

INCH-POUND

MIL-PRF-1/747F
w/AMENDMENT 1
20 November 2025
SUPERSEDING
MIL-PRF-1/747F
21 June 2011

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, CATHODE RAY

TYPE 3XP1

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: Electrostatic deflection and focus.

DIMENSIONS AND PIN CONNECTIONS: See [figure 1](#).

ABSOLUTE RATINGS:

Parameter:	Ef	Ec1	ed	Eb1	Eb2	Light output	Rg	Zd	Alt
Unit:	V	V dc	v	V dc	V dc	ftL	MegΩ	MegΩ	ft
Maximum	6.9	0, -200	550	1,100	2,750	---	1.5	1.0	10,000
Minimum	5.7	---	---	---	1,000 <u>1/</u>	20 <u>2/</u>	---	---	---
Test conditions:	6.3	Adj	---	Focus	2,000	---	---	---	---

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.



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TABLE I. Testing and inspection.

Inspection	MIL-STD-1311 Method	Notes	Conditions	Symbol	Limits		Unit
					Min	Max	
<u>First article inspection</u>							
Pressure (implosion)	1141	---		---	---	---	---
Vibration	5111	---		Width	---	1.0	mm
Direct-interelectrode capacitance	1331	---	g1 to a11	Cg1	---	7	pF
			D1 to D2	C1D2	---	4	pF
			D3 to D4	C3D4	---	4	pF
			D1 to all except D2	CD1	---	4	pF
			D2 to all except D1	CD2	---	4	pF
			D3 to all except D4	CD3	---	4	pF
			D4 to all except D3	CD4	---	4	pF
Neck and bulb alignment (electrostatic types)	5101	---		Dia	---	1.5	Inch
Focusing voltage (zero-bias)	5246	---	Ec1 = 0	Eb1	400	---	V dc
Deflection-factor uniformity	5248	---		---	---	---	---
<u>Conformation inspection part 1</u>							
Electrode current (cathode)	5201	---	Light = 20 ftL	Ik	---	1,000	μA dc
Voltage breakdown	5201	---		---	---	---	---
Voltage breakdown (electrostatic types)	5201	---		---	---	---	---
Gas "cross"	5206	3/	Light = 20 ftL	---	---	---	---
Base alignment (electrostatic types)	5101	---	+3D4; pin No. 5	---	---	---	---
Angle, bulb, and trace	---	---	+1D2; bulb wall	---	---	1.5	Degrees
Screen and faceplate blemishes	5106	---		---	---	---	---
Light output	5221	2/ 3/		Light	20	---	ftL
Modulation	5223	---	Light = 20 ftL	ΔEc1	---	38	V dc
Spot position (electrostatic deflection)	5231	---		---	---	15.0	mm
Spot displacement (leakage)	5231	---		Displ	---	7.0	mm
Grid cutoff voltage	5241	---		Ec1	---	-67.5	V dc
Grid No. 1 leakage current	5251	---		---	---	---	---
Anode No. 2 leakage current	5251	---		---	---	---	---

See footnotes at end of table.

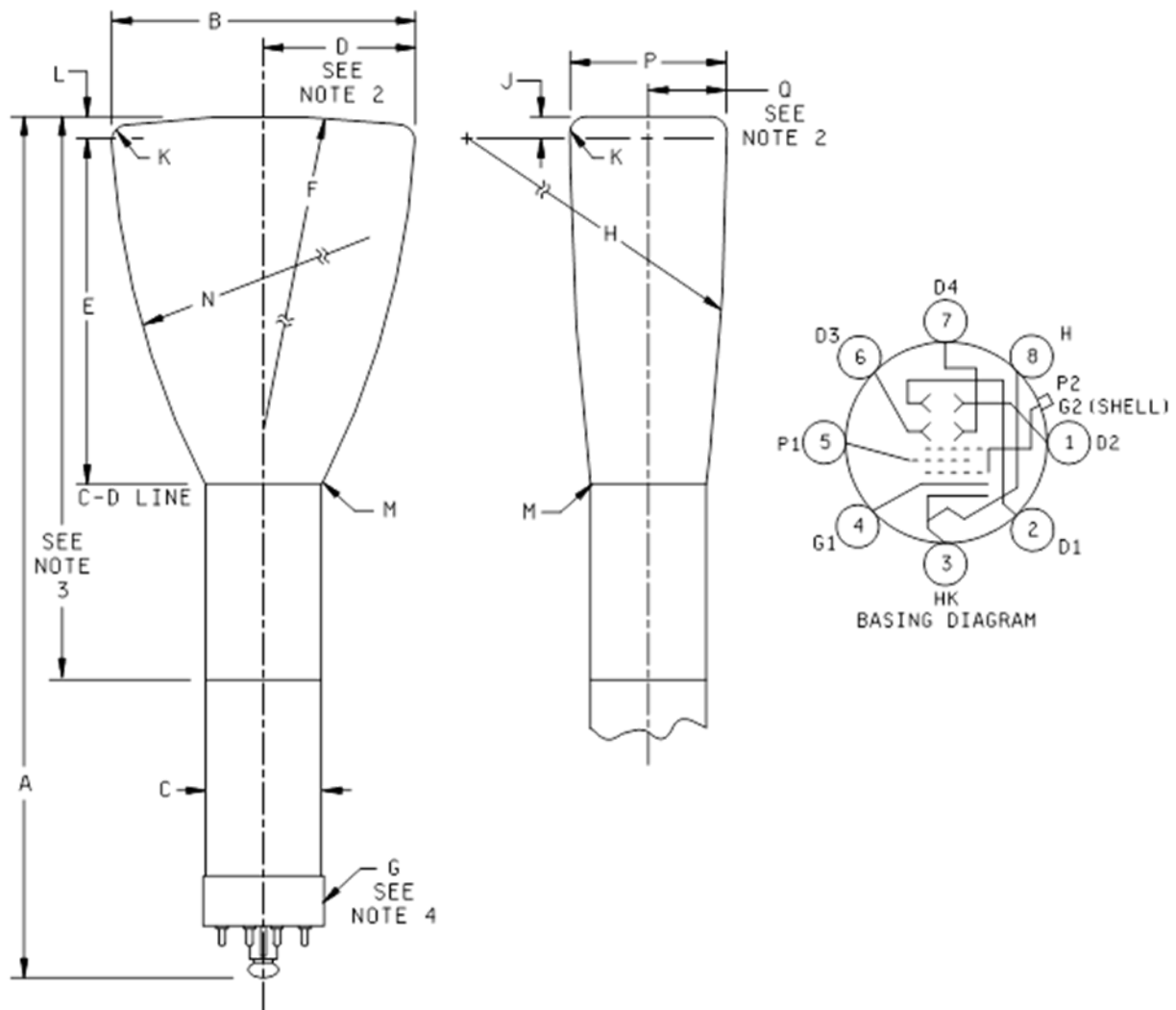
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TABLE I. Testing and inspection - Continued.

