

INCH-POUND

MIL-PRF-1/1330G
w/AMENDMENT 1
5 October 2022
SUPERSEDING
MIL-PRF-1/1330G
9 July 2004

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, NEGATIVE GRID (MICROWAVE) TYPE 7486

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

Inactive for new design
after 26 June 2012

The requirements for acquiring the electron tube described
herein shall consist of this document and [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	Ec	Ehk	Rk	Rg
Unit:	V	V dc	V dc	v	ohms	MegΩ
Maximum:	6.6	250	0	+50	---	0.01
Minimum:	6.0	---	-50	-50	---	---
Test conditions:	6.3	150	0	---	82	---

ABSOLUTE RATINGS:

Parameter:	ik	lk	lc	Pp	TE	Barometric pressure, reduced
Unit:	ma	mA dc	mA dc	W	°C	mm Hg
Maximum:	40	11	2.2	1.0	250 <u>1</u> /	8
Minimum:	---	---	---	---	---	---
Test conditions:	---	---	---	---	---	---

See footnotes at end of [table I](#).

GENERAL:

Qualification – Not Required.

AMSC N/A

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

FSC 5960



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TABLE I. Testing and inspection.

Inspection	MIL-STD-1311 Method	Notes	Conditions	Acceptance Level 11/	Symbol	Limits		Unit
						Min	Max	
<u>Conformance inspection, part 1</u>								
Barometric pressure, reduced	1002	<u>4/</u>	Voltage = 300 V ac	---	---	---	---	---
Heater current	1301	---		0.65	I _f	222	258	mA
Heater-cathode leakage	1336	---		0.65	I _{hk}	---	20	μA dc
Electrode current (anode)	1256	---		0.65	I _b	4.5	11.0	mA dc
Transconductance (1)	1306	---	E _b = 100 V dc; R _k = 0	0.65	S _m	8,000	---	μmhos
Pulsing emission	1231	<u>2/</u>	R _k = 1.0 ohm	0.65	i _k	90	---	ma
Short and discontinuity detection	1201	---		0.65	---	---	---	---
<u>Conformance inspection, part 2</u>								
insulation of electrodes	1211	---		---	R	100	---	MegΩ
Transconductance (2)	1306	---	E _f = 6.0 V; E _b = 100 V dc; R _k = 0	---	ΔS _m E _f	---	20	%
Electrode voltage (grid)	1261	---	R _k = 0; E _c /I _b = 100 μA dc	---	E _c	---	-4.5	V dc
Amplification factor	1316	---		---	Mu	65	115	---

See footnotes at end of table.

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TABLE I. Testing and inspection - Continued.

Inspection	MIL-STD-1311 Method	Notes	Conditions	Acceptance Level 11/	Symbol	Limits		Unit
						Min	Max	
<u>Conformance inspection, part 2</u> - Continued.								
Grid emission	1266	<u>3/</u>	Ef = 7 V; Ecc = -20 V dc; Rg = 0.1 MegΩ	---	Ic	0	-2.0	μA dc
Grid recovery	2210	<u>7/</u>	Ebb = 250 V dc; Ec/Ib = 3.0 mA dc; Rp = 0.01 MegΩ	---	{ ΔIb ΔIb	--- ---	0.6 1.0	mA dc ma
Direct-interelectrode capacitance	1331	---		---	{ Cgp Cin Cout Chk	1.06 1.20 0.005 0.80	1.36 2.10 0.015 1.40	pF pF pF pF
Envelop strain	---	<u>5/</u>		---	---	---	---	---
Low-frequency vibration	1031	<u>9/</u>	Ebb = 150 V dc; Rp = 10,000 ohms; 15 G; F = 40 Hz	---	Ep	---	10	mV ac
<u>Conformance inspection, part 3</u>								
Heater-cycling life	1506	<u>8/</u>	Ef = 7 V; Ehk = +70 V; Rk = 0; Ec = Eb = 0	---	---	---	---	---
Heater-cycling life-test end points:	---							
Heater-cathode leakage	1336	---		---	Ihk	---	40	μA dc
Stability life	1516	<u>6/</u>	Ebb = 150 V dc; Rk = 0; Eg = 7.7 V ac; Ehk = -70 V dc; Rg = 3,300 ohms; Rb = 4,700 ohms; TA = 20°C	2.5	---	---	---	---
Stability life-test end-point: (2 and 20 hours)	---							
Change in transconduc- tance (1) of individual tubes	---	---		---	ΔSm t	---	15	%

See footnotes at end of table.

