



ELECTRONIC TUBE REFERENCE

17JQ6

Power - TV Vertical Output electronic tube

CONSOLIDATED TECHNICAL DATA

2 SECTIONS

CONSTRUCTION

BEAMPOWER-DIODE

Beam-power deflection tube with an integral diode connected to grid No. 3, intended for feedback-stabilized television vertical-output circuits and rated for severe pulse operation.

GENERAL CHARACTERISTICS

BASE DESIGNATION	9RA	BASE PINS	9
NOMINAL HEATER	16.8 V / 450 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Dissimilar

SECTION RATINGS

SECTION1 Beam Power	
PLATE RESISTANCE	15000 Ω
TRANSCONDUCTANCE	0.0075 S
AMPLIFICATION FACTOR	6.5
MAXIMUM PLATE VOLTAGE	770 V
MAXIMUM SCREEN VOLTAGE	220 V
MAXIMUM PLATE DISSIPATION	17.5 W
MAXIMUM SCREEN DISSIPATION	3.5 W
MAXIMUM CATHODE CURRENT	175 mA
6JQ6 beam-power section; heater changed by 17JQ6 sheet.	

SECTION2 Diode

MAXIMUM CATHODE CURRENT	100 mA
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NOMINAL OUTPUT CURRENT	1 mA
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Integral diode section from 6JQ6 electrical system.

17JQ6 — Beam Power Tube with Integral Diode

The **17JQ6** is a miniature beam power tube featuring an integral diode internally connected to grid No. 3. It is designed primarily for feedback-stabilized vertical-deflection-amplifier applications in color and black-and-white television receivers operating on 525-line, 30-frame scanning systems.

Overview and Family Relationships

The 17JQ6 belongs to a family of electrically similar beam power tubes. It is identical to the [6JQ6](#), [12JQ6](#), and [25JQ6](#) except for its specific heater ratings. The tube's design incorporates an integral diode plate connected internally to the suppressor grid (grid No. 3), making it uniquely suited for specialized vertical-deflection circuitry where feedback stabilization is required.

Construction, Pinout, and Heater Ratings

The 17JQ6 is housed in a miniature glass envelope requiring a standard miniature 9-contact socket. The physical outline corresponds to section 6G, and the electrical connections are defined by the 9RA pinout diagram.

Pin Connection Diagram (9RA)

The nine pins of the base are connected as follows:

- **Pin 1:** Plate (P)
- **Pin 2:** Internal Connection (IC) — Do not use
- **Pin 3:** Grid No. 2 (Screen Grid) (G2)
- **Pin 4:** Heater (H)
- **Pin 5:** Heater (H)
- **Pin 6:** Grid No. 3 and Diode Plate (G3, PD)
- **Pin 7:** Grid No. 1 (Control Grid) (G1)
- **Pin 8:** Grid No. 1 (Control Grid) (G1)
- **Pin 9:** Cathode (K)

Heater Specifications

The heater is designed for operation in series or parallel heater chains:

- **Heater Voltage (AC or DC):** 16.8 V to 17.0 V

- **Heater Current:** 0.45 A (with a tolerance of ± 0.030 A)
- **Average Warm-up Time:** 11 seconds
- **Heater-Cathode Voltage:**
 - **Peak value:** ± 200 V maximum
 - **Average value:** 100 V maximum

Direct Interelectrode Capacitances

The direct interelectrode capacitances of the 17JQ6, measured without an external shield, are:

- **Grid No. 1 to Plate:** 0.32 pF
- **Grid No. 1 to Cathode, Heater, Grid No. 2, Grid No. 3, and Diode Plate:** 13 pF
- **Plate to Cathode, Heater, Grid No. 2, Grid No. 3, and Diode Plate:** 6 pF

Electrical Characteristics and Class A1 Operation

The 17JQ6 can be characterized under Class A1 amplifier conditions. Because of the high currents drawn at low bias levels, certain characteristics must be measured using recurrent waveform methods to prevent exceeding the tube's maximum ratings.

