MICROWAVE ASSOCIATES, INC.
Type 6276

Microwave Associates INC.
22 CUMMINGTON STREET, BOSTON 15, MASSACHUSETTS

Description: ATR Tube

Rating: Transmitter Peak Power 5KW (Min.)

Dimensions: Per drawing attached

Ref.	Test	Conditions		Min.	Max.
D-2	Qualification Approval:	Required for JAN Marking			
F-6a	Drop:				
F-6b(2)	**Vibration:	F=50;G=10;t=60			
E-4b	Salt Spray Corrosion:	Omit			
F-5g	*Glass Strain:				
---	**Loaded Q:	Note 1	QL:	---	6.5
---	Tuning Susceptance:	Note 2	(B/Yo):	-0.06	+0.06
---	*Equivalent Conductance:	Note 3	(B/Yo):	---	0.1
---	☆Firing Time:	Note 4	t:	---	10 sec
---	Arc Loss:	Note 4		---	0.8 db
---	**High Level Standing Wave:	Note 5	6:	---	1.10
---	Temperature Cycle Test:	Note 6			
---	Temperature Cycle Life Test:	Group B;Note 6	Cycles:	50	---
---	Temperature Cycle End Point:	Firing Time: Note 4	t:	---	10 sec
F-4	Life Test:	Group D;Note 7	t:	1000	--- hrs
F-4b	Life Test End Point:	Arc Loss;Note 4		---	1.0 db
		Equivalent Conductance; Note 3	G/Yo:	---	0.1
		Tuning Susceptance; Note 2	B/Yo:	-0.06	+0.06

Note 1: Loaded Q (QL) is to be measured in a mount, as shown on our diagram and is to be terminated in a matched load. QL is defined as:

$$QL = \frac{Fo \frac{d\,B/Yo}{d\,F}}{2(1/G/Yo)}$$ where Fo=9300Mc.

Note 2: The tube is mounted as in Note 1 and tested at 9300 Mc ±0.1%. The susceptance may be measured by comparing the phase of the reflection with that of a tube that is resonant at the test frequency. The susceptance is given by:

$$B/Yo = \frac{(1+2G/Yo}{2} \tan \frac{4\pi\Delta\ell}{\lambda g} \cong \frac{2(1.1\pi\Delta\ell)}{\lambda g} \text{ (for small } \Delta\ell)$$

Where λg is the guide wavelength and $\Delta\ell$ is the phase shift measured in the same units λg and where G/Yo is assumed to be .05.

Note 3: The tube is mounted as in Note 1. A curve of standing wave versus frequency is plotted around a center value of 9300 Mc. The tube is resonant ($B=0$) at the frequency corresponding to the maximum standing wave. The value of the standing wave is:

$$= \frac{1}{G/Yo} \quad \pm 1$$

therefore

$$G/Yo = \frac{1}{\sigma - 1}$$

If the tube has passed the susceptance test ($B \leq .06$ Yo), the standing wave measured at 9300 Mc is very nearly equal to $\frac{1}{G/Yo} \pm 1$, and may be used to measure G.

Note 4: The tube shall be mounted as in Note 1 and followed by a matched load. With the line energized by pulsed RF power, 4 Kw peak, .45 to .65 us pulse length, 1000 ± 10% repetition rate, 9025 ± 4.0% Mc, the tube shall fire within 10 seconds after application of the power. The power loss in the arc (PL) shall be less than 680 peak watts.

$$\frac{P}{P-PL} = \frac{4000}{4000 - 680} \cong 1.20 \text{ (0.8 db)}$$

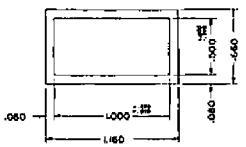
This test shall be performed at least 7 days after pumping and at least 24 hours after any previous discharge.

Note 5: The tube shall be mounted as in Note 4. The RF power shall be greater than 20 Kw peak, the pulse length greater than 1 us, and a repetition rate of 1000 pps. With a load standing wave ratio of less than 1.03, the standing wave produced by the tube shall be less than 1.10 in voltage. This test may be made at low levels by simulating the arc by a metallic short in intimate contact with the inside of the window.

Note 6: Test all tubes only once by exposing to temperature change from room temperature to -40°C to 100°C to room temperature. The temperature may be allowed to come to equilibrium at room temperature in going from -40° to 100°C.

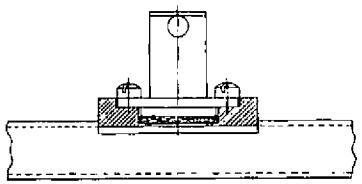
Note 7: The tubes are to be tested in mounts as shown on drawing.

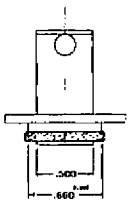
pi = 30 kw (min.) σ = 1.2:1
DuCy = 0.001 F = 9025 ± 4% Mc

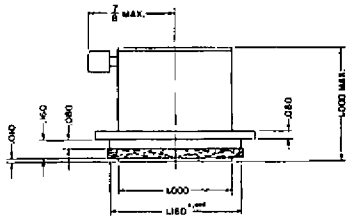


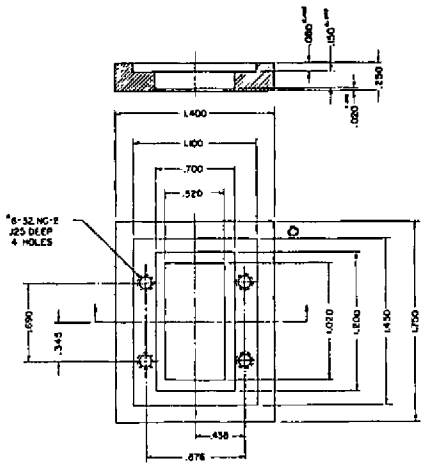
GASKET-.080 THICK WOVEN BRAID
MEASURED UNDER MICROMETER
RATCHET PRESSURE.

TUBE SHOWN BELOW SEATED IN
RG-52/U (1.000 x .500 x .050 WALL)
WAVEGUIDE.

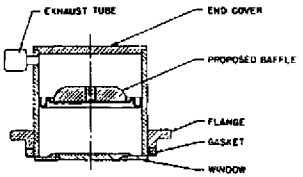




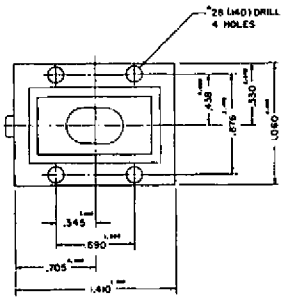




PROPOSED SEAT



TUBE HALF-SECTION



Microwave Associates

SCALE 2:1	
	PROPOSED ATR TUBE TYPE 6276
	DWG. NO. OD-6276