MINISTRY OF AVIATION - DLRD/RRE

VALVE ELECTRONIC CV2303

Specification MOA/CV2303 Issue 3A Dated 1st July, 1966 To be read in conjunction with K1001	SECURITY	
	Specification	Valve
	UNCLASSIFIED	UNCLASSIFIED ←

← Indicates change

TYPE OF VALVE - Twin-primer Broad-band TR Cell

PROTOTYPE - VX3153

MARKING

See K1001/4

RATINGS AND CHARACTERISTICS

			Note
Operating Frequency Range	(Mc/s)	3275 to 3325	
Max. Peak Power	(kW)	250	A
Min. Peak Power	(kW)	4	
Min. Primer Supply Voltage	(V)	-950	B
Max. Main Primer Current	(μA)	160	
Min. Main Primer Current	(μA)	75	
Max. Auxiliary Primer Current	(μA)	80	
Min. Auxiliary Primer Current	(μA)	40	

DIMENSIONS

See Drawing on Page 6.

NOTES

A. Duty cycle not greater than 0.001.

B. The primer currents shall be limited by series resistances of which at least one megohm must be placed adjacent to each electrode.

To be performed in addition to those tests applicable in K1001

K1001 Ref5H	Test	Test Conditions		Insp leve	AQL %	Sym bol	Limits Min	Limits Max	Unit
	(a) Primer Breakdown The delay between the application of the primer voltage simultaneously to each primer and the resulting breakdowns shall be measured.	Primer Currents -	Test shall be performed at least 7 days after any previous discharge. The primer supply voltage shall be 900V. Note 1	100%			-	5	Secs
	(b) Running Voltage The voltage drop across each electrode shall be measured by an approved method, after breakdown has occurred.	Main:- 100 µA ± 3% Auxiliary: 50 µA± 3%	Notes 1 and 5	100%			240	400	Volts
	(c) Vacuum Test After completing tests (a) and (b) the cell shall remain inactive for one month, after which time tests (a) and (b) shall be repeated. If the voltage drop across either electrode has increased by more than 10% the cell shall be rejected; otherwise the remaining tests of the specification shall be completed.		Note 1	100%					
4.1.3	(d) VSWR	Main:- 100µA ± 3% Auxiliary 50µA±3%	Line shall energised with not more than 10 mW RF and terminated in a load matched better than 1.02 VSWR. (Cont'd)	100%			-	1.10	Ratio

TESTS (cont'd)

CV2303

K1001 Ref5H	Test	Test Conditions		Insp level	AQL %	Sym bol	Limits Min	Limits Max	Unit
	(d) cont'd.	Primer Currents	Measured at frequencies 3275 ± 2, 3300 ± 2, 3325 ± 2 Mc/s. Note 1						
4.1.1	(e) Insertion Loss (db)	Main:- 100 µA ± 3% Auxiliary: 50 µA ± 3%.	Cell shall be mounted between impedances matched to VSWR better than 1.10. Line shall be energised with not more than 10 mW RF. Test frequency = 3300 ± 2 Mc/s. Note 1	10%			-	1.0	dB
4.2	(f) High Power Leakage	Main:-	Test frequency = 3300 ± 12 Mc/s						
	(i) Spike Energy	100 µA ± 3% Auxiliary: 50 µA ± 3%	Line shall be energised with 180 ± 40 kW peak RF with PRF = 1000 c/s ± 10%, and terminated in a matched load. The apparatus used for this test shall be approved. Notes 1,2 & 3	100%			-	0.30	Erg/ Pulse
	(ii) Flat Power			100%			10	75	mW
4.2.5	(g) Recovery Time The time shall be measured from the trailing edge of the transmitter pulse for an insertion loss exceeding that immediately before the transmitter pulse by:-	Main:- 100 µA ± 3% Auxiliary: 50 µA ± 3%	The test frequency of the simulated echo pulse shall be the same as the frequency of the magnetron, and its power incident on the cell shall be less than 10 mW meak RF. The test frequency of the transmitter pulse shall be 3300 ± 12 Mc/s. Notes 1 & 4						
	(i) 6 db			10%			-	3	µsec
	(ii) 2 dB		Note 1	10%			-	8	µsec

K1001 Ref 5H	Test	Test Conditions		Insp level	AQL %	Sym bol	Limits Min	Limits Max	Unit
	(g) Recovery Time (Cont'd)		and the power 180 ± 40 kW peak RF. Tp = 0.5 µsec ± 10% PRF = 1000 c/s ± 10%. Note 1						
4.2.4.4	(h) Low Power Leakage The total leakage through the cell shall be measured as the applied power is raised from 500 mW to 100W peak.	Main:- 100 µA ± 3% Auxiliary: 50 µA ± 3%	Applied power raised from 500 mW to 100W peak. Tp = 0.5 µsec ± 10%. Other conditions as for Test (f). Note 1	5%			-	500	mW
	(j) Position of Short The position of the effective RF short behind the front flange of the cell shall be measured.	Main:- 100 µA ± 3% Auxiliary: 50 µA ± 3%.	Tp = 0.5 µsec ± 10%. Other conditions as for Test (f). Note 1	QA			0.065	0.085	ins
	(k) Arc Loss	Main:- 100 µA ± 3% Auxiliary: 50 µA ± 3%	Line shall be energised with not more than 4 kW peak RF power measured immediately after the cell. Tp = 0.5 µsec ± 10%. Other conditions as for Test (f). Note 1.	QA			-	0.8	dB

