

INCH-POUND

MIL-PRF-1/484E
w/AMENDMENT 1
5 October 2022
SUPERSEDING
MIL-PRF-1/484E
17 October 2008

PERFORMANCE SPECIFICATION SHEET
ELECTRON TUBE, NEGATIVE GRID (MICROWAVE)
TYPE 6299

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

Inactive for new design
after 7 March 1997.

The requirements for acquiring the electron tube described
herein shall consist of this document and [MIL-PRF-1](#).

DESCRIPTION: Planar triode, metal-ceramic

See [figure 1](#)

Mounting position: Any

Weight: 0.16 ounce nominal (4.54 grams)

ABSOLUTE RATINGS:

Parameter:	F	Ef	Eb	Ec	Ib	Pp	tk	Cooling	T(seal)
Unit:	MHz	V	V dc	V dc	mA dc	W	sec	---	°C
Maximum:	3,000	6.6	200	0,-10	12	2.0	---	Conduction	150
Minimum:	---	6.0	---	---	---	---	---	---	---
TEST CONDITIONS:	---	6.3	175	Adj	10	---	180	Conduction	---

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

Requirement or test	MIL-STD-1311 method	Notes	Conditions	Acceptance level	Symbol	Limits		Unit
						Min	Max	
<u>Conformance inspection, part 1</u>								
Insulation of electrodes	1211	---	Ebb = -500 V dc; Ekk = +45 V dc (see figure 2)	0.65 0.65	Rgp Rgk	5.0 0.25	---	MegΩ MegΩ
Pulsing emission	1231	1	Ef = 5.5V; Eb = 0, Ec = -18 V dc; eb = 390 v (peak-to-peak); ec = 46 v (peak-to-peak); Rg = 470 ohms; Rk = 10 ohms	0.65	Is	3.5	---	mA dc
Electrode voltage (anode)	1261	---	Ec = 0; Eb/Ib = 10 mA dc	0.65	Eb	75	175	V dc
Heater current	1301	---		0.65	If	280	320	mA
Transconductance	1306	---		0.65	Sm	11,500	---	μmhos
Power gain (1)	---	2	Ec = 0; Eb/Ib = 10 mA dc; F = 1,200 +5 MHz; bandwidth = 10 MHz (min); Drawing 271-JAN	0.65	Gain	15.0	---	dB
Noise figure (1)	---	2	Ec = 0; Eb/Ib = 10 mA dc; F = 1,200 +5 MHz; Drawing 271-JAN	0.65	NF	---	8.5	dB
<u>Conformance inspection, part 2</u>								
Power gain (2)	---	2	Ec = 0; Eb/Ib = 10 mA dc; F = 3,000 +5 MHz; Drawing 272-JAN	---	Gain	10.0	---	dB
Noise figure (2)	---	2	Ec = 0; Eb/Ib = 10 mA dc; F = 3,000 +5 MHz; Drawing 272-JAN	---	NF	---	13.5	dB
Amplification factor	1316	---		---	Mu	85	140	---
Direct-interelectrode capacitance	1331	---	No voltages; Drawing 270-JAN	---	Cin Cgp Cout	3.0 1.5 ---	5.0 2.0 0.025	pF pF pF
Envelope strain	2126	3		---	---	---	---	---

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

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TABLE I. Testing and inspection- Continued.

