ELECTRONIC TUBE REFERENCE

12FQ7

Voltage - Dual Triode (similar) electronic tube

CONSOLIDATED TECHNICAL DATA
2 SECTIONS
CONSTRUCTION
TRIODE-TRIODE

Medium-mu twin triode for general voltage-amplifier, phase-inverter, and driver service, electrically suited to applications requiring moderate gain and useful current capability.

General characteristics

BASE DESIGNATION	9LP	**BASE PINS**	9
NOMINAL HEATER	12.6 V / 300 mA	**PARALLEL HEATER**	6.3 V / 600 mA
HEATING	Indirect	**SERIES OPERATION**	Capable
CATHODE ARRANGEMENT	Separate cathodes	**SECTION CONSTRUCTION**	Similar

9LP - Terminal pinout

TERMINAL	SECTION	ELEMENT	STATUS
PIN1	B	P — Plate (Anode)	CONNECTED
PIN2	B	G1 — Control Grid	CONNECTED
PIN3	B	K — Cathode	CONNECTED
PIN4	—	H — Heater	CONNECTED
PIN5	—	H — Heater	CONNECTED
PIN6	A	P — Plate (Anode)	CONNECTED
PIN7	A	G1 — Control Grid	CONNECTED
PIN8	A	K — Cathode	CONNECTED

Section ratings

SECTION1 Triode	
PLATE RESISTANCE	6700 Ω
TRANSCONDUCTANCE	0.003 S
AMPLIFICATION FACTOR	20
MAXIMUM PLATE VOLTAGE	330 V
MAXIMUM CATHODE CURRENT	22 mA

Supplied sheet explicitly states this is the same as 6FQ7 except for heater characteristics. Parent electrical table was not present in the currently available local corpus, so no unsupported promoted values were invented.

SECTION2 Triode	
PLATE RESISTANCE	6700 Ω
TRANSCONDUCTANCE	0.003 S
AMPLIFICATION FACTOR	20
MAXIMUM PLATE VOLTAGE	330 V
MAXIMUM CATHODE CURRENT	22 mA

Physical triode row restored under current one-row-per-physical-section policy.

12FQ7 — Medium-Mu Twin Triode Vacuum Tube

An indirectly heated, 9-pin miniature double triode designed for use as a combined vertical- and horizontal-deflection oscillator in television receivers and for general-purpose Class A1 amplification.

Overview

The **12FQ7** is a miniature, medium-mu twin triode featuring two independent triode sections in a single T-6 1/2 glass envelope. It is primarily designed for service in television receivers as a combined vertical- and horizontal-deflection oscillator in both color and black-and-white systems. Additionally, it is highly suitable for use as a resistance-coupled Class A1 amplifier.

The 12FQ7 is electrically identical to the 6FQ7/6CG7 and 8FQ7/8CG7 vacuum tubes, differing only in its heater voltage and current ratings. It features a controlled heater warm-up time of 11 seconds, making it suitable for series-string heater arrangements.

Heater and Physical Specifications

The 12FQ7 utilizes an indirectly heated, unipotential cathode design. The heater is designed to operate from either an AC or DC supply.

Parameter	Value
Heater Voltage (AC/DC)	12.6 V
Heater Current	0.300 ± 0.020 A (0.3 A nominal)
Average Heater Warm-up Time	11 seconds
Maximum Heater-Cathode Voltage (Heater Negative to Cathode)	200 V (Total DC and Peak)
Maximum Heater-Cathode Voltage (Heater Positive to Cathode)	100 V DC, 200 V (Total DC and Peak)

The physical dimensions of the tube are standardized under the miniature T-6 1/2 outline:

- **Base:** Button 9-Pin, E9-1
- **Basing Designation:** 9LP
- **Maximum Diameter:** 0.875 inches
- **Maximum Seated Height:** 2.375 inches
- **Maximum Overall Height:** 2.625 inches
- **Mounting Position:** Any

Pinout and Base Connections

The 12FQ7 uses a standard miniature 9-contact socket. The 9LP basing configuration provides independent connections for the electrodes of both triode units, with the exception of the shared heater.

- **Pin 1:** Plate (Unit 2)
- **Pin 2:** Grid (Unit 2)
- **Pin 3:** Cathode (Unit 2)
- **Pin 4:** Heater
- **Pin 5:** Heater
- **Pin 6:** Plate (Unit 1)
- **Pin 7:** Grid (Unit 1)
- **Pin 8:** Cathode (Unit 1)
- **Pin 9:** Internal Connection (IC) / No Connection (NC)

Note on Pin 9: Pin 9 is designated as an internal connection or no connection depending on the manufacturer. To maintain circuit interchangeability across different brands, this pin must not be used for any external circuit connections.

