ELECTRONIC TUBE REFERENCE

19H1

Rectifier - Half Wave electronic tube

CONSOLIDATED TECHNICAL DATA
1 SECTION
CONSTRUCTION
RECTIFIER

High-voltage industrial half-wave rectifier for substantial power-supply service. Its heavy filament and multi-kilovolt capability provide useful current in demanding professional DC supplies.

General characteristics

BASE DESIGNATION	_	**BASE PINS**	_
NOMINAL HEATER	4 V / 2 A	**PARALLEL HEATER**	_ / _
HEATING	Direct	**SERIES OPERATION**	Not specified
CATHODE ARRANGEMENT	Separate cathodes	**SECTION CONSTRUCTION**	Similar

Section ratings

SECTION1 Rectifier

MAXIMUM CATHODE CURRENT	75 mA
PEAK INVERSE VOLTAGE	17500 V
NOMINAL OUTPUT CURRENT	75 mA
PEAK FORWARD CURRENT	600 mA

19H1 — High Voltage Half-Wave Rectifier

The **19H1** (also designated as the **19.H.1**) is a directly heated, high-voltage half-wave rectifier tube designed for high-voltage power supply applications. It features a clear glass bulb, a standard top cap anode connection, and a 4-pin base.

Filament and Cathode Characteristics

The 19H1 is equipped with a directly heated cathode. The filament is designed to operate under the following nominal electrical conditions:

Parameter	Value
Filament Voltage (V_f)	4.0 V
Filament Current (I_f)	2.0 A
Calculated Filament Power	8.0 W

The filament supply must be capable of delivering the nominal current of 2.0 A at 4.0 V to ensure proper cathode emission and longevity.

Physical and Mechanical Specifications

The tube is constructed with a clear glass bulb and requires a specific mounting orientation. The physical dimensions and mechanical properties are detailed below:

- **Mounting Position:** Vertical only
- **Bulb Type:** Clear
- **Anode Connection:** B.V.A. Standard top cap
- **Base Type:** 4-pin base
- **Maximum Overall Length:** 210 mm
- **Maximum Seated Height:** 195 mm
- **Maximum Diameter:** 51 mm
- **Approximate Net Weight:** 5 oz
- **Approximate Packed Weight:** 14 oz

The vertical mounting position is a strict requirement for operation.

Pin Connections and Base Configuration

The 19H1 utilizes a 4-pin base in conjunction with a top cap for the anode connection. When viewed from the free end of the pins, the electrical connections are assigned as follows:

- **Pin 1:** No connection (-)
- **Pin 2:** No connection (-)
- **Pin 3:** Filament (f)
- **Pin 4:** Filament (f)
- **Top Cap:** Anode (A)

The separation of the high-voltage anode to the top cap minimizes the risk of arcing across the base pins.

Absolute Maximum Ratings

The ratings listed below are absolute maximum values, not design-center limits. Operating the tube beyond these limits may cause permanent damage or severely degrade performance.

Rating Parameter	Absolute Maximum Value
Maximum D.C. Output Current ($I_{a(av)max}$)	75 mA
Maximum Working Peak Inverse Voltage (P.I.V. max)	15.0 kV
Maximum No Load Peak Inverse Voltage (P.I.V. max)	17.5 kV
Maximum Peak Anode Current ($I_{a(pk)max}$)	600 mA
Maximum Reservoir Capacitor	0.5 uF
Minimum Limiting Resistor	2,500 ohms
H.T. Switching Delay Period	10 seconds

The maximum permissible RMS working anode voltage is dependent on the regulation of the power transformer. Circuit designers must ensure that under no-load conditions, the peak inverse voltage does not exceed the absolute limit of 17.5 kV. Additionally, a minimum limiting resistance of 2,500 ohms must be present in the anode circuit, and a high-tension (H.T.) switching delay of at least 10 seconds must be observed to protect the tube during startup.

Electrical Characteristics and Pulse Curves

The relationship between the anode voltage (V_a) and the resulting anode current (I_a) has been characterized using short-duration pulses to prevent thermal overload during testing. The average characteristic curve exhibits the following typical operating points:

- At an anode voltage of **40 V**, the anode current is approximately **25 mA**.
- At an anode voltage of **80 V**, the anode current rises to approximately **100 mA**.
- At an anode voltage of **120 V**, the anode current reaches approximately **200 mA**.
- At an anode voltage of **160 V**, the anode current is approximately **340 mA**.
- At an anode voltage of **200 V**, the anode current is approximately **480 mA**.
- At an anode voltage of **230 V**, the anode current reaches **600 mA**, which represents the absolute maximum peak anode current limit ($I_{a(pk)max}$).

These points illustrate the non-linear, low-impedance forward characteristic of the diode under pulsed conditions up to its maximum peak current rating.

SOURCE OPERATING CONDITIONS

1960 Mazda

SOURCE PDF

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

1960 MAZDA

Section 1 · Rectifier

CHARACTERISTICS

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
No-load peak inverse voltage	**17.5 kV**	—
Maximum reservoir capacitance	**0.5 uF**	—

TUBE TINKER

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