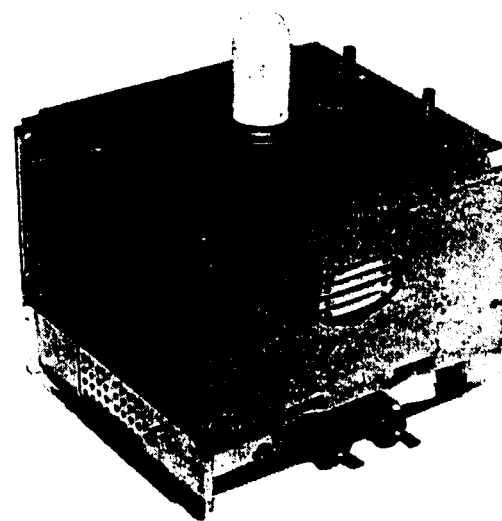


Toshiba 2M164 is a fixed frequency continuous wave magnetron intended for use in microwave heating and cooking appliance. The average output power is 1300 ~ 1600 watts to a matched load in the frequency range from 2440' to 2460 MHz. The tube is a package magnet type and requires forced air cooling. The output is fed either into a rectangular wave guide or into a heating oven directly. This tube has superior features on the suppression of the spurious radiation with the special structure of the output antenna and the integrated filter.



FEATURES

1. Low magnetic leakage flux

The operation of the tube is hardly influenced by other surrounding magnetic materials.

2. Low spurious noise radiation

The integrated filter suppresses spurious noise radiation through filament leads effectively.

3. Stable under the most severe load conditions

With acceptable VSWR up to 4 at any phase, high output power with good heating uniformity is ensured. The load condition with VSWR higher than 4 may be also allowable if it is instantaneous.

- ★ The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of TOSHIBA or others.
- ★ The information contained herein may be changed without prior notice. It is therefore advisable to contact TOSHIBA before proceeding with the design of equipment incorporating this product.

4. High reliability and long life, expectancy

Selected materials and Toshiba's superior manufacturing process with long experience in vacuum tube production ensure long life far exceeding normal life of household and commercial microwave oven.

5. Light and compact

GENERAL DATA

ELECTRICAL:

Frequency (matched load)	2450 \pm 10 MHz
Filament Voltage	4.0 V
Filament Current	20 A
Cold Filament Resistance	0.025 ohms
Anode Potential	Earth
Filament Potential	Negative high voltage

MECHANICAL:

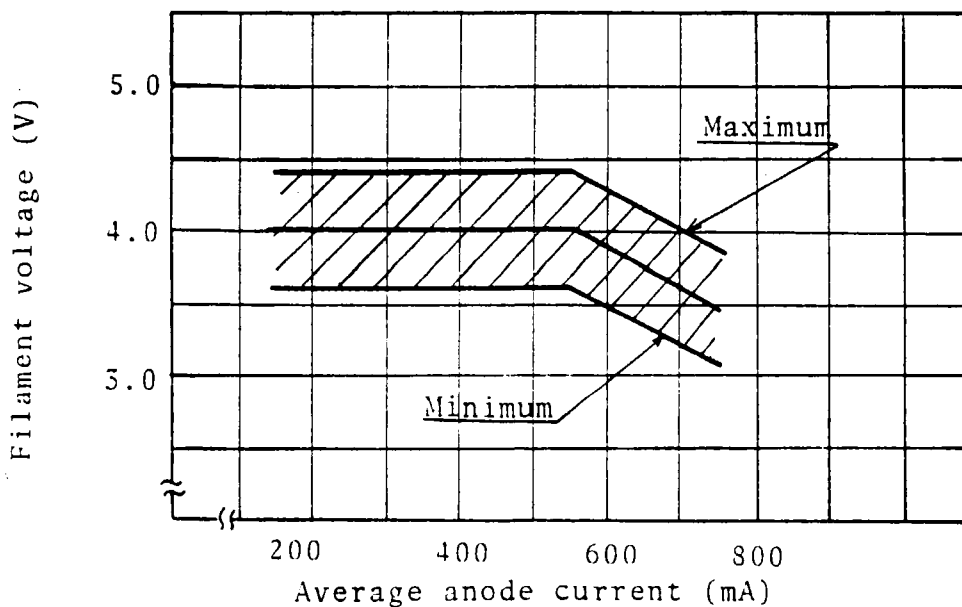
Physical Dimensions	See outline drawing
Terminal Connection	See outline drawing
Mounting Position	Cathode axis vertical
Output Coupling	See attached drawing
Magnetic Field	Ferrite magnet packaged
Cooling	Forced air (Side blow)
Weight (Approx.)	2.5 kg (5.5 lbs)
Type of Cathode	Directly heated thoriated tungsten filament

