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

VALVE ELECTRONIC **CV4094**

Specification MOS/CV4094
Issue 1 Dated 8.1.59
To be read in conjunction with K.1001, BS448 and BS1409

SECURITY	
Specification	Valve
Unclassified	Unclassified

→ Indicates a change

Type of Valve - Reliable R.F. Beam Tetrode Sharp Cut Off
Cathode - Directly Heated
Envelope - Glass Metallised
Prototype - VX9186

MARKING

See K1001/4 except that the valve shall only be marked with the CV No. factory and date code

RATING
(All limiting values are absolute)

			NOTE
Filament Voltage	(V)	1.25	
Filament Current	(mA)	100	
Max. Anode Voltage	(V)	100	
Max. Screen Voltage	(V)	100	
Max. Cathode Current	(mA)	7.0	
Max. Bulb Temperature	(°C)	100	
Max. Shock (Short Duration)	(g)	450	
Max. Acceleration (Continuous Operation)	(g)	5	

BASE

~~See App. 1 to CV2237~~
BS 448/B5G/F

CONNECTIONS

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

Typical Operating Conditions

Measured at Va = Vg_2 = 45V. Vg_1 = 0
Rg_1 = 2 MΩ

Anode Current	(mA)	3.0
Screen Current	(mA)	0.9
Mutual Conductance	(mA/V)	2.0

DIMENSIONS

See BS448/B5G/F
Size Reference No. 1
~~See App. 1 to CV2237~~

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

Capacitances (pF)

C_{in} (nom.)	4.0
C_{out} (nom.)	4.0
Ca, g_1 (max.)	0.01

MOUNTING POSITION
ANY

CV4094

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)	Vg_2(V)	Vg_1(V)	Rg_1 (Megohms)
1.25	45	45	0	2

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 Vg_2 - all = -100V Va - all = -100V		100%	R R R	100 100 100		MΩ MΩ MΩ
	Reverse Grid Current	Rg_1 = 500 kΩ max. Va = Vg_2 = 55V Vg_1 = -1.0V		100%	Ig_1	-	0.5	μA
	Contact Potential	Vf = 1.25V Va = Vg_2 = 0 Rg_1 = 200 kΩ		100%	Ig_1	0.25		μA
	GROUP B	Combined AQL	1.0	II				
	Filament Current		0.65	II	If	88	122	mA
	Anode Current		0.65	II	Ia	1.9	4.1	mA
	Screen Grid Current		0.65	II	Ig_2	0.5	1.3	mA
	Mutual Conductance (1)		0.65	II	gm	1.5	2.5	mA/V
	GROUP C	Combined AQL	6.5	I				
	Mutual Conductance (2)	Vf = 1.0V	2.5	I	gm	1.2	2.5	mA/V
	Mutual Conductance (3)	Vf = 1.0V Take reading after 15 mins.	2.5	I	gm	1.2	2.5	mA/V
	Mutual Conductance (4)	Vf = 0.8V	2.5	I	gm	1.1	—	mA/V
	Anode Resistance		2.5	I	Ra	0.2		MΩ
	R.F. Noise	E_{sig} = 30 mVrms Ref. K.1006 (4.10.3.1)	2.5	I				

TESTS (Cont'd)

CV4094

K.1001 Ref.	Test	Test conditions	AQL %	Insp. Level	Symbol	Limits Min.	Limits Max.	Units
	GROUP D							
5.12	Lead Fragility		6.5	IA				
	Filament Anode Short	Note 1		T.A.				
	Capacitances	Measured on a 1Mc/s bridge with the valve mounted in a fully screened socket. No shield.	6.5	IC				
					C_{a,g_1}		0.01	pF
					C_{in}	3	5	pF
					C_{out}	3	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 hours Note 2		IA				
	Post Fatigue Tests	Combined AQL	4.0					
	R.F. Noise	As in Group C	2.5					
	Mutual Conductance (1)		2.5		gm	1.2		mA/V
11.4	Shock	No voltages. Hammer Angle 30°		IA				
	Post Shock Tests	Combined AQL	4.0					
	R.F. Noise	As in Group C	2.5					
	Mutual Conductance (1)		2.5		gm	1.2		mA/V
	GROUP F							
A VI/5 A VI/ 5.1	Life	Rg_1 = 5 MΩ						
	Stability Life Test							
	Mutual Conductance (2)	Vf = 1.0V	1.0	I	gm	1.2		mA/V

TESTS (Cont'd)

K.1001 Ref.	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits Min.	Limits Max.	Units
	GROUP F (Cont'd)							
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)		2.5		gm	1.2		mA/V
	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 (~~1,000hrs.~~ 500 Hours.)	Combined AQL	10	IA				
A VI/ 5.6	Inoperatives		4.0					
	Mutual Conductance (1)		4.0		gm	1.2		mA/V
	Reverse Grid Current	As in Group A	4.0		Ig_1	-	1.0	μA
	Contact Potential	Vf = 1.25V Va = Vg_2 = 0 Rg_1 = 200kΩ	4.0		Ig_1	To be recorded		
	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
	GROUP G							
A IX/ 2.4 and 2.5	Electrical retest after 28 days holding period			100%				
A VI/ 5.6	Inoperatives		0.5					
	Mutual Conductance (1)				gm	1.5	2.5	mA/V
	Reverse Grid Current	As in Group A	0.5		Ig_1	-	0.5	μA

NOTES

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

2. Filament voltage and H.T. voltage switched simultaneously 1 min. on and 3 min. off throughout duration of 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.

SPECIFICATION CV.4094

ISSUE 1 DATED 8.1.59

AMENDMENT No. 1

Page 2 GROUP C

Immediately following the test for "Mutual Conductance (3)"

Add new test as follows:-

Test	Test Conditions	AQL %	Insp. Level	Sym-bol	Limits Min.	Limits Max.	Units
Mutual Conductance (4)	Vf = 0.8V	2.5	I	gm	1.1	-	mA/V

April, 1959.
N.54788/D.

T.V.C. for S.R.D.E.

9.7.59

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION MOS/CV4094
ISSUE NO.1 DATED 8.1.59.

AMENDMENT NO.2

On Page 4, under GROUP F
(Cont'd)
Intermittent
Life Test

(1) Delete Life Test
End Point
(500 hours)

(2) Immediately following the above, in column headed "Test"

Amend Life Test
End Point
(1,000 hours) to read Life Test
End Point
(500 hours)

TVC for SRDE

August, 1959

N.71076/D

ELECTRONIC VALVE SPECIFICATION

CV.4094 Issue 1 Dated 8.1.59

AMENDMENT NO. 3

Page 1 Base

Delete:- See Appendix 1 to CV.2237

Dimensions

Delete:- See Appendix 1 to CV.2237

21.3.62

Signals Radio Development Establishment

JANUARY, 1962.
(8533)