Inspection	MIL-STD-1311 Method	Notes	Conditions	Symbol	Limits		Unit
					Min	Max	
<u>Conformance inspection, part 2</u>							
Heater current	1301	---		If	540	660	mA
Electrode current (anode No. 1)	5201	---	Ec1 = 0	Ib1	-15	10	μA dc
Neck and base alignment (electrostatic types)	5101	---		---	---	---	---
Angle between traces	5101	---		---	---	---	---
Cathode illumination	5216	---		---	---	---	---
Stray light emission (conventional types)	5216	---	Eb2 = 2,750 V dc	---	---	---	---
Line width A (electrostatic deflection)	5226	---	Light = 20 ftL	Width	---	0.65	mm
Line width B (electrostatic deflection)	5226	---	Light = 20 ftL	Width	---	0.65	mm
Focusing voltage at cutoff	5246	---	Ec1 = cutoff	Eb1	---	700	V dc
Deflection factor	5248	---	1D2	DF	68	92	Vdc/inch
Deflection factor	5248	---	3D4	DF	28	38	Vdc/inch
Secureness of base, cap, or insert	1101	---		---	---	---	---
Permanence of marking	1105	---		---	---	---	---
<u>Conformance inspection, part 3</u>							
Life test	---	---	Group C; light = 20 ftL Eb2 = 2,750 V dc; t = 500 hrs (min)	---	---	---	---
Life-test end points:	---						
Line width A	5226	---	Light = 16 ftL	Width	---	0.65	mm
Line width B	5226	---	Light = 16 ftL	Width	---	0.65	mm
Modulation	5223	---	Light = 16 ftL	ΔEC	---	38	V dc

1/ This value is recommended only for low-velocity deflecting and low-ambient light levels.

2/ All light dependent tests to be measured with a 1.125 inch (28.58 mm) vertical and 1.562 inch (39.69 mm) horizontal, 30-line raster. Photocell is to have a 1-inch (25.40 mm) active aperture and calibrated in foot lamberts similar to Photovolt Corporation type 200-A, or equal.

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



NOTES:

1. These dimensions are for information only and are not required for inspection purposes.
2. Useful screen.
3. This portion of the envelope shall be coated with clear-baking synthetic XS-1810, as supplied by Coating Materials Laboratories, Inc., or equal.
4. Base: D8-1 (EIA) (Except the "D" dimension of the base shell shall be modified to 1.170 (min) - 1.250 (max)).

FIGURE 1. Outline drawing of electron tube type 3XP1.

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Ltr	Dimensions			
		Inches	Millimeters	
	Min	Max	Min	Max
	First article inspection			
B	2.953	3.047	75.01	77.39
G	Base:	D8-1 (EIA)	(see note 4)	
P	---	1.516	---	38.51
	Conformance		Inspection,	part 2
A	8.750	9.000	222.25	222.60
C	---	1.125 DIA	---	28.57 DIA
D	1.375	---	34.93	---
Q	.563	---	14.30	---
	Reference		dimensions	(see note 1)
E	3.879		98.53	
F	30.000 R		1524.00 R	
H	35.500 R		901.70 R	
J	.188		4.78	
K	.188 R		4.78 R	
L	.246		6.25	
M	1.000 R		25.40 R	
N	10.000 R		254.00 R	

FIGURE 1. Outline drawing of electron tube type 3XP1 - Continued.

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Referenced documents. In addition to [MIL-PRF-1](#), this specification sheet references [MIL-STD-1311](#).

Amendment notations. The margins of this specification sheet are marked with vertical line to indicate modifications generated by this amendment. 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.

Custodians:

Army - CR
Navy – EC
Air Force - 85
DLA - CC

Preparing activity:

DLA - CC
Project (5960-2025-011)

Review activities:

Army - MI
Navy - CG, MC

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil/>.