INCH-POUND

MIL-E-1/175J
28 February 2003
SUPERSEDING
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12 January 1979

MILITARY SPECIFICATION SHEET

ELECTRON TUBE, RECEIVING
TYPE 5902

This specification sheet is inactive for new design after 7 March 1997.

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 MIL-PRF-1.

DESCRIPTION: Pentode, subminiature, beam power

Outline	---	3-3 (EIA)
Base	---	E8-10
Envelope	---	T3
Cathode	---	Coated unipotential

Base connections:

Pin No.	---	1	2	3	4	5	6	7	8
Element	---	g1	k, g3	h	k, g3	a	h	g2	k, g3

ABSOLUTE- RATINGS:

Parameter:	Ef	Eb	Ec1	Ec2	Ehk	Rk	Rg1	Ik	Pp	Pg2	TE	Alt
Unit:	V	V dc	V dc	V dc	v	Ohms	Meg	mA dc	W	W	°C	ft
Maximum:	6.6	165	0, -55	155	200	---	0.55	50	3.7	0.4	220	See Note 1
Minimum:	6.0	---	---	---	---	---	---	---	---	---	---	---
Test Conditions:	6.3	110	0	110	0	270	---	---	---	---	---	---

GENERAL:

First Article Test is required and shall consist of all tests in table I with a sample size of 2 for a lot size less than or equal to 150 units and a sample size of 4 units for a lot size greater than or equal to 151 units. All samples will pass Conformance Inspection part 1 of table I before continuing. Half of the samples shall then be subjected to Conformance Inspection part 2, and the remaining samples shall be subjected to part 3, with no test failures permitted during any testing.

After First Article approval, Acceptance testing shall consist of Conformance Inspection part 1 of table I with sample size per table III, category XVI of MIL-PRF-1.

TABLE I. Testing and inspection.

MIL-STD-1311 Test method	Requirement or test	Conditions	Symbol	Limits		Units
				Min	Max	
	Conformance inspection, part 1					
1256	Electrode current (1) (anode)	See note 2	Ib	23	37	mA dc
1256	Electrode current (2) (anode)	Ec1 = -40 V dc; Rk = 0	Ib	---	100	µA dc
1266	Total grid current (1)	Rgl = 1.0 Meg (see note 2)	Icl	0	-1.0	µA dc
1301	Heater current		If	420	480	mA
1336	Heater-cathode leakage		Ihk	---	15	µA dc
1341	Power output (1)	Esig = 6.4 V ac; Rp = 3,000 ohms	Po	0.75	---	W
1201	Short and discontinuity detection		---	---	---	---
	Conformance inspection, part 2					
1211	Insulation of electrodes		R	50	---	Meg
1031	Low-frequency vibration	Rp = 2,000 ohms; 15 G; F = 40 Hz	Ep	---	100	mV ac
1246	Audio frequency noise	Ecal = 150 mV ac; Ecc2 = 110 V dc; Ecl = -8.7 V dc; Rk = 0; Rp = 2,000 ohms; Rgl = 0.5 Meg; Rg2 = 10,000 ohms; Cg2 = 4.0 µF	EB	---	17	vu
1256	Electrode current (screen)		Ic2	0	4.0	mA dc
1266	Grid currents	Ef = 7.5 V; Ecl = -40 V dc; Rgl = 1.0 Meg; Rk = 0 (see note 3)	Is(gl)	0	-2.0	µA dc
1306	Transconductance		Sm	3,500	4,900	µmhos
1311	Anode resistance		rp	0.01	---	Meg
1331	Direct-interelectrode capacitance	0.405 in. dia shield	Cpq Cin Cout	--- 5.5 6.5	0.20 7.5 8.5	pF pF pF
1341	Power output (2)	Ef = 5.7 V; Esig 6.5 V ac; Rp - 3,000 ohms	ΔPo Ef	---	15	%
1116	Lead fatigue		---	---	---	---

TABLE I. Testing and inspection - Continued.

