MIL-E-1/496C
30 October 1969
SUPERSEDING
MIL-E-1/496B
9 September 1965

MILITARY SPECIFICATION SHEET

ELECTRON TUBE, KLYSTRON

TYPE 2K28

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

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

DESCRIPTION: Reflex, external cavity, frequency range 3,315 to 3,680 MHz

ABSOLUTE RATINGS:

Parameter:	Ef	Ec1	Ec2	Ec3	Er	Ik	Alt
Unit:	V	Vdc	Vdc	Vdc	Vdc	mAdc	ft
Maximum:	6.6	325	325	325	-300	45	10,000
Minimum:	6.0	---	---	---	-50	---	---

PHYSICAL CHARACTERISTICS:

Dimensions: See figure 1
Cathode: Unipotential

TEST CONDITIONS:

Parameter:	Ef	Ec1	Ec2	Ec3	Er	Ik
Unit:	V	Vdc	Vdc	Vdc	Vdc	mAdc
	6.3	300	300	300	Adjust	(see note 1)

GENERAL:

Qualification - Required

© denotes changes

METHOD	REQUIREMENT OR TEST	CONDITIONS	SYMBOL	LIMITS MIN	LIMITS MAX	UNIT
	Quality conformance inspection, part 1					
1256	Electrode current (cathode)		Ik	---	40	mAdc
4213	Reflector voltage	F = 3,315 to 3,680 MHz (see note 1)	Er	See figure 2		Vdc
4229	Total reflector current	See note 1	Ir	---	5.0	μAdc
4223	Mechanical tuning		F	3,315	3,680	MHz
4250	Power output		Po	80	---	mW
4214	Cathode emission	Ef = 5.7 V	ΔIk	---	15	%
4231	Hysteresis		---	---	10	%
	Quality conformance inspection, part 2					
1301	Heater current	Ef = 6.3 V	If	600	720	mA
1336	Heater-cathode leakage		Ihk	0	75	μAdc
4280	Electronic tuning range	Er/Po = 50% (see note 3)	ΔF	20	---	MHz
	Quality conformance inspection, part 3					
---	Life-test provisions	Group C	t	500	---	hrs
---	Life-test end point					
4250	Power output		Po	50	---	mW
(C)	Periodic-check tests					
1031	Low-frequency vibration	10 G; Er = -50 to -300 Vdc	ΔF	---	100	kHz
4004	Temperature coefficient	20°C range; t = 20 minutes max (see note 2)	ΔF/°C	---	3	MHz/20°C

NOTES:

1. The tube shall be mounted in a cavity as per Drawing 222-JAN. Er is adjusted for maximum power output into a 50-ohm load with VSWR less than 1.2:1 in the range between -140 and -300 Vdc.
2. Temperature coefficient shall be measured over any 20° C range between 25° and 80° C with the tube mounted in a cavity as shown on figure 3, or equivalent. Temperature shall be monitored by means of a thermocouple directly connected to the inner surface of the cavity.
3. The tube shall be mounted in a cavity as per Drawing 223-Jan. Electronic tuning shall be measured in the N = 3-3/4 mode (3-3/4 cycles for complete transit) with the reflector potential at approximately -75 Vdc.

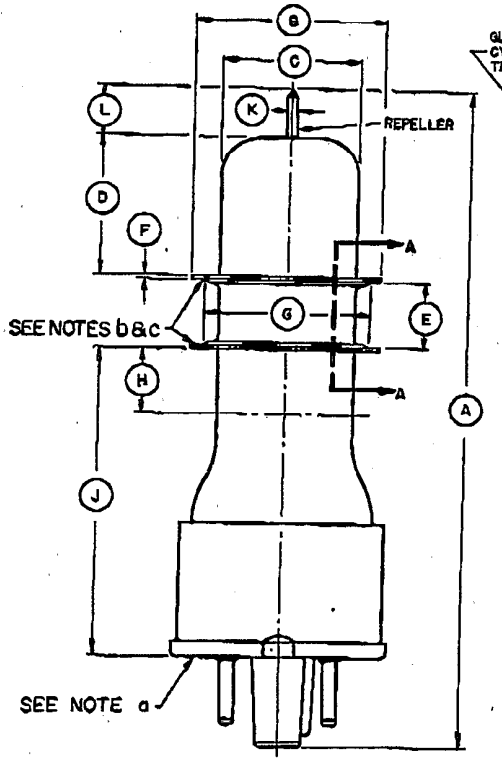
Custodians:
Army - EL
Navy - EC
Air Force - 85

Review activities:
Army - EL
Navy -
Air Force - 11, 85
DSA - ES

User activities:
Army - WC, ME
Navy - AS, OS, MC, CG, SH
Air Force - 19

Preparing activity:
Navy - EC

(Project 5960-2412)



Pin connections	
Pin No.	Element
2	h
3	k
6	g1
7	h
Lower disk	g2
Upper disk	g3
Cap	r

Ltr	Dimensions in inches with metric equivalents (mm) in parentheses	
	Minimum	Maximum
Quality conformance inspection, part 1		
B	1.115 (28.32)	1.135 (28.83)
E	.402 (10.21)	.408 (10.36)
G		1.005 (25.53)
M		.188 (4.78)
N	.250 (6.35)	
P	.201 (5.11)	.204 (5.18)
Quality conformance inspection, part 2		
A		4.15 (105.41)
C	.781 (19.84)	.843 (21.41)
D	.797 (20.24)	.891 (22.63)
H	.250 (6.35)	
J	1.531 (38.89)	1.781 (45.24)
Quality conformance inspection, part 3 (periodic check)		
K	.055 (1.40)	.062 (1.57)
L	.313 (7.95)	
Nominal dimensions		
F	.010 (.25)	

NOTES:
a. Base: B4-165.
b. Disks shall be concentric with each other within .094.
c. Disks shall be smooth, free from tears, and shall be gold plated 20 MSI or 10 MSI nickel plus 10 MSI silver.

