

ELECTRONIC TUBE REFERENCE

17BW3

Rectifier - Damper Diode electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
RECTIFIER

Half-wave vacuum rectifier designed for television horizontal-deflection damper service, handling the repetitive high-voltage pulses produced by the line-scan circuit.

GENERAL CHARACTERISTICS

BASE DESIGNATION	12FX	BASE PINS	12
NOMINAL HEATER	16.8 V / 600 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

12FX - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1	–	H – Heater	CONNECTED
PIN4	–	P – Plate (Anode)	CONNECTED
PIN5	–	–	IC
PIN6	–	–	IC
PIN7	–	K – Cathode	CONNECTED
PIN8	–	–	IC
PIN9	–	–	IC
PIN10	–	P – Plate (Anode)	CONNECTED
PIN12	–	H – Heater	CONNECTED

SECTION RATINGS

SECTION1 Rectifier	
MAXIMUM PLATE DISSIPATION	6.5 W
PEAK INVERSE VOLTAGE	5000 V
NOMINAL OUTPUT CURRENT	175 mA
PEAK FORWARD CURRENT	1.1 A
FORWARD VOLTAGE DROP	32 V
WARM-UP TIME	11 s
<i>Reference/equivalence-only source does not reproduce the referenced electrical ratings/characteristics; promoted values intentionally not inferred from external datasheets.</i>	

17BW3 — Half-Wave Vacuum Rectifier and Damper Diode

A half-wave vacuum rectifier and damper diode designed for television horizontal-deflection circuits, featuring a duodecar construction and high-voltage insulation capabilities.

Overview

The **17BW3** is a half-wave vacuum rectifier and damper diode (heater-cathode diode) designed primarily for use in the horizontal-deflection circuits of television receivers. Constructed in a compactron T-9 glass envelope with a 12-pin button base, it is engineered to handle the high peak inverse voltages and peak currents typical of television damper service.

The 17BW3 belongs to a family of damper tubes that includes the [6BW3](#) and [22BW3](#). It is electrically identical to the [22BW3](#) except for its heater ratings, which are optimized for series-string heater chains requiring a 16.8 V supply at 0.6 A.

Construction and Physical Characteristics

The 17BW3 features a T-9 glass bulb envelope and a duodecar-type construction. It utilizes a 12-pin button base (E12-70) and requires a standard duodecar 12-contact socket. The physical dimensions of the tube are:

- **Maximum overall height:** 2.875 inches
- **Maximum seated height:** 2.500 inches
- **Maximum diameter:** 1.188 inches

The tube's internal structure is designed to minimize interelectrode capacitances and withstand high voltage gradients. The unshielded direct interelectrode capacitances are:

- **Cathode to plate and heater:** 8.5 pF
- **Plate to cathode and heater:** 6.0 pF

- **Heater to cathode:** 3.8 pF

Heater Ratings and Warm-up

The heater is designed for series or parallel operation, with a controlled warm-up time to ensure reliable operation in series-connected heater strings.

- **Heater Voltage (AC/DC):** 16.8 V
- **Heater Current:** 0.6 A (600 mA)
- **Heater Warm-up Time:** 11 seconds

Pinout and Base Connections

The 17BW3 uses the **12FX** basing arrangement. There is a minor variation in documented pin assignments for the cathode and internal connections across different manufacturing specifications. The cathode is assigned to either Pin 6 or Pin 7, with the alternate pin designated as an internal connection (IC) that must not be used for external circuit wiring.

The complete pinout configuration is as follows:

- **Pin 1:** Heater (H)
- **Pin 2:** No Connection (NC)
- **Pin 3:** No Connection (NC)
- **Pin 4:** Internal Connection (IC)
- **Pin 5:** Internal Connection (IC)
- **Pin 6:** Cathode (K) or Internal Connection (IC)
- **Pin 7:** Internal Connection (IC) or Cathode (K)
- **Pin 8:** Internal Connection (IC)
- **Pin 9:** Internal Connection (IC)
- **Pin 10:** Plate (P)
- **Pin 11:** No Connection (NC)
- **Pin 12:** Heater (H)

Note: Pins designated as Internal Connection (IC) should not be used as tie points for external circuitry, as they may be connected to internal elements or support structures.

Damper Service Ratings and Operating Conditions

The 17BW3 is rated under the **Design-Maximum Rating System** for damper service in television receivers operating on a standard 525-line, 30-frame system. Under these conditions, the tube is subjected to high-voltage pulses during the horizontal retrace period.

Maximum Ratings

- **Peak Inverse Plate Voltage:** 5000 V (The pulse duration must not exceed 15% of one horizontal scanning cycle, equivalent to a maximum of 10 microseconds).
- **Steady State Peak Plate Current:** 1100 mA
- **DC (Average) Plate Current:** 175 mA
- **Plate Dissipation:** 6.5 W

Heater-Cathode Voltage Limits

Because the cathode of a damper tube in a horizontal-deflection circuit carries high pulse voltages, the heater-to-cathode insulation must withstand severe electrical stress. The maximum ratings are specified for both polarities:

- **Heater Negative with Respect to Cathode:**
 - **DC Limit:** 900 V
 - **Total DC and Peak Limit:** 5000 V
- **Heater Positive with Respect to Cathode:**
 - **DC Limit:** 100 V
 - **Total DC and Peak Limit:** 300 V

Typical Electrical Characteristics

The efficiency of a damper diode is largely determined by its internal voltage drop during conduction. The 17BW3 exhibits a low internal resistance, resulting in a low instantaneous voltage drop:

- **Tube Voltage Drop (Instantaneous):** 32 V, measured at an instantaneous plate current of 350 mA.

Technical Summary

The **17BW3** is a duodecar-type, half-wave vacuum rectifier designed specifically for television horizontal-deflection damper service. Operating with a **16.8 V, 0.6 A** heater, it features a controlled 11-second warm-up time. It is capable of handling peak inverse voltages up to **5000 V** and peak currents up to **1100 mA**, with a maximum plate dissipation of **6.5 W**. Its low instantaneous voltage drop of **32 V** at **350 mA** ensures efficient operation in demanding deflection circuits.



SOURCE OPERATING CONDITIONS

1968 General Electric Co

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

1968 GENERAL ELECTRIC CO

Section 1 · Rectifier

OTHER

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Warmup Time	11 s	—



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1975 RCA RC30

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

1975 RCA RC30

Section 1 · Rectifier

OTHER

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak inverse plate voltage	5000 V	DamperService
Peak plate current	1100 mA	DamperService
Average plate current	175 mA	DamperService
Plate dissipation	6.5 W	DamperService

CHARACTERISTIC

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Tube voltage drop	32 V	PlateCurrent=350mA
Heater warm-up time	11 s	Average

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode-to-heater/plate capacitance	8.5 pF	Approximate
Plate-to-cathode/heater capacitance	6 pF	Approximate
Heater-to-cathode capacitance	3.8 pF	Approximate