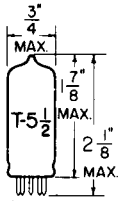
TUNG-SOL

# PENTODE

MINIATURE TYPE



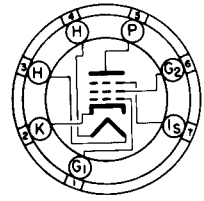

GLASS BULB

COATED UNIPOTENTIAL CATHODE

HEATER

4.2 VOLTS 0.45 AMP.
AC OR DC

ANY MOUNTING POSITION




**BOTTOM VIEW**

MINIATURE BUTTON
7 PIN BASE

7CM

THE 4CB6 IS A SHARP CUT-OFF PENTODE USING THE SMALL BUTTON SEVEN PIN MINIATURE CONSTRUCTION. IT IS DESIGNED FOR USE IN 450 MA. SERIES HEATER OPERATED RECEIVERS AS AN IF AMPLIFIER OPERATING AT FREQUENCIES ABOVE 20 MC. IT IS ALSO WELL SUITED FOR USE AS AN RF AMPLIFIER IN VHF TELEVISION RECEIVERS. IT IS CHARACTERIZED BY HIGH TRANSCONDUCTANCE AND LOW CAPACITANCE VALUES. 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. WITH EXCEPTION OF HEATER RATINGS ITS CHARACTERISTICS ARE IDENTICAL TO THE 6CB6.

## DIRECT INTERELECTRODE CAPACITANCES

| | WITHOUT SHIELD | WITH[A] SHIELD | |
|---|---|---|---|
| GRID TO PLATE: ($G_1$ TO P) MAX. | 0.025 | .015 | μμf |
| INPUT: $G_1$ TO (H+K+$G_2$+$G_3$&IS) | 6.5 | 6.5 | μμf |
| OUTPUT: P TO (H+K+$G_2$+$G_3$&IS) | 2.0 | 3.0 | μμf |

[A]EXTERNAL SHIELD #316 CONNECTED TO PIN #2.

## RATINGS

INTERPRETED ACCORDING TO DESIGN MAXIMUM SYSTEM[B]

| | | |
|---|---|---|
| HEATER VOLTAGE | 4.2 | VOLTS |
| MAXIMUM PLATE VOLTAGE | 330 | VOLTS |
| MAXIMUM GRID #2 VOLTAGE | SEE J5-C4-2 | |
| MAXIMUM GRID #2 SUPPLY VOLTAGE | 330 | VOLTS |
| MAXIMUM PLATE DISSIPATION | 2.3 | WATTS |
| MAXIMUM GRID #2 DISSIPATION | 0.55 | WATT |
| MAXIMUM POSITIVE DC GRID #1 VOLTAGE | 0 | VOLTS |
| MAXIMUM HEATER-CATHODE VOLTAGE: | | |
| 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 |
| HEATER WARM-UP TIME (APPROX.)* | 11.0 | SECONDS |

●DC COMPONENT MUST NOT EXCEED 200 VOLTS.

→ INDICATES A CHANGE.

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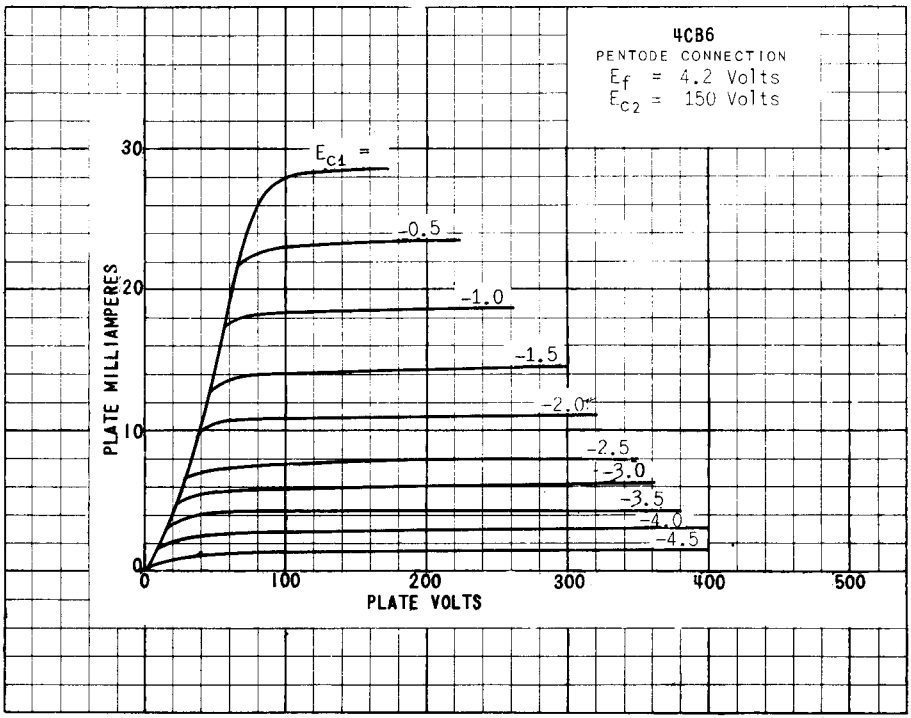
CONTINUED FROM PRECEDING PAGE