ABSOLUTE RATINGS

	Minimum	Maximum	
Filament Voltage	Note 1	Note 1	V
Cathode Preheating Time	Note 2	-	sec
Peak Anode Voltage	-	4.0	kV
Average Anode Current	-	750	mAdc
Peak Anode Current	-	2.2	A
Anode Power Input	-	2.8	kW
Load VSWR (Note 3)	-	4	
Anode Temperature (Note 4)	-	150	°C
Seal Temperature (Note 5)	-	180	°C
Case Temperature (Note 4)	-	80	°C

Note 1. Filament voltage should be adjusted according to the following Filament voltage reduction chart.

Filament voltage reduction chart



Note 2. For a full wave rectified with capacitor or a full wave doubler rectified power supply, preheating is necessary as follows.
 Preheating filament voltage: 4.2~5.0 V
 Preheating time: minimum 3 sec

Note 3. The load VSWR larger than 4 may be allowable unless it is locked in such a condition. Permission is required from Toshiba for specific load condition.

Note 4. See outline drawing for measuring point.

Note 5. Temperature of metal to ceramic seal.

TYPICAL OPERATION

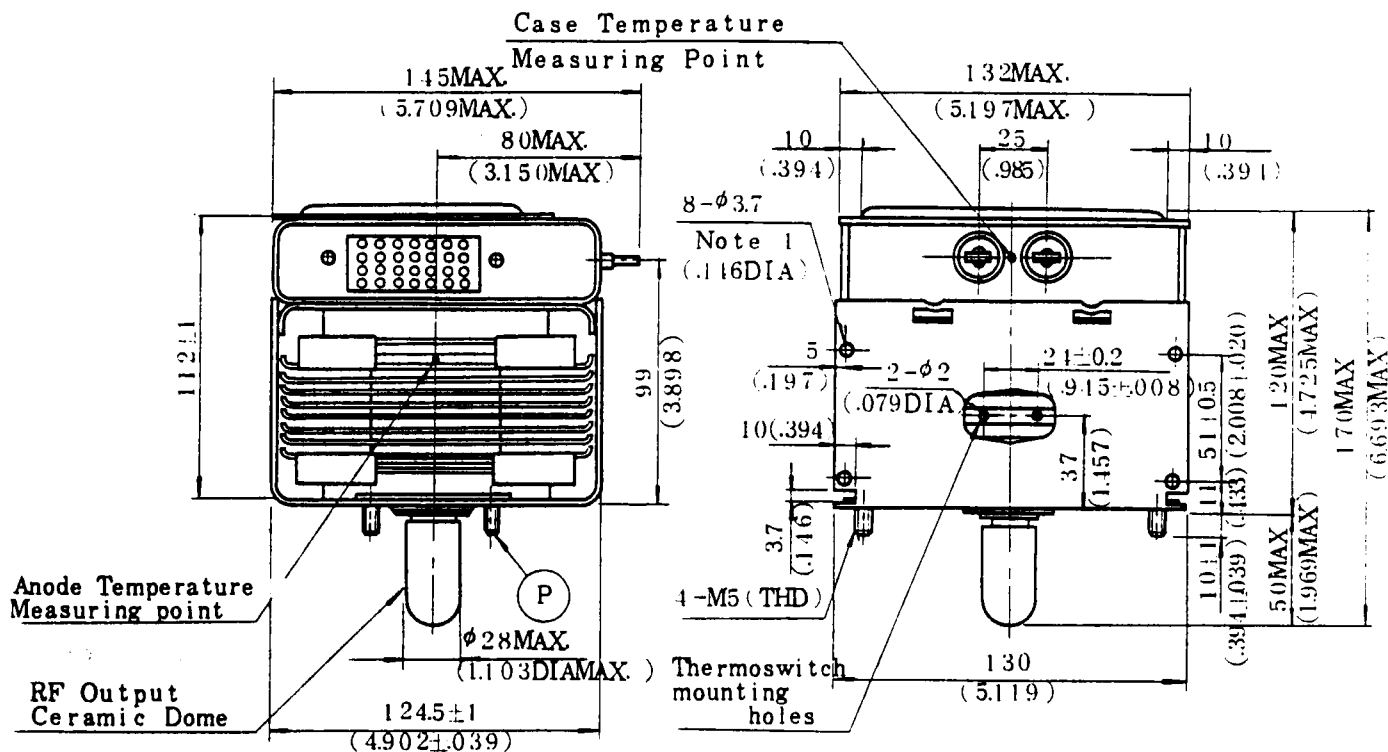
Power Supply Single phase full wave rectified without filter

