

ELECTRONIC TUBE REFERENCE

11DS5

Power - Beam Single (NOT sweep) (under 10W) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
BEAMPOWER

Miniature beam-power output tube intended for Class-A audio-frequency output stages in television and radio receivers, delivering several watts from a compact receiving-tube envelope.

GENERAL CHARACTERISTICS

BASE DESIGNATION	7BZ	BASE PINS	7
NOMINAL HEATER	11.2 V / 450 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

7BZ - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1 – Pin 1	A	G1 – Control Grid	CONNECTED • verified
PIN2 – Pin 2	A	G3 – Suppressor Grid	CONNECTED • verified
PIN2 – Pin 2	A	K – Cathode	CONNECTED • verified
PIN3 – Pin 3	–	H – Heater	CONNECTED • verified
PIN4 – Pin 4	–	H – Heater	CONNECTED • verified
PIN5 – Pin 5	A	P – Plate (Anode)	CONNECTED • verified
PIN6 – Pin 6	A	G2 – Screen Grid	CONNECTED • verified
PIN7 – Pin 7	A	G1 – Control Grid	CONNECTED • verified

SECTION RATINGS

SECTION1 Beam Power	
PLATE RESISTANCE	28000 Ω
TRANSCONDUCTANCE	0.0058 S
MAXIMUM PLATE VOLTAGE	275 V
MAXIMUM SCREEN VOLTAGE	275 V
MAXIMUM PLATE DISSIPATION	9 W
MAXIMUM SCREEN DISSIPATION	2.2 W
<i>Inherited from explicitly referenced parent type 6DS5; supplied sheet changes heater rating.</i>	

11DS5

The 11DS5 is a miniature beam power tube designed primarily for use in the audio output stages of television and radio receivers.

Overview

The **11DS5** is a glass-envelope miniature beam power tube. It is designed for Class A1 audio power amplification, making it highly suitable for the audio output stages of television and radio receivers. The tube is constructed in a compact form factor requiring a standard miniature 7-contact socket.

In terms of its physical construction and electrical characteristics, the 11DS5 is identical to the [6DS5](#), with the sole exception of its heater ratings. While the [6DS5](#) is designed for standard 6.3 V heater supplies, the 11DS5 is designed with an 11.2 V heater, making it suitable for series-string heater arrangements or specific power supply configurations.

Heater Characteristics and Basing

The 11DS5 features an indirectly heated, coated cathode. The heater is designed for operation on either AC or DC power supplies.

Heater Ratings

- **Heater Voltage (AC/DC):** 11.2 V
- **Heater Current:** 0.450 A (with an allowable tolerance of ± 0.030 A)
- **Heater Warm-up Time (Average):** 11 seconds
- **Peak Heater-Cathode Voltage:** ≤ 200 V maximum
- **Calculated Heater Power:** 5.04 W (calculated as 11.2 V $\times$ 0.45 A)

7BZ Pin Connection Diagram

The tube utilizes a miniature 7-contact base (designated **7BZ**). When viewed from the bottom of the tube, the pin assignments are as follows:

- **Pin 1:** Grid No.1 (Control Grid)
- **Pin 2:** Cathode and Grid No.3 (Beam Plates)
- **Pin 3:** Heater
- **Pin 4:** Heater
- **Pin 5:** Plate
- **Pin 6:** Grid No.2 (Screen Grid)
- **Pin 7:** Grid No.1 (Control Grid)

Grid No.1 is internally connected to both Pin 1 and Pin 7 to facilitate flexible circuit layout and heat dissipation.

Maximum Ratings

The maximum ratings for the 11DS5 are defined under the Design-Maximum system. Operating the tube beyond these limits may impair its performance and reduce its operational lifespan.

