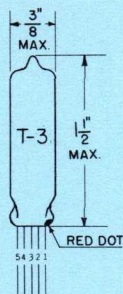
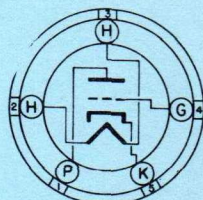


TUNG-SOL

TRIODE
SUBMINIATURE TYPE

HEATER

ANY MOUNTING POSITION



BOTTOM VIEW

0.016" TINNED
FLEXIBLE LEADS

0.048" CENTER-TO-CENTER

GLASS BULB

DOT IS ADJACENT
TO LEAD 1

THE 5744WB IS A HEATER-CATHODE TYPE HIGH-MU TRIODE OF SUBMINIATURE CONSTRUCTION CAPABLE OF OPERATION AS A FREQUENCY CONVERTER OR OSCILLATOR IN THE UHF REGION. IT IS ALSO USEFUL IN GENERAL PURPOSE AUDIO FREQUENCY VOLTAGE AMPLIFIER SERVICE. IT IS DESIGNED FOR SERVICE WHERE SEVERE CONDITIONS OF HIGH TEMPERATURE AND MECHANICAL SHOCK OR VIBRATION ARE ENCOUNTERED. THE FLEXIBLE TERMINAL LEADS MAY BE SOLDERED OR WELDED DIRECTLY TO THE TERMINALS OF CIRCUIT COMPONENTS WITHOUT THE USE OF SOCKETS. STANDARD INLINE SUBMINIATURE SOCKETS MAY BE USED BY CUTTING THE LEADS TO A SUITABLE LENGTH.

RATINGS

MECHANICAL

MAXIMUM IMPACT ACCELERATION (SHOCK TEST-NOTE 3)	450	G
MAXIMUM UNIFORM ACCELERATION (CENTRIFUGE TEST-NOTE 4)	1000	G
MAXIMUM VIBRATIONAL ACCELERATION (96 HR. FATIGUE-NOTE 5)	2.5	G
MAXIMUM BULB TEMPERATURE	220	°C

RATINGS AND NORMAL OPERATION

	MIL-E-1 SYMBOL	DES. MIN.	NORMAL TEST CONDI- TIONS NOTE 7	NORMAL OPER- ATION NOTE 6	DES. MAX.	MIL-E-1 UNITS
HEATER VOLTAGE (NOTE 8)	Ef:	5.7	6.3	6.3	6.9	VOLTS
PLATE VOLTAGE	Eb:	---	250	250	275	vdc
GRID #1 VOLTAGE	Ec1:	-55	0	0	---	vdc
PLATE DISSIPATION	Pp:	---	---	1.1	1.3	W
HEATER-CATHODE VOLTAGE	Ehk:	-200	---	100	+200	VOLTS
PLATE CURRENT	Ib:	---	---	4.2	6.5	mA _{dc}
CATHODE RESISTANCE	Rk:	---	500	500	---	OHMS
GRID CIRCUIT RESISTANCE	Rg:	---	---	---	1.2	MEGΩHMS
GRID CURRENT	Ic:	---	---	---	1.0	mA _{dc}
TRANSCONDUCTANCE (1):	Sm(1):	---	---	4000	---	μMHOS
AMPLIFICATION FACTOR	Mu:	---	---	70	---	---

