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

VALVE ELECTRONIC **CV4096**

Specification MOS/CV4096
Issue 1, Dated 7.5.59
To be read in conjunction with K.1001, BS448 and BS1409

SECURITY	
Specification	Valve
Unclassified	Unclassified

→ Indicates a change

Type of Valve - Reliable H.F. Beam Tetrode Sharp Cut Off
Cathode - Directly Heated
Envelope - Glass - Un-metallised
Prototype - VX9185

RATING
(All limiting values are absolute)

			NOTE
Filament Voltage	(V)	1.25	
Filament Current	(mA)	20	
Max. Anode Voltage	(V)	100	
Max. Screen Voltage	(V)	100	
Anode Impedance	(MΩ)	1.0	
Max. Bulb Temperature	(°C)	100	
Max. Shock (Short Duration)	(g)	450	
Max. Acceleration (Continuous Operation)	(g)	5	

Typical Operating Conditions

Measured at $V_a = V_{g2} = 67.5V$
$V_{g1} = 0$, $R_{g1} = 5\ M\Omega$

Anode Current	(mA)	1.8
Screen Current	(mA)	0.5
Mutual Conductance	(mA/V)	1.1

Capacitances (pF)

C_{in} (nom.)	3.4
C_{out} (nom.)	2.1
C_a, g_1 (max.)	0.06

MARKING

See K.1001/4, except that the valve shall only be marked with the CV Number Factory and Date Code.

BASE

~~See App. 1 to CV 2237~~
BS 448/B5G/F

CONNECTIONS

PIN	ELECTRODE
1	a (red dot)
2	g_2
3	f (-), bp_1
4	g_1
5	f (+), bp_2

DIMENSIONS

~~See App. 1 to CV 2237~~
See BS448/B5G/F
Size Ref. No. 1

Dimensions (millimetres)	Min.	Max.
A. Overall Length	-	38.15
Diameter		
B. Minor	-	7.264
C. Major	-	9.804
Lead Length	38.1	

MOUNTING POSITION
ANY

CV 4096/1/1

Z.19171.

CV4096

TESTS

To be performed in addition to those applicable in K.1001. Tests shall be performed in the specified order unless otherwise agreed with the Inspecting Authority.

Test conditions - unless otherwise specified

Vf(V)	Va(V)	Vg2(V)	Vg_1(V)	Rg_1 (Megohms)
1.25	67.5	67.5	0	5

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	Vg_1 - all = -100V		100%	R	100		MΩ
		Vg_2 - all = -100V		100%	R	100		MΩ
		Va - all = -100V		100%	R	100		MΩ
		Vf = 0						
	Reverse Grid Current	Vg_1 = -0.5V		100%	Ig_1	-	0.5	μA
		Rg_1 = 0.1 MΩ max.						
	Contact Potential	Vf = 1.25V		100%	$+Ig_1$	0.25		μA
		Va = Vg_2 = 0						
		Vg_1 = + 1.8V through 200 KΩ						
	GROUP B	Combined AQL	1.0	II				
	Filament Current		0.65	II	If	18	22	mA
	Anode Current		0.65	II	Ia	1.2	2.4	mA
	Screen Grid Current		0.65	II	Ig_2	0.35	0.7	mA
	Mutual Conductance (1)	Note 1	0.65	II	gm	0.75	1.45	mA/V
	GROUP C	Combined AQL	4.0	I				
	Mutual Conductance (2)	Note 1 Vf = 1.0V	2.5	I	gm	0.60	1.45	mA/V
	Mutual Conductance (3)	Note 1 Vf = 1.0V Take reading after 15 minutes	2.5	I	gm	0.60	1.45	mA/V
	GROUP D							
5.12	Lead Fragility		6.5	IA				
	Filament Anode Short	Note 2		T.A.				

