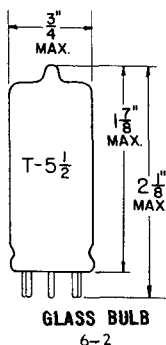


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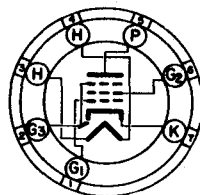
PENTODE

MINIATURE TYPE



HEATER

ANY MOUNTING POSITION



BOTTOM VIEW
MINIATURE BUTTON
7 PIN BASE

7BK

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 CONDI- TIONS (NOTE 6)	NORMAL OPER- ATION (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	mA dc
CATHODE RESISTANCE	Rk:	---	160	160	---	OHMS
PLATE CURRENT (1)	Ib(1):	---	---	10	---	mA dc
GRID #2 CURRENT	Ic2:	---	---	2.5	---	mA dc
TRANSCONDUCTANCE (1)	Sm(1):	---	---	9000	---	μMHOS
PLATE RESISTANCE	rp:	---	---	0.5	---	MEG.

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CHARACTERISTICS AND QUALITY CONTROL TESTS¹

TEST	AQL MIL-E-1 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	I _f :	420	432	450	468	480	36 mA
HEATER-CATHODE LEAKAGE:								
E _{hk} =+100 Vdc	0.65	I _{hk} :	---	---	---	---	15	μAdc
E _{hk} =-100 Vdc		I _{hk} :	---	---	---	---	15	μAdc
GRID CURRENT:								
R _{g1} = 1.0 MEG.	0.65	I _c (1):	---	---	---	---	-2.0	μAdc
PLATE CURRENT (1):	0.65	I _b (1):	7.5	8.7	10.0	11.3	12.5	mAdc
PLATE CURRENT (2):								
E _{c1} =10.0 Vdc	0.65	I _b (2):	---	---	---	---	30	μAdc
TRANSCONDUCTANCE (1):	0.65	S _m (1):	7000	8000	9000	10000	11000	12000 μMHOS
SCREEN GRID CURRENT:	0.65	I _{c2} :	1.5	1.9	2.5	3.1	3.5	mAdc
CONTINUITY AND SHORTS (INOPERATIVES):	0.4	---	---	---	---	---	---	---
MECHANICAL:	---	---	---	---	---	---	---	---
ENVELOPE T-5½ (6-2)								
MEASUREMENTS ACCEPTANCE								
TESTS PART 2								
INSULATION OF ELECTRODES: E _f =6.3V								
E _{g1} -ALL=-100 Vdc	2.5	R _{g1} -all:	100	---	---	---	---	MEG.
E _p -ALL=-300 Vdc		R _p -all:	100	---	---	---	---	MEG
PLATE CURRENT (3):								
E _{c1} =-5.0 Vdc	2.5	I _b (3):	5	---	---	---	---	μAdc
TRANSCONDUCTANCE (2):								
E _f =5.7 (NOTE 8)	2.5	Δ _{E_f}	---	---	---	---	15	PERCENT
GRID EMISSION:		S _m (2):	---	---	---	---		
E _f =7.5V; PREHEAT 5 MINUTES AT E _{c1} =0 Vdc; TEST AT E _{c1} =-10 Vdc	2.5	I _{c1} (2):	---	---	---	---	-2.0	μAdc
RF NOISE:								
E _{bi} =35 mVac; C _k =0.2 μf	2.5	EB:	---	---	---	---	5	VU
NOISE AND MICRO-PHONICS:								
E _f =6.3 Vac; E _{bb} =E _{cc2} =300 Vdc; E _{c1} =0; R _k =200 OHMS; E _{c3} to GROUND; R _p =10,000 OHMS; R _{g2} =60,000 OHMS; C _{g2} =2 μf; C _k =1000 μf; E _{c1} =300 mVac.	2.5	EB:	---	---	---	---	17	VU

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CHARACTERISTICS AND QUALITY CONTROL TESTS¹ - cont'd.

