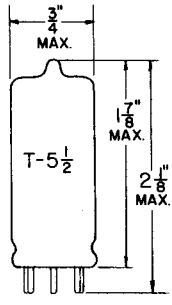
TUNG-SOL

DIODE PENTODE

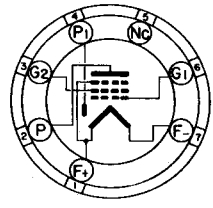
MINIATURE TYPE



GLASS BULB

HEATER

ANY MOUNTING POSITION



BOTTOM VIEW

MINIATURE BUTTON
7 PIN BASE

6BW

THE 1U5WA IS A FILAMENT TYPE, SHARP CUT-OFF, DIODE PENTODE IN THE 7 PIN MINIATURE CONSTRUCTION. ITS PRINCIPAL APPLICATION IS AS A DIODE DETECTOR, AVC RECTIFIER, AUDIO FREQUENCY AMPLIFIER IN PORTABLE RECEIVERS. THE 1U5WA IS PARTICULARLY USEFUL IN DETECTOR AMPLIFIER CIRCUITS WHERE ITS LOW MICROPHONIC NOISE AND VIBRATION OUTPUT ARE ESSENTIAL FOR SPECIALIZED MILITARY ELECTRONIC EQUIPMENT.

RATINGS

MECHANICAL

MAXIMUM IMPACT ACCELERATION (SHOCK TEST – NOTE 2)	450	G
MAXIMUM VIBRATIONAL ACCELERATION(96 HR. FATIGUE TEST–NOTE 3)	2.5	G

RATINGS

AND NORMAL OPERATION

	MIL-E-1 SYMBOL	DES. MIN.	NORM. TEST CONDITIONS NOTE 5	NORM. OPERATION NOTE 4	DES. MAX.	MIL-E-1 UNITS
HEATER VOLTAGE (NOTE 6)	Ef:	1.00	1.25	1.25	1.50	Vdc
PLATE VOLTAGE (NOTE 7)	Eb:	---	67.5	67.5	100	Vdc
GRID VOLTAGE	Ec1:	---	0	0	0	Vdc
GRID VOLTAGE #2 (NOTE 7)	Ec2:	---	67.5	67.5	100	Vdc
PLATE DISSIPATION	Pp:	---	---	---	0.13	WATTS
GRID #2 DISSIPATION	Pg2:	---	---	---	0.035	WATTS
GRID RESISTANCE	Rg(1):	---	---	---	2.0	MEG.
TRANSCONDUCTANCE	Sm:	---	---	650	---	μMHOS
PLATE CURRENT	Ib1:	---	---	1.6	---	mAdc
CATHODE CURRENT	Ik:	---	---	---	5.0	mAdc
DIODE CURRENT	Iib:	---	---	---	250	μAdc

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CHARACTERISTICS AND QUALITY CONTROL[1]

TEST	AQL %	MIL-E-1 SYMBOL	MIN.	LAL	BOG	UAL	MAX	ALD	MIL-E-1 UNITS
MEASUREMENTS ACCEPTANCE TESTS PART 1			COMBINED AQL=1.0% EXCLUDING MECH. AND INOPERATIVES.						
GRID CURRENT (1): Eb=Ec2=90Vdc; Ec1=-2.5 Vdc	0.65	Ic1:	0	---	---	---	-0.5	---	μAdc
PLATE CURRENT (1):	0.65	Ib1:	1.05	---	---	---	2.15	---	mAdc
SCREEN GRID CURRENT:	0.65	Ic(2):	0.24	---	---	---	0.56	---	mAdc
TRANSCONDUCTANCE (1): Ef=1.0 Vdc	0.65	Sm(1):	380	---	---	---	775	---	μMHOS
AC AMPLIFICATION: Ebb=Ecc2=45 Vdc; Rg2=2.0 MEG; Rg1= 10 MEG.; Rp=0.5MEG.; Esig=0.2 Vac;0.1μf BETWEEN G2 &-F	0.65	Ep:	6.5	---	---	---	---	---	Vac
EMISSION (DIODE) Eib=10 Vdc	0.65	Lis:	0.5	---	---	---	---	---	mAdc
NOISE AND MICROPHONICS: Ebb=Ecc2=135 Vdc; Ecal=10.0 mVac; Rp= 1.0 MEG.; Cg2=0.1 μf; Ec1=0; Rp OF DIODE = 2 MEG. TO GROUND. COUPLE PLATE OF DIODE TO G1 THROUGH A 0.1μf CAPACITOR; Rg1=1.5 MEG.; R_{g2}=0.1μf (NOTE 9, 10)	0.65	---	---	---	---	---	---	---	---
CONTINUITY AND SHORTS: (INOPERATIVES)	0.4	---	---	---	---	---	---	---	---
MECHANICAL: ENVELOPE OUTLINE (6-2)	---	---	---	---	---	---	---	---	---
MEASUREMENTS ACCEPTANCE TESTS, PART 2									
INSULATION OF ELECTRODES: g1-all=-100 Vdc	4.0	Rg-all:	100	---	---	---	---	---	MEG.
p-all=-100 Vdc		Rp-all:	100	---	---	---	---	---	MEG.
TRANSCONDUCTANCE (2):	6.5	Sm:	525	---	---	---	775	---	μMHOS
FILAMENT CURRENT:	6.5	If:	44	---	---	---	56	---	mA
VIBRATION (1): Rp=10,000 OHMS; F= 40 cps; G=15	6.5	Ep(1):	---	---	---	---	10	---	mVac
VIBRATION (2): F=50 cps-3500 cps; Rp=10,000 OHMS (NOTE 8)	6.5	Ep(2):	---	---	---	---	25	---	mVac

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CHARACTERISTICS AND QUALITY CONTROL TESTS[1] - cont'd.

