TOSHIBA

TO : Luxtem Co.

ACCEPTANCE SIGNATURE
We shall regard this specification was accepted by you, if we progressed one year (from issued date) without your acceptance signature.

SPECIFICATION

FOR
MAGNETRON
E3327

SPECIFICATION NUMBER : E200012-L935 October 22, 2020
REVISION STATUS :

H. Tamura

GROUP MANAGER
MAGNETRON QUALITY GROUP
MAGNETRON DIVISION

S. Sugano

GROUP MANAGER
MAGNETRON PLANNING & APPLICATION ENGINEERING
GROUP MAGNETRON DIVISION

1. Description

Toshiba E3327 type Magnetron (Fixed frequency,2460MHz band continuous wave oscillation, Packaged magnet with sub-electromagnet and Forced air/water cooling)

2. Used for

Industrial microwave heating

3. General Characteristics

(1) Electrical

Frequency	2460 MHz typical
Filament voltage	5 Vac typical
Filament current	33 A typical
Cold filament resistance	0.023 ohms
Pre－heat time	10 seconds

(2) Mechanical

Net weight	4.3kg approximately
Mounting position	Any
Cooling	
Anode	2.5 litter/minute Water
Output antenna	60 litter/minute Forced air
Filter box	120 litter/minute Forced air
RF output connector	See Figure 3
Outer dimensions	See outline (Figure 1&2) drawing

4. Absolute maximum ratings (Note A1, A2)

	Items	Minimum	Maximum	Unit	Note
(1)	Filament voltage (preheating)	4.5	5.5	Vac	
(2)	Filament voltage (operating)	Vn－0. 2	Vn＋0. 2	Vac	A3
(3)	Filament surge current	－	85	A	
(4)	Cathode pre-heat time	10	－	seconds	
(5)	Peak anode voltage	－	8	kV	
(6)	Peak anode surge voltage	－	10 (0.1 s max.)	kV	
(7)	Peak anode current	－	1400	mA	A4
(8)	Mean anode current	100	1150	mA	A4
(9)	Mean anode input power	－	9	kW	
(10)	Electromagnet coil current (absolute value of summation of individual electromagnet coil current)	－	5	Adc	
(11)	Voltage between coil and tube	－	48	Vdc	A5
(12)	Load VSWR	－	4:1		
(13)	Storage relative humidity	－	95	%	A5,A6
(14)	Water pressure	－	0.49	MPa	
(15)	Operating temperature (ambient)	－	+60	℃	
(16)	Storage temperature	-30	+60	℃	A6
(17)	Anode temperature(Ref. outline)	－	+85	℃	
(18)	Ceramic seal portion temperature	－	+220	℃	
(19)	Cooling water outlet temperature				
	aa) Closed cooling circuit	－	+75	℃	
	bb) Open cooling circuit	－	+65	℃	
(20)	Inlet temperature of cooling air to Filter Box	－	+50	℃	

Notes

A1 Note of the absolute maximum ratings should be exceeded under any circumstances even for an instant or transient ,since to do so may cause damage to the magnetron.
A combination of the maximum rating conditions can not be guaranteed.
Life of magnetron is strongly affected by the operating conditions.
E3327 should be operated under the typical operating conditions noted on T/D.
Care should be taken for negative factors affecting the life of magnetron noted on T/D.

A2 All the voltage parameters are in reference to the cathode voltage.

A3 “Vn” is nominal filament voltage for mean anode current. (Reference figure 4)
Filament Voltage has to be immediately reduced after applying the anode current, in accordance with figure 4.

A4 The anode current ripple is as follows.

$$\frac{\text{Peak anode current max.} - \text{Peak anode current min.}}{\text{Mean anode current}}$$

less than 0.3.

A5 No drench condition.

A6 On the condition that filament voltage is off.

5. Test specifications (Note B1, B2, and B3)

		Items	Minimum	Maximum	Unit	Note
*	(1)	Filament current	30	35	Aac	B4
	(2)	Electromagnet current	-2	0	Adc	
	(3)	Peak anode current	-	1200	mA	
	(4)	Mean output power(1)	4.3	-	kW	B5
	(5)	Mean output power(2)	5.5	-	kW	B6
	(6)	Frequency	2450	2470	MHz	B5
	(7)	Stability(1)	-	-		B7
	(8)	Stability(2)	-	-		B8
**	(9)	Life test	500	-	hrs	
**	(10)	Life test end point				
		Mean output power(2)	4.4	-	kW	B6
		Frequency	2440	2480	MHz	B5
**	(11)	Environmental				
		Storage temperature	-	-		B9
		Vibration	-	-		B10
		Shock	-	-		B11

Notes

B1 This specification is based on the Testing Methods for Continuous Wave Magnetrons ED-1501(publication, March 1991) set by the Standard of Electronic Industries Association of Japan(EIAJ).

