TOSHIBA Industrial Magnetron 2M164

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 waveguide 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.

(4) High reliability and long life expectancy

Selected materials and 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

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ELECTRICAL:		
Frequency (matched load)	2450±10	MHz
Filament voltage (rms)	4	V
Filament Current (rms)	20	A
Filament cold resistance	0.025	Ω
Anode potential	Earth	
Filament potential	Negative high voltage	
MECHANICAL		
Physical dimensions	See Dimensional Outline	
Terminal connection	See Dimensional Outline	
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
Cathode type	Directly heated thoriated tungsten filament	

ABSOLUTE MAXIMUM RATINGS (1)(2)				
	Min	Max	Unit	
Fimament voltage (pre-heat)	Note 1		V	
Cathode pre-heating time	Note 2		sec	
Peak anode voltage	-	4	kV	
Average anode current	-	750	mA dc	
Peak anode current	-	2.2	A	
Anode power Input	-	2.8	kW	
Load VSWR	-	4	:1	Note 3
Anode temperature	-	150	℃	Note 4
Seal temperature	-	180	℃	Note 5
Case temperature	-	80	℃	Note 4

TYPICAL OPERATION				
	ex.1	ex.2	Unit	
Frequency	2450	2450	MHz	
Filament voltage (pre-heating)	Note 2		V	
Filament voltage (operating)	4	3.6	V	
Peak anode voltage	3.5	3.6	kV	Note 6
Average anode current	550	700	mA dc	
Output power (matdhed load)	1300	1600	W	
Output power	1000	1300	W	
(typical oven with 2 ℓ water load)				
Cooling air flow	1500	2500	ℓ/min	
Presure drop	70	170	Pa	approx

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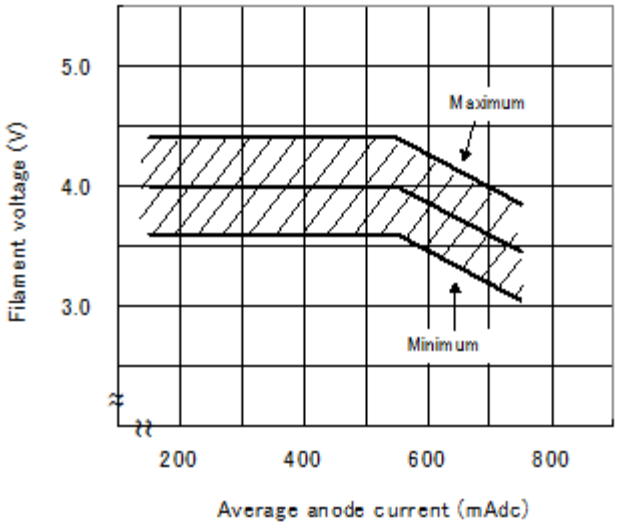
Fig. 1 Filament voltage reduction Chart



(Note 1) Filament voltage should be adjusted according to the following 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 seconds

(Note 3) The load VSWR larger than 4 may be allowable unless it is locked in such a condition.

(Note 4) See outline drawing for measuring point.

(Note 5) Temperature of metal to ceramic seal.

(Note 6) This is measured within 15 seconds after applying anode voltage. The standard ambient temperature of the magnetron during this measurement is 25 0C. Peak anode voltage goes down with operating time from this value to a lower value due to the temperature coefficient of ferrite magnet.

