



ELECTRONIC TUBE REFERENCE

117N7GT

Power - Beam (NOT sweep) electronic tube

CONSOLIDATED TECHNICAL DATA

2 SECTIONS

CONSTRUCTION

BEAMPOWER-RECTIFIER

117 V combination tube containing a half-wave rectifier and beam-power amplifier, intended for transformerless equipment with the power section providing Class-A audio output.

GENERAL CHARACTERISTICS

BASE DESIGNATION	8AV	BASE PINS	8
NOMINAL HEATER	117 V / 90 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Dissimilar

SECTION RATINGS

SECTION1 Rectifier	
PEAK INVERSE VOLTAGE	350 V
NOMINAL OUTPUT CURRENT	75 mA
PEAK FORWARD CURRENT	450 mA
FORWARD VOLTAGE DROP	6 V
MAXIMUM HEATER-CATHODE VOLTAGE	175 V
<i>Published handbook ratings and operating characteristics reviewed.</i>	

SECTION2 Beam Power	
PLATE RESISTANCE	16000 Ω
TRANSCONDUCTANCE	0.007 S
MAXIMUM PLATE VOLTAGE	117 V
MAXIMUM SCREEN VOLTAGE	117 V
MAXIMUM PLATE DISSIPATION	5.5 W
MAXIMUM SCREEN DISSIPATION	1 W
<i>Published handbook ratings and operating characteristics reviewed.</i>	

117N7GT — Combined Half-Wave Rectifier and Beam Power Amplifier

The **117N7GT** (also written as **117N7-GT**) is a multi-unit vacuum tube containing a half-wave rectifier and a beam power amplifier within a single glass envelope. It is specifically designed with a high-voltage heater for direct connection across a 117-volt AC or DC power line, eliminating the need for a power transformer or series dropping resistor in compact line-operated equipment.

Physical Construction and Pinout

The 117N7GT is constructed in a T-9 glass bulb with an intermediate shell 8-pin octal base. The tube features coated unipotential cathodes and is designed to operate in any mounting position.

The physical dimensions of the device are:

- **Maximum overall length:** 3 7/16 inches
- **Maximum seated height:** 2 7/8 inches
- **Maximum diameter:** 1 3/16 inches

The base connections follow the **8AV** pinout configuration, viewed from the bottom of the tube:

- **Pin 1:** No Connection (NC)
- **Pin 2:** Heater (H)
- **Pin 3:** Plate, Beam Power Amplifier (P_A)
- **Pin 4:** Screen Grid, Beam Power Amplifier (G_2)
- **Pin 5:** Control Grid, Beam Power Amplifier (G_1)
- **Pin 6:** Plate, Rectifier (P_R)
- **Pin 7:** Heater (H)
- **Pin 8:** Common Cathode (K_R and K_A internally connected)

Both the rectifier cathode (K_R) and the beam power amplifier cathode (K_A) share the connection at Pin 8.

Heater and Rectifier Unit Ratings

The heater is designed to operate directly from standard mains voltages:

- **Heater Voltage (AC or DC):** 117 Volts
- **Heater Current:** 0.09 Ampere

The rectifier unit is a half-wave high-vacuum rectifier. Its maximum ratings are interpreted according to the RMA Standard M8-210:

- **Maximum Peak Inverse Plate Voltage:** 350 Volts
- **Maximum Peak Plate Current:** 450 mA
- **Maximum DC Heater-Cathode Potential:** 175 Volts
- **Tube Voltage Drop (at 150 mA DC):** 16 Volts

When used with a condenser-input filter, the rectifier is subject to the following operating limits:

- **Maximum AC Plate Voltage (RMS):** 117 Volts
- **Maximum DC Output Current:** 75 mA
- **Minimum Total Effective Plate Supply Impedance:** 15 Ohms

If a filter-input condenser larger than 40 μF is employed, additional plate-supply impedance must be added to the circuit to limit the peak plate current to the rated 450 mA maximum.

Beam Power Amplifier Performance and Operating Points

The beam power amplifier section is designed for Class A1 audio power amplification.

