2K25JANM

2K25-JAN

MIL-E-1/982B
3 JAN 1977
SUPERSEDING
MIL-E-1/982A
14 July 1970

MILITARY SPECIFICATION SHEET

ELECTRON TUBE, KLYSTRON

TYPE 2K25

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The complete requirements for procuring the electron tube described herein shall consist of this document and the latest issue of Specification MIL-E-1.

DESCRIPTION: Integral cavity, mechanically tuned, frequency range 8,500 to 9,660 MHz

ABSOLUTE RATINGS:

Parameter:	Ef	Ers	Er	Ik	Ehk	F	Alt
Unit:	V	Vdc	Vdc	mAdc	Vdc	MHz	ft
Maximum:	6.8	350	-400	37	50	---	10,000
Minimum:	5.8	---	---	--	--	---	---

PHYSICAL CHARACTERISTICS:

Dimensions:	See figure 1
Cathode:	Coated unipotential
Mounting position:	Any

TEST CONDITIONS: See note 2

Parameter:	Ef	Ers	Er	Mode	F
Unit:	V	Vdc	Vdc	----	MHz
Test					
1	6.3	---	----	----	---
2	6.3	300	-143 to -200	A	9,660
3	5.8	300	-85 to -135	A	8,500
4	5.8	300	-125 to -180	A	9,370
5	5.8	300	-143 to -200	A	9,660
6	5.8	300	-75 to -120	B	9,370
7	5.8	300	-40 to -75 (See note 4)	C	9,370

GENERAL:

Qualification - Required

(B) Denotes changes

METHOD	REQUIREMENT OR TEST	TEST	CONDITIONS	SYMBOL	LIMITS MIN	LIMITS MAX	UNIT
	Qualification inspection						
1031	High-frequency vibration	--	No voltages	---	---	---	---
4027	Temperature coefficient	4	See figure 2	---	0	-0.20	MHz/°C
1216	Base material insulating quality	--	Phenolic wafer (See figure 1)	---	---	---	---
	Quality conformance inspection, part 1	--	See note 7				
1256	Electrode current (cathode)	2		Ik	---	32	mAdc
4214	Cathode emission	2	Ef = 5.8 V; t = 2 minutes	ΔIk/Ik	---	15	%
4250	Power output (1)	3,4,5	See notes 3 and 5	Po	20	---	mW
4213	Reflector voltage (1)	5		Er	-143	-200	Vdc
----	Mode continuity	4	See note 1	---	---	---	---
4229	Total reflector current	5	See note 6	Ir	---	7.0	µAdc
4229	Reflector-leakage current	5	See note 6	Ir	---	5.0	µAdc
4229	Reflector-gas current	5	See note 6	Ir	---	2.0	µAdc
	Quality conformance inspection, part 2						
1336	Heater-cathode leakage	--	Ehk = ±45 Vdc	Ihk	0	100	µAdc
1301	Heater current	1		If	410	470	mA
1211	Insulation of electrodes	--	300 Vdc; tube cold	Rkrs Rhrs	2.0 2.0	--- ---	Meg Meg
4250	Power output (2)	6		Po	15	---	mW
4213	Reflector voltage (2)	6		Er	-75	-120	Vdc
4280	Electronic tuning range (1)	4	Er/50% max Po	ΔF	35	---	MHz
4280	Electronic tuning range (2)	4	Er/2.5% max Po	ΔF	---	145	MHz
4231	Electronic tuning hyteresis (1)	3,5		Ratio	---	0.25	---
(B) 4250	Power output (3)	7		Po	3.0	---	mW
(B) 4280	Electronic tuning range (3)	3,5	Er/50% max Po See note 5	ΔF	28	---	MHz
	Quality conformance inspection part 3						
----	Life-test provisions	2	Group B	t	500	---	hrs
----	Life test end point:						
4250	Power output (1)	3,4,5		Po	10	---	mW
(B) 4213	Reflector voltage (1)	3		Er	-85	-135	Vdc

NOTES:

1. The mechanical tuning shall be set for F = 9,370 MHz ±0.3 percent and sufficient 60 Hz ac voltage superimposed on the direct reflector voltage to suppress oscillation on the ends of the sweep. The crystal current as a function of reflector voltage shall be observed with an amplifier and an oscilloscope having a minimum pass band of 0.1 MHz. With the standing-wave introducer in accordance with Drawing 227-JAN, inserted in the guide, there shall be no discontinuity at the maximum power points for any phase of standing wave, when the magnitude of the standing wave is specified.

