MINISTRY OF SUPPLY (S.R.D.E.)

VALVE ELECTRONIC **CV2240**

Specification M.O.S./CV2240 incorporating MIL-E-1/34B Issue: 1 22.7.55. To be read in conjunction with K1006	SECURITY Specification: Unclassified	Valve: Unclassified

TYPE OF VALVE: R.F. Beam Power Amplifier, transmitting

CATHODE: Directly heated

ENVELOPE: Glass unmetallised

PROTOTYPE: 3B4

MARKING

See K1001/4
add 3B4

RATING

			Note
Filament Voltage (Parallel)	(V)	1.25	
Filament Voltage (Series)	(V)	2.5	
Filament Current (Parallel)	(mA)	330	
Filament Current (Series)	(mA)	165	
Max. Anode Voltage (I_a = 0	(V)	150	A
Max. Screen Voltage (I_{g2} = 0)	(V)	135	A
Anode Current	(mA)	25	A
Screen Current	(mA)	1.5	A
Max. Anode Dissipation	(W)	3	A
Max. Screen Dissipation	(W)	1.1	A
Mutual Conductance	(mA/V)	1.85	B
Max. Operating Frequency	(Mc/s)	100	

BASE

BS448/B7G
(Miniature button 7 pin)

Connections

Pin	Electrode
1	g2
2	fct, g3, Int.sd.
3	g1
4	-f
5	+f
6	fct, g3, Int.sd.
7	p.
Note	See Note D

Dimensions (inches)

See BS448/B7G/2.1
Size ref. 2

CAPACITANCES (pF)

C_{g1p} (Max.)	0.16	C	
$C_{in.}$ (nom)	4.5	C	
$C_{out.}$ (nom)	7.5	C	

Dimensions	Min.	Max.
seated height	-	1 7/8
diameter	5/8	3/4
overall length	-	2 5/32

Mounting Position
Any

NOTES

A. Absolute maximum or minimum values.

B. Measured at Va = 200 Vg2 = 150 Vg1 = -25

C. Measured WITH metal screen

D. For parallel filament connection pins 2 and 6 are negative and pins 4 and 5 are positive.

Z.10018.R.

CV2240

TESTS

Additional to or modifying those specified in the attached MIL-E-1/34B specification.

Ref.	Test	Conditions	AQL%	Insp. Level or Code	Sym.	Limits Min.	Limits Max.	Units
	Operation Peak Output voltage.	Ebb = 150 Vdc; Ec_1 = 0; Ec_2 = 135 Vdc; RL = 1000: Eg_1 = 50 Vac; Rg_1 = 55000; NOTE 3.	0.65	II	ep:	95	-	V
	Operation Screen Grid Current	Ebb = 150 Vdc; Ec_1 = 0; Ec_2 = 135 Vdc; RL = 1000; Eg_1 = 50 Vac; Rg_1 = 55000; NOTE 3	0.65	II	Ic_2	5.5	14	mAdc
4.10.2.2.	Class C Amplifier	F = 100 Mc; Eb = Ec_2 = 90 Vdc; Rg_1 = 45,000; NOTE 5.	6.5	1A	Po	0.35	-	W
4.11.4.	Intermittent Life test end points	Activity	-	-	ΔEp	-	15	%
		Operation Screen Grid Current	-	-	Ic_2	-	20	mAdc
		Operation Peak output voltage	-	-	ep.	85	-	V

CV 2240

MIL-E-1/34B
17 December 1954
Superseding
MIL-E-1/34A
20 May 1953

INDIVIDUAL MILITARY SPECIFICATION SHEET

ELECTRON TUBE, RECEIVING, BEAM POWER AMPLIFIER

JAN-3B4

This specification sheet forms a part of the latest issue of Military Specification MIL-E-1.

Description: Filamentary RF Beam Power Amplifier

Ratings:	Ef	Eb	Ec1	Ec2	Ib	Ic1	Pp	Pg2	Alt	Fl
Absolute	V	Vdc	Vdc	Vdc	mAdc	mAdc	W	W	ft	Mc
Maximum:	1.438 Par. 2.875 Ser.	150	—	135	25	1.5	3	1.1	10,000	100
Minimum:	1.062 Par. 2.125 Ser.	—	-75	—	—	—	—	—	—	---
Test Cond.:	2.5 Vac	200	-25	150	—	—	—	—	—	---

Cathode: Oxide Coated Filament
Base: Miniature Button 7-Pin, E7-1

Diameter: 3/4 in. max.
Height: 2-1/8 in. max.

Pin No.:	1	2	3	4	5	6	7
Element:	g2	fct * g3 int.sd.	g1	-i	+f	fct g3 int.sd.	p
Note 1							

Envelope: T-5-1/2

The following tests shall be performed:
For miscellaneous requirements, see Paragraph 3.3, Inspection Instructions for Electron Tubes.