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TABLE I. Testing and inspection - Continued.

Inspection	MIL-STD-1311 Method	Notes	Conditions	Acceptance Level 11/	Symbol	Limits		Unit
						Min	Max	
<u>Conformance inspection,</u> <u>part 3</u> - Continued.								
Intermittent life	1501	---	Group A					
Operation (1)	---	---	Stability life-test conditions; t = 1,000 hours	---	---	---	---	---
Operation (2)	---	---	Ebb = 150 V dc; Ec = -10 V dc; ec = +8 v (driver side of Rg); Rg/g = 50 ohms; Rb = 60 ohms; tp = 10 ± 1 μs; Du = 0.01 ± 0.1 %; Ehk = -70 V dc; t = 1,000 hours	---	---	---	---	---
Intermittent life-test end points:								
Operation (1)	---	---						
Heater current	1301	---		---	If	222	264	mA
Transconductance (1)	1306	---		---	Sm	6,500	---	μmho
Transconductance (2)	1306	---		---	ΔSm	---	25	s
Heater-cathode leakage	1336	---		---	Ef lhk	---	20	% μA dc
Operation (2)	---	---						
Heater current	1301	---		---	If	222	264	mA
Pulsing emission	1231	---		---	ik	60	---	ma
Heater-cathode leakage	1336	---		---	lhk	---	20	μA dc
Shock	1041	<u>10/</u>	Hammer angle = 30° Ehk = 50 V dc	---	---	---	---	---
Shock-test end points:								
Low-frequency vibration	1031	---		---	Ep	---	15	mV ac
Heater-cathode leakage	1336	---		---	lhk	---	30	μA dc
Transconductance (1)	1306	---		---	Sm	6,500	---	μmho
Heater current	1301	---		---	If	222	258	s mA

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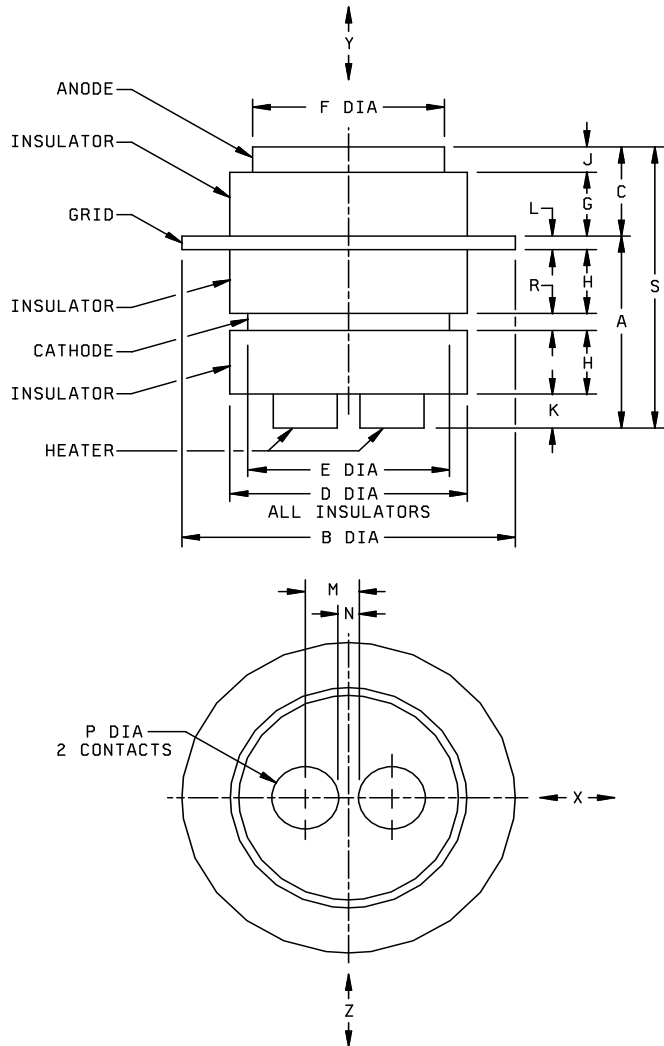
TABLE I. Testing and inspection - Continued.

