

ELECTRONIC TUBE REFERENCE

12L8GT

Voltage - Radio Detector Converter electronic tube

CONSOLIDATED TECHNICAL DATA

2 SECTIONS

CONSTRUCTION

DIODE-PENTODE

Combined detector diode and pentode designed for detector and amplifier service in receiving equipment.

GENERAL CHARACTERISTICS

BASE DESIGNATION	8BU	BASE PINS	8
NOMINAL HEATER	12.6 V / 150 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Dissimilar

8BU - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1 – 1G1	A	G1 – Control Grid	CONNECTED
PIN2 – 1G3	A	G3 – Suppressor Grid	CONNECTED
PIN2 – K	A	K – Cathode	CONNECTED
PIN2 – 2G3	B	G3 – Suppressor Grid	CONNECTED
PIN3 – 2G1	B	G1 – Control Grid	CONNECTED
PIN4 – 2P	B	P – Plate (Anode)	CONNECTED
PIN5 – 1G2	A	G2 – Screen Grid	CONNECTED
PIN5 – 2G2	B	G2 – Screen Grid	CONNECTED
PIN6 – H	–	H – Heater	CONNECTED
PIN7 – H	–	H – Heater	CONNECTED
PIN8 – 1P	A	P – Plate (Anode)	CONNECTED

SECTION RATINGS

SECTION1 Diode
<i>No fixed ratings recorded.</i>
<i>Published promoted values applied where semantically applicable; additional table values retained in section parameters.</i>

SECTION2 Pentode	
PLATE RESISTANCE	160000 Ω
TRANSCONDUCTANCE	0.00215 S
MAXIMUM PLATE VOLTAGE	180 V
MAXIMUM SCREEN VOLTAGE	180 V
Published promoted values applied where semantically applicable; additional table values retained in section parameters.	

12L8GT — Twin-Pentode Power Amplifier

The **12L8GT** is a double-unit power amplifier vacuum tube containing two power-amplifier pentodes in a single glass envelope. Utilizing single-ended GT construction, this tube is designed for use in the output stage of compact, lightweight equipment where moderate power output is required. The two pentode units share a common cathode and a common screen grid, allowing for simplified circuit layouts in push-pull or parallel configurations.

Construction, Heater, and Physical Specifications

The 12L8GT features a T-9 glass bulb with an 8-pin intermediate shell octal base. The tube is designed to operate in any mounting position.

The heater is an indirectly heated, coated unipotential cathode type. The nominal heater specifications and physical dimensions are as follows:

Parameter	Value
Heater Voltage (AC or DC)	12.6 V
Heater Current	0.15 A
Calculated Heater Power	1.89 W
Maximum Overall Length	3-5/16 inches
Maximum Seated Height	2-3/4 inches
Maximum Diameter	1-5/16 inches

Note: The calculated heater power of 1.89 W is derived directly from the nominal voltage of 12.6 V and current of 0.15 A.

Pin Connections and Internal Structure

The 12L8GT utilizes the **8BU** octal basing arrangement. A key structural feature of this tube is the internal connection of several electrodes. Specifically, the cathodes and suppressor grids of both pentode units (P_1 and P_2) are tied together internally and brought out to a single pin. Similarly, the screen grids (Grid No. 2) of both units are internally connected to a single pin. The control grids and plates remain independent.

The pin assignments, viewed from the bottom of the base, are:

Pin	Connection
Pin 1	Control Grid, Pentode Unit P_1
Pin 2	Cathode and Suppressor Grids (Common to P_1 & P_2)
Pin 3	Control Grid, Pentode Unit P_2
Pin 4	Plate, Pentode Unit P_2
Pin 5	Screen Grid (Common to P_1 & P_2)
Pin 6	Heater
Pin 7	Heater
Pin 8	Plate, Pentode Unit P_1

Direct Interelectrode Capacitances

The direct interelectrode capacitances are measured without an external shield. The values for each individual pentode unit, as well as the cross-unit capacitances, are detailed below:

Capacitance Parameter	Pentode Unit P_1	Pentode Unit P_2
Control Grid to Plate	0.7 pF	0.7 pF
Input (Control Grid to Cathode)	5.0 pF	5.0 pF
Output (Plate to Cathode)	6.0 pF	6.0 pF
Grid to Grid (Between Units)	-	0.08 pF
Plate to Plate (Between Units)	-	1.5 pF
Grid P_1 to Plate P_2	-	0.2 pF

Capacitance Parameter	Pentode Unit P_1	Pentode Unit P_2
Grid P_2 to Plate P_1	-	0.1 pF

Maximum Ratings and Typical Operating Conditions

The maximum ratings for the 12L8GT are established under the Design-Center system. These ratings apply to each individual pentode unit:

Rating Parameter	Maximum Value
Plate Voltage	180 V
Screen Voltage	180 V
Plate Dissipation	2.5 W
Screen Dissipation	1.0 W
D-C Heater-Cathode Potential	100 V

