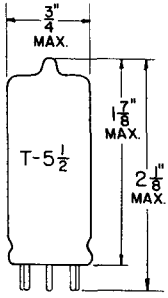
TUNG-SOL

PENTODE

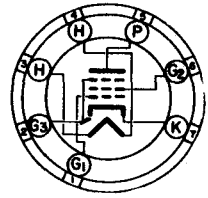
MINIATURE TYPE



GLASS BULB
6-2

HEATER

ANY MOUNTING POSITION



BOTTOM VIEW
MINIATURE BUTTON
7 PIN BASE
78K

THE 6AH6WA IS A HEATER-CATHODE TYPE, HIGH TRANSCONDUCTANCE, SHARP CUT-OFF PENTODE IN THE 7 PIN MINIATURE CONSTRUCTION. IT IS DESIGNED FOR USE AS A WIDE BAND OR IF AMPLIFIER IN MOBILE AND AIRCRAFT APPLICATIONS.

RATINGS

MECHANICAL

MAXIMUM IMPACT ACCELERATION (SHOCK TEST—NOTE 3)	450	G
MAXIMUM VIBRATIONAL ACCELERATION (96 HR FATIGUE TEST—NOTE #4)	2.5	G
MAXIMUM BULB TEMPERATURE	180	°C

RATINGS

AND NORMAL OPERATION

	MIL-E-1 SYMBOL	DES. MIN.	NORMAL TEST CONDITIONS (NOTE 6)	NORMAL OPERATION (NOTE 5)	DES. MAX.	MIL-E-1 UNITS
HEATER VOLTAGE (NOTE 7)	Ef:	5.7	6.3	6.3	6.9	VOLTS
PLATE VOLTAGE	Eb:	---	300	300	330	Vdc
GRID #1 VOLTAGE	Ec1:	---	0	0	---	Vdc
GRID #2 VOLTAGE	Ec2:	---	150	150	165	Vdc
GRID #3 VOLTAGE	Ec3:	---	0	0	---	Vdc
PLATE DISSIPATION	Pp:	---	---	3.0	3.3	W
GRID #2 DISSIPATION	Pg2:	---	---	0.38	0.45	W
HEATER-CATHODE VOLTAGE	Ehk:	-200	---	100	+200	v
CATHODE CURRENT	Ik:	---	---	12.5	28	mAdc
CATHODE RESISTANCE	Rk:	---	160	160	---	OHMS
PLATE CURRENT (1)	Ib(1):	---	---	10	---	mAdc
GRID #2 CURRENT	Ic2:	---	---	2.5	---	mAdc
TRANSCONDUCTANCE (1)	Sm(1):	---	---	9000	---	µMHOS
PLATE RESISTANCE	rp:	---	---	0.5	---	MEG.

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CHARACTERISTICS AND QUALITY CONTROL TESTS[1]

