Max. Resonator Voltage	(V)	350	B
Max. Resonator Current	(mA)	45	
Reflector Voltage Range	(-V)	20 to 500	F
Min. R.F. Power Output	(mW)	25	
Mechanical Tuning Range	(MHz)	9160 to 9340	A
Typical Mechanical Tuning Rate	(MHz)	200	
Typical Mechanical Tuner Torque	(ozs.ins)	25	
Electronic Tuning Range to 3 dB points	(MHz)	30	
Long Term Frequency Stability		-	A
Typical Frequency Pulling	(MHz)	4	C
Typical F.M. on Vibration	(kHz pk.)	100	D
Max. Body Temperature	(°C)	150	E
Max. Operating Temperature Range	(°C)	-55 to +150	H
Max. Storage Temperature Range	(°C)	-55 to +75	
Typical Negative Temperature Coefficient	(kHz/°C)	130	
Max. Reflector Circuit Impedance	(kΩ)	500	
Typical Reflector Modulation Sensitivity	(MHz/V)	1	

MARKING
See K1001/4

BASE
Flying Leads

CONNECTIONS
See drawing on page 5

MOUNTING POSITION
Any (See Note E)

PACKAGING
See K1005

DIMENSIONS
See page 5

ALTITUDE
80,000 feet

WEIGHT
3.25 ozs. maximum for lead length of 4 ins. max..

NATO STOCK NUMBER
5960-99-037-5171

NOTES

A. For a given position of the mechanical tuner and given voltages, the output frequency is expected to stay within the electronic tuning range of the valve for 3000 hours operation. Clockwise rotation of the tuner decreases frequency.

B. Normal operation is with the resonator earthed. The heater, reflector and resonator voltages may be applied simultaneously.

C. V.S.W.R. = 1.5 all phases.

D. 10g, 30 to 1000Hz.

E. The valve shall be operated with its waveguide flange in good thermal contact with the main waveguide system.

F. Over this voltage range the potential difference between the resonator and reflector must not exceed 500V. The reflector must always be negative w.r.t. cathode even when modulated and must always be connected to its supply when the resonator voltage is applied. If the possibility exists that the reflector potential can become equal to or more positve than that of the cathode then a protective diode should be fitted.

H. Temperature as measured at the centre of the rectangular face of valve body (marked A on outline, page 5).

To be performed in addition to those tests applicable in K1001

Test conditions unless otherwise stated (Note 1)

V_h (V)	V_{res} (V)	V_{ref} (V)	Load v.s.w.r.	Tamb. (°C)
6.3	275	Adjust for max power output	1.1	15 - 35

K1001 Ref.5B	TEST	TEST CONDITIONS	AQL %	Insp. Level	Symbol	Limits Min.	Limits Max.	Units
	GROUP A			100%				
3.1.1	Heater Current			100%	Ih	0.52	0.61	Amps
	Reflector Current	V_{ref} = -150V Note 6		100%	I_{ref}	-	1	µA
	Mechanical Tuning Range			100%		9160	9340	MHz
	Power Oscillation (1)	f = 9160 MHz		100%				
	Negative Reflector Voltage	Note 2			V_{ref}	75	100	V
4.2.6	Electronic Tuning Range	Note 3			Δf	25	-	MHz
	Resonator Current				I_{res}	20	40	mA
4.1	r.f. Power Output				P_{out}	25	60	mW
	Power Oscillation (2)	f = 9340 MHz		100%				
	Negative Reflector Voltage	Note 2			V_{ref}	75	100	V
4.2.6	Electronic Tuning Range	Note 3			Δf	25	-	MHz
	Resonator Current				I_{res}	20	40	mA
4.1	r.f. Power Output				P_{out}	25	60	mW
	Power Oscillation (3)	At any one frequency in the range 9160 - 9340 MHz.		100%				
	Negative Reflector Voltage	Note 2			V_{ref}	75	100	V
4.2.6	Electronic Tuning Range	Note 3			Δf	25	-	MHz
	Resonator Current				I_{res}	20	40	mA
4.1	r.f. Power Output				P_{out}	25	60	mW

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K1001 Ref. 5B	TEST	Test Conditions	AQL %	Insp. Level	Symbol	Limits Min	Limits Max	Units
	GROUP A (contd.)							
	Mode Separation Test							
	Negative Reflector Voltage	See Note 4		100%	V_{ref}	50	125	V
3.4	Emission Change	f = 9250± 20 MHz Reduce Vh from 6.3 to 5.7V.		100%	$\frac{\Delta Ires}{Ires}$	-	10	%
	GROUPS B and C omitted							
	GROUP D							
	Vibration		6.5	II				
	Frequency Modulation	f = 9250± 20MHz, 10g, 30 to 1000Hz swept at the rate of 1 octave per minute. Note 7			Δf	-	200	kHz pk.
	Mechanical Tests		6.5	II				
	Mechanical Tuning Rate					150	250	MHz per turn
	Mechanical Tuning Torque	At Tamb.				15	35	oz/in
	Pulling Test	At a random frequency in the range 9160 to 9340 MHz. VSWR = 1.5 all phases.	6.5	II		-	6	MHz
	Power Output				Pout	10		mW
	Hysteresis	Note 5				-	50	%
	Reflector Modulation Sensitivity	At mode optimum 1V pk to pk deviation.	6.5	II	$\frac{\delta f}{\delta Vref}$	0.5	1.5	MHz/V
4.3.1.1	Temperature Coefficient	f = 9250± 20 MHz	6.5	S2	$\frac{\Delta f}{\Delta T}$	-50	-200	kHz/ C
1.1.3	Warm-up Test	Note 8	6.5	S2	ΔPout	-	±1	dB
	GROUP E omitted							
	GROUP F							
	Life Test							
	Test Point 2000 hrs.	f = 9250 ± 110MHz		Note 10				
	Life Test End Points							
	r.f. Power Output				Pout	15	-	mW
	Electronic Tuning Range	Notes 3 and 4			Δf	20	-	MHz
	GROUP G							
	Retest after 14 days Holding Period	Note 9		100%				