Frequency	2450	2450	MHz
Filament Voltage (Preheating)	—	Note 2	V
Filament Voltage (Operating)	4.0	3.6	V
Peak Anode Voltage (Note 6)	3.5	3.6	kV
Average Anode Current	550	700	mAdc
Output Power (matched load)	1300	1600	W
Output Power	1000	1300	W
(typical oven with 2 liter water load)			
Cooling Air Flow	1500	2500	ℓ/min
Pressure Drop (Approx.)	70	170	Pa

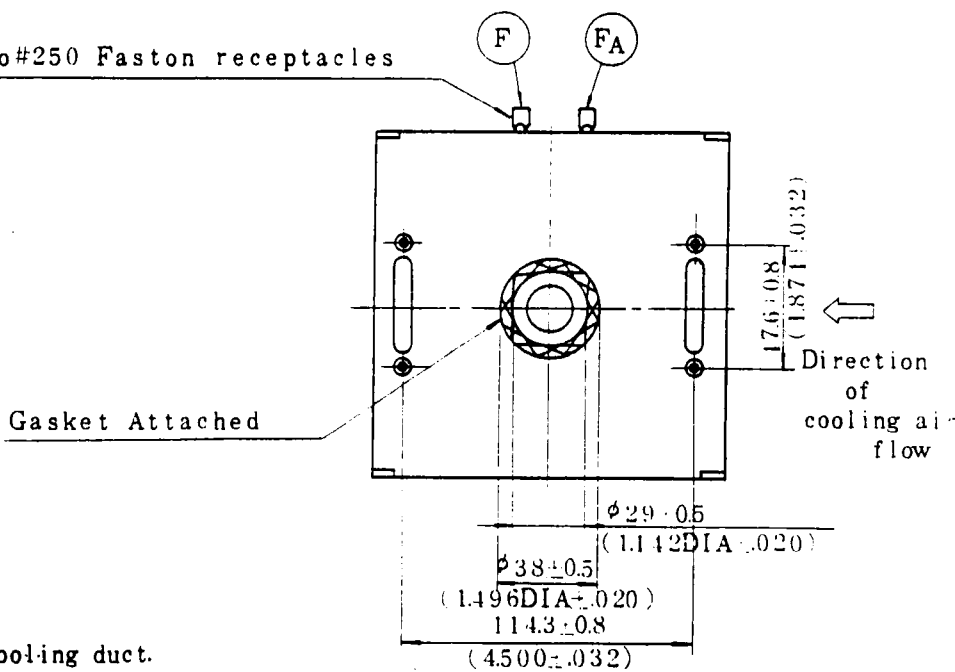
Note 6. This is measured within 15 seconds after applying anode voltage. The standard ambient temperature of the magnetron during this measurement is 25°C. Peak anode voltage goes down with operating time from this value to a lower value due to the temperature coefficient of ferrite magnet.