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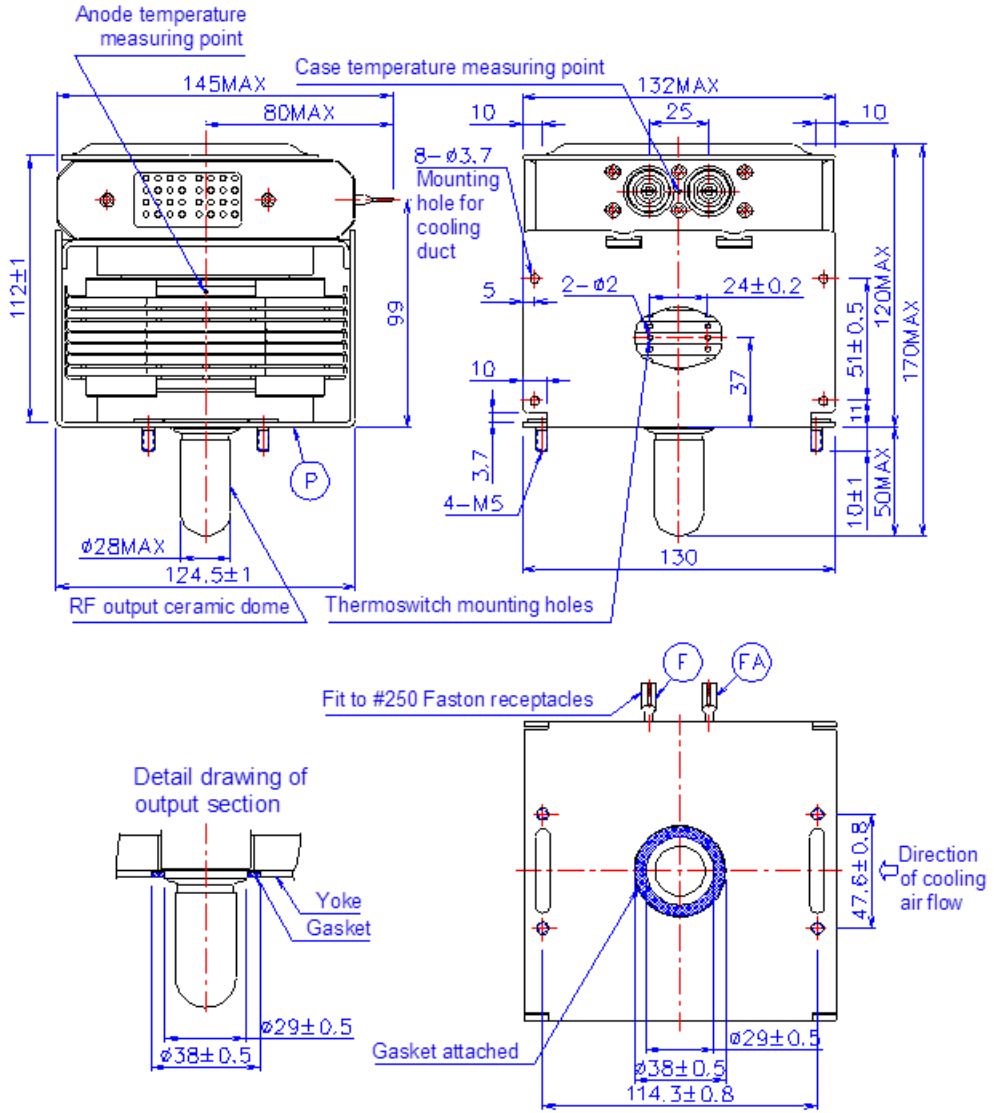
Fig. 2 Outline Drawing