NOTES

1. The same reflector voltage mode shall be used for all oscillatory tests. Except where stated oscillatory tests shall be made with the valve rigidly connected to a UG-39/U flange on appropriate RG-52/U waveguide with a load V.S.W.R. of 1.1 or better.

2. Reflector voltages quoted are relative to the cathode and correspond to the maximum power point of the mode. The limits include variations over the mechanical tuning range and also from valve to valve.

3. Measurements are to be made between the half power points of the mode. There shall be no discontinuities between these half power points.

4. No mode or part of a mode, other than the required mode, shall exist within the reflector voltage range quoted as the valve is mechanically tuned over the complete frequency range.

5. There shall be no discontinuities in either the power voltage or frequency voltage characteristics between the half power points of the valve.

6. The reflector current shall be measured 2 minutes after switching on all supplies.

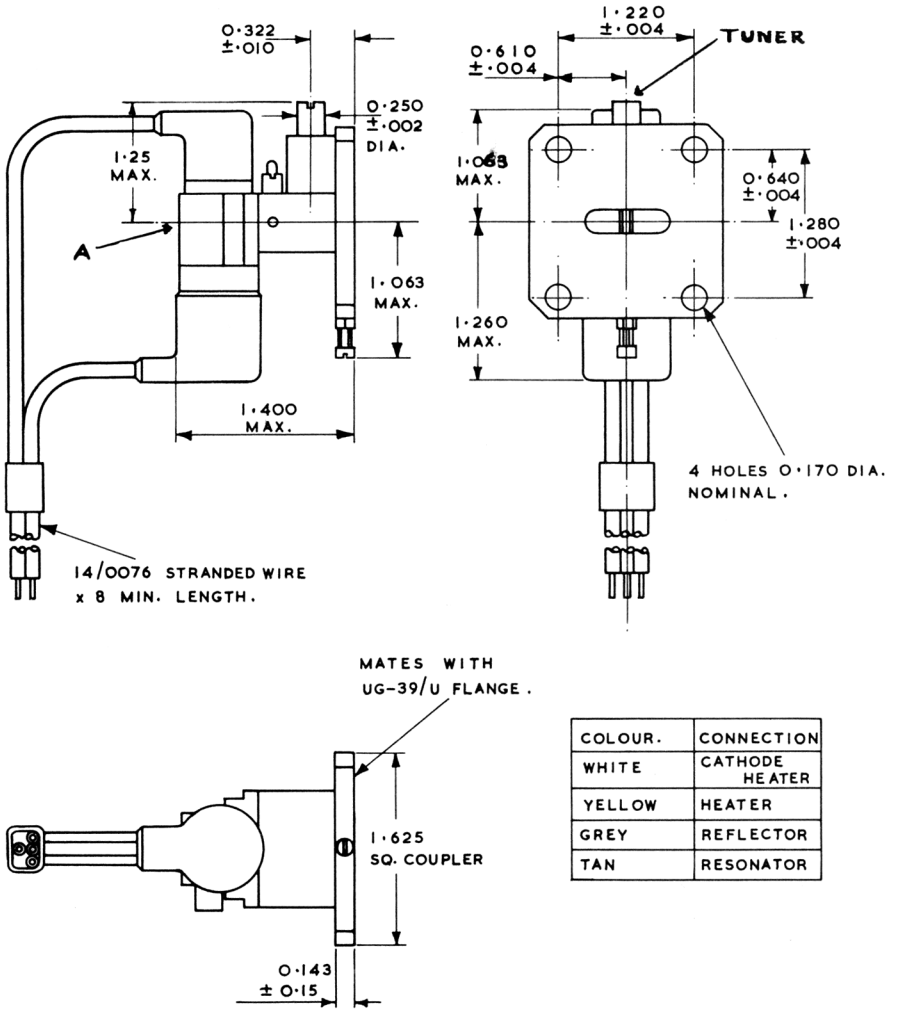
7. The vibration test shall be performed with the valve attached by its waveguide flange to an approved mount. The valve shall be vibrated with sinusoidal excitation in the direction of the electron beam.

8. The power output variation between 40 seconds and 3 minutes subsequent to similtaneous application of all voltages shall not exceed the specified limits.

9. The tests to be performed shall be those tests specified as Group A tests, down to completion of the Power Oscillation (1) tests. The limits in Group A shall apply.

10. One valve from every 20 consecutive acceptable valves shall be life tested. If the initial orders are less than 20, one sample shall be tested. Subsequent orders placed within 6 months of the previous order shall be considered as continuous for the purpose of this test. The Approving Authority shall be notified of any failures. Acceptable valves are valves which have passed the Group A tests.

OUTLINE DRAWING
(THIRD ANGLE PROJECTION)



COLOUR.	CONNECTION
WHITE	CATHODE HEATER
YELLOW	HEATER
GREY	REFLECTOR
TAN	RESONATOR

DIMENSIONS IN INCHES