This specification is based on the testing methods for continuous wave magnetrons ED-1501 set by the Electronic Industries Association of Japan (old EIAJ).

| Continuous Wave Magnetron | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESCRIPTION | Magnetron (Fixed Frequency, Integral Magnet, Forced Air Cooled) | | | | | | | | | | | |
| FUNCTION | 2450 MHz band continuous wave oscillation | | | | | | | | | | | |
| OUTER DIMENSIONS | See outline drawing | | | | | | | | | | | |
| ABSOLUTE MAXIMUM RATING | Term | Ef | tk | ebm (2) | Ib | ibm (10) | Pi | σL | Tp (3) | Tcon (4) | Tstorage | Tant (5) |
| | Unit | V | s | kV | mAdc | A | kW | - | ℃ | ℃ | ℃ | ℃ |
| | Max | 3.60 | - | 4.85 | 380 | 1.3 | 1.7 | 4 | 300 | 120 | 60 | 360 |
| | Min | 2.70 | 0 | - | - | - | - | - | - | - | -30 | |
| STANDARD TEST CONDITION: (1)(2)(3) | | 3.15 | 5 | - | 330 | - | - | 1.1Max | - | - | - | - |

TEST SPECIFICATIONS

| | TEST TERM (6) | | TEST METHOD (old EIAJ ED-1501) | TEST CONDITION | SYMBOL | NOMINAL | Limit Min | Limit Max | Unit |
|---|---|---|---|---|---|---|---|---|---|
| ** | Vibration | | 5.4.1 | | - | - | - | - | - |
| | Breakdown Voltage | | 4.2 | Et=10kVdc (11) | - | - | - | - | - |
| | Insulation | | - | Et=1kVdc (7) | - | - | - | - | - |
| * | Cold Start Voltage Transient | | - | (8) | - | - | - | 10 | kV |
| | Filament Current | | 4.1.1 | tk=120s | If | 11.0 | 9.0 | 13.0 | A |
| | Peak Anode Voltage | | 4.3.1 | (9) | ebm | 4.40 | 4.20 | 4.60 | kV |
| | Average Output Power (1) | | 4.3.3.1 | (9) | Po | 1080 | 1030 | 1130 | W |
| * | Average Output Power (2) | | 4.3.3.2 | σL=4, Power Min (9) | Po | - | 580 | - | W |
| | Frequency | | 4.3.4 | (9) | f | 2465 | 2455 | 2475 | MHz |
| * | Stability/Moding | | 4.3.11.2 | σL=2,3,4 | - | - | - | - | - |
| * | Stability/Runaway | | 4.3.11.1 | σL=6, t=30s | - | - | - | - | - |
| * | Pulling Factor | | 4.3.6 | σL=2 | fpl | - | - | 28 | MHz |
| * | Sink Phase | | 4.3.7 | σL=2 | λsink /λg | 0.24 | - | - | - |
| | Power Leakage | | 4.3.15 | σL=3 | $S_l$ | - | - | 10 | $W/m^2$ |
| ** | Life Test | | 4.5.1 | (12) | t | - | 500 | - | h |
| ** | Life Test End Point | Average output power (1) | 4.3.3.1 | (9) | Po | - | 820 | - | W |
| | | Stability/ Moding | 4.3.11.2 | σL=2,3,4 | - | - | - | - | - |
| | | Stability/ Runaway | 4.3.11.1 | σL=6, t=30s | - | - | - | - | - |

Note (1) The tube shall be mounted on the output coupler (containing tapered wave-guide) shown in the attached drawing (Page-4) and cooled by forced air of 800 L/min.
Single phase full wave rectifier without filter shall be used for power supply.
The diagram of the test equipment is shown in the attached drawing (Page-3).

(2) During normal oscillation.

(3) The points for measuring anode temperature is shown in the outline drawing.
Maximum anode temperature for normal condition (with load in the cavity) should be 250 ℃

(4) The point for measuring feed through capacitor temperature is shown in the outline drawing.

