VALVE ELECTRONIC CV6178 CV6192 CV6206

MINISTRY OF TECHNOLOGY - DLRD/RRE

Specification Mintech./CV6178; CV6192; CV6206 Issue 1A, Dated April 1968 To be read in conjunction with K1001 and BS1409.	SECURITY Specification: Unclassified Valve: Unclassified

← indicates a change

TYPE OF VALVE: Broad Band T.R. Solid State Limiter (See Note D). PROTOTYPES: CV6178 - BS808 (RVTS 0055) CV6192 - BS814 (RVTS 0061) CV6206 - BS818	MARKING See K1001/4 DIMENSIONS and CONNECTIONS See drawing on Page 5

RATINGS AND CHARACTERISTICS

(Absolute, non-simultaneous and not for Inspection purposes)

	Min.	Typical	Max.	Notes
Operating Frequency:-				
CV6178 (MHz)	8500		9100	
CV6192 (MHz)	9000		9700	
CV6206 (MHz)	9400		10000	
Peak Power (kW)	1	-	200	A, B
Primer Supply Voltage (V)	-	-1000	-	
Primer Current (μA)	-	-	150	C
Spike Energy (ergs/pulse)	-	-	0.02	

NOTES

A. The life expectancy of the tube exceeds 500 hours at r.f. power levels less than that quoted, and falls progressively as the power level is increased above the quoted value. Consequently it is recommended that to ensure long life and for satisfactory operation at power levels above 50kW, that the valve be preceded by a Pre-T.R. cell.

B. With duty ratio not exceeding 0.001.

C. Primer current to be limited by a series resistance of 5.5 MΩ ± 5%, of which at least 0.5 MΩ must be placed adjacent to the valve.

D. The varactor used as the limiter is specified in R.V.T.S. 0057.

E. N.A.T.O. Stock Numbers are:-

CV6178 - 5960-99-037-4603
CV6192 - 5960-99-037-4952
CV6206 - 5960-99-037-5439

TESTS

To be performed in addition to those tests applicable in K1001

TEST CONDITIONS: Unless otherwise specified primer supply voltage = -1000V. Primer supply resistance = 5.5MΩ of which at least 0.5MΩ shall be adjacent to the cell.

K1001 Ref. 5H		Test	Test Conditions	AQL %	Insp Level	Symbol	Limits Min.	Limits Max	Units
3.1.1	(a)	Primer Breakdown The delay between application of primer voltage and initial breakdown to be measured	Primer supply voltage to be -900V. Test to be performed at least 7 days after any previous discharge		100%	t_i	-	5	S
3.1.2	(b)	Primer Operating Current The primer current to be measured after breakdown has occurred.	As for test "a"		100%	I_d	75	150	μA
4.1.3.1	(c)	V.S.W.R. VSWR to be measured over frequency band:- CV6178 - 8500 to 9100 MHz. CV6192 - 9000 to 9700 MHz. CV6206 - 9400 to 10000 MHz.	Line to be energised with not more than 10 mW RF power and terminated in a load matched better than 1.02 VSWR		100%	-	-	1.3	-
4.1.1.1	(d)	Low Level Insertion Loss Measured at frequencies:- CV6178 - 8500 8800; 9100 MHz. CV6192 - 9000; 9350; 9700 MHz. CV6206 - 9400; 9700; 10000 MHz.	Line to energised with not more than 10 mW r.f. power. Valve mounted between impedance matched better than 1.1 v.s.w.r.		100%	αp	-	0.8	dB
4.2.4	(e)	High Power Leakage Test (e) cont'd. on page 3.	Line to be energised using 50kW ± 10% peak r.f. power with PRF = 1000Hz ± 10%, terminated in a matched load. Test frequencies:- CV6178 - 8800MHz. CV6192 - 9350MHz. CV6206 - 9700MHz. Tolerance ± 100MHz.		100%	See Page 3			

TESTS (Cont'd)

K1001 Ref. 5H		Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits Min	Limits Max	Units
4.2.4.2.2 (e cont'd)		1. Spike Energy	tp >40nS.			Was	-	0.02	ergs/pulse
4.2.4.1		2. Total Leakage Power	tp = 1.0 µS ±10%			Poc	-	30	mW
4.2.5	(f)	Recovery Time The time to be measured from the trailing edge of the applied pulse until the insertion loss has fallen to a value 6 dB above its value immediately before the pulse is applied.	tp = 1 µs ± 10% Other conditions as in test 'e'		100%	tdoc	-	2	µS
4.2.4.4	(g)	Low Power Leakage The peak total leakage through the valve is to be measured as the applied power is varied	Applied peak RF power varied from 100 mW to 100 Watts tp = 1µs ± 10% Other conditions as in test 'e'	6.5	I	PoL	-	50	mW
4.2.7	(h)	Position of Short The distance of the effective RF short circuit behind the front flange of the valve is to be measured	tp = 1 µs ± 10% Other conditions as in test 'e'	6.5	I	l	0.014	0.028	in
4.2.2	(j)	Arc Loss	Line to be energised with 4kW peak RF power measured immediately after the valve tp = 1 µs ± 10% Other conditions as in test 'e'		1%	(A) oc arc	-	0.8	dB
5.2.3	(k)	Temp.Cycling Post Temperature Cycling Tests	The valve shall be stored at 70°C for one hour, followed by one hour at room temperature and one hour at -40°C. This cycle to be repeated six times. Tests and limits as contained in (a), (b) (d) and (e). Note 1.		1%				

