



ELECTRONIC TUBE REFERENCE

16CHP4A

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Sixteen-inch P4 direct-view picture tube with wide magnetic deflection and a large projected screen area. RCA documentation gives an anode operating range around 12-20 kV, with approximately 16 kV typical.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	7
NOMINAL HEATER	6.9 V / 20 A	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray	
MAXIMUM SCREEN VOLTAGE	14 V
<i>CRT-specific ratings, operating conditions, capacitances, focus/deflection, cutoff, optical, and screen data are retained in section parameters.</i>	

16CHP4A Picture Tube

The 16CHP4A is a PAN-O-PLY type cathode-ray picture tube designed for television receiver applications. It features low-voltage electrostatic focusing, 114-degree magnetic deflection, and a low Grid-No.2 voltage requirement.

Overview

The **16CHP4A** is a specialized, rectangular picture tube utilizing a unipotential focus lens and an electron gun design that operates without requiring an external ion-trap magnet. The tube incorporates a high-efficiency, aluminized P4-sulfide phosphor screen and a filterglass faceplate designed to optimize contrast

and picture quality. It is constructed with a short neck and a wide deflection angle to minimize overall cabinet depth in television receiver designs.

Mechanical and Optical Specifications

The physical structure of the 16CHP4A is defined by the J125 B2A bulb designation. It utilizes a rectangular glass envelope with integrated implosion protection hardware.

Dimensional Characteristics

- **Overall Length:** 10.569 ± 0.242 inches
- **Neck Length:** 4.375 ± 0.125 inches
- **Neck Diameter:** $1.125 +0.043 / -0.025$ inches
- **Screen Projected Area:** 125 square inches
- **Minimum Screen Dimensions:**
 - Diagonal: 14.875 inches
 - Width: 12.938 inches
 - Height: 10.250 inches
- **Outer Bulb Dimensions:**
 - Diagonal: 15.720 ± 0.125 inches
 - Width/Height: 13.835 ± 0.125 inches by 11.280 ± 0.125 inches
- **Weight (Approximate):** 9.5 lb (including implosion protection hardware)

Optical and Screen Properties

- **Phosphor:** P4-Sulfide Type, Aluminized
- **Faceplate Material:** Filterglass
- **Light Transmission at Center:** Approximately 54%
- **Deflection Angle:** 114° (magnetic deflection)

External Coatings and Grounding

The tube features an external conductive coating of the Regular-Band type. The contact area for grounding this coating is located near the reference line. The capacitance between this external conductive coating and the internal anode is rated between a minimum of 1000 pF and a maximum of 1500 pF.

Electrical Connections and Pinout

The 16CHP4A is equipped with a **Small-Button Neoeightar 7-Pin** base (Arrangement 1, JEDEC No. B7-208) and a **Recessed Small Cavity** cap (JEDEC No. J1-21) for the high-voltage anode connection. The terminal configuration follows the **8HR** diagram, viewed from the bottom of the base:

Pin / Terminal	Connection
Pin 1	Heater
Pin 2	Grid No. 1
Pin 3	Grid No. 2
Pin 4	Grid No. 4 (Focus Electrode)
Pin 5	<i>No Connection</i>
Pin 6	Grid No. 1
Pin 7	Cathode
Pin 8	Heater
Cap	Anode (Grid No. 3, Grid No. 5, Screen, Collector)
C	External Conductive Coating (Ground)

Heater and Cathode Characteristics

The 16CHP4A operates with an indirectly heated cathode. The heater is designed for parallel or series service in television receivers.

