VALVE ELECTRONIC

Admiralty Surface Weapons Establishment

CV5847

SPECIFICATION AD/CV5847 ISSUE NO. 2 dated 1.9.66 To be read in conjunction with K1001, BS448 & BS1409	SECURITY	
	SPECIFICATION	VALVE
	Unclassified	Unclassified

TYPE OF VALVE: Double R.F. Beam Tetrode
CATHODE: Indirectly - Heated
ENVELOPE: Glass, Unmetallised
PROTOTYPE: QQV07-50

MARKING
See K1001/4

BASE
BS448/B7A

RATINGS

(All limiting values are absolute)

			NOTES
Heater Voltage	(V)	6.3	A
Heater Current	(A)	1.8	A
Max. Anode Voltage (f = 250 Mc/s)	(V)	750	
Max. Anode Voltage (f = 500 Mc/s)	(V)	600	
Max. Screen Grid Voltage	(V)	300	
Max. Negative Grid Voltage	(V)	175	
Max. Anode Dissipation	(W)	25	B
Max. Screen Grid Dissipation	(W)	3.5	B
Max. Control Grid Dissipation	(W)	1.0	B
Max. Heater-Cathode Voltage	(V)	100	
Max. Peak Cathode Current	(mA)	875	B
Max. Mean Cathode Current	(mA)	150	B
Max. Grid-Cathode Resistance (fixed bias)	(kΩ)	50	
Max. Grid-Cathode Resistance (auto bias)	(kΩ)	100	
Max. Temperature of Anode Pins	(°C)	250	C
Max. Temperature of Base Pins	(°C)	180	C

CONNECTIONS

PIN	Electrode
1	Heater h
2	Control Grid (1) g1'
3	Screen Grid (Common) g2
4	Cathode k
5	Heater (Centre tap) h c.t.
6	Control Grid (2) g1"
7	Heater
TC1	Anode 1 a'
TC2	Anode 2 a"

DIMENSIONS
See drawing on Page 6

CAPACITANCES (pF)

C in (nom.)	10	B
C out (nom.)	3.4	B
C g'g" (nom.)	1.2	
C a'a" (nom.)	0.24	

MOUNTING POSITION
Any

NOTES

A. Centre tapped heater (series connected 12.6V 0.9A).

B. Each Section.

C. Temperature measured at the junction of glass and pins. The valve may be operated at full ratings up to a frequency of 100 Mc/s with only normal radiation and convection cooling. Above this frequency or in poorly ventilated conditions, a minimum air flow of 5 c.ft./min. shall be directed onto the top of the envelope to ensure operation within the specified limits.

NOTES (cont'd.)

D. The Joint Service Catalogue Number is 5960-99-037-2925

TYPICAL CHARACTERISTICS AND OPERATING CONDITIONS

CHARACTERISTICS (each section)

Ia = 30 mA
gm = 4.5 mA/V
μg1-g2 = 8.0

PUSH PULL OPERATION

RATINGS CLASS 'C' TELEGRAPHY OR F.M. TELEPHONY			TYPICAL CONDITIONS			
Max. f	(Mc/s)	500	f	(Mc/s)	200	475
Max. Va (f = 250 Mc/s)	(V)	750	Va	(V)	600	500
(f = 500 Mc/s)	(V)	600	Vg2	(V)	250	250
Max. Pa	(W)	2 x 25	-Vg1	(V)	80	60
Max. Vg2 (b)	(V)	600	Ia	(mA)	2 x 115	2 x 115
Max. Vg2	(V)	300	Ig2	(mA)	2 x 8.0	2 x 4.0
Max. Pg2	(W)	2 x 3.5	Ig1	(mA)	2 x 4.0	2 x 3.0
Max. Pg1	(W)	2 x 1.0	Pload (driver)	(W)	4.0	12.0
Max. Ig1	(mA)	2 x 5.0	Pa	(W)	2 x 17.5	2 x 23
Max. Ik	(mA)	2 x 150	Pout	(W)	103	69
Max. Ik pk	(mA)	2 x 875	ηa	(%)	75	60
Max. -Vg1	(V)	100	Pload	(W)	87	59
			η transfer	(%)	85	85

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TESTS

TEST CONDITIONS:- Unless otherwise stated.

