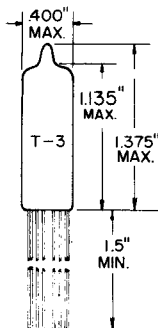
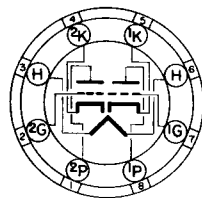


TUNG-SOL

DOUBLE TRIODE
SUBMINIATURE TYPE

GLASS BULB

ANY MOUNTING POSITION



BOTTOM VIEW

SUBMINIATURE BUTTON
8 PIN
0.017" TINNED
FLEXIBLE LEADS

THE 6112 IS A HEATER-CATHODE TYPE HIGH-MU DOUBLE TRIODE OF SUBMINIATURE CONSTRUCTION, CAPABLE OF OPERATION IN THE UHF REGION. IT IS DESIGNED FOR SERVICE WHERE SEVERE CONDITIONS OF HIGH TEMPERATURE AND MECHANICAL SHOCK OR VIBRATION ARE ENCOUNTERED. THE FLEXIBLE LEADS MAY BE SOLDERED OR WELDED DIRECTLY TO THE TERMINALS OF CIRCUIT COMPONENTS WITHOUT THE USE OF SOCKETS. STANDARD 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 (100 HOUR FATIGUE TEST-NOTE 5)	2.5	G
MAXIMUM BULB TEMPERATURE	220	*C

RATINGS

AND NORMAL OPERATION

	MIL-E-18 SYMBOL	ABS. MIN.	NORM. TEST CONDI- TIONS (NOTE 7)	NORM. OPER- ATION (NOTE 6)	ABS. MAX.	MIL-E-18 UNITS
HEATER VOLTAGE (NOTE 8)	Ef:	6.0	6.3	6.3	6.6	V
PLATE VOLTAGE	Eb:	---	100	100	165	Vdc
GRID #1 VOLTAGE	Ec1:	-55	0	0	0	Vdc
PLATE DISSIPATION (PER PLATE)	Pp/p:	---	---	0.08	0.10	W
GRID #1 CIRCUIT RESISTANCE	Rg/g:	---	---	1.0	1.1	MEG.
HEATER-CATHODE VOLTAGE	Ebk:	-200	---	100	+200	Vdc
PLATE CURRENT (PER PLATE)	Ip/p:	---	---	---	3.3	mA _{dc}
GRID CURRENT	Ic/c:	---	---	---	---	mA _{dc}
CATHODE RESISTANCE (PER UNIT)	Rk:	---	1500	1500	---	OHMS

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CHARACTERISTICS AND QUALITY CONTROL TESTS¹

(IN THE FOLLOWING TESTS, EACH UNIT IS TESTED SEPARATELY)

