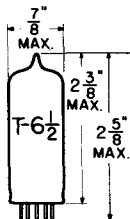


TUNG-SOL

DOUBLE TRIODE

MINIATURE TYPE



GLASS BULB

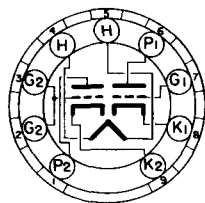
COATED UNIPOTENTIAL CATHODE

HEATER

13.0 VOLTS 0.45 AMP.

AC OR DC

ANY MOUNTING POSITION


 BOTTOM VIEW
 MINIATURE BUTTON
 9 PIN BASE

9HF

THE 13DE7 IS A MINIATURE DOUBLE TRIODE IN THE 9-PIN MINIATURE CONSTRUCTION. SECTION #1 IS INTENDED FOR USE AS A VERTICAL DEFLECTION OSCILLATOR HAVING MEDIUM MU AND SECTION #2 IS INTENDED FOR USE AS A VERTICAL DEFLECTION AMPLIFIER WITH LOW MU. THERMAL CHARACTERISTICS OF THE HEATER ARE CONTROLLED SUCH THAT HEATER VOLTAGE SURGES DURING THE WARM-UP CYCLE ARE MINIMIZED PROVIDED IT IS USED WITH OTHER TYPES WHICH ARE SIMILARLY CONTROLLED. EXCEPT FOR HEATER RATINGS, THE 13DE7 IS IDENTICAL TO THE 10DE7.

DIRECT INTERELECTRODE CAPACITANCES - APPROX.

GRID TO PLATE: (G TO P)	4.0	8.5	$\mu\mu\text{f}$
INPUT: G TO (H+K)	2.2	5.5	$\mu\mu\text{f}$
OUTPUT: P TO (H+K)	0.52	1.0	$\mu\mu\text{f}$

RATINGS

INTERPRETED ACCORDING TO DESIGN CENTER SYSTEM

VERTICAL DEFLECTION OSCILLATOR AND AMPLIFIER^A

	TRIODE #1 OSCILLATOR	TRIODE #2 AMPLIFIER	
HEATER VOLTAGE	13.0	13.0 ←	VOLTS
MAXIMUM HEATER-CATHODE VOLTAGE ^B			
HEATER NEGATIVE WITH RESPECT TO CATHODE			
TOTAL DC AND PEAK		200	VOLTS
HEATER POSITIVE WITH RESPECT TO CATHODE			
DC	100		VOLTS
TOTAL DC AND PEAK		200	VOLTS
MAXIMUM DC PLATE VOLTAGE	330	275	
MAXIMUM PEAK POSITIVE PULSE PLATE VOLTAGE (ABS. MAX.)	---	1500 ←	VOLTS
MAXIMUM PEAK NEGATIVE PULSE GRID VOLTAGE	400	250	VOLTS
MAXIMUM PLATE DISSIPATION ^C	1.5	7.0	WATTS
MAXIMUM AVERAGE CATHODE CURRENT	22	50	MA.
MAXIMUM PEAK CATHODE CURRENT	77	175	MA.
MAXIMUM GRID CIRCUIT RESISTANCE			
SELF BIAS	2.2	2.2	MEGOHMS
HEATER WARM-UP TIME (APPROX.) [*]		11.0	SECONDS

CONTINUED ON FOLLOWING PAGE

TUNG-SOL

CONTINUED FROM PRECEDING PAGE

TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

	TRIODE #1	TRIODE #2	
HEATER VOLTAGE		13.0	VOLTS
HEATER CURRENT		0.45	AMP.
PLATE VOLTAGE	250	150	VOLTS
GRID #1 VOLTAGE	-11	-17.5	VOLTS
PLATE CURRENT	5.5	35	MA.
TRANSCONDUCTANCE	2000	6500	μ MHOS
AMPLIFICATION FACTOR	17.5	6.0	
PLATE RESISTANCE (APPROX.)	8750	925	
GRID VOLTAGE FOR $I_b = 10 \mu A$	-20	---	VOLTS
GRID VOLTAGE FOR $I_b = 50 \mu A$	---	-44	VOLTS
PLATE CURRENT AT $E_c = -24 V_{dc}$	---	10	MA.
ZERO BIAS PLATE CURRENT			
$E_b = 60V$; $E_c = 0$ (INSTANTANEOUS VALUES)	---	80	MA.

A FOR OPERATION IN A 525-LINE, 30-FRAME SYSTEM AS DESCRIBED IN "STANDARDS OF GOOD ENGINEERING PRACTICE FOR TELEVISION BROADCAST STATIONS: FEDERAL COMMUNICATIONS COMMISSION", THE DUTY CYCLE OF THE VOLTAGE PULSE MUST NOT EXCEED 15% OF ONE SCANNING CYCLE.

B DESIGN-MAXIMUM RATINGS ARE THE LIMITING VALUES EXPRESSED WITH RESPECT TO BOGIE TUBES AT WHICH SATISFACTORY TUBE LIFE CAN BE EXPECTED TO OCCUR. TO OBTAIN SATISFACTORY CIRCUIT PERFORMANCE, THEREFORE, THE EQUIPMENT DESIGNER MUST ESTABLISH THE CIRCUIT DESIGN SO THAT NO DESIGN-MAXIMUM VALUE IS EXCEEDED WITH A BOGIE TUBE UNDER THE WORST PROBABLE OPERATING CONDITIONS WITH RESPECT TO SUPPLY-VOLTAGE VARIATION, EQUIPMENT COMPONENT VARIATION, EQUIPMENT CONTROL ADJUSTMENT, LOAD VARIATION, AND ENVIRONMENTAL CONDITIONS.

C IN STAGES OPERATING WITH GRID LEAK BIAS, AN ADEQUATE CATHODE BIAS RESISTOR OR OTHER SUITABLE MEANS IS REQUIRED TO PROTECT THE TUBE IN THE ABSENCE OF EXCITATION.

* HEATER WARM-UP TIME IS DEFINED AS THE TIME REQUIRED FOR THE VOLTAGE ACROSS THE HEATER TO REACH 80% OF ITS RATED VOLTAGE AFTER APPLYING 4 TIMES RATED HEATER VOLTAGE TO A CIRCUIT CONSISTING OF THE TUBE HEATER IN SERIES WITH A RESISTANCE OF VALUE 3 TIMES THE NOMINAL HEATER OPERATING RESISTANCE.

→ INDICATES A CHANGE.

