

ELECTRONIC TUBE REFERENCE

19DEP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Nineteen-inch rectangular glass television picture tube with electrostatic focus, 114-degree magnetic deflection, aluminized screen, external conductive coating, and a non-ion-trap gun. It uses higher grid-2 and cutoff voltages than the related 19CKP4.

GENERAL CHARACTERISTICS

BASE DESIGNATION	8HR	BASE PINS	—
NOMINAL HEATER	6.3 V / 600 mA	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Cathode Ray
No fixed ratings recorded.
CRT specialized anode, grid, optical, and deflection data retained in TUBE_SECTION_PARAMETER.

19DEP4 — Electrostatic Focus Cathode Ray Tube

The **19DEP4** is a 19-inch rectangular glass cathode ray tube (picture tube) designed for television display applications. It features electrostatic focusing and magnetic deflection, utilizing a short-neck design to minimize overall cabinet depth. The tube incorporates an aluminized fluorescent screen to maximize light output and prevent screen charging, alongside a non-ion trap gun design.

Physical Construction and Envelope

The 19DEP4 is constructed using a J149-A1 glass bulb envelope. The faceplate is made of spherical gray glass with approximately 78% light transmittance at the center, which helps improve picture contrast under ambient light.

The physical dimensions and alignment specifications are as follows:

- **Overall Length:** 11 7/8 ± 1/4 inches
- **Neck Length:** 4 5/8 ± 1/8 inches
- **Deflection Angles (Approximate):** Diagonal 114°, Horizontal 102°, Vertical 87°
- **Bulb Contact:** JEDEC No. J1-21 recessed cavity contact (Anode terminal)
- **Bulb Contact Alignment:** The anode contact aligns with Pin No. 4 within ± 30 degrees.
- **Base:** JEDEC No. B7-237 or B7-208
- **Basing Configuration:** 8HR

The tube is equipped with an external conductive coating. When properly grounded, this coating serves as a filter capacitor in conjunction with the internal anode.

Heater Ratings and Pinout

The 19DEP4 is designed with an indirectly heated cathode. The heater is engineered with a controlled warm-up time for use in series-string or parallel receiver designs.

Heater Parameter	Value
Nominal Heater Voltage	6.3 V
Heater Current	600 ± 30 mA
Heater Warm-up Time	11 seconds

The 8HR basing diagram provides the following pin connections, viewed from the bottom of the base:

Pin Number	Connection
Pin 1	Heater (H)
Pin 2	Grid No. 1 (G1)
Pin 3	Grid No. 2 (<u>G2</u>)
Pin 4	Focus / Grid No. 4 (F)
Pin 6	Grid No. 1 (G1)
Pin 7	Cathode (K)
Pin 8	Heater (H)

Pin Number	Connection
Recessed Cavity	Anode (A)

Interelectrode Capacitances

The direct interelectrode capacitances of the 19DEP4 are approximately:

- **Cathode to all other electrodes:** $\sim 5 \mu\text{f}$
- **Grid No. 1 to all other electrodes:** $\sim 6 \mu\text{f}$
- **External conductive coating to Anode:** 1000 pF (μf) minimum / 1500 pF (μf) maximum

Absolute and Design-Maximum Ratings

The following ratings are established under the Design Maximum System. All voltages are measured with respect to the cathode unless otherwise specified.

Parameter	Minimum	Maximum
Anode Voltage	15,000 V	22,000 V
Grid No. 4 (Focusing Electrode) Voltage	-500 V	+1000 V
Grid No. 2 Voltage	100 V	500 V
Grid No. 1 Negative DC Voltage	—	140 V
Grid No. 1 Negative Peak Voltage	—	200 V
Grid No. 1 Positive DC Voltage	—	0 V
Grid No. 1 Positive Peak Voltage	—	2 V
Heater Voltage	5.7 V	6.9 V

Heater-Cathode Voltage Limits

- **Heater negative with respect to cathode:**
 - During the equipment warm-up period (less than or equal to 15 seconds): 410 V maximum.
 - After equipment warm-up is complete: 300 V maximum.
- **Heater positive with respect to cathode:** 180 V maximum.

Typical Operating Conditions (Cathode Drive Service)

Under typical operating conditions in cathode drive service, the operating parameters are defined as follows:

- **Anode Voltage:** 18,000 V DC
- **Grid No. 4 Voltage (Focusing Electrode):** 250 V DC (Individual tubes focus satisfactorily within a range of 0 V to 500 V DC)
- **Grid No. 2 Voltage:** 300 V DC
- **Cathode to Grid No. 1 Voltage:** 36 V to 54 V DC (required for visual extinction of the focused raster)

Maximum Circuit Values

To ensure safe operation and protect the tube from internal arcing or damage, the following circuit resistance limits and recommendations must be observed:

- **Grid No. 1 Circuit Resistance:** 1.5 MΩ maximum
- **Grid No. 2 Circuit Resistance:** 0.1 MΩ minimum
- **Focusing Electrode Circuit Resistance:** 0.1 MΩ minimum

Note: It is recommended to include protective resistance in the Grid No. 2 and focusing electrode circuits to prevent damage during transient conditions.

Related Designations

The **19DEP4** is closely related to the **19CKP4**. The **19CKP4** is identical to the 19DEP4 except that the 19DEP4 is designed with higher Grid No. 2 and cut-off voltage ratings.

Technical Summary

The **19DEP4** is a 19-inch rectangular glass cathode ray tube utilizing electrostatic focus and a 114-degree magnetic deflection angle. It features a short-neck design (overall length of 11 7/8 inches), an aluminized screen, and a non-ion trap gun. Operating at a nominal heater voltage of 6.3 V, it is rated for anode voltages up to 22,000 V. The tube is optimized for cathode drive service, requiring a cathode-to-grid voltage of 36 V to 54 V for raster extinction under typical operating conditions.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1968 General Electric Co

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

1968 GENERAL ELECTRIC CO

Section 1 · Cathode Ray

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Anode Voltage	22000 V	—
Heater Warmup Time	11 s	—
Minimum Anode Voltage	15000 V	—
Maximum Grid2 Voltage	500 V	—
Minimum Grid2 Voltage	100 V	—
Typical Anode Voltage	18000 V	—
Typical Focus Grid Voltage	250 V	—
Typical Grid2 Voltage	300 V	—
Cathode To Grid1 Voltage	36–54 V	CathodeDriveService

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Horizontal Deflection Angle	102 degree	—
Vertical Deflection Angle	87 degree	—
Diagonal Deflection Angle	114 degree	—

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Cathode To All Other Electrodes Capacitance	5 pF	—
Grid1 To All Other Electrodes Capacitance	6 pF	—
External Coating To Anode Capacitance	1000–1500 pF	—