

Specification: MOA/CV2391/2 Issue 3 Dated July 1962 To be read in conjunction with K1007	<u>SECURITY</u>	
	<u>Specification</u>	<u>Valve</u>
	Unclassified	Unclassified

Indicates a change

<u>TYPE OF VALVE:</u> Silicon mixer crystal diode <u>PROTOTYPE:</u> CV2391 - VX3136 CV2392 - VX3171		<u>MARKING</u>	
		C.V. Number and if possible, the Factory Code and Date Code - see K1007/4	
<u>RATINGS and CHARACTERISTICS</u> (Not for Inspection Purposes) All limiting values are absolute		<u>DIMENSIONS</u>	
		As K1007/A1/ See Note 8, page 4	
		<u>POLARITY</u>	
		CV2391: Red mark on body indicates positive polarity of pin. CV2392: Green mark on body indicates negative polarity of pin. See K1007/4	
		<u>PACKAGING</u>	
		See K1005 In K1005/8.1 read "metal foil" instead of "lead foil"	
Max. Operating temperature (°C) 100 Max. storage temperature (°C) 100 Min. storage temperature (°C) -55 Max. burnout (a) r.f. spikes (ergs) 0.1 A (b) d.c. spikes (ergs) 0.04 Max. load resistance (ohms) 20 B Max. forward resistance (at 0.5 V) (ohms) 750 C Min. reverse resistance (at -0.5 V) (kohms) 10 C Frequency range: minimum (kMc/s) 26 maximum (kMc/s) 40 Max. noise factor (dB) 16.5 D Typical operating rectified current (mA) 0.5 E		Note	

NOTES

- A. For min. of 90% survival, due to magnetron spikes. The user is warned that the crystal can also be damaged by excessive voltage of an oscillatory or transient nature.
- B. This includes resistance of meter and that of any filter network in series with diode.
- C. It is recommended that the crystal diode is replaced in service when the d.c. characteristics fall outside either of these values.
- D. For i.f. amplifier noise factor of 2 dB.
- E. Rectified current for optimum performance depends on noise factor of i.f. amplifier and amount of local oscillator noise. With negligible local oscillator noise and i.f. noise factor of about 2 dB, the rectified current should be between 0.3 and 1.0 mA.

CV2391-2

GENERAL TEST CONDITIONS

TEMPERATURE: 15-30°C
 SOURCE IMPEDANCE: V.S.W.R. 1.05 max. at signal and image frequencies
 LOAD RESISTANCE: 15 ohms max.
 TEST HOLDERS: Note 1
 STANDARDS: Note 2

K1007	Test	Test Conditions	AQL %	Insp. Level	Sym.	Limits		Units
						Min.	Max.	
	<u>Group A</u> - omitted							
	<u>GROUP B</u>							
	Reverse current	$V_r = -0.5 \text{ V}$	0.65	II	I_r	-	25	μA
5A.4	Noise factor	Local Oscillator = 34,860 \pm 100 Mc/s $I_o = 0.5 \pm .05 \text{ mA}$ i.f. amplifier noise factor = 2 dB Note 3	0.65	II	N	-	12.5	dB
	<u>GROUP C</u>							
5A.3	Rectifier Admittance(1)	$f = 34,860 \pm 100 \text{ Mc/s}$ (a) r.f. power = 1,000 $\pm 15\% \mu\text{W}$ or (b) $I_o = .5 \pm .05 \text{ mA}$	2.5	I	VSWR	-	1.8	Ratio
5A.5	i.f. impedance	$f = 34,860 \pm 100 \text{ Mc/s}$ (a) L.O. power = 1,000 $\pm 15\% \mu\text{W}$ or (b) $I_o = .5 \pm .05 \text{ mA}$ i.f. frequency = 45 \pm 15 Mc/s. Note 4	2.5	I	R_{iF}	300	600	ohms
	Forward current	$V_f = 0.5 \text{ V}$ Note 4	2.5	I	I_f	1.5		mA
	<u>GROUP D</u>							
	Resistance to voltage breakdown (burnout)	r.f. level = 0.15 ergs Note 5	Note 6		$N_{\Delta N}$	-	16.5 2.0	dB dB
	<u>GROUP E</u>							
10.2	TEMPERATURE CYCLING	3 cycles: -55°C to +100°C Note 7	10					
	<u>Post temperature cycling test</u>							
8	Inoperatives		6.5					
	Reverse current	As in Group B	6.5		I_r	-	40	μA
	Noise factor	As in Group B Note 5	6.5		$N_{\Delta N}$	-	16.5 2	dB dB

K1007	Test	Test Conditions	AQL %	Insp. Level	Sym.	Limits		Units
						Min.	Max.	
11.1	AXIAL TENSION	Force of 10 lbs.	6.5	IC				
11.3	FATIGUE	No voltages		QA				
11.4	SHOCK	Hammer angle = 20°		QA				
	<u>Post fatigue and shock tests</u>							
8	Inoperatives Reverse current Noise factor	As in Group B As in Group B Note 5			I _R N ΔN	- - -	40 16.5 2	μA dB dB
	<u>GROUP F</u>			IA				
13	LIFE	To be agreed						
13.3	<u>Post life tests</u>							
8	Inoperatives Reverse current Noise factor	As in Group B As in Group B Note 5	6.5 6.5 6.5		I _R N ΔN	- - -	40 16.5 2	μA dB dB
13.4	STORAGE LIFE(1)	No voltages. Note 7 T _{amb} = -55°C t = 150 h			I			
13.5	STORAGE LIFE(2)	No voltages. T _{amb} = +100°C t = 150h			I			
	<u>Post storage tests</u>	Combined AQL for (a) Storage Life (1) (b) Storage Life (2)	4.0 4.0					
	<u>GROUP G</u>							
5.3.2.11	Retest after 28 days holding period							
8	Inoperatives Noise factor	As in Group B	0.5% 2.0%	100% 100%				
					N	-	16.5	dB

