

ELECTRONIC TUBE REFERENCE

18GV8

Power - Pentode (NOT beam) electronic tube

CONSOLIDATED TECHNICAL DATA

2 SECTIONS

CONSTRUCTION

PENTODE-TRIODE

High-mu triode and power-pentode combination for television sync amplification and video-output service.

GENERAL CHARACTERISTICS

BASE DESIGNATION	9LY	BASE PINS	9
NOMINAL HEATER	18 V / 300 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Dissimilar

9LY - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1	B	P – Plate (Anode)	CONNECTED
PIN2	B	G1 – Control Grid	CONNECTED
PIN3	B	K – Cathode	CONNECTED
PIN4	–	H – Heater	CONNECTED
PIN5	–	H – Heater	CONNECTED
PIN6	A	P – Plate (Anode)	CONNECTED
PIN7	A	G2 – Screen Grid	CONNECTED
PIN8	A	G3 – Suppressor Grid	CONNECTED
PIN8	A	K – Cathode	CONNECTED
PIN8	–	IS – Internal Screen	CONNECTED
PIN9	A	G1 – Control Grid	CONNECTED

SECTION RATINGS

SECTION1 Triode	
PLATE RESISTANCE	7600 Ω
TRANSCONDUCTANCE	0.0065 S
AMPLIFICATION FACTOR	50
MAXIMUM PLATE VOLTAGE	250 V
MAXIMUM PLATE DISSIPATION	0.5 W
<i>Triode unit; 550 V plate-supply rating and peak/average cathode-current conditions preserved as parameters.</i>	

SECTION2 Pentode	
PLATE RESISTANCE	25000 Ω
TRANSCONDUCTANCE	0.0075 S
MAXIMUM PLATE VOLTAGE	250 V
MAXIMUM SCREEN VOLTAGE	250 V
MAXIMUM PLATE DISSIPATION	7 W
MAXIMUM SCREEN DISSIPATION	2 W
MAXIMUM CATHODE CURRENT	75 mA
<i>Power pentode unit; 2000 V peak plate and 550 V supply ratings preserved as parameters.</i>	

18GV8 — High-Mu Triode and Power Pentode

The **18GV8** is a miniature multi-unit vacuum tube containing a high-mu triode and a power pentode within a single envelope. It is designed primarily for use in television receivers, specifically for vertical deflection amplifier, sync-amplifier, and video-output applications. The 18GV8 is electrically identical to the [6GV8](#) (also designated as [ECL85](#)) except for its heater ratings, and is closely related to the [9GV8](#). Its alternative European designation is [PCL85](#).

Construction, Pinout, and Heater Ratings

The 18GV8 is constructed in a miniature T-6½ glass envelope with a button 9-pin base (E9-1 designation), requiring a standard miniature 9-contact socket. The physical dimensions of the tube include a maximum diameter of 0.875 inches, a maximum seated height of 2.812 inches, and a maximum overall height of 3.062 inches.

The tube features a 9LY basing arrangement, which provides separate connections for the triode and pentode sections, with the pentode's cathode internally tied to its third grid and an internal shield.

Pin Connection Table (9LY Basing)

Pin	Connection
1	Triode Grid (GT)
2	Triode Cathode (KT)
3	Pentode Cathode (KP), Pentode Grid No. 3 (G_{3P}), Internal Shield
4	Heater (H)
5	Heater (H)
6	Pentode Plate (PP)
7	Pentode Grid No. 2 (G_{2P})
8	Pentode Grid No. 1 (G_{1P})
9	Triode Plate (PT)

Heater Specifications

The heater is designed for series or parallel operation with the following ratings:

- **Heater Voltage (AC/DC):** 18 V
- **Heater Current:** 0.3 A (300 mA)
- **Maximum Heater-Cathode Voltage:**
 - Heater negative with respect to cathode (Total DC and Peak): 200 V
 - Heater positive with respect to cathode (Total DC and Peak): 220 V (some specifications list a general peak limit of ± 200 V)

Electrical Characteristics and Typical Operation

The 18GV8 combines a high- μ triode section suitable for voltage amplification or signal processing with a robust power pentode section capable of handling higher currents.