B2 The production tests are signified by on mark. The AQL of the tests signified by mark “＊” shall be 6.5% inspection level S3. The type approval tests are signified by mark “＊＊” and are intended for determining if the standard design complies with the given specifications.

B3 All the voltage parameters are in reference to the cathode voltage.

Notes continued

B4 Test conditions are as follows.

1) Filament voltage＝5 Vac
2) Cathode pre－heat time＝10 sec.
3) Anode voltage is off.

B5 Measurement shall be conducted after passing 10 minutes from the time when anode power is turned on. Test conditions are as follows.

1) Filament Voltage＝0.5 Vac
2) Load VSWR＝1.1：1 max.
3) Mean anode current＝950 mA.
4) Electromagnet current is adjusted so as to reach 7.2kV peak anode voltage / 950 mA mean anode current operating condition.

B6 Measurement shall be conducted after passing 10 minutes from the time when anode power is turned on. Test condition are as follows.

1) Filament voltage＝0 V
2) 2.5：1 Load VSWR and at sink phase
3) Mean anode current＝1150 mA.
4) Electromagnet current is adjusted so as to reach 7.2kV peak anode voltage / 1150 mA mean anode current operating condition.

B7 Measurement shall be conducted after passing 10 minutes from the time when anode power is turned on. Magnetron characteristics such as Mean output power (1), (2) or Frequency should not be abnormally changed by this test. Stability shall be tested under every VSWR value of 1.5, 2.0, 2.5, 3.0 and 4.0 (over all phase). Conditions are as follows.

1) Filament voltage＝0.5 Vac
2) Mean anode current is 950 mA when Load VSWR is 1.1：1 max.
3) Electromagnet current is adjusted so as to reach 7.2kV peak anode voltage / 950 mA mean anode current operating condition.

B8 Measurement shall be conducted after passing 10 minutes from the time when anode power is turned on. Magnetron characteristics such as Mean output power(1),(2) or Frequency should not be abnormally changed by this test. Stability shall be tested under VSWR value of 4.0 (at anti-sink phase). Conditions are as follows.

1) Filament voltage=0.5 Vac
2) Mean anode current is 950 mA when Load VSWR is 1.1：1 max.
3) Electromagnet current is adjusted so as to reach 7.2kV peak anode voltage / 950 mA mean anode current operating condition.

Notes continued

B9 The values of Filament current, and mean output power (2) should not abnormally change after the environment test. The environment test condition is as follows.

1) Filament voltage : 0 V
2) Temperature : －30℃ to ＋60 ℃
3) Time and cycle －30℃ : 1 hour
＋60℃ : 1 hour
cycle : 42 cycle

B10 The values of Filament current and Mean output power(2) should not abnormally change after the vibration test. The vibration test condition is as follows.

1) Filament voltage : 0 V
2) Frequency : 25 ± 2Hz
3) Double amplitude : 2 mm ± 10%
4) Time : each 3 minutes

B11 The values of Filament current and Mean output power(2) should not abnormally change after the shock test. The shock test condition is as follows.

1) Filament voltage : 0 V
2) Shock : 98m/s^2 (10G)
3) Acceleration period : 11 ms
4) The trapezoidal shock pulse configuration and its tolerance limits is according with the MIL－STD－810D figure 516.3－5.