TEST	AQL %	MIL-E-1	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:	420	432	450	468	480	36	mA
HEATER-CATHODE LEAKAGE:									
Ehk=+100 Vdc	0.65	Ihk:	---	---	---	---	15	---	μAdc
Ehk=-100 Vdc		Ihk:	---	---	---	---	15	---	μAdc
GRID CURRENT:									
Rg1= 1.0 MEG.	0.65	Ic(1):	---	---	---	---	-2.0	---	μAdc
PLATE CURRENT (1):	0.65	Ib(1):	7.5	8.7	10.0	11.3	12.5	2.5	mAdc
PLATE CURRENT (2):									
Ec1=10.0 Vdc	0.65	Ib(2):	---	---	---	---	30	---	μAdc
TRANSCONDUCTANCE (1):	0.65	Sm(1):	7000	8000	9000	10000	11000	12000	μMHOS
SCREEN GRID CURRENT:	0.65	Ic2:	1.5	1.9	2.5	3.1	3.5	1.4	mAdc
CONTINUITY AND SHORTS (INOPERATIVES):	0.4	---	---	---	---	---	---	---	---
MECHANICAL:	---	---	---	---	---	---	---	---	---
ENVELOPE T-5½ (6-2)									
MEASUREMENTS ACCEPTANCE TESTS PART 2									
INSULATION OF ELECTRODES: Ef=6.3V									
Eg1-ALL=-100 Vdc	2.5	Rg1-all:	100	---	---	---	---	---	MEG.
Ep-ALL=-300 Vdc		Rp-all:	100	---	---	---	---	---	MEG
PLATE CURRENT (3):									
Ec1=-5.0 Vdc	2.5	Ib(3):	5	---	---	---	---	---	μAdc
TRANSCONDUCTANCE (2):									
Ef=5.7 (NOTE 8)	2.5	Δ_{Ef} Sm(2):	---	---	---	---	15	---	PERCENT
GRID EMISSION: Ef=7.5V; PREHEAT 5 MINUTES AT Ec1= 0 Vdc; TEST AT Ec1= =-10 Vdc	2.5	Ic1(2):	---	---	---	---	-2.0	---	μAdc
RF NOISE: Esig=35 mVac; Ck= 0.2 μf	2.5	EB:	---	---	---	---	5	---	VU
NOISE AND MICROPHONICS: Ef=6.3 Vac; Ebb=Ecc2= 300 Vdc; Ec1=0; Rk= 200 OHMS; Ec3 to GROUND; Rp=10,000 OHMS; Rg2=60,000 OHMS; Cg2=2 μf; Ck= 1000 μf: Ecal=300 mVac.	2.5	EB:	---	---	---	---	17	---	VU

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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
MEASUREMENTS ACCEPTANCE TESTS PART 2- cont'd.		COMBINED AQL=1.0% EXCLUDING MECHANICAL AND INOPERATIVES							
CAPACITANCE		Cgp:	---	---	---	---	0.035	---	pf
CAPACITANCE(NOTE 2)	6.5	Cin:	8.0	---	10	---	12	---	pf
CAPACITANCE		Cout:	3.0	---	4.5	---	6	---	pf
LOW PRESSURE VOLTAGE BREAKDOWN: PRESSURE=55±5mmHg; VOLTAGE =500 VAC.	6.5	---	---	---	---	---	---	---	---
VIBRATION (2): F=25 cps; G=2.5: Rp=2000 OHMS; Ck=1000 μf	2.5	Ep:	---	---	---	---	100	---	mVac
DEGRADATION RATE ACCEPTANCE TESTS									
SHOCK: HAMMER ANGLE=30°; Ehk=+100 Vdc; (NOTE 3)	20	---	---	---	---	---	---	---	---
FATIGUE: 96 HRS; G=2.5 FIXED FREQUENCY; F=25 min.,60 max. (NOTE 4)	6.5	---	---	---	---	---	---	---	---
POST SHOCK AND FATIGUE TEST END POINTS: VIBRATION (2): F=25cps; G=2.5; Rp=2000 ohms; Ck=1000 μf	---	Ep:	---	---	---	---	200	---	mVac
HEATER-CATHODE LEAKAGE: Ehk=+100 Vdc		Ihk:	---	---	---	---	30	---	μAdc
Ehk=-100 Vdc	---	Ihk:	---	---	---	---	30	---	μAdc
CHANGE IN TRANSCONDUCTANCE (1) OF INDIVIDUAL TUBES:	---	Δ_t Sm(1):	---	---	---	---	20	---	PERCENT
GRID CURRENT(1):	---	Ic1:	---	---	---	---	-4.0	---	μAdc
MINIATURE TUBE BASE STRAIN:	---	---	---	---	---	---	---	---	---
GLASS STRAIN (THERMAL SHOCK)	2.5	---	---	---	---	---	---	---	---
ACCEPTANCE LIFE TESTS									
HEATER CYCLING LIFE TEST: Ef=7.5V; Eb=Ec1=Ec2=Ec3=0V; Ehk=+100 Vdc; 1min on, 4 min. off.	1.0	---	---	---	---	---	---	---	---

