

INCH-POUND

MIL-E-1/190K  
17 September 2013  
SUPERSEDING  
MIL-E-1/190J  
21 February 2003

MILITARY SPECIFICATION SHEET

ELECTRON TUBE, RECEIVING

TYPE 6112

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: Twin triode, subminiature, high Mu.

Outline --- 3-1 (EIA).  
Base --- E8-10.  
Envelope --- T3.  
Cathode --- Coated unipotential.

Base connections:

Pin No. --- 1 2 3 4 5 6 7 8  
Element --- 2a 2g h 2k 1k h 1g 1a

ABSOLUTE RATINGS:

Parameter:	Ef	Eb	Ec	Ehk	Rk/k	Rg/g	Ib/a	Pp/a	TE	Alt
Unit:	V	V dc	V dc	v	Ohms	MegΩ	mAdc	W	°C	ft
Maximum:	6.6	165	0, -55	200	---	1.1	3.3	0.30	+220	See Note 1
Minimum:	6.0	---	---	---	---	---	---	---	---	---
Test Conditions:	6.3	100	0	0	1,500	---	---	---	---	---

GENERAL:

Qualification – Not required.

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 for a lot size greater than or equal to 151 units. All samples shall 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 in accordance with table III, category XVI (acceptance level 10.0) of MIL-PRF-1.

## MIL-E-1/190K

TABLE I. Testing and inspection.

Requirement or test	MIL-STD-1311 Method	Conditions	Symbol	Limits		Units
				Min	Max	
<u>Conformance inspection, part 1</u>						
Electrode current (1) (anode)	1256	See note 2 and 3	Ib	0.5	1.10	mA dc
Electrode current (2) (anode)	1256	Ec = -2.8 V dc; Rk = 0 (see note 2)	Ib	---	50	μA dc
Total grid current	1266	Eb = 150 V dc; Ec = 0; Rk/k = 820 ohms; Rg/g = 1.0 MegΩ (see notes 2 and 3)	Ic	0	-0.3	μA dc
Heater current	1301		If	280	320	mA
Transconductance (1)	1306	See note 2	Sm	1,500	2,100	μmhos
Heater-cathode leakage	1336	See note 2	Ihk	---	5.0	μA dc
Short and discontinuity detection	1201		---	---	---	---
<u>Conformance inspection, part 2</u>						
Insulation of electrodes	1211	See note 2	---	50	---	---
Low-frequency vibration	1031	Rp = 10,000 ohms; E = 40 Hz; 15 G (see note 2)	Ep	---	25	mV ac
Audio frequency noise	1246	Esig = 45 mV ac; Rg = 0.5 MegΩ; Rp = 0.2 MegΩ; Rk = 750 ohms; (see note 4)	EB	---	17	vu
Grid currents	1266	Ef = 7.5 V; Ec = -4.0 V dc; Eb = 150 V dc; Rk = 0; Rg/g = 1.0 MegΩ (see notes 2 and 5)	Ic	0	-0.5	μA dc
Transconductance (2)	1306	Ef = 5.7 V (see note 2)	$\frac{\Delta S_m}{E_f}$	---	15	%
Amplification factor	1316	See note 2	Mu	60	80	---
AC amplification	1321	Ebb = 100 V dc; Ecc = 0; Esig = 0.2 V ac; Rk = 0 (see note 2)	Ep	8.0	---	V ac

## MIL-E-1/190K

TABLE I. Testing and inspection - Continued.