TESTS (Cont'd)

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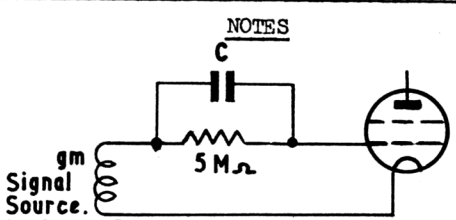
K.1001 Ref.	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits Min.	Limits Max.	Units
	GROUP D (Cont'd)							
	Capacitance	Measured on a 1 Mc/s bridge with the valve mounted in a fully screened socket. No shield.	6.5	IC	C_{a,g_1}		0.06	pF
					C_{in}	3.0	3.8	pF
					C_{out}	1.7	2.5	pF
	Functional Test			T.A.		The valves shall operate satisfactorily in W.S. A40 and A41.		
	GROUP E							
11.3	Fatigue	Acceleration = 5g peak min. Time = 99 hrs. Note 3		IA				
	Post Fatigue Tests							
	Mutual Conductance (1)	Note 1	2.5		gm	0.60		mA/V
11.4	Shock	Hammer Angle 30° No voltages		IA				
	Post Shock Tests							
	Mutual Conductance (1)	Note 1	2.5	gm		0.60		mA/V
A VI/ 5	GROUP F Life							
A VI/ 5.1	Stability Life Test							
	Mutual Conductance (2)	Note 1 Vf = 1.0V	1.0	I	gm	0.60		mA/V
A VI/ 5.3	Intermittent Life Test							
	Life Test End Point (500 hrs.)	Combined AQL	6.5	IA				
A VI/ 5.6	Inoperatives		2.5					
	Mutual Conductance (1)	Note 1	2.5		gm	0.60		mA/V

K.1001 Ref.	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits Min.	Limits Max.	Units
	GROUP F (Contd.)							
	Electrode Insulation	Vf = 0 Vg_1 - all = -100V Vg_2 - all = -100V Va - all = -100V	4.0		 R R R	 50 50 50		 MΩ MΩ MΩ
	Life Test End Point 1,000 hrs.	Combined AQL	10	1A				
A VI/ 5.6	Inoperatives		4.0					
	Mutual Conductance (1)	Note 1	4.0		gm	0.60		mA/V
	Reverse Grid Current	As in Group A	4.0		Ig_1	-	1.0	μA
	Electrode Insulation	Vf = 0 Vg_1 - all = -100V Vg_2 - all = -100V Va - all = -100V	6.5		 R R R	 30 30 30		 MΩ MΩ MΩ
	Contact Potential	As in Group A			$+Ig_1$	To be recorded		μA
	GROUP G							
A IX/ 2.4 & 2.5	Electrical Retest after 28 days holding period			100%				
A VI/ 5.6	Inoperatives		0.5					
	Mutual Conductance (1)	Note 1			gm	0.75	1.45	mA/V
	Reverse Grid Current	As in Group A	0.5		Ig_1	-	0.5	μA

NOTES

1. Test in circuit



Bypass capacity C shall have a resistance of less than 20,000 ohms at the test frequency.

2. Raise Vf until filament opens. Test for filament to anode short only. After performance of the filament burn out test, if the short circuit shall pass in excess of five times the rated filament current without burning out the short circuit, the valve shall be deemed a failure. This test shall be performed by a Service

NOTES (Cont'd)

Laboratory on three valves which shall be in addition to the required number for Type Approval samples. Manufacturer's data are not required for this test.

3. Filament voltage and H.T. voltage are switched simultaneously 1 min. on 3 min. off throughout the duration of the test. Frequency = 170 cps. The valves to be vibrated in each of three mutually perpendicular planes in turn for periods of 30, 30 and 39 hours. One plane to include the longitudinal axis of the valve.

ELECTRONIC VALVE SPECIFICATION

CV.4096 Issue 1, Dated 7.5.59

AMENDMENT NO. 1

Page 1 Base

Delete:- See Appendix 1 to CV2237

Dimensions

Delete:- See Appendix 1 to CV2237

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Signals Radio Development Establishment

December, 1961.

(7731)