INCH-POUND

MIL-PRF-1/37F
23 September 2014
SUPERSEDING
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18 October 2002

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, POWER
TYPE 8166

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

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

DESCRIPTION: Tetrode.

See figure 1.

Operating position: Vertical, base down or up.

Weight: 1.5-pound nominal (680 grams).

ABSOLUTE RATINGS: C Telegraphy

Parameter:	F	Ef	Eb	Ec1	Ec2	Ib	Pg1	Pg2	Pp	T(seal)	Te	Cooling
Unit:	MHz	V ac	V dc	V dc	V dc	mA dc	W	W	W	°C	°C	Note 1/
Maximum:	110	7.9	6,000	-500	1,000	700	25	75	1,000	200	225	- - -
Minimum:	- - -	7.1	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
Test Condition:	- - -	7.5	2,500	Adjust	500	400	- - -	- - -	- - -	- - -	- - -	Note 2/

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 Inspection.

Inspection	Method MIL-STD-1311	Notes	Conditions	Symbol	Limits		Units
					Min	Max	
Conformance inspection, part 1		4/					
Filament current	1301	-		If	20.0	22.7	A ac
Peck emission	1231	-	eb = ec1 = ec2 = 2,500 v	is	15.0	- - -	a
Electrode current (screen)	1256	-		Ic2	0.0	+20	mA dc
Electrode voltage (grid)	1261	-		Ec1	-15	-35	V dc
Total grid current	1266	3/		Ic1	- - -	-25	μA dc

Primary grid emission (control)	1266	-	Ef = 8.25 V ac;
			Pg1 = 30 W
			or Ic1 = 150 mA dc;
			t = 15 seconds;
			anode and screen-grid floating
				Isg1	- - -	-250	μA dc

Primary grid emission (screen)	1266	-	Ef = 8.25 V ac;
			Pg2 = 90 W
			or Ic2 = 160 mA dc;
			t = 15 seconds;
			Ec1 = 0;
			anode floating
				Isg2	- - -	-250	μA dc

Conformance inspection, part 2		4/					
Low-frequency vibration	1031	-	No voltages	- - -	- - -	- - -	- - -
Bump	1036	-	Angle = 10°	- - -	- - -	- - -	- - -
Amplification factor (g1 to g2)	1316	-	Ec2 =1,000 V dc; Ic2 = 75 mA dc; Eb = 0	Mu	6.1	7.7	- - -
Direct-interelectrode capacitance	1331	-		Cgp Cin Cout	- - - 23.8 6.8	0.35 32.4 9.4	pF pF pF
Power oscillation	1236	-	F = 110 MHz (min); Eb = 5,000 V dc; Ec2 = 450 V dc; Ib = 600 mA dc	Po	1,500	- - -	W
Conformance inspection, part 3		5/					
Life test	- - -	-	Group C; power oscillation; t = 500 hours	- - -	- - -	- - -	- - -
Life-test end points:	- - -						
Peck emission	1231	-		is	12.0	- - -	a
Primary grid emission (control)	1266	-		Isg1	- - -	-250	μA dc
Primary grid emission (screen)	1266	-		Isg2	- - -	-250	μA dc

NOTES:

1/ Adequate forced-air cooling must be provided to maintain base and anode seal temperatures below their maximum rating. In all cases of operation, it is recommended that a heat-radiating connector, EIMAC HR-8, or equivalent, be installed on the anode terminal, and that a socket and chimney be used which provide for cooling of the seals. The following table applies to socket and chimney at sea level, and with air at 25°C, and should be considered as minimum cooling requirements. The approximate pressure drop values given first are for the socket as measured in the socket; those given next are for the socket as measured in the equivalent of a pressurized chassis or plenum chamber. The data applies with maximum rated anode dissipation.

	Socket and chimney (pressure drop measured in socket)		Socket and chimney (pressure drop measured in equivalent pressurized chassis or plenum chamber)	
Frequency	Airflow (cfm)	Approximate pressure drop (In. H_2O)	Airflow (cfm)	Approximate pressure drop (In. H_2O)
30 to 110 MHz	35	1.9	35	1.0
Below 30 MHz	20	0.6	20	0.42

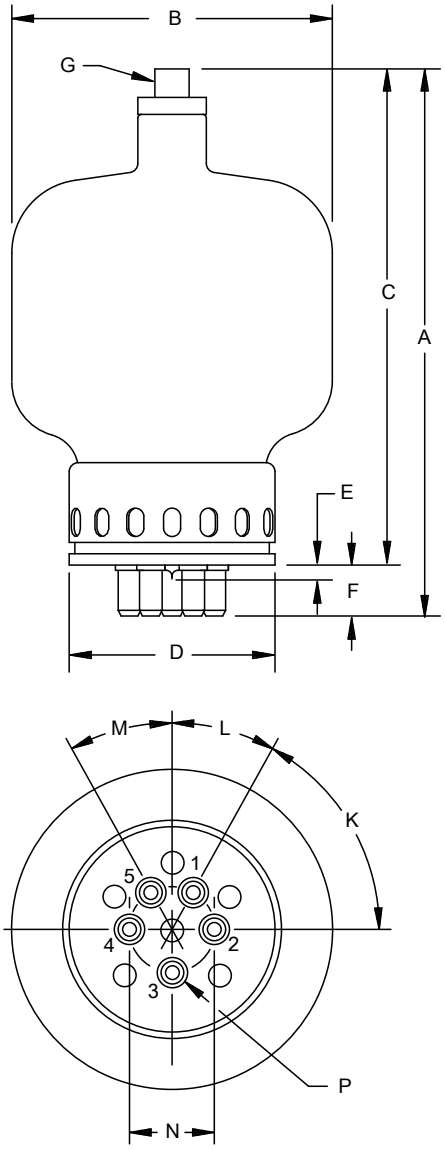
Cooling air should be supplied before or simultaneously with the application of filament voltage, and may be removed simultaneously with filament voltage. Operation at higher altitudes or higher ambient temperatures will require an increase in cooling airflow.

2/ During all electrical tests involving application of filament power, forced-air cooling of the tube is allowable and a heat-dissipating connector (EIMAC HR-8, or equivalent) may be used on the anode terminal.

3/ This test is to be the first test performed at the conclusion of the holding period.

4/ When type 8166 and type 8189 of MIL-PRF-1/1473 are physically identical, and have been made in the same production run, differing only in high voltage processing and testing of type 8189, then one sample may represent both types as the tests are identical.

5/ When type 8166 and type 8189 of MIL-PRF-1/1473 are physically identical and have been made in the same production run, differing only in high voltage processing and testing of type 8189, then one life-test sample may represent both types.



Dimensions (see note)				
	Minimum		Maximum	
Ltr	inch	mm	inch	mm
Conformance inspection, part 2				
A	8.875	225.43	9.625	244.48
B			5.250	133.35
C	8.000	203.20	8.750	222.25
E			.313	7.95
Conformance inspection, part 3 (see note)				
D			3.625	92.08
F	.825	20.96	.925	23.50
G	Cap: C1 - 26 (EIA)			
N	1.495	37.97	1.505	38.23
P	.371	9.42	.377	9.58
Reference dimensions				
K	60°			
L	30°			
M	30°			

Pin connections	
Pin No.	Element
1 & 5	f
2 & 4	g^1
3	g^2
Cap	a

NOTE:
Dimensions listed under conformance inspection, part 3, shall be checked annually.

FIGURE 1. Outline drawing of electron tube type 8166.

Referenced documents. In addition to MIL-PRF-1, this specification sheet references MIL-STD-1311, and MIL-PRF-1/1473

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 5960-2014-022)

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

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