

MILITARY SPECIFICATION SHEET  
 ELECTRON TUBE, RECEIVING  
 TYPE 6AN5WA

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

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

DESCRIPTION: Pentode, miniature, video amplifier

Outline - - - - - 5-2 (EIA)  
 Base - - - - - E7-1  
 Envelope - - - - - T5-1/2  
 Cathode - - - - - Coated unipotential  
 Base connections:  
 Pin No. - - - 1 2 3 4 5 6 7  
 Element - - - g1 k,g3 h h a g2 k,g3

ABSOLUTE-MAXIMUM RATINGS:

Parameter:	Ef	Eb	Ec1	Ec2	Ehk	Rk	Rg1	Ik	Pp	Pg2	TE	Alt
Unit:	V	Vdc	Vdc	Vdc	V	Ohms	Meg	mAdc	W	W	°C	ft
Maximum:	6.9	135	0, -55	135	200	---	0.1	55	4.6	1.55	+200	Note 1
Minimum:	5.7	---	---	---	---	---	---	---	---	---	---	---
<u>TEST CONDITIONS:</u>	6.3	120	0	120	0	125	---	---	---	---	---	---

GENERAL:

Qualification - Required  
 Reliable tube

6AN5WA

FSC 5960

Method	Requirement or Test	Notes	Conditions	AQL (percent defective)	Inspection level or code	Symbol	Limits		Unit
							Min	Max	
<u>Quality conformance inspection, part 1</u>									
1301	Heater current			0.4	II	I <sub>f</sub>	420	480	mA
1336	Heater-cathode leakage			0.4	II	I <sub>hk</sub>	---	20	μA <sub>dc</sub>
1266	Total grid current	2		0.4	II	I <sub>c1</sub>	0	-2.0	μA <sub>dc</sub>
1256	Electrode current (1) (anode)	2		0.4	II	I <sub>b</sub>	25	43	mA <sub>dc</sub>
1341	Power output		E <sub>sig</sub> = 4.25 V <sub>ac</sub> ; R <sub>L</sub> = 2,500 ohms	0.4	II	P <sub>o</sub>	1.0	---	W
1201	Short and discontinuity detection			0.4	II	---	---	---	---
<u>Quality conformance inspection, part 2</u>									
1211	Insulation of electrodes			2.5	I	R	---	---	---
1256	Electrode current (1) (screen grid)			2.5	I	I <sub>c2</sub>	6.0	16.0	mA <sub>dc</sub>
1256	Electrode current (2) (anode)		E <sub>c1</sub> = -20 V <sub>dc</sub>	2.5	I	I <sub>b</sub>	---	1.0	mA <sub>dc</sub>
1306	Transconductance (1)			2.5	I	S <sub>m</sub>	7,000	10,000	μmhos
1266	Grid emission	3	E <sub>f</sub> = 7.5 V; E <sub>c1</sub> = -45 V <sub>dc</sub> ; R <sub>g1</sub> = 0.01 Meg (min)	2.5	S3	I <sub>c1</sub>	0	-4.0	μA <sub>dc</sub>
1306	Transconductance (2)		E <sub>f</sub> = 5.7 V	2.5	I	ΔS <sub>m</sub> E <sub>f</sub>	---	10	μ
1231	Emission		E <sub>b</sub> = E <sub>c2</sub> = E <sub>c1</sub> = 15 V <sub>dc</sub>	2.5	I	I <sub>s</sub>	100	---	mA <sub>dc</sub>
2201	Noise and microphonics		E <sub>sig</sub> = 500 mV <sub>ac</sub> ; R <sub>p</sub> = 2,000 ohms; R <sub>g1</sub> = 0.1 Meg	2.5	I	---	---	---	---
1331	Direct-interelectrode capacitance		Shield No. 316 Shield No. 316 Shield No. 316	6.5	Code E	{ C <sub>g1p</sub> C <sub>in</sub> C <sub>out</sub>	---	0.075 12.0 7.0	pF pF pF
1256	Electrode current (3) (anode)		E <sub>b</sub> = E <sub>c2</sub> = 60 V <sub>dc</sub> ; E <sub>c1</sub> = 0; R <sub>k</sub> = 0	2.5	I	I <sub>b</sub>	25	---	mA <sub>dc</sub>
1256	Electrode current (2) (screen grid)		E <sub>b</sub> = E <sub>c2</sub> = 60 V <sub>dc</sub> ; E <sub>c1</sub> = 0; R <sub>k</sub> = 0	6.5	Code E	I <sub>c2</sub>	6.5	15.5	mA <sub>dc</sub>
1031	High-frequency vibration		R <sub>p</sub> = 2,000 ohms	2.5	I	E <sub>p</sub>	---	150	mV

