



ELECTRONIC TUBE REFERENCE

12CK3

Rectifier - Damper Diode electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
RECTIFIER

Half-wave vacuum rectifier designed for black-and-white television horizontal-deflection damper service, using a 12.6-volt heater.

GENERAL CHARACTERISTICS

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

SECTION RATINGS

SECTION 1 Rectifier

No fixed ratings recorded.

Supplied sheet explicitly states this is the same as 6CK3 except for heater characteristics. Parent electrical table was not present in the currently available local corpus, so no unsupported promoted values were invented.

12CK3 — Half-Wave Vacuum Rectifier

Overview

The **12CK3** is a Novar-type half-wave vacuum rectifier designed specifically for use as a damper tube in the horizontal-deflection circuits of black-and-white television receivers. It features a heater-cathode diode structure housed in a T-9 glass envelope with a 9-pin button base. The 12CK3 is electrically identical to the [6CK3](#), [17CK3](#), and [25CK3](#) damper tubes, differing only in its heater ratings and warm-up characteristics.

Construction, Physical Dimensions, and Basing

The 12CK3 utilizes a Novar T-9 construction with an E9-89 Novar button 9-pin base, which features an exhaust tip on the base. The physical dimensions of the tube are as follows:

- **Maximum Diameter:** 1.188 inches
- **Maximum Seated Height:** 2.625 inches
- **Maximum Overall Height:** 3.005 inches

Pinout and Socketing

The tube uses the **9HP** basing arrangement. It requires a standard Novar 9-contact socket.

The pin connections for the 9HP basing configuration are:

- **Pin 1:** Internal Connection (IC) — Do not use as a tie point
- **Pin 2:** Plate (P)
- **Pin 3:** Internal Connection (IC) — Do not use as a tie point
- **Pin 4:** Heater (H)
- **Pin 5:** Heater (H)
- **Pin 6:** Internal Connection (IC) — Do not use as a tie point
- **Pin 7:** Plate (P)
- **Pin 8:** Internal Connection (IC) — Do not use as a tie point
- **Pin 9:** Cathode (K)

To minimize the possibility of electrical arc-over and to reduce leakage currents, it is recommended that socket tabs corresponding to the unused pins (terminals 1, 3, 6, and 8) be removed. Additionally, because the 12CK3 is a power-handling device, adequate ventilation must be provided in the equipment layout to prevent overheating.

Heater Characteristics

The 12CK3 is designed with a controlled heater warm-up time, making it suitable for series-string heater arrangements. Its heater characteristics differ from its sister tubes (such as the 6.3-volt [6CK3](#)) to accommodate different power supply configurations:

Parameter	Value
Heater Voltage (AC or DC)	12.6 V
Heater Current	0.600 ± 0.040 A (600 mA)
Average Heater Warm-up Time	11 seconds

For comparison, other tubes in this family share the same physical construction and electrical ratings but operate at different heater points: the [6CK3](#) operates at 6.3 V (1.2 A), the [17CK3](#) operates at 16.8 V (0.45 A), and the [25CK3](#) operates at 25.2 V (0.3 A).

Electrical Ratings and Damper Service

The 12CK3 is rated under the Design-Maximum Rating System for operation in television receivers utilizing a standard 525-line, 30-frame system.

Direct Interelectrode Capacitances

The approximate unshielded interelectrode capacitances of the tube are:

- **Heater to Cathode:** 3.0 pF
- **Plate to Cathode and Heater:** 6.5 pF
- **Cathode to Plate and Heater:** 9.0 pF

Maximum Ratings (Design-Maximum Values)

When operated in television damper service, the following maximum limits must be observed:

- **Peak Inverse Plate Voltage:** 5200 V (with a maximum pulse duration not exceeding 15% of a horizontal scanning cycle, or 10 microseconds)
- **Steady State Peak Plate Current:** 1200 mA
- **DC Plate Current (Average):** 250 mA
- **Plate Dissipation:** 6.5 W
- **Bulb Temperature at Hottest Point:** 220 °C

Heater-Cathode Voltage Limits

Because the damper diode cathode experiences high-voltage pulses during horizontal retrace, the heater-to-cathode insulation is heavily stressed. The maximum ratings are specified for both heater-negative and heater-positive conditions:

- **Heater Negative with Respect to Cathode:**
 - **DC Limit:** 900 V
 - **Total DC and Peak (Pulse):** 5200 V (with peak pulse value up to -5200 V)
- **Heater Positive with Respect to Cathode:**
 - **DC Limit:** 100 V
 - **Total DC and Peak:** 300 V (with peak pulse value up to +800 V)

Tube Voltage Drop

Under typical operating conditions, the instantaneous tube voltage drop is **16 V** when the plate current is at **350 mA**.

Technical Summary

The **12CK3** is a Novar-based, indirectly heated half-wave vacuum rectifier optimized for damper service in black-and-white television receivers. Operating with a **12.6 V, 0.6 A** heater with an 11-second warm-up

time, it provides robust high-voltage performance, including a peak inverse plate voltage rating of **5200 V** and a peak plate current capability of **1200 mA**. Its physical design utilizes a T-9 bulb and a 9HP basing scheme, requiring careful socket implementation and adequate ventilation to ensure reliable operation under high-temperature and high-voltage conditions.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

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

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Section 1 · Rectifier

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Current – published value 1	0.6	Published value from the filename-designated RCA datasheet block; multiple numbers on one row represent separate limits or heater arrangements.
Current – published value 2	0.04	Published value from the filename-designated RCA datasheet block; multiple numbers on one row represent separate limits or heater arrangements.
Voltage	12.6 V	Published value from the filename-designated RCA datasheet block; multiple numbers on one row represent separate limits or heater arrangements.
Heater voltage	12.6 V	Nominal heater rating
Heater current	600 mA	Nominal heater rating

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