Vh (V)	Va (V)	Vg2 (V)	
6.3	600	250	Notes 1, 9

K1001 Ref.	Test	Test Conditions	AQL %	Insp. Level	Symbol	LIMITS Min.	LIMITS Max.	Units
	GROUP A							
	Reverse Grid Current	Adjust Vg1 for Ia = 40 mA. Note 2	-	100%	-Ig1	-	6.0	μA
	Anode Current(1)	Vg1 = -40V	-	100%	Ia(1)	-	5.0	mA
	Screen Current	Adjust Vg1 for Ia = 40 mA	-	100%	Ig2	-	6.0	mA
	Anode Current(2)	Vg1 = -24V	-	100%	Ia(2)	18	52	mA
	Heater Current		-	100%	Ih	1.6	2.0	A
AV	Emission	a + g2 + g1 (strapped) = 225V. Note 3	-	100%	Is	1.8	-	A
	GROUP B							
	Heater-Cathode Leakage Current	Vhk = ± 100V	0.65	II	Ihk	-	40	μA
	Change in Grid Voltage	Set Vg2 = 250V. Adjust Vg1 for Ia = 40 mA, reduce Vg2 to 200V and readjust Vg1- for Ia = 40 mA	0.65	II	ΔVg1	5.2	7.5	V
	GROUP C							
	Power Output (200 Mc/s)	Va = 700V Vg1 = -90V Ia = 225mA Ig1 = 4-10 mA Ig2 = 20 mA max. Note 4	6.5	IC	Pout (load)	95	-	W
	Vibration Noise	Va = 250V Adjust Vg1 for Ia = 10 mA RL = 2k, Vibration Amplitude = ± 0.01" Note 5	6.5	IC	Va (AC)	-	800	mV r.m.s.

TESTS

K1001 Ref.	Test	Test Conditions	AQL %	Insp. Level	Symbol	LIMITS Min.	LIMITS Max.	Units
	GROUP D							
AIII	Capacitances	The valves shall be measured on a 1 Mc/s r.f. bridge in a fully shielded socket. Top cap connectors to be screened. Note 8.	6.5	L5	Ca'g1'~ Ca"g1'	-	0.015	pF
			6.5	L5	Ca"g1"~ Ca'g1"	-	0.015	pF
			6.5	L5	C'in	9.0	11.5	pF
			6.5	L5	C"in	9.0	11.5	pF
			6.5	L5	C'out	2.8	3.8	pF
			6.5	L5	C"out	2.8	3.8	pF
			6.5	L5	C'out~ C"out	-	0.5	pF
	GROUP E							
11.3	Fatigue	No voltages applied. The valves shall be vibrated sinusoidally on the axis perpendicular to the planes of the anodes at a frequency = 50 c/s amplitude = ±0.02". Duration = 15 mins.	-	IC	-	-	-	-
11.4	Shock	Hammer angle = 30° The Valve shall be struck at an angle of 45° to the press seal. Three blows.	-	IC	-	-	-	-
	Post Fatigue & Shock Tests	Combined AQL	6.5					
	Inoperatives		2.5	-	-	-	-	-
	Reverse Grid Current	As in Group A	2.5	-	-Ig1	-	7.5	μA
	Vibration Noise	As in Group C	2.5	-	Va (AC)	-	1.0	V r.m.s.
	Power Output (200 Mc/s)	As in Group C	2.5	-	Pout (load)	90	-	W
	GROUP F							
AVI/S	Life Test	Va = 700V, Ia = 225 mA. Notes 6, 7.		IC				
AVI/S.6	Life Test (End Point 500 hrs.)							
	Inoperatives		2.5	-	-	-	-	-
	Reverse Grid Current	As in Group A	2.5	-	-Ig1	-	7.5	μA
	Power Output	As in Group C	2.5	-	Pout (load)	90	-	W

