



ELECTRONIC TUBE REFERENCE

17H3

Diode (NOT rectifier) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
DIODE

Diode documented by General Electric; the available source establishes the device identity but does not provide enough clear application evidence for a narrower functional classification.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	9
NOMINAL HEATER	17.5 V / 300 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Diode	
MAXIMUM CATHODE CURRENT	75 mA

17H3 — Miniature Damper Diode

The **17H3** is a miniature heater-cathode type diode designed specifically for use as a damping diode in the horizontal-deflection circuit of compact, 300-milliampere series-string television receivers. It features a small physical footprint, low power requirements, and a controlled heater warm-up characteristic. Operation of the 17H3 as a power rectifier is not recommended.

Mechanical Specifications and Pinout

The 17H3 is constructed in a T-6 1/2 glass envelope with an E9-1 small button 9-pin base. The tube can be mounted and operated in any position.

The physical dimensions of the device are:

- **Maximum Diameter:** 7/8 inch

- **Maximum Overall Length:** 2 5/8 inches
- **Seated Height:** 2 3/16 inches $\pm$ 3/32 inch (conforming to RETMA 6-3)

The terminal connections are arranged according to the RETMA 9FK pinout configuration, viewed from the bottom of the tube:

Pin Number	Connection
Pin 1	Cathode
Pin 2	No Connection — Do Not Use
Pin 3	Plate
Pin 4	Heater
Pin 5	Heater
Pin 6	No Connection — Do Not Use
Pin 7	No Connection — Do Not Use
Pin 8	Plate
Pin 9	No Connection — Do Not Use

Pins designated as "No Connection" must not be utilized as tie points for external circuit wiring.

Heater and Cathode Characteristics

The 17H3 incorporates a coated unipotential cathode. The heater is designed for series-string operation with a controlled warm-up characteristic to minimize voltage surges across other tubes in the string during start-up.

- **Heater Voltage (AC or DC):** 17.5 V
- **Heater Current:** 0.3 $\pm$ 6% A
- **Heater Warm-up Time:** 11 seconds

The heater warm-up time is defined as the time required for the heater voltage to reach 80% of its rated value (14.0 V) when a voltage equal to four times the rated heater voltage (70.0 V) is applied to the heater in series with an external resistance. This series resistance is calculated as three times the rated heater voltage divided by the rated current:

$$\text{Series Resistance} = \frac{3 \times 17.5 \text{ V}}{0.3 \text{ A}} = 175 \Omega$$

Using the nominal heater voltage of 17.5 V and nominal heater current of 0.3 A, the nominal heater power dissipation is calculated as:

$$\text{Heater Power} = 17.5 \text{ V} \times 0.3 \text{ A} = 5.25 \text{ W}$$

Direct Interelectrode Capacitances

The direct interelectrode capacitances of the 17H3, measured without an external shield, are:

- **Cathode to Plate and Heater:** 5.5 μF
- **Plate to Cathode and Heater:** 4.0 μF
- **Heater to Cathode:** 2.0 μF

TV Damper Service Ratings

The ratings for the 17H3 are specified under the Design-Maximum system. These ratings are established for operation in a standard 525-line, 30-frame television system, where the voltage pulse duty cycle does not exceed 15% of one scanning cycle.

Parameter	Design-Maximum Rating
Peak Inverse Plate Voltage	2000 V
Plate Dissipation	3.0 W
Steady-State Peak Plate Current	450 mA
DC Output Current	75 mA

Heater-Cathode Voltage Limits

Because the cathode in a horizontal-deflection damping circuit is subjected to high-voltage pulses, the heater-cathode insulation is rated to withstand significant potential differences. These limits depend on the polarity of the heater relative to the cathode:

- **Heater Positive with Respect to Cathode:**
 - Maximum DC Component: 100 V
 - Maximum Total DC and Peak Voltage: 200 V
- **Heater Negative with Respect to Cathode:**
 - Maximum DC Component: 500 V
 - Maximum Total DC and Peak Voltage: 2000 V

Electrical Characteristics and Plate Behavior

Under typical operating conditions, the tube exhibits a low internal voltage drop:

- **Tube Voltage Drop:** 22 V at a direct plate current (I_b) of 140 mA DC

Analysis of Plate Characteristics

The average plate characteristics of the 17H3, measured at the rated heater voltage, demonstrate a distinct non-linear to linear transition:

- **Low-Voltage Region (0 V to 15 V):** The plate current (I_b) rises non-linearly from 0 mA to approximately 75 mA.
- **High-Current Region (above 15 V):** The relationship between plate voltage and plate current transitions into a highly linear behavior, reaching a peak current of 450 mA at approximately 48 V of plate voltage. This linear characteristic at higher currents ensures efficient damping action with minimal distortion in the horizontal-deflection waveform.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1968 General Electric Co

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

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Section 1 · Diode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Warmup Time	11 s	—
Peak Inverse Plate Voltage	2000 V	TVDamperService
Steady State Peak Plate Current	450 mA	TVDamperService
DC Output Current	75 mA	TVDamperService

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