TEST	AQL %	MIL-E-1B SYMBOL	MIN.	LAL	BOG.	UAL.	MAX.	A.L.D.	MIL-E-1B UNITS
MEASUREMENTS ACCEPTANCE									
TESTS - PART 1									
COMBINED AQL=1.0% EXCLUDING MECHANICAL AND INOPERATIVES									
HEATER CURRENT:	0.65	If:	280	288	300	312	320	24	mA.
HEATER-CATHODE									
LEAKAGE: $E_{hk} = -100$ Vdc	0.65	I _{hk} :	---	---	---	---	5.0	---	μ Adc
$E_{hk} = +100$ Vdc			---	---	---	---	5.0	---	μ Adc
GRID CURRENT:									
$E_b = 150$ Vdc; $E_c = 0$;									
$R_k = 820$ OHMS; $R_g =$									
1.0 MEG.	0.65	I _c (1):	---	---	---	---	-0.3	---	μ Adc
PLATE CURRENT (1):	0.65	I _b (1):	0.50	---	0.8	---	1.10	---	mA
PLATE CURRENT (2):									
$E_c = -2.8$ Vdc	0.65	I _b (2):	---	---	---	---	50	---	μ Adc
TRANSCONDUCTANCE (1):	0.65	S _m (1):	1500	1650	1800	1950	2100	350	μ MHOS
CONTINUITY AND SHORTS									
(INOPERATIVES):	0.4	---	---	---	---	---	---	---	---
MECHANICAL:									
(ENVELOPE (8-1))	---	---	---	---	---	---	---	---	---
MEASUREMENTS ACCEPTANCE									
TESTS - PART 2									
INSULATION OF									
ELECTRODES:									
$E_f = 6.3$ V									
$E_g = -100$ Vdc	2.5	R _g -all:	100	---	---	---	---	---	MEG.
$E_p = -300$ Vdc		R _p -all:	100	---	---	---	---	---	MEG.
TRANSCONDUCTANCE (2):									
$E_f = 5.7$ V (NOTE 9)	2.5	$\Delta S_m(2): E_f$:	---	---	---	---	15	---	PERCENT
GRID EMISSION:									
$E_b = 150$ Vdc; $R_g = 1.0$ MEG;									
$R_k = 820$ OHMS; $E_f = 7.5$ V;									
PREHEAT AT $E_c = 0$;									
TEST AT $E_c = -4.0$ Vdc:	2.5	I _c (2):	---	---	---	---	-0.5	---	μ Adc
AF NOISE:									
$E_{sig} = 45$ mVac; $R_g = 0.5$									
MEG; $R_p = 0.02$ MEG; $R_k =$									
750 OHMS; CK = 1000 μ f;									
UNITS CONNECTED IN									
PARALLEL	2.5	EB:	---	---	---	---	17	---	VU
AMPLIFICATION FACTOR;	6.5	Mu:	60	---	70	---	80	---	---
A.C. AMPLIFICATION:									
$E_{sig} = 0.2$ Vac; $E_{bb} = 100$									
Vdc; $E_{cc} = 0$; $R_k = 0$;	6.5	E _p :	8.0	---	---	---	---	---	Vac
CAPACITANCE:		C _{gp} :	0.8	---	1.00	---	1.20	---	μ f
CAPACITANCE:		C _{in} :	1.30	---	1.70	---	2.10	---	μ f
CAPACITANCE: (NOTE 2)		C _{out} :	0.16	---	0.23	---	0.30	---	μ f
	6.5	(Unit #1)							
CAPACITANCE:		C _{out} :	0.21	---	0.28	---	0.35	---	μ f
		(Unit #2)							
CAPACITANCE:		C _{gg} :	---	---	---	---	0.014	---	μ f
CAPACITANCE:		C _{pp} :	---	---	---	---	0.80	---	μ f

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CHARACTERISTICS AND QUALITY CONTROL TESTS¹ - cont'd.

TEST	AQL MIL-E-1B % SYMBOL	MIN.	LAL	BOG.	UAL	MAX.	ALD	MIL-E-1B UNITS
MEASUREMENTS ACCEPTANCE TESTS - PART 2 (cont'd.)								
LOW PRESSURE VOLTAGE BREAKDOWN:								
PRESSURE = 55 ± 5 mmHG;								
VOLTAGE = 300 Vac.	6.5							
VIBRATION (1):								
NO VOLTAGES; F VARIABLE								
FROM 10- 50 cps; G MAX. =								
10; FIXED AMPLITUDE 0.040";								
POST SHOCK AND FATIGUE								
TEST END POINTS APPLY	10.0	---	---	---	---	---	---	---
VIBRATION (2):								
F= 40cps; G=15; Rp= 10,000								
OHMS	2.5	Ep:	---	---	---	---	25	mVac
DEGRADATION RATE ACCEPTANCE TESTS								
SUBMINIATURE LEAD								
FATIGUE:	2.5	---	4.0	---	---	---	---	arcs
SHOCK:								
Ehk =+100 Vdc; Rg =0.1 MEG								
HAMMER ANGLE =30°. (NOTE 3)	20	---	---	---	---	---	---	---
FATIGUE:								
96 HOURS; G = 2.5 ; FIXED								
FREQUENCY; F=25 min;								
60 max. (NOTE 5)	6.5	---	---	---	---	---	---	---
POST SHOCK AND FATIGUE								
TEST END POINTS:								
VIBRATION (2):								
F=40 cps; G=15; Rp=								
10,000 OHMS	---	Ep:	---	---	---	---	100	mVac
HEATER-CATHODE LEAKAGE:								
Ehk=± 100 Vdc Ehk=-100 Vdc		ihk:	---	---	---	---	20	μAdc
CHANGE IN TRANSDUC-								
DUCTANCE (1) OF INDI-								
VIDUAL TUBES:								
Ef=6.3 V		ΔtSm(1):	---	---	---	---	20	PERCENT
GLASS STRAIN (THERMAL SHOCK):	6.5	---	---	---	---	---	---	---
ACCEPTANCE LIFE TESTS								
HEATER CYCLING:								
Ef= 7.0 V; Eb=Ec= 0V;								
Ehk =140 Vac; 1 min. on,								
4 min. off.	---	---	2.5	---	---	---	2000	CYCLES

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CHARACTERISTICS AND QUALITY CONTROL TESTS¹ - cont'd.