OUTLINE DRAWING OF 2M164

Unit: mm (inch)

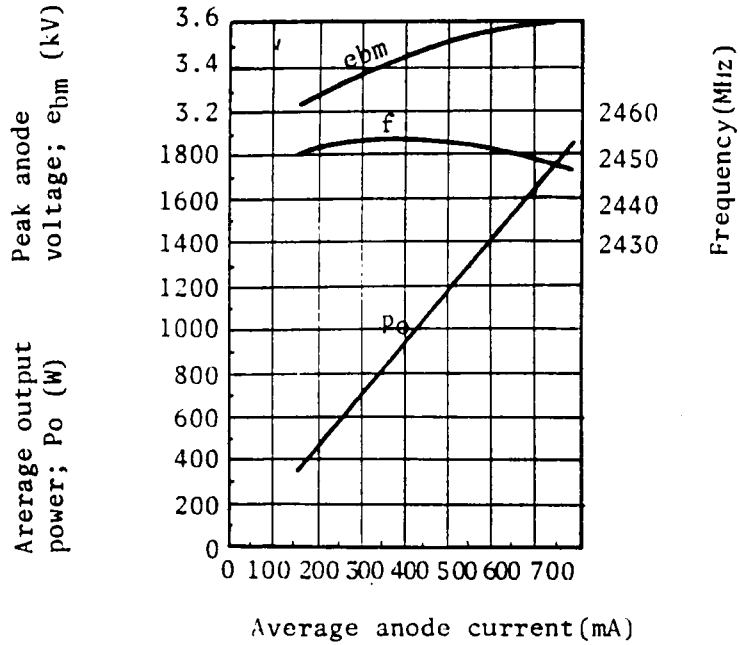


Fit to #250 Faston receptacles



Note 1. Mounting hole for cooling duct.

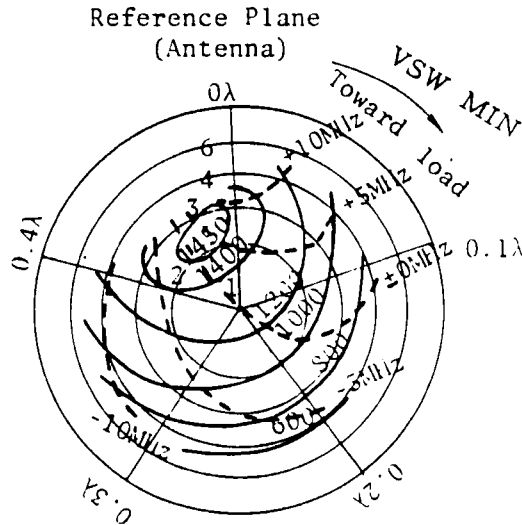
PERFORMANCE CHART



Operating condition

- Anode supply; Single phase full wave rectified without filter
- Filament voltage; Note 1
- Load VSWR; 1.1 max
- This is measured within 15 seconds after applying anode voltage

