

INCH-POUND

MIL-PRF-1/1335H  
9 JULY 2004  
SUPERSEDING  
MIL-PRF-1/1335G  
14 July 1999

PERFORMANCE SPECIFICATION SHEET  
ELECTRON TUBE, NEGATIVE GRID (MICROWAVE)  
TYPE 7462

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: Triode, metal-ceramic.

See figure 1.

Mounting position: Any.

Weight: 0.06 ounce (1.7 grams) nominal.

ABSOLUTE RATINGS:

Parameter:	Ef	Eb	eb	Ec	egk	Ehk
Unit:	V	V dc	v	V dc	V dc	v
Maximum:	6.6	250	400	0, -50	0	50
Minimum:	6.0	---	---	---	---	---
Test conditions:	6.3	150	---	+6	---	---

ABSOLUTE RATINGS:

Parameter:	Rk	Rg	Ik	Pp	TE	Barometric pressure, reduced
Unit:	Ohms	Meg	mA dc	W	°C	mm Hg
Maximum:	---	0.01 <u>1</u> /	11.0	1.1	250 <u>2</u> /	8
Minimum:	---	---	---	---	---	---
Test conditions:	910	---	---	---	---	---

See footnotes at end of table I.

GENERAL:

Qualification - Required.

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TABLE I. Testing and inspection.

Inspection	Method MIL-STD- 1311	Notes	Conditions	Acceptance Level <u>12/</u>	Symbol	Limits		Unit
						Min	Max	
<u>Qualification inspection</u>								
Barometric pressure, reduced	1002	<u>4/</u>	Pressure = $8 \pm 1$ mmHg; voltage = 300 V ac	---	---	---	---	---
Sweep-frequency vibration	1031	<u>9/</u>	Ebb = 150 V dc; Rp = 10,000 ohms; Rk = 82 ohms; Ec = 0; 10 G; F = 100 to 2,000 Hz	---	Ep	---	15	mV ac
Sweep-frequency vibration fatigue	1031	<u>10/</u>	Eb = Ec = 0; Ef = 6.3 V	---	---	---	---	---
Sweep-frequency vibration fatigue test end points:	---	---	---	---	---	---	---	---
Low-frequency vibration	1031	---	---	---	Ep	---	15	mV ac
Heater-cathode leakage	1336	---	---	---	lhk	---	20	$\mu$ Adc
Transconductance (1)	1306	---	---	---	Sm	6,800	---	$\mu$ mhos
Heater current	1301	---	---	---	lf	222	258	mA
<u>Conformance inspection, part 1</u>								
Heater current	1301	---	---	0.65	lf	222	258	mA
Heater-cathode leakage	1336	---	---	0.65	lhk	---	20	$\mu$ A dc
Transconductance (1)	1306	<u>7/</u>	---	0.65	Sm	8,000	13,000	$\mu$ mhos
Electrode current (anode)	1256	---	Ec = 0; Rk = 82 ohms	0.65	lb	4.5	11.0	mA dc
Short and discontinuity detection	1201	---	---	0.65	---	---	---	---
<u>Conformance inspection, part 2</u>								
Insulation of electrodes	1211	---	---	---	R	100	---	Meg $\Omega$
Electrode voltage (grid)	1261	---	Rk = 0; Ec/lb = 0.1 mA dc	---	Ec	---	-4.5	V dc
Amplification factor	1316	<u>7/</u>	---	---	Mu	65	115	---
Transconductance (2)	1306	<u>7/</u>	Ef = 6.0 V	---	$\Delta$ Sm Ef	---	15	%

See footnotes at end of table.

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TABLE I. Testing and inspection - Continued.

