

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, GAS SWITCHING  
TYPES 1B35A, 1B37A, 6162, AND 5864

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

The complete requirements for procuring the electron tubes described herein shall consist of this document and the latest issue of Specification MIL-PRF-1.

DESCRIPTION: ATR, frequency: 1B35A ---  $F_o = 9,300$  MHz, incident power 250 kw  
1B37A ---  $F_o = 8,750$  MHz  
6162 ---  $F_o = 9,080$  MHz  
5864 ---  $F_o = 9,375$  MHz

ABSOLUTE RATINGS:

Parameter:	Incident power	Du	TA	Alt
Unit:	kw	---	°C	ft
Maximum	250	0.001	+100	10,000
Minimum:	4	---	-40	---

(See note 1) OF Table I

PHYSICAL CHARACTERISTICS: See figure 1

TEST CONDITIONS: See note 2

Parameter:	F	tp	prf	Du	Incident power	$\sigma'$
Unit:	MHz	$\mu$ s	pps	---	kw	---
Test condition 1:	$F_o \pm 3\%$	$1.0 \pm 0.1$	1,000	0.001	200	1.2 (max)
Test condition 2:	$F_o \pm 3\%$	$1.0 \pm 0.1$	1,000	---	20	1.03

GENERAL:

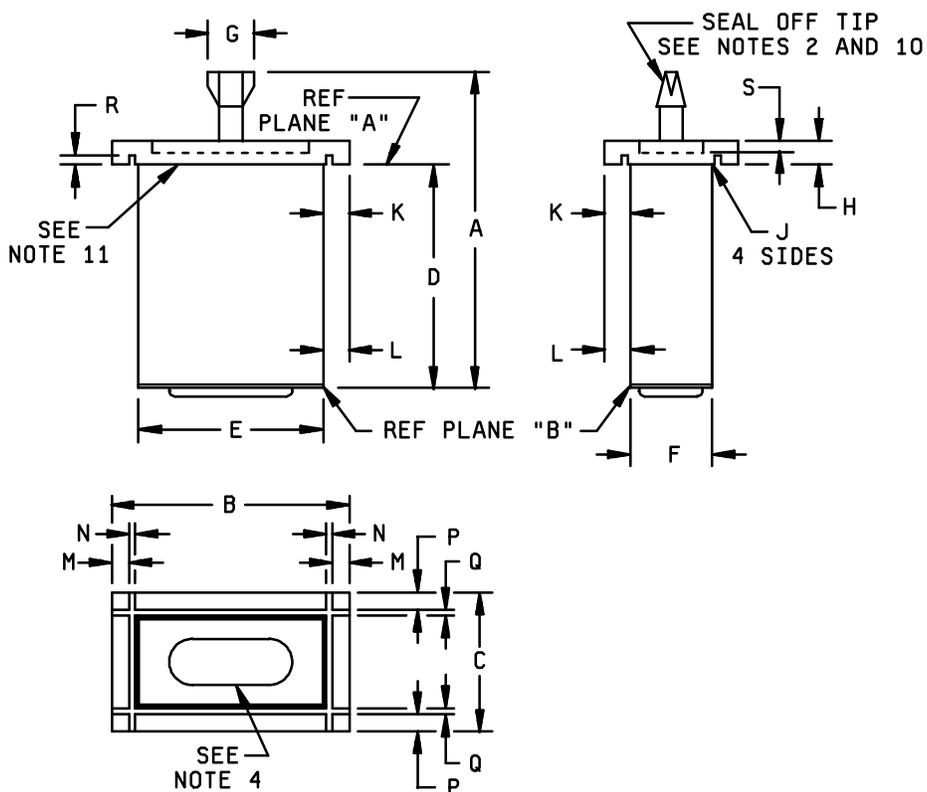
Qualification - Required

Table I. Testing and Inspection.

