TUNG-SOL

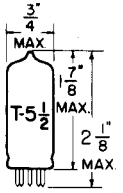
PENTODE

MINIATURE TYPE

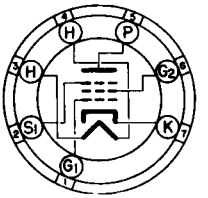
COATED UNIPOTENTIAL CATHODE

HEATER
6.3 VOLTS 0.3 AMP.
AC OR DC

ANY MOUNTING POSITION



GLASS BULB



BOTTOM VIEW
MINIATURE BUTTON
7 PIN BASE
7BK

THE 6AU6WA IS A RUGGEDIZED SHARP CUT-OFF PENTODE AMPLIFIER IN THE 7-PIN MINIATURE CONSTRUCTION. THE TUBE HAS HIGH TRANSCONDUCTANCE AND LOW GRID-PLATE CAPACITANCE AND IS INTENDED FOR USE AS A VOLTAGE AMPLIFIER OVER THE AF, IF AND RF FREQUENCY RANGES. CONTROLS ON THE PRODUCT AVERAGE FOR SUCH CHARACTERISTICS AS HEATER CURRENT, PLATE CURRENT, SCREEN CURRENT, TRANSCONDUCTANCE, INPUT CAPACITANCE AND OUTPUT CAPACITANCE, ASSURE THAT THESE CRITICAL CHARACTERISTICS WILL REMAIN WELL CENTERED. SINCE IT MUST BE ABLE TO WITHSTAND SEVERE MECHANICAL TESTS TO MEET TEST SPECIFICATIONS, THE 6AU6WA IS ESPECIALLY SUITED FOR USE IN INDUSTRIAL AND MILITARY AIR-BORNE EQUIPMENT WHICH MAY BE SUBJECTED TO SEVERE SHOCK AND VIBRATION.

DIRECT INTERELECTRODE CAPACITANCES

	WITH* SHIELD	WITHOUT SHIELD	
MAXIMUM GRID #1 TO PLATE	---	.0035	μμf
INPUT (RATED)	5.5	5.5	μμf
MAXIMUM	---	7.2	μμf
MINIMUM	---	4.8	μμf
OUTPUT (RATED)	5.0	5.0	μμf
MAXIMUM	---	5.9	μμf
MINIMUM	---	3.9	μμf

*SHIELD #316 CONNECTED TO PIN #7.

RATINGS
ABSOLUTE MAXIMUM VALUES

HEATER VOLTAGE	6.3±10%	VOLTS
MAXIMUM DC PLATE VOLTAGE	330	VOLTS
MAXIMUM DC GRID #1 VOLTAGE	0	VOLTS
MAXIMUM DC GRID #2 VOLTAGE	165	VOLTS
MAXIMUM DC GRID #3 VOLTAGE	0	VOLTS
MAXIMUM PLATE DISSIPATION	3.3	WATTS
MAXIMUM GRID #2 DISSIPATION	0.7	WATT
MAXIMUM HEATER CATHODE VOLTAGE	±100	VOLTS
MAXIMUM BULB TEMPERATURE	165	°C
MAXIMUM ALTITUDE	10 000	FEET
MAXIMUM SHOCK	450	G/1 msec

CONTINUED ON FOLLOWING PAGE

CONTINUED FROM PRECEDING PAGE

TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

CLASS A_1 AMPLIFIER – PENTODE CONNECTION

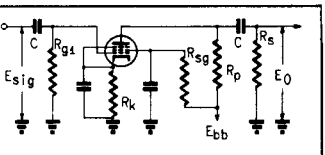
HEATER VOLTAGE	6.3	6.3	6.3	VOLTS
HEATER CURRENT	0.3	0.3	0.3	AMP.
PLATE VOLTAGE	100	250	250	VOLTS
GRID #2 VOLTAGE	100	125	150	VOLTS
CATHODE BIAS RESISTOR	150	100	68	OHMS
GRID #3 VOLTAGE	PIN #2 CONNECTED TO PIN #7 AT SOCKET			
TRANSCONDUCTANCE	3900	4500	5200	μMHOS
PLATE CURRENT	5	7.6	10.6	mA
GRID #2 CURRENT	2.1	3	4.3	mA
PLATE RESISTANCE (APPROX.)	0.5	1.5	1	MEGOHM
GRID #1 VOLTAGE (APPROX.) FOR I_b = 10 μA	−4.2	−5.5	−6.5	VOLTS