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CHARACTERISTICS AND QUALITY CONTROL TESTS¹

TEST	AQL %	MIL- E-1 SYM- BOL	MIN.	LAL	BOG.	UAL.	MAX.	ALD.	MIL-E-1 UNITS
MEASUREMENTS ACCEPTANCE TESTS PART 1									
COMBINED AQL = 1.0% EXCLUDING MECHANICAL AND INOPERATIVES									
HEATER CURRENT:	0.65	If:	190	---	200	---	210	---	mA
HEATER-CATHODE									
LEAKAGE: E _{hk} = -100Vdc;									
E _{hk} = +100 Vdc	0.65	I _{hk} :	---	---	---	---	5	---	μAdc
GRID CURRENT	0.65	I _c (1):	---	---	---	---	-0.3	---	μAdc
PLATE CURRENT (1):	0.65	I _b (1):	3.2	3.7	4.2	4.7	5.2	1.2	mA
PLATE CURRENT (2):									
E _{c1} = -6.5 vdc	0.65	I _b (2):	---	---	---	---	50	---	μAdc
TRANSCONDUCTANCE (1):	0.65	S _m (1):	3400	3700	4000	4300	4600	660	μMHOS
AC AMPLIFICATION:									
E _{sig} = 0.2 Vac;									
E _{bb} = 100 Vdc; E _{cc} = 0;									
R _{g1} = 10 MEG; R _k = 0;									
R _p = 0.5 MEG.	0.65	E _p :	6.5	---	---	---	---	---	Vac
CONTINUITY AND SHORTS									
(INOPERATIVES:)	0.4	---	---	---	---	---	---	---	---
MECHANICAL:									
ENVELOPE (8-7)	---	---	---	---	---	---	---	---	---
MEASUREMENTS ACCEPTANCE TESTS PART 2									
INSULATION OF									
ELECTRODES: E _f = 6.3V.									
E _g -all = -100 Vdc	2.5	R _{g1} - all:	100	---	---	---	---	---	MEG.
E _p -all = -300 Vdc	2.5	R _p - all:	100	---	---	---	---	---	MEG.
PLATE CURRENT (3)									
E _{c1} = -4.0 Vdc	2.5	I _b (3):	5	---	---	---	---	---	μAdc
TRANSCONDUCTANCE (2):									
E _f = 5.7 V.	2.5	ΔE _f S _m (2):	---	---	---	---	5	---	PERCENT
GRID EMISSION:									
E _f = 7.5V; R _g = 1.0MEG.									
PREHEAT 5 MINUTES AT									
E _{c1} = 0; TEST AT E _{c1} = -									
10 Vdc	2.5	I _c (2):	---	---	---	---	-0.4	---	μAdc
AF NOISE:									
E _{sig} = 50 mVac; R _g =									
1.0 MEG; R _p = 0.2MEG.	2.5	EB:	---	---	---	---	17	---	VU
AMPLIFICATION FACTOR	6.5	Mu:	60	65	70	75	80	7	---
CAPACITANCE:		C _{gp} :	0.65	---	0.8	---	0.95	---	μuf
CAPACITANCE:(NOTE 2)	6.5	C _{in} :	2.0	---	2.7	---	3.4	---	μuf
CAPACITANCE:		C _{out} :	1.6	---	2.3	---	3.0	---	μuf
LOW PRESSURE									
VOLTAGE BREAKDOWN:									
PRESSURE = 55±5 mm Hg:									
VOLTAGE = 300 Vac	6.5	---	---	---	---	---	---	---	---

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CHARACTERISTICS AND QUALITY CONTROL TESTS - cont'd.

TEST	AQL %	MIL-E-1 MIN SYMBOL	LAL	BOGIE	UAL	MAX	ALD	MIL-E-1 UNITS
------	----------	-----------------------	-----	-------	-----	-----	-----	------------------

MEASUREMENTS ACCEPTANCE
TESTS PART 2 - cont'd.

COMBINED AQL = 1.0% EXCLUDING MECHANICAL AND INOPERATIVES

OPERATION TIME (NOTE 10)	4.0	t:	---	---	---	20	---	SEC.
VIBRATION (2): F = 40 cps; G = 15; R _p = 10,000 OHMS	2.5	Ep:	---	---	---	15	---	mVac.
VIBRATION (3): R _p = 10,000 OHMS; F = 30 - 1000 cps; G = 15; POSITION X ₁ AND X ₂ ONLY.	4.0	ep:	---	---	---	75 PEAK TO PEAK	---	mv

DEGRADATION RATE
ACCEPTANCE TESTS

SUBMINIATURE LEAD FATIGUE:	2.5	---	4.0	---	---	---	---	qics
SHOCK (1): HAMMER ANGLE = 30°; Ehk = +100 vdc; R _{g1} = 0.1 MEG.;	20	---	---	---	---	---	---	---
(NOTE 3) FATIGUE (1): 96 HOURS; G = 2.5; FIXED FREQUENCY; F = 25 MIN. 60 MAX.	6.5	---	---	---	---	---	---	---
(NOTE 5) FATIGUE (2): 6 HOURS; G = 10; FIXED FREQUENCY; F = 25 MIN. 60 MAX.	6.5	---	---	---	---	---	---	---
(NOTE 11)								

ALLOWABLE DEFECTS PER CHARACTERISTIC	AQL %	MIL-E-1 SYMBOL	MIN	MAX	MIL-E-1 UNITS
1st COMBINED SAMPLE SAMPLES					

POST SHOCK (1) AND FATIGUE TESTS (1) AND (2) END POINTS; VIBRATION (2): F = 40 cps; G = 15; R _p = 10,000 OHMS	---	Ep:	---	25	mVac
HEATER-CATHODE LEAKAGE: Ehk = ± 100 vdc	---	lhk;	---	10	μAdc
CHANGE IN TRANSCONDUCTANCE (1) OF INDIVIDUAL TUBES; E _f = 6.3 VOLTS	---	Δ _t sm(1):	---	10	PERCENT
GRID CURRENT (1):	---	lc:	---	-1.0	μAdc

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CHARACTERISTICS AND QUALITY CONTROL TESTS¹ - cont'd.

