INCH-POUND

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SUPERSEDING
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PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, THYRATRON

TYPE 8354

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, ceramic-metal.
See figure 1.
Mounting position: Any.
Weight: 2 pounds (907.2 grams) nominal.

ABSOLUTE RATINGS:

Parameter:	Ef	epy	epx	Ebb	egy	egx	Ecc	ib	Ib
Unit:	V ac	kv	kv	V dc	v	v	V dc	a	A dc
Maximum:	6.8	25	25 1/	---	1,500 2/	400	-200	1,000	2.2
Minimum:	5.8	---	5% epy	1,500	500	---	---	---	---
Test conditions: 8/	6.3	25	---	---	450	---	---	---	---

ABSOLUTE RATINGS:

Parameter:	Ip	tj	prr	dik/dt	Pb	tk	TA	Cooling	Eres
Unit:	A ac	μs	---	a/μs	---	sec	°C	---	V ac
Maximum:	40	0.005	4,000	5,000	25×10^9 7/	---	+85	--- 7/	6.8
Minimum:	---	---	---	---		300	-55	---	5.8
Test conditions: 8/	---	---	---	---	---	300	Ambient	---	6.3

See footnotes at end of table I.

GENERAL:

Qualification – Required.

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

TABLE I. Testing and inspection.

Inspection	Method MIL-STD-1311	Notes	Condition	Symbol	Limits		Unit
					Min	Max	
Conformance inspection, part 1							
Pulse emission	3251	---	ik = 1,500 a; tp = 5 μs ± 10 percent; prr = 60 ± 10 percent; tr = 0.5 μs (max); specified time interval = 2.5 μs	egk	---	250	v
Heater current (cathode)	3241	---		If	11	18	A ac
Heater current (reservoir)	3241	---		Ires	3	8	A ac
Operation (1)	3246	3/ 4/ 5/	Ef = Eres = 5.8 V ac; epy = 24 kv; Ib = 2.2 A dc; t = 1 hour	egy	---	450	v
Operation (2)	3246	10/	Operation (1), except Ef = Eres = 6.3 V ac; t = 5 hours	egy	---	450	v
Instantaneous starting	3267	3/ 6/	epy = 18 kv (min); Ef = Eres = 6.8 V ac	---	---	---	---
DC anode voltage for conduction	3247	---	Ef = Eres = 5.8 V ac	Ebb	---	1,000	V dc
Conformance inspection, part 2							
Anode delay time	3256	---	Operation (1), except t = 120 seconds	tad	---	0.5	μs
Anode delay time drift	3256	9/	Anode delay time	Δtad	---	0.15	μs
Time jitter	3261	12/	Operation (2); tk = 300 seconds	tj	---	0.005	μs
Conformance inspection, part 3							
Sweep-frequency vibration	1031	11/	No voltages applied	---	---	---	---
Shock	1041	11/	250 G; no voltages applied	---	---	---	---
Shock and sweep-frequency vibration end points	---	---	DC anode voltage for conduction	Ebb	---	1,250	V dc
Life test	---	3/	Group C; t = 500 hours	---	---	---	---
Life test end points:	---	---		---	---	---	---
Operation (1) and (2)	3246	---	Except 5/	egy	---	450	v
DC anode voltage	3247	13/		Ebb	---	1,250	V dc
Time jitter	3261	---		tj	---	0.005	μs

See footnotes at top of next page.

TABLE I. Testing and inspection - Continued.

1/ In pulsed operation, the peak inverse voltage exclusive of a spike of 0.05 μs maximum duration, shall not exceed 5 kv during the first 25 μs following the anode pulse.

2/ The driver pulse, measured at the tube socket with the thyratron grid disconnected: tr = 0.35 μs maximum; grid pulse duration = 2 μs minimum. The impedance of the drive circuit shall be 50 to 200 ohms.

