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Released

C band 250kW Magnetron

Model No. M1913S

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Microwave Division

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New Japan Radio Co., Ltd.
Microwave Division

Title:

Datasheet of M1913S

Reference No.:

DS-M1913S

Rev.:

02E

Sheet:

1/6

■ GENERAL DESCRIPTION

M1913S is a mechanically tunable frequency pulsed type C band magnetron designed to operate in the frequency range of 5450 MHz to 5820 MHz with a peak output power of 250 kW.

It is a waveguide output type and is forced air cooled.

A permanent magnet is packaged as part of the magnetron.



■ GENERAL CHARACTERISTICS

ELECTRICAL

PARAMETERS		
Heater voltage	(note 1)	9.5 V
Heater current		11 A
Minimum preheat time		300 sec

MECHANICAL

PARAMETERS		
Overall dimensions		See outline
Mounting position		Any
Cooling		Forced air.
Output		WR187 waveguide
Output coupling		Mates with UG-148C/U flange

■ ABSOLUTE MAXIMUM RATINGS

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

PARAMETERS	MINIMUM	MAXIMUM	UNITS
Heater voltage	-	10.5	V
Heater current	-	13	A
Heater surge current	-	30	A
Cathode preheating time	300	-	sec
Anode voltage (peak)	-	29.0	kV
Anode current (peak)	15	32	A
Input power (peak)	-	928	kW
Input power (average)	-	928	W
Rate of rise of voltage pulse (note 6)	-	100	kV/ μ s
Duty cycle	-	0.0012	-

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PARAMETERS	MINIMUM	MAXIMUM	UNITS
Pulse duration	0.2	3.5	μs
Pulse recurrence rate	-	2000	pps
Anode temperature	-55	115	°C
Cathode bushing temperature	-55	250	°C
V.S.W.R. at load	-	1.5:1	-
Tuner torque	-	0.98	N·m
	-	10	kgf·cm
Pressurizing of output circuit	0.1	0.31	Mpa(abs.)
	1	3.2	kg/cm ² (abs.)

■ ELECTRICAL CHARACTERISTICS

TEST CONDITIONS	OSCILLATION	UNITS
Heater voltage (preheating)	9.5	V
Heater voltage (for test)	7.5	V
Anode current (average)	24	mA
Duty cycle	0.001	-
Pulse duration	1.7 to 2.3	μs
V.S.W.R. at the output coupler	1.1:1	-
Rate of rise of voltage pulse (note 6)	90 max	kV/μs
Pressurizing of output circuit	0.15~0.2	MPa
	1.5~2	kg/cm ²

LIMITS	MINIMUM	MAXIMUM	UNITS
Anode voltage (peak) (note 3)	24	27	kV
Output power (average) (note 3)	250	-	W
Tunable Frequency	5825	-	Upper Limit
			Lower Limit
R.F. bandwidth at 1/4 power (note 3,5)		2.5/tpc	MHz
Minor lobes (note 3,5)	8	-	dB
Stability (note 2,3,4)	-	0.5	%
Heater current Ef=9.5 V, tk = 180 sec min	10	12	—
Spurious output ratio (note 3,7)	-45	-	dBc

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■ LIFE TEST

Life test conditions

Under the test conditions specified above.

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

PARAMETERS	MINIMUM	MAXIMUM	UNITS
Output power (average) (note3)	200	-	W
R.F. bandwidth at 1/4 power (note3,5)	-	3.0/tpc	MHz
Stability (notes 2,3,4)	-	1.0	%

Notes

1. With no anode input power.

During high voltage operation it is essential to operate the heater according to the following schedule:

$$\text{Heater voltage(for test)} = 9.5(1 - P_i/2850) \text{ volts}$$

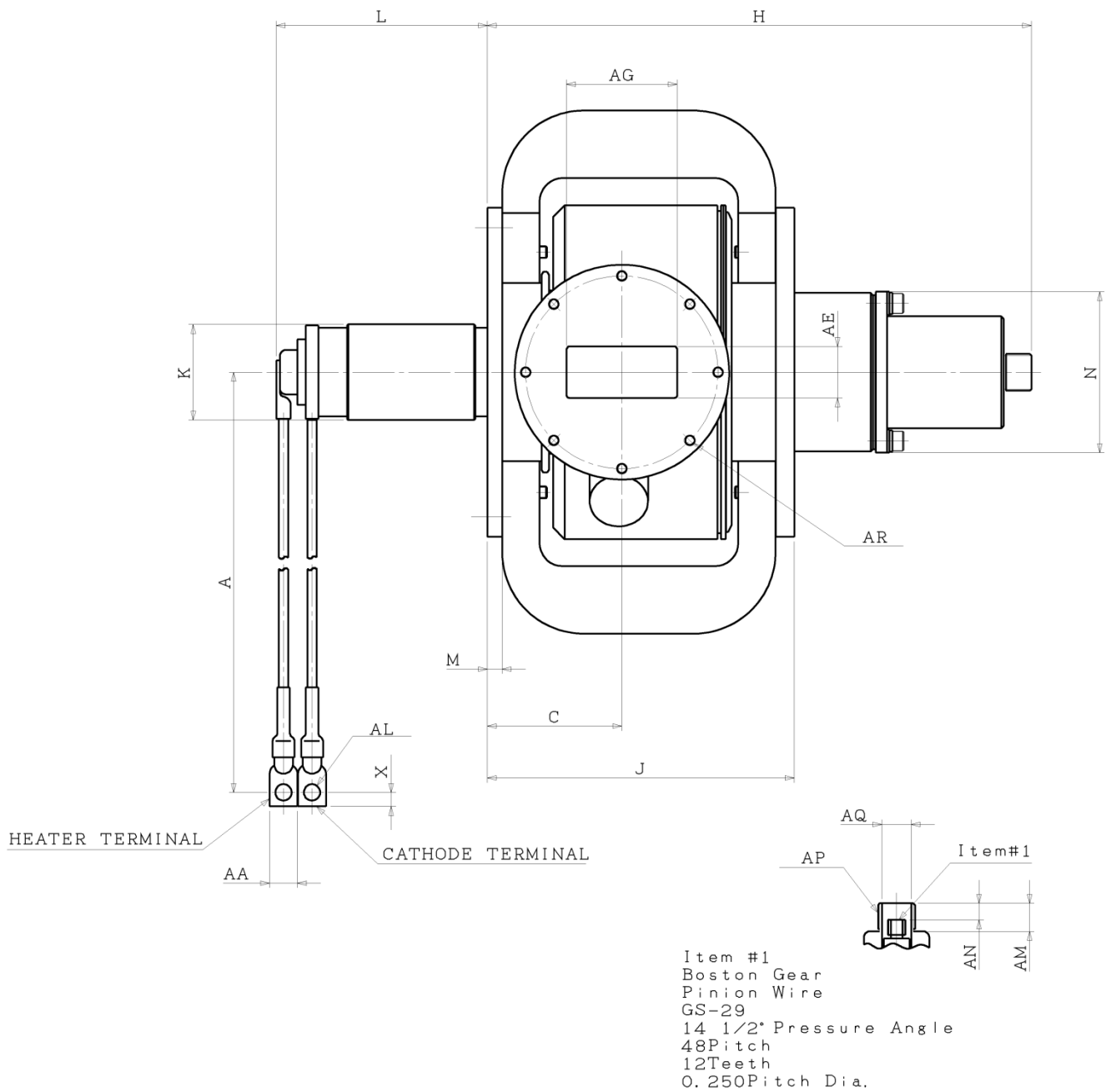
Where P_i = average input power in watts.

The magnetron heater shall be protected against arcing by use of a minimum capacitance of 4000 pF shunted across the heater directly at the terminals.

