

TUNG-SOL

BEAM POWER PENTODE

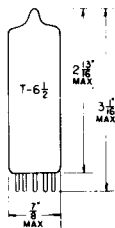
MINIATURE TYPE

UNIPOTENTIAL CATHODE

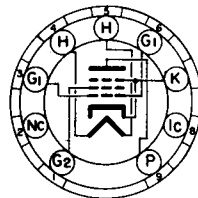
HEATER
4.7 VOLTS 0.6±10% AMP.

AC OR DC

ANY MOUNTING POSITION



GLASS BULB



BOTTOM VIEW

SMALL BUTTON
9 PIN NOVAL

9HM

THE 5CZ5 IS A HIGH PERVEANCE BEAM POWER PENTODE IN THE 9-PIN MINIATURE CONSTRUCTION. IT IS INTENDED PRIMARILY FOR USE AS A VERTICAL-DEFLECTION AMPLIFIER TUBE IN HIGH-EFFICIENCY DEFLECTION CIRCUITS OF TELEVISION RECEIVERS UTILIZING PICTURE TUBES HAVING DIAGONAL DEFLECTION ANGLES OF 110 DEGREES AND OPERATING AT VOLTAGES UP TO 18,000 VOLTS. IT IS ALSO USEFUL IN THE AUDIO OUTPUT STAGES OF TELEVISION AND RADIO RECEIVERS. 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.

DIRECT INTERELECTRODE CAPACITANCES

WITHOUT EXTERNAL SHIELD

GRID #1 TO PLATE (MAX.)	0.4	μuf
GRID #1 TO: (K+G ₃ +G ₂ +H)	9.0 ←	μuf
PLATE TO: (K+G ₃ +G ₂ +H)	6.0	μuf

RATINGS

INTERPRETED ACCORDING TO DESIGN MAXIMUM SYSTEM

VERTICAL DEFLECTION AMPLIFIER^A

HEATER VOLTAGE	4.7	VOLTS
MAXIMUM PLATE VOLTAGE:		
DC	315	VOLTS
PEAK POSITIVE PULSE (ABS. MAX.) ^B	2 200 ^C	VOLTS
MAXIMUM GRID #2 VOLTAGE	315 ←	VOLTS
MAXIMUM PEAK NEGATIVE-PULSE GRID #1 VOLTAGE	-275 ←	VOLTS
MAXIMUM CATHODE CURRENT:		
PEAK	155 ←	MA.
AVERAGE	45 ←	MA.
MAXIMUM PLATE DISSIPATION	10	WATTS
MAXIMUM GRID #2 INPUT	2.2 ←	WATTS
MAXIMUM PEAK HEATER-CATHODE VOLTAGE:		
HEATER NEGATIVE WITH RESPECT TO CATHODE	200	VOLTS
HEATER POSITIVE WITH RESPECT TO CATHODE	200 ^D	VOLTS
BULB TEMPERATURE (AT HOTTEST POINT ON BULB SURFACE)	250	°C
HEATER WARM-UP TIME (APPROX.) [*]	11.0	SECONDS

CONTINUED ON FOLLOWING PAGE

← INDICATES A CHANGE.

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CONTINUED FROM PRECEDING PAGE

RATINGS - CONT'D.
 INTERPRETED ACCORDING TO DESIGN MAXIMUM SYSTEM
 VERTICAL DEFLECTION AMPLIFIER^A

MAXIMUM CIRCUIT VALUES

GRID #1 CIRCUIT RESISTANCE:		
FOR FIXED-BIAS OPERATION	0.5	MEGOHM
FOR CATHODE-BIAS OPERATION	1	MEGOHM

TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

CHARACTERISTICS
 CLASS A₁ AMPLIFIER

HEATER VOLTAGE	4.7	4.7	VOLTS
HEATER CURRENT	0.6	0.6	AMP.
PLATE VOLTAGE	75	250	VOLTS
GRID #2 (SCREEN-GRID) VOLTAGE	250	250	VOLTS
GRID #1 (CONTROL-GRID) VOLTAGE	0	-14	VOLTS
PLATE RESISTANCE (APPROX.)	---	73 000	OHMS
TRANSCONDUCTANCE	---	4 800	μMHOS
PLATE CURRENT	130 ^G	46	MA.
GRID #2 CURRENT	16 ^G	4.6	MA.
GRID #1 VOLTAGE (APPROX.) FOR PLATE CURRENT OF 100 μAMP.	---	-40 ←	VOLTS

NOTES

^A AS DESCRIBED IN "STANDARDS OF GOOD ENGINEERING PRACTICE CONCERNING TELEVISION BROADCAST STATIONS", FEDERAL COMMUNICATIONS COMMISSION.

^B THIS RATING IS APPLICABLE WHERE THE DURATION OF THE VOLTAGE PULSE DOES NOT EXCEED 15 PER CENT OF ONE VERTICAL SCANNING CYCLE. IN A 525-LINE, 30-FRAME SYSTEM, 15 PER CENT OF ONE SCANNING CYCLE IS 2.5 MILLISECONDS.

^C UNDER NO CIRCUMSTANCES SHOULD THIS ABSOLUTE VALUE BE EXCEEDED.

^D THE DC COMPONENT MUST NOT EXCEED 100 VOLTS.

^E SUBSCRIPT 1 INDICATES THAT GRID #1 CURRENT DOES NOT FLOW DURING ANY PART OF THE INPUT CYCLE.

^F THE TYPE OF INPUT COUPLING NETWORK USED SHOULD NOT INTRODUCE TOO MUCH RESISTANCE IN THE GRID #1 CIRCUIT. TRANSFORMER OR IMPEDANCE-COUPLING DEVICES ARE RECOMMENDED

^G THESE VALUES CAN BE MEASURED BY A METHOD INVOLVING A RE-CURRENT WAVEFORM SUCH THAT THE PLATE DISSIPATION AND GRID #2 INPUT WILL BE KEPT WITHIN RATINGS IN ORDER TO PREVENT DAMAGE TO THE TUBE.

* 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.