3/ The anode circuit constants shall be chosen for a resonant charging condition of prr = 4,000 minimum. At epy = 24 kv and ib = 580 a minimum, the rate of rise of the current pulse (dik/dt) shall be 5,000 a/μs minimum. The pulse width (tp) shall be 2.4 μs ± 10 percent. The grid pulse measurements at the tube socket with the thyratron grid disconnected shall be as follows:
tr = 0.35 μs minimum, tp = 2.0 μs maximum, Zg = 200 ohms minimum, Ecc = -70 V minimum.

4/ The anode temperature and grid seal temperature shall not exceed 350°C at any time during this test.

5/ Anode voltage shall be applied as specified in 6/. Full anode voltage (epy = 24 kv) shall be reached within 5 seconds after starting. The tube shall operate at the specified anode voltage for a total of 6 hours, which may include two interruptions during the initial 30 minutes and one interruption during the last 5.5 hours.

6/ The tube shall operate satisfactorily on push button starting within two attempts when the anode voltage (epy) is applied to the tube under test in such a manner as to rise from 0 to 18 kv minimum within 0.03 second. (The filter in the rectifier shall be designed so that epy reaches at least 9 kv within 0.015 second). Any tube failing to start within three attempts will be considered a failure.

7/ There shall be no artificial anode or envelope cooling directed onto the tube. Blowers or anode radiators shall not be used.

8/ The heat dissipater, Hughes Aircraft Co. Part No. 529033 (grid radiator), or equivalent shall be used during all tests of this specification.

9/ This test shall be performed simultaneously with operation (1) test. Anode delay time measurement shall be made at the end of 2, 4, and 30 minutes of the operation (1) tests. The anode delay time drift (Δtad) measurement is the numerical difference between 2 minute and 4 minute, or 2 minute and 30 minute anode delay time readings, whichever is greater.

10/ Operation (2) shall be a continuation of operation (1) with the specified change in operating conditions made after 1 hour.

11/ This test shall be performed during the initial production and once each succeeding 12-calendar months in which there is production. A regular double sampling plan shall be used, with the first sample of three tubes with an acceptance number of zero, and a second sample of three tubes with a combined acceptance number of two. In the event of failure, the test will be made as part of conformance inspection, part 2, code level D, with an acceptance level of 6.5. The regular “12-calendar month” double sampling plan shall be reinstated after three consecutive samples have been accepted.

12/ The tube shall be tested by applying a peak forward anode voltage, as specified in the test conditions for the time jitter test immediately after the tk. The tj shall be not greater than the amount specified after 120 seconds of operation.

13/ The tube shall operate at the specified anode voltage for a total of 6 hours which may include three interruptions during the initial 30 minutes and three interruptions during the last 5.5 hours.