CLASS A_1 AMPLIFIER – TRIODE CONNECTION[A]

HEATER VOLTAGE	6.3	VOLTS
HEATER CURRENT	0.3	AMP.
PLATE VOLTAGE	250	VOLTS
GRID #2 VOLTAGE	PLATE	
CATHODE RESISTOR	330	OHMS
GRID #3 VOLTAGE	PLATE	
TRANSCONDUCTANCE	4800	μMHOS
PLATE CURRENT	12.2	mA
AMPLIFICATION FACTOR	36	

CLASS A RESISTANCE-COUPLED AMPLIFIER

Rp Meg.	Rs Meg.	Rg1 Meg.	Ebb = 90 Volts Rk	Rsg	Gain	Eo	Ebb = 180 Volts Rk	Rsg	Gain	Eo	Ebb = 300 Volts Rk	Rsg	Gain	Eo
0.10	0.10	0.1	960	0.14	68	13	610	0.19	96	27	480	0.17	117	47
0.10	0.24	0.1	1000	0.16	93	16	630	0.21	127	35	480	0.16	153	60
0.24	0.24	0.1	2900	0.35	88	12	1700	0.46	115	25	820	0.59	200	44
0.24	0.51	0.1	3600	0.39	108	14	1800	0.53	171	31	960	0.73	229	53
0.51	0.51	0.1	5300	0.92	108	10	4000	0.97	156	23	2100	1.10	227	38
0.51	1.0	0.1	4600	1.10	122	12	3800	1.10	198	25	1800	1.30	296	44
0.24	0.24	10	0	0.42	100	12	0	0.53	157	25	0	0.45	212	44
0.24	0.51	10	0	0.46	118	14	0	0.59	184	31	0	0.70	271	52
0.51	0.51	10	0	0.92	116	11	0	1.10	197	22	0	1.20	280	38
0.51	1.0	10	0	1.00	145	12	0	1.10	238	25	0	1.30	348	42



Note: Coupling capacitors (C) should be adjusted to give desired frequency response. Rk and Rsg should be adequately by-passed.

NOTES: 1. EO IS MAXIMUM RMS VOLTAGE OUTPUT FOR FIVE PERCENT (5%) TOTAL HARMONIC DISTORTION. 2. GAIN MEASURED AT 2.0 VOLTS RMS OUTPUT. 3. FOR ZERO-BIAS DATA, GENERATOR IMPEDANCE IS NEGLIGIBLE.

CONTINUED ON FOLLOWING PAGE

TUNG-SOL

CONTINUED FROM PRECEDING PAGE

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

E_{c3}[B], E_f = 6.3, E_b = 250Vdc, E_{c1} = 0Vdc, R_k = 68 OHMS[C], E_{c2} = 150Vdc
(EXCEPT AS MODIFIED BELOW)

	INITIAL				500 HOUR LIFE TEST		
	INDIVIDUAL MIN.	INDIVIDUAL MAX.	PROD. MIN.	AVG. MAX.	INDIVIDUAL MIN.	INDIVIDUAL MAX.	
HEATER CURRENT	275	325	289	311	275	325	mA
HEATER-CATHODE LEAKAGE (E_{hk} =±100 Vdc)	---	±10	---	±2	---	±10	μAdc
#1 GRID CURRENT (E_{c1}=-1Vdc, R_{g1}= 0.25MEG)	---	-1.0	---	-0.2	---	-1.0	μAdc
PLATE CURRENT (1)	8.0	13.5	9.1	12.1	---	---	mAdc
TRANSCONDUCTANCE (1)	4150	6250	4620	5780	3600	6250	μMHOS
Δ AVERAGE TRANS-CONDUCTANCE (1)	---	---	---	---	---	17	PERCENT
INSULATION OF ELECTRODES[D] (E_f =6.3V, E(g-all). -100Vdc, E(p-all)=-300Vdc)							
R(g1-all)	100	---	---	---	50	---	MEGOHMS
R(p-all)	100	---	---	---	50	---	MEGOHMS
PLATE CURRENT (2) (E_{c1}=-9Vdc, R_p=0.1 MEG, R_k=0, C_k=0)	---	35	---	---	---	---	μAdc
SCREEN GRID CURRENT	2.6	6.0	3.5	5.1	---	---	mAdc
TRANSCONDUCTANCE (2)[E] (E_f = 5.5V)	3900	---	4200	---	---	---	μMHOS
#1 GRID EMISSION[F] (E_f=7.5V, E_{c1}=-10Vdc, R_{g1}= 0.25 MEG, R_k=0, C_k=0)	---	-2.0	---	---	---	---	μAdc

