Ministry of Aviation - D.L.R.D./S.R.D.E.

VALVE ELECTRONIC **CV4097**

Specification MOA/CV 4097
Issue 2A Dated 8.8.66
To be read in conjunction with K1001, B448 and BS1409

SECURITY	
Specification	Valve
Unclassified	Unclassified

→ Indicates a change

Type of Valve - R.F. Power Amplifier Beam Tetrode
Cathode - Directly Heated
Envelope - Glass, Unmetallised
Prototype - VX6137

RATING
(All limiting values are absolute)

			NOTE
Filament Voltage (//)	(V)	2.5	
Filament Voltage (Series)	(V)	5.0	
Filament Current (//)	(mA)	460	
Filament Current (Series)	(mA)	230	
Max. Anode Voltage	(V)	150	
Max. Anode Dissipation	(W)	5.0	
Max. Screen Voltage	(V)	150	
Max. Screen Dissipation	(W)	2.0	
Anode Current	(mA)	28	A
Screen Current	(mA)	2.0	A
Mutual Conductance	(mA/V)	4.3	A
Max. Operating Frequency	(mc/s)	100	
Max. Shock (Short Duration)	(g)	500	
Max. Acceleration (Continuous operation)	(g)	2.5	

Capacitances (pF)

C_{in} (nom.)	8.5
C_{out} (nom.)	4.6
Ca, g_1 (max.)	0.17

MARKING
K1001/4

BASE
BS.448/B9A

CONNECTIONS

PIN	ELECTRODE
1	a
2	NC
3	bp
4	f(-), (f(+)//)
5	f(+)
6	g2
7	g1
8	bp
9	ftap, (f(-)//)

DIMENSIONS
See BS.448/B9A/2.1
Size Reference No. 3

Dimensions (millimetres)	Min.	Max.
A. Seated Height	-	60.5
C. Diameter	19.0	22.2
D. Overall Height	-	67.5

MOUNTING POSITION
ANY

NOTE
A. Measured Vf = 5.0, Va = Vg2 = 150, Vg1 = -10, Vbp = 0

CV4097

TESTS

To be performed in addition to those applicable in K1001. Tests shall be performed in the specified order unless otherwise agreed with the Inspecting Authority.

Test Conditions - unless otherwise specified

Vf(V)	Va(V)	Vg_1(V)	Vg_2(V)	Vbp(V)
5.0 DC	150	-10	150	0

K.1001 Ref.	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits Min.	Limits Max.	Units
7.1	Glass Strain	No voltages	6.5	I				
	GROUP A							
	Electrode Insulation	Vf = 0						
		Vg_1 - all = -100V		100%	R	100		MΩ
		Vg_2 - all = -300V		100%	R	100		MΩ
		Va - all = -300V		100%	R	100		MΩ
		Vbp - all = -300V		100%	R	100		MΩ
	Reverse Grid Current			100%	Ig_1	-	2	μA
	GROUP B	Combined AQL	1.0	II				
	Filament Current		0.65	II	If	210	250	mA
	Anode Current		0.65	II	Ia	21	35	mA
	Screen Current		0.65	II	Ig_2	0	4.0	mA
	Mutual Conductance		0.65	II	gm	3.2	5.4	mA/V
	g_1 Cut-off voltage	Ia = 2 mA	0.65	II	$-Vg_1$	-	25	V
	Peak Anode Current	Va(b) = Vg_2 = 120V R_L = 320Ω Vf = 5.0V D.C. V_{sig} = 20V r.m.s. Rg_1 = 22kΩ Vg_1 = 0 (Note 1)	0.65	II	$Ia_{(pk)}$	110	-	mA
	GROUP C							
	Change in Peak Anode Current	Va(b) = Vg_2 = 120V R_L = 320Ω Vf = 4.5V D.C. V_{sig} = 20 V r.m.s. Rg_1 = 22kΩ Vg_1 = 0 (Note 1)	2.5	I	$\Delta Ia_{(pk)}$	-	25	mA
11.1	Vibration Noise	Va(b) = Vg_2 = 150V Vg_1 = -10V Vf = 5.0 V D.C. R_L = 2kΩ (Note 2)	2.5	I	Va(AC)	-	500	mVrms

TESTS (Cont'd)