(5) Tant means Ttip and Tseal which is the following parts of magnetron antenna.
Ttip : Temperature of tip off portion of exhaust pipe of the tube
Tseal : Temperature of ceramic-to-metal seal position of the tube
Maximum allowable build-up curve of seal temperature is shown in the attached drawing (Page-6).

* Basically, when Tant becomes higher, magnetron life characteristic becomes shorter and there is a tendency for arcing to occur easily.
Considering magnetron life characteristics, lower Tant is recommended.

(6) Tests shall be classified as follows:

| Mark | Class |
|---|---|
| None | Production test |
| * | Design test |
| ** | Type approval test |

The Mark is placed on the left of each test item, for instance, **Vibration

(7) See the attached drawing (Page-6, Insulation).

(8) Measurement shall be conducted by standard oven which has a single phase half wave doubler power supply without filter, where no load voltage of the transformer shall be less than 2.4 kV rms.
The voltage transient just before start of oscillation shall be measured.

(9) Measurement shall be conducted within 15 seconds after anode power is turned on.
Magnetron is kept in the constant ambient temperature for more than 4 hours before testing.
Standard ambient temperature is 25 °C. Correction factor of peak anode voltage (ebm) and output power (Po) vs. temperature is shown in the attached drawing (Page-6).

(10) For each oven model, both microwave oven manufacturer and Toshiba Hokuto should evaluate and agree on the stability characteristics in the design stage of the oven.

(11) Test equipment should have a protect resistance specified in the table connecting in series to the products under the test. Leakage current should not exceed the limit specified in the table during the test of 10 seconds.

| Leakage current | Protect resistance |
|---|---|
| 100mA | 200k-300kΩ |

Connection of a magnetron should be as follows.
Anode : Plus
Cathode (terminal): Minus

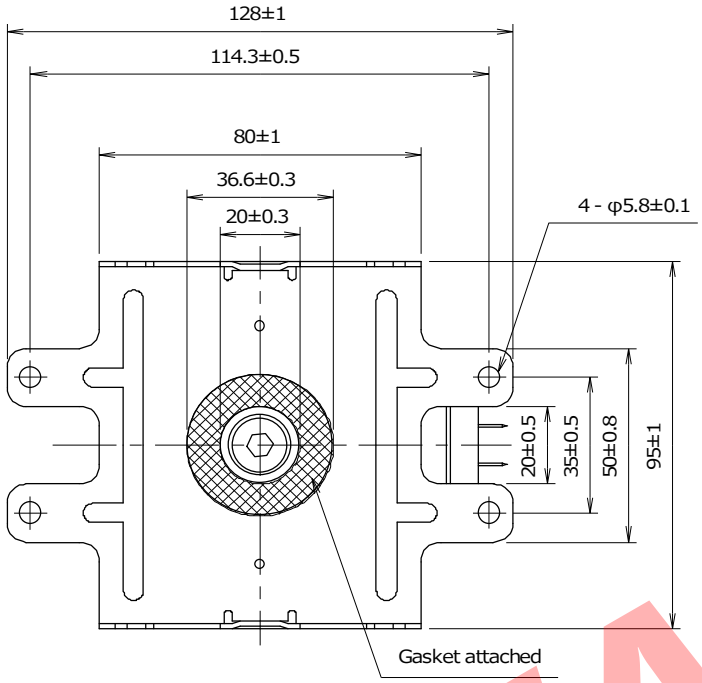
(12) The tube shall not appreciably be damaged in the following abnormal test.
Condition:

| Anode temperature(Tp) | Cycle(Time) | Corresponding operating condition |
|---|---|---|
| 350℃MAX | 10 cycles (15minutes / cycle) | No load |

* Basically, when Tp becomes higher, magnetron life characteristic becomes shorter.
Considering magnetron life characteristics, lower Tp is recommended.

OUTLINE DRAWING

Unit : mm




Note (1) Temperature to be measured at the outlet side air flow.
(2) Radiator number : 6 pcs.
(3) Ceramic colors are as follows. Pink, Violet, White
(4) Capacitor types are as follows.