

ELECTRONIC TUBE REFERENCE

17DM4

Rectifier - Damper Diode electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
RECTIFIER

Television damper diode designed for horizontal-deflection energy-recovery service, with high-voltage rectifier characteristics appropriate to line-scan circuits.

GENERAL CHARACTERISTICS

BASE DESIGNATION	4CG	BASE PINS	9
NOMINAL HEATER	16.8 V / 300 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

4CG - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1 – IC	–	–	IC
PIN2 – IC	–	–	IC
PIN3 – K	A	K – Cathode	CONNECTED
PIN5 – P	A	P – Plate (Anode)	CONNECTED
PIN7 – H	–	H – Heater	CONNECTED
PIN8 – H	–	H – Heater	CONNECTED

SECTION RATINGS

SECTION1 Rectifier	
MAXIMUM PLATE DISSIPATION	6.5 W
PEAK INVERSE VOLTAGE	6000 V
NOMINAL OUTPUT CURRENT	175 mA
PEAK FORWARD CURRENT	1.1 A
FORWARD VOLTAGE DROP	35 V
WARM-UP TIME	11 s
<i>Published ratings/characteristics promoted where applicable; additional operating data retained in TUBE_SECTION_PARAMETER.</i>	

17DM4 — Half-Wave Vacuum Rectifier

The **17DM4** is an indirectly heated, half-wave vacuum rectifier designed specifically for service as a damper diode in the horizontal-deflection circuits of black-and-white television receivers. It features a coated unipotential cathode and is housed in a glass envelope with an octal base. The tube is electrically identical to the **6DM4** and **12DM4** except for its heater characteristics and heater warm-up time.

Mechanical Construction and Pinout

The 17DM4 is constructed using a **T-9 glass bulb** with a JEDEC 9-44 outline. It utilizes a short intermediate-shell, 5-pin octal base with external barriers, designated as the JEDEC B5-85 (or 85-85) base. The tube can be mounted and operated in any physical position.

Physical Dimensions

- **Maximum Diameter:** 1.188 inches
- **Maximum Bulb Height:** 3.250 inches
- **Maximum Overall Height:** 3.812 inches

Pin Connections and Socket Considerations

The 17DM4 uses the **JEDEC 4CG** bottom-view basing diagram. The pin assignments are as follows:

Pin Number	Connection
Pin 1	Omitted (Internal Connection stem lead)
Pin 2	IC (Internal Connection)
Pin 3	K (Cathode)
Pin 4	Omitted

Pin Number	Connection
Pin 5	P (Plate)
Pin 6	Omitted (Internal Connection stem lead)
Pin 7	H (Heater)
Pin 8	H (Heater)

Pins are physically omitted from the base in positions 1, 4, and 6. However, positions 1 and 6 contain internal connections that terminate in stem leads inside the envelope. Position 2 has a physical base pin that may also connect to an internal stem lead. To prevent high-voltage breakdown between adjacent pins in television damper service, the socket clips corresponding to positions 1, 2, 4, and 6 must be removed from the tube socket.

Heater Characteristics and Ratings

The heater of the 17DM4 is designed for series-string current-operated heater chains. It features a controlled warm-up time to ensure reliable operation in series configurations.

Heater Parameter	Value
Average Heater Voltage	16.8 V
Average Heater Current	450 mA (0.45 A)
Heater Supply Limits (Current Operation)	450 $\pm$ 27 mA
Average Heater Warm-up Time	11 seconds

The average heater warm-up time of 11 seconds is specifically defined under standardized test conditions: the time required for the heater voltage to reach 80% of its rated value when four times the rated heater voltage (67.2 V) is applied in series with an external resistance equal to three times the nominal heater operating resistance.

Heater-Cathode Voltage Limits

Because the cathode of a damper diode operates at high pulse potentials relative to ground, the heater-to-cathode insulation must withstand severe electrical stress. The design maximum ratings (under EIA Standard RS-239) specify:

- **Heater Negative with Respect to Cathode:** 5000 V peak maximum, with the DC component not exceeding 900 V.
- **Heater Positive with Respect to Cathode:** 300 V peak maximum, with the DC component not exceeding 100 V.