TEST	AQL %	MIL-E-1 SYMBOL	MIN	LAL	BOG	UAL	MAX	ALD	MIL-E-1 UNITS
DEGRADATION RATE ACCEPTANCE TESTS	COMBINED AQL =1.0% EXCLUDING MECH. AND INOPERATIVES								
SHOCK: HAMMER ANGLE=30° (NOTE 2)	---	---	---	---	---	---	---	---	---
FATIGUE: G=2.5; F=25cps MIN., 60 cps MAX., FIXED FREQUENCY (NOTE 3)	6.5	---	---	---	---	---	---	---	---
POST SHOCK AND FATIGUE TEST END POINTS:									
TRANSCONDUCTANCE (2):	---	Sm:	450	---	---	---	---	---	μMHOS
VIBRATION (1):	---	Ep:	---	---	---	---	15	---	mVac
DIODE EMISSION	---	Iis:	0.2	---	---	---	---	---	mAdc
MINIATURE TUBE BASE STRAIN:	---	---	---	---	---	---	---	---	---
GLASS STRAIN (THERMAL SHOCK):	2.5	---	---	---	---	---	---	---	---

TEST	ALLOW. DEF. PER CHARAC. 1st SAMP.	COMB. SAMP.	AQL %	MIL-E-1 SYMBOL	MIN	MAX.	MIL-E-1 UNITS
ACCEPTANCE LIFE TESTS							
INTERMITTENT LIFE TEST: Ef=1.25 Vdc OR Vac WITH EQUIVALENT BIAS, GROUP A	---	---	---	t:	500	---	HOURS
INTERMITTENT LIFE TEST END POINTS:							
TRANSCONDUCTANCE (2)	---	---	---	Sm(2):	450	---	μMHOS
OR AC AMPLIFICATION	---	---	---	Ep:	5.0	---	Vac
EMISSION (DIODE)	---	---	---	Iis:	0.2	---	mAdc

NOTES

1. CHARACTERISTICS, QUALITY CONTROL PROCEDURES, AND INSPECTION LEVELS ARE MADE ACCORDING TO THE APPROPRIATE PARAGRAPH OF MIL-E-1, AND MIL-STD-105A.
2. TEST CONDITIONS AND ACCEPTANCE CRITERIA PER SHOCK TEST PROCEDURES OF MIL-E-1 BASIC SPECIFICATIONS.
3. TEST CONDITIONS AND ACCEPTANCE CRITERIA PER FATIGUE TEST PROCEDURES OF MIL-E-1 BASIC SPECIFICATIONS.
4. THESE NORMAL VALUES REPRESENT CONDITIONS AT WHICH CONTROL OF RELIABILITY MAY BE EXPECTED.

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NOTES

CONT'D.

5. THESE NORMAL TEST CONDITIONS ARE USED FOR ALL CHARACTERISTICS UNLESS OTHERWISE STATED UNDER THE INDIVIDUAL TEST ITEM.

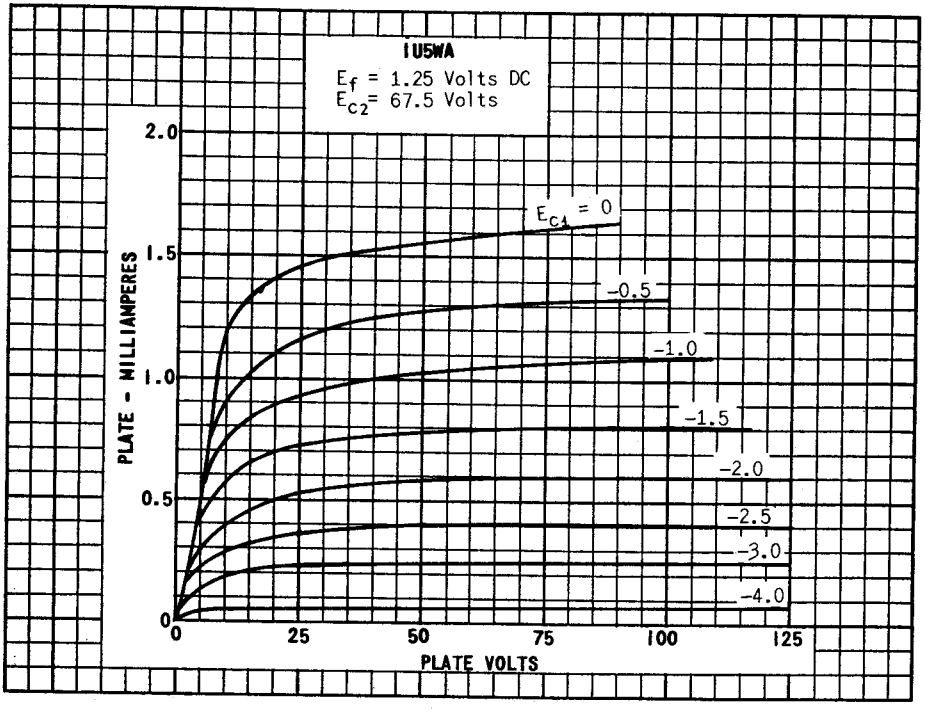
6. FOR MOST APPLICATIONS THE PERFORMANCE WILL NOT BE ADVERSELY AFFECTED BY ±10% HEATER VOLTAGE VARIATION, BUT WHEN THE APPLICATION CAN PROVIDE A CLOSER CONTROL OF HEATER VOLTAGE, AN IMPROVEMENT IN RELIABILITY WILL BE REALIZED.