SPECIAL REQUIREMENTS

	MIN.	MAX.	
VARIABLE FREQUENCY VIBRATION[G] (R_p = 2000)	---	300	mVac
VIBRATIONAL FATIGUE[H]	---	---	
MINIATURE TUBE BASE STRAIN[K] (NO VOLTAGES)	---	---	
STABILIZATION INTERMITTENT LIFE TEST CONDITIONS OR EQUIVALENT	---	---	
SHOCK[L] (HAMMER ANGLE=30°, E_{hk}=100Vdc, R_{g1}=0.1 MEG, C_k=0)	---	---	
POST SHOCK AND VIBRATIONAL FATIGUE TEST END POINTS			
LOW FREQUENCY VIBRATION	---	450	mVac
HEATER CATHODE LEAKAGE	---	±30	μAdc
TRANSCONDUCTANCE (1)	3600	---	μMHOS
#1 GRID CURRENT	---	-2.0	μAdc
SHORT AND CONTINUITY[M]	---	---	
RF NOISE[N] (E_{c1}=-1.0Vdc, E_{sig}=15mVac, R_k=0, C_k=0)	---	---	
LOW FREQUENCY VIBRATION[P] (R_p = 2000)	---	300	mVac
INTERMITTENT LIFE TEST (E_b=300Vdc, E_{c2}=150Vdc, E_{hk}=135Vdc. R_{g1}=0.5MEG, R_k=80, C_k=0, 20 TUBES)	---	---	
HEATER CYCLING LIFE TEST (E_f=7.5V, E_b=E_{c2}=0, E_{hk}=135Vdc)	2000	---	CYCLES
HEATER CYCLING LIFE TEST END POINT HEATER CATHODE LEAKAGE	---	20	μAdc

CONTINUED ON FOLLOWING PAGE

TUNG-SOL

CONTINUED FROM PRECEDING PAGE

NOTES

A GRID #2 AND GRID #3 CONNECTED TO PLATE

B TIE GRID #3 TO NEGATIVE TERMINAL OF CATHODE RESISTOR.

C THE CATHODE RESISTOR SHALL BE SHUNTED WITH A CAPACITIVE REACTANCE NOT EXCEEDING 3 OHMS AT 60 CYCLES PER SECOND.

D SEE MIL-E-1C 4.8.2

E PREHEAT ALL TUBES UNDER THE FOLLOWING CONDITIONS FOR A PERIOD OF 5 MINUTES PRIOR TO TESTING. E_f=5.5V, E_b=300Vdc, E_{c1}=0, E_{c2}=150Vdc, E_{c3}=0, R_k=80, R_{g1}=0.5 MEG.

F PREHEAT ALL TUBES UNDER THE FOLLOWING CONDITIONS FOR A PERIOD OF 5 MINUTES PRIOR TO TESTING. E_f=7.5V, E_b=300Vdc, E_{c1}=0, E_{c2}=150Vdc, E_{c3}=0, R_k=80, R_{g1}=0.5MEG. TWO (2) SECONDS SHALL BE THE MAXIMUM TIME BETWEEN PREHEAT AND TEST.

