

INCH-POUND

MIL-PRF-1/887E  
27 March 2012  
SUPERSEDING  
MIL-PRF-1/887D  
7 January 2000

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, POWER  
TYPE 8438 \*

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 down or up.

Weight: 9 ounces (255.15 grams) nominal.

ABSOLUTE RATINGS: F1 = 110 MHz.

Parameter:	Ef	Eb	Ec1	Ec2	Ib	Pp	Pg1	Pg2	Cooling
Unit:	V ac	V dc	V dc	V dc	mA dc	W	W	W	1/
Maximum:									---
C Teleg:	5.0 ± 5%	3,200	-500	600	275	270	10	35	---
C Teleg:	5.0 ± 5%	4,000	-500	600	350	400	10	35	---
AB Audio:	5.0 ± 5%	4,000	-500	800	350	400	10	35	---
Test conditions:	5.0	2,500	Adj	500	160	---	---	---	2/

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.

\* Formerly JAN 8438/4-400A.

TABLE I. Testing and inspection.

Inspection	Method MIL-STD-1311	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>4/</u>	Ic1	---	-10	μA dc											
Primary-grid emission (control)	1266	Ef = 5.5 V ac; Ic1 = 165 mA dc; t = 15; anode and screen grid floating	Isg1	---	-100	μA dc											
Primary-grid emission (screen)	1266	Ef = 5.5 V ac; Ic2 = 135 mA dc; Ec1 = 0; t = 15; anode floating	Isg2	---	-200	μA dc											
Electrode voltage (grid)	1261		Ec1	-55	-80	V dc											
Peak emission	1231	eb = ec1 = ec2 = 2,500 v	is	7.0	---	a											
<u>Conformance inspection, part 2</u>																	
Amplification factor	1316	g1 to g2; Ic2 = 70 mA dc; Eb = 0	Mu	4.5	6.0	---											
Power oscillation	1236	Class C amplifier; grid driven; Eb = 3 kV dc; Eg1/Ib = 350 mA dc; F = 110 MHz (min)	Po	500	---	W (useful)											
Direct-interelectrode capacitance	1331		<table border="0"> <tr> <td rowspan="3">[</td> <td>Cgp</td> <td>---</td> <td>0.17</td> <td rowspan="3">pF</td> </tr> <tr> <td>Cin</td> <td>10.70</td> <td>14.50</td> </tr> <tr> <td>Cout</td> <td>4.20</td> <td>5.60</td> </tr> </table>	[	Cgp	---	0.17	pF	Cin	10.70	14.50	Cout	4.20	5.60			
[	Cgp	---	0.17		pF												
	Cin	10.70	14.50														
	Cout	4.20	5.60														
<u>Conformance inspection, part 3</u>																	
Life test	---	Group C; power output; t = 500 hours	---	---	---	---											
Life-test end points:	---																
Peak emission	1231		is	5.6	---	a											
Primary-grid emission (control)	1261		Isg1	---	-100	μA dc											
Primary-grid emission (screen)	1266		Isg2	---	-200	μA dc											

See footnotes at end of table.

TABLE I. Testing and inspection - Continued.

Inspection	Method MIL-STD-1311	Conditions	Symbol	Limits		Unit
				Min	Max	
<u>Conformance inspection, part 3 - Continued</u>						
<u>Periodic-check tests</u>						
Low-frequency vibration	1031	No voltages <u>5/</u>	---	---	---	---
Low-frequency vibration end points:	---					
Electrode voltage (grid)	1261		Ec1	-55	-80	V dc
Total grid current	1266		Ic1	---	-10	μA dc
Shock, specified pulse	1042	No voltages; accel = 15 G peak (min); D = 11 ± 2 ms half-sine <u>5/</u>	---	---	---	---
Shock, specified pulse end points:	---					
Electrode voltage (grid)	1261		Ec1	-55	-80	V dc
Total grid current	1266		Ic1	---	-10	μA dc

1/ Forced-air cooling shall be provided for the base-pin and anode-lead seals. This air should be applied simultaneously with filament power, using the 259-JAN socket. A minimum airflow of 14 cubic feet/minute shall be used. The pressure drop as measured in the socket at this flow equals 0.25 inches of water. The air requirements stated above are based on operation at sea level and on ambient temperature of 20°C. Operation at high altitude or at high temperature requires a greater volume of airflow.