Class A1 Operating Points

The electrical characteristics are documented under two distinct operating points:

Parameter	Condition 1	Condition 2
Plate Voltage	40 V	140 V
Grid-No. 3 (Suppressor) Voltage	0 V	0 V
Grid-No. 2 (Screen) Voltage	120 V	140 V
Grid-No. 1 (Control) Voltage	0 V	-18 V
Plate Current	150 mA*	35 mA
Grid-No. 2 Current	20 mA*	2.5 mA
Plate Resistance (Approx.)	—	10,500 Ω
Transconductance	—	4,200 μmhos
Triode Amplification Factor	—	6.5**

**Measured using a recurrent waveform method to avoid exceeding maximum ratings.*

***Measured with Grid No. 3 and the diode plate connected to the cathode, and Grid No. 2 connected to the plate at the socket.*

Under the 140 V operating condition, the Grid-No. 1 voltage required to reduce the plate current to 1 mA is **-37 V**.

Integral Diode Characteristics

The integral diode, which shares its connection with grid No. 3, exhibits the following typical characteristic:

- **Instantaneous Diode-Plate-to-Cathode Voltage Drop:** 5 V at an instantaneous diode-plate current of 2 mA.

Vertical-Deflection Amplifier Service and Ratings

In television receivers utilizing a 525-line, 30-frame system, the 17JQ6 operates under demanding pulsed conditions. The following maximum ratings are Design-Maximum values, except where noted:

- **DC Plate Voltage:** 425 V
- **Peak Positive-Pulse Plate Voltage (Absolute-Maximum Value):** 2,000 V (The pulse duration must not exceed 15% of a vertical scanning cycle, or 2.5 ms)
- **DC Grid-No. 3 and Diode-Plate Voltage:** +10 V / -150 V
- **DC Grid-No. 2 Voltage:** 330 V
- **Peak Negative-Pulse Grid-No. 1 Voltage:** 150 V
- **Average Cathode Current:** 70 mA
- **Peak Cathode Current:** 250 mA
- **Average Diode-Plate (and Grid-No. 3) Current:** 1 mA
- **Plate Dissipation:** 10 W
- **Grid-No. 2 Input:** 2 W
- **Bulb Temperature (at hottest point):** 240 °C

Maximum Circuit Values

- **Grid-No. 1-Circuit Resistance:** 2.2 MΩ maximum for both fixed-bias (or resistor-bias) and cathode-bias operation.

Qualitative Curve Observations

The published characteristic curves for the 17JQ6 illustrate the behavior of the tube under various voltage and current conditions:

- **Plate and Grid-No. 2 Current vs. Plate Voltage (at Grid-No. 2 Voltage of 140 V):** At a Grid-No. 1 voltage of 0 V, the plate current rises sharply as plate voltage increases from 0 V up to approximately 50 V. At this point, it forms a distinct knee and transitions into a flatter, more gradual upward slope. The Grid-No. 2 current peaks sharply at very low plate voltages and drops to a low, stable level once the plate voltage rises above the 50 V knee.
- **Plate Current vs. Plate Voltage (at Grid-No. 1 Voltage of 0 V):** When plotted across a family of Grid-No. 2 voltages ranging from 60 V to 140 V, higher screen-grid voltages shift the entire plate

current curve upward, raising the overall saturation current level.

- The curves are provided for Grid-No. 1 voltages ranging from 0 V down to -30 V.

Technical Summary

The **17JQ6** is a miniature, 9-pin beam power tube with an integral diode connected to grid No. 3, specifically designed for feedback-stabilized vertical-deflection-amplifier service in television receivers. It features a 16.8 V to 17.0 V heater drawing 0.45 A, a maximum plate dissipation of 10 W, and a peak positive-pulse plate voltage rating of 2,000 V. Under typical Class A1 conditions, it exhibits a transconductance of 4,200 μmhos and a plate resistance of approximately 10,500 Ω .