NOTES

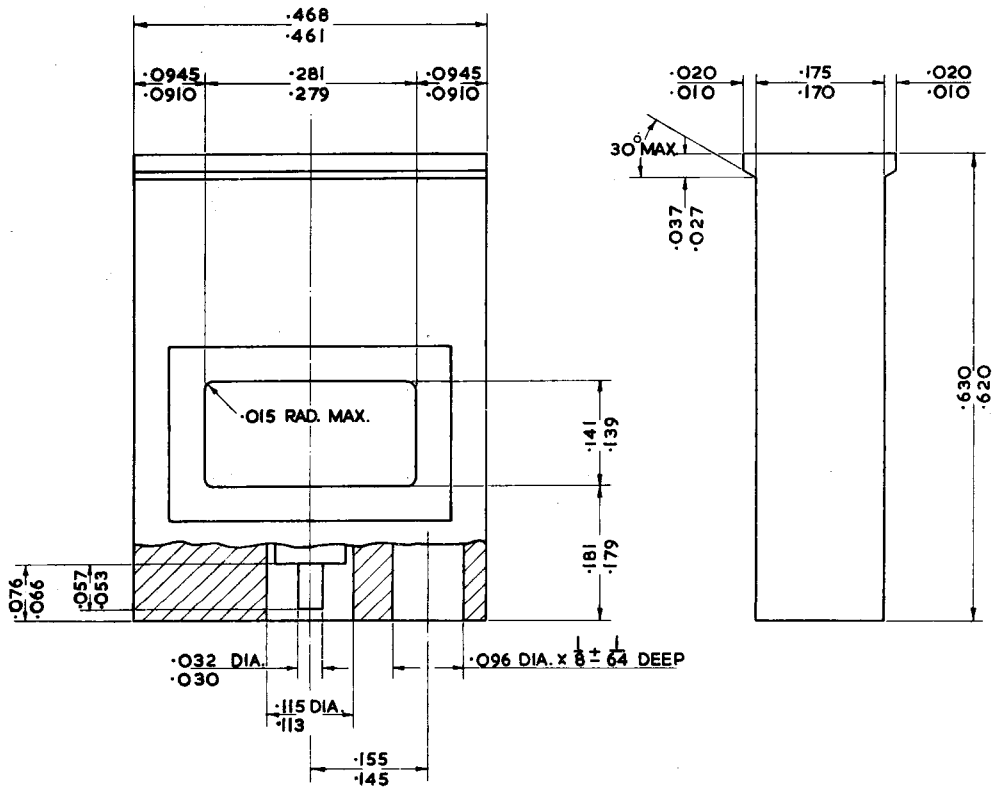
1. All test and standard holders shall conform to RRE Drawing BRR/222727. Test holders should give the same VSWR as the appropriate standard holder within $\pm 2\%$.
2. Crystals shall not be used as standards for measurement of any parameter, but may be used as transfer standards. The standard admittance shall be defined by holders supplied by the Approving Authority. Calibrated crystals will also be supplied for the noise factor test (Note 3).
3. The standard of reference shall be a noise tube type VI9166, assuming a noise level of 16.0dB above thermal for a discharge current of 100 mA. Any approved method of measurement may be used with allowance for experimental error.
4. The standard of reference shall be a RC7K resistor within the range 430-510 ohms, mounted axially in a holder having the same socket dimensions as a CV2391, with lead lengths less than 0.125 inch. The resistance shall be assumed equal to the d.c. value.
5. The limit applied shall be that which is more favourable to the crystal, i.e. a crystal that changes from say 14.0 dB to 16.4 dB is acceptable as is one that changes from say 15.3 dB to 17.3 dB.
6. The crystal diodes for subjecting to this test shall be obtained by either of the following methods:-
 - (a) 100 completed diodes selected at random from the diodes made from each ingot of semiconductor material which are satisfactory after Group B tests.
 - or (b) random slices from each ingot of semiconductor material are subjected to all normal processing and sufficient semiconductor elements, (wafers) are selected at random and assembled to provide 100 completed diodes satisfactory after Group B tests.

The burnout test of 5,000 pulses may be at a level of 0.15 erg r.f. or 0.06 erg d.c. (K1007/5A.2) at the discretion of the diode manufacturer.

If more than 50 diodes (of the 100 above) fail this test the ingot and all diodes subjected to the test shall be rejected.

Crystal diodes from an acceptable ingot which pass this test and are also satisfactory on Group B tests will be accepted for delivery but not for tests subsequent to Group B.
7. These crystal diodes are not hermetically sealed; precautions must therefore be taken to prevent the formation of frost during low temperature tests.
8. The dimensions are as in Issue 2 but with minor amendments.

THIRD ANGLE PROJECTION
DIMENSIONS IN INCHES



FINISH:- BODY- NICKEL PLATE
PIN - SILVER PLATE