Unit : mm

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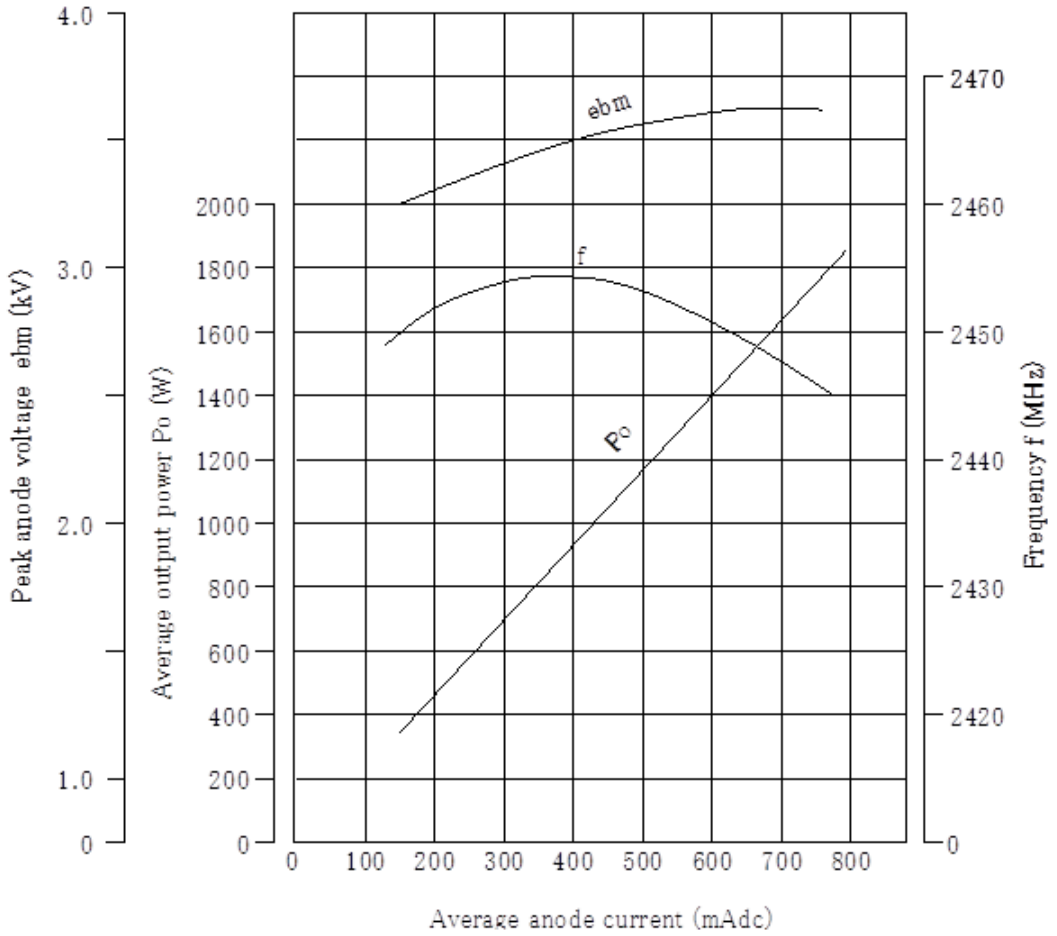
Fig. 3 Performance Chart



Operating conditions:
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 the anode voltage.

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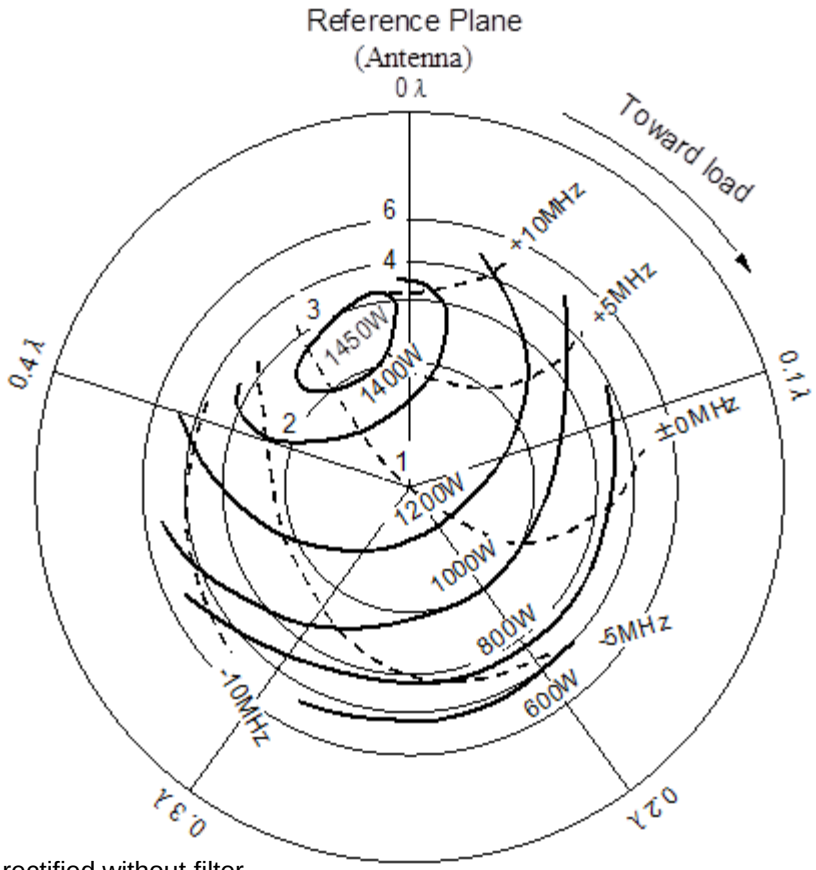
Fig. 4 Rieke Diagram