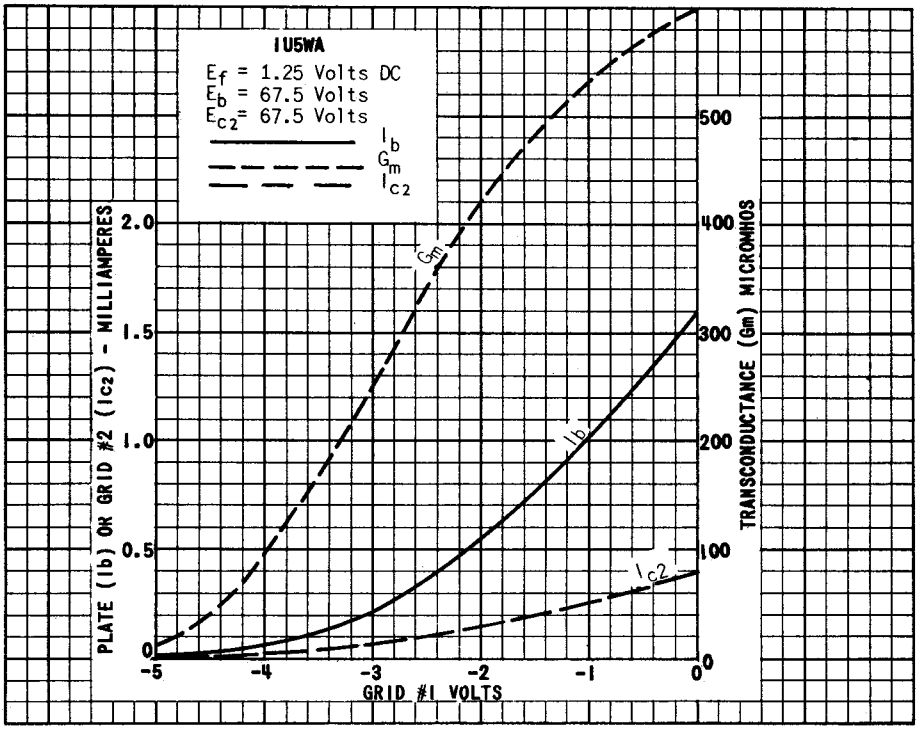
7. PLATE AND SCREEN VOLTAGES SHOULD NOT EXCEED THESE VALUES UNDER ANY CIRCUMSTANCES.

8. THE TUBE UNDER TEST SHALL BE RIGIDLY MOUNTED ON A VIBRATION TABLE VIBRATING WITH SIMPLE HARMONIC MOTION. THE TEST CONDITIONS OF PARAGRAPH 4.9.19.1 OF MIL-E-1 SHALL BE APPLIED AND E_p MONITORED WHILE THE FREQUENCY OF VIBRATION IS CONTINUOUSLY SWEPT FROM 50-3500 CPS AND THE PEAK ACCELERATION CONTROLLED CONSTANT AT 2G. A LOW PASS FILTER WHICH FOLLOWS THE LOAD RESISTOR OF THE TUBE UNDER TEST SHALL HAVE A CUT-OFF FREQUENCY OF 3500 CPS. THE TOTAL TIME OF SWEEP SHALL NOT BE LESS THAN ONE (1) MINUTE.

9. TUBES SHALL BE SO SHIELDED THAT OPERATOR PROXIMITY OR MOVEMENT WILL NOT AFFECT OUTPUT READINGS.

10. THE REJECTION LEVEL SHALL BE SET AT THE VU METER READING OBTAINED DURING CALIBRATION.




1U5WA
E_f = 1.25 Volts DC
E_b = 67.5 Volts
E_{c2} = 67.5 Volts
I_b
G_m
I_{c2}
PLATE (I_b) OR GRID #2 (I_{c2}) - MILLIAMPERES
TRANSCONDUCTANCE (Gm) MICROMHOS
GRID #1 VOLTS
0
0.5
1.0
1.5
2.0
100
200
300
400
500
-5
-4
-3
-2
-1
0