New Product Bulletin

Ku-band 60kW Magnetron

M 1 9 1 0

M1910 is a mechanically tunable frequency pulsed type Ku-band magnetron; designed to operate in the frequency range of 16.1 GHz to 16.7 GHz with a peak output power of 60kW.

It is a waveguide output type and is forced air cooled. A permanent magnet is packaged as part of the magnetron.

GENERAL CHARACTERISTICS

----ELECTRICAL----		
Heater voltage	(note 1).	12.5 V
Heater current		2.5 A
Minimum preheat time		180 sec
----MECHANICAL----		
Dimensions		See outline drawing
Net weight		2.6 kg approximately
Mounting position		Any
Cooling		Forced air.
Output		WR62 waveguide
Output coupling		UG-541/U

ABSOLUTE MAXIMUM RATINGS

These ratings cannot necessarily be used simultaneously, and no individual ratings should be exceeded.

	Min	Max	Units
Heater voltage	—	14	V
Heater starting current (peak)	—	10	A
Cathode preheating time	180	—	sec
Peak anode voltage	—	18	kV
Peak anode current	11	18	A
Input power (peak)	—	288	kW
Input power (average)	—	300	W
Rate of rise of voltage pulse (note 6)	—	160	kV/μs
Duty cycle	—	0.001	—
Pulse duration	0.15	2.5	μs
Anode temperature	-65	160	℃
Cathode terminal temperature	-65	175	℃
V.S.W.R at load	—	1.5:1	—
Pressurizing of output circuit	0.05	0.41	MPa(abs)
	〔 0.5	4.2	kg/cm^2(abs) 〕

TEST CONDITIONS AND LIMITS

The tube is tested to comply with the following electrical specification:

Test conditions

Heater voltage (preheat)	12.5	V
Heater voltage (for test)	9.1±10%	V
Anode current (average)	8.5	mA
Duty cycle	0.0006	
Pulse duration	0.2±20%	μs
V.S.W.R. at the output coupler	1.05:1	
Rate of rise of voltage pulse (note 6)	160max	kV/μs
Pressurizing of output circuit	0.15～0.2	MPa
	〔 1.5～2	kg/cm^2〕

Limits

	Min	Max	
Anode voltage (peak) (note 3)	15	18	kV
Output power (average) (note 3)	36	—	W
Frequency	16080	16720	MHz
R.F. bandwidth at 1/4 power (note 3,5)	—	1.9/tpc	MHz
Minor lobes (note 3,5)	9	—	dB
Stability (note 2,3,4)	—	0.25	%
Heater current Ef=12.5V, tk=180sec min	2.2	2.8	A

LIFE TEST

Life Test conditions
Under the test conditions specified above.

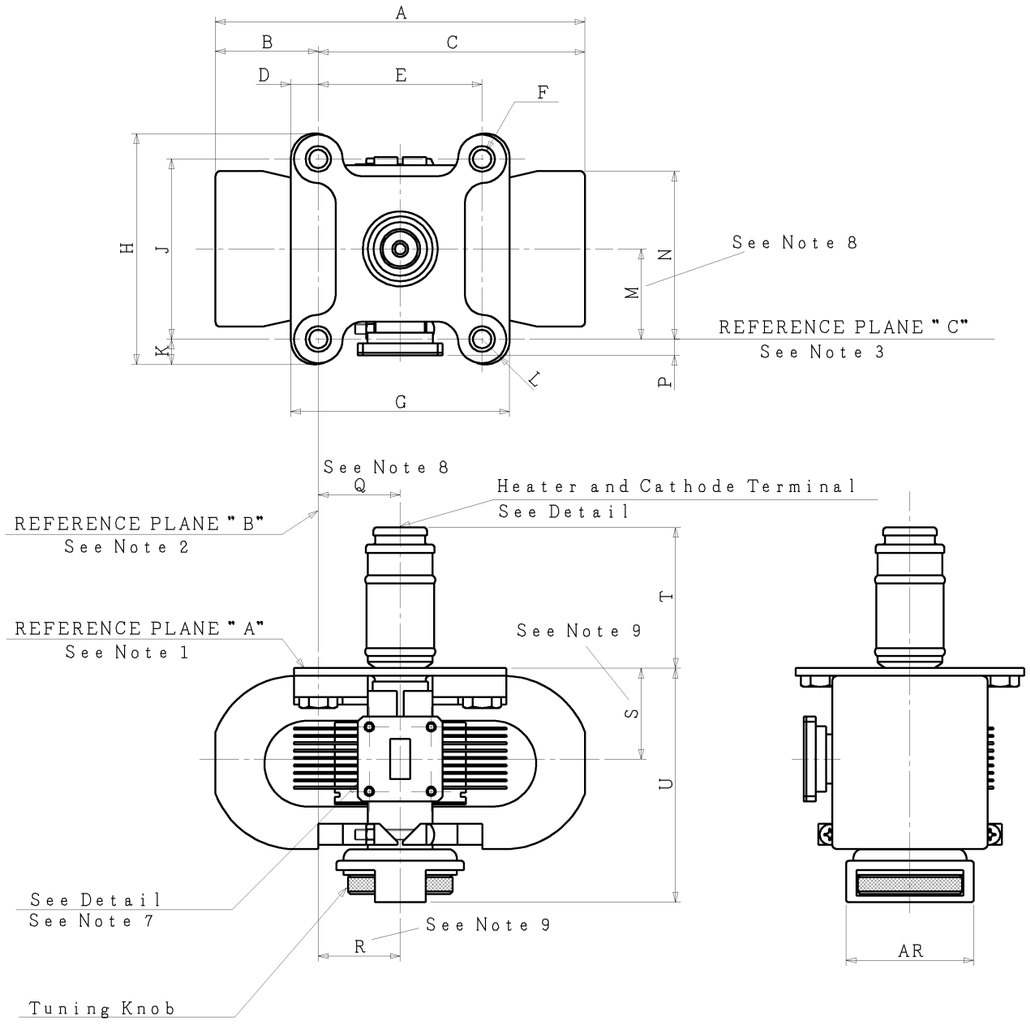
The tube is deemed to have reached end of life when it fails to satisfy the following:

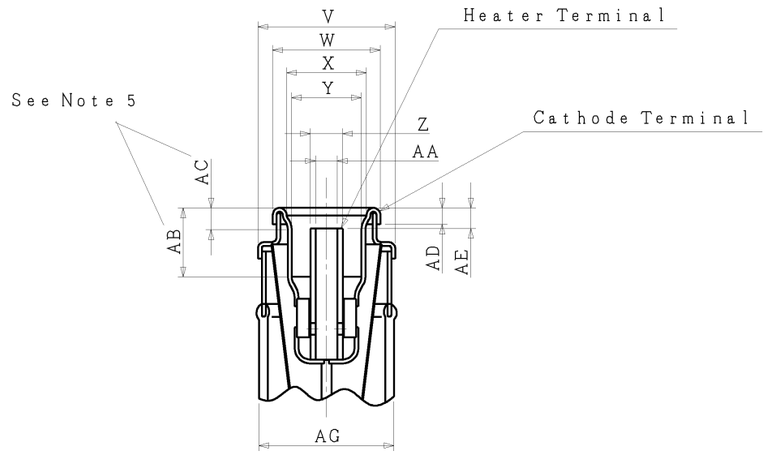
End of Life Criteria	Min	Max	
Output power (average) (note 3)	29	—	W
R.F. bandwidth at 1/4 power (note 3,5)	—	2.5/tpc	MHz
Stability (note 2,3,4)	—	1	%

NOTE:

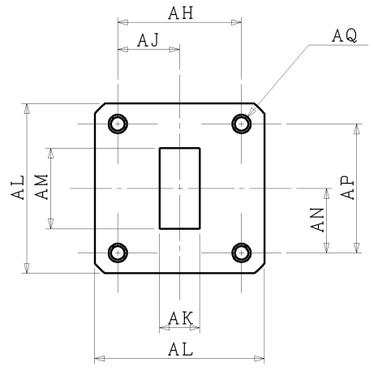
1. With no anode input power.
   During high voltage operation it is essential to operate the heater according to the following schedule:
   Heater voltage(for test) = 12.5 - 0.0232×Pi volts
   Where Pi = average input power in watts.
   The magnetron heater shall be protected against arcing by use of a minimum capacitance of 4000pF shunted across the heater directly at the terminals.
2. Pulses are defined as missing when the r.f. energy level is less than 70% of the normal energy level in the rated frequency range of the magnetron. Missing pulses are expressed as a percentage of the number of input pulses applied during the last 3 minutes of a test interval not to exceed 6 minutes.
3. These tests are carried out at
   F1=16100±20MHz,
   F2=16400±20MHz,
   F3=16700±20MHz.
4. With the magnetron operating into a V.S.W.R. of 1.3:1 phased to give maximum instability.
5. With the magnetron operating into a V.S.W.R. of 1.3:1 phased to give maximum spectrum degradation.
6. The rate of rise of voltage is the slope of the steepest tangent to the leading edge of the voltage pulse above 70% amplitude. Any capacitance used in the viewing system must not exceed 6.0pF.

Outline





Detail of Heater and Cathode Terminal



Detail of Waveguide Output Flange

All specifications are subject to change without notice.

New Japan Radio Co.,Ltd.

Outline Dimensions

Ref	Min	Max
A	—	150.79
B	—	42.84
C	—	107.95
D	—	11.4
E	64.03	64.54
F	φ7.02	φ7.26
G	—	87.32
H	—	92.07
J	70.39	70.89
K	—	10.69
L	8.74	10.31
M	(35.33)	
N	—	68.14
P	5.72	6.98

Ref	Min	Max
Q	(32.13)	
R	31.750	32.512
S	35.16	36.22
T	—	56.36
U	—	93.25
V	(φ25.4)	
W	φ20.955	φ21.285
X	φ15.317	φ15.875
Y	φ13.513	φ13.843
Z	φ5.944	φ6.756
AA	φ4.166	φ4.419
AB	13.107	—
AC	—	5.080
AD	2.921	3.429

Ref	Min	Max
AE	3.175	4.749
AG	(φ30.149)	
AH	24.181	24.384
AJ	12.091	12.192
AK	7.849	7.95
AL	32.538	34.112
AM	15.748	15.849
AN	12.5857	12.6873
AP	25.172	25.374
AQ	#6-32NC-2	
AR	—	φ50.8

(Dimensions in millimeters)

Outline Notes

1. Reference plane A is defined as a plane passing along the face of the mounting plate.
2. Reference plane B is defined as a plane perpendicular to plane A and passing through the center of the holes shown.
3. Reference plane C is defined as a plane mutually perpendicular to plane A and B and passing through the center of the holes as shown.
4. The reference point for anode temperature measurements is located on the anode block near the output section.
5. These dimensions define the extremities of the cylindrical section given by the dimension Y.
6. The heater terminal will be concentric with the cathode terminal within 0.25mm.
7. Mate with UG-541/U
8. These dimensions define the axis of the cathode terminal.
9. These dimensions define the center of the output waveguide.
10. Warning. A minimum clearance of 6cm must be maintained between the magnet and any other magnetic materials (magnets, steel tools, plates etc.).