

INCH-POUND

  
MIL-PRF-1/37E  
18 October 2002  
SUPERSEDING  
MIL-PRF-1/ 37D  
19 September 1997

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	E <sub>f</sub>	E <sub>b</sub>	E <sub>c1</sub>	E <sub>c2</sub>	I <sub>b</sub>	P <sub>g1</sub>	P <sub>g2</sub>	P <sub>p</sub>	T(seal)	T <sub>e</sub>	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

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GENERAL:

Qualification - Required

## MIL-PRF-1/ 37E

Table 1. Testing and Inspection.

Inspection	Method	Notes	Conditions	Symbol	Limits Min	Limits Max	Units
<u>Conformance inspection, part 1</u>		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 = seconds; Ec1 = 0; anode floating	Isg2	---	-250	μA dc
<u>Conformance inspection, part 2</u>		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

MIL-PRF-1/ 37E

Table 1. Testing and Inspection -Continued.

Inspection	Method	Notes	Conditions	Symbol	Limits Min	Limits Max	Units
<u>Conformance inspection, part 3</u>		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	-		lsg1	---	-250	μA dc
Primary grid emission (screen)	1266	-		lsg2	---	-250	μA dc

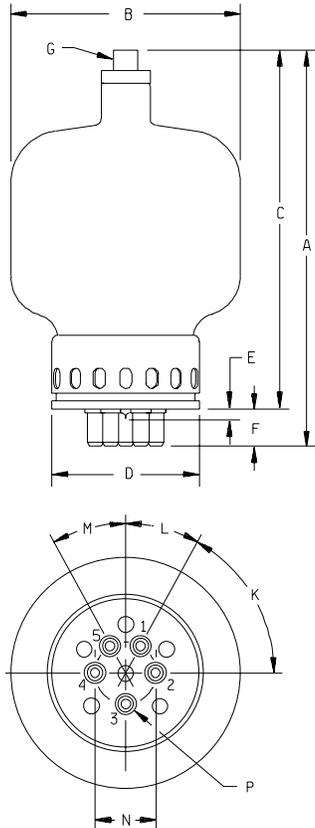
NOTES:

- 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.

Frequency	Socket and chimney (pressure drop measured in socket)		Socket and chimney (pressure drop measured in equivalent pressurized chassis or plenum chamber)	
	Airflow (cfm)	Approximate pressure drop (In. H <sub>2</sub> O)	Airflow (cfm)	Approximate pressure drop (In. H <sub>2</sub> O)
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 in inches with metric equivalents (mm) in parentheses (see note)		
Ltr	Minimum	Maximum
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 <sup>1</sup>
3	g <sup>2</sup>
Cap	a

**NOTE:**

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

FIGURE 1. Outline drawing of electron tube type 8166.

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

Preparing activity:  
 DLA - CC  
 (Project 5960-3596)

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