



ELECTRONIC TUBE REFERENCE

17BZ3

Rectifier - Damper Diode electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

RECTIFIER

Half-wave vacuum rectifier intended for television horizontal-deflection damper service, providing energy-recovery rectification in the line-scan circuit.

GENERAL CHARACTERISTICS

BASE DESIGNATION	12GA	BASE PINS	12
NOMINAL HEATER	16.8 V / 450 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Rectifier	
MAXIMUM PLATE DISSIPATION	6.6 W
PEAK INVERSE VOLTAGE	5000 V
NOMINAL OUTPUT CURRENT	200 mA
PEAK FORWARD CURRENT	1.2 A
FORWARD VOLTAGE DROP	26 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>	

17BZ3 — Half-Wave Vacuum Rectifier and Damper Diode

The **17BZ3** is a heater-cathode half-wave vacuum rectifier designed specifically for use as a damper tube in the horizontal-deflection circuits of color and black-and-white television receivers. It is electrically

identical to the [6BE3](#), [6BZ3](#), and [12BE3](#) vacuum tubes, differing only in its heater voltage and current ratings.

Mechanical Construction and Physical Dimensions

The 17BZ3 is constructed using a glass envelope with a 12-pin base, utilizing either a **Duodecar** or a **Compactron T-9** configuration. The tube requires a standard 12-contact socket (such as a duodecar 12-contact socket or a button 12-pin E12-70 base).

For the Compactron T-9 construction, the physical dimensions are as follows:

- **Maximum Overall Height:** 2.875 inches
- **Maximum Seated Height:** 2.500 inches
- **Maximum Diameter:** 1.188 inches

The physical outline of the tube is designated as Section 8D or 9-60 depending on the manufacturing standard. The tube is designed to withstand the high thermal and electrical stresses associated with television horizontal-deflection systems.

Heater and Interelectrode Capacitances

The 17BZ3 features an indirectly heated, coated unipotential cathode. The heater is designed for operation in series or parallel heater chains, with a controlled warm-up time to minimize voltage imbalances in series-connected strings.

Parameter	Value
Heater Voltage (AC or DC)	16.8 V
Heater Current	0.46 A
Average Heater Warm-up Time	11 s

Direct Interelectrode Capacitances

The approximate direct interelectrode capacitances of the 17BZ3, measured without an external shield, are:

- **Plate to Cathode and Heater:** 10 pF
- **Cathode to Heater and Plate:** 8 pF
- **Heater to Cathode:** 3.4 pF

Pinout and Basing Configurations

The 17BZ3 has been documented with three distinct pinout configurations depending on the specific basing standard (such as 12GA or 12FX) and envelope style.

12GA Basing Configuration (Variant A)

In this configuration, the heater is connected to pins 1 and 12, and the plate is connected to pins 5 and 10:

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

12GA Basing Configuration (Variant B)

In this alternative 12GA configuration, the heater is connected to pins 4 and 12, and the plate is connected to pin 10:

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

12FX Basing Configuration (Compactron)

In the 12FX basing configuration, the heater is connected to pins 1 and 12, and the plate is connected to pins 4 and 10:

- **Pin 1:** Heater (H)
- **Pin 2:** No Connection (NC)
- **Pin 3:** No Connection (NC)

- **Pin 4:** Plate (P)
- **Pin 5:** Internal Connection (IC)
- **Pin 6:** Internal Connection (IC)
- **Pin 7:** 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) must not be used for circuit tie points, as they may be connected to internal tube structures or used during manufacturing.

Damper Service Ratings and Operating Characteristics

The ratings of the 17BZ3 are established under the Design-Maximum system. These ratings represent the limits within which the tube can be operated safely and reliably in a standard 525-line, 30-frame television scanning system.

Design-Maximum Ratings (Damper Service)

- **Peak Inverse Plate Voltage:** 5000 V (The pulse duration must not exceed 15% of a horizontal scanning cycle, or a maximum of 10 μ s)
- **Peak Plate Current:** 1200 mA
- **Average Plate Current:** 200 mA
- **Plate Dissipation:** 6.5 W
- **Peak Heater-Cathode Voltage:**
 - **Heater Positive (with respect to cathode):** +300 V
 - **Heater Negative (with respect to cathode):** -5000 V
- **Average Heater-Cathode Voltage:**
 - **Heater Positive (with respect to cathode):** +100 V
 - **Heater Negative (with respect to cathode):** -900 V

Instantaneous Electrical Characteristics

- **Tube Voltage Drop:** 25 V (measured at a direct current plate current of 350 mA)

The low tube voltage drop of 25 V at 350 mA indicates high efficiency during the conduction phase of the horizontal deflection cycle, minimizing power loss and heat generation within the tube envelope.

Technical Summary

The **17BZ3** is a specialized **Duodecar/Compactron half-wave vacuum rectifier** designed for high-stress damper service in television horizontal-deflection circuits. It features a **16.8 V, 0.46 A heater** with

a controlled **11-second warm-up time**, making it suitable for series-string heater designs. The tube is capable of handling a **peak inverse plate voltage of 5000 V** and a **peak plate current of 1200 mA**, with a maximum **plate dissipation of 6.5 W**. Its low forward voltage drop of **25 V at 350 mA** ensures efficient operation. Depending on the specific envelope and socketing standard, the tube is configured with either a **12GA** or **12FX** basing arrangement, utilizing a 12-pin button or duodecar base.



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	1200 mA	DamperService
Average plate current	200 mA	DamperService
Plate dissipation	6.6 W	DamperService

CHARACTERISTIC

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Tube voltage drop	26 V	PlateCurrent=350mA
Heater warm-up time	11 s	Average

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate-to-cathode/heater capacitance	10 pF	Approximate
Cathode-to-heater/plate capacitance	8 pF	Approximate
Heater-to-cathode capacitance	3.4 pF	Approximate

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