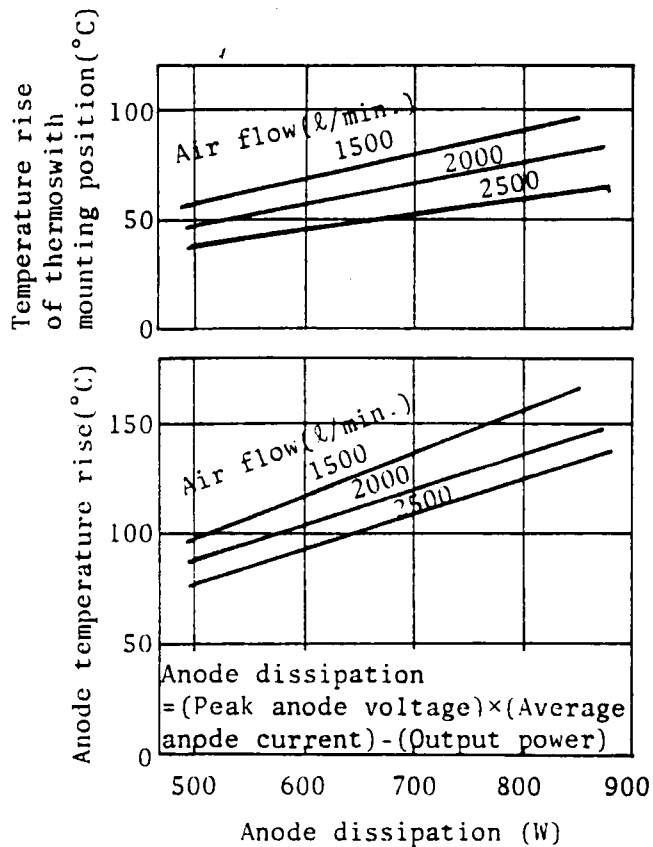
RIEKE DIAGRAM



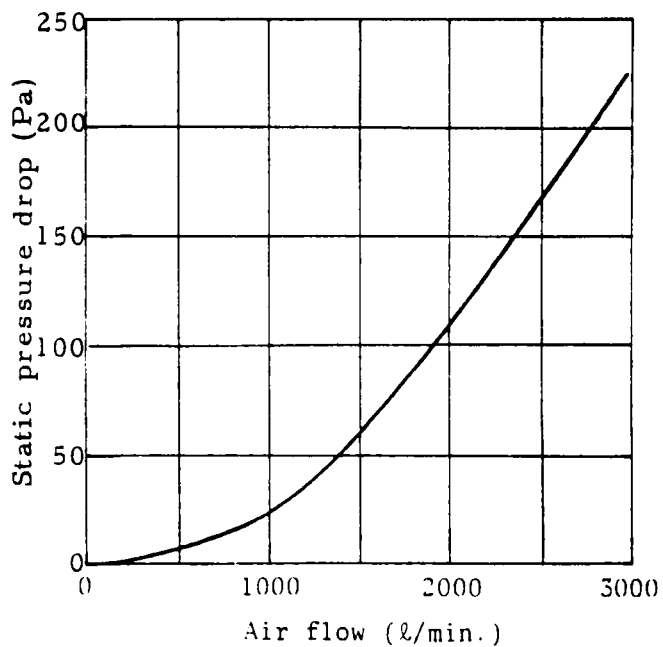
Operating conditions:

- Anode supply; Single phase full wave rectified without filter
- Filament voltage, 4.0 V
- Average anode current, 550 mA (constant)
- Peak anode voltage (matched load); 3.5 kV
- Oscillating frequency (matched load); 2450 MHz

COOLING CHARACTERISTICS



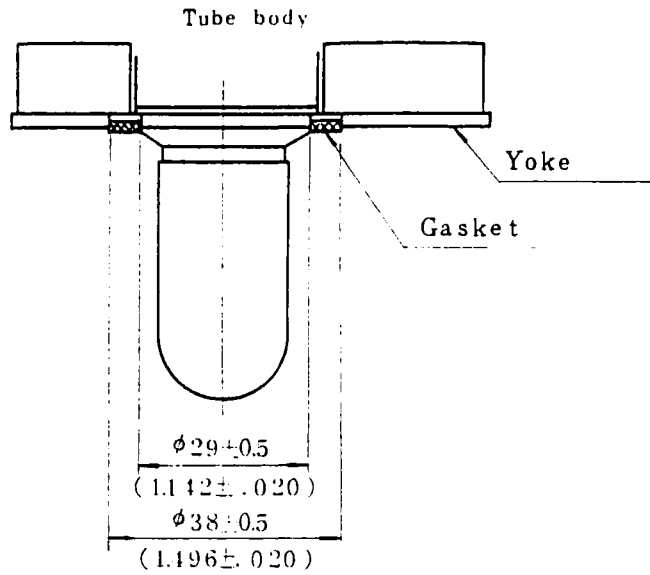
RADIATOR CHARACTERISTICS



Anode dissipation
= (Peak anode voltage) × (Average anode current) - (Output power)

DETAIL OF OUTPUT COUPLING PART

UNIT : mm (inch)



OUTPUT COUPLER

