INCH-POUND

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4 July 2014
SUPERSEDING
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w/AMENDMENT 1
3 December 2007

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, RADIATION COUNTER
TYPE 8767

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 MIL-PRF-1.

DESCRIPTION: Geiger - Mueller, very high beta sensitivity, very thin mica window frisker probe, low background, halogen, self-quenching, ruggedized.
See figures 1, 2, 3, 4, and 5.
Mounting position: Any.
Weight: 6.5 ounces (184.3 grams) nominal.

ABSOLUTE RATINGS:

Parameter:	Ebb V dc	TA EC	Rp (external resistance) MegΩ	Window thickness mgs/cm^2
Maximum:	950	+55	---	2.0
Minimum:	850	-20	3.3	1.4
Test conditions:	900	---	3.3	---

GENERAL:

Qualification - Required.

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

Marking - Each tube shall have an individual serial number which shall be legibly punched or engraved into the cathode.

Holding period (MIL-STD-1311) - 720 hours

Packaging - Tubes shipped under Government contract must be packaged in hermetically sealed containers to withstand low external pressure which might occur in air shipment.

Service-life guarantee (MIL-PRF-1) - 500 hours minimum operating time

TABLE I. Group A inspection.

Inspection	MIL-STD-1311 method	Conditions	Symbol	Limits		Unit
				Min	Max	
Conformance inspection, part 1						
Background, contamination, and photosensitivity 2/ 3/	6201	t = 2 minutes	N/T	---	33.0	Npm
Starting voltage	6211	Pulse amplitude = 0.25 V use test circuit shown on figure 5; Nps = 200 (max)	Es	---	750	V dc
Relative plateau slope 1/ 2/	6216	Nps = 5,000	---	---	---	---
Response count rate and current (beta) 2/ 5/	6221	t = 2 minutes	---	---	---	---
Dead time	---	Nps = 5,000; use test circuit shown on figure 5.	td	---	100	μs
Conformance inspection, part 2						
Shock, specified 4/ 7/ 9/ 10/	1042	15G, 11 ms duration, half-sine waveform; 3.4 ft/sec velocity	---	---	---	---
Pulse amplitude 12/	6226	Use test circuit shown on figure 5.	eo	13	100	v
Conformance inspection, part 3						
Shock 4/ 7/ 10/	1041	Hammer angle = 20˚	---	---	---	---
Life test (1) 1/ 11/	---	Group D; Npm 200 (min); t = 500 hours	---	---	---	---
Life test endpoints 11/						
Background, contamination, and photosensitivity	6201		N/T	---	60	Npm
Starting voltage	6211		ΔEs	---	±15	V dc
Pulse amplitude	6226		eo	13	---	V
Variable frequency vibration 4/ 7/ 10/	1031		---	---	---	---
Leakage current 8/ 10/	6205	Ebb = 500 V dc	Lib	---	0.5	μA dc
Temperature cycling 6/ 10/			---	---	---	---

See footnotes at top of next page.

TABLE I. Group A inspection - Continued.

1/ Npm - N_{850} = ±0.05 Npm maximum.
Npm - N_{950} = ±0.05 Npm maximum.
Npm - 5,000 cpm nominal at V dc = 900 V dc.
N_{850} = Count rate at V dc = 850 V.
N_{950} = Count rate at V dc = 950 V.

2/ Tube count rates shall be determined using a scaler having a maximum pulse pair resolving time of 10 μs and a pulse height discrimination level of 0.25 volt.

3/ The tube end window shall be exposed to radiation from a General Electric 15-watt germicidal lamp and a General Electric 15-watt fluorescent lamp, or equivalents. Light sources shall be located not more than 1 inch (25.4 mm) from the mica window surface (see figure 2).

4/ The criterion for passing this test shall be compliance of at least 80 percent of the tubes, after test, with the requirements for starting voltage and relative plateau slope.

5/ The counting rate shall be not less than 10 percent below the value of the count rate specified in the EON TC-9 excitation unit, or equivalent (see figure 3).

6/ With the tube in a field giving 100 ±10 Nps at 900 V dc, determine tube response (count rate) at each of the following temperatures and in the order shown:

(1) Room temperature
(2) -20°C
(3) Room temperature
(4) +55°C
(5) Room temperature

A minimum stabilization time of 30 minutes shall be allowed at each temperature. The absolute count rate at 900 V dc shall not differ from the initial readings at room temperature by more than 10 percent at any of the four subsequent temperatures.

