

INCH-POUND

MIL-PRF-1/812E
w/AMENDMENT 1
12 February 2018
SUPERSEDING
MIL-PRF-1/812E
27 March 2012

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, POWER

TYPE 5D22

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: Tetrode.

See figure 1.

Mounting position: Vertical, base up or down.

Weight: 8 ounces (226.8 grams) nominal.

ABSOLUTE RATINGS: C Telegraphy

Parameter:	F1	Ef	Eb	Ec1	Ec2	Ib	Pp	Pg1	Pg2	Cooling
Unit:	MHz	V ac	V dc	V dc	V dc	mA dc	W	W	W	<u>1</u> /
Maximum:	75	5.25	4,000	-500	600	350	250	10	35	---
Minimum:	---	4.75	---	---	---	---	---	---	---	---
Test conditions:	---	5.0	2,500	Adjust	500	100	---	---	---	<u>2</u> /

See footnotes at end of table I.

GENERAL:

Qualification: Not required.

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

AMSC N/A

FSC 5960



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TABLE I. Testing and inspection.

Inspection	Method MIL-STD-1311	Notes	Conditions	Symbol	Limits		Unit
					Min	Max	
<u>Conformance inspection, part 1</u>							
Filament current	1301	---		If	13.5	14.7	A ac
Total grid current	1266	<u>3/</u>		Ic1	---	-10	μA dc
Primary grid emission (control)	1266	---	Ef = 5.5 V ac; Ic1 = 165 mA dc; t = 15 sec; anode and screen grid floating	Isg1	---	-100	μA dc
Primary grid emission (screen)	1266	---	Ef = 5.5 V ac; Ec1 = 0; Ic2 = 135 mA dc; t = 15 sec; anode floating	Isg2	---	-200	μA dc
Electrode voltage (grid)	1261	---		Ec1	-65	-95	V dc
Peak emission	1231	---	eb = ec1 = ec2 = 2,500 v	is	5.0	---	a
<u>Conformance inspection, part 2</u>							
Amplification factor	1316	---	g1 to g2; Ec2 = 500 V dc; Ic2 = 70 mA dc; Eb = 0 (anode grounded)	Mu	4.5	6.0	---
Power oscillation (1)	1236	---	Ebb = 3,000 V dc; Ib = 200 mA dc; Ec2 = 350 V dc; Rg1 = 12,000 ohms; F = 15 MHz	Po	350	---	W (useful)
				Ic2	50	100	mA dc
Direct-interelectrode capacitance	1331	---		Cgp	---	0.14	pF
				Cin	10.7	14.5	pF
				Cout	3.7	5.1	pF

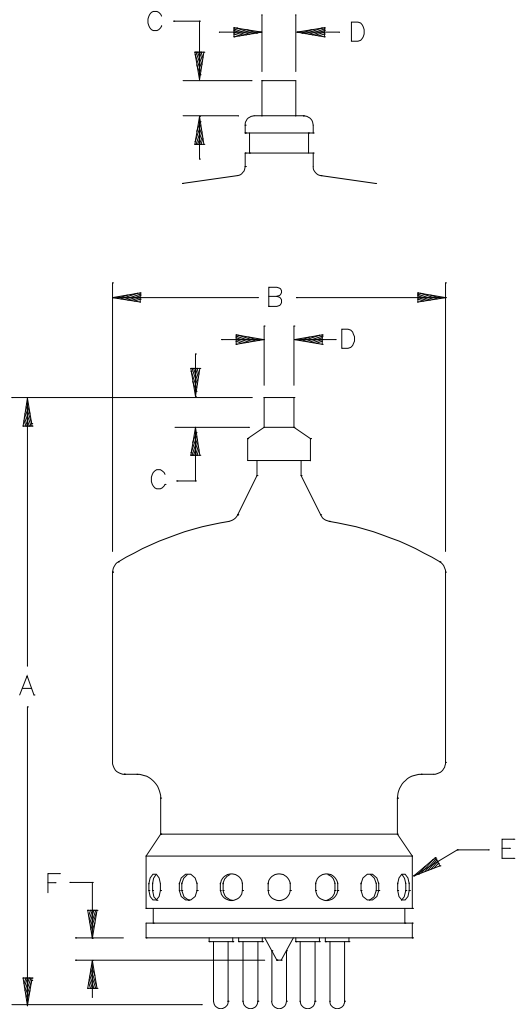
See footnotes at end of table.