- 1/ Operation below the rated maximum temperature is recommended for applications requiring the longest possible tube life.
- 2/ $E_c = -10$ V dc. Grid is driven with the pulse circuit as follows: $e_c = +7$ V; $prr = 1,000$; $t_p = 10 \pm 1$ μ s; $t_r = 1$ μ s (max); $t_f = 1$ μ s maximum. Read peak cathode current.
- 3/ Prior to this test, tubes shall be preheated a minimum of 5 minutes at the conditions indicated below. The 3-minute test is not permitted. Test within 3 seconds after preheating. Grid emission shall be the last test performed on the sample selected for the grid-emission test.

E_f	E_{cc}	E_b	R_k	R_g
V	V dc	V dc	Ohms	Meg
7	0	150	82	0.1

- 4/ The tube shall be tested as specified in [MIL-STD-1311](#) method 1002 with the exception that the specified voltage shall be applied between the anode and grid.
- 5/ 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.
- 6/ $E_g = 7.7$ V ac, 60 Hz, applied to grid through 100 μ F coupling capacitor. Grid is connected to ground through 3,300 ohms.
- 7/ Grid recovery. Test shall be performed as follows:
 - a. With tube under test (TUT) operating under specified conditions, adjust E_c for $I_b = 3$ mA dc.
 - b. Apply 5 volt pulse, 20 μ s duration, 60 pps to the grid.
 - c. With application of pulse, measure undershoot (ΔI_b) and change in average current (ΔI_b).
- 8/ The heater-cycling life-test sample shall consist of 15 tubes and no tube failure shall be permitted. In the event of rejection of the first sample due to failure of 1 tube, a second sample of 15 tubes shall be selected from the lot. Acceptance shall then be based on the combined first and second samples. The total tube failures from the combined first and second samples shall not exceed one.
- 9/ 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 parallel to a line through the heater contacts.
- 10/ This test shall be performed during the initial 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 [11/](#)).
- 11/ This specification sheet uses accept on zero defect sampling in accordance with [MIL-PRF-1](#), table III.

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Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
	conformance	inspection	part 2	
A	.268	.292	6.81	7.42
B	.476	.484	12.09	12.29
C	.156	.174	3.96	4.42
D	---	.335	---	8.51
E	.281	.289	7.14	7.34
F	.271	.279	6.88	7.09
G	.095	.105	2.41	2.67
H	.095	.105	2.41	2.67
J	.034	.046	0.86	1.17
K	.047	.063	1.19	1.60
L	.024	.030	0.61	0.76
M	.055	.081	1.40	2.06
N	.030	---	0.76	---
P	.086	.094	2.18	2.39
R	.022	.028	0.56	0.71
S	.430	.460	10.92	11.68

NOTES:

1. Eccentricity of anode, grid, and cathode with respect to centerline shall be .005 inch (0.13 mm) maximum.
2. Eccentricity of insulators with respect to centerline shall be .010 (0.25 mm) maximum.
3. Centerline of grid shall be reference line for horizontal tolerances.
4. Bottom surface of grid shall be reference plane for vertical tolerances.

FIGURE 1. Outline drawing of electron tube type 7486.

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Referenced documents. In addition to [MIL-PRF-1](#), this specification sheet references [MIL-STD-1311](#).

Amendment notations. The margins of this specification sheet are marked with vertical line to indicate modifications generated by this amendment. 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.

Custodians:

Army - CR
Navy - EC
Air Force - 85
DLA - CC

Preparing activity:

DLA - CC

(Project 5960-2022-018)

Review activities:

Navy - AS, CG, MC, OS

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil>.