

INCH-POUND

MIL-PRF-1/1771A
10 June 2020
SUPERSEDING
MIL-E-1/1771 (ER)
1 March 1979

PERFORMANCE SPECIFICATION SHEET

ELECTRON TUBE, NEGATIVE GRID (MICROWAVE)

TYPE DOD-041 1/

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: Planar triode
See [figure 1](#)
Mounting position: Any
Weight: 0.3 ounces (7.5 grams) nominal

ABSOLUTE RATINGS: Pulsed oscillator service

Parameter:	F	Ef	Eb	Ec	Ehk	Rk	Ib	fb	ic	tp	Du	Pp	TE
Unit:	GHz	V	kV dc	V dc	V	Ohms	mA dc	a	a	μs	---	w	°C
Maximum:	6.0	6.6	1,200	-75	+50	---	60	5	1.5	1.0	0.02	50	250
Minimum:	---	6.0	---	---	-50	---	---	---	---	---	---	---	---
												Note 6	Note 7
TEST CONDITIONS	---	6.3	300	---	---	82	---	---	---				

GENERAL:

Qualification - Required.

1/ Replaces General Electric Company type Y-2113-2.

AMSC N/A

FSC 5960



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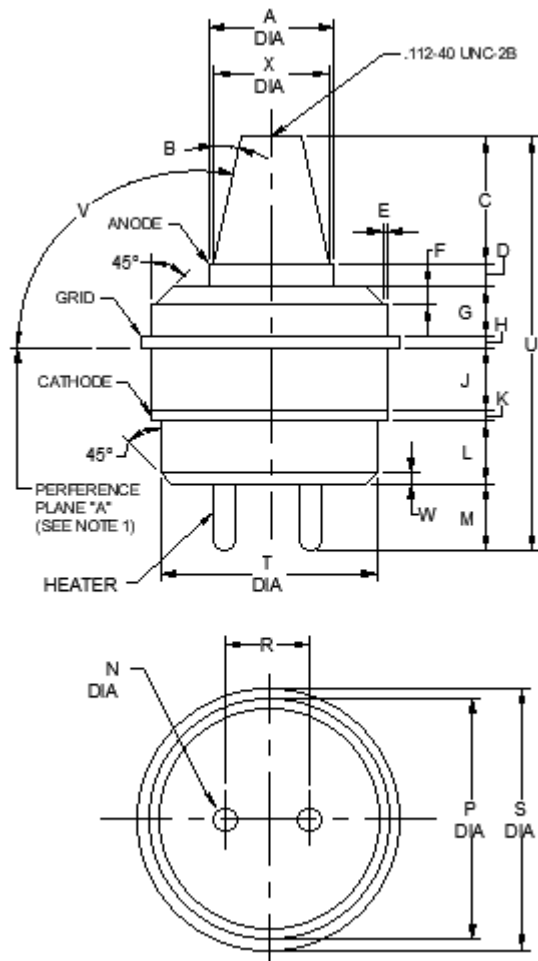
TABLE I. Testing and inspection.

Inspection	Method MIL-STD-1311	Notes	Conditions	Acceptance level (note 8)	Symbol	Limits		Unit
						Min	Max	
<u>Conformance inspection, part 1</u>								
Heater current	1301	---			If	---	850	mA
Heater- cathode leakage	1336				Ihk	--	50	μ Adc
Total grid current	1266		Rg = 100K		Ic	---	1.0	μ A
Electrode voltage (grid)	1261		Eb = 1150 Vdc Rp = 47 K; Rg = 100k; Rk = 0; Ec/Ib = 1.0 mAdc		Ec	---	-40	V dc
Grid- pulse operation (1)	1356		Eb = 400Vdc; Ec = -30 v; tp = 1 μ s; prf = 1,000; egy/ib = 5.0 a		egy	---	80	V
Grid- pulse operation (2)	1356	1	Eb = 400 Vdc; Ec = -30 V; tp = 1 μ s; prf = 1,000 ; egy/ib = 6.0 a		Δ egy	---	20	V
Insulation of electrodes	1211	---			R	50	---	Meg Ω
<u>Conformance inspection, part 2</u>								
Cathode warmup time	4303	2, 3	Eb = 400 Vdc; Ec = -30 v; tp = 1 μ s prf = 1,000; egy/ib = 5.0 a		t	--	6.0	sec
Amplification factor	1316	---	Ck = 1,000 μ F		Mu	40	60	---
Electrode current (anode)	1256	---			Ib	31	57	mA dc
Transconductance	1306	---	Ck = 1,000 μ F		Sm	22,000	36,000	$\mu\Omega$
Direct- interelectrode capacitance	1331	---			Cgp Cin Cout	2.10 5.7 ---	2.60 8.2 .08	pF pF pF
Low- frequency vibration	1031	4	Ebb = 300 Vdc Ec = 0; Ck = 1,000 μ F; Rp = 2,000 Ω ; 15G ; F = 40Hz		Ep	---	75	mV ac
<u>Conformance inspection, part 3</u>								
Heater- cycling Life test	1506	5	Ef = 7.0 V; Ehk = +70 Vdc; no other voltages applied		Cycles	2,000	---	----
Heater- cycling Life test End point: Heater- cathode leakage	-- 1336	----			Ihk	--	100	μ A dc

See footnotes at end of table.