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

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Fig. 5 Cooling Characteristic

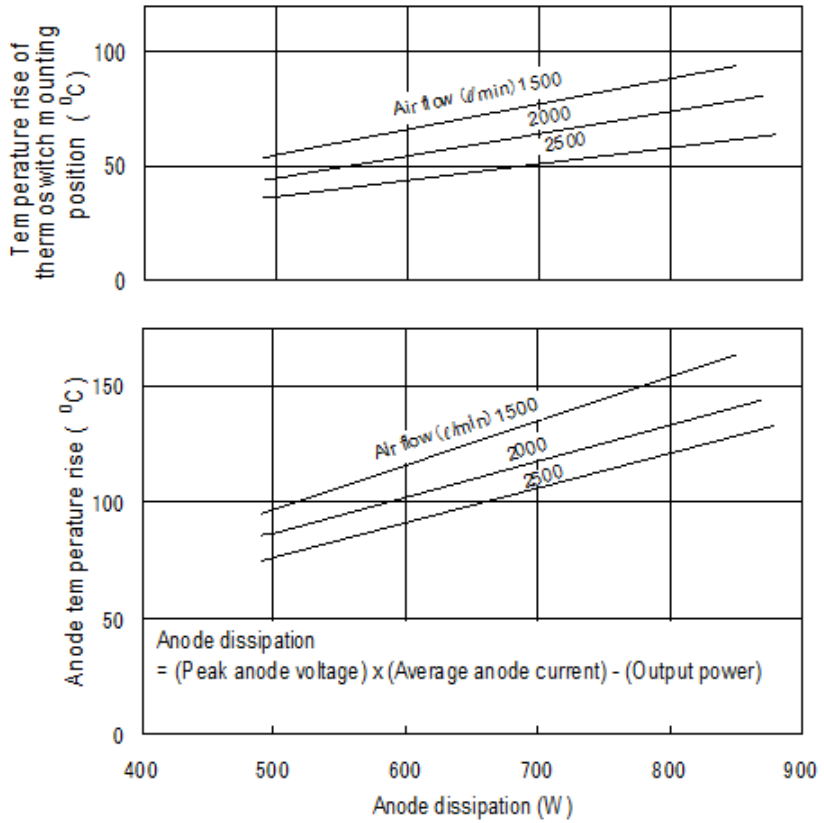

Fig. 6 Radiator Characteristic

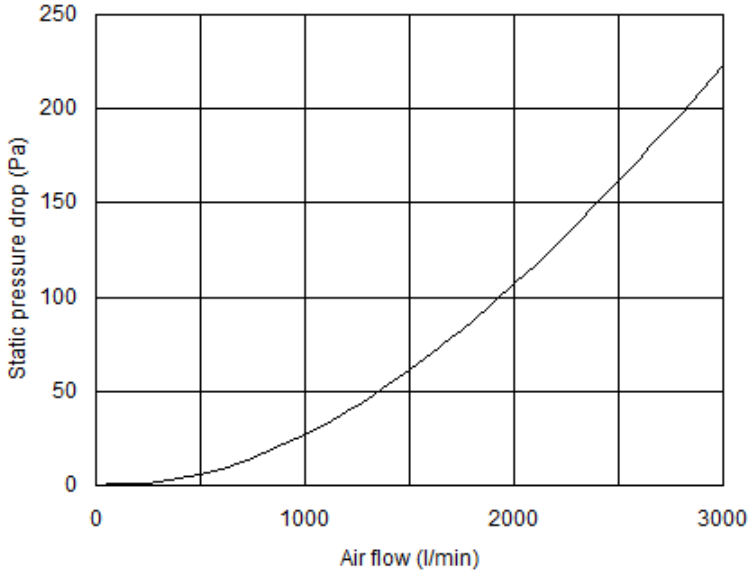