Ref.	Test	Conditions	AQL(%)	Insp. Level or Code	Sym.	LIMITS Min.				Max.		Units
	Qualification Approval Tests											
3.1	Qualification Approval:	Required for JAN Marking	—	—								
—	Cathode:	Oxide Coated Filament	—	—								
3.4.3	Base Connections:		—	—								
	Measurements Acceptance Test Part 1, Note 2											
4.10.6.1	†Grid Current:	t=120	0.65	II	Ic1:	0	—	—	—	-1.5	—	uAdc
4.10.4.1	Plate Current:		0.65	II	Ib:	13	—	—	—	26	—	mAdc
4.10.4.3	Screen Grid Current:		0.65	II	Ic2:	—	—	—	—	2	—	mAdc
—	Operation Peak Output Voltage:	Ebb=150Vdc; Ec1=0; Ec2=135Vdc; RL=1000; Eg1=50Vac; Rg1=55,000; Note 3	0.65	II	ep:	100	—	—	—	—	—	v
—	Operation Screen Grid Current:	Ebb=150Vdc; Ec1=0; Ec2=135Vdc; RL=1000; Eg1=50Vac; Rg1=55,000; Note 3	0.65	II	Ic2:	5.5	—	—	—	11	—	mAdc
—	Activity:	Ef=2.125Vac; Note 4	0.65	II	ΔEp:	—	—	—	—	7.5	—	%
4.9.1	Mechanical:	Envelope: (6-2)	—	—		—	—	—	—	—	—	
	Measurements Acceptance Tests Part 2											
4.10.8	Filament Current:	Ef=2.5V	6.5	1A	If:	150	—	—	—	180	—	mA
4.10.9	Transconductance:		6.5	1A	Sm:	1400	—	—	—	2300	—	umhos
4.10.11.1	Triode Amplification Factor:	Eb=150Vdc; Tie screen to plate	6.5	1A	Mu:	2.7	—	—	—	4.7	—	
4.10.2.2	Class C Amplifier:	F=100Mc; Eb=Ec2=90Vdc; Rg1=45,000; Note 5	6.5	1A	Po:	0.5	—	—	—	—	—	W
4.10.6.6	Primary Screen Grid Emission:	Eb=0; Ec2=127Vac; Ec1/Pg2=1W; t=300; Note 6	6.5	1A	—	—	—	—	—	400	—	uAdc

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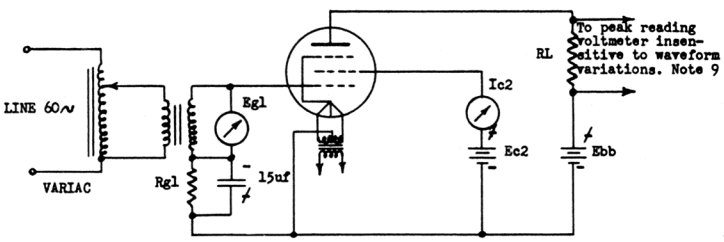
Ref.	Test	Conditions	AQL(%)	Insp. Level or Code	Sym.	LIMITS Min.				Max.		Units
	Measurements Acceptance Test Part 2(Contd)											
4.10.14	Capacitance:	Shield No. 316			Cglp:	—	—	—	—	0.16	—	uuf
		Shield No. 316	6.5	1A	Cin:	3.5	—	—	—	5.5	—	uuf
		Shield No. 316			Cout:	6.0	—	—	—	9.0	—	uuf
4.9.19.1	Vibration:	Ef=2.5Vdc;Ec1=-30Vdc; Rp=2000	6.5	1A	Ep:	—	—	—	—	500	—	mVac

Ref.	Test	Conditions	AQL(%)	Insp. Level or Code	Allowable Defectives per Characteristic 1st Sample	Allowable Defectives per Characteristic Combined Samples	Sym.	LIMITS Min.	LIMITS Max.	Units
	Acceptance Life Tests									
4.11.5	Intermittent Life Test:	Group B;Operation; Ebb=135Vdc;Ec2=90Vdc; RL=1100;Ef=1.25Vac; Eg1=43Vac;Ec1=-30Vdc; Notes 7,8	—	—	—	—	t:	350	—	hrs
4.11.4	Intermittent Life Test End Points:	Activity	—	—	—	—	ΔEp:	—	15	%
		Operation Screen	—	—	—	—	Ic2:	—	15	mAdc
		Grid Current Operation Peak Output Voltage	—	—	—	—	ep:	85	—	v
	Packaging Information									
4.9.18.1.1	Carton Drop:	(d) Package Group 1; Carton Size B								

Note 1: For parallel filament connection pins 2 and 6 are negative and pins 4 and 5 are positive.

Note 2: The AQL for the combined defectives for attributes in Measurements Acceptance Tests, Part 1, excluding Mechanical shall be one (1) percent. A tube having one (1) or more defects shall be counted as one (1) defective. MIL-STD-105, Inspection Level II shall apply.

Note 3: Operation at power line frequency as per circuit.



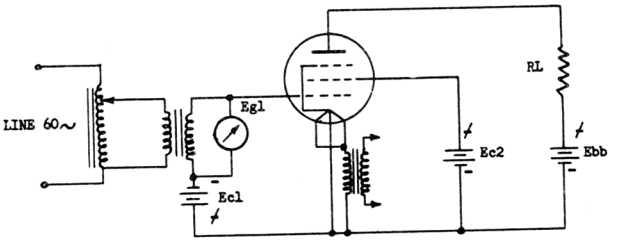
Power supplies and grid driving source to have negligible impedance at operating frequency.

Note 4: Reduce filament potential of operation test and read percentage decrease in operation peak output voltage.

Note 5: Use separately excited oscillator. Hold excitation at 35 volts peak. Load for maximum Po at Ib=15mAdc. Limit is for useful power output in load.

Note 6: Pg2 is equal to 2.48 times the product of the rectified screen current and the rectified screen voltage.

Note 7: Life Test at power line frequency as per circuit:



Power supplies and grid driving source to have negligible impedance at operating frequency.

Note 8: The filament voltage and grid driving voltage may be 90° out of phase. The filament and grid driving voltage should be interrupted simultaneously. The life cycling schedule is 1-3/4 hours ON and 1/4 hour OFF.

Note 9: The peak reading voltmeter should have a minimum input impedance of 2 megohms.

Note 10: Reference specification shall be of the issue in effect on the date of invitation for bid.