TEST	ALLOWABLE DEFECTS PER CHARACTERISTIC	AQL %	MIL-E-1 SYMBOL	MIN.	MAX.	MIL-E-1 UNITS
DEGRADATION RATE ACCEPTANCE TESTS	1st SAMPLE	COMBINED SAMPLES				
- cont'd.						
SHOCK (3):						
75G; (HAMMER ANGLE=						
120°+RUBBER PAD); t=						
10 MILLISEC. (NOTE 12)						
Ehk =+100 Vdc; Rg1=						
0.1 MEG.						
		20	---	---	---	----
POST SHOCK TEST (2)						
END POINTS:						
VIBRATION (2):						
F=40 cps; G=15;						
Rp = 10,000 OHMS						
		---	Ep:	---	25	mVac
HEATER-CATHODE						
LEAKAGE:						
Ehk=±100 Vdc						
		---	lhk:	---	10	μAdc
CHANGE IN TRANSCON-						
DUCTANCE (1) OF IN-						
DIVIDUAL TUBES::						
Ef =6.3 VOLTS						
		---	Δ _t Sm(1):	---	10	PERCENT
GRID CURRENT						
		---	lc:	---	-1.0	μAdc
GLASS STRAIN						
{THERMAL SHOCK}						
ACCEPTANCE LIFE						
TESTS						
HEATER CYCLING						
LIFE TEST:						
Ef = 7.5 V; Eb =						
Ecd =0V; Ehk =140 Vdc;						
1 MIN. ON, 1 MIN. OFF						
		1.0	---	2000	---	CYCLES
HEATER CYCLING LIFE						
TEST END POINTS;						
HEATER-CATHODE LEAKAGE:						
Ehk =±100 Vdc						
		---	lhk:	---	20	μAdc
1 HOUR STABILITY LIFE TEST:						
TA = ROOM; Ehk=+200 Vdc;						
Rg1 = 1.0 MEG.						
		---	---	---	---	----
1 HOUR STABILITY LIFE TEST						
END POINTS:						
CHANGE IN TRANSCON -						
DUCTANCE (1) OF						
INDIVIDUAL TUBES:						
(TYPICAL SAMPLE SIZE =						
50 TUBES)						
		1.0	Δ _t Sm(1):	---	10	PERCENT
100 HOUR SURVIVAL RATE						
LIFE TEST:						
TA = ROOM; Ehk=+200 Vdc;						
Rg= 1.0 MEG.						
		---	---	---	---	----

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CHARACTERISTICS AND QUALITY CONTROL TESTS¹ - cont'd.

TEST	ALLOWABLE DEFECTS PER CHARACTERISTIC			AQL %	MIL-E-1 SYMBOL	MIN.	MAX.	MIL-E-1 UNITS
	1st SAMPLE	COMBINED SAMPLES						
ACCEPTANCE LIFE TEST - cont'd.								
100 HOUR SURVIVAL RATE								
LIFE TEST END POINTS:								
(TYPICAL SAMPLE SIZE								
= 200 TUBES)								
INOPERATIVES:								
TRANSCONDUCTANCE (1):								
INTERMITTENT HIGH TEM-								
PERATURE LIFE TEST:								
T _{BULB} = 220 °C; E _{hk}								
= +200 vdc; R _g = 1.0 MEG.								
500 HOUR INTERMITTENT								
HIGH TEMPERATURE LIFE								
TEST END POINTS:								
(TYPICAL SAMPLE SIZE								
= 20 TUBES 1st SAMPLE,								
40 TUBES 2nd SAMPLE)								
INOPERATIVES:								
GRID CURRENT (1):								
HEATER CURRENT:								
CHANGE IN TRANSCON-								
DUCTANCE (1) OF IN-								
DIVIDUAL TUBES:								
TRANSCONDUCTANCE (2):								
(NOTE 9)								
HEATER-CATHODE								
LEAKAGE:								
E _{hk} = ±100 vdc								
INSULATION OF								
ELECTRODES:								
g ₁ - a ₁₁								
p - a ₁₁								
TRANSCONDUCTANCE								
(1) AVERAGE CHANGE:								
TOTAL DEFECTIVES:								
1000 HOUR INTERMITTENT								
HIGH TEMPERATURE LIFE								
TEST END POINTS:								
(TYPICAL SAMPLE SIZE								
= 20 TUBES 1st SAMPLE,								
40 TUBES 2nd SAMPLE)								
INOPERATIVES:								
GRID CURRENT (1):								
HEATER CURRENT:								
CHANGE IN TRANSCON-								
DUCTANCE (1) OF IN-								
DIVIDUAL TUBES:								
HEATER-CATHODE								
LEAKAGE:								
E _{hk} = ±100 vdc								
TOTAL DEFECTIVES:								