Inspection	Method MIL-STD-1311	Notes	Conditions	Acceptance Level <u>12/</u>	Symbol	Limits		Unit
						Min	Max	
<u>Conformance inspection, part 2</u> - Continued.								
Grid emission	1266	<u>3/</u>	Ef = 7.0 V; Ecc = -10 V dc; Rg = 0.1 MegΩ	---	Ic	0	-2.0	μA dc
Direct-interelectrode capacitance	1331	---		---	{ Cgp Cin Cout Chk	1.05	1.45	pF
						1.25	2.25	pF
						0.013	0.045	pF
						1.1	1.9	pF
Envelope strain	---	<u>6/</u>		---	---	---	---	---
Low-frequency vibration	1031	<u>8/</u>	Ebb = 150 V dc; Rp = 10,000 ohms; Rk = 82 ohms; Ec = 0; 15 G; F = 40 Hz	---	Ep	---	10	mV ac
<u>Conformance inspection, part 3</u>								
Heater-cycling life	1506	<u>5/</u>	Ef = 7.0 V; Ehk = +70 V dc; Rk = 0; Ec = Eb = 0	---	---	---	---	---
Heater-cycling life-test end points:	---							
Heater-cathode leakage	1336	---		---	Ihk	---	40	μA dc
Stability life	1516	---	Eb = 150 V dc; Ecc = +6 V dc; Ehk = -70 V dc; Rk = 910 ohms; Rg = 0.1 MegΩ	2.5	---	---	---	---
Stability life-test end-point: (2 and 20 hours)	---							
Change in transconductance (1) of individual tubes	1306	---		---	$\Delta S_{m_t}$	---	15	%

See footnotes at end of table.

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TABLE I. Testing and inspection - Continued.

Inspection	Method MIL-STD-1311	Notes	Conditions	Acceptance Level <u>12/</u>	Symbol	Limits		Unit
						Min	Max	
<u>Conformance inspection, part 3</u> - Continued.								
Intermittent life	1501	---	Group A; stability life-test conditions; t = 1,000 hours	---	---	---	---	---
Intermittent life-test end points:	---							
Heater current	1301	---		---	If	222	264	mA
Transconductance (1)	1306	---		---	Sm	6,500	---	μmhos
Change in trans-conductance (1) of individual tubes	1306	---		---	ΔSm t	---	30	%
Transconductance (2)	1306	---		---	ΔSm	---	20	%
Heater-cathode leakage	1336	---		---	Ef lhk	---	20	μA dc
Insulation of electrodes	1221	---		---	R	50	---	MegΩ
Shock	1041	<u>11/</u>	Hammer angle = 30°; Ehk = 50 V dc; Eb = 150 V dc; Rk = 82 ohms; Ec = 0	---	---	---	---	---
Shock-test end points:	---							
Low-frequency vibration	1031	---		---	Ep	---	15	mV ac
Heater-cathode leakage	1336	---		---	lhk	---	20	μA dc
Transconductance (1)	1306	---		---	Sm	6,800	---	μmhos
Heater current	1301	---		---	If	222	258	mA

1/ If resistance is used in the cathode or anode circuits, the grid circuit resistance may be as high as (10,000 + 100 Rk + 10 Rl) ohms, where Rk is the cathode-bias resistance in ohms and the Rl is the ac anode load resistance in ohms.

2/ Operation below the rated maximum temperature is recommended for applications requiring the longest possible tube life.

3/ Prior to this test, tubes shall be preheated a minimum of 5 minutes at the conditions specified below. The 3-minute test is not permitted. Test within 3 seconds after preheating.