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TESTS

K1001 Ref.	Test	Test Conditions	AQL %	Insp. Level	Symbol	LIMITS Min.	LIMITS Max.	Units
	GROUP G							
AIX/2.4	Electrical Retest after 28 days Holding Period			100%				
AVI/S.6	Inoperatives		0.5	-	-	-	-	-
	Reverse Grid Current	As in Group A	0.5	-	-Ig1	-	7.5	μA

NOTES

1. Test each section separately with g1 of the non-active section biased to -100V. Heaters parallel connected.

2. Read after a minimum period of three minutes operation when the measurement shall neither be rising nor out of limit.

3. The two sections connected in parallel.

4. At a circuit efficiency of 80%.

5. The valve shall be vibrated sinusoidally at f = 50 c/s in each of the following planes:-

   (a) Major axis.

   (b) Transversely in the planes of the anodes.

   (c) Transversely, perpendicular to the planes of the anodes.

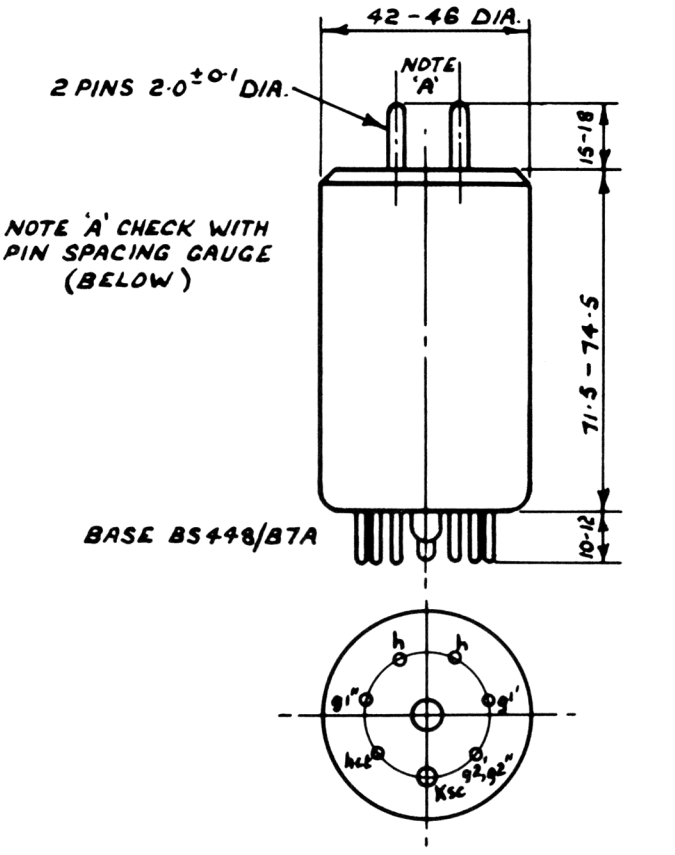
6. The life test is to be performed in an approved dynamic circuit.

7. The Inspection Level of IC is applicable to production quantities in excess of 1000 valves. Where orders are for less than this quantity, the life test specified in K1001 Section 13 shall apply.

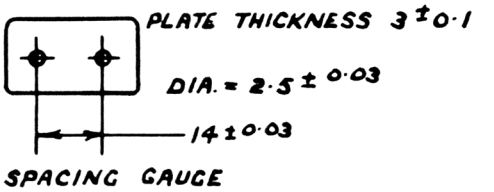
8. The connections for the capacitance test shall be as follows:-

TEST	H.P.	LP	E
Ca'g1'	TC1	2	1,3,4,5,6,7, TC2
Ca"g1'	TC2	2	1,3,4,5,6,7, TC1
Ca"g1"	TC2	6	1,2,3,4,5,7, TC1
Ca'g1"	TC1	6	1,2,3,4,5,7, TC2
C'in	2	1,3,4,5,7	TC1, TC2, 6
C"in	6	1,3,4,5,7	TC1, TC2, 2
C'out	TC1	1,3,4,5,7	2, 6, TC2
C"out	TC2	1,3,4,5,7	2, 6, TC1

9. Readings to be made after a minimum of 3 mins. operation.



VIEW LOOKING ON TO PINS



PIN SPACING GAUGE

NOTE :- ALL DIMENSIONS IN MILLIMETRES