2. The tube shall be fixed firmly in a suitable socket by clamps in accordance with Drawing 227-JAN. The measurements on the tube in an oscillating state shall be made with the output line coupled into measuring circuits in accordance with Drawing 227-JAN.

3. The power output shall be above the limit specified throughout the specified frequency range.

4. Reflector voltage shall be adjusted to the value within the specified limits which is necessary to obtain maximum power output.

5. The tube shall meet the requirement of this test over the operating band, however, the test need be conducted only at the designated frequency or frequencies.

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

7. Unless otherwise specified, the AQL for all tests listed under quality conformance inspection, part 1, shall be 1.0 percent, inspection level II.

Custodians:

Army - EL
Navy - EC
Air Force - 85

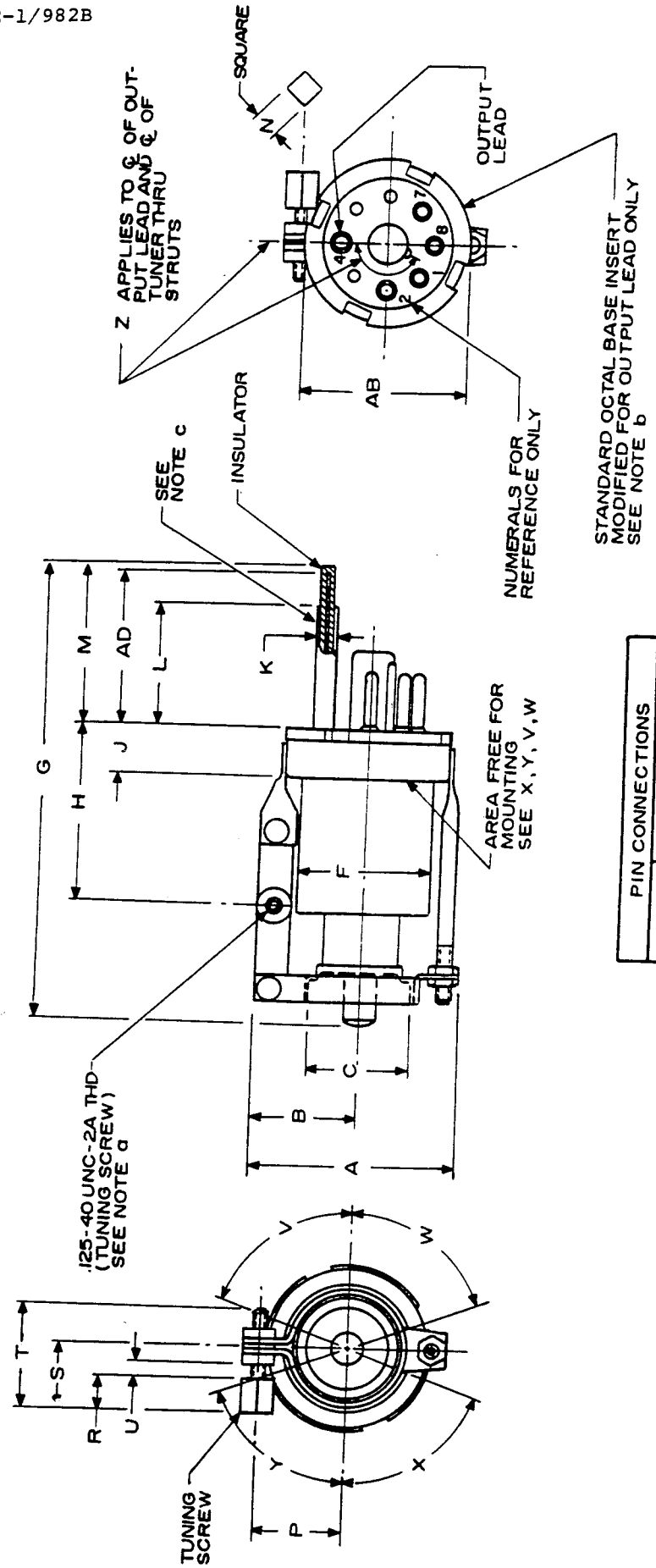
Preparing activity:

Air Force - 85

Review activities:
Army - EL, MU
Air Force - 99
DSA - ES

(Project No. 5960-3013)

User activities:
Army - ME, WC
Navy - AS, OS, MC, CG, SH
Air Force - 11



PIN CONNECTIONS	
PIN NO.	ELEMENT
1	sh
2	h
4	OUTPUT LEAD
7	h
8	GUN
CAP	r

FIGURE 1 Outline drawing of electron tube type 2K25

LTR	DIMENSIONS IN INCHES WITH METRIC EQUIVALENTS (mm) IN PARENTHESES	
	MINIMUM	MAXIMUM
QUALITY CONFORMANCE INSPECTION, PART 1		
H	1.312 (33.32)	1.438 (36.53)
J	.330 (8.38)	.400 (10.16)
K	.135 (3.43)	.145 (3.68)
L	.910 (23.11)	.930 (23.62)
M	1.203 (30.56)	1.234 (31.34)
P	.656 (16.66)	.719 (18.26)
Z	154° 30'	160° 30'
AD	1.168 (29.67)	1.188 (30.18)
QUALITY CONFORMANCE INSPECTION, PART 2		
A		1.609 (40.87)
B		.859 (21.82)
F	1.000 (25.40)	1.016 (25.81)
G		3.562 (90.47)
N	.182 (4.62)	.192 (4.88)
R	.203 (5.16)	.234 (5.94)
S	.484 (12.29)	.516 (13.11)
U		.116 (2.95)
QUALIFICATION INSPECTION		
C	.767 (19.48)	.797 (20.24)
T	.766 (19.46)	.797 (20.24)
V		70°
W		70°
X		70°
Y		70°
AB	1.271 (32.28)	1.312 (33.32)

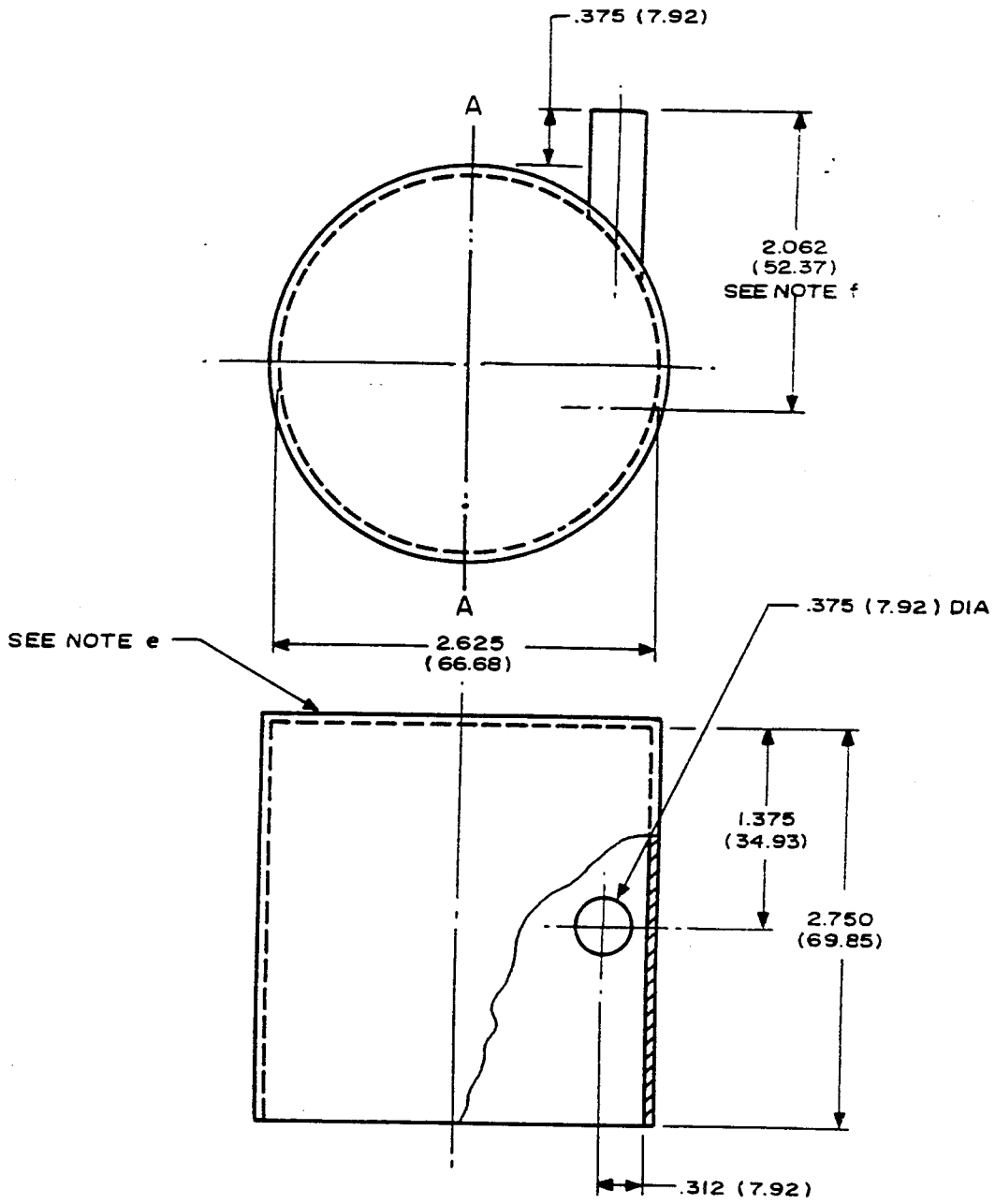
NOTE:

a. THE TUNING SCREW SHALL BE LUBRICATED WITH OILDAG OR EQUAL NON-CORROSIVE LUBRICANT. IT SHALL BE CAPABLE OF BEING OPERATED SMOOTHLY THROUGH ITS ENTIRE RANGE WITHOUT PERCEPTIBLE BINDING.

b. THE BASE SHALL BE CAPABLE OF BEING INSERTED IN A GAGE 1.219 (30.96 mm) THICK HAVING 4 HOLES .250 (6.35 mm) DEEP FROM THE TOP OF THE GAGE WHOSE DIAMETERS ARE .103 (2.62 mm) FOR THE CONTACT PINS. REMAINING PORTION OF HOLE TO BE CLEARANCE, APPROXIMATELY .016 (.41 mm) LARGER IN DIAMETER AND A FIFTH HOLE WHOSE DIAMETER .160 (4.06 mm) BY 1.219 (30.96 mm) DEEP FOR THE OUTPUT LEAD. ALL HOLES LOCATED ON THE TRUE CENTER. ALSO A CENTER HOLE HAVING THE CONTOUR OF THE PILOT BUT WITH THE CLEARANCE OF .002 (.05 mm) OVER THE MAXIMUM DIAMETER.

c. NICKEL (30 MSI SILVER PERMISSIBLE).

FIGURE 1 Outline drawing of electron tube type 2K25 - Continued



NOTES:

a. DIMENSIONS ARE IN INCHES. (MILLIMETERS IN PARENTHESES).

b. UNLESS OTHERWISE SPECIFIED, TOLERANCE IS .016 (.41 mm).

c. THE TUBE SHALL BE MOUNTED WITH AN APPROXIMATE CLEARANCE BETWEEN IT AND THE COVER OF 1/2 INCH. THE PLANE PASSING THROUGH THE TUNING MECHANISM AND THE LONGITUDINAL AXIS OF THE TUBE SHALL BE PARALLEL TO PLANE A-A.

d. ENCLOSED METAL COVER IN CYLINDER TO SHIELD IT FROM EXTERNAL AIR CURRENTS.

e. HEATING AND COOLING ELEMENTS SHALL BE APPLIED TO THE TOP OF COVER.

f. DEPTH OF PENETRATION OF THERMOMETER.

FIGURE 2 Metal cover for temperature coefficient test

U.S. GOVERNMENT PRINTING OFFICE: 1977—703-020:1388