7/ The tube shall be mounted by means of a rigid fixture which clamps the detector at the cathode as shown on figure 4.

8/ Test shall be made at ambient conditions of normal room temperature and humidity.

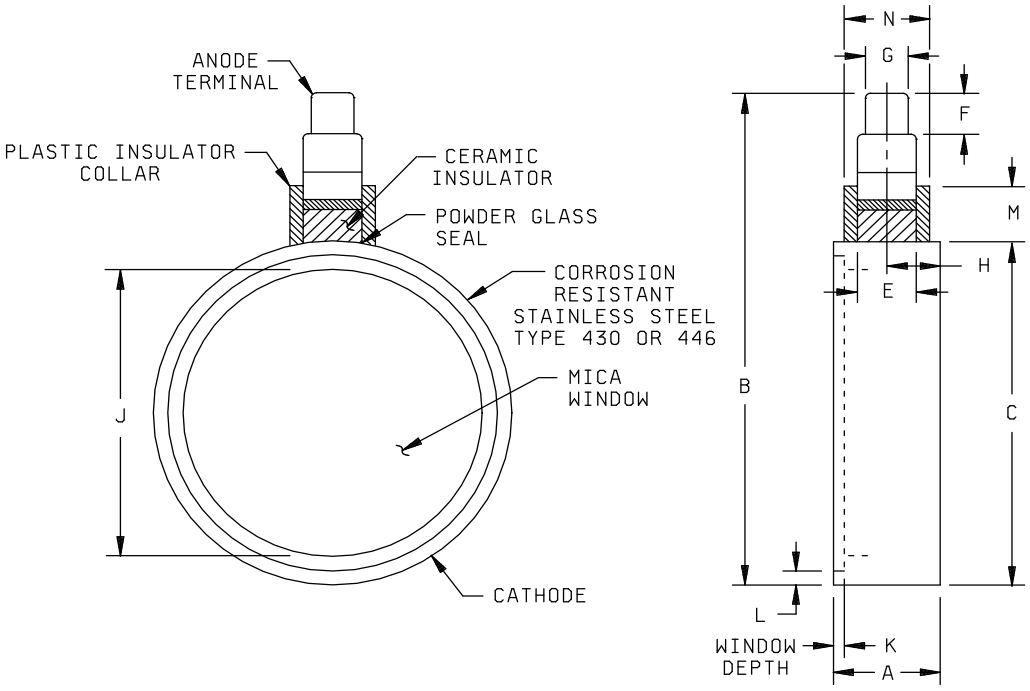
9/ This is an alternate test to method 1041. Either method 1041 or method 1042 may be used but only one of these tests shall be performed.

10/ The manufacturer, with the approval of the qualifying activity, may perform this test on a periodic basis, versus performing the test on every lot. Approval will be based on demonstrating to the qualifying activity the capability of the design to meet this requirement. If the design, material construction or processing of the tube is changed or if there are any quality problems, the qualifying activity may require resumption of the original testing frequency. This allowance does not relieve the manufacturer from meeting the test requirements in case of dispute. It is mandatory that the manufacturer shall immediately inform the qualifying activity of any known changes to the design, material construction or manufacturing processes or of quality problems with the electron tube. The periodic test cycle approved shall not exceed in duration the current conformance test cycle or two years, whichever is shorter.

TABLE I. Group A inspection - Continued.