- **Plate Voltage:** 275 V maximum
- **Grid-No.2 (Screen-Grid) Voltage:** 275 V maximum
- **Grid-No.1 (Control-Grid) Voltage (Positive-bias value):** 0 V maximum
- **Plate Dissipation:** 9 W maximum
- **Grid-No.2 Input:** 2.2 W maximum
- **Bulb Temperature (At hottest point):** 250 °C maximum

Typical Operation and Electrical Characteristics

The 11DS5 is operated as a Class A1 amplifier. It can be configured using either cathode-bias or fixed-bias topologies. The typical operating parameters under these conditions are detailed below:

Parameter	Cathode-Bias (Option 1)	Cathode-Bias (Option 2)	Fixed-Bias (Option 1)	Fixed-Bias (Option 2)	Unit
Plate Supply Voltage	200	250	200	250	V
Grid-No.2 Supply Voltage	200	200	200	200	V
Grid-No.1 Voltage	0	0	-7.5	-8.5	V

Parameter	Cathode-Bias (Option 1)	Cathode-Bias (Option 2)	Fixed-Bias (Option 1)	Fixed-Bias (Option 2)	Unit
Cathode-Bias Resistor	180	270	□	□	'
Peak AF Grid-No.1 Voltage	7.5	9.2	7.5	8.5	V
Zero-Signal Plate Current	34.5	27	35	29	mA
Maximum-Signal Plate Current	32.5	25	36	32	mA
Zero-Signal Grid-No.2 Current	3.5	3	3	3	mA
Maximum-Signal Grid-No.2 Current	9	9	9	10	mA
Plate Resistance (Approx.)	28,000	28,000	28,000	28,000	'
Transconductance	6,000	5,800	6,000	5,800	'mhos
Load Resistance	6,000	8,000	6,000	8,000	'
Total Harmonic Distortion	10	10	9	10	%
Maximum-Signal Power Output	2.8	3.6	3	3.8	W

Interelectrode Capacitances and Circuit Limits

Direct Interelectrode Capacitances

These approximate values are measured without an external shield:

- **Grid No.1 to Plate:** 0.19 pF
- **Grid No.1 to Cathode, Heater, Grid No.2, and Grid No.3:** 9.5 pF
- **Plate to Cathode, Heater, Grid No.2, and Grid No.3:** 6.3 pF

Maximum Circuit Values

To maintain thermal stability and prevent grid emission issues, the maximum resistance in the grid-No.1 circuit must not exceed the following values:

- **For Fixed-Bias Operation:** 0.1 M maximum
- **For Cathode-Bias Operation:** 1 M maximum

Technical Summary

The **11DS5** is a miniature, 7-pin beam power tube optimized for audio output stages in consumer electronics. It features an 11.2 V, 0.45 A heater with a controlled 11-second warm-up time, making it highly compatible with series-string heater configurations. With a maximum plate dissipation rating of 9 W and a maximum power output of 3.8 W under typical Class A1 fixed-bias conditions, the 11DS5 provides a robust and efficient solution for compact audio amplification designs.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1971 RCA HB3 Binder 5 of 7

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

1971 RCA HB3 BINDER 5 OF 7

Section 1 · Beam Power

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-to-plate capacitance	0.19 pF	Inherited from explicitly referenced 6DS5 parent type.
Input capacitance	9.5 pF	Inherited from explicitly referenced 6DS5 parent type.
Output capacitance	6.3 pF	Inherited from explicitly referenced 6DS5 parent type.

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate supply voltage	250 V	ClassA1 Inherited from explicitly referenced 6DS5 parent type.
Screen voltage	200 V	ClassA1 Inherited from explicitly referenced 6DS5 parent type.
Zero-signal plate current	27 mA	ClassA1 Inherited from explicitly referenced 6DS5 parent type.
Maximum-signal power output	3.6 W	ClassA1 Inherited from explicitly referenced 6DS5 parent type.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1975 RCA RC30

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

1975 RCA RC30

Section 1 · Beam Power

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid No.1 to Plate	0.19 pF	—
Grid No.1 to other electrodes	9.6 pF	—
Plate to other electrodes	6.3 pF	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	250 V	ClassA
Screen-grid voltage	250 V	ClassA
Plate current	35 mA	ClassA
Load resistance	5000 ohm	ClassA