INCH-POUND

MIL-PRF-1/484E
17 October 2008
SUPERSEDING
MIL-E-1/484D
31 March 1975

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 – Required.

TABLE I. Testing and inspection

MIL-STD-1311 method	Requirement or test	Notes	Conditions	Acceptance level	Symbol	Limits Min	Limits Max	Unit
	Conformance inspection, part 1							
1211	Insulation of electrodes	---	Ebb = -500 V dc; Ekk = +45 V dc (see figure 2)	0.65 0.65	Rgp Rgk	5.0 0.25	--- ---	MegΩ MegΩ

1231	Pulsing emission	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

1261	Electrode voltage (anode)	--- ---	Ec = 0; Eb/Ib = 10 mA dc	0.65	Eb	75	175	V dc
1301	Heater current	---		0.65	If	280	320	mA
1306	Transconductance	---		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
	Conformance inspection, part 2							
---	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
1316	Amplification factor	---		---	Mu	85	140	---
1331	Direct-interelectrode capacitance	---	No voltages; Drawing 270-JAN	---	Cin Cgp Cout	3.0 1.5 ---	5.0 2.0 0.025	pF pF pF
2126	Envelope strain	3		---	---	---	---	---

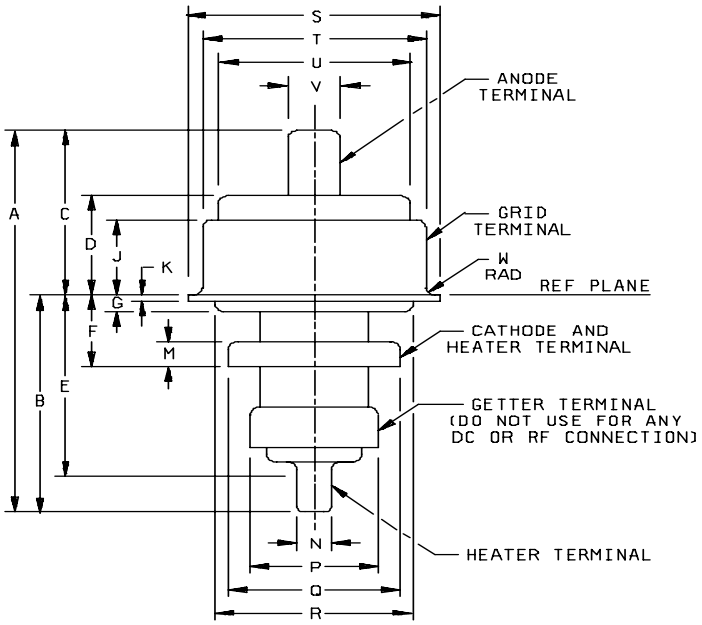
See notes at end of table I.

TABLE I. Testing and inspection- Continued.

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

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). After three consecutive successful submissions, the test shall revert back to the 10-tube quarterly test.
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. After three consecutive successful submissions, the test shall revert back to a 10-tube annual test.
6. This specification utilizes an accept on zero defect sampling plan in accordance with MIL-PRF-1, table III.
7. Drawings 270-JAN, 271-JAN, 272-JAN, 273-JAN and 274-JAN are referenced herein. Contact the preparing activity for availability information, if required."



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.

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.

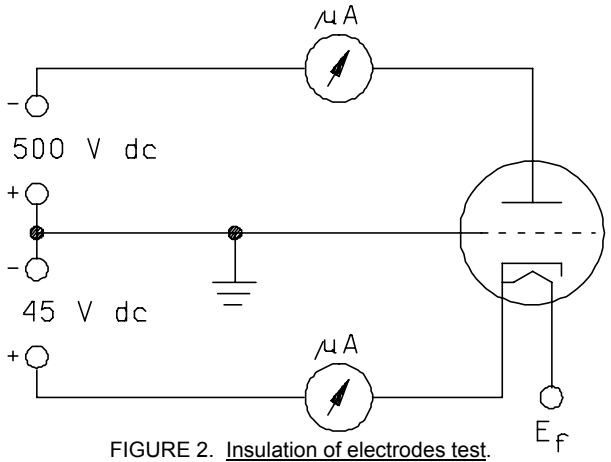
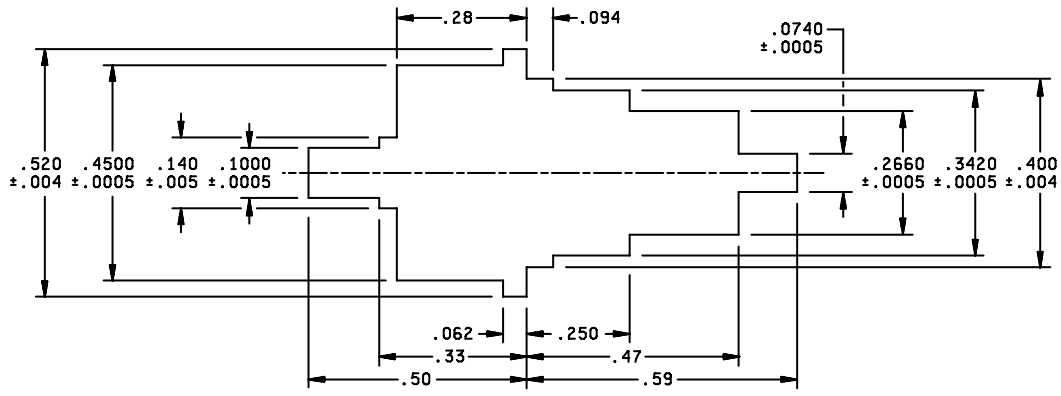


FIGURE 2. Insulation of electrodes test.



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

FIGURE 3. Gauge.

Referenced documents. In addition to MIL-PRF-1, this document references
MIL-STD-1311
270-JAN
271-JAN
272-JAN
273-JAN
274-JAN

Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

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

Preparing activity:
DLA - CC

(Project 5960-2008-064)

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

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 http://assist.daps.dla.mil/.