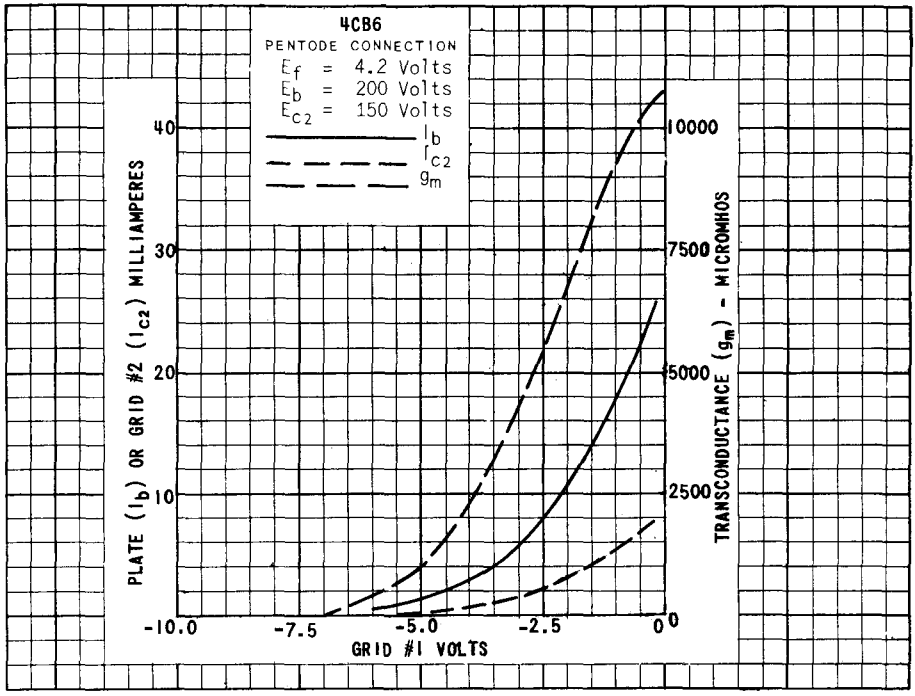
## TYPICAL OPERATING CONDITIONS AND CHARACTERISTICS

| | | |
|---|---|---|
| HEATER VOLTAGE | 4.2 | VOLTS |
| HEATER CURRENT | 0.45 | AMP. |
| PLATE VOLTAGE | 125 | VOLTS |
| GRID #2 VOLTAGE | 125 | VOLTS |
| GRID #3 VOLTAGE | | |
| CATHODE BIAS RESISTOR | 56 | OHMS |
| PLATE RESISTANCE (APPROX.) | 0.28 | MEGOHM |
| TRANSCONDUCTANCE | 8 000 | µMHOS |
| PLATE CURRENT | 13.0 | MA. |
| GRID #2 CURRENT | 3.7 | MA. |
| GRID #1 VOLTAGE (APPROX.) FOR $I_b$=20 µA. | -6.5 | VOLTS |
| PLATE CURRENT AT $E_{c1}$=-3V., $R_k$=0 | 2.8 | MA. |

B DESIGN MAXIMUM RATINGS ARE THE LIMITING VALUES EXPRESSED WITH RESPECT TO BOGIE TUBES AT WHICH SATISFACTORY TUBE LIFE CAN BE EXPECTED TO OCCUR IN THE TYPES OF SERVICE FOR WHICH THE TUBE IS RATED. THEREFORE, THE EQUIPMENT DESIGNER MUST ESTABLISH THE CIRCUIT DESIGN SO THAT INITIALLY AND THROUGHOUT EQUIPMENT LIFE 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.

*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.




4CB6
PENTODE CONNECTION
Ef = 4.2 Volts
Eb = 200 Volts
Ec2 = 150 Volts
Ib
Ic2
gm
PLATE (Ib) OR GRID #2 (Ic2) MILLIAMPERES
40
30
20
10
TRANSCONDUCTANCE (gm) - MICROMHOS
10000
7500
5000
2500
0
-10.0
-7.5
-5.0
-2.5
0
GRID #1 VOLTS