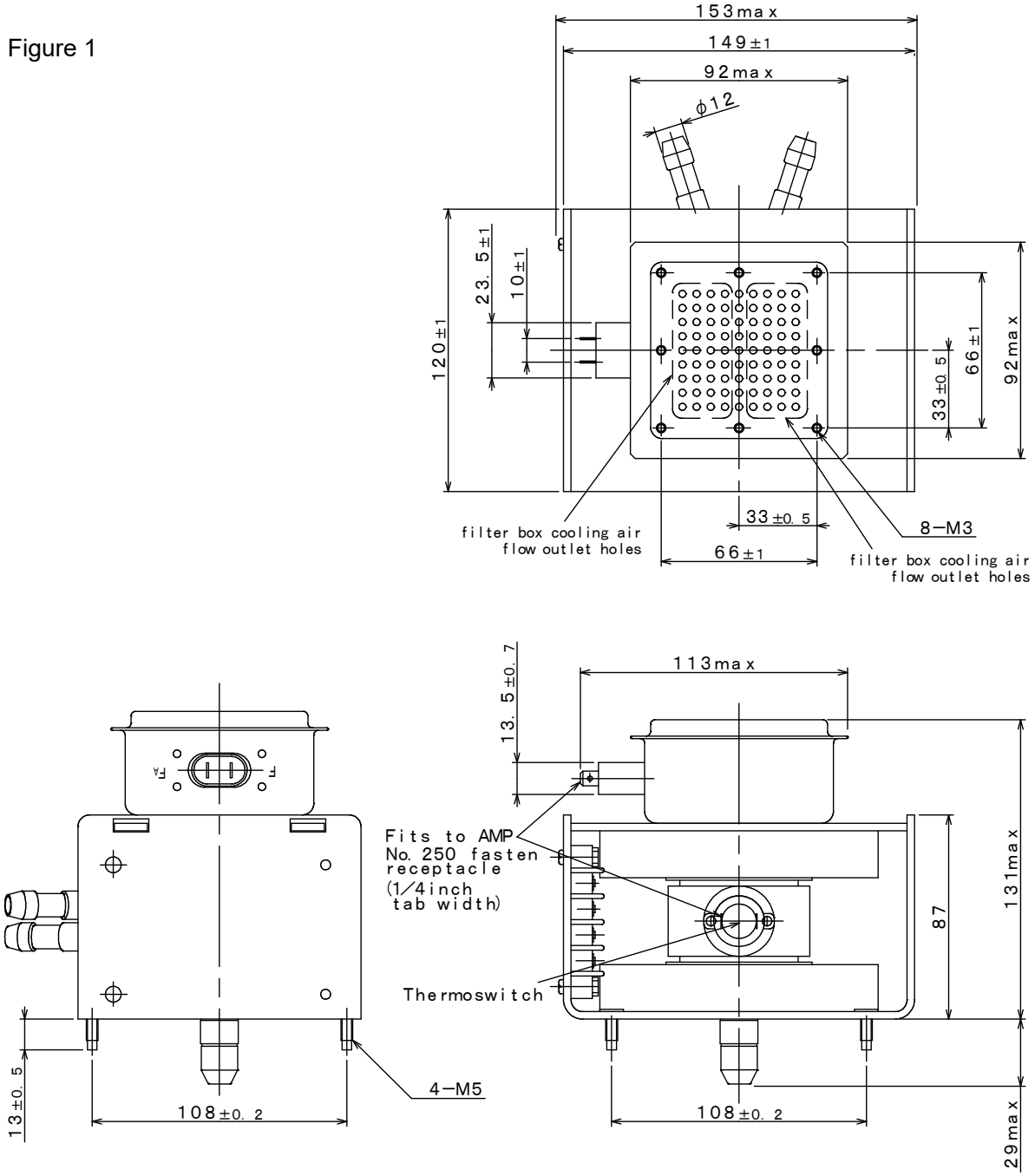
6. Thermoswitch

(1) Rated voltage		125 Vac
(2) Rated current		15 A
(3) Operating temperature	ON	60±10℃
	OFF	80±5℃
(4) Durability for on/off operation		10,000 times(Min.) / rated operation
(5) Breakdown voltage		1500 Vac/1 minute
(6) Thermal endurance		150℃
(7) Fasten tab		#250

7. Outline drawing

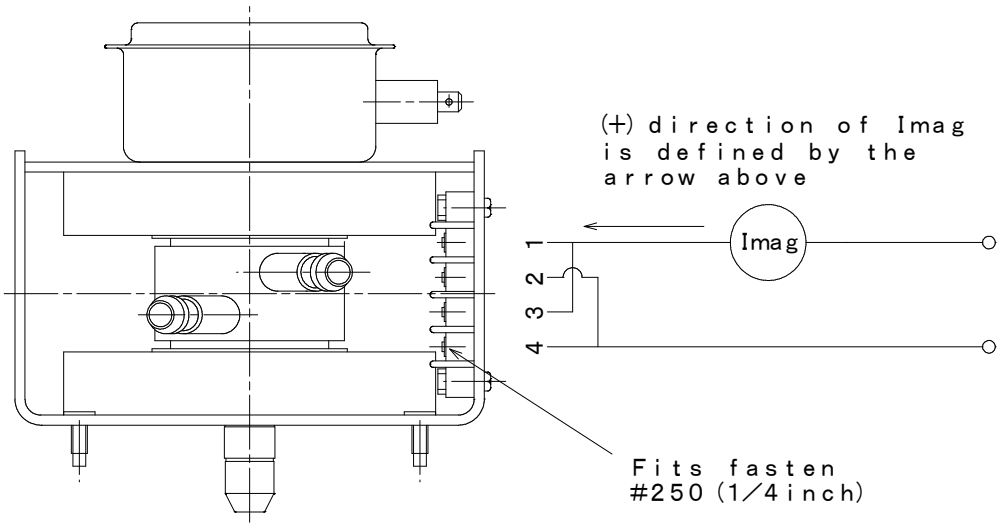
Unit : mm

Figure 1



8. Wiring diagram

Figure 2



10. Optimum filament voltage vs. Average anode current

Figure 4