FIGURE 1. Outline drawing of electron tube type 2K28.

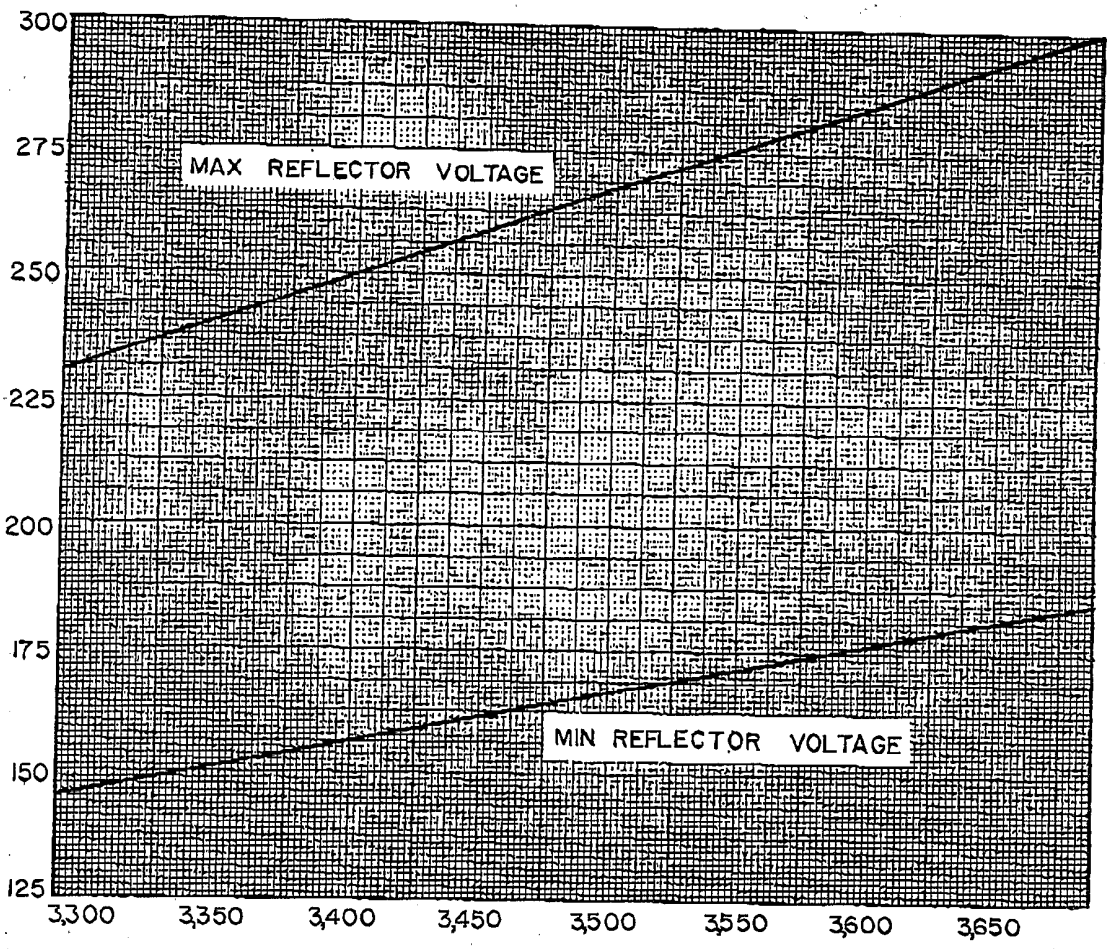
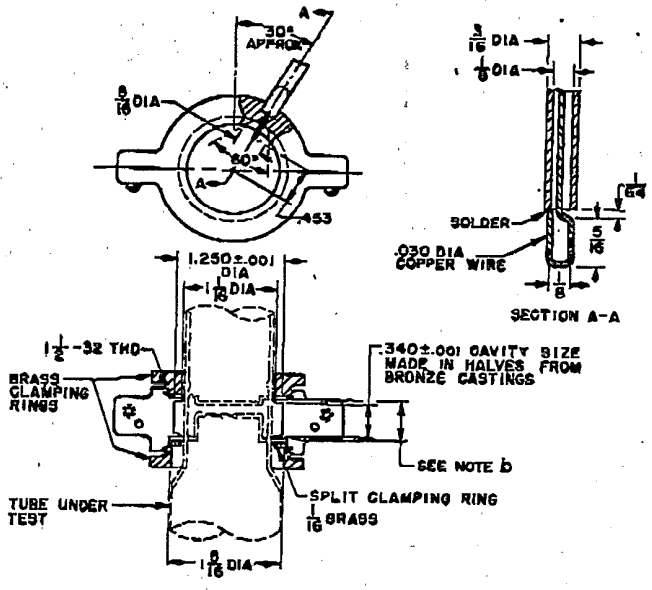


FIGURE 2. Reflector voltage.



NOTES:

a. Dimensions are in inches.
b. This dimension, which corresponds to dimension E on figure 1, shall be .401 maximum and .396 minimum.
c. Cavity and loop to be silver plated 50 MSI per Specification QQ-S-365; other parts NICI chrome flashed.
d. Tolerance is ±.005 on decimals and ±1/64 on fractions unless otherwise specified.

FIGURE 3. Cavity.

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