

INCH-POUND

MIL-PRF-1/1389F(NAVY)
22 July 1999
SUPERSEDING
MIL-E-1/1389E(NAVY)
1 July 1975

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, CATHODE RAY
TYPE 10ANP7

This specification is approved for use by the Department of the Navy and is available 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: 10 inch, magnetic deflection, magnetic focus cathode ray tube with aluminized screen.

DIMENSIONS AND PIN CONNECTIONS: See figure 1.

ABSOLUTE RATINGS:

Parameter:	Ef	Ec1	Ec2	Eb	Ehk	Rg1	Alt
Unit:	V	V dc	V dc	V dc	V dc	Meg	ft
Maximum:	6.9	0	450	11,000	+125	1.5	20,000
Minimum:	5.7	-200	---	7,000	-125	---	---
Test condition:	6.3	Adj 1/	250	9,000	---	---	---

See footnotes at end of table I.

GENERAL:

Qualification - Required. 5/

TABLE I. Testing and inspection.

Inspection	Method	Notes	Conditions	Symbol	Limits		Unit
					Min	Max	
<u>Qualification inspection</u>							
Cathode illumination	5216	---		---	---	---	---
Direct-interelectrode capacitance	1331	---	k to all g1 to all	Ck	---	5.0	pF
				Cg1	---	6.3	pF
Electrode current (grid No. 2)	5201	---	Ec1 = 0	Ic2	---	5.0	μA dc
Pressure (implosion)	1141	---		---	---	---	---
Barometric pressure, reduced	1002	<u>7/</u>		---	---	---	---
Vibration	5111	---		Width	---	2.0	mm
<u>Conformance inspection, part 1</u>							
Voltage breakdown	5201	---		---	---	---	---
Voltage breakdown (magnetic types)	5201	---		---	---	---	---
Gas ratio	5206	<u>6/</u>		Gr	---	0.25	---
Neck straightness	5101	<u>2/</u>		---	---	---	---
Screen and faceplate blemishes	5106	---		---	---	---	---
Modulation	5223	<u>1/</u>	Ib = 400 μA dc	ΔEc1	---	40	V dc
Spot position (magnetic deflection)	5231	---		Radius	---	12.5	mm
Grid cutoff voltage	5241	---		Ec1	20	45	V dc
Focus coil current	5246	---	Ib = 100 μA dc; D = 2.5 inch using JEDEC No. 127 focus coil, or equivalent	---	40	60	mA dc
Aperture alignment	---	<u>4/</u>		---	---	8	mm
Grid No. 1 leakage current	5251	---		---	---	---	---

See footnotes at end of table.

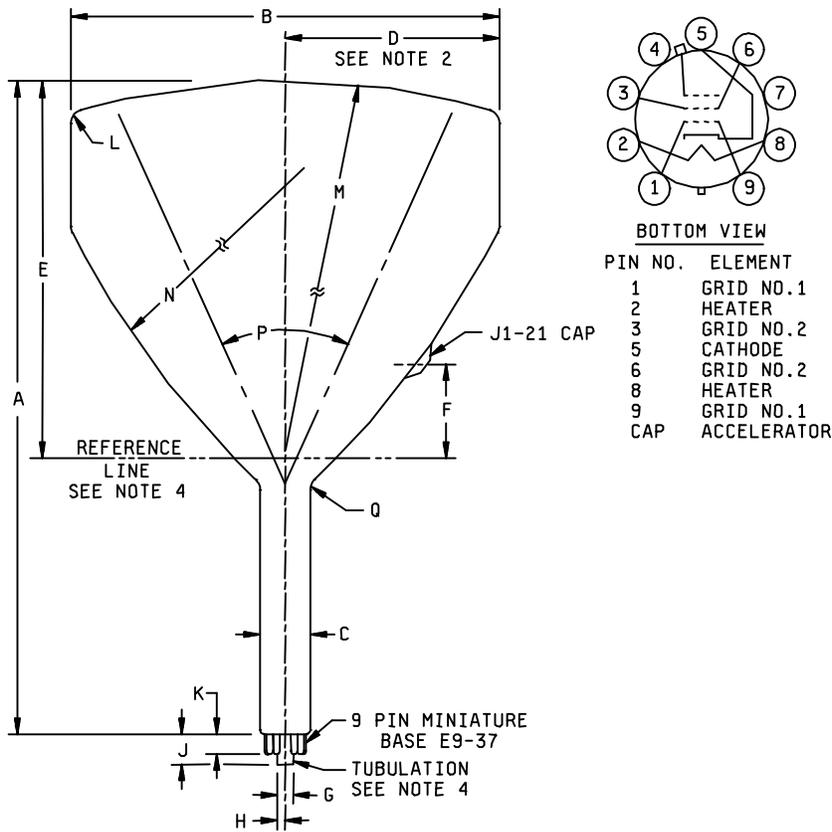
TABLE I. Testing and inspection - Continued.

