INCH-POUND

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SUPERSEDING
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PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, THYRATRON
TYPE 4C35A

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: Triode, hydrogen.

See figure 1.

Mounting position: Any.

Weight: 8 ounces (226.8 grams) nominal.

ABSOLUTE RATINGS:

Parameter:	Ef	epy	epx	Ebb	Ecc	egx	egy
Unit:	V	kv	kv	V dc	V dc	v	v
Maximum:	6.6	8.0 1/	8.0 2/	---	---	200	---
Minimum:	5.7	---	5% epy	2,500	---	---	3/
Test conditions:	6.3	8.0	---	---	0	---	130

ABSOLUTE RATINGS:

Parameter:	ib	lb	prr	Pb	$\frac{dik}{dt}$	tk	TA
Unit:	a	mA dc	---	---	$\frac{a}{\mu s}$	---	°C
Maximum:	90	100	---	2.0×10^9	1,000	---	+90
Minimum:	---	---	---	---	---	180	-50
Test conditions:	---	---	2,800	---	---	---	---

See footnotes at end of table I.

GENERAL:

Qualification - Required.

TABLE I. Testing and inspection.

Inspection	Method MIL-STD-1311	Notes	Conditions	Acceptance Level 11/	Symbol	Limits Min	Limits Max	Units
Conformance inspection, part 1								
Heater current	3241	---		0.65	If	5.50	6.70	A ac

Instantaneous starting	3267	5/ 6/	epy = 7.0 kv (min);
			tk = 180 sec;
			Ef = 6.60 V ac
				0.65	---	---	---	---

Operation (1)	3246	5/ 9/	epy = 10.0 kv (min); Ef = 5.70 V ac; t = 300 sec	0.65	egy	---	130	v
DC anode voltage for conduction	3247	---	Ef = 5.70 V ac	0.65	Ebb	---	1,500	V dc
Pulse emission (method A)	3251	---	ik = 90a (min); prr = 60 ± 10 percent; tp = 5.0 µs ± 10 percent; tr = 0.5 µs (max); specified time interval= 2.5 µs	0.65	egk	---	150	v
Conformance inspection, part 2								
High-frequency vibration	1031	---	No voltages applied	---	---	---	---	---
Operation (2)	3246	---	Operation (1); Ef = 6.60 V ac	---	egy	---	130	v
Anode delay time	3256	---	Operation (1); Ef = 6.3 V ac; t = 120 sec	---	tad	---	0.60	µs
Anode delay time drift	3256	7/	Anode delay time	---	Δtad	---	0.10	µs
Time jitter	3261	5/	epy = 3.0 kv (max)	---	tj	---	0.005	µs

See footnotes at end of table.

TABLE 1. Testing and inspection - Continued.

Inspection	Method MIL-STD-1311	Notes	Conditions	Acceptance Level 11/	Symbol	Limits Min	Limits Max	Units
Conformance inspection, part 3								
Life test	---	5/	Group B; t = 96 hours "on" and 1 hour "off" (tube mounted horizontally); t = 500 hours	---	---	---	---	---
Life test end points:	---							
Operation (1) and operation (2)	3246	8/		---	egy	---	140	v
DC anode voltage for conduction	3247	---	egy = 140 v	---	Ebb	---	2,000	V dc
Anode delay time	3256	---	egy = 140 v	---	tad	---	0.70	µs
Anode delay time drift	3256	---	egy = 140 v	---	Δtad	---	0.10	µs
Time jitter	3261	---	egy = 140 v	---	tj	---	0.01	µs
Variable-frequency vibration	1031	10/	No voltages applied	---	---	---	---	---
Shock	1041	4/ 10/	Angle = 24°	---	---	---	---	---
Electrical characteristics measured before and after shock	---	5/ 10/	epy = 10.0 kv (min); t = 300 sec; epy = 3.0 kv (max)	---	egy Ebb tj	--- --- ---	130 1,500 0.005	v V dc µs
Operation at elevated ambient temperature	3246	5/ 10/	TA = 90°C; Ef = 6.3 ± 0.50 V ac; t = 5.0 hours	---	egy	---	130	v

1/ For instantaneous starting applications where anode voltage is applied instantaneously, the maximum permissible epy is 7.0 kv and shall be attained in not less than 0.04 second.

2/ In pulsed operation, the peak inverse voltage, exclusive of a spike of 0.05 µs maximum duration, shall not exceed 2.5 kv during the first 25 µs after the pulse.