MIL-STD-1311 Test method	Requirement or test	Conditions	Symbol	Limits		Units
				Min	Max	
	Conformance inspection, part 2 - Continued					
2126	Envelope strain		---	---	---	---
1041	Shock	450 G: Ebk = +100 V dc; Rg1 = 0.1 Meg				
1031	Vibration fatigue test	2.5 G; fixed frequency; F = 25 min, 60 max	---	---	---	---
---	Post-shock and vibration-fatigue test end points:					
1031	Low-frequency vibration		Ep	---	300	mV ac
1336	Heater-cathode leakage		Ihk	---	40	µA dc
1341	Change in power output (1) of individual tubes		ΔPo t	---	20	%
1105	Permanence of marking		---	---	---	---
	Conformance inspection, part 3					
1516	Stability life test	Eb = Ec2 = 100 V dc; Ehk = +200 V dc; Rgl = 0.47 Meg; Rk = 220 ohms; TA = room	---	---	---	---
---	Stability life test end point:					
1341	Change in power output (1) of individual tubes		ΔPo t	---	10	%
1506	Heater-cycling life test	Ef = 7.0 V; 1 min “on”; 4 min “off”; Ehk = 140 V ac; Ecl = Ec2 = Eb = 0	---	---	---	---
---	Heater-cycling life - test end point:					
	Heater-cathode leakage		Ihk	---	40	µA dc
1501	Intermittent life test (room temperature)	Stability life-test, or equivalent conditions; TA = room	---	---	---	---
---	Intermittent life-test end point (room temperature 500 hours):					
1211	Insulation of electrodes		R	50	---	Meg

TABLE I. Testing and inspection - Continued.

MIL-STD-1311 Test method	Requirement or test	Conditions	Symbol	Limits		Units
				Min	Max	
	Conformance inspection, part 3 - Continued					
---	Intermittent life-test end point (room temperature) (1,000 hours):					
1211	Insulation of electrodes		R	25	---	Meg
1501	Intermittent life test	Stability life-test conditions; TE = +220°C (min) (see note 4)	---	---	---	---
---	Intermittent life-test end points (500 hours):					
1301	Heater current		If	414	492	mA
1336	Heater-cathode leakage		Ihk	---	60	µA dc
1266	Total grid current (1)		Icl	0	-2.0	µA dc
1341	Change in power output (1) of individual tubes		ΔPot	---	20	%
1341	Power output (1) average change		Avg ΔPot	---	15	%
1211	Insulation of electrodes		R	50	---	Meg
1341	Power output (2)		ΔPoEf	---	15	%
---	Intermittent life-test end points: (1,000 hours)					
---	Inoperatives		---	---	---	---
1301	Heater current		If	414	492	mA
1336	Heater-cathode leakage		Ihk	---	60	µA dc
1266	Total grid current (1)		Icl	0	-2.0	µA dc
1341	Change in power output (1) of individual tubes		ΔPot	---	25	%
1211	Insulation of electrodes		R	25	---	Meg
1341	Power output (2)		ΔPoEf	---	20	%

NOTES:

1. See “Reduced pressure (altitude) rating”, and altitude, maximum peak voltage in the basic document.

2. This test to be performed at the conclusion of the holding period.

3. Prior to this test, the tube shall be preheated a minimum of 5 minutes at the conditions specified below. The 3-minute test is not permitted. Test at preheat conditions within 3 seconds after preheating. Total grid current (2) shall be the last test performed on the sample selected for the total grid current (2) test.

Ef	Ec1	Ec2	Ec3	Eb	Rk	Rg1
V	V dc	V dc	V dc	V dc	Ohms	Meg
7.5	0	100	0	100	220	0.47

4. Envelope temperature (TE) requirements, when measured in accordance with the temperature by conduction-band measurement (method 1226), will be satisfied if a tube having bogey IB (+5 percent) under normal test conditions, is determined to operate at or above minimum specified temperature at any position in the life-test rack.

Custodians:
Army - CR
Navy - EC
Air Force - 11
DLA - CC

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

Preparing activity:
DLA - CC

(Project 5960-3610)