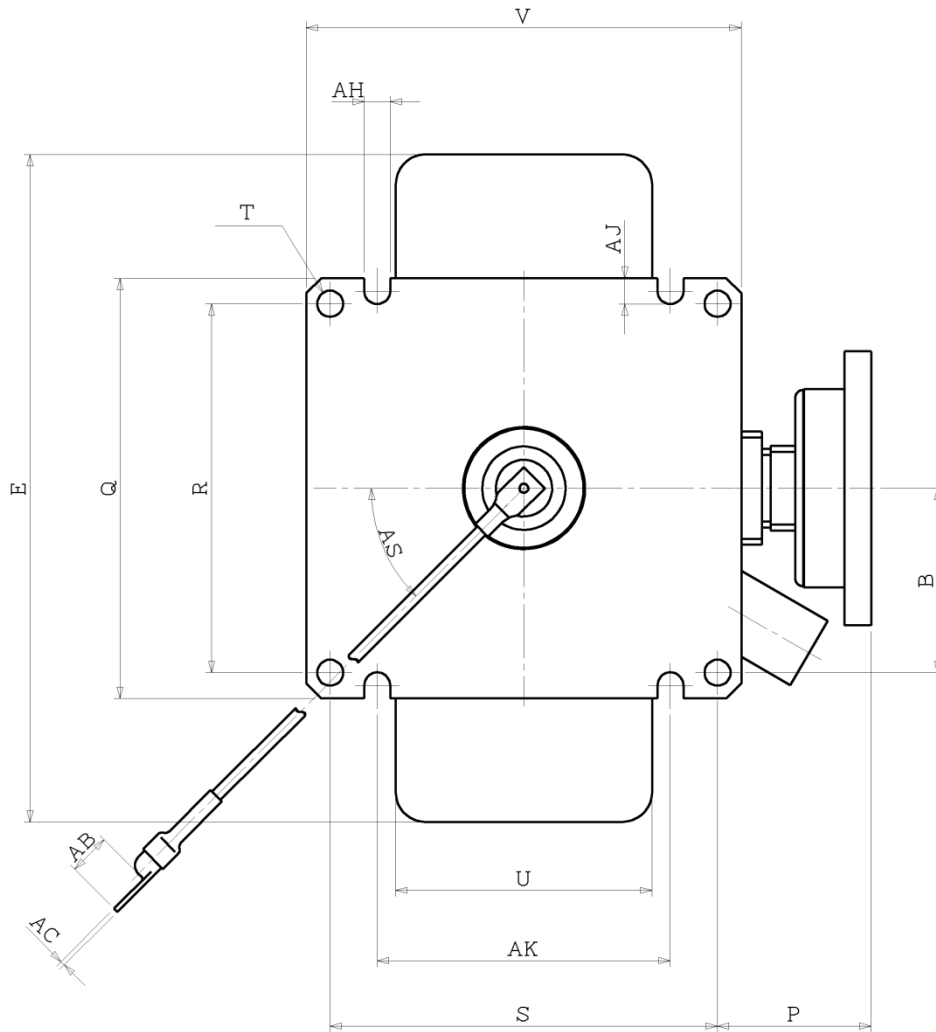
2. Pulses are defined as missing when the r.f. energy level is less than 70% of the normal energy level in the rated frequency range of the magnetron. Missing pulses are expressed as a percentage of the number of input pulses applied during the last 3 minutes of a test interval not to exceed 6 minutes.
3. These tests are carried out at
 - F1=5450 ± 20 MHz,
 - F2=5600 ± 20 MHz,
 - F3=5750 ± 20 MHz.
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 6.0 pF.
7. Spurious output ratio shall be measured in accordance with MIL-STD-1311C, method 4243A. Spurious output signals are measured within 5 GHz to 6 GHz.

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■ OUTLINE



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Outline Dimensions (All dimensions without limits are nominal)

REF.	MIN.	MAX.	REF.	MIN.	MAX.	REF.	MIN.	MAX.
A	210.0	230.0	R	123.55	124.05	AJ		8.4
B	58.72	65.07	S	129.75	130.25	AK	98.15	98.65
C	57.0	58.4	T	φ8.5	φ8.9	AL		φ6.4
E	—	226.21	U	—	98.0	AM		12
H	—	235.45	V	—	147.3	AN		7
J	—	131.57	X		6	AP		5/8-24-NEF-2
K	—	φ41.66	AA		12	AQ	φ12.3	φ12.9
L	—	92.08	AB		19	AU		No10-32-Nf-2
M		6.35	AC		1	AS		45°
N	—	φ74.7	AE		22.15			
P	49.92	53.12	AG		47.55			
Q	—	141	AH		8.4			

(Dimensions in millimeters)

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