INCH-POUND

MIL-PRF-1/60D
5 December 2006
SUPERSEDING
MIL-E-1/60C
20 July 1976

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, RECEIVING

TYPES 6SA7, 6SA7WGT, 12SA7, 12SA7GT, AND 12SY7 1/
a b c d e

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 the latest issue of MIL-PRF-1.

DESCRIPTION: Pentagrid converter.

Outline	a, c, e	- - - -	8-1 (EIA)
	b, d	- - - -	9-11 or 9-41 (EIA)
Base	a, c, e	- - - -	B8-21
	b, d	- - - -	B8-6 or B8-58
Envelope	a, c, e	- - - -	MT8
	b, d	- - - -	T9
Cathode	All	- - - -	Coated unipotential

Base connections:

Pin No.			1	2	3	4	5	6	7	8
Element	a, c, e	- - - -	g5, sh	h	a	g2, g4	g1	k	h	g3
Element	b, d	- - - -	nc	h	a	g2, g4	g1	k, g5	h	g3

ABSOLUTE RATINGS:

Parameter: / Unit:		Ef V	Eb V dc	Ec2+4 V dc	Ec1 V dc	Ec3 V dc	Pp W	Pg2+4 W	Ic1 mA dc	Ik mA dc	Ehk v	Alt ft
Maximum:	a, b	6.9	330	110	---	---	1.1	1.1	0.5	15.5	100	Note 1
Minimum:	a, b	5.7	---	---	---	---	---	---	---	---	---	---
Maximum:	c, d, e	13.9	330	110	---	---	1.1	1.1	0.5	15.5	100	Note 1
Minimum:	c, d, e	11.3	---	---	---	---	---	---	---	---	---	---
Test conditions (1):	a, b	6.3	250	100	0	-2	---	---	---	---	---	---
	c, d, e	12.6	250	100	0	-2	---	---	---	---	---	---
Test conditions (2):	e	12.6	28	28	0	-1	---	---	---	---	---	---

GENERAL:

Qualification - Not required.

1/ To identify those tests that are applicable to a given type or to several types; tube types are designated by letters, as follows: 6SA7, 6SA7WGT, 12SA7, 12SA7GT, 12SY7.
a b c d e

TABLE I. Testing and inspection.

MIL-STD-1311 method	Requirement or test	Type	Conditions	Acceptance level (see note 12)	Symbol	Limits		Unit
						Min	Max	
	Conformance inspection, part I							
1326	Conversion transconductance (1)	All	Test conditions (1) (see notes 2 or 3)	1.0	Sc	300	600	μmhos
1266	Total grid current	a, b, c, d	Test conditions (1) (see note 2 or 3, and note 4)	1.0	Ic3	0	-2.0	μA dc
1266	Total grid current	e	Test conditions (2) Rg3 = 0.1 MegΩ (see note 2 or 3 and note 4)	1.0	Ic3	0	-2.0	μA dc
1266	Grid emission	All	Preheat with Ehk = 100 V dc for 5 minutes; Ec1 = Ec3 = -3.4 V dc (see note 5)	---	Ic1	---	-5.0	μA dc
1237	Oscillator grid current (1)	All	Test conditions (1) (see note 3)	1.0	---	---	---	---
1231	Emission	All	Eb = Ec1 = Ec2 = Ec3 = Ec4 = 30 V dc (see note 4)	1.0	Is	70	---	mA dc
1256	Electrode current (anode)	All	Test conditions (1) (see note 2 or 3)	1.0	Ib	2.5	4.5	mA dc
1256	Electrode current (screen)	All	Test conditions (1) (see note 2 or 3)	1.0	Ic2 + 4	6.5	11.5	mA dc
	Conformance inspection, part 2							
1031	Low-frequency vibration	All	Rp = 10,000 ohms; Ec1 = Ec3 = -3.5 V dc	---	Ep	---	300	mV ac
1301	Heater current	a, b		---	If	275	325	mA
1301	Heater current	c, d, e		---	If	138	162	mA
1336	Heater-cathode leakage	All		---	Ihk	---	20	μA dc
1326	Conversion transconductance (2)	e	Test conditions (2), Ic1 = 120 μA dc, (see note 2 or 3)	---	Sc	200	400	μmhos
1326	Conversion transconductance (3)	All	Test conditions (1); Ec3 = -35 V dc; (see note 2 or 3)	---	Sc	0.5	25	μmhos
1306	Transconductance	All	Test conditions (1); Eb = 100 V dc; Ec3 = 0 (see note 6)	---	Sg1g2	3,500	5,900	μmhos
1237	Oscillator grid current (2)	e	Test conditions (2); Rg1 = 50,000 ohms, (see note 7)	---	Ic1	100	200	μA dc

See notes at end of table.