2/ Forced-air cooling of the anode and base seals to an extent not to exceed the minimum values specified in 1/ is permitted.

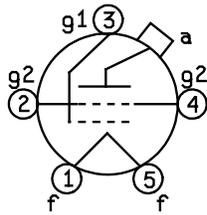
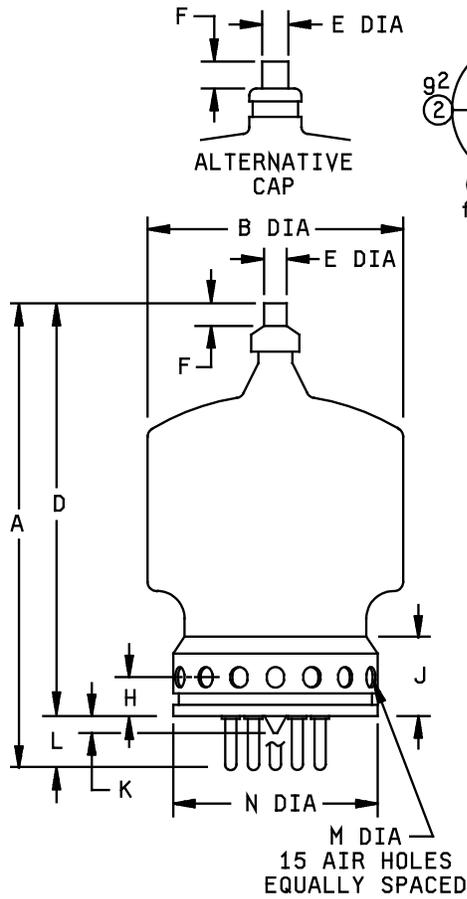
3/ It is recommended that a heat-radiating type of connector (EIMAC Type HR-6, or equivalent) be used on the anode terminal in all rf applications.

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

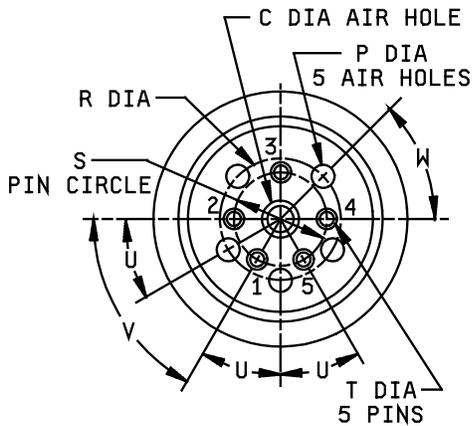
5/ Shock and vibration tests shall be performed quarterly, with sampling as follows:

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

Separate samples may be used at the option of the manufacturer, and the tests shall be considered as nondestructive except in case of failure. In case of failure after double sampling, the failing test shall become a conformance inspection, part 2, acceptance level 6.5, for three consecutive successful submissions, at which time the testing may revert to the periodic-check test basis.



Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
Conformance inspection, part 2					
A	5.875	6.375	149.23	161.93	
B	---	3.563	---	90.50	
K	---	.250	---	6.35	1
T	.185	.191	4.70	4.85	1
Conformance inspection, part 3 (periodic check)					
D	5.125	5.625	130.18	142.88	
E	.350	.365	8.89	9.27	
F	.328	---	8.33	---	
J	---	.969	---	24.61	
N	---	2.750	---	69.85	
Reference dimensions					
C	.500		12.70		
H	.438		11.13		
L	.750		19.05		
M	.250		6.35		
P	.312		7.92		
R	1.625		41.28		
S	1.250		31.75		1
U	30°		30°		1
V	60°		60°		1
W	45°		45°		1



NOTE:

1. Base pins T and tubulation K are so aligned that they can be freely inserted in a gauge .250 inch (6.35 mm) thick with hole diameters of .204 inch (5.18 mm) and .500 inch (12.70 mm) respectively, located on the true centers by the given dimensions S, U, and V.

FIGURE 1. Outline drawing of electron tube type 8438.

Referenced documents. In addition to MIL-PRF-1, this specification sheet references:  
MIL-STD-1311 259-JAN

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 - 99  
DLA - CC

Preparing activity:

DLA - CC  
  
(Project 5960-2012-013)

Review activities:

Army - AR, AV  
Navy - AS, CG, MC, OS, SH  
Air Force - 19

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