Class A Amplifier Characteristics

The typical operating parameters for each section under Class A conditions are outlined below:

Parameter	Triode Section	Pentode Section
Plate Voltage	100 V	170 V
Grid-No. 2 (Screen Grid) Voltage	—	170 V

Parameter	Triode Section	Pentode Section
Grid-No. 1 (Control Grid) Voltage	-0.8 V	-15 V
Amplification Factor (μ)	50	—
Mu-Factor (G_1 to G_2)	—	7
Plate Resistance (Approx.)	7,600 Ω	25,000 Ω
Transconductance	6,500 μmhos	7,500 μmhos
Plate Current	5 mA	41 mA
Grid-No. 2 Current	—	2.7 mA

Pentode Knee Current Characteristics

To evaluate the peak performance of the pentode section without exceeding maximum dissipation limits, measurements are conducted using a recurrent waveform method. The knee characteristics of an average tube under these conditions are:

- **Condition 1:** At a plate voltage of 50 V, screen grid voltage of 170 V, and control grid voltage of -1 V, the plate current reaches 200 mA and the screen grid current is 40 mA.
- **Condition 2:** At a plate voltage of 65 V, screen grid voltage of 210 V, and control grid voltage of -1 V, the plate current reaches 240 mA and the screen grid current is 50 mA.

Absolute Maximum Ratings

The absolute maximum ratings define the limiting operational boundaries for the 18GV8 to ensure reliable operation and prevent damage.

Pentode Section Limits

- **Plate Supply Voltage (Cut-off Condition):** 550 V
- **DC Plate Voltage:** 250 V
- **Peak Plate Voltage:** 2,000 V (maximum pulse duration of 5% of a cycle, not to exceed 1 ms)
- **Screen Grid Supply Voltage (Cut-off Condition):** 550 V
- **Screen Grid Voltage:** 250 V
- **Screen Grid Dissipation:** 2 W
- **Plate Dissipation:** 7 W
- **Average Cathode Current:** 75 mA
- **Maximum Series Grid-No. 1 Resistor (Fixed Bias):** 1 M Ω
- **Maximum Series Grid-No. 1 Resistor (Automatic/Cathode Bias):** 2.2 M Ω
- **Maximum Heater-Cathode Resistance:** 20,000 Ω

Triode Section Limits

- **Plate Supply Voltage:** 550 V
- **DC Plate Voltage:** 250 V
- **Plate Dissipation:** 0.5 W
- **Average Cathode Current:** 15 mA
- **Peak Cathode Current:** 200 mA (maximum pulse duration of 200 μ s; if a larger flyback is required, this limit may be reduced to 100 mA with a maximum pulse duration of 400 μ s)
- **Maximum Series Grid-No. 1 Resistor (Fixed Bias):** 1 M Ω
- **Maximum Series Grid-No. 1 Resistor (Automatic/Cathode Bias):** 3.3 M Ω
- **Maximum Heater-Cathode Resistance:** 20,000 Ω

Vertical Sweep Circuit Applications

The pentode section of the 18GV8 is highly optimized for vertical deflection sweep circuits. Designers can implement the tube in both stabilized and non-stabilized circuit configurations.

Operating Examples in Vertical Sweep Service

- **Non-stabilized Circuits (Condition A):** Operating with a screen grid voltage of 170 V and a minimum plate voltage of 55 V at the end of the scan. The control grid voltage at the end of the scan is -6 V, yielding a peak plate current of 135 mA and a nominal screen grid dissipation of 1.1 W.
- **Non-stabilized Circuits (Condition B):** Operating with a screen grid voltage of 200 V and a minimum plate voltage of 55 V at the end of the scan. The control grid voltage at the end of the scan is -9.5 V, yielding a peak plate current of 135 mA and a nominal screen grid dissipation of 1.4 W.
- **Stabilized Circuits:** Operating with a screen grid voltage of 210 V and a minimum plate voltage of 75 V at the end of the scan. The control grid voltage at the end of the scan is -11 V, yielding a peak plate current of 125 mA and a nominal screen grid dissipation of 1.35 W.

Circuit Design Considerations

When designing vertical sweep circuits to achieve full deflection at nominal line voltage, the circuit must account for tube aging. If the minimum plate voltage (E_b), screen grid voltage (E_{c2}), and plate current (I_b) are designed to their specified values, full deflection can still be maintained with an end-of-life tube at the lower limit of its characteristic spread. This is achievable provided the control grid voltage (E_{c1}) at the end of the scan is -1 V, even when the line voltage drops up to 10% below its nominal value.