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

TEST ACCEPTANCE LIFE TESTS	ALLOW. DEF. per CHARAC. 1st SAMP.	COMB. SAMP.	AQL &	MIL-E-1 SYMBOL	MIN.	MAX.	MIL-E-1 UNITS
HEATER CYCLING LIFE TEST END POINTS:							
HEATER-CATHODE LEAKAGE:							
Ehk=+100 Vdc			---	Ihk:	---	30	μAdc
Ehk=-100 Vdc			---	Ihk:	---	30	μAdc
1 HOUR STABILITY LIFE TEST: TA=ROOM; Ehk=+135Vdc; Rgi=0.1 meg. min.			---	---	---	---	---
1 HOUR STABILITY LIFE TEST END POINTS; CHANGE IN TRANS-CONDUCTANCE (1) OF INDIVIDUAL TUBES: (TYPICAL SAMPLE SIZE=50 TUBES)			1.0	$\Delta_t Sm(1)$:	---	10	PERCENT
100 HOUR SURVIVAL RATE LIFE TEST: TA=ROOM; Ehk=+135 Vdc; Rgi=0.1meg. min.			---	---	---	---	---
100 HOUR SURVIAL RATE LIFE TEST END POINTS: (TYPICAL SAMPLE SIZE=200 TUBES)			---	---	---	---	---
CONTINUITY AND SHORTS (INOPERATIVES):			0.65	---	---	---	---
TRANSCONDUCTANCE (1):			1.0	Sm(1):	6300	---	μMHOS
INTERMITTENT HIGH TEMPERATURE LIFE TEST: T BULB=+180°C; Ehk=+135 Vdc; Rgi=0.1meg.min.			---	---	---	---	---
500 HOUR INTERMITTENT HIGH TEMPERATURE LIFE TEST END POINTS: (TYPICAL SAMPLE SIZE= 20 TUBES 1st SAMPLE; 40 TUBES 2nd SAMPLE)							
INOPERATIVES:	1	3	---	---	---	---	---
GRID CURRENT (1):	1	3	---	Ic(1):	0	-2.0	μAdc
HEATER CURRENT:	1	3	---	If:	410	490	MA
CHANGE IN TRANSCON-DUCTANCE (1) OF IN-DIVIDUAL TUBES:	1	3	---	$\Delta_t Sm(1)$:	---	20	PERCENT
TRANSCONDUCTANCE (2): (NOTE 8)	2	5	---	$\Delta_{Ef} Sm(2)$:	---	15	PERCENT
HEATER-CATHODE LEAKAGE:							
Ehk=+100 Vdc	1	3	---	Ihk:	---	20	μAdc
Ehk=-100 Vdc			---	Ihk:	---	20	μAdc

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

TEST ACCEPTANCE LIFE TESTS - cont'd.	ALLOWABLE DEF. PER CHARACTER. 1st SAMP.	COMB. SAMP.	AQL %	MIL-E-1 SYMBOL	MIN.	MAX.	MIL-E-1 UNITS
ELECTRODE INSULATION:							
g1-all			---	Rg1-all:	50	---	MEG.
p-all	2	5	---	Rp-all:	50	---	MEG.
TRANSCONDUCTANCE (1) AVG. CHANGE:	---	---	---	Avg.Δ_tSm(1):	---	15	PERCENT
TOTAL DEFECTIVES	4	8	---	---	---	---	---
1000 HOUR INTERMITTENT LIFE TEST END POINTS: (TYPICAL SAMPLE SIZES= 20 TUBES 1st SAMPLE; 40 TUBES 2nd SAMPLE)	---	---	---	---	---	---	---
INOPERATIVES:	2	5	---	---	---	---	---
GRID CURRENT (1):	2	5	---	Ic1(1):	0	-2.0	µAdc
HEATER CURRENT:	2	5	---	If:	410	490	MA.
CHANGE IN TRANSCONDUCTANCE (1) OF INDIVIDUAL TUBES:	2	5	---	Δ_tSm(1):	---	20	PERCENT
HEATER-CATHODE LEAKAGE:							
Ehk=+100 Vdc	2	5	---	Ihk:	---	20	µAdc
Ehk=-100 Vdc			---	Ihk:	---	20	µAdc
TOTAL DEFECTIVES:	5	10	---	---	---	---	---
500 HOUR CATHODE INTERFACE RESISTANCE LIFE TEST: TA=ROOM; Ef=7.5 Vac; Ehk=0; g1, g2, g3 and P FLOATING	---	---	---	---	---	---	---
500 HOUR CATHODE INTERFACE RESISTANCE LIFE TEST END POINTS: (TYPICAL SAMPLE SIZE= 20 TUBES 1st SAMPLE, 40 TUBES 2nd SAMPLE)							
INTERFACE RESISTANCE:	1	3	---	ri:	---	25	OHMS