Inspection	Method	Notes	Conditions	Symbol	Limits Min	Limits Max	Unit
<u>Qualification inspection</u>							
Degradation due to vibration	4021	-		---	---	---	---
Loaded Q (ATR tubes)	4461	-		QL	---	6.5	---
High-level VSWR	4474	-	Test condition 2	$\sigma$	---	1.10	---
<u>Conformance inspection, part 1</u>							
Tuning susceptance	4482	-	$F_o \pm 0.1\%$ MHz	$b = B/Y_o$	---	$\pm 0.06$	---
Firing time	4486	3		t	---	10	sec
Arc loss	4488	3		La	---	0.8	dB
<u>Conformance inspection, part 2</u>							
Dielectric material strain	4101	-		---	---	---	---
Normalized conductance	4484	-	$F_o \pm 0.1\%$ MHz	$g = G/Y_o$	---	0.1	---
Recovery time	4471	-	Test condition 1	t	---	10	$\mu$ s
<u>Conformance inspection, part 3</u>							
<u>Life test</u>	---	-	Group D; test condition 1				
Type 1B35A		-		---	500	---	Hrs
Type 1B37A		-		---	500	---	Hrs
Type 6162		-		---	500	---	Hrs
Type 5864		-		---	1,000	---	Hrs
Life-test end points:	---						
Arc loss	4488	3		La	---	1.0	dB
Normalized conductance	4484	-	$F_o \pm 0.1\%$ MHz	$g = G/Y_o$	---	0.1	---
Tuning susceptance	4482	-	$F_o \pm 0.1\%$ MHz	$b = B/Y_o$	---	$\pm 0.06$	---
Recovery time	4471	-	Test condition 1; VSWR > 10 dB	t	---	20	$\mu$ s
Temperature cycling (nonoperating)	1027	-		---	---	---	---
<u>Periodic-check tests</u>							
Temperature cycling life-test end point	1027	3	Group D; 10 cycles (min)	---	---	---	---

## NOTES:

- For 500 hours life, the duty cycle is 0.001 at pulse width of 1.0  $\mu$ s. Operation at greater than 1.0  $\mu$ s pulse width at 250 kw is permissible but may result in decreased life.
- For electrical tests, the tubes shall be mounted as shown on figure 2. A suitable gasket shall be placed between the tube and the tube seat.
- This test shall be performed at least 168 hours after pumping, and at least 24 hours after any previous discharge.



Dimensions in inches with metric equivalents (mm) in parentheses.					
Ltr	Minimum	Maximum	Ltr	Minimum	Maximum
Conformance inspection, part 1					
B	1.297 (32.94)	1.303 (33.10)	K	0.142 (3.61)	
C	0.797 (20.24)	0.803 (20.40)	L	0.138 (3.53)	
D	1.296 (32.92)	1.302 (33.07)	S		0.078 (1.98)
J		0.020 (0.51)			
Dim M through R for 1B37A only					
M	0.103 (2.62)	0.111 (2.82)	Q	0.030 (.76)	0.040 (1.02)
N	0.030 (0.76)	0.040 (1.02)	R	0.035 (.89)	0.045 (1.14)
P	0.103 (2.62)	0.111 (2.82)			
Conformance inspection, part 2					
A		1.813 (46.05)	G		0.250 (6.35)
E	0.990 (25.15)	1.010 (25.65)	H	0.117 (2.97)	0.133 (3.38)
F	0.490 (12.45)	0.510 (12.95)			