Direct Interelectrode Capacitances

Measured without an external shield, the approximate direct interelectrode capacitances of the 17DM4 are:

- **Plate to Heater and Cathode:** 8.5 pF
- **Cathode to Heater and Plate:** 11.5 pF
- **Heater to Cathode:** 4.0 pF

Electrical Characteristics and Plate Curves

The 17DM4 exhibits a low internal voltage drop, which is critical for maintaining efficiency in horizontal-deflection damping applications. Under typical operating conditions, the tube voltage drop is approximately **35 V** at a forward plate current of **400 mA**.

The average plate characteristics under rated heater conditions demonstrate the following relationship between plate voltage and plate current:

- **At 10 V Plate Voltage:** ~75 mA
- **At 20 V Plate Voltage:** ~200 mA
- **At 35 V Plate Voltage:** ~400 mA
- **At 50 V Plate Voltage:** ~660 mA
- **At 70 V Plate Voltage:** ~1040 mA

The plate characteristic curve is nearly linear for plate voltages above 20 V, indicating stable internal resistance during the conduction cycle.

Maximum Ratings for Damper Service

The maximum ratings of the 17DM4 are defined under the Design Maximum System (EIA Standard RS-239) for television damper service:

- **Peak Inverse Plate Voltage:** 5000 V
- **Peak Plate Current:** 1100 mA
- **DC Plate Current:** 175 mA
- **Plate Dissipation:** 6.5 W

Pulse Duty Cycle Constraints

The peak inverse plate voltage rating of 5000 V is specified for operation in a standard 525-line, 30-frame television system (FCC standards). Under these operating conditions, the duty cycle of the horizontal voltage pulse must not exceed 15% of one scanning cycle. For a standard horizontal scanning line, this 15% duty cycle corresponds to a maximum pulse duration of **10 microseconds**.

Technical Summary

The **17DM4** is a specialized **half-wave vacuum rectifier** designed for television horizontal damper service. It features a **16.8 V, 450 mA** heater with a controlled **11-second warm-up time** for series-string applications. Utilizing a **T-9 glass envelope** and a **5-pin octal base (JEDEC 4CG)**, it requires the removal of unused socket clips to prevent high-voltage breakdown. With a peak inverse voltage rating of **5000 V**, a peak current capability of **1100 mA**, and a low typical voltage drop of **35 V at 400 mA**, the 17DM4 provides robust and efficient damping performance in black-and-white television receivers.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1961 Tung Sol

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

1961 TUNG SOL

Section 1 · Rectifier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	16.8 V	Nominal
Heater current	300 mA	Nominal



SOURCE OPERATING CONDITIONS

1965 Sylvania Electronic Tubes Vol3

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

1965 SYLVANIA ELECTRONIC TUBES VOL3

Section 1 · Rectifier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak inverse voltage	5000 V	—
Peak plate current	1100 mA	—
DC plate current	175 mA	—



1966 Tung Sol Electronic Tubes 3 of 4

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

1966 TUNG SOL ELECTRONIC TUBES 3 OF 4
Section 1 · Rectifier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak inverse plate voltage	5000 V	DamperService
Peak plate current	1100 mA	DamperService
DC output current	175 mA	DamperService
PLATE TO HEATER AND CATHODE	8.5 pF	Published datasheet
CATHODE TO HEATER AND PLATE	11.5 pF	Published datasheet
HEATER TO CATHODE	4 pF	Published datasheet
DESIGN MAXIMUM VARIATIONS - SEE EIA STANDARDS	9 mA	Published datasheet
AVERAGE CHARACTERISTICS	45 V	Published datasheet
CURRENT OPERATION	450127 mA	Published datasheet
HEATER POSITIVE WITH RESPECT TO CATHODE	300 V	Published datasheet
HEATER WARM-UP TIME (AVERAGE)	11 s	Published datasheet
DESIGN MAXIMUM VALUES - SEE EIA STANDARDS	9 mA	Published datasheet
PLATE DISSIPATION	6.5 W	Published datasheet
THE DC COMPONENT MUST NOT EXCEED	100 V	Published datasheet

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Tube voltage drop	35 V	PlateCurrent=400mA
PEAK PLATE CURRENT	1100 mA	Published datasheet
DC PLATE CURRENT	175 mA	Published datasheet

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate to heater and cathode capacitance	8.5 pF	—
Cathode to heater and plate capacitance	11.5 pF	—
Heater to cathode capacitance	4 pF	—