



ELECTRONIC TUBE REFERENCE

19BMP4

Specialized - Cathode Ray electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
CATHODERAY

Nineteen-inch cathode-ray picture tube documented by Philco for direct-view television service. The approved source is sparse in the extracted record, so additional construction or performance properties are not asserted.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	0
NOMINAL HEATER	— / —	PARALLEL HEATER	— / —
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Cathode Ray*No fixed ratings recorded.**Published values promoted where clearly attributable to this section.*

19BMP4 Television Picture Tube

The **19BMP4** is a directly viewed, rectangular glass television picture tube. It is designed with a short, improved electron gun that eliminates the need for an external ion trap magnet while providing enhanced edge focus. Electrically, the 19BMP4 is identical to the [19BLP4](#). The tube features an external conductive coating and a short integral glass button base with straight-through leads and an indexing lug.

Electro-Optical and Mechanical Specifications

The 19BMP4 utilizes electrostatic focusing combined with magnetic deflection. Its physical and optical characteristics are optimized for compact television receiver designs.

Deflection and Screen Characteristics

- **Deflection Angles (approximate):** Horizontal: 102°, Vertical: 86°, Diagonal: 114°
- **Phosphor:** Aluminized P4, which produces a white fluorescent color with medium-short persistence.
- **Faceplate (Bonded Shield):** FP159A2 with a light transmission of approximately 44% at the center.
- **Minimum Useful Screen Dimensions:** 172 square inches, with a diagonal of 17-3/4 inches, a width of 15-1/16 inches, and a height of 12-1/16 inches.

Physical Dimensions and Base

- **Overall Length:** 11-9/16 ± 1/4 inches
- **Neck Length:** 4-7/16 ± 1/16 inches
- **Bulb Dimensions:** Diagonal: 19.856 ± 0.094 inches; Width: 17.264 ± 0.094 inches; Height: 14.090 ± 0.094 inches
- **Bulb Designation:** J149-C1
- **Base Type:** B7-208
- **Basing Configuration:** 8HR
- **Anode Contact:** J1-21 cavity contact, which aligns with Pin #4 within a tolerance of ± 30°.

Heater and Interelectrode Capacitances

The 19BMP4 is designed for operation in series or parallel heater strings, featuring a controlled warm-up characteristic.

Heater Ratings

- **Heater Voltage:** 6.3 V
- **Heater Current:** 0.600 ± 0.030 A (at 6.3 V)
- **Heater Warm-up Time:** 11 seconds. This is defined as the time required to reach 80% of the rated heater voltage in a series circuit with a resistance equal to three times the rated heater voltage divided by the rated current, after applying four times the rated voltage.

Interelectrode Capacitances

- **Cathode to all other electrodes:** 4 µF (approximate)
- **Grid #1 to all other electrodes:** 5 µF (approximate)
- **External conductive coating to anode:** 1300 pF minimum / 1700 pF maximum

Grid Drive Service

In grid drive service, operating voltages are referenced to the cathode.

Design-Maximum Ratings

- **Anode Voltage (Anode, Grid #3, Grid #5):** 20,000 V max. DC

- **Grid #4 Voltage:** -550 to +1100 V DC
- **Grid #2 Voltage:** 200 to 550 V DC
- **Grid #1 Voltage:**
 - **Negative bias:** 154 V max. DC
 - **Negative peak:** 220 V max.
 - **Positive bias:** 0 V max. DC
 - **Positive peak:** 2 V max.
- **Peak Heater-Cathode Voltage:**
 - **Heater negative to cathode (during warm-up ≤ 15 s):** 450 V max.
 - **Heater negative to cathode (after warm-up):** 200 V max.
 - **Heater positive to cathode:** 200 V max.

Typical Operating Conditions

- **Anode Voltage:** 16,000 V DC
- **Grid #4 Voltage (Focusing Electrode):** 0 to +400 V DC
- **Grid #2 Voltage:** 400 V DC
- **Grid #1 Voltage (for raster extinction):** -36 to -94 V DC. The cutoff of an undeflected spot increases the required bias magnitude by approximately 5 V.

Maximum Circuit Values

- **Grid #1 Circuit Resistance:** 1.5 M Ω max.

Cathode Drive Service

In cathode drive service, operating voltages are referenced to Grid #1.

Absolute-Maximum Ratings

- **Anode Voltage:** 20,000 V max. DC
- **Grid #4 Voltage:** -400 to +1250 V DC
- **Grid #2 Voltage:** 350 to 700 V DC
- **Cathode Voltage:**
 - **Positive bias:** 154 V max. DC
 - **Positive peak:** 220 V max.
 - **Negative bias:** 0 V max. DC
 - **Negative peak:** 2 V max.
- **Peak Heater-Cathode Voltage:**
 - **Heater negative to cathode (during warm-up ≤ 15 s):** 450 V max.
 - **Heater negative to cathode (after warm-up):** 200 V max.
 - **Heater positive to cathode:** 200 V max.

Typical Operating Conditions

- **Anode Voltage:** 16,000 V DC
- **Grid #4 Voltage (Focusing Electrode):** 0 to +400 V DC
- **Grid #2 Voltage:** 400 V DC
- **Grid #1 Voltage:** 0 V DC
- **Cathode Voltage (for raster extinction):** +36 to +78 V DC. The cutoff of an undeflected spot increases the required bias magnitude by approximately 5 V.

Maximum Circuit Values

- **Grid #1 Circuit Resistance:** 1.5 MΩ max.

Safety Considerations

When operating the 19BMP4, safety precautions regarding X-ray radiation must be observed. X-ray shielding may be required if the tube is operated at anode voltages exceeding 16,000 V.