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 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage (ac/de) 6.3 9.5 11.6	18 V	Published in approved ECL85 target datasheet entry; Section1
Heater Current 0.9 0.6 0.45	300 mA	Published in approved ECL85 target datasheet entry; Section1
IMate Supply Voltage 550	550 V	Published in approved ECL85 target datasheet entry; Section1
Peak Plate Voltage 0	2000 V	Published in approved ECL85 target datasheet entry; Section1
DC Plate Voltage 250	250 V	Published in approved ECL85 target datasheet entry; Section1
Grid-No.2 (Screen-Grid) Supply Voltage	550 V	Published in approved ECL85 target datasheet entry; Section1
Grid-No. 2 Voltage	250 V	Published in approved ECL85 target datasheet entry; Section1
Peak Cathode Current"	200 mA	Published in approved ECL85 target datasheet entry; Section1
Average Cathode Current 15	75 mA	Published in approved ECL85 target datasheet entry; Section1
Plate Dissipation 0.5	7 W	Published in approved ECL85 target datasheet entry; Section1
Crid-No.2 Input	2 W	Published in approved ECL85 target datasheet entry; Section1
Plate Voltage 100 50 65	170 V	Published in approved ECL85 target datasheet entry; Section1
Grid-No.2 Voltage 170 210	170 V	Published in approved ECL85 target datasheet entry; Section1
Grid-No. 1 Voltage -0.8 - -1	-15 V	Published in approved ECL85 target datasheet entry; Section1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
For fixed-bias operation 1	1 MΩ	Published in approved ECL85 target datasheet entry; Section1
For cathode-bias operation 3.3	2.2 MΩ	Published in approved ECL85 target datasheet entry; Section1
Maximum pulse duration	5 %	Published in approved ECL85 target datasheet entry; Section1
Maximum pulse duration 5 per cent of a cycle with a maximum of	1 millisecond	Published in approved ECL85 target datasheet entry; Section1
Maximum pulse duration	200 microseconds	Published in approved ECL85 target datasheet entry; Section1
be reduced to 100 mA with a maximum pulse duration of	400 microseconds	Published in approved ECL85 target datasheet entry; Section1

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Resistance (Appro*.) 7600	-25000 Ω	Published in approved ECL85 target datasheet entry; Section1
Transccnductance 6500	7500 μS	Published in approved ECL85 target datasheet entry; Section1
Plate Current 5 200" 240	41 mA	Published in approved ECL85 target datasheet entry; Section1
Grid-No.2 Current 40« 50*	2.7 mA	Published in approved ECL85 target datasheet entry; Section1

1975 RCA RC30

Section 2 · Pentode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage (ac/de) 6.3 9.5 11.6	18 V	Published in approved ECL85 target datasheet entry; Section2
Heater Current 0.9 0.6 0.45	300 mA	Published in approved ECL85 target datasheet entry; Section2
IMate Supply Voltage 550	550 V	Published in approved ECL85 target datasheet entry; Section2
Peak Plate Voltage 0	2000 V	Published in approved ECL85 target datasheet entry; Section2
DC Plate Voltage 250	250 V	Published in approved ECL85 target datasheet entry; Section2

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-No.2 (Screen-Grid) Supply Voltage	550 V	Published in approved ECL85 target datasheet entry; Section2
Grid-No. 2 Voltage	250 V	Published in approved ECL85 target datasheet entry; Section2
Peak Cathode Current"	200 mA	Published in approved ECL85 target datasheet entry; Section2
Average Cathode Current 15	75 mA	Published in approved ECL85 target datasheet entry; Section2
Plate Dissipation 0.5	7 W	Published in approved ECL85 target datasheet entry; Section2
Crid-No.2 Input	2 W	Published in approved ECL85 target datasheet entry; Section2
Plate Voltage 100 50 65	170 V	Published in approved ECL85 target datasheet entry; Section2
Grid-No.2 Voltage 170 210	170 V	Published in approved ECL85 target datasheet entry; Section2
Grid-No. 1 Voltage -0.8 – -1	-15 V	Published in approved ECL85 target datasheet entry; Section2
For fixed-bias operation 1	1 MΩ	Published in approved ECL85 target datasheet entry; Section2
For cathode-bias operation 3.3	2.2 MΩ	Published in approved ECL85 target datasheet entry; Section2
Maximum pulse duration	5 %	Published in approved ECL85 target datasheet entry; Section2
Maximum pulse duration 5 per cent of a cycle with a maximum of	1 millisecond	Published in approved ECL85 target datasheet entry; Section2
Maximum pulse duration	200 microseconds	Published in approved ECL85 target datasheet entry; Section2
be reduced to 100 mAwith a maximum pulse duration of	400 microseconds	Published in approved ECL85 target datasheet entry; Section2

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Resistance (Appro*.) 7600	-25000 Ω	Published in approved ECL85 target datasheet entry; Section2
Transccnductance 6500	7500 μS	Published in approved ECL85 target datasheet entry; Section2
Plate Current 5 200" 240	41 mA	Published in approved ECL85 target datasheet entry; Section2

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-No.2 Current 40« 50*	2.7 mA	Published in approved ECL85 target datasheet entry; Section2

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