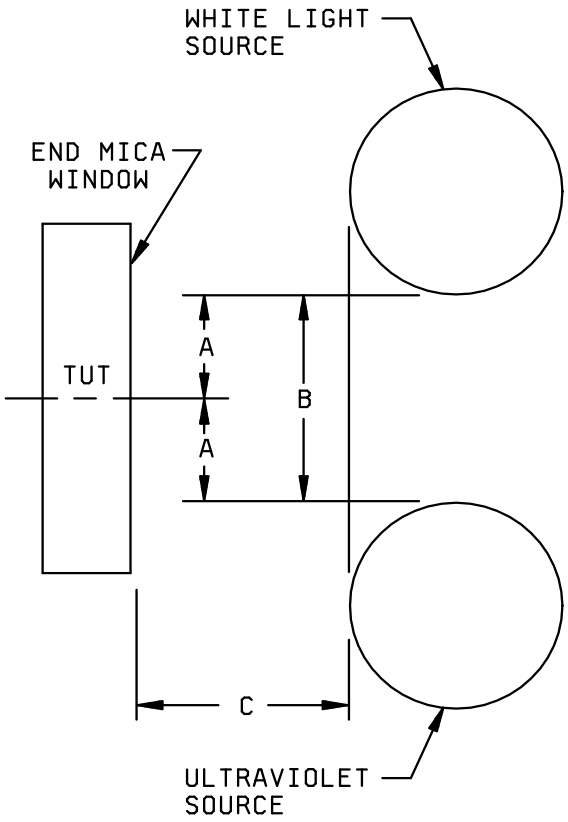
11/ With qualifying activity approval the manufacturer may provide, in accordance with MIL-PRF-1, service-life guarantee, in lieu of performing life testing. Life test endpoints specified shall apply to service-life guarantee conformance as well as to life test conformance. The number of hours of system-deployed, accumulated tube-operating time shall be approved by the qualifying activity and shall be a minimum of 500 hours. Service-life guarantee shall define tube operating life and not time from purchase or delivery. Tubes sold under service-life guarantee shall be marked with contract number and with the number of tube operating hours guaranteed. The qualifying activity may restore life testing requirements when service performance or tube reliability indicate it is justified.

12/ This pulse amplitude test of conformance inspection, part 2 shall be performed in accordance with the same test frequency and following application of shock testing, whenever shock testing is performed.



Ltr	Dimensions			
	Millimeters		Inches	
CONFORMANCE INSPECTION, PART 2				
	Min	Max	Min	Max
A	15.09	15.85	0.594	0.624
B	------	76.20	-----	3.000
C	53.34	53.85	2.100	2.120
E	8.48	8.99	0.334	0.354
G	6.22	6.48	0.245	0.255
J	------	4.45	-----	1.750
L	1.78	2.16	0.070	0.085
M	8.43	8.76	0.332	0.345
N	12.19	12.83	0.480	0.505
REFERENCE DIMENSIONS				
F	6.35		0.250	
H	7.95		0.313	
K	1.60		0.063	

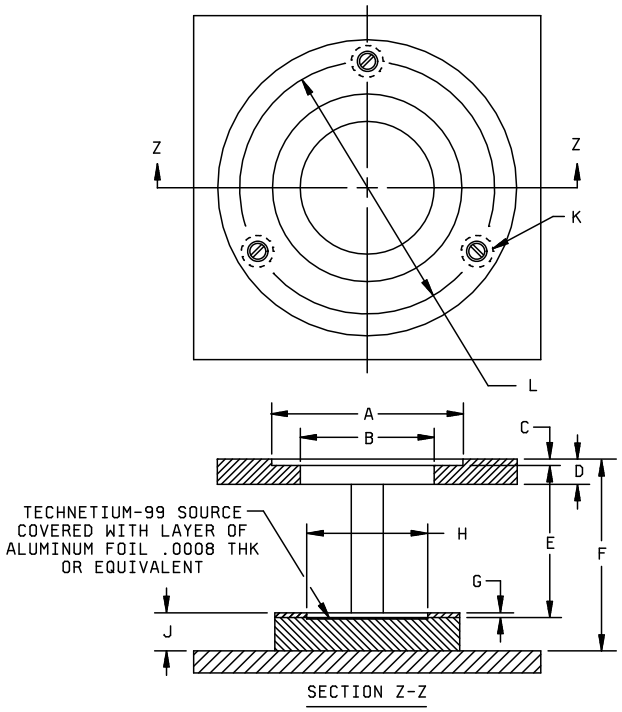
FIGURE 1. Outline drawing of electron tube type 8767.



Ltr	Dimensions			
	Millimeters		Inches	
	Minimum	Maximum	Minimum	Maximum
A	12.7 Nominal		0.50 Nominal	
B	-----	25.4	-----	1.00
C	-----	25.4	-----	1.00