Inspection	Method	Notes	Conditions	Symbol	Limits		Unit
					Min	Max	
<u>Conformance inspection, part 2</u>							
Heater current	1301	---		If	270	330	mA
Neck and bulb (magnetic types)	5101	---		---	---	---	---
Side terminal and base alignment	5101	---	Halfway between 1 and 9	---	-10	+10	Degrees
Face tilt	5101	---		---	---	---	---
Stray light emission (conventional types)	5216	---	Eb = 11,000 V dc; Ec2 = 450 V dc	---	---	---	---
Screens	5221	3/		---	---	---	---
Line width A (magnetic deflection)	5226	---	Ib = 100 μ A dc	Width	---	0.33	mm
Line width C (magnetic deflection)	5226	---	Ib = 100 μ A dc	Width	---	0.50	mm
Heater-cathode leakage current	5251	---		---	---	---	---
Grid No. 2 leakage current	5251	---		---	---	---	---
Permanence of marking	1105	---		---	---	---	---
<u>Conformance inspection, part 3</u>							
Life test	---	---	Group C; Eb = 11,000 V dc; Ec2 = 450 V dc; Ib = 60 μ A dc	t	500	---	hrs
Life-test end points:	---	---					
Line width A	5226	---	Ib = 60 μ A	Width	---	0.33	mm
Modulation	5223	1/	Ib = 320 μ A	Δ Ec1	---	40	V dc

See footnotes at top of next page.

TABLE I. Testing and inspection - Continued.

- 1/ ΔE_{c1} shall be not greater than the value of grid cutoff voltage (see method 5241).
- 2/ Cylinder shall be 4 inches (101.60 mm) long and .910 inch (23.11 mm) maximum inside diameter.
- 3/ The screen characteristics shall be measured with constant beam energy of 0.24 watt defocused to a spot approximately 0.25 cm in diameter. The test conditions shall be anode voltage (relative to cathode) 9,000 volts and beam current 27 μ A dc maximum. The screen characteristics shall comply with the following minimum limits: cB5 = 480 cB; G5: 1 = 4.
- 4/ The distance between the center of the unfocused, undeflected spot at low intensity (E_{c1} near cutoff) and the center of the image of the masking aperture observed at high intensity of the unfocused, undeflected spot shall not exceed the limit specified herein. E_{c1} shall not be held at zero for more than approximately 10 seconds to prevent damage to the screen.
- 5/ The activity responsible for the qualified products list is the Defense Supply Center Columbus, Code VQE, 3990 E. Broad Street, Columbus, Ohio 43216-5000 and information pertaining to qualification of products may be obtained from that activity. Applications for qualification tests shall be made in accordance with "Provisions Governing Qualifications SD-6". (Copies of "Provisions Governing Qualification SD-6" may be obtained upon application to Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)
- 6/ This test is to be performed at the conclusion of the holding period.
- 7/ The low-pressure test shall be made with maximum voltages applied, and pressure equivalent to 20,000 feet (348 mmHg). Connections shall be made to the base pins in a manner that does not degrade the tube breakdown characteristics. Satisfactory operation shall be the absence of arc-over and harmful corona.



Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
A	---	16.00	---	406.40
B	10.437	10.563	265.10	268.30
C	.810	.896	20.57	22.76
D	4.500	---	114.30	---
E	9.233	9.483	234.52	240.87
F	1.915	2.415	48.64	61.34
G	---	.250	---	6.35
H	---	.125	---	3.18
J	---	.437	---	11.10
K	---	.250	---	6.35
L	.437 Rad		11.10 Rad	
M	42.000 Rad		1066.80 Rad	
N	20.000 Rad		508.00 Rad	
P	50°			
Q	.500 Rad		12.70 Rad	

NOTES:

1. Reference line is determined by the point where JEDEC G-141 reference line gauge will stop.
2. Useful screen radius.
3. Dimensions without tolerance are for information only.
4. The tubulation diameter shall be less than the diameter of the socket hole and the tubulation shall not cant so as to bear on the sides of the socket hole.

FIGURE 1. Outline drawing of electron tube type 10ANP7.

MIL-PRF-1/1389F

Custodians:

Navy - EC
DLA - CC

Review activities:

Navy - AS, CG, MC, OS, SH

Preparing activity:
DLA - CC

(Project 5960-3547-03)