PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, MAGNETRON
TYPES 2J49 AND 2J50

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the electron tube described herein shall consist of this document and the latest issue of MIL-PRF-1.

DESCRIPTION: Pulsed, fixed frequency (2J49) 9,080 ± 80 MHz, (2J50) 8,825 ± 75 MHz; magnet separate; 50-kw rated peak power output.

ABSOLUTE RATINGS:

Parameter:	Ef	tk	tpc	Du	epy	Pi	pi	ib	T(anode)	Alt
Unit:	V	sec	µs	---	kv	W	kw	a	°C	ft
Maximum:	7.0	---	2.5	0.0012	16	180	260	16	100	10,000
Minimum:	--- 2/	120	---	----	---	----	---	---	---	---

PHYSICAL CHARACTERISTICS:

Dimensions: See figure 1.
Marking: 3/
Weight: 23 ounces (652.04 grams) approximately.
Cathode: Unipotential.

TEST CONDITIONS:

Parameter:	Ef	tk	tpc	Du	Ib	VSWR	H
Unit:	V	sec	µs	---	mA dc	Ratio	Gauss
Tolerance:	---	---	±10%	---	---	---	---
Test 1:	6.3	120(max)	---	---	---	---	---
Test 2:	0	---	1.0	0.001	12	1.05:1	5,400
Test 3:	0	---	1.0	0.001	11	1.5:1	5,400
Test 4:	0 2/	---	1.0	0.001	13	1.5:1	5,400 4/

See footnotes at end of table I.

GENERAL:

Qualification: Required.

TABLE I. Testing and inspection.

Inspection	Method	Notes	Test	Conditions	Symbol	Limits		Unit
						Min	Max	
Qualification inspection								
Barometric pressure, reduced	1002	---	2	Pressure = 380 mmHg (absolute)	---	---	---	---
Temperature coefficient	4027	---	2		$\frac{\Delta F}{^{\circ}C}$	---	0.25	MHz
Low-temperature operation	1047	---	2	tk = 120 sec (max)	---	---	---	---
High-frequency vibration	1031	---	---	No voltages applied	---	---	---	---
Conformance inspection, part 1		1/	---					
Pressurizing	4003	---	----	40 to 45 psia	---	---	---	---
Heater current	4289	---	1		If	0.90	1.10	A
Fixed-tuned frequency	4223	---	2	T(anode) = 80°C ± 10°C Type 2J49 Type 2J50	 F F	 9,000 8,750	 9,160 8,900	 MHz MHz
Pulse storage	4306	---	2		epy	11	13	kv
Power output	4250	---	2	t = 300 (max)	Po	40	---	W
RF bandwidth	4308	5/	3, 4		BW	---	2.5	MHz
Pulling factor	4310	---	2		ΔF	---	15	MHz
Stability	4315	6/	2		MP	---	0.5	%
Conformance inspection, part 2								
Low-frequency vibration	1031	---	---	No voltages applied	---	---	---	---
Conformance inspection, part 3								
Life test	---	7/	---	Group D	Life	600	---	Cycles
Life-test end points:	---							
Power output	4250	---	2		Po	30	---	W
RF bandwidth	4308	---	2		BW	---	4	MHz

See footnotes at top of next page.

TABLE I. Testing and inspection - Continued.

1/ Unless otherwise specified, the acceptance level for all tests listed under conformance inspection, part 1, shall be 1.0 in accordance with MIL-PRF-1, Table III, accept on zero (c = 0) sampling plan.

2/ During high voltage pulsed operation, the heater should be varied with input power in accordance with the following formula: $Ef = 6.3\sqrt{1 - \frac{Pi}{150}}$ with Ef = 0 for all values of Pi greater than 150.

3/ In addition to the regular markings, the frequency of each 2J50 tube shall be indicated by three colored dots in accordance with the following color code:

Orange, violet, green..... 8,750 to 8,800 MHz
Orange, violet, blue..... 8,800 to 8,850 MHz
Orange, violet, violet..... 8,850 to 8,900 MHz

NOTE: The dots shall be .125 inch to .312 inch (3.18 mm to 4.76 mm) in diameter and placed in a row after the type marking.