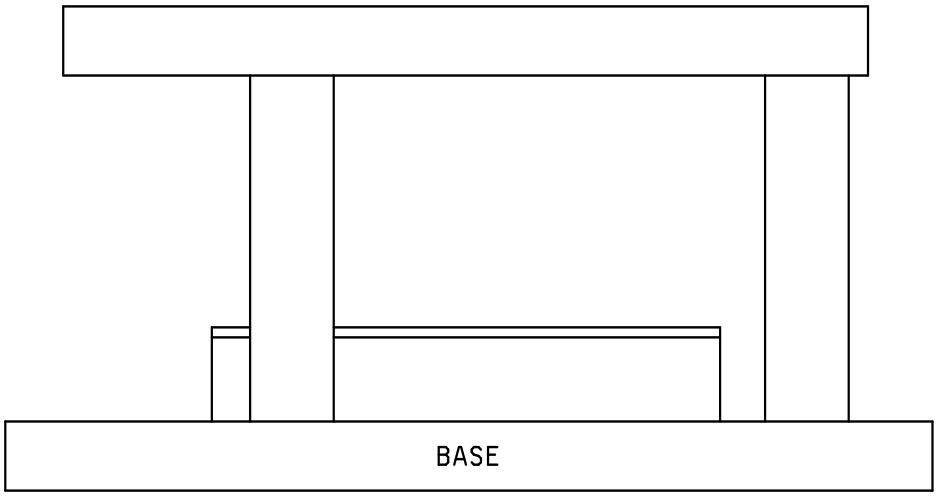
NOTE: Axis of tube and centers of lamps lie in plane of paper.

FIGURE 2. Position of tube for photosensitivity test.



Ltr	Dimensions				Ltr	Dimensions			
	Millimeters		Inches			Millimeters		Inches	
	Minimum	Maximum	Minimum	Maximum		Minimum	Maximum	Minimum	Maximum
A	53.72	53.85	2.115	2.120	B	44.83 Nominal		1.765 Nominal	
C	2.36 Nominal		0.093 Nominal		D	9.52 Nominal		0.375 Nominal	
E	47.62 Nominal		1.875 Nominal		F	54.10	66.80	2.130	2.630
G	3.96 Nominal		0.156 Nominal		H	49.20 Nominal		1.937 Nominal	
J	14.73 Nominal		0.580 Nominal		L	103.12 Nominal		4.060 Nominal	
K	Post, 3 each, 0.50 diameter, equally spaced								

FIGURE 3. Excitation fixture.



Beta fixture:

Bogey value for beta response is 7,000 Npm.

FIGURE 3. Excitation fixture - Continued.

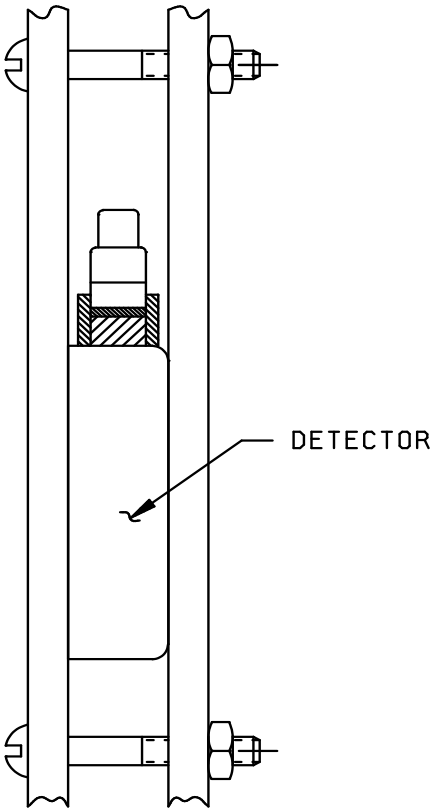


FIGURE 4. Method of clamping detector for shock and vibration test.

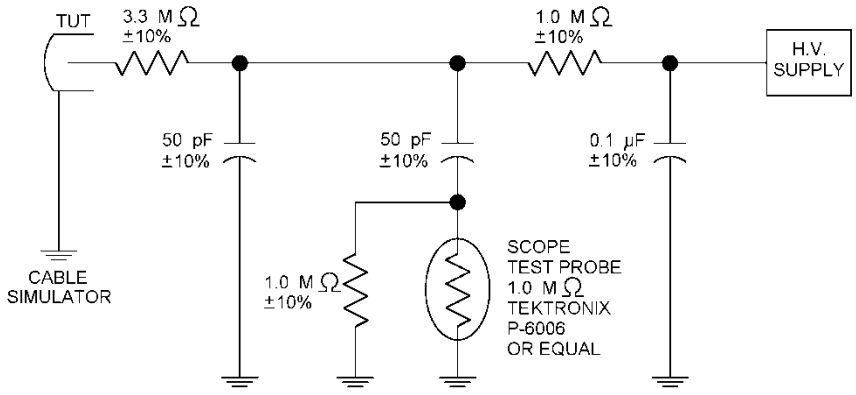


FIGURE 5. Test circuit.

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

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