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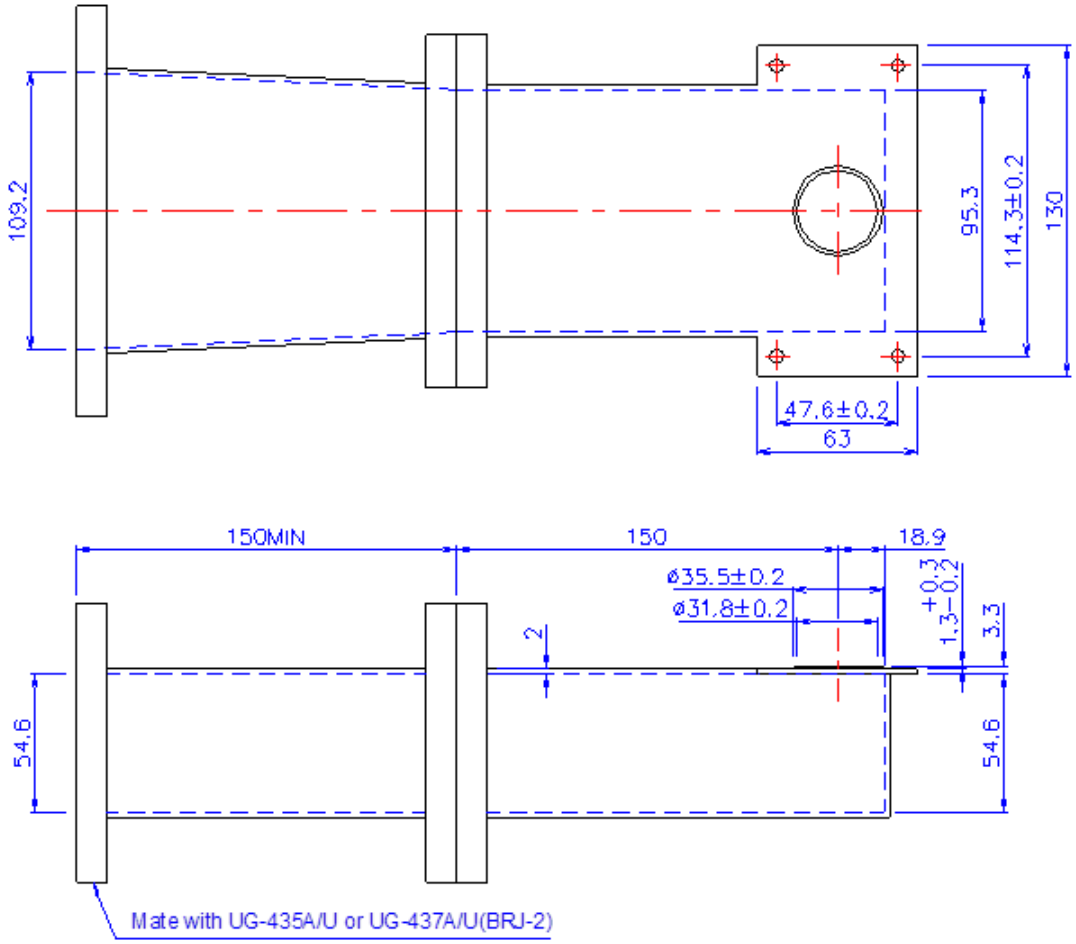
Fig. 7 Output Coupler

Unit : mm



Note (1) This drawing is to show the main dimensions of standard output coupler suitable for Toshiba 2M164.
(2) This is not an accessory part nor optional part.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