Requirement or test	MIL-STD-1311 Method	Conditions	Symbol	Limits		Units
				Min	Max	
<u>Conformance inspection, part 2 - Continued</u>						
Direct-inter-electrode capacitance	1331	No shield (see note 2)	C <sub>gp</sub>	0.8	1.20	pF
		No shield (see note 2)	C <sub>in</sub>	1.30	2.10	pF
		No shield; section 1	C <sub>out</sub>	0.16	0.30	pF
		No shield; section 2	C <sub>out</sub>	0.21	0.35	pF
		No shield;	C <sub>gg</sub>	---	0.014	pF
		No shield	C <sub>pp</sub>	---	0.80	pF
Lead fatigue	1116		---	---	---	---
Envelope strain	2126		---	---	---	---
Shock	1041	450 G; E <sub>hK</sub> = +100 V dc; R <sub>g</sub> = 0.1 MegΩ; (see note 6)	---	---	---	---
Vibration fatigue	1031	2.5 G; fixed frequency; F = 25 min, 60 max	---	---	---	---
Post-shock and vibration-fatigue test end points:	---					
Low-frequency vibration	1031		E <sub>p</sub>	---	100	mV ac
Heater-cathode leakage	1336		I <sub>hk</sub>	---	20	μA dc
Change in transconductance (1) of individual tubes	1306		$\frac{\Delta S_m}{t}$	---	20	%
Permanence of marking	1105					
<u>Conformance inspection, part 3</u>						
Heater-cycling life	1506	E <sub>f</sub> = 7.0 V; 1 min "on", 4 min "off"; E <sub>hk</sub> = 140 V ac; E <sub>c</sub> = E <sub>b</sub> = 0	---	---	---	---
Stability life	1516	E <sub>b</sub> = 150 V dc; E <sub>hk</sub> = +200 V dc; R <sub>g/g</sub> = 1.0 MegΩ; R <sub>k/k</sub> = 820 ohms; T <sub>A</sub> = room (see note 2)	---	---	---	---
Stability life-test end point:	---					
Change in transconductance (1) of individual tubes	1306		$\frac{\Delta S_m}{t}$	---	10	%
Intermittent life (room temperature)	1501	Stability life test, or equivalent conditions; T <sub>A</sub> = room				
Intermittent life-test end point (room temperature) (500 hours):	---					
Insulation of electrodes	1211		R	50	---	MegΩ

## MIL-E-1/190K

TABLE I. Testing and inspection - Continued.

Requirement or test	MIL-STD-1311 Method	Conditions	Symbol	Limits		Units
				Min	Max	
<u>Conformance inspection, part 3 - Continued</u>						
Intermittent life-test end point (room temperature) (1,000 hours): Insulation of electrodes	---		R	25	---	MegΩ
Intermittent life (high temperature)	1501	Stability life-test conditions; TE = +220°C (min) (see notes 2 and 7)	---	---	---	---
Intermittent life-test end points (500 hours) (high temperature):	---					
Total grid current	1266		I <sub>c</sub>	0	-0.9	μA dc
Heater current	1301		I <sub>f</sub>	276	328	mA
Change in transconductance (1) of individual tubes	1306		$\frac{\Delta S_m}{t}$	---	20	%
Transconductance (2)	1306		$\frac{\Delta S_m}{E_f}$	---	15	%
Heater-cathode leakage	1336		I <sub>hk</sub>	---	10	μA dc
Insulation of electrodes	1211		R	50	---	MegΩ
Transconductance (1) average change	1306		Avg $\frac{\Delta S_m}{t}$	---	15	%
Intermittent life-test end points (1,000 hours) (high temperature):	---					
Total grid current	1266		I <sub>c</sub>	0	-0.9	μA dc
Heater current	1301		I <sub>l</sub>	276	328	mA
Change in transconductance (1) of individual tubes	1306		$\frac{\Delta S_m}{t}$	---	25	%
Transconductance (2)	1306		$\frac{\Delta S_m}{E_f}$	---	20	%
Heater-cathode leakage	1336		I <sub>hk</sub>	---	10	μA dc
Insulation of electrodes	1211		R	25	---	MegΩ

## NOTES:

1. See "Reduced pressure (altitude) rating", and altitude, maximum peak voltage in the basic document.
2. Test each unit separately.
3. This test to be performed at the conclusion of the holding period.
4. Tie 1k to 2k; 1g to 2g; and 1a to 2a.

NOTES: - Continued.

5. Prior to this test, tubes shall be preheated a minimum of 5 minutes with all sections operating at the conditions specified below. The 3-minute test is not 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.

Ef	Ec1	Eb	Rk	Rg
V	V dc	V dc	Ohms	MegΩ
7.5	0	150	820	1.0

6. A grid resistor of 0.1 megohm shall be added; however, this resistor shall not be used when a thyratron type short indicator is used.
7. Envelope temperature (TE) requirements, when measured in accordance with the temperature by conduction-band measurement (MIL-STD-1311, method 1226), will be satisfied if a tube having bogey Ib ( $\pm 5$  percent) under normal test conditions, is determined to operate at or above minimum specified temperature at any position in the life-test rack.

Referenced documents. In addition to MIL-PRF-1 this specification sheet references MIL-STD-1311.

The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. 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 and relationship to the last previous issue.

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

Preparing activity:  
 DLA - CC

(Project 5960-2013-026)

Review activities:  
 Army - AR, MI  
 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 <https://assist.dla.mil/>.