

ELECTRONIC TUBE REFERENCE

0Y4

Rectifier - Half Wave electronic tube

CONSOLIDATED TECHNICAL DATA
1 SECTION
CONSTRUCTION
RECTIFIER

Gas-filled half-wave rectifier with a starter anode for power supplies. It requires no conventional heater supply and is rated for approximately 300 V peak inverse voltage, 75 mA DC output, and 500 mA peak current.

GENERAL CHARACTERISTICS

BASE DESIGNATION	4BU	BASE PINS	4
NOMINAL HEATER	– / –	PARALLEL HEATER	– / –
HEATING	Indirect; cold cathode	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Rectifier	
PEAK INVERSE VOLTAGE	300 V
NOMINAL OUTPUT CURRENT	75 mA
PEAK FORWARD CURRENT	500 mA
Published handbook ratings and operating characteristics reviewed.	

0Y4 — Half-Wave Gas Rectifier

The **0Y4** (also designated as **0Y4-G**) is a cold-cathode, ionically heated, half-wave gas rectifier designed for power supply applications. It features a specialized starter anode that permits direct operation from standard 117-volt AC or DC power lines without requiring a filament heating transformer.

Overview and Operating Principle

Unlike conventional thermionic rectifiers that rely on a heated filament to emit electrons, the 0Y4 utilizes an **ionically heated** cold cathode. Conduction is initiated by gas ionization within the tube envelope. To facilitate reliable starting at line voltages, the tube incorporates an auxiliary starter anode. This design allows the 0Y4 to initiate conduction and operate directly from a 117-volt AC or DC line, making it highly useful in compact or transformerless power supply designs.

Because the cathode is ionically heated by the current flowing through the tube, a minimum current must be maintained during operation to keep the gas ionized. Consequently, the tube has a specified minimum DC output current rating alongside its maximum limits.

Physical Specifications and Basing

The 0Y4 is constructed with a glass envelope and is available in standard and "G" (glass shoulder) variants. The physical dimensions and mechanical features of the tube include:

- **Bulb Type:** MT-8
- **Base:** Small Wafer Octal 5-Pin
- **Maximum Diameter:** 1 5/16 inches
- **Maximum Seated Height:** 2 1/16 inches
- **Maximum Overall Length:** 2 5/8 inches
- **Mounting Position:** Any
- **Outline Drawing:** 8-1
- **Type Classification:** T-X

Pin Connections and Wiring Requirements

The 0Y4 uses the **4BU** base connection diagram. The pin assignments, viewed from the bottom of the base, are as follows:

Pin Number	Connection
Pin 1	Shell
Pin 2	None
Pin 3	Starter Anode
Pin 4	None
Pin 5	Plate
Pin 6	None
Pin 7	Filament
Pin 8	Filament

A critical wiring requirement for the 0Y4 is that **Pin 7 and Pin 8 must be connected together** externally. Additionally, circuit designers must avoid rapid intermittent operation, as it is undesirable for the longevity and stability of the gas tube.

Electrical Ratings and Operating Characteristics

The 0Y4 is rated for service as a half-wave rectifier operating into a condenser-input filter. Its electrical limits and typical operating parameters are strictly defined to ensure reliable ionization and prevent damage to the tube electrodes.

Absolute Maximum and Minimum Ratings

Parameter	Value	Unit
Maximum Inverse Peak Voltage	300	Volts
Maximum Peak Current	500	mA
Maximum DC Output Current	75	mA
Minimum DC Output Current	40	mA
Minimum Series Anode Resistance (for 117-Volt Line)	50	Ohms

The minimum series anode resistance of 50 ohms is mandatory when operating directly from a 117-volt line to limit the peak inrush current and protect the cold cathode from excessive bombardment. The minimum DC output current of 40 mA is required to maintain stable gas ionization; if the current drops below this threshold, the plasma discharge may extinguish.

Conduction and Starting Characteristics

During normal conduction, the voltage drop across the tube is relatively constant and independent of current, which is typical of gas-discharge devices:

- **Approximate Tube Drop:** 12 Volts
- **Maximum DC Starting Voltage:** 95 Volts

The maximum DC starting voltage of 95 volts is specified under a specific starter anode circuit configuration. For reliable starting, the starter anode must be connected to the main anode through a **10-megohm resistor** by-passed with a **0.002 μ F condenser**. This high-resistance path allows a small auxiliary discharge to initiate between the starter anode and the cathode, which then transitions into the main arc discharge between the plate and the cathode once the ionization threshold is reached.

Technical Summary

The **0Y4** and **0Y4-G** represent a specialized class of gas-filled rectifiers that eliminate the need for filament power. By utilizing an ionically heated cathode and a starter anode, the tube can start and run

directly from a 117-volt line. Operating within its limits—specifically maintaining a DC output current between 40 mA and 75 mA, ensuring a minimum of 50 ohms series anode resistance, and utilizing the recommended starter anode network—the 0Y4 provides efficient half-wave rectification with a low, stable tube drop of approximately 12 volts.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

195X General Electric Essential Characteristics

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

195X GENERAL ELECTRIC ESSENTIAL CHARACTERISTICS

Section 1 · Rectifier

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DC output current	75 mA	RectifierService
Peak inverse voltage	300 V	RectifierService
Peak current	500 mA	RectifierService
Maximum starting voltage	95 V	GasRectifierService

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Minimum DC output current	40 mA	GasRectifierService

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

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DC Starting Voltage	95 V	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DCOutputCurrentMaximum	75 mA	—

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