

ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA

12GK17

1 SECTION
CONSTRUCTION
RECTIFIER

Rectifier - Damper Diode electronic tube

High-perveance half-wave vacuum rectifier designed for television damper service, with controlled heater warm-up for series-string receiver operation.

GENERAL CHARACTERISTICS

BASE DESIGNATION	B5-85	BASE PINS	8
NOMINAL HEATER	12.6 V / 600 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Rectifier	
PEAK INVERSE VOLTAGE	4500 V
NOMINAL OUTPUT CURRENT	175 mA
PEAK FORWARD CURRENT	1.05 A
WARM-UP TIME	11 s

12GK17 — High-Perviance Half-Wave Vacuum Rectifier

The **12GK17** (also designated as the **12G-K17**) is a high-perviance, half-wave vacuum rectifier tube designed specifically for use as a damper diode in transformer-less television receivers. Featuring an octal base and a rugged construction capable of withstanding high peak voltages, the tube is optimized to handle the demanding electrical stresses encountered in horizontal deflection circuits.

Physical Construction and Pinout

The 12GK17 is constructed in a T9 glass bulb envelope. It has a maximum overall length of 3-13/16 inches, a maximum seated height of 3-1/4 inches, and a maximum diameter of 1-9/32 inches. The tube is designed to be versatile in physical installation, permitting mounting in any position.

The device utilizes a **B5-85 Octal** base. The pin connections, viewed from the bottom of the base, are assigned as follows:

Pin Number	Connection	Description
1	NC	No Connection (Do Not Use)
2	NC	No Connection
3	K	Cathode
4	NC	No Connection
5	P	Plate
6	NC	No Connection
7	H	Heater
8	H	Heater

A critical installation requirement is that socket terminals 1, 2, 4, and 6 must not be used as tie points for auxiliary circuit wiring. This restriction is necessary to prevent voltage breakdown or unwanted coupling, given the high peak voltages present on adjacent active pins during operation.

Heater Characteristics

The 12GK17 is designed for use in series-string heater circuits typical of transformer-less television receivers. It features a controlled warm-up time to ensure reliable operation and minimize thermal stress when power is applied to the series string.

- **Heater Voltage:** 12.6 V
- **Heater Current:** 0.6 A
- **Heater Warm-up Time:** 11 seconds
- **Calculated Heater Power:** 7.56 W (calculated as 12.6 V multiplied by 0.6 A)

The 11-second warm-up characteristic is coordinated with other tubes in the receiver's heater string to prevent transient overvoltage conditions across individual heaters during the warm-up phase.

Maximum Ratings and Damper Service Limits

The maximum ratings of the 12GK17 are defined under the Design Center system and are specifically rated for operation in a 525-line, 30-frame television system. Damper service subjects the tube to high-

voltage pulses during horizontal retrace, requiring stringent limits on peak inverse voltage and heater-to-cathode potential.

Parameter	Maximum Rating	Special Conditions / Restrictions
Peak Inverse Plate Voltage	4,500 V	Pulse duration must not exceed 15% of one horizontal scanning cycle. This is an absolute limit.
Peak Plate Current	1,050 mA	
D.C. Plate Current	175 mA	
Peak Heater-Cathode Voltage (Heater Negative)	4,500 V	The D.C. component must not exceed 900 V.
Peak Heater-Cathode Voltage (Heater Positive)	300 V	The D.C. component must not exceed 100 V.

The peak inverse plate voltage limit of 4,500 V is an absolute maximum value that must never be exceeded under any circumstances, even transiently beyond the specified 15% duty cycle of the horizontal scanning period. Similarly, the high heater-to-cathode voltage rating (4,500 V peak when the heater is negative with respect to the cathode) allows the cathode to swing to high pulse potentials relative to the heater, which is typical in booster/damper circuits where the heater is grounded or kept near chassis potential.

Average Plate Characteristics

The high-perviance design of the 12GK17 is characterized by its ability to conduct high currents with a relatively low voltage drop across the tube. This minimizes power dissipation within the tube and improves the efficiency of the horizontal deflection system.

The relationship between plate voltage and plate current is illustrated by the following typical operating points derived from the average plate characteristics:

- At a plate voltage of **10 V**, the plate current is approximately **100 mA**.
- At a plate voltage of **20 V**, the plate current rises to approximately **300 mA**.
- At a plate voltage of **30 V**, the plate current is approximately **500 mA**.
- At a plate voltage of **40 V**, the plate current reaches approximately **750 mA**.
- At a plate voltage of **50 V**, the plate current is approximately **1,000 mA** (1.0 A).
- The maximum rated peak plate current of **1,050 mA** is achieved at a plate voltage drop of approximately **52 V**.

This steep conduction curve demonstrates the low internal resistance of the diode during its conduction cycle, which is essential for maintaining linear deflection and recovering energy from the yoke during the horizontal scan.

Technical Summary

The **12GK17** is a specialized **octal-based, high-perviance half-wave vacuum rectifier** engineered for damper service in transformer-less television receivers. Operating with a **12.6 V, 0.6 A** heater with an **11-second controlled warm-up time**, it is optimized for series-string integration. The tube is capable of handling peak inverse voltages up to **4,500 V** and peak plate currents up to **1,050 mA**, with a maximum DC plate current rating of **175 mA**. Its physical construction in a **T9 bulb** allows mounting in any position, provided that socket pins 1, 2, 4, and 6 are kept free of external connections.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1963 Hitachi

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

1963 HITACHI

Section 1 · Rectifier

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Warm-up Time	11 s	—

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