NOTES

1. CHARACTERISTICS, 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.

2. WITH CYLINDRICAL SHIELD #316 CONNECTED TO CATHODE LEAD.

3. TEST CONDITIONS AND ACCEPTANCE CRITERIA PER SHOCK TEST PROCEDURES OF MIL-E-1 BASIC SPECIFICATIONS.

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NOTES – CONT'D.

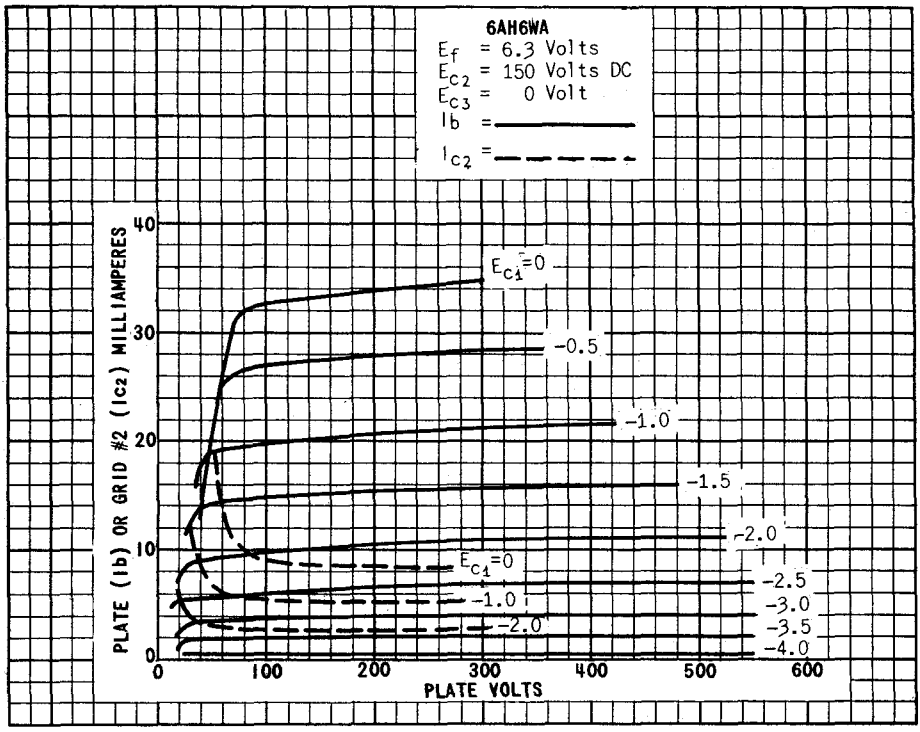
4. TEST CONDITIONS AND ACCEPTANCE CRITERIA PER FATIGUE TEST PROCEDURES OF MIL-E-1 BASIC SPECIFICATIONS.