3/ The driver pulse, measured at tube socket with thyratron grid disconnected, shall be: egy = 175 v minimum; time of rise = 0.5 µs maximum; grid pulse duration = 2 µs minimum. Impedance of drive circuit = 1,500 ohms maximum.

4/ Use clamp as specified on Drawing 243-JAN.

5/ The anode circuit constants shall be so chosen that at epy = 8.0 kv under resonant charging conditions: dik/dt = 1,000 a/µs minimum; ib = 90 a; tp = 0.5 µs ± 10 percent; prr = 3,000. The grid pulse characteristics shall be tp = 2.0 µs maximum; tr = 0.5 µs minimum; driver impedance = 1,500 ohms minimum.

6/ The grid-drive voltage shall be applied within 10 seconds before application of anode voltage. The tube shall operate satisfactorily on pushbutton starting within three attempts when the anode voltage (epy) is applied to the tube under test (TUT) in such a manner as to rise from 0 to 7,000 v within 0.03 second (the filter in the rectifier shall be so designed that the epy reaches at least 3,500 v within 0.015 second). Any tube failing to start within three attempts shall be considered a failure.

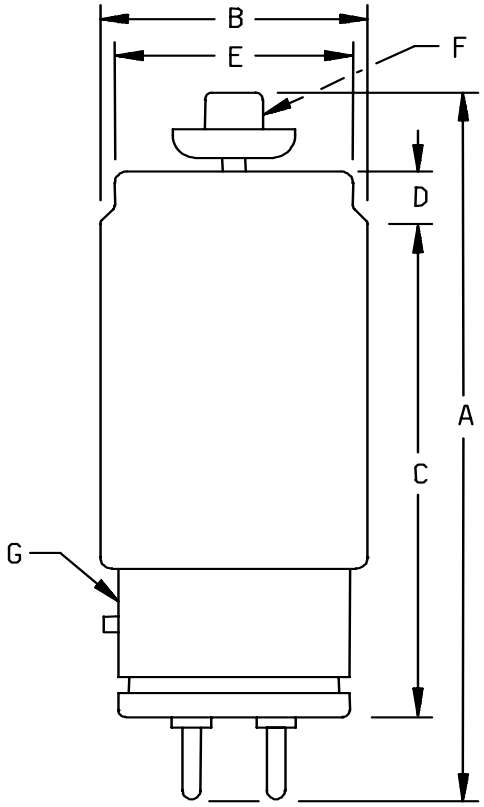
7/ During the interval between 2 minutes and 7 minutes of the anode delay time test, the change in anode delay time (Δtad) relative to the tad value observed on the anode delay time test shall not exceed the specified value.

8/ Anode heating shall not be cause for rejection on operation (1) and operation (2) performed during life-test end point tests.

9/ This test shall be the first test performed at the conclusion of the holding period.

10/ This test shall be performed during the initial production and once each succeeding 12-calendar months in which there is production. An accept on zero defect sampling plan shall be used, with sample of three tubes with an acceptance number of zero. In the event of failure, the test will be made as a part of conformance inspection part 2, with an acceptance level of 6.5 (see 11/) . The "12-calendar month" sampling plan shall be reinstated after three consecutive samples have been accepted.

11/ This specification uses accept on zero defect sampling plan, in accordance with MIL-PRF-1, Table III.



Pin connections	
Pin No.	Element
1	g
2	h, k
3	h
4	k
cap	a

Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
Conformance inspection, part 2				
A	6.250	6.875	158.75	174.63
B	2.380	2.562	60.45	65.07
Conformance inspection, part 3 (see note)				
C	4.000	5.000	101.60	127.00
D	.400	---	10.16	---
E	2.000	2.300	50.80	58.42
F	Cap: C1-43 (EIA)			
G	Base: A4-18 (EIA)			

NOTE:
These dimensions shall be checked annually with the following accept on zero defect sampling plan:

n1 = 4 c1 = 0
n2 = 4 c2 = 0;

In case of failure, the failing dimensions(s) shall become conformance inspection, part 2, for three successful consecutive submissions, at which time the test may revert to the conformance inspection, part 3 basis.

FIGURE 1. Outline drawing of electron tube type 4C35A.

NOTES

Referenced documents. In addition to MIL-PRF-1, this specification sheet sheet references MIL-STD-1311, Drawing 243-JAN.

Changes from previous issue. 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 previous issue.

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

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

Preparing activity:
DLA - CC

(Project 5960-3753)

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 www.dodssp.daps.mil.