4/ Field strength must be as specified with the magnet at operating temperature. Field strength to be measured in accordance with method 1367.

5/ Bandwidth measurements shall be made at each anode current value into a 1.5:1 VSWR transmission line adjusted in phase to produce maximum spectrum degradation.

6/ Stability shall be measured with the tube operating into a transmission line with a VSWR of 1.5:1 adjusted in phase to produce maximum instability. The missing pulses shall be counted during any 3-minute period of a test interval not to exceed 6 minutes.

7/ VSWR shall be 1.5:1 minimum with phase varying through a minimum of .50 λ approximately every 15 minutes. Each cycle shall be conducted in accordance with the following schedule:

Test condition 1 ..... 2 minutes
Test condition 2 ..... 50 minutes
Off ..... 8 minutes

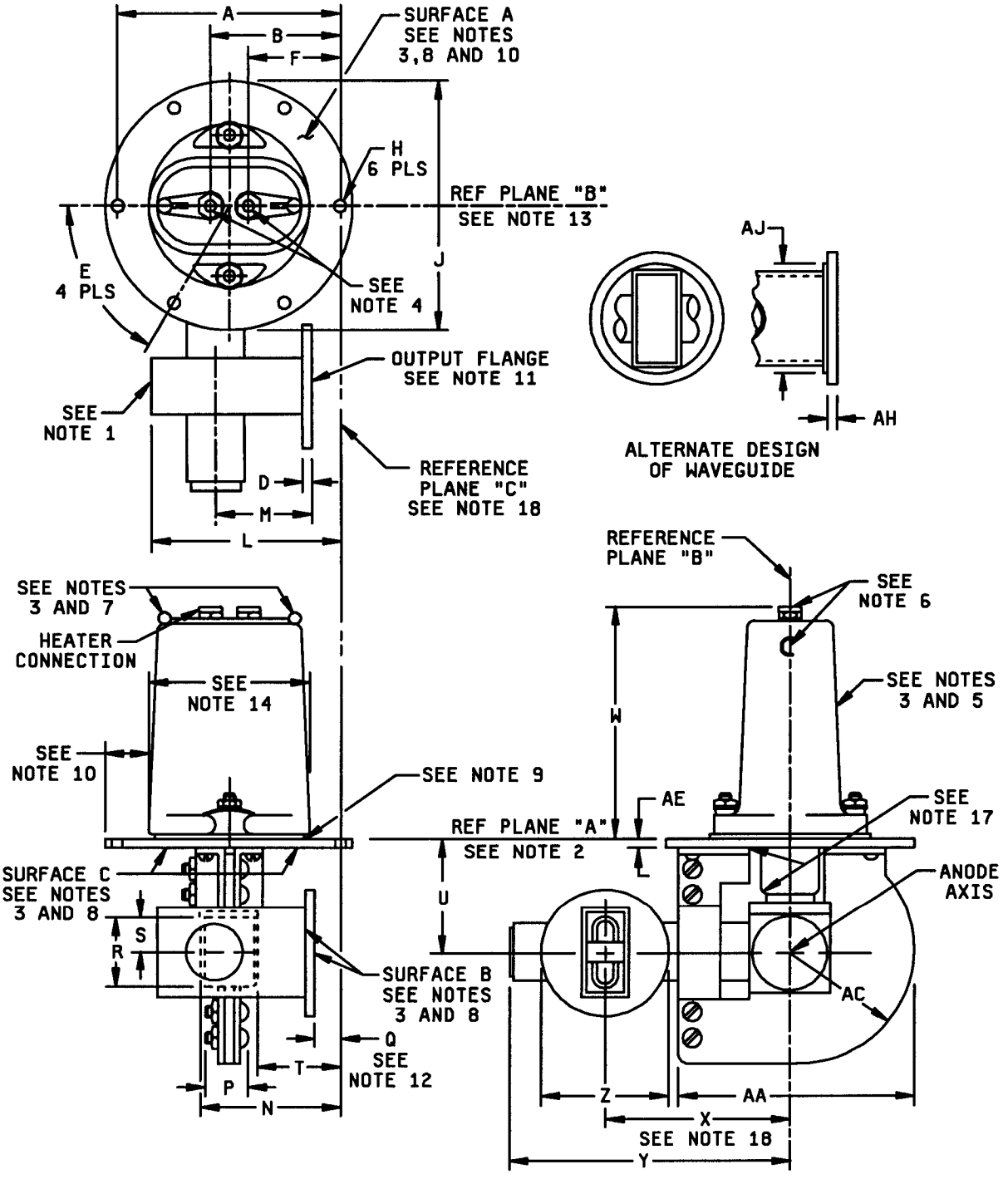

FIGURE 1. Outline drawing of electron tube types 2J49 and 2J50.

Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
Qualification inspection					
E	59°48'	60°12'	59°48'	60°12'	
Conformance inspection, part 1					19
B	1.664	1.710	42.27	43.43	
D	.080	.090	2.03	2.29	
F	1.164	1.210	29.57	30.73	
H	.190	.196	4.83	4.98	
N	---	1.750	---	44.45	
P	---	.500	---	12.70	
Q	.417	.457	10.59	11.61	12
T	1.125	---	28.58	---	
U	1.542	1.582	39.17	40.18	
X	2.417	2.457	41.39	42.41	
Z	1.743	1.757	44.27	44.63	
AH	.080	.090	2.03	2.29	
AJ	---	1.446	---	36.73	
Conformance inspection, part 2					
A	2.869	2.881	52.87	53.18	
J	3.219	3.281	81.76	83.34	
L	---	2.625	---	46.68	
M	---	1.187	---	30.15	
R	.969	1.031	24.61	26.19	
S	.469	.531	11.91	13.49	
W	2.922	3.047	54.22	77.39	
Y	---	3.906	---	99.21	
AA	---	3.125	---	79.38	
AC	---	1.500R	---	38.10R	
AF	.120	.130	3.05	3.30	

FIGURE 1. Outline drawing of electron tube types 2J49 and 2J50 - Continued.

NOTES:

1. Section of waveguide M85/1-073-120.
2. Reference plane A is defined as that plane which coincides with the face of the mounting plate.
3. Qualification inspection applies.
4. Jacks shall be locking type as illustrated in MIL-PRF-1. The centerline of the jack holes shall be within .023 inch (0.58 mm) of reference plane B, and shall be perpendicular, within 3° of reference plane A.
5. Insulator shall be pyrex glass, porcelain, or approved equivalent.
6. Common heater-cathode connection shall be identified by the letter C.
7. Filament leads shall be flexible and slack, and shall be soldered to terminal clips.
8. All metal surfaces shall be painted with heat resistant, noncorrosive paint except surfaces A, B, and C which shall be free from paint.
9. It is recommended that asbestos gasket shall not be used unless other type of gaskets cannot meet performance requirements.
10. With surface A resting on a plane surface, flatness of mounting plate .500 inch (12.70 mm) from outer edge shall be such that a gauge .010 inch (0.25 mm) thick and .125 inch (3.18 mm) wide will not enter more than .250 inch (6.35 mm). Conformance inspection, part 2, applies.
11. Protective cover shall be provided for output flange.
12. Tolerances include angular and lateral deviations.
13. Reference plane B is defined as that plane which passes through the centers of holes H and H1 and is perpendicular to reference plane A.
14. Any portion of the assembly within this area shall lie within a 1.109 inch (28.17 mm) radius of the true center of the mounting plate.
15. Output flange and open end of waveguide shall be concentric within .010 inch (0.25 mm).
16. Waveguide assembly shall provide hermetic seal with output flange.
17. Coaxial tube shall provide hermetic seal with surface A.
18. Reference plane C is defined as that plane which passes through the center of hole H1 and is mutually perpendicular to reference planes A and B.
19. Unless otherwise specified, the acceptance level for all tests listed under conformance inspection, part 1, shall be 1.0 in accordance with MIL-PRF-1, Table III, accept on zero (c = 0) sampling plan.

FIGURE 1. Outline drawing of electron tube types 2J49 and 2J50 - Continued.

Custodians:
Army - CR
Navy - EC
Air Force - 11
DLA - CC

Review activities:
Army - AV
Navy - AS, CG, MC, OS, SH
Air Force - 99

Preparing activity:
DLA - CC

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