MINISTRY OF SUPPLY (D.C.D.)

VALVE ELECTRONIC **CV 253**

Specification MAP/CV253/Issue 4 Dated - 3.3.50. To be read in conjunction with K1002.	SECURITY Specification [redacted] Unclassified	Valve UNCLASSIFIED

⟶ Indicates a change

TYPE OF VALVE - Matched crystal valve for use in preplumbed mixers.

FREQUENCY RANGE - The crystal valve is intended to operate within a frequency range of 12,000 Mc/s. (2.5cms) to 6,000 Mc/s (5.0cms.)

CONSTRUCTION - The Crystal valve shall be rendered pan-climatic within the temperature range -40°C to +100°C.

MARKING

Valves to be marked:-

"CV253"

DIMENSIONS

See K1002/AI.

CV253

TESTS

To be performed in addition to those applicable in K1002.

	K1002 para. ref.	Test	Limits Min.	Limits Max.	No. Tested	Note
a		Crystal shall be subjected to 3,000 pulses of duration $2\frac{1}{2} \times 10^{-9}$ secs. in an approved D.C. "spike" pulse tester at an energy level of 0.2 ergs. Deterioration of overall noise factor (db)		2	20 per week	1, 3 and 4
b	6.2	Back to forward resistance ratio	10:1	-	100%	2
c	6.3	Forward resistance (Ω)	-	250	100%	2
d		Conversion loss To be measured at a frequency of 9375 Mc/s. ± 0.1% by an approved prediction method (db)	-	9.5	100%	5
e		Noise temperature ratio at a frequency of 9375 Mc/s. ± 0.1% (times)	-	2.0	5% (20)	3
f		Conversion loss to be measured at a frequency of 9375 Mc/s. ± 0.1% by an absolute method with a local oscillator crystal current of 0.8 mA. and in the preplumbed mixer unit used in TR3523A (db)	-	9.5	5% (20)	3
g		Standing wave ratio To be measured at a frequency of 9375 Mc/s. ± 0.1% in the preplumbed mixer unit used in TR3523A.	Not worse than 0.4 : 1.0		5% (20)	3
h		I.F. Impedance at a frequency of 45 Mc/s. or other approved frequencies in the preplumbed mixer unit used in TR3523A.	275	550	5% (20)	3

NOTES

1 - Crystals submitted to this test should not be put up for acceptance.

2 - This figure applies only to the factor test.
Subsequently the back to forward resistance ratio may fall and the forward resistance rise, when crystal valves within the following limits may be regarded as satisfactory for operational use:-
(a) Back to forward resistance ratio (min) 8 : 1
(b) Forward resistance (max) 265Ω

3 - Clauses 5.5.2., 5.5.3 and 5.5.4 in Specification K1001 shall apply.

4 - Overall Noise Factor may be deduced from the formula:-
Overall Noise Factor = $L + 10 \log_{10} (t + F - 1) \leqslant 15$ db.
where L = conversion loss in db.
t = noise temperature ratio (times)
F = I.F. Noise = 3.16 times (5 db)

NOTES (Contd.)

5.- The limit of 9.5 db. may be reduced according to the accuracy of the prediction method. The actual limit to be used will be stated at the same time as approval is granted for any particular prediction method.