K1001 Ref. 5H		Test	Test Conditions	AQL %	Insp. Level	Sym-bol	Limits Min	Limits Max	Units
5.3	(1)	Life Test	The valves to be mounted in series E-Plane T junctions followed by a matched load. The input power into the life test assembly shall be that which provides an RF power level of not less than 20kW into the matched termination. Other conditions as in test (e) 2. Note 1.		4.0%		500 See Note 2	-	hours

NOTES

1. The tests shall be performed on a sampling basis consisting of the specified percentage of the contract requirement (taken to the nearest whole number in excess of the percentage value) and spread evenly over the production period. The valves used shall be taken from those in current production at the time of the commencement of the test.

   Where the rate of production is less than 25 valves per month a batch size may be considered as being that obtained over a period of one month. The manufacturer may at his discretion test additional valves.

   During continuous production (which for the purpose of this specification shall be considered as being production which has not been interrupted for a period in excess of six calendar months) the criterion of acceptance shall be based on not more than one failure in any ten consecutive valves tested and shipment of valves may be permitted from the commencement of a contract provided that rejection of earlier production lots has not occurred.

   Following a six months non-production period shipment may be permitted after the first sample satisfies the specified tests. In the event of a failure before the criterion of acceptance can be applied, the manufacturer shall test at least two further devices made at the time of failure.

   If neither valve fails acceptance then shipment is permitted, but in the event of an additional failure the Approval Authority shall be informed.

2. End of life test point shall be 500 hours or when the valve is tested for the tests given in b,c,d, e and f and fail to meet the following relaxation of limits:-

   (c) V.S.W.R. Max 1.4
   (d) Insertion loss Max 1.0
   (e) Spike energy 0.02 ergs/pulse max
   (f) Recovery time 10 dB at 4 μs.

   The criterion for acceptance of the production at 500 hours shall be at least 90% where life expectancy:-

$$\geq \frac{\text{Total Hours (or cycles) of operation}}{\text{Number of samples x 500 hours (or 2500 cycles)}}$$

   The number of samples shall not be less than one per month and may be increased above 4% of production at the manufacturer's discretion.

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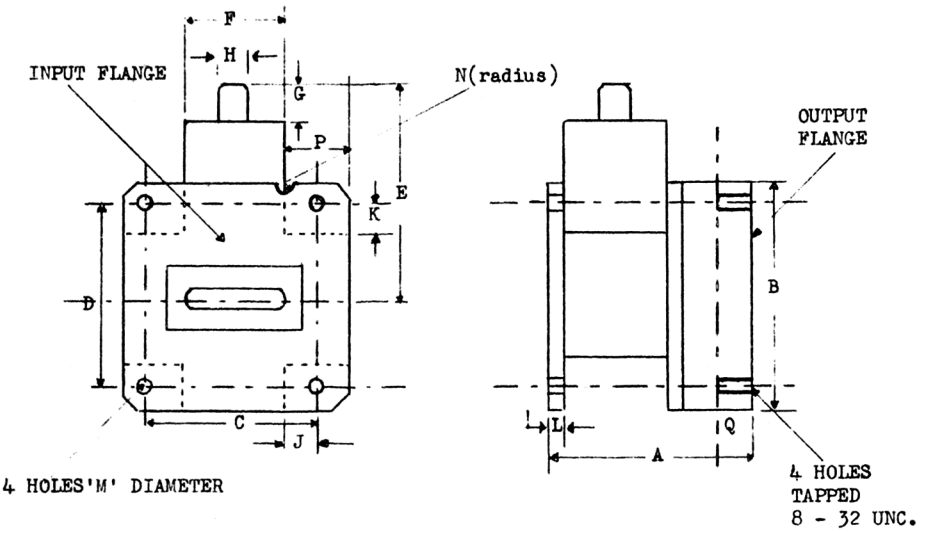
OUTLINE DRAWING



DIMENSIONS

	Inch	mm.
A	1.555 ±0.005	39.3
B	1.625 ± 1/64	41.3
C	1.22 ±0.004	31.0
D	1.28 ±0.004	32.5
E	1.625 max	41.3
F	0.78 max	19.9
G	0.25 min.	6.35 min.
H	0.25 min	6.35
J	7/32 min	5.55
K	3/16 ~~max.~~ min	4.77
L	0.093 min.	2.4
M	0.173 ±0.004	4.4 ± 0.1
N	1/16 ± 1/32	1.59
P	7/16	11.1
Q	0.25 min.	6.35

Original dimensions are inch except for dimension 'M'.

Tolerances are 0.005, unless otherwise stated.

Finish. In accordance with DEF-5000

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION Mintech/CV6178; CV6192; CV6206. Issue 1A, Dated April 1968

AMENDMENT No. 1

Page 5 Outline Drawing:

In the table of dimensions, amend the following dimensions as appropriate:-

'B' - amend to read "1.625 ± 1/64"

'E' - amend to read "1.625 max."

'F' - amend to read "0.78 max."

'H' - amend to read "0.25 min."

'J' - amend to read "7/32 min."

'K' - amend to read "3/16 min."

August 1968

T.V.C. for R.R.E.

20/11/68