NOTES

1. The primer supply voltage shall be D.C. having a peak-to-peak ripple voltage not greater than 1%, and shall be negative with respect to the body of the cell. The minimum open-circuit voltage shall be 900 volts, and the regulation shall be negligible at load currents up to 0.3 mA.
The currents in the primers shall be limited to the stated values by series resistances, of which at least one megohm shall be placed adjacent to each primer.

2. High power leakage tests must be made using a Magnetron Type CV192, which has been calibrated against a suitable sub-standard.

3. High power leakage may be measured by the three-pulse method or by other suitable methods using approved equipment. If the three-pulse method is used, the pulse lengths shall be approximately 0.1 (t_1), 0.5 (t_2) and 1.0 (t_3) microseconds. If the measured leakage powers are respectively p_1, p_2 and p_3 microwatts:-

   (a) Spike Energy

   With pulse length t_1,

   $$\text{Spike Energy} = \frac{10p_1}{PRF} \text{ ergs/pulse.}$$

   (b) Flat Power

   With pulse lengths t_2 and t_3.

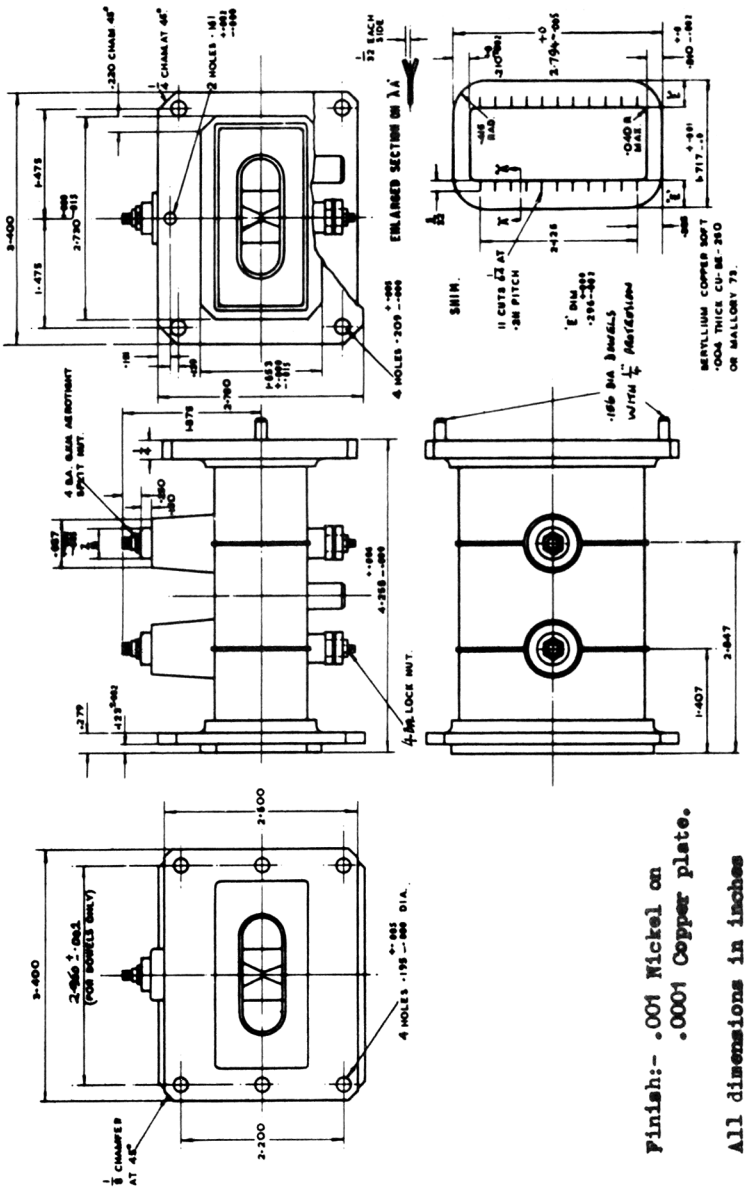
   $$\text{Flat power} = \frac{p_3-p_2}{t_3-t_2} \times \frac{10^3}{PRF} \text{ mW peak.}$$

4. The limits for recovery time are manufacturing limits applying to new cells only. The recovery time will change with life, and a cell is considered to have reached its end-of-life if the recovery time to 6db exceeds 10 micro-seconds.

5. These results shall be recorded.

CV2303

OUTLINE DRAWING



Finish:- .001 Nickel on
.0001 Copper plate.

All dimensions in inches