- **Nominal Heater Voltage:** 6.3 V (with an allowable operating range of 5.7 V minimum to 6.9 V maximum)
- **Heater Current at 6.3 V:** 450 ± 20 mA
- **Average Heater Warm-Up Time:** 11 seconds
- **Direct Interelectrode Capacitances:**
 - Cathode to all other electrodes: 5 pF
 - Grid No. 1 to all other electrodes: 6 pF

Heater-Cathode Voltage Ratings

To prevent insulation breakdown and maintain reliable operation, the voltage difference between the heater and the cathode must be kept within strict limits:

- **Heater negative with respect to cathode:**
 - During equipment warm-up period (≤ 15 seconds): 450 max V
 - After equipment warm-up period: 300 max V
- **Heater positive with respect to cathode:**
 - Combined AC & DC voltage: 200 max V
 - DC component: 100 max V

Maximum and Minimum Ratings

The following design-maximum values represent the absolute limits within which the 16CHP4A must be operated. All voltages are positive with respect to Grid No. 1 unless otherwise specified.

Parameter	Minimum Value	Maximum Value
Anode Voltage	12,000 V	20,000 V
Grid-No. 4 (Focus) Voltage (Positive)	—	1,250 V
Grid-No. 4 (Focus) Voltage (Negative)	—	400 V
Grid-No. 2 Voltage	20 V	60 V
Cathode Voltage (Negative peak value)	—	2 V
Cathode Voltage (Negative bias value)	—	0 V
Cathode Voltage (Positive bias value)	—	100 V
Cathode Voltage (Positive peak value)	—	150 V
Grid-No. 1 Circuit Resistance	—	1.5 MΩ

Typical Operating Conditions (Cathode-Drive Service)

Under typical operating conditions in cathode-drive service, the voltages are referenced positive with respect to Grid No. 1:

- **Anode Voltage:** 16,000 V
- **Grid-No. 2 Voltage:** 30 V
- **Cathode Voltage (for visual extinction of focused raster):** 22 to 45 V
- **Grid-No. 4 (Focusing) Voltage:** 100 V

Focus Voltage Adjustment

While the typical Grid-No. 4 voltage is listed as 100 V, the actual voltage required for optimum focus on any individual tube can vary. The focus voltage may range anywhere between -100 V and +300 V. This optimum point is determined with the combined cathode voltage and video-signal voltage adjusted to produce an anode current of 100 microamperes on a 9-inch by 12-inch pattern (using an RCA-2F21 monoscope or equivalent).

Centering Requirements

An adjustable centering magnet is required to align the electron beam. The required magnetic field strength of this centering device ranges from 0 to 8 Gauss.

Technical Summary

The **16CHP4A** is a high-performance, 114-degree magnetic deflection picture tube designed for compact television chassis. By utilizing a unipotential electrostatic focus lens (Grid No. 4) operating typically at 100 V and a low Grid-No. 2 voltage of 30 V, the tube simplifies power supply requirements. Its physical design features a J125 B2A bulb, a Small-Button Neoeightar 7-pin base, and a recessed small cavity anode cap. Operating at an anode potential of up to 20,000 V, it delivers a bright, well-focused raster on its 125-square-inch aluminized P4-sulfide screen.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

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

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Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
1 14o MAGNETIC DEFLECTION – published value 1	1 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
1 14o MAGNETIC DEFLECTION – published value 2	14 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid No.1toall other electrodes	6 pF	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
External conductive coating to anodea . 1000 min– 1500 max pF – published value 1	1000 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
External conductive coating to anodea . 1000 min– 1500 max pF – published value 2	1500 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Light transmission at center (Approx)	54	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Projected Area of Screen	125	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Anode Voltage – published value 1	12000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Anode Voltage – published value 2	20000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.2 Voltage – published value 1	20 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-No.2 Voltage – published value 2	60 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Heater Voltage – published value 1	5.7 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Heater Voltage – published value 2	6.9 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Combined AC & DC voltage	200 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Anode Voltage	16000 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.4 Voltageb	100 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No.2 Voltage	30 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Cathode Voltage – published value 1	22 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Cathode Voltage – published value 2	45 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No. 1 Circuit Resistance – published value 1	1 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
Grid-No. 1 Circuit Resistance – published value 2	5 mA	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
ch ode voltage and video - sign 1 voltage adj usced [o	1 V	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
SCREEN 11280 – published value 1	11280	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.
SCREEN 11280 – published value 2	1	Published CRT datasheet value; multiple numbers on one source row represent its separate limits or operating conditions.



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