

Specification MOS(A)/CV5167

Issue 1 Dated 18.9.58

To be read in conjunction with K1001, excluding clauses 5.2, 5.3 and 5.8

SECURITY

Specification Valve

UNCLASSIFIED UNCLASSIFIED

→ Indicates a change

TYPE OF VALVE - Magnetron

CATHODE - Indirectly-heated

ENVELOPE - Copper

PROTOTYPE - VX4080

MARKING

See K1001/4

BASE

None

RATING

Heater Voltage
Heater Current
Operating Frequency
Max. Mean Input Power

(V)	6.3	
(A)	0.8	
(Mc/s)	9080	B
(W)	120	D

Note

CONNECTIONS & DIMENSIONS

See Drawing on Page 5

TYPICAL OPERATING CONDITIONS

Peak Anode Voltage	(kV)	16	AC
Peak Anode Current	(A)	11	AC
Field Strength	(Gauss)	6000	AC
Peak Power Output	(kW)	60	AC

NOTES

- A. When operating under these conditions the magnetron must be air-cooled so that the temperature of the block does not exceed 140°C.
- B. A mechanical tuning adjustment is provided so that the valve can be set to operate precisely at this frequency.
- C. These operating conditions apply for
 - $T_p = 0.2 \text{ } \mu\text{sec.}$
 - $\text{prf} = 3500 \text{ pps.}$
 - $\text{VSWR} = 1.5 : 1 \text{ max. in No.16 waveguide.}$

Under these conditions the heater voltage should be reduced to 4V when the HT is applied.
- D. Heater volts (V_f) shall be adjusted in accordance with the following formula except that for output powers greater than 60 kw this voltage may be 0

$$V_f = 6.3 \sqrt{1 - \frac{\text{Input power in } k_W}{150}}$$

To be performed in addition to those applicable in K1001

Test Conditions							Test	Limits		No. Tested	Note
								Min.	Max.		
	Field Strength (Gauss)	V _f (V)	Pulse Length (μsec)	Rep. Freq. (pps)	Freq. (Mc/s)	Peak I _a (A)					
a	0	6.3	0	0	0	0	Heater Current (A)	0.7	0.9	100%	3
b	5000 ± 50	4.0	0.5	1400	See Note 1	9	Peak Anode Voltage (kV)	10	14	100%	1,3,5
c	5000 ± 50	4.0	0.5	1400	adjust	9	Frequency (mc/s) HF Limit LF Limit	9120 -	- 9040	100%	5
d	5000 ± 50	4.0	0.5	1400	9080	9	Efficiency (%)	25	-	100%	1,5
e	5000 ± 50	4.0	0.5	1400	9080	9	Frequency Pulling (Mc/s)	-	15 20	100%	6
f	5000 ± 50	4.0	0.5	1400	9080	9	Bandwidth (Mc/s)	-	5	TA	4,5,7,9
g	5000 ± 50	4.0	0.5	1400	9080	Peak current varied from 6 to 12	There shall be no mode change			TA	4,5,8
h	5000 ± 50	4.0	0.2	3500	9080	9	Efficiency (%)	25	-	TA	5
j	5000 ± 50	4.0	0.2	3500	9080	9	Bandwidth (%)	-	12.5	TA	4,5,7,9
k	5000 ± 50	4.0	0.2	3500	9080	Peak current varied from 6 to 12	There shall be no mode change			TA	4,5,8

Test Conditions							Test	Limits		No. Tested	Note
								Min.	Max.		
l	Field Strength (Gauss) 6000 ± 50	V _f (V) 0	Pulse Length (μsec) 0.5	Rep. Freq. (pps) 1400	Freq. (Mc/s) See Note 1	Peak I _a (A) 11	Peak Anode Voltage (kV)	13	17	100%	1,3,5
m	6000 ± 50	0	0.5	1400	Adjust	11	Frequency (Mc/s) H.F. Limit L.F. Limit	9210 -	- 9040	100%	
n	6000 ± 50	0	0.5	1400	9080	11	Power Output (kW)	60	-	100%	1,5
o	6000 ± 50	0	0.5	1400	9080	11	Frequency Pulling (Mc/s)	-	15	100%	6
p	6000 ± 50	0	0.5	1400	9040 to 9120	11	Stability	-	0.1%	100%	10

NOTES

1. Applicable over whole tuning range. Tests shall be performed at HF, LF limits and at the nominal centre frequency as in Test (c).
2. For the above tests, the temperature of the anode block shall not exceed 140°C.
3. The valve shall be operated with full heater voltage applied for not more than 2 mins. before the application of HT and then reduced to 4V.
4. The max. rate of rise of the voltage pulse shall not be less than 120 kV/μsec at the operating voltage.
5. The valve shall be coupled by means of Coupling I-S Cat. No. Z830003 to Waveguide No. WG16, which shall be terminated in a resistive load giving a VSWR better than 1.1 : 1.
6. Measured with a VSWR of 1.5 : 1 varied through all phases.
7. The RF bandwidth shall be measured at one-quarter power by means of the Spectrum Analyser.
8. No pulse shall be missing when viewed on the Spectrum Analyser. No double traces of voltage and current shall appear during a 5 sec. interval while the peak current is varied over the specified range.
9. The time of fall of the current pulse shall be less than 0.2 μsec when measured between the points where the amplitude is 20% and 80% of the average amplitude over 80% of the flat portion of the pulse.
10. The valve shall be stored for 168 hours before this test.

Stability shall be measured with the V.S.WR adjusted to that phase which produces maximum instability within the specified frequency band. The stability shall be defined as the average number of missing output pulses expressed as a percentage of the number of input pulses measured over a period of 1 minute on a coincident type missing pulse counter.