Typical Class A1 Operation

For typical Class A1 amplifier service, both pentode units are operated under identical conditions. The typical operating parameters per unit are:

Operating Parameter	Value
Plate Voltage	180 V
Screen Voltage	180 V
Control Grid Voltage (Grid No. 1)	-9 V
Peak A-F Grid Voltage	9 V
Zero-Signal Plate Current	13 mA
Maximum-Signal Plate Current	13.5 mA
Zero-Signal Screen Current	2.8 mA
Maximum-Signal Screen Current	4.6 mA
Plate Resistance	0.16 M Ω
Transconductance	2150 μ mos
Load Resistance	10,000 Ω
Power Output (at 10% Total Harmonic Distortion)	1.0 W

Circuit Applications and Performance Curves

Because the 12L8GT contains two power pentodes in a single envelope, it is highly suited for push-pull or parallel output stages. In push-pull service, the common cathode configuration simplifies biasing, though it requires the two units to share a single self-bias resistor if cathode bias is used. In parallel service, the plates and control grids are tied together externally, doubling the current capability and halving the required load resistance to $5,000\ \Omega$ (calculated as $10,000\ \Omega / 2$).

The average plate characteristics for each pentode unit show typical pentode behavior. At a fixed screen voltage of 180 V, the plate current (I_b) rises sharply at low plate voltages (below 50 V) and then flattens into a relatively flat plateau across the remainder of the voltage range up to 400 V. The curves are plotted for control grid voltages (E_{c1}) from 0 V down to -18 V in 3-volt steps. At $E_{c1} = 0$ V, the plate current reaches approximately 35 to 40 mA at plate voltages above 100 V, while the screen current (I_{c2}) exhibits a corresponding decrease as plate voltage increases, stabilizing at lower values.

Technical Summary

The **12L8GT** is an octal-based, twin-pentode power amplifier featuring a 12.6 V, 0.15 A heater and a common cathode structure. Each pentode unit is capable of dissipating up to 2.5 W and delivering 1.0 W of audio power under typical Class A1 conditions with 10% total harmonic distortion. Its compact GT envelope, combined with the ability to run the units in push-pull or parallel, makes it an efficient choice for space-constrained, moderate-power audio output 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 · Pentode

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Input capacitance	5 pF	Section1
Output capacitance	6 pF	Section1
Grid-to-plate capacitance	0.7 pF	Section1

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	180 V	ClassA
Screen voltage	180 V	ClassA
Control-grid voltage	-9 V	ClassA
Plate current	13 mA	ClassA
Screen current	2.8 mA	ClassA
Load resistance	10000 Ω	ClassA
Power output	1 W	ClassA

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	160000 Ω	Section1
Transconductance	2150 μS	Section1

1971 RCA HB3 Binder 3 of 7

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

1971 RCA HB3 BINDER 3 OF 7
Section 1 · Diode

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Voltage	12.6 V	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Current	0.15	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
~^'! – published value 1	0.7 pF	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
~^'! – published value 2	0.7 pF	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Grid to Grid	0.08	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Plate to Plate	1.5	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Grid P1 to Plate P2	0.2	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Grid P2 to Plate P1	0.1	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Pin 1 -Grid P1 – published value 1	1	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Pin 1 -Grid P1 – published value 2	4	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
(C a[hod e,	5	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Pi n 2 - suppres – published value 1	2	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Pi n 2 - suppres – published value 2	6	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Pin 7 -Heater	7	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Pin 3 -Grid P2 – published value 1	3	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Pin 3 -Grid P2 – published value 2	8	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Plate Voltage	180 V	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Screen Voltage	180 V	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Grid Voltage (Grid No. 1) – published value 1	1 V	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Grid Voltage (Grid No. 1) – published value 2	-9 V	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Peak A-F Grid Voltage	9 V	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Zero-Sig. Plate Cur	13 mA	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Zero-Sig. Screen Cur	2.8 mA	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Plate Resistance	0.16 Mohm	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Transconductance	2150	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Load Resistance	10000 ohm	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Power Output {rotas harmonic disc. f0S)	1 W	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
E { = 12.6 – published value 1	12.6 V	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
E { = 12.6 – published value 2	180 V	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
E { = 12.6 – published value 3	0 V	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Voltage	180 V	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Screen Voltage	180 V	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Plate Dissipation	2.5 mA	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Screen Dissipation	1 mA	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
D-C Heater-Cathode Potential	100 V	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Max.-Sig. Plate Cur	13.5 mA	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.
Max.-Sig. Screen Cur	4.6 mA	Published datasheet value; multiple numbers on one source row represent separate limits or operating conditions.

TUBE TINKER

An independent reference for electronic tubes, vacuum tubes,
and their source documents.

[Catalog](#) [Tube types](#) [Full books](#) [Blog](#) [Feedback & corrections](#)

© 2026 Tube Tinker