The 38HK7 is a compactron containing a high-perveance diode and a beam-power pentode. The diode is intended for service as the damping diode and the pentode as the horizontal-deflection amplifier in television receivers.

**ELECTRICAL**

**Cathode - Coated Unipotential**

**Heater Characteristics and Ratings**
- Heater Voltage, AC or DC*: 37.8 Volts
- Heater Current*: 0.45±0.03 Amperes
- Heater Warm-up Time, Average$: 11 Seconds
- Direct Inter-electrode Capacitances, approximate**:

**Diode Section**
- Cathode to Plate and Heater: k to (p + h) = 10 pf
- Plate to Cathode and Heater: p to (k + h) = 9.0 pf
- Heater to Cathode: (h to k) = 2.0 pf

**Pentode Section**
- Grid-Number 1 to Plate:
  - (g1 to p) = 0.38 pf
  - Input: g1 to (h + k + g2 + b.p.) = 19 pf
  - Output: p to (h + k + g2 + b.p.) = 8.0 pf

**MECHANICAL**

- Operating Position: Any
- Envelope: T-12, Glass
- Base: EI12-74, Button 12-Pin
- Outline Drawing: EIA 12-57
- Maximum Diameter: 1.563 Inches
- Minimum Diameter: 1.437 Inches
- Maximum Over-all Length: 3.125 Inches
- Maximum Seated Height: 2.750 Inches
- Minimum Seated Height: 2.500 Inches

**MAXIMUM RATINGS**

Design-Maximum ratings are limiting values of operating and environmental conditions applicable to a bogey electron tube of a specified type as defined by its published data and should not be exceeded under the worst probable conditions.

The tube manufacturer chooses these values to provide acceptable serviceability of the tube, making allowance for the effects of changes in operating conditions due to variations in the characteristics of the tube under consideration.

The equipment manufacturer should design so that initially and throughout life no design-maximum value for the intended service is exceeded with a bogey tube under the worst probable operating conditions with respect to supply-voltage variation, equipment component variation, equipment control adjustment, load variation, signal variation, environmental conditions, and variations in the characteristics of all other electron devices in the equipment.

---

**PHYSICAL DIMENSIONS**

- **1.563" Max.**
- **1.437" Min.**
- **3.125" Max.**
- **2.750" Max.**
- **2.500" Min.**

**TERMINAL CONNECTIONS**

- Pin 1 - Heater
- Pin 2 - Diode Plate
- Pin 3 - No Connection
- Pin 4 - Diode Cathode
- Pin 5 - Pentode Plate
- Pin 6 - No Connection
- Pin 7 - Internal Connection
- Pin 8 - Pentode Cathode and Beam Plates
- Pin 9 - Pentode Grid Number 1
- Pin 10 - Internal Connection
- Pin 11 - Pentode Grid Number 2 (Screen)
- Pin 12 - Heater

**BASE DIAGRAM**

EIA 12FS
MAXIMUM RATINGS (Cont’d)

DESIGN-MAXIMUM VALUES

HORIZONTAL-DEFLECTION AMPLIFIER SERVICEΔ—Pentode Section

DC Plate-Supply Voltage (Boost + DC Power Supply) ........................................ 500 Volts
Peak Positive Pulse Plate Voltage ................................................................. 5000 Volts
Peak Negative Pulse Plate Voltage ................................................................. 0 Volts
Screen Voltage ......................................................................................... 150 Volts
Negative DC Grid-Number 1 Voltage ......................................................... 55 Volts
Peak Negative Grid-Number 1 Voltage ............................................................ 330 Volts
Plate Dissipation** .................................................................................... 10 Watts
Screen Dissipation ....................................................................................... 3.5 Watts
Screen Dissipation (With Plate Dissipation Limited to 9 Watts or Less) ....... 4.0 Watts
DC Cathode Current .................................................................................. 230 Milliamperes
Peak Cathode Current .................................................................................. 800 Milliamperes
Heater-Cathode Voltage
   Heater Positive with Respect to Cathode
      DC Component .................................................................................. 100 Volts
      Total DC and Peak .......................................................................... 200 Volts
   Heater Negative with Respect to Cathode
      Total DC and Peak .......................................................................... 200 Volts
Grid-Number 1 Circuit Resistance ............................................................... 1.0 Megohms

TV DAMPER SERVICEΔ—Diode Section

Peak Inverse Plate Voltage ........................................................................... 3700 Volts
Steady-State Peak Plate Current ................................................................... 1200 Milliamperes
DC Output Current ....................................................................................... 200 Milliamperes
Heater-Cathode Voltage
   Heater Positive with Respect to Cathode
      DC Component .................................................................................. 100 Volts
      Total DC and Peak .......................................................................... 200 Volts
   Heater Negative with Respect to Cathode
      DC Component .................................................................................. 500 Volts
      Total DC and Peak .......................................................................... 3700 Volts
Bulb Temperature at Hottest Point ................................................................ 200° C

CHARACTERISTICS AND TYPICAL OPERATION

AVERAGE CHARACTERISTICS

Pentode Section

Plate Voltage ........................................................................................... 3500 Volts
Screen Voltage ......................................................................................... 130 Volts
Grid-Number 1 Voltage .......................................................... -22 Ohms
Plate Resistance, approximate ......................................................... 6200 Ohms
Transconductance .................................................................................. 8800 Micromhos
Plate Current ............................................................................................ 450 Milliamperes
Screen Current .......................................................................................... 40 Milliamperes
Grid-Number 1 Voltage, approximate
   Ib = 1.0 Milliamperes ........................................................................ -66 Volts
Triode Amplification Factor$$ .................................................................. 4.2

Diode Section

Tube Voltage Drop
   Ib = 350 Milliamperes ........................................................................ 16 Volts
NOTES

* Heater voltage for a bogey tube at If = 0.45 amperes.

† The equipment designer should design the equipment so that heater current is centered at the specified bogey value, with heater supply variations restricted to maintain heater current within the specified tolerance.

§ The time required for the voltage across the heater to reach 80 percent of the bogey value after applying 4 times the bogey heater voltage to a circuit consisting of the tube heater in series with a resistance equal to 3 times the bogey heater voltage divided by the bogey heater current.

¶ Without external shield.

# Socket terminals 3, 6, 7, and 10 should not be used as tie points.

△ For operation in a 525-line, 30-frame television system as described in "Standards of Good Engineering Practice Concerning Television Broadcast Stations", Federal Communications Commission. The duty cycle of the voltage pulse must not exceed 15 percent of one scanning cycle.

** 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.

†† Applied for short interval (two seconds maximum) so as not to damage tube.

§§ Triode connection (screen tied to plate) with Eb = Ec2 = 130 volts and Ec1 = -22 volts.

The tubes and arrangements disclosed herein may be covered by patents of General Electric Company or others. Neither the disclosure of any information herein nor the sale of tubes by General Electric Company conveys any license under patent claims covering combinations of tubes with other devices or elements. In the absence of an express written agreement to the contrary, General Electric Company assumes no liability for patent infringement arising out of any use of the tubes with other devices or elements by any purchaser of tubes or others.