

ELECTRONIC TUBE REFERENCE

19ETP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Wide-angle aluminized P4 monochrome television picture tube using electrostatic focusing and magnetic deflection, designed for high-voltage direct-view service with a large approximately 19-inch screen.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	6.3 V / 450 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.
Television CRT electron-gun/display section.

19ETP4

The **19ETP4** is a 19-inch cathode-ray tube (CRT) designed primarily for television display applications. It features a 114-degree diagonal deflection angle, electrostatic focusing, and magnetic deflection. The tube is constructed with a straight electron gun that does not require an ion trap, utilizing a unipotential focus lens. It is specifically optimized for cathode-drive service.

Mechanical Design and Physical Dimensions

The 19ETP4 is built using a JEDEC J-149-F1 glass bulb and is equipped with a banded implosion protection system without cloth, which includes integrated mounting lugs. The screen features a P4 aluminized phosphor with a light transmittance of approximately 49% at the center, and it does not have an antireflection treatment.

The physical dimensions of the tube are as follows:

- **Overall Length:** 11 5/8 ± 1/4 inches
- **Neck Length:** 4 3/8 ± 1/8 inches
- **Greatest Diagonal:** 18 7/8 inches maximum
- **Greatest Width:** 16 11/16 inches maximum
- **Greatest Height:** 13 39/64 inches maximum

The projected minimum useful screen dimensions are:

- **Diagonal:** 17 9/16 inches
- **Horizontal Axis:** 15 1/8 inches
- **Vertical Axis:** 12 inches
- **Total Useful Area:** 172 square inches

Electrical connection to the high-voltage anode is made via a recessed small cavity cap (JEDEC J1-21 bulb contact). This ultor terminal is located on the same side as Pin No. 4, with the contact aligning with Pin Position No. 4 within a tolerance of ± 30 degrees. The base of the tube is a JEDEC B7-208 Small Button Neoeightar 7-Pin base, which conforms to the JEDEC 8HR basing configuration.

Electrical Connections and Basing

The 19ETP4 utilizes the JEDEC 8HR basing arrangement. The pin assignments, viewed from the bottom of the base, are detailed below:

Pin / Terminal	Connection
Pin 1	Heater
Pin 2	Grid No. 1
Pin 3	Grid No. 2
Pin 4	Grid No. 4 (Focusing Electrode)
Pin 5	No Connection
Pin 6	Grid No. 1
Pin 7	Cathode
Pin 8	Heater
Cap	Ultor (Grid No. 3, Grid No. 5, Collector)
External Coating	External Conductive Coating (C)

The external conductive coating must be connected to a reliable system ground.

Heater Characteristics

The heater is designed for nominal AC or DC operation. The heater specifications are:

- **Nominal Heater Voltage:** 6.3 V
- **Heater Current:** 450 $\pm$ 20 mA
- **Heater Warm-up Time:** 11 seconds

Interelectrode Capacitances and Coating Resistance

The electrical isolation and capacitive coupling between the electrodes, as well as the external coating characteristics, are defined by the following parameters:

- **Cathode to all other electrodes:** Approximately 5 pF
- **Grid No. 1 to all other electrodes:** Approximately 6 pF
- **External conductive coating to anode:** 1,000 pF minimum to 1,500 pF maximum (measured with the implosion protection hardware connected to the external coating)
- **Minimum resistance between coating and implosion hardware:** 50 M Ω

Design-Maximum Ratings

The following design-maximum ratings represent the limiting values of operating conditions for the 19ETP4. Unless otherwise specified, all voltages are positive and measured with respect to Grid No. 1.

- **Anode Voltage:** 12,000 V minimum to 21,000 V maximum
- **Grid No. 4 (Focusing Electrode) Voltage:** -500 V to +1,000 V
- **Grid No. 2 Voltage:** 25 V minimum to 60 V maximum
- **Cathode Voltage:**
 - Maximum Negative DC value: 0 V
 - Maximum Negative peak value: 2 V
 - Maximum Positive DC value: 100 V
 - Maximum Positive peak value: 150 V
- **Heater Voltage:** 5.8 V minimum to 6.9 V maximum
- **Maximum Grid No. 1 Circuit Resistance:** 1.5 M Ω

Heater-Cathode Voltage Limits

To prevent insulation breakdown, the voltage difference between the heater and the cathode must be kept within the following limits:

- **Heater negative with respect to cathode:**
 - During the equipment warm-up period (less than or equal to 15 seconds): 450 V maximum
 - After the equipment warm-up period: 200 V maximum
- **Heater positive with respect to cathode:** 200 V maximum

Typical Operating Conditions (Cathode Drive Service)

In typical cathode-drive applications, the operating voltages are referenced positively with respect to Grid No. 1. Under these conditions, the tube operates with the following parameters:

- **Anode Voltage:** 16,000 V DC
- **Grid No. 4 (Focusing Electrode) Voltage:** 250 V DC (Individual tubes may achieve focus within a range of 0 to +400 V DC)
- **Grid No. 2 Voltage:** 50 V DC
- **Cathode Voltage (for visual extinction of focused raster):** 32 V to 50 V DC

By utilizing a low Grid No. 2 voltage of 50 V, the 19ETP4 is highly compatible with solid-state or low-voltage tube drive circuitry, requiring a relatively small cathode video signal swing to achieve complete raster cutoff.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1964 RMA EIA

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

1964 RMA EIA

Section 1 · Cathode Ray

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater Voltage	6.3 V	—
Heater Current	450 mA	—
Heater Warm-up Time	11 s	—
Focusing Method	Electrostatic text	—
Deflection Method	Magnetic text	—
Horizontal Deflection Angle	102 deg	—
Vertical Deflection Angle	85 deg	—
Diagonal Deflection Angle	114 deg	—
Cathode-to-All Capacitance	5 pF	Approximate
Grid1-to-All Capacitance	6 pF	Approximate
External Coating-to-Anode Capacitance Minimum	1000 pF	—
External Coating-to-Anode Capacitance Maximum	1500 pF	—
Phosphor	P4 Aluminized text	—
Fluorescence	White text	—
Light Transmittance	49 percent	ScreenCenter

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid2 Voltage	50 V	CathodeDriveDesign