Maximum Ratings (RMA Standard M8-210)

- **Maximum Plate Voltage:** 117 Volts
- **Maximum Screen Voltage:** 117 Volts
- **Maximum Plate Dissipation:** 5.5 Watts
- **Maximum Screen Dissipation:** 1.0 Watt

Typical Operating Conditions and Characteristics

Under typical Class A1 operating conditions, the amplifier unit provides the following electrical characteristics:

- **Plate Voltage:** 100 Volts
- **Screen Voltage:** 100 Volts
- **Grid Voltage:** -6 Volts
- **Peak AF Grid Voltage:** 6 Volts
- **Zero-Signal Plate Current:** 51 mA
- **Zero-Signal Screen Current:** 5 mA

- **Plate Resistance (Approximate):** 16,000 Ohms
- **Transconductance:** 7,000 μmhos
- **Load Resistance:** 3,000 Ohms
- **Total Harmonic Distortion:** 6%
- **Maximum Signal Power Output:** 1.2 Watts

Grid Circuit Resistance Limits

To ensure stable operation and prevent thermal runaway, the resistance in the control grid circuit must be limited based on the biasing method:

- **Maximum Grid Resistance (Fixed Bias):** 0.25 Megohm
- **Maximum Grid Resistance (Cathode Bias):** 1.0 Megohm

The input coupling network should be designed so that it does not introduce excessive resistance into the grid circuit.

Comparison with Related Types

The 117N7GT is part of a family of 117-volt combination rectifier-amplifier tubes. It can be compared with the **117P7-GT** and **117L7/M7-GT**:

- **117P7-GT:** This type shares the same **8AV** pinout and physical envelope as the 117N7GT, but its amplifier section is designed for different operating conditions, resulting in lower power output. At a plate and screen voltage of 105 V and a grid bias of -5.2 V, the 117P7-GT has a transconductance of 5,300 μmhos , a plate resistance of 17,000 Ohms, and delivers 0.85 Watts into a 4,000 Ohm load.
- **117L7/M7-GT:** This tube has identical electrical characteristics to the 117P7-GT (delivering 0.85 Watts under the same operating conditions) but utilizes a different base connection layout (**8AO** instead of 8AV).

All three types share the same heater rating (117 V, 0.09 A) and a rectifier tube voltage drop of 16 V at 150 mA DC.

Technical Summary

The **117N7GT** is an octal-based, multi-unit vacuum tube combining a **half-wave rectifier** and a **beam power amplifier** in a single T-9 glass envelope. Its high-voltage heater (**117 V, 0.09 A**) is optimized for direct line-voltage operation. The rectifier unit can deliver up to **75 mA** of DC output current with a maximum peak inverse voltage of **350 V**, while the beam power amplifier unit is capable of delivering **1.2 Watts** of audio output power into a **3,000 Ohm** load under Class A1 operating conditions. The integration of these two functions, along with a shared cathode connection on an 8-pin octal base, makes the 117N7GT an efficient solution for line-powered audio and receiver applications.

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 2 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum plate voltage	117 V	Published handbook rating
Maximum screen voltage	117 V	Published handbook rating
Plate voltage	100 V	ClassA
Screen voltage	100 V	ClassA
Control-grid bias	6 V	ClassA
Plate current	51 mA	ClassA
Screen current	5 mA	ClassA
Load resistance	3000 ohm	ClassA
Power output	1.2 W	ClassA
DC output current	75 mA	RectifierService
Peak inverse voltage	350 V	RectifierService
RMS supply voltage per plate	117 V	RectifierService
Peak current	450 mA	RectifierService

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	16000 ohm	Published handbook characteristic
Transconductance	7000 μS	Published handbook characteristic
Heater/filament voltage	117 V	Published heater/filament rating
Heater/filament current	90 mA	Published heater/filament rating
Tube voltage drop	6 V	At 150 mA DC

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 (Ac Or Dc)	117 V	—
Max. Peak Inverse Plate Voltage	350 V	—
Max. Peak Plate Curremnt	450 mA	—
Max., Dc Heater–Cathode Potential	175 V	—
Max. Ac Plate Voltage(Rms)	117 V	—
Max. Dc Output Current	75 mA	—
Min. Total Esfective Plate Supply Impedance"	15 ohm	—

1961 TUNG SOL

Section 2 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Max. Plate Voltage	117 V	—
Max. Screen Voltage	117 V	—
May. Screen Dissipation	1 W	—
Plate Voltage	100 V	—
Screen Voltage	100 V	—
Grid Voltage®	-6 V	—
Peak Af Grid Voltabe	6 V	—
Gnal Screen Current	5 mA	—
Plate Resistance (Approx.)	16000 ohm	—
Load Resistance	3000 ohm	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Transconductance	7000 μ S	—