INCH-POUND

MIL-PRF-1/852F
6 March 2015
SUPERSEDING
MIL-PRF-1/852E
17 October 2008

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, TRANSMITTING

TYPE 5933WA

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

Inactive for new design after 30 April 1997.

The requirements for acquiring the electron tube described herein shall consist of this document and MIL-PRF -1.

DESCRIPTION: Pentode, beam power amplifier, F1 = 50 MHz, F2 = 125 MHz

Outline

Base --- See figure 1

Cathode --- Coated unipotential

Base connections:

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

ABSOLUTE-MAXIMUM RATINGS:

Parameter:	Ef	Eb	Ec1	Ec2	Ib	Ic1	Pp
Unit:	V	V dc	V dc	V dc	mA dc	mA dc	W
Maximum:							
Class B, AF:	6.6	600	---	300	120	---	25
Class B, RF:	6.6	600	---	300	80	---	25
Class C, Telep:	6.6	475	-200	300	83	5	
Class C, Teleg:	6.6	600	-200	300	100	5	16.5
							25
Minimum:	6.0	---	---	---	---	---	---
TEST CONDITIONS:	6.3	600	-29	300	---	---	---

ABSOLUTE-MAXIMUM RATINGS:

Parameter:	Pg2	Pi	Ehk	TE	Modulation	Alt
Unit:	W	W	V	°C	---	ft
Maximum:						
Class B, AF:	3.5	60	135	160	---	60,000
Class B, RF:	2.5	37.5	135	160	---	60,000
Class C, Telep:	2.5	40	135	160	Anode	60,000
Class C, Teleg:	3.5	60	135	160	---	60,000
Minimum:	---	---	---	---	---	---
TEST CONDITIONS:	---	---	---	---	---	---

GENERAL:

Qualification – Not Required.

This specification sheet uses accept on zero defect sampling in accordance with MIL-PRF-1, table III.

TABLE I. Testing and conditions.

Requirement or test	MIL-STD-1311 method	Notes	Conditions	Symbol	Limits		Unit
					Min	Max	
Conformance inspection, part 1							
Heater current	1301			If	810	990	mA
Heater-cathode leakage	1336			Ihk	---	100	µAdc
Total grid current	1266	1		Ic1	0	-4.0	µAdc
Electrode current (1) (anode)	1256	1		Ib	24	48	µAdc
Electrode current (2) (anode)	1256		Ec1 = -100 Vdc	Ib	---	500	µAdc
Power oscillation	1236		Ec2 = 200 V dc; Rg1 = 0.01 MegΩ; Ib = 100 mAdc (max); Ic1 = +6 mAdc; F = 15 MHz; Eccl = 0	Po	33	---	w
Short and discontinuity detection	1201			---	---	---	---
Conformance inspection, part 2							
Insulation of electrodes	1211		Ep-all = -500 Vdc; Eg1-all = -300 Vdc	R	50	---	MegΩ
Electrode current (screen)	1256			Ic2	0	3.0	mAdc
Grid emission	1266	2	Ef = 7.5 V; Ec1 = -70 V dc	Ic1	0	-6.0	µAdc
Transconductance (1)	1306		Eb = Ec2 = 250 V dc; Ec1 = -15 Vdc	Sm	4,500	6,500	µmhos
Transconductance (2)	1306		Ef = 5.7 V; Eb = Ec2 = 250 Vdc; Ec1 = -15 Vdc	$\frac{\Delta Sm}{Ef}$	---	10	%
Primary grid emission (screen)	1266	4	Eb = Ec2 = 0; Eg2 = 175 Vac	Isc2	0	-750	µAdc
Direct-interelectrode capacitance	1331		Shield No. 312 No shield No shield	Cg1p Cin Cout	--- 8.0 5.3	0.2 14 8.7	pF pF pF
Barometric pressure, reduced	1002		Pressure = 55±5 mm Hg; Voltage = 700 Vac	---	---	---	---
Low-frequency vibration	1031		Eb = 250 Vdc; Ec1 = -10 Vdc; Ec2 = 100 Vdc; Rp = 2,000 ohms	Ep	---	250	mVac

See notes at end of table I.

TABLE I. Testing and conditions - Continued.

Requirement or test	MIL-STD-1311 method	Notes	Conditions	Symbol	Limits		Unit
					Min	Max	
Conformance inspection, part 2 - Continued							
Shock	1041	6	450G; Ehk = +135 V dc	---	---	---	---
Vibration fatigue	1031			---	---	---	---
Shock and vibration fatigue test end points:	---						
Low-frequency vibration	1031			Ep	---	500	mA dc
Heater-cathode leakage	1336			Ihk	---	100	µA dc
Power oscillation (change in individual tubes)	1236			ΔPot	---	20	%
Base pin solder depth	1111			---	---	---	---
Secureness of base, cap, or insert	1101			---	---	---	---
Base material insulating quality	1216			---	---	---	---
Permanence of marking	1105			---	---	---	---
Conformance inspection, part 3							
Heater-cycling life	1506		Ef = 7.5 V; Ehk = +135 V dc Ec1 = Ec2 = Eb = 0; 1 min on, 4 min off	---	---	---	---
Stability life	1516		Ehk = 135 V dc; Rg1 = 0.01 Meg Ω; TA = room	---	---	---	---
Stability life-test end point (1 hour):	---						
Power oscillation (change in individual tubes)	1236			ΔPot	---	20	%
Intermittent Life	1501	3, 7	Ehk = 135 V dc; Rg1 = 0.01 Meg Ω; TA = room TE = 160°C (min)	---	---	---	---

See notes at end of table I.