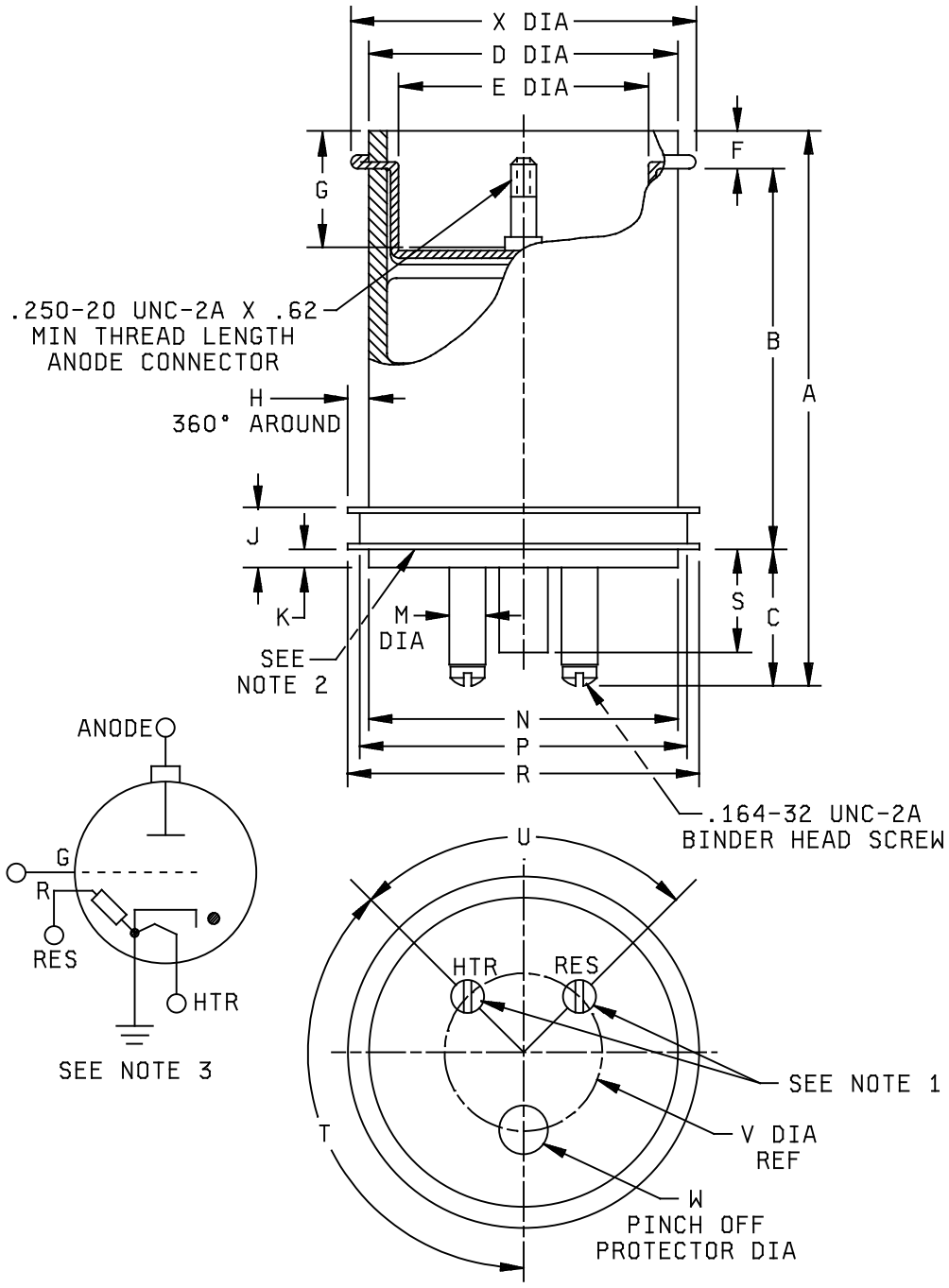

FIGURE 1. Outline drawing of tube type 8354.

Ltr	Dimensions			
	Inches		Millimeters	
	Min	Max	Min	Max
Conformance inspection, part 1				
K	.100	.180	2.54	4.57
N	2.985	3.015	75.82	76.58
Conformance inspection, part 2				
A	---	5.895	---	149.73
B	3.945	4.340	100.20	110.24
C	---	1.555	---	39.50
D	2.985	3.015	75.82	76.58
E	2.410	2.530	61.21	64.26
F	---	.313	---	7.95
G	.980	1.355	24.89	34.42
H	.093	---	2.36	---
J	.520	.570	13.21	14.48
M	---	.375	---	9.53
P	3.235	3.265	82.17	82.93
R	3.245	3.305	82.42	83.95
S	---	1.081	---	27.46
W	---	.469	---	11.91
X	---	3.430	---	87.12
Reference dimensions				
T	135°			
U	90°			
V	1.500		38.10	

NOTES:
1. Reservoir and heater terminals shall be identified and marked on tube base as specified herein.
2. Cathode ring connection.
3. Other side of reservoir and heater terminals are internally connected and are common to cathode.

FIGURE 1. Outline dimensions of tube type 8354 - Continued.

Referenced documents. In addition to MIL-PRF-1, this document references the following: MIL-STD-1311

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(Project 5960-2015-043)

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