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1971 RCA HB3 Binder 5 of 7

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

1971 RCA HB3 BINDER 5 OF 7

Section 1 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	17 V	—
Heater current	450 mA	—
Heater warm-up time	11 s	ControlledWarmup
Maximum DC plate voltage	770 V	HorizontalDeflection
Peak positive-pulse plate voltage	6500 V	HorizontalDeflection
Maximum screen voltage	220 V	HorizontalDeflection
Average cathode current	175 mA	HorizontalDeflection
Plate dissipation	17.5 W	BeamPower

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	250 V	BeamPower
Screen voltage	150 V	BeamPower
Plate current	70 mA	BeamPower
Plate resistance	15000 ohm	BeamPower
Transconductance	7500 uS	BeamPower

1971 RCA HB3 BINDER 5 OF 7

Section 2 · Diode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak inverse voltage	5000 V	IntegralDiode
Peak diode current	700 mA	IntegralDiode

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Average diode current	100 mA	IntegralDiode

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Forward voltage drop	20 V	IntegralDiode;100mA



SOURCE DATA APPENDIX

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 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
10 /iA	-8 V	Published in approved 17JQ6 target datasheet entry; Section1
For fixed-bias operation 2.2	2.2 MΩ	Published in approved 17JQ6 target datasheet entry; Section1
For cathode-bias operation 2.2	2.2 MΩ	Published in approved 17JQ6 target datasheet entry; Section1
Heater Voltage (ac/dc) 12.6	17 V	Published in approved 17JQ6 target datasheet entry; Section1
Heater Current 1.2 0.6	450 mA	Published in approved 17JQ6 target datasheet entry; Section1
Heater Warm-up Time (Average) . . 11	11 seconds	Published in approved 17JQ6 target datasheet entry; Section1
Grid-No.1 Voltage for plate current of	1 mA	Published in approved 17JQ6 target datasheet entry; Section1
for Instantaneous Diode-Plate Current of	2 mA	Published in approved 17JQ6 target datasheet entry; Section1
DC Plate Voltage	425 V	Published in approved 17JQ6 target datasheet entry; Section1
(Absolute-Maximum Value)*	2000 V	Published in approved 17JQ6 target datasheet entry; Section1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
DC Grid-No.3 and Diode-Plate Voltage	10 V	Published in approved 17JQ6 target datasheet entry; Section1
DC Grid-No. 2 Voltage	330 V	Published in approved 17JQ6 target datasheet entry; Section1
Peak Negative-Pulse Grid-No.1 Voltage	150 V	Published in approved 17JQ6 target datasheet entry; Section1
Peak Cathode Current	250 mA	Published in approved 17JQ6 target datasheet entry; Section1
Grid-No.2 Input	2 W	Published in approved 17JQ6 target datasheet entry; Section1
For grid-No.1-resistor-bias operation	2.2 MΩ	Published in approved 17JQ6 target datasheet entry; Section1
For cathode-bias operation	2.2 MΩ	Published in approved 17JQ6 target datasheet entry; Section1
cycle (	2.5 milliseconds	Published in approved 17JQ6 target datasheet entry; Section1
Heater Voltage (ac/dc) 6.3 16.8 22	33 V	Published in approved 17JQ6 target datasheet entry; Section1
Heater Current 1.6 0.6 0.45	300 mA	Published in approved 17JQ6 target datasheet entry; Section1
(Average) 11 11	11 seconds	Published in approved 17JQ6 target datasheet entry; Section1

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid No.1 to Plate	0.32 pF	Published in approved 17JQ6 target datasheet entry; Section1
and Diode Plate	13 pF	Published in approved 17JQ6 target datasheet entry; Section1
Grid No.1 to Plate	0.7 pF	Published in approved 17JQ6 target datasheet entry; Section1
and Grid No.3	22 pF	Published in approved 17JQ6 target datasheet entry; Section1
and Grid No.3	9 pF	Published in approved 17JQ6 target datasheet entry; Section1