TABLE I. Testing and conditions - Continued.

Requirement or test	MIL-STD-1311 method	Notes	Conditions	Symbol	Limits		Unit
					Min	Max	
Conformance inspection, part 3 - Continued.							
Intermittent life-test end points (500 hours):							
Total grid current	1266			Ic1	0	-6.0	µAdc
Heater current	1301			If	800	1,010	mA
Power oscillation (Ef = 5.7 V)	1236			ΔPo Ef	---	15	%
Power oscillation (change in individual tubes)	1236			ΔPo t	---	20	%
Power oscillation (overage change)	1236			Avg ΔPo t	---	15	%
Heater-cathode leakage	1336			Ihk	---	150	µAdc
Insulation of electrodes	1211			R	25	---	MegΩ
Total defectives	---			---	---	---	---
Intermittent life-test end points (1,000 hours):	---						
Total grid current	1266			Ic1	0	-6.0	µAcc
Heater current	1301			If	800	1,010	mA
Power oscillation (change in individual tubes)	1236			ΔPo t	---	25	%
Power oscillation (average change)	1236			Avg ,ΔPo t	---	20	%
Heater-cathode leakage	1336			Ihk	---	150	µAdc
Insulation of electrodes	1211			R	25	---	MegΩ
Total defectives	---			---	---	---	---

NOTES:

1. This test shall be performed at the conclusion of the holding period.

2. Prior to this test, the tubes shall be preheated a minimum of 5 minutes at the conditions indicated 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	Eb	Ec1	Ec2	Rg1
V	V dc	V dc	V dc	Meg Ω
7.5	600	-29	300	0.01

3. 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 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.

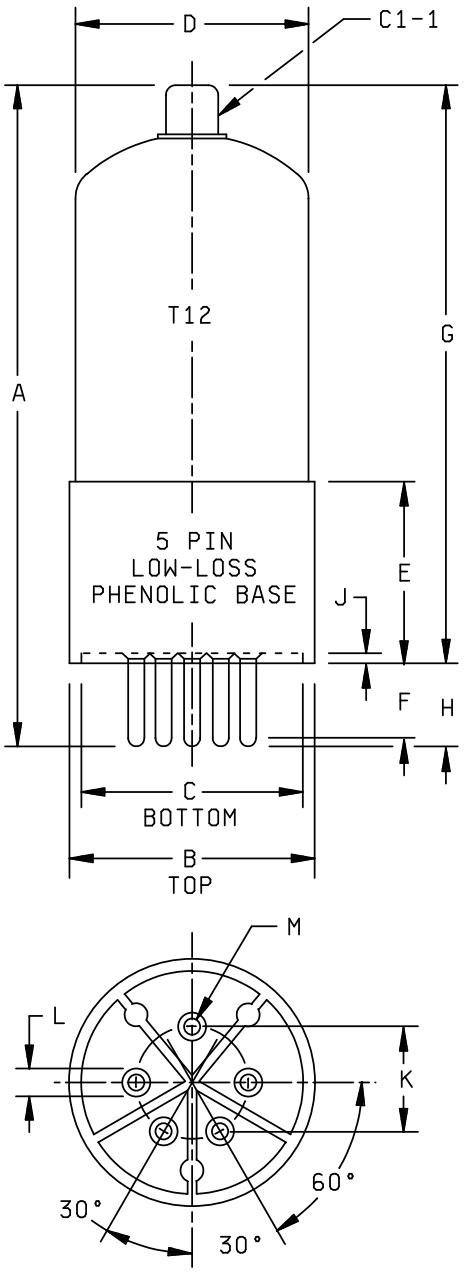
TABLE I. Testing and conditions - Continued.

4. The test duration shall be of sufficient length to obtain a stabilized negative Isc2 value. Adjust Ec1 (0 to 6 V dc) to give Pg2 = 5 W. Pg2 shall be calculated as 2.48 times the product of the rectified current and rectified voltage. A protective resistor of 15,000 ohms shall be placed in series with the primary emission current meter.

5. 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 a lot failure, the lot shall be rejected and the succeeding lots shall be subjected to this test until a lot passes. ANSI/ASQ Z1.4, sample size code letter E, shall apply.

6. A grid resistor of 0.1 MegΩ shall be added; however, this resistor shall not be used when a thyratron-type short indicator is employed.

7. 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.



Ltr	Inches		mm	
	Min	Max	Min	Max
Conformance inspection, part 1				
A	---	4.688	---	119.08
B	1.655	1.700	42.04	43.18
C	1.630	1.655	41.40	42.04
D	---	1.562	---	39.67
E	1.245	1.265	31.62	32.13
F	.430	---	10.92	---
G	3.750	4.062	95.25	103.17
H	---	.562	---	14.27
J	.075	---	1.91	---
K	.750 Nom		19.05 Nom	
L	---	.195	---	4.95
M	.122	.128	3.10	3.25

FIGURE 1. Outline drawing of electron tube type 5933 WA.

Referenced documents. In addition to MIL-PRF-1, this document references the following: MIL-STD-1311 and ANSI/ASQ Z1.4.

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.

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Navy - EC
Air Force - 85
DLA - CC

Preparing activity:
DLA - CC

(Project No. 5960-2015-027)

Review activities:
Navy - AS, MC, OS, SH
Air Force - 99

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