Ef	Ecc	Eb	Rk	Rg
V	V dc	V dc	Ohms	Meg
7.0	0	150	82	0.1

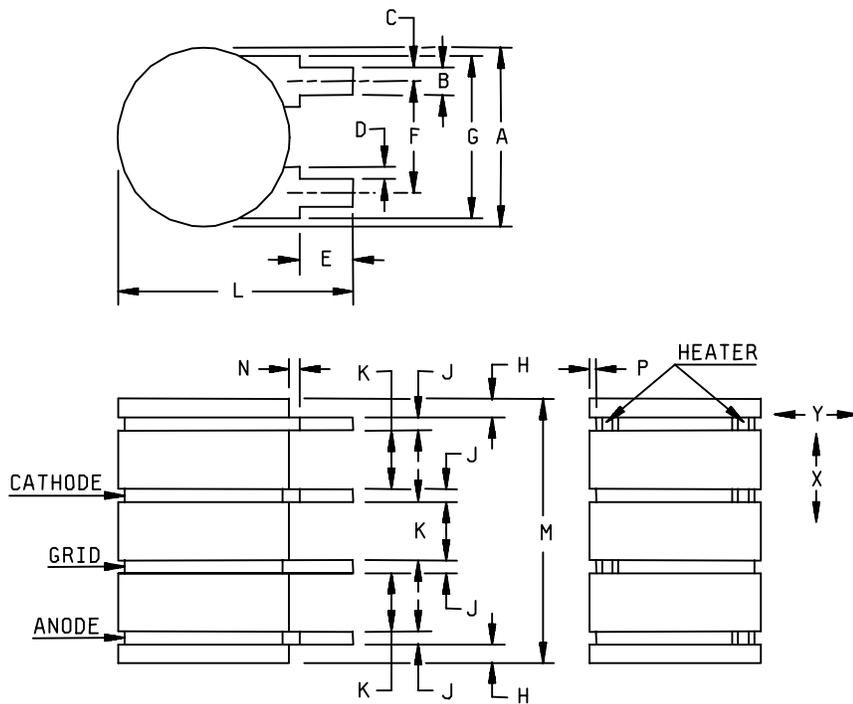
4/ The specified voltages shall be applied between the anode and grid.

5/ Sampling and acceptance criteria shall be as follows: Sample shall consist of 15 tubes with an acceptance number of zero (see 12/).

6/ Tubes shall be tested as specified in MIL-STD-1311 method 2126, except that they shall be first immersed in water at not more than 5°C for 15 seconds and immediately thereafter subjected to the standard temperature cycle specified in MIL-STD-1311 method 2126. Tubes having high-heater current of 300 mA or more shall be rejected as evidence of air leaks.

TABLE I. Testing and inspection - Continued.

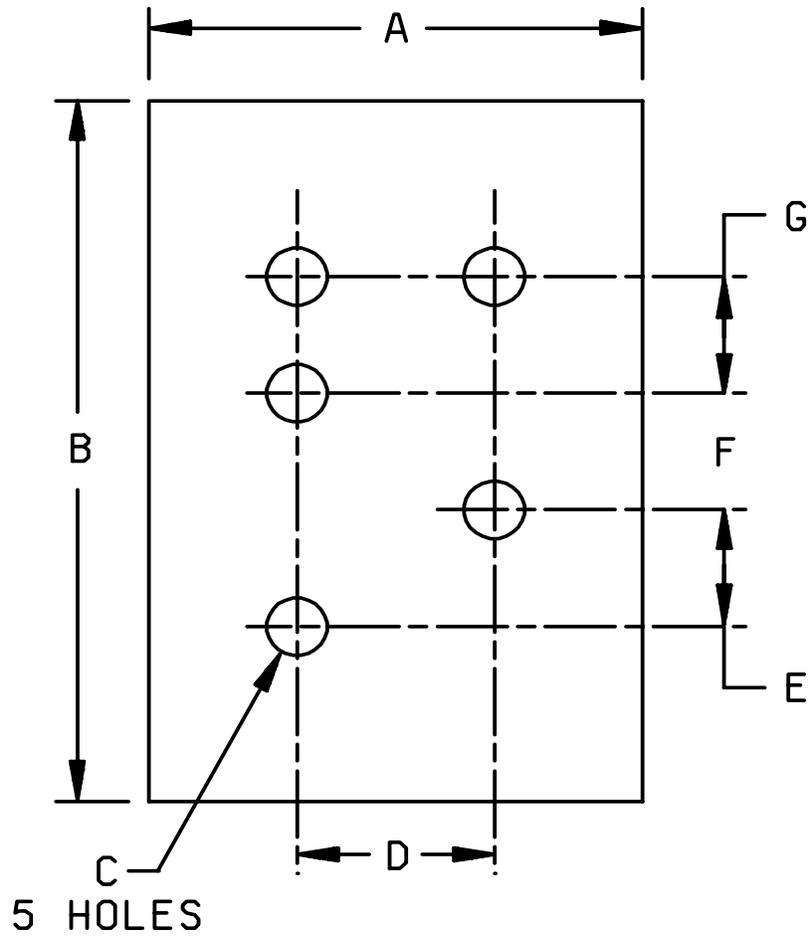
- 7/ In performing this test, the cathode by-pass capacitor should be charged to +6 volts prior to insertion of the tube into the test socket to prevent high-initial surge current.
- 8/ Low-frequency vibration. Test shall be performed as follows: The tube shall be vibrated with simple harmonic motion in each of two planes; first, parallel to the cylindrical axis; second, perpendicular to the cylindrical axis and perpendicular to major axis of terminal lug.
- 9/ Sweep-frequency vibration. Test shall be performed as follows:
- a. The frequency shall be increased from 100 to 2,000 Hz with approximately logarithmic progression in  $3 \pm 1$  minutes. The return sweep (2,000 to 100 Hz) is not required.
  - b. The tube shall be vibrated with simple harmonic motion in each of two planes; first, parallel to the cylindrical axis; second, perpendicular to the cylindrical axis and parallel to a line through the major axis of a terminal lug. At all frequencies from 100 to 2,000 Hz, the total harmonic distortion of the acceleration waveform shall be less than 5 percent.
  - c. The peak acceleration shall be maintained at  $10 \pm 1.0$  G throughout the test.
  - d. The value of the alternating voltage,  $E_p$ , produced across the resistor,  $R_p$ , as a result of the vibration shall be measured with a suitable device having a response of the RMS value of the voltage to within  $\pm 0.5$  dB of the response at 400 Hz for the frequency range of 100 to 3,000 Hz, and having a bandpass filter with an attenuation rate of 24 dB per octave below the low-frequency cutoff point of 50 Hz and above the high-frequency cutoff point of 5,000 Hz. The meter shall have a dynamic response characteristic equivalent to, or faster than, a VU meter (operated in accordance with Standard ASA No. C 16.5-1954).
- 10/ Sweep-frequency vibration fatigue. Test shall be performed as specified in MIL-STD-1311 method 1031, except that the tubes shall be vibrated for a total of 6 hours, that is, 3 hours in each of two directions; first, parallel to the cylindrical axis; second, perpendicular to the cylindrical axis and parallel to a line through the major axis of a terminal lug.
- 11/ This test shall be performed during the initial production and once each succeeding 12-calendar months in which there is production. An accept on zero defect sampling plan shall be used, with sample of three tubes with an acceptance number of zero. In the event of failure, the test will be made as a part of conformance inspection, part 2, with an acceptance level of 6.5 (see 12/). The regular "12-calendar month" sampling plan shall be reinstated after three consecutive samples have been accepted.
- 12/ This specification sheet uses accept on zero defect sampling in accordance with MIL-PRF-1, table III.



Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
Conformance inspection, part 1				
A	.316	.330	8.03	8.38
B	.046	.052	1.17	1.32
E	.096	.104	2.44	2.64
J	.020	.026	0.51	0.66
L	.429	.459	10.90	11.66
M	.460	.490	11.68	12.45
Conformance inspection, part 2				
C	.023	.031	0.58	0.79
D	.018	.026	0.46	0.66
F	.190	.210	4.83	5.33
K	.100	.110	2.54	2.79
Reference dimensions				
G	.300		7.62	
H	.040		1.02	
N	.020		0.51	
P	.012		0.30	

NOTE: All terminals shall be so aligned that they are capable of being inserted into a gauge .125 inch (3.17 mm) thick having 5 holes .062 inch (1.57 mm) ± .001 (0.03 mm) in diameter as shown on figure 2.

FIGURE 1. Outline drawing of electron tube type 7462.



Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	.495	.505	12.57	12.83
B	.745	.755	18.92	19.18
C	.061 DIA	.063 DIA	1.55 DIA	1.60 DIA
D	.199	.201	5.05	5.11
E	.124	.126	3.15	3.20
F	.124	.126	3.15	3.20
G	.124	.126	3.15	3.20

NOTE: Dimensions are in inches.

FIGURE 2. Terminal position gauge.

NOTES

Referenced documents. In addition to MIL-PRF-1, this specification sheet sheet references MIL-STD-1311.

Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the previous issue.

Custodians:

Army - CR  
Navy - EC  
Air Force - 11  
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Preparing activity:

DLA - CC

(Project 5960-3732)

Review activities:

Navy - AS, CG, MC, OS  
Air Force - 99

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