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TABLE I. Testing and inspection - Continued.

Inspection	Method MIL-STD-1311	Notes	Conditions	Symbol	Limits		Unit
					Min	Max	
<u>Conformance inspection, part 3</u>							
Low-frequency vibration	1031	<u>4/</u>	No voltages applied	---	---	---	---
Bump	1036	<u>4/</u>	Angle = 20°	---	---	---	---
Low-frequency vibration and shock end points:	---						
Electrode voltage (grid)	1261	---		Ec1	-65	-95	V dc
Total grid current	1266	---		Ic1	---	-10	μA dc
Life test	---	---	Group C; power oscillation (1); t = 500 hours	---	---	---	---
Life-test end points:	---						
Peak emission	1231	---		is	4.0	---	a
Primary grid emission (control)	1266	---		Isg1	---	-100	μA dc
Primary grid emission (screen)	1266	---		Isg2	---	-200	μA dc
Total grid current	1266	---		Ic1	---	-10	μA dc
Power oscillation (2)	1236	<u>4/</u>	Ebb = 3,000 V dc; Ib = 200 mA dc; Ec2 = 350 V dc; Rg1 = 12,000 ohms; F = 75 MHz	Po	350	---	W (useful)

- 1/ Adequate cooling shall be provided for the seals and envelope of the tube. An air-system socket and air director (chimney) is desirable, such as Eimac SK-400/SK-406 or SK-410/SK-406, or equal. At frequencies below 30 MHz, cooling air in the amount of 5 cfm around the base of the tube past the envelope is required. At frequencies above 30 MHz, losses in the leads and envelope contribute to heating, and additional cooling may be required. Cooling should be applied simultaneously with filament power, and in all cases there should be some movement of air past the base and envelope.
- 2/ Cooling of the tube is permitted to an extent not to exceed that specified in 1/.
- 3/ This test shall be the first test performed at the conclusion of the holding period.
- 4/ This test shall be performed during the initial production and once each succeeding 12-calendar months in which there is production. A regular double sampling plan shall be used, with the first sample of three tubes with an acceptance number of zero, and a second sample of three tubes with a combined acceptance number of zero. In the event of failure, the test will be made as a part of conformance inspection, part 2, code level D, with an acceptance level of 6.5. The regular "12-calendar month" double sampling plan shall be reinstated after three consecutive samples have been accepted.



Pin connections	
Pin no.	Element
1	f
2	g2
3	g1
4	g2
5	f
cap	a

Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
Conformance inspection, part 2				
A	5.875	6.375	149.23	161.93
B	---	3.563	---	90.50
F	---	.250	---	6.35
Conformance inspection, part 3 (see note)				
C	.328	---	8.33	---
D	.350	.365	8.89	9.27
E	A5-97 (EIA)			

NOTE:
These dimensions shall be checked annually with the following sampling plan:

n1 = 4 c1 = 0 where c2 represents the total failures for the
n2 = 4 c2 = 0; first and second samples combined.

In case of failure after double sampling, the failing dimension(s) shall become conformance inspection, part 2, for three successful consecutive submissions, at which time the test may revert to the conformance inspection, part 3, basis.

FIGURE 1. Outline drawing of electron tube type 5D22.

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

The margins of this specification sheet are marked with vertical lines to indicate modifications generated by this amendment. 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.

Custodians:

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

Preparing activity:
DLA - CC

(Project: 5960-2018-006)

Review activities:

Navy - AS, CG, MC, OS, SH
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>.