NOTES:

1. Test limit Δe_{gy} applies to individual tubes and is defined as the net difference between the grid pulse voltages necessary to obtain 5.0a and 6.0a.
2. Prior to cathode warmup test, establish for individual TUT's the grid drive necessary to obtain an ip of 5.0 amp. No voltages shall be applied to the TUT for 5 minutes (minimum) immediately prior to the cathode warmup test.
3. Cathode warmup is defined as the time in seconds required for the plate current to reach 2.5 amp.
4. The TUT shall be vibrated with simple harmonic motion in each of two planes (1) parallel to the cylindrical axis and (2) perpendicular to the cylindrical axis and parallel to a plane through the heater pins.
5. An accept on zero defect sampling plan shall be used (see 8/) with a sample of 4 tubes.
6. Up to 50 watts dissipation is allowable provided there is adequate heat sink at the anode.
7. In addition to the specified maximum envelope temperature rating of 250°C, appropriate conduction, convection, or forced-air cooling should be provided to limit the temperature gradient across individual ceramic insulator sections to a maximum of 100°C.
8. This specification sheet uses accept on zero defect sampling in accordance with [MIL-PRF-1](#), table III.
9. In addition to the marking requirement per MIL-PRF-1, each tube shall be marked with a five-character lot identification code that identifies the lot of the tube (associated with its life test data).



Dimensions are in inches with metric equivalents (mm) in parentheses		
Ltr.	Minimum	Maximum
Conformance inspection, Part 2		
H	.025 (.635)	.031 (.787)
J	.166 (4.126)	.176 (4.470)
R	.186 (4.724)	.214 (5.436)
S	.598 (15.19)	.608 (15.44)
T	.485 (12.32)	.515 (13.081)
Conformance inspection, Part 3 see note 2		
A	.288 (7.135)	.297 (7.544)
C	.323 (8.204)	.363 (9.220)
D	.048 (1.219)	.068 (1.727)
F	.040 (1.016)	.060 (1.524)
G	.145 (3.683)	.155 (3.937)
K	.025 (.635)	.031 (.787)
L	.170 (4.318)	.180 (4.572)
M	.170 (4.318)	.180 (4.572)
N	.047 (1.194)	.053 (1.346)
P	.535 (13.59)	.565 (14.35)
W	.020 (.508)	.040 (1.016)
Reference dimensions (note 3)		
B	10°	
E	.005 (.125)	
U	1.128 (28.65)	
V	100°	
X	.272 (6.909)	

NOTES:

- Tube concentricity shall be measure by chucking in test fixture arbor – [Figure 2](#) which is fastened to the anode terminal.
 - The axis of the grid flange shall be coincident with the axis of the anode terminal within .013 (.33mm).
 - The place of the annular surface “A” (cathode side of the grid flange) shall be perpendicular to the axis of the anode terminal within $\pm 1 \frac{1}{4}$ degree. The above concentricity measurements shall be conformance inspection, part 1 (see [8/](#)).
- Dimensions shall be checked during initial production and once each succeeding 12-calendar months during which there is production. An accept on zero defect sampling plan (see [8/](#)) shall be used with a sample of three tubes. In the event of failure, the test will be made a part of conformance inspection, part 2 (see [8/](#)). The regular 12-calendar month sampling plan shall be reinstated after three consecutive samples have been accepted.
- Dimensions without tolerances are for information and are not required for inspection.

FIGURE 1. Outline drawing of electron tube type DOD -041.

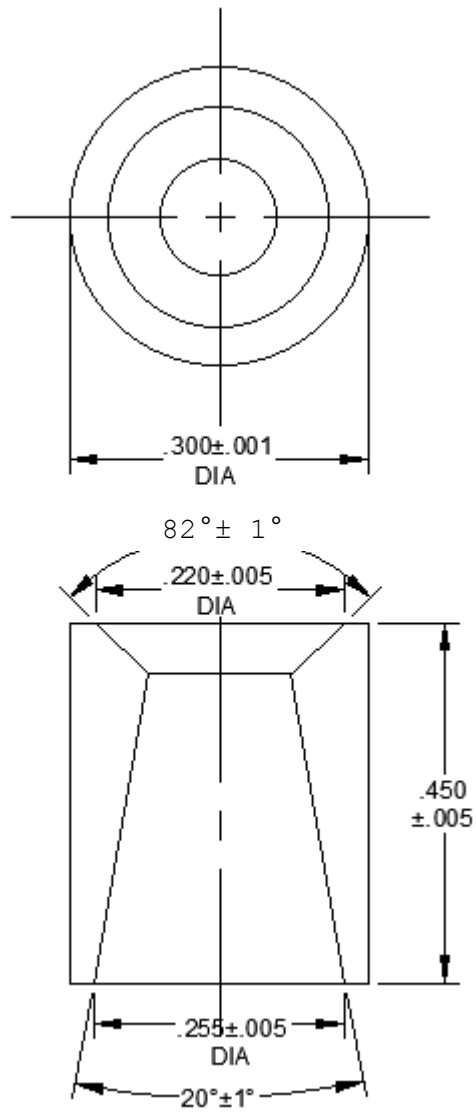


FIGURE 2. Test fixture arbor.

Referenced documents. In addition to [MIL-PRF-1](#), this document references the following:
[MIL-STD-1311](#).

Changes from previous issue. The margins of this specification sheet 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 last previous issue.

Custodians:
Army - CR
DLA - CC

Preparing activity:
DLA – CC
(Project 5960-2020-005)

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>.