TEST	MAX. DEFECTS PER CHARACT. 1st COMB. SAMPLE SAMPLE		AQL %	MIL-E-1B SYMBOL	MIN.	MAX.	MIL-E-1B UNITS
ACCEPTANCE LIFE TESTS (cont'd.)							
1 HOUR STABILITY LIFE TEST: TA = ROOM; E _{hk} = +200 Vdc; R _g /g = 1.0 MEG.	---	---	---	---	---	---	---
1 HOUR STABILITY LIFE TEST END POINTS: CHANGE IN TRANSDUC- TANCE (1) OF INDI- VIDUAL TUBES: (TYPICAL SAMPLE SIZE = 50 TUBES.	---	---	1.0	ΔtSm(1):	---	10	PERCENT
100 HOUR SURVIVAL RATE LIFE TEST: TA = ROOM; E _{hk} = +200 Vdc; R _g /g = 1.0 MEG.							
100 HOUR SURVIVAL RATE LIFE TEST, END POINTS: (TYPICAL SAMPLE SIZE = 200 TUBES)	---	---	---	---	---	---	---
CONTINUITY AND SHORTS (INOPERATIVES):	---	---	0.65	---	---	---	---
TRANSDUCTANCE (1):	---	---	1.0	Sm(1):	1200	---	μMHOS
500 HOUR INTERMITTENT HIGH TEMPERATURE LIFE TEST: T BULB = 220 °C; E _{hk} = +200 Vdc; R _g /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	1	3	---	---	---	---	---
HEATER CURRENT	2	5	---	lf:	276	328	mA
HEATER-CATHODE LEAKAGE: E _{hk} = ±100 Vdc E _{hk} = -100 Vdc	2	5	---	lhk:	---	10	μAdc
GRID CURRENT (1)	1	3	---	lc(1):	---	-0.9	μAdc
TRANSDUCTANCE (1) CHANGE OF INDIVIDUAL TUBES FROM INITIAL:	1	3	---	ΔtSm(1):	---	25	PERCENT
TRANSDUCTANCE (1) AVERAGE CHANGE:	---	---	---	AveΔtSm(1):	---	15	PERCENT
INSULATION OF ELECTRODES; g1-all	2	5	---	Rg1-all:	50	---	MEG.
p-all	2	5	---	Rp-all:	50	---	MEG.
TRANSDUCTANCE (2): (NOTE 9)	2	5	---	ΔtSm(2):	---	15	PERCENT
TOTAL DEFECTIVES	4	8	---	---	---	---	---
1000 HOUR HIGH TEMPERATURE INFORMATION LIFE TEST: T BULB = 220°C; E _{hk} = +200 Vdc; R _g /g = 1.0 MEG.							
1000 HOUR HIGH TEMPERATURE INFORMATION LIFE TEST END POINTS: READ FOR SAME CHARACTERISTICS AS FOR 500 HOUR INTERMITTENT HIGH TEMPERATURE LIFE TEST. LIMITS NOT ESTABLISHED.							

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NOTES

- NOTE 1: CHARACTERISTICS, QUALITY CONTROL TEST PROCEDURES, AND INSPECTION LEVELS ARE MADE ACCORDING TO THE APPROPRIATE PARAGRAPHS OF MIL-E-1B, 'INSPECTION INSTRUCTIONS FOR ELECTRON TUBES,' AND MIL-STD-105A.
- NOTE 2: WITHOUT SHIELD.
- NOTE 3: TEST CONDITIONS AND ACCEPTANCE CRITERIA PER SHOCK TEST PROCEDURES OF MIL-E-1B BASIC SPECIFICATION.
- NOTE 4: CENTRIFUGE TEST WITH FORCES APPLIED IN ANY DIRECTION.
- NOTE 5: TEST CONDITIONS AND ACCEPTANCE CRITERIA PER FATIGUE TEST PROCEDURES OF MIL-E-1B BASIC SPECIFICATION.
- NOTE 6: THESE NORMAL VALUES REPRESENT CONDITIONS AT WHICH CONTROL OF RELIABILITY MAY BE EXPECTED.
- NOTE 7: THESE NORMAL TEST CONDITIONS ARE USED FOR ALL CHARACTERISTIC TESTS UNLESS OTHERWISE STATED UNDER THE INDIVIDUAL TEST ITEM.
- NOTE 8: FOR MOST APPLICATIONS THE PERFORMANCE WILL NOT BE ADVERSELY AFFECTED BY $\pm 5\%$ HEATER VOLTAGE VARIATION, BUT WHEN THE APPLICATION CAN PROVIDE A CLOSER CONTROL OF HEATER VOLTAGE, AN IMPROVEMENT IN RELIABILITY WILL BE REALIZED.
- NOTE 9: CHANGE 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.