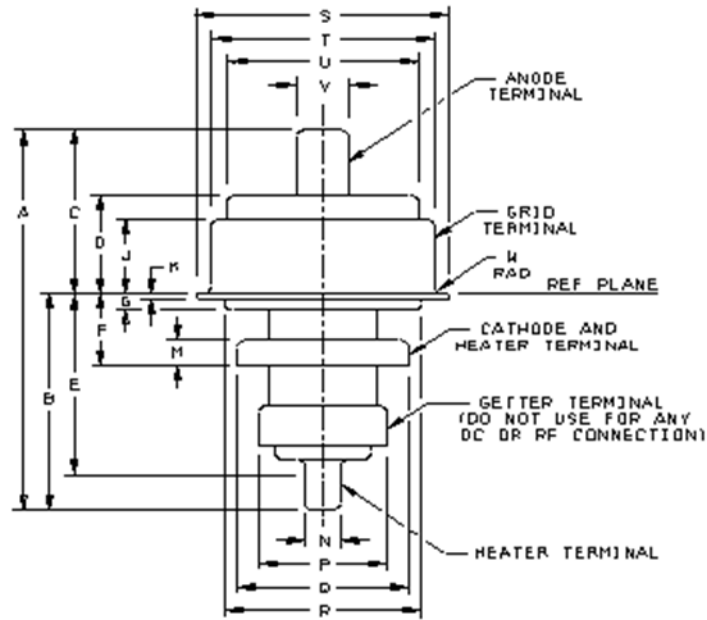
Requirement or test	MIL-STD- 1311 method	Notes	Conditions	Acceptance level	Symbol	Limits		Unit
						Min	Max	
<u>Conformance inspection, part 3</u>								
Life test	---	---	Group B; Eb = 200 V dc; Rk/lb = 10 mA dc; t = 1,000 hours	---	---	---	---	---
Life-test end points:	---							
Transconductance	1306	---		---	ΔS_{mt}	---	25	%de- crease
Noise figure (1)	---	---		---	ΔNF_t	---	1.0	dB in- crease
Low-frequency vibration	1031	4	Ec = 0; Eb/lb = 10 mA dc; Rp = 10,000 ohms; Drawing 273-JAN	---	Ep	---	100	mVac
Shock	1041	5	No voltages; hammer Angle=20°; Drawing 274-JAN	---	---	---	---	---
Shock-test end points:	---							
Transconductance	1306	---		---	Sm	11,500	---	μmhos
Insulation of electrodes	1211	---		---	Rgp	5.0	---	MegΩ
Insulation of electrodes	1211	---		---	Rgk	0.25	---	MegΩ

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NOTES:

1. The 60 Hz voltages eb and ec shall be in phase, and the sinusoidal waveform should not be distorted. Read average cathode current.
2. An approved noise source shall be used for noise figure measurements. Power input level shall be about -75 dBm for power gain (1), noise figure (1), power gain (2), and noise figure (2).
3. Envelope strain procedure. Tubes shall be tested as specified in [MIL-STD-1311](#) method 2126, except that they shall first be immersed in water at not more than 5°C for 15 seconds, and immediately thereafter subjected to the standard temperature cycle specified in method 2126. The criteria for air leaks shall be heater current of 330 mA, or more.
4. Vibrate in plane perpendicular to the plane of the grid. Test 10 tubes selected at random from the first production lot of each calendar year, and approximately every 90 days of production during the year. If one tube fails to pass the specified end points, the test shall become a part of conformance inspection, part 2, acceptance level of 6.5 (see note 6).
5. Apply the force perpendicular to the plane of the grid from the cathode end. Test 10 tubes selected at random from the first production lot of each calendar year. If one tube fails to pass the specified endpoints, the test shall become a part of conformance inspection, part 2, acceptance level of 6.5 (see note 6), on all lots in process.
6. This specification utilizes an accept on zero defect sampling plan in accordance with [MIL-PRF-1](#), table III.

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Ltr	Dimensions in inches with metric	equivalents (mm) in parentheses	Notes
	Minimum	Maximum	
	Conformance	inspection, part 2	1
A	.960 (24.38)	1.040 (26.42)	
B	.530 (13.46)	.590 (14.99)	
C	.410 (10.41)	.470 (11.94)	
D	---	.272 (6.91)	
E	---	.475 (12.07)	
F	.163 (4.14)	.193 (4.90)	
	Conformance	inspection, part 3	2
G	---	.060 (1.52)	
H	---	.030 (.76)	
J	.190 (4.83)	.210 (5.33)	
K	.009 (.23)	.015 (.38)	
M	.040 (1.02)	.070 (1.78)	
N	.059 (1.50)	.065 (1.65)	
P	---	.257 (6.53)	
Q	.326 (8.28)	.334 (8.48)	
R	---	.385 (9.78)	
S	.483 (12.27)	.497 (12.62)	
T	.435 (11.05)	.445 (11.30)	5
U	---	.385 (9.78)	
V	.088 (2.24)	.094 (2.39)	6
W	---	.008 (.20)	

FIGURE 1. Outline drawing of electron tube type 6299

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NOTES:

1. These dimensions shall be checked on a lot-to-lot basis under conformance inspection, part 2 to an acceptance level of 6.5, inspection level S3. The acceptance level is applied to each dimension separately and is not combined.
2. These dimensions shall be inspected at the start of production and periodically every 3 months during production. The sample size shall be six tubes and the acceptance number shall be zero defects for each dimension. Failure of any dimension to meet conformance inspection, part 3 requirements shall cause the nonconforming dimension to be inspection on a lot-to-lot basis to a 6.5 acceptance level, inspection level S3. After three consecutive successful submissions, the inspection shall revert to 3-month intervals.
3. All tubes are to be 100 percent tested for concentricity in gauge (see [figure 3](#)). Tube shall be rotated 360° in gauge without binding.
4. Grid shell seal shall be completely filled to cathode ceramic shelf.
5. 'T' dimension shall be measured other than across tube designation etch, and approximately .100 (2.54 mm) from the reference plane.
6. 'V' dimension shall be measured approximately .100 (2.54 mm) from the end of the anode terminal.

FIGURE 1. Outline drawing of electron tube type 6299 – Continued.

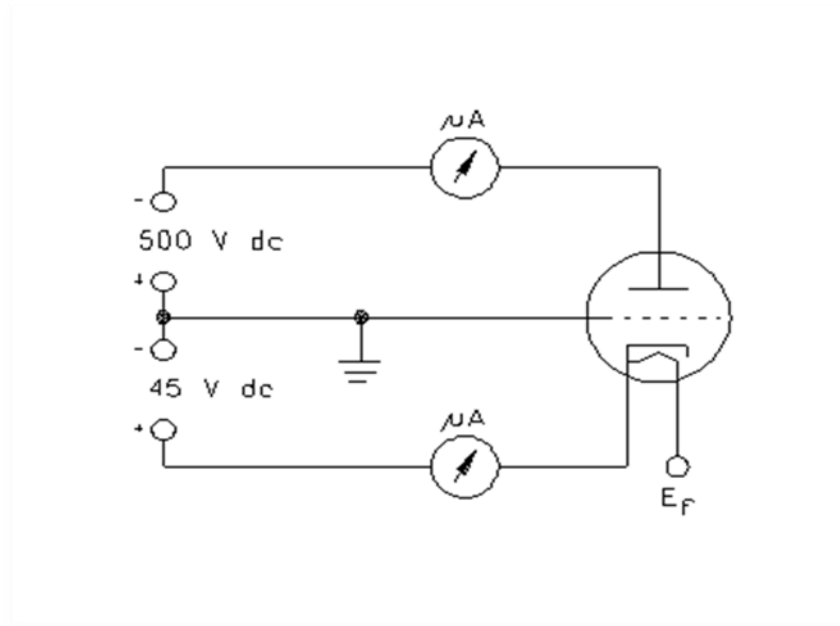
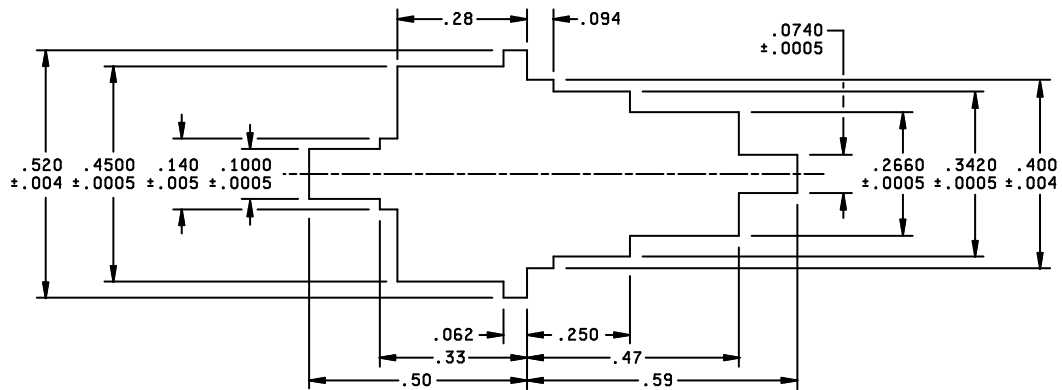


FIGURE 2. Insulation of electrodes test.

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NOTE: Unless otherwise specified, tolerance for dimension .250 or less $\pm .008$; over .25 $\pm .02$.

FIGURE 3. Gauge.

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

Drawing 270-JAN
Drawing 271-JAN
Drawing 272-JAN
Drawing 273-JAN
Drawing 274-JAN

NOTE: To obtain copies of JAN drawings, please send a request via email to TubesAmps@dla.mil.

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 5960-2022-015)

Review activities:
Army - AR
Navy - AS, CG, MC, OS

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