



ELECTRONIC TUBE REFERENCE

17CQ4

Rectifier - Damper Diode electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

RECTIFIER

High-voltage television damper diode with controlled heater warm-up, designed for horizontal-deflection energy-recovery service in series-string receivers.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	17 V / 600 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Rectifier	
PEAK INVERSE VOLTAGE	5500 V
NOMINAL OUTPUT CURRENT	190 mA
PEAK FORWARD CURRENT	1.2 A
WARM-UP TIME	11 s
Published ratings/characteristics promoted where applicable; additional operating data retained in TUBE_SECTION_PARAMETER.	

17CQ4 — Half-Wave Rectifier and Television Damper Diode

An indirectly heated half-wave rectifier designed for television damping diode service in horizontal deflection circuits, featuring controlled heater warm-up and high-voltage insulation.

Overview

The **17CQ4** is an indirectly heated half-wave rectifier tube specifically designed for television damping diode service in horizontal deflection circuits. It is engineered for use in television receivers employing series-connected heater strings, particularly where the picture-tube heater is wired in series with other 600 mA heaters. The tube features a controlled warm-up time to minimize heater voltage surges during receiver startup.

Construction and Physical Characteristics

The 17CQ4 incorporates specialized construction techniques to handle the demanding electrical stresses of television damper service. It features a unique glass button suspension and insulation design, which virtually eliminates plate-to-cathode mica arcing. Additionally, the tube utilizes an improved heater-cathode design and enhanced processing control to permit high pulse voltage breakdown ratings.

The physical envelope and base details include:

- **Bulb:** T-9 glass envelope
- **Base:** Intermediate-Shell Octal 5-Pin (JEDEC B5-147) or Short Intermediate-Shell Octal 5-Pin (JEDEC B5-85)
- **Mounting Position:** Any orientation is permitted.

Heater and Warm-Up Specifications

The heater of the 17CQ4 is designed for series-string operation with a controlled warm-up characteristic.

Parameter	Value
Heater Voltage (AC or DC)	17.0 V
Heater Current	0.6 A
Controlled Warm-up Time	11 seconds

The warm-up time of 11 seconds is defined as the time required to reach 80% of the rated heater voltage when tested in series with an external resistance equal to three times the rated heater voltage divided by the rated heater current, after applying four times the rated voltage.

Heater Power Calculation

Using the rated heater voltage ($V_H = 17.0\text{ V}$) and rated heater current ($I_H = 0.6\text{ A}$), the nominal heater power is calculated as: $\text{Power} = V_H \times I_H = 17.0\text{ V} \times 0.6\text{ A} = 10.2\text{ W}$

Pinout and Basing Configuration

The 17CQ4 uses the **4CG** basing diagram. The physical pin layout and internal connections are structured as follows:

Pin Number	Connection
Pin 2	Base pin (may be connected to stem lead)
Pin 3	Cathode (K)
Pin 5	Plate (P)
Pin 7	Heater (H)
Pin 8	Heater (H)

Basing and Socketing Precautions

- Base positions 1, 4, and 6 do not have physical pins.
- Positions 1 and 6 have internal connections (IC) terminating in stem leads.
- Socket clips for positions 1, 2, 4, and 6 should be removed or left unused as circuit tie points unless specific precautions against voltage breakdown are implemented.

Direct Interelectrode Capacitances

The direct interelectrode capacitances of the 17CQ4, measured without an external shield, are:

- **Heater to Cathode:** 4.0 μF
- **Plate to Cathode and Heater:** 8.5 μF
- **Cathode to Plate and Heater:** 11.5 μF

Maximum Ratings (Design Maximum Values)

The following maximum ratings are established under the Design Maximum System for television damper service:

Rating Parameter	Maximum Limit
Peak Inverse Voltage	5500 V
Peak Plate Current	1200 mA
DC Plate Current	190 mA
Plate Dissipation	6.5 W
Heater Negative with Respect to Cathode (DC)	900 V
Heater Negative with Respect to Cathode (Total DC and Peak)	5500 V
Heater Positive with Respect to Cathode (DC)	100 V

Rating Parameter	Maximum Limit
Heater Positive with Respect to Cathode (Total DC and Peak)	300 V

Operating Conditions and Electrical Characteristics

In typical operation, the tube exhibits a low internal voltage drop:

- **Tube Voltage Drop:** 25 V at a plate current (I_b) of 250 mA.

For operation in a standard 525-line, 30-frame television system, the duty cycle of the horizontal voltage pulse must not exceed 15% of one scanning cycle.

Plate Characteristics and Curve Analysis

The average plate characteristic of the 17CQ4 under rated heater conditions shows a non-linear, upward-curving relationship between plate voltage and plate current. This behavior is typical of a high-vacuum rectifier diode. Representative operating points along this characteristic curve include:

- At a plate voltage of 20 V, the plate current is approximately 170 mA.
- At a plate voltage of 40 V, the plate current rises to approximately 480 mA.
- At a plate voltage of 60 V, the plate current reaches approximately 920 mA.
- At a plate voltage of 73 V, the plate current reaches its peak rated value of approximately 1200 mA.

Technical Summary

The **17CQ4** is a specialized T-9 octal half-wave rectifier tube engineered for television horizontal damper service. Operating with a 17.0 V, 0.6 A heater, it features an 11-second controlled warm-up time to prevent heater voltage surges in series-connected receiver strings. Its construction utilizes a glass button suspension and insulation design to prevent plate-cathode arcing under high pulse voltages. With a peak inverse voltage rating of 5500 V, a peak plate current capability of 1200 mA, and a low typical voltage drop of 25 V at 250 mA, the 17CQ4 provides reliable, high-voltage damping performance in television deflection circuits.

SOURCE OPERATING CONDITIONS

1965 Sylvania Electronic Tubes Vol3

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1965 SYLVANIA ELECTRONIC TUBES VOL3

Section 1 · Rectifier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak inverse voltage	5500 V	—
Peak plate current	1200 mA	—
DC plate current	190 mA	—

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater-to-cathode capacitance	4 pF	—