TABLE I. Testing and inspection.

MIL-STD-1311 method	Requirement or test	Type	Conditions	Acceptance level (see note 12)	Symbol	Limits Min	Limits Max	Unit
	Conformance inspection, part 2 - Continued							
1331	Direct-interelectrode capacitance	a, c, e	No shield	---	Cga	---	0.25	pF
		b, d	Shield No. 308		Cga	---	0.5	pF
		All	Shield No. 308 for T9 bulbs		Cg3-all	7.6	11.4	pF
		All	Shield No. 308 for T9 bulbs		Ca-all	7.0	12.0	pF
1041	Shock	b	450 G (see note 8)	15	---	---	---	---
---	Post-shock test end points:							
1336	Heater-cathode leakage	b		---	Ihk	---	30	μA dc
1306	Transconductance	b		---	Sg1g2	3,000	6,000	μmhos
1105	Permanence of marking	All		---	---	---	---	---
	Conformance inspection, part 3							
1501	Intermittent life	All	Test conditions (1), Group A, Ehk = 100 V (see note 9)	---	---	---	---	---
---	Intermittent life-test end points (500 hours):			---				
1326	Conversion trans-conductance (1)	All		---	Sc	225	---	μmhos
1237	Oscillator grid current (1)	All		---	Ic1	See note 10	---	---
1031	Vibration fatigue (see note 11)	b		---	---	---	---	---
---	Vibration-fatigue test end points:							
1336	Heater-cathode leakage	b		---	Ihk	---	30	μA dc
1306	Transconductance	b		---	Sg1g2	3,000	6,000	μmhos
1031	Variable-frequency vibration (see note 11)	b	Rp = 2,000 ohms	---	Ep	---	500	mV ac

See notes on top of next page.

TABLE I. Testing and inspection - Continued.

NOTES:

1. See "Reduced pressure (altitude) rating" and altitude maximum peak voltage in the basic document.
2. Insert 20,000 ohms and a suitable bypass capacitor in series with grid No. 1. Apply sufficient ac signal to produce 0.5 mA dc average grid current.
3. In place of circuit of note 2, the tube may be operated in converter oscillator test set, with tank circuit impedance adjusted to 3,100 ohms, with Rg1 = 50,000 ohms, Ic1 shall be between 150 and 260 μA dc; or with Rg1 = 20,000 ohms. Ic1 shall be between 380 and 640 μA dc. Ec3 = 0.
4. This test to be performed at the conclusion of the holding period.
5. One tube from every other day's production shall be subjected to this test. Any failure shall cause this test to be performed at an acceptance level of 6.5 (see note 12).
6. Tie screen and anode together at socket.
7. Tank circuit impedance adjusted to 9,000 ohms.
8. Rated heater voltage shall be applied.
9. Ec1 = -16 V dc; Ec3 = 0; apply 16.5 V ac to grid 1. Ec1 may be obtained by self rectification.
10. See note 3. With Rg1 = 50,000 ohms; Ic1 (min) = 135 μA dc or with Rg1 = 20,000 ohms; Ic1 (min) = 330 μA dc.
11. This test shall be performed during the initial production and once each succeeding 12-calendar months in which there is production. An accept on zero defect sampling plan shall be used, with a sample of three tubes with an acceptance number of zero. In the event of failure, the test will be made as a part of conformance inspection, part 2, with an acceptance level of 6.5 (see note 12). The regular "12-calendar month" sampling plan shall be reinstated after three consecutive samples have been accepted.
12. This specification sheet uses accept on zero defect sampling plan in accordance with MIL-PRF-1, table III.

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

Preparing activity:
DLA - CC

(Project 5960-2007-001)

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.