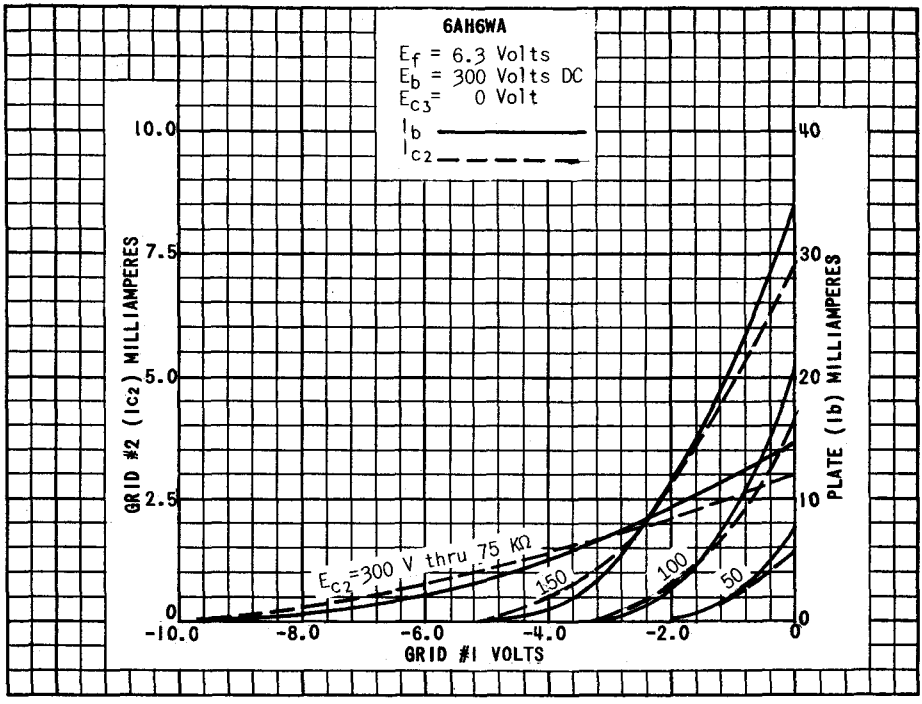
5. THESE NORMAL VALUES REPRESENT CONDITIONS AT WHICH CONTROL OF RELIABILITY MAY BE EXPECTED.

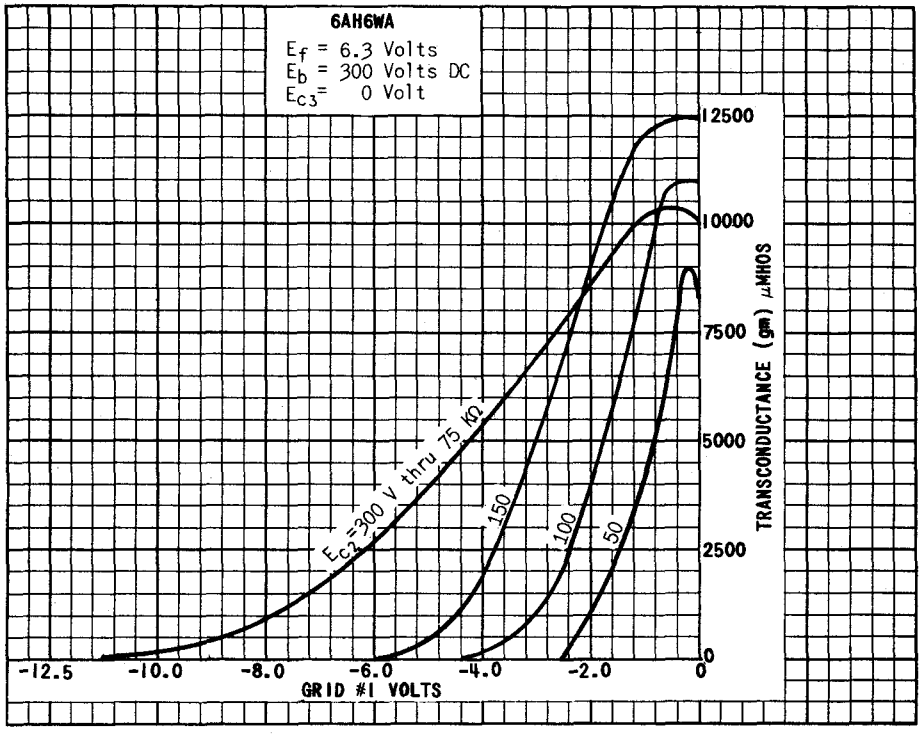
6. THESE NORMAL TEST CONDITIONS ARE USED FOR ALL CHARACTERISTIC TESTS UNLESS OTHERWISE STATED UNDER INDIVIDUAL TEST ITEMS.

7. 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.

8. CHANGE OF TRANSCONDUCTANCE FOR INDIVIDUAL TUBES FROM THAT VALUE MEASURED AT Ef=6.3 TO THAT VALUE MEASURED AT Ef=5.7 V.







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