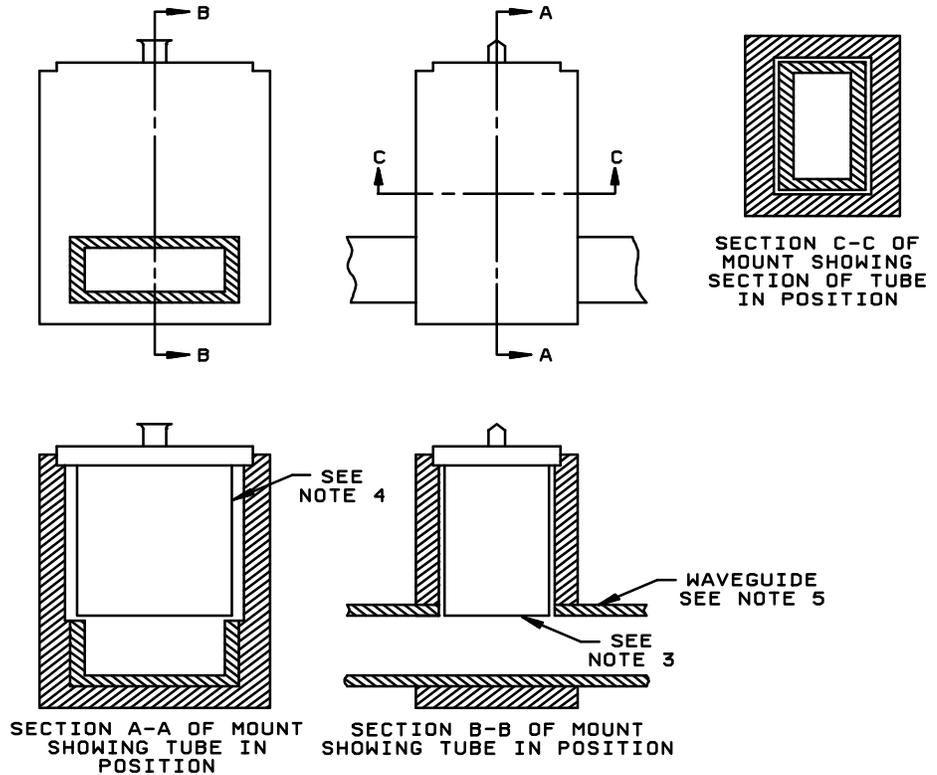
FIGURE 1. Outline drawing of electron tube types 1B35A, 1B37A, 6162 and 5864

MIL-PRF-1/22J

NOTES:

1. Metric equivalents (to the nearest 0.01 mm) are given for general information only and are based upon 1 inch = 25.4 mm.
2. Tubulation shall lie within a circle 0.38 (9.65mm) diameter maximum located from centerlines of flange. Qualification inspection required.
3. Entire tube shall be plated 100 MSI minimum silver, or equivalent. Qualification inspection required.
4. Centerlines of window shall coincide with corresponding centerlines of tube body within .015 (0.38 mm) measured in plane of window. Conformance inspection, part 2, required.
5. Two gaskets as specified on Drawing 191-JAN shall be supplied unmounted. Conformance inspection, part 2 required.
6. Dimension K shall be measured 0.12 (3.05 mm) from reference plane A.
7. Dimension L shall be measured 0.12 (3.05 mm) from window plane.
8. Reference plane A shall be normal to reference plane B.
9. Flat end plate and dimpled window optional.
10. Seal-off cap over exhaust tubulation optional.
11. Position of gasket when mounted.

FIGURE 1. Outline drawing of electron tube types 1B35A, 1B37A, 6162 and 5864. -Continued.



NOTES:

1. Design of holder optional.
2. Tube shall be held firmly in position by means of spring or screw clamps.
3. Bottom of the tube shall be flush with inside surface of waveguide within  $\pm 0.004$ .
4. Clearance between tube walls and inner surface of mount shall be 0.030 to 0.040.
5. Waveguide shall be RG-52/U for the 1B35A, 1B37A, and 6162; and RG-51/U for the 5864. It is recommended that the RG-52/U waveguide be pressurized to prevent pulse power breakdown at 250 kw. The RG-52/U and RG-51/U waveguides shall be in accordance with MIL-W-85/1.

FIGURE 2. Test mount.

Custodians:  
 Army - CR  
 Navy - EC  
 Air Force - 85

Preparing activity:  
 DLA - CC  
 (Project 5960-3436)

Review activities:  
 Army - MU  
 Navy - AS, CG, MC, OS, SH  
 Air Force - 11, 99