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NOTES

- ¹CHARACTERISTICS, QUALITY CONTROL TEST PROCEDURES, AND INSPECTION LEVELS ARE MADE ACCORDING TO THE APPROPRIATE PARAGRAPHS OF MIL-E-1 "INSPECTION INSTRUCTIONS FOR ELECTRON TUBES," AND MIL-STD-105A.
- ²WITH A CYLINDRICAL SHIELD (0.405" I.D.-1 7/8" LONG) CONNECTED TO LEAD 5.
- ³TEST CONDITIONS AND ACCEPTANCE CRITERIA PER SHOCK TEST PROCEDURES OF MIL-E-1 BASIC SPECIFICATIONS.
- ⁴CENTRIFUGE TEST WITH FORCES APPLIED IN ANY DIRECTION.
- ⁵TEST CONDITIONS AND ACCEPTANCE CRITERIA PER FATIGUE TEST PROCEDURES OF MIL-E-1 BASIC SPECIFICATIONS.
- ⁶THESE NORMAL VALUES REPRESENT CONDITIONS AT WHICH CONTROL OF RELIABILITY MAY BE EXPECTED.
- ⁷THESE NORMAL TEST CONDITIONS ARE USED FOR ALL CHARACTERISTICS TESTS UNLESS OTHERWISE STATED UNDER THE INDIVIDUAL TEST ITEM.
- ⁸FOR MOST APPLICATIONS THE PERFORMANCE WILL NOT BE ADVERSELY AFFECTED BY $\pm 10\%$ HEATER VOLTAGE VARIATION, BUT WHEN THE APPLICATION CAN PROVIDE A CLOSER CONTROL OF HEATER VOLTAGE, AN IMPROVEMENT IN RELIABILITY WILL BE REALIZED.
- ⁹CHANGE OF TRANSCONDUCTANCE FOR INDIVIDUAL TUBES FROM THAT VALUE MEASURED AT $E_f = 6.3$ V TO THAT VALUE MEASURED AT $E_f = 5.7$ V.
- ¹⁰OPERATION TIME IS THE TIME IN SECONDS REQUIRED FOR THE PLATE CURRENT TO ATTAIN A VALUE WITHIN PLUS OR MINUS 10% OF THE THREE MINUTE PLATE CURRENT (1) VALUE. NO PREHEATING BEFORE THIS TEST WILL BE ALLOWED.
- ¹¹THE TUBES SHALL BE RIGIDLY MOUNTED ON A TABLE VIBRATING WITH SIMPLE HARMONIC MOTION. THE TUBES SHALL BE VIBRATED FOR A TOTAL OF 6 HRS, 2 HRS IN EACH OF THREE POSITIONS, X1, X2, Y1. ONLY RATED HEATER VOLTAGE SHALL BE APPLIED. TUBES WHICH SHOW ONE OR MORE OF THE FOLLOWING DEFECTS SHALL BE CONSIDERED FAILURES:
 - (A) TUBES WHICH SHOW PERMANENT OR TAP SHORTS OR OPEN CIRCUITS FOLLOWING FATIGUE TEST, WHEN TESTED AS SPECIFIED IN PARAGRAPH 4.7.2 AND 4.7.3 OF SPECIFICATION MIL-E-1.
 - (B) TUBES WHICH DO NOT COMPLY WITH POST FATIGUE LIMITS. THIS IS DESTRUCTIVE TEST.
- ¹²THE PROVISIONS OF PARAGRAPH 4.9.20.5 OF SPECIFICATION MIL-E-1 SHALL APPLY, EXCEPT FOR TEST CONDITIONS LISTED FOR SHOCK TEST (2).