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Voltage 40	140 V	Published in approved 17JQ6 target datasheet entry; Section1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-No.3 (Suppressor-Grid) Voltage 0	0 V	Published in approved 17JQ6 target datasheet entry; Section1
Grid-No.2 (Screen-Grid) Voltage 120	140 V	Published in approved 17JQ6 target datasheet entry; Section1
Grid-No.1 (Control-Grid) Voltage 0	-18 V	Published in approved 17JQ6 target datasheet entry; Section1
Plate Current 150#	35 mA	Published in approved 17JQ6 target datasheet entry; Section1
Grid-No.2 Current 20#	2.5 mA	Published in approved 17JQ6 target datasheet entry; Section1

1975 RCA RC30

Section 2 · Diode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
10 /iA	-8 V	Published in approved 17JQ6 target datasheet entry; Section2
For fixed-bias operation 2.2	2.2 MΩ	Published in approved 17JQ6 target datasheet entry; Section2
For cathode-bias operation 2.2	2.2 MΩ	Published in approved 17JQ6 target datasheet entry; Section2
Heater Voltage (ac/dc) 12.6	17 V	Published in approved 17JQ6 target datasheet entry; Section2
Heater Current 1.2 0.6	450 mA	Published in approved 17JQ6 target datasheet entry; Section2
Heater Warm-up Time (Average) . . 11	11 seconds	Published in approved 17JQ6 target datasheet entry; Section2
Grid-No.1 Voltage for plate current of	1 mA	Published in approved 17JQ6 target datasheet entry; Section2
for Instantaneous Diode-Plate Current of	2 mA	Published in approved 17JQ6 target datasheet entry; Section2
DC Plate Voltage	425 V	Published in approved 17JQ6 target datasheet entry; Section2
(Absolute-Maximum Value)*	2000 V	Published in approved 17JQ6 target datasheet entry; Section2
DC Grid-No.3 and Diode-Plate Voltage	10 V	Published in approved 17JQ6 target datasheet entry; Section2
DC Grid-No. 2 Voltage	330 V	Published in approved 17JQ6 target datasheet entry; Section2

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak Negative-Pulse Grid-No.1 Voltage	150 V	Published in approved 17JQ6 target datasheet entry; Section2
Peak Cathode Current	250 mA	Published in approved 17JQ6 target datasheet entry; Section2
Grid-No.2 Input	2 W	Published in approved 17JQ6 target datasheet entry; Section2
For grid-No.1-resistor-bias operation	2.2 MΩ	Published in approved 17JQ6 target datasheet entry; Section2
For cathode-bias operation	2.2 MΩ	Published in approved 17JQ6 target datasheet entry; Section2
cycle (	2.5 milliseconds	Published in approved 17JQ6 target datasheet entry; Section2
Heater Voltage (ac/dc) 6.3 16.8 22	33 V	Published in approved 17JQ6 target datasheet entry; Section2
Heater Current 1.6 0.6 0.45	300 mA	Published in approved 17JQ6 target datasheet entry; Section2
(Average) 11 11	11 seconds	Published in approved 17JQ6 target datasheet entry; Section2

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid No.1 to Plate	0.32 pF	Published in approved 17JQ6 target datasheet entry; Section2
and Diode Plate	13 pF	Published in approved 17JQ6 target datasheet entry; Section2
Grid No.1 to Plate	0.7 pF	Published in approved 17JQ6 target datasheet entry; Section2
and Grid No.3	22 pF	Published in approved 17JQ6 target datasheet entry; Section2
and Grid No.3	9 pF	Published in approved 17JQ6 target datasheet entry; Section2

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Voltage 40	140 V	Published in approved 17JQ6 target datasheet entry; Section2
Grid-No.3 (Suppressor-Grid) Voltage 0	0 V	Published in approved 17JQ6 target datasheet entry; Section2
Grid-No.2 (Screen-Grid) Voltage 120	140 V	Published in approved 17JQ6 target datasheet entry; Section2

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-No.1 (Control-Grid) Voltage 0	-18 V	Published in approved 17JQ6 target datasheet entry; Section2
Plate Current 150#	35 mA	Published in approved 17JQ6 target datasheet entry; Section2
Grid-No.2 Current 20#	2.5 mA	Published in approved 17JQ6 target datasheet entry; Section2

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