CV4097

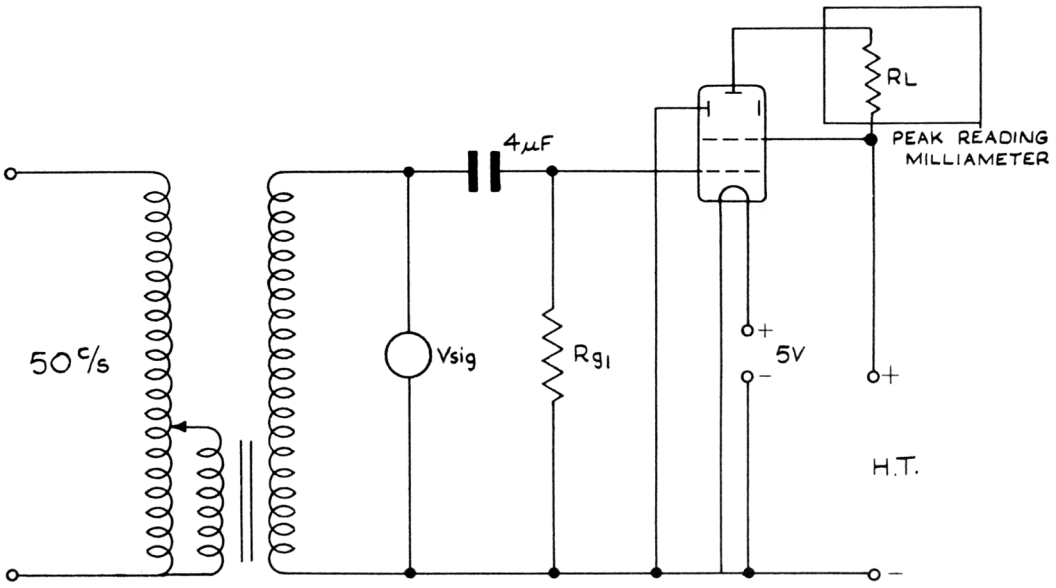
K.1001 Ref.	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits Min.	Limits Max.	Units
	GROUP D							
7.2	Base Strain		6.5	IA				
	Capacitances	Measured on 1 Mc/s Bridge with the valve mounted in a fully screened socket. No shield or skirt.	6.5	IC	C_{a,g_1}	-	0.17	pF
					C_{in}	6.5	10.5	pF
					C_{out}	5.6	7.6	pF
	Functional Test			TA		The valve shall operate satisfactorily in W.S. A.41 and A.42.		
	GROUP E							
11.2	Resonance Search	$V_{a(b)} = V_{g_2} = 150V$ $V_f = 5.0V$ $V_{g_1} = -10V$ $R_L = 2k\Omega$	2.5	IC				
		(1) 25-200 c/s			$V_{a(AC)}$	To be recorded mV rms		
		(2) 200-500c/s (Note 2)			$V_{a(AC)}$	To be recorded mV rms		
11.3	Fatigue	$V_f = 5.0V$ r.m.s. $V_a = V_{g_2} = 150V$ $V_{g_1} = -10V$ Voltages switched 1 min on 3 min. off. Frequency = 170 c/s Min. peak acceleration=5g Duration = 30, 39, 30 hrs.		IA				
	Post Fatigue Tests							
	Reverse Grid Current		2.5		I_{g1}	-	4	μA
	Peak Anode Current	As in Group B			$I_{a(pk)}$	To be recorded mA		
	Vibration Noise	As in Group C	2.5		$V_{a(AC)}$	-	1000	mVrms
11.4	Shock	Hammer angle = 30° No voltages		IA				
	Post Shock Tests							
	Reverse Grid Current		2.5		I_{g1}	-	4	μA
	Peak Anode Current	As in Group B			$I_{a(pk)}$	to be recorded mA		
	Vibration Noise	As in Group C	2.5		$V_{a(AC)}$	-	1000	mVrms

K.1001 Ref.	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits Min.	Limits Max.	Units
	GROUP F							
A VI/ 5	Life	Va = 150 V Vg1 = Adjust to give I_a = 33mA Vg_2 = 150 V Vf = 5.0 V r.m.s.						
A VI/ 5.1	Stability Life Test							
	Change in Peak Anode Current	As in Group B	1.0	I	Ia(pk)	-	20	%
	Life Test End point (250hrs.)	Combined AQL	6.5	IA				
A VI/ 5.6	Inoperatives		2.5					
	Reverse Grid Current		2.5		Ig1	-	4	µA
	Peak Anode Current	As in Group B	2.5		Ia(pk)	100	-	mA
11.2	Electrode Insulation	Vf = 0	4.0					
		Vg_1-all = -100V			R	50		MΩ
		Vg_2-all = -300V			R	50		MΩ
		Va-all = -300V			R	50		MΩ
		Vbp-all = -300V			R	50		MΩ
	GROUP G							
A IX/ 2.5	Electrical re-test after 28 days holding period			100%				
A VI/ 5.6	Inoperatives		0.5					
	Reverse Grid Current		0.5		Ig1	-	3	µA

NOTES

CV4097

1. Test in circuit:-



All power supplies shall have negligible impedance to operating frequency. Grid signal impedance shall be less than 5 ohms; voltage sinusoidal.

2. Preheat for 15 minutes before testing under the following conditions:-

Va = Vg2 = 150V
Vg1 = -10V
Vf = 5.0V