G SEE MIL-E-1C 4.9.20.3

H SEE MIL-E-1C 4.9.20.6

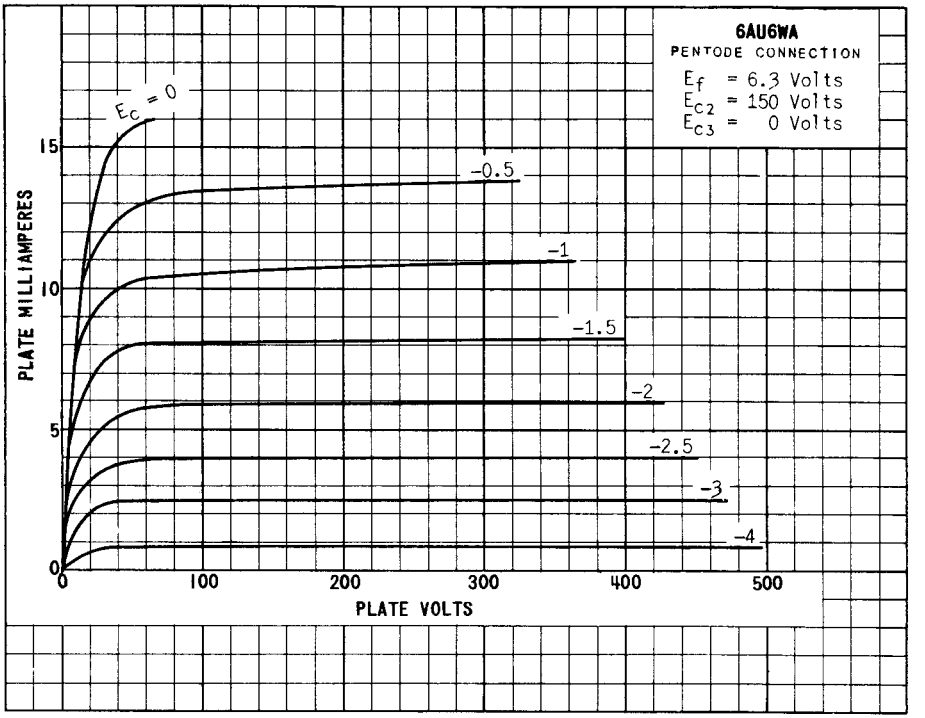
K SEE MIL-E-1C 4.9.6.1

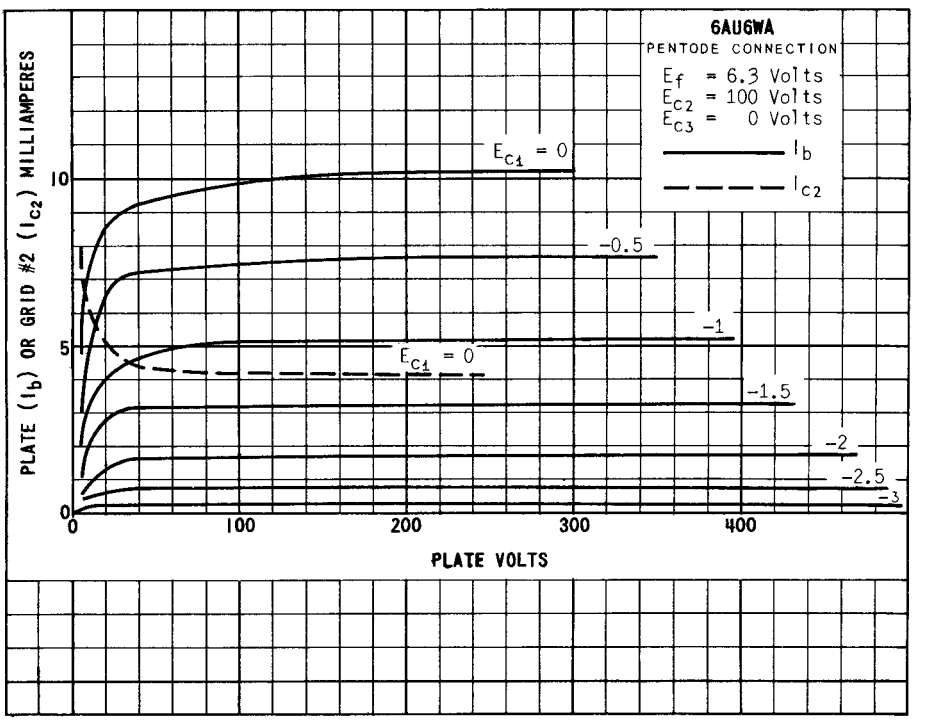
L SEE MIL-E-1C 4.9.20.5

M SEE MIL-E-1C 4.7.5

N SEE MIL-E-1C 4.10.3.1

P SEE MIL-E-1C 4.9.20.4


6AU6WA
PENTODE CONNECTION
E_f = 6.3 Volts
E_{c2} = 150 Volts
E_{c3} = 0 Volts
E_c = 0
-0.5
-1
-1.5
-2
-2.5
-3
-4
PLATE MILLIAMPERES
PLATE VOLTS
0
5
10
15
100
200
300
400
500


6AU6WA
PENTODE CONNECTION
E_f = 6.3 Volts
E_{c2} = 100 Volts
E_{c3} = 0 Volts
I_b
I_{c2}
E_{c1} = 0
E_{c1} = 0
-0.5
-1
-1.5
-2
-2.5
-3
PLATE (I_b) OR GRID #2 (I_{c2}) MILLIAMPERES
PLATE VOLTS
0
5
10
100
200
300
400

6AU6WA
PREMIUM TUBE