Method	Requirement or test	Notes	Conditions	AQL (percent defective)	Inspection level or code	Symbol	Limits		Unit
							Min	Max	
	<u>Quality conformance inspection, part 2</u> -Continued								
1031	Vibration-fatigue			6.5	Note 4	---	---	---	---
1041	Shock	5	450 G; Ehk = 100 Vdc	---	Note 4	---	---	---	---
---	Shock and vibration-fatigue-test end points:								
1031	High-frequency vibration		Rp = 2,000 ohms	---	---	Ep	---	300	mVac
1336	Heater-cathode leakage			---	---	Ihk	---	50	µAdc
1266	Total grid current			---	---	Ic1	0	-4.0	µAdc
1341	Power output		Esig = 4.25 Vac; RL = 2,500 ohms	---	---	Po	0.8	---	W
1121	Base strain	6		---	---	---	---	---	---
2126	Envelope strain			2.5	1	---	---	---	---
1105	Permanence of marking			---	---	---	---	---	---
Method	Requirement or test	Notes	Conditions			Symbol	Limits		Unit
	<u>Quality conformance inspection, part 3</u>								
1506	Heater-cycling life		Ef = 7.5 V; Ehk = +100 Vdc; Ec1 = Ec2 = Eb = 0; 1 min "on", 4 min "off"			---	---	---	---
---	Heater-cycling life-test end point:								
1336	Heater-cathode leakage					Ihk	---	30	µAdc
1516	Stability life		Ehk = +135 Vdc; Rg1 = 0.1 Meg; TA = room			---	---	---	---
---	Stability life-test end point (2 and 20 hours):								
1306	Change in transconductance (1) of individual tubes					ΔSm t	---	10	%
1501	Intermittent life	8	Ehk = 135 Vdc; Rg1 = 0.1 Meg; TA = room; TE = 200°C (min);			---	---	---	---

Method	Requirement or test	Notes	Conditions	Symbol	Limits		Unit
					Min	Max	
	<u>Quality conformance inspection, part 3</u> - Continued						
---	Intermittent life-test end points (1,000 hours):						
1266	Total grid current			I <sub>c</sub>	0	-3.0	μA
1301	Heater current			I <sub>f</sub>	410	490	mA
1306	Change in transconductance (1) of individual tubes			ΔS <sub>m</sub>	---	20	%
1341	Power output		E <sub>sig</sub> = 4.25 Vac; R <sub>L</sub> = 2,500 ohms	P <sub>o</sub>	0.50	---	W
1336	Heater-cathode leakage			I <sub>hk</sub>	---	50	μA
1211	Insulation of electrodes			R	50	---	Meg
1511	Cathode interface life	7	E <sub>f</sub> = 6.9 V; E <sub>hk</sub> = 0	R <sub>i</sub>	---	25.0	Ohms

## NOTES:

- See "Reduced pressure (altitude) rating," and altitude, maximum peak voltage in the basic document.
- This test shall be performed at the conclusion of the holding period.
- Prior to this test, the tubes under test (TUT) shall be preheated a minimum of 5 minutes operating at the conditions specified below. The 3-minute test shall not be permitted. Test at specified conditions within 3 seconds after preheating. Grid emission shall be the last test performed on the sample selected for the grid emission test.

E <sub>f</sub>	E <sub>c1</sub>	E <sub>b</sub>	R <sub>k/k</sub>	R <sub>g/g</sub>	E <sub>c2</sub>
V	Vdc	Vdc	Ohms	Meg	Vdc
7.5	0	120	125	0.01	120

- This test shall be conducted on the initial lot and thereafter on a lot approximately every 12 months. When one lot has passed, the 12-month rule shall apply. In the event of lot failure, the lot shall be rejected and the succeeding lots shall be subjected to this test until a lot passes. MIL-STD-105, sample size code letter E, shall apply.
- A grid resistor of 0.1 megohm shall be added except when a thyratron-type short indicator is used.
- Acceptance sampling procedure shall be in accordance with "Base-strain test, miniature, sampling (method 1121)", except that data covered in "Acceptance and rejection criteria" shall be modified as follows:
  - Accepted if not more than one defective for class "A", "B", or "C" defects, respectively (see method 1121), or if not more than a total of two defectives are found in the sample.
  - Rejected if two or more defectives for class "A", "B", or "C" defects, respectively, or if a total of three or more defectives are found in the sample.
- The life-test sample shall consist of 20 tubes per lot and not more than 1 tube failure shall be permitted. In the event of rejection of the first sample due to failure of more than 1 tube, a second sample of 40 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 three.
- Envelope temperature (TE) requirements, when measured in accordance with the temperature by conduction-band measurement (method 1226), will be satisfied if a TUT having bogey I<sub>b</sub> (+5 percent) under normal test conditions, is determined to operate at or above minimum specified temperature at any position in the life-test rack.
- Revision letters are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.