TEST	AQL %	MIL-E-1 SYM- BOL	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 μ f	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 μ f	---	Ep:	---	---	---	---	200	---	mVac
HEATER-CATHODE									
LEAKAGE:									
Ehk=+100 Vdc		lhk:	---	---	---	---	30	---	μ Adc
Ehk=-100 Vdc	---	lhk:	---	---	---	---	30	---	μ Adc
CHANGE IN TRANSCON-									
DUCTANCE (1) OF IN-		Δ_t							
DIVIDUAL TUBES:	---	Sm(1):	---	---	---	---	20	---	PERCENT
GRID CURRENT(1):	---	lc1:	---	---	---	---	-4.0	---	μ Adc
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 TESTS¹ - cont'd.

TEST	ALLOW. DEF. per CHARAC.		AQL	MIL-E-1	MIN.	MAX.	MIL-E-1 UNITS
ACCEPTANCE LIFE TESTS	1st SAMP.	CONC. SAMP.	&	SYMBOL			
HEATER CYCLING LIFE							
TEST END POINTS:							
HEATER-CATHODE							
LEAKAGE:							
Ehk=+100 Vdc			---	lhk:	---	30	μ adc
Ehk=-100 Vdc			---	lhk:	---	30	μ adc
1 HOUR STABILITY							
LIFE TEST:							
TA=ROOM; Ehk=+							
135Vdc; Rg1=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; Rg1=0.1meg.							
min.			---	---	---	---	---
100 HOUR SURVIVAL RATE							
LIFE TEST END POINTS:							
(TYPICAL SAMPLE							
SIZE=200 TUBES)							
CONTINUITY AND SHORTS							
(INOPERATIVES):							
TRANSCONDUCTANCE (1):							
			0.65		---	---	---
			1.0	$Sm(1):$	6300	---	μ MHOS
INTERMITTENT HIGH							
TEMPERATURE LIFE TEST:							
T BULB=+180°C; Ehk=+							
135 Vdc; Rg1=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	---	lc(1):	0	-2.0	μ adc
HEATER CURRENT:	1	3	---	lf:	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	---	lhk:	---	20	μ adc
Ehk=-100 Vdc			---	lhk:	---	20	μ adc

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CHARACTERISTICS AND QUALITY CONTROL TESTS¹ - cont'd.

TEST	ALLOWABLE DEF. PER CHARACTER.		AQL	MIL-E-1			MIL-E-1
ACCEPTANCE LIFE TESTS - cont'd.	1st SAMP.	COMB. SAMP.	%	SYMBOL	MIN.	MAX.	UNITS
ELECTRODE INSULA- TION:							
g1-all			---	Rg1-all:	50	---	MEG.
p-all	2	5	---	Rp-all:	50	---	MEG.
TRANSCONDUCTANCE							
(1) AVG. CHANGE:	---	---	---	Avg. $\Delta_t Sm(1)$:	---	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	μ Adc
HEATER CURRENT:	2	5	---	If:	410	490	MA.
CHANGE IN TRANSCON- DUCTANCE (1) OF IN- DIVIDUAL TUBES:							
HEATER-CATHODE	2	5	---	$\Delta_t Sm(1)$:	---	20	PERCENT
LEAKAGE:							
Ehk=+100 Vdc	2	5	---	lhk:	---	20	μ Adc
Ehk=-100 Vdc			---	lhk:	---	20	μ Adc
TOTAL DEFECTIVES:	5	10	---	---	---	---	---
500 HOUR CATHODE INTER- FACE RESISTANCE LIFE TEST:							
TA=ROOM; Ef=7.5 Vac;							
Ehk=0; g1, g2, g3 and P FLOATING							

500 HOUR CATHODE INTER- FACE RESISTANCE LIFE TEST END POINTS:							
(TYPICAL SAMPLE SIZE=							
20 TUBES 1st SAMPLE,							
40 TUBES 2nd SAMPLE)							
INTERFACE RE- SISTANCE:							
	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 $\pm 10\%$ 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 $E_f = 6.3$ TO THAT VALUE MEASURED AT $E_f = 5.7$ V.