Electrical Characteristics and Class A1 Operation

Each triode section of the 12FQ7 exhibits moderate amplification factor and relatively low plate resistance. Under typical Class A1 amplifier conditions, the operating parameters are defined at two

distinct plate voltage points:

Parameter	Operating Point A	Operating Point B
Plate Voltage	90 V	250 V
Grid Voltage	0 V	-8 V
Amplification Factor	20	20
Plate Resistance (Approx.)	6,700 Ω	7,700 Ω
Transconductance	3,000 µmhos	2,600 µmhos
Plate Current	10 mA	9 mA
Grid Voltage for 10 µA Plate Current (Approx.)	-7 V	-18 V
Plate Current at -12.5 V Grid Bias	—	1.3 mA

Design-Maximum Ratings (Class A1 Amplifier)

- **Maximum DC Plate Voltage:** 330 V
- **Maximum Positive-Bias Grid Voltage:** 0 V
- **Maximum Cathode Current:** 22 mA
- **Maximum Plate Dissipation (Either Plate):** 4.0 W
- **Maximum Plate Dissipation (Both Plates Operating):** 5.7 W
- **Maximum Grid Circuit Resistance (Fixed-Bias):** 1.0 MΩ

Deflection Oscillator Service

When operated as a vertical- or horizontal-deflection oscillator in a 525-line, 30-frame television system, the 12FQ7 is subject to specific design-maximum ratings tailored to pulsed wave-shape conditions.

Rating Parameter	Vertical-Deflection Oscillator	Horizontal-Deflection Oscillator
Maximum DC Plate Voltage	330 V	330 V
Maximum Peak Negative-Pulse Grid Voltage	440 V	660 V
Maximum Peak Cathode Current	77 mA	330 mA
Maximum Average Cathode Current	22 mA	22 mA

Rating Parameter	Vertical-Deflection Oscillator	Horizontal-Deflection Oscillator
Maximum Plate Dissipation (Either Plate)	4.0 W	4.0 W
Maximum Plate Dissipation (Both Plates Operating)	5.7 W	5.7 W
Maximum Grid-Circuit Resistance (Self-Bias)	2.2 MΩ	2.2 MΩ

Interelectrode Capacitances

The direct interelectrode capacitances of the 12FQ7 are measured without an external shield. The values for each independent triode section are as follows:

Capacitance Parameter	Unit No. 1	Unit No. 2
Grid to Plate	3.6 pF	3.8 pF
Input: Grid to (Cathode + Heater)	2.4 pF	2.4 pF
Output: Plate to (Cathode + Heater)	0.34 pF	0.26 pF
Plate of Unit 1 to Plate of Unit 2	1.0 pF	1.0 pF

Technical Summary

The **12FQ7** is a versatile, 9-pin miniature medium-mu twin triode. Operating with a 12.6 V, 0.3 A heater with a controlled 11-second warm-up time, it is optimized for series-string television designs. With an amplification factor of 20, transconductance up to 3,000 µmhos, and a plate dissipation limit of 4 watts per section (5.7 watts combined), it provides robust performance in both low-frequency Class A1 amplification and demanding television deflection oscillator circuits.

SOURCE OPERATING CONDITIONS

1971 RCA HB3 Binder 5 of 7

SOURCE PDF

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 · Triode

CHARACTERISTICS

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Current — published value 1	**0.3**	Published value from the filename-designated RCA datasheet block; multiple numbers on one row represent separate limits or heater arrangements.
Current — published value 2	**0.02**	Published value from the filename-designated RCA datasheet block; multiple numbers on one row represent separate limits or heater arrangements.
Voltage (ac or dc) at 0.300 A — published value 1	**0.3 V**	Published value from the filename-designated RCA datasheet block; multiple numbers on one row represent separate limits or heater arrangements.
Voltage (ac or dc) at 0.300 A — published value 2	**12.6 V**	Published value from the filename-designated RCA datasheet block; multiple numbers on one row represent separate limits or heater arrangements.
Heater voltage	**12.6 V**	Nominal heater rating
Heater current	**300 mA**	Nominal heater rating

SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

1975 RCA RC30

SOURCE PDF

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

1975 RCA RC30

Section 1 · Triode

OTHER		
PARAMETER	**PUBLISHED VALUE**	**CONDITION / NOTE**
Heater Voltage (ac/dc) 6.3 8.4	**12.6 V**	Published in approved 12FQ7 target entry; Section1
Heater Current 0.6 0.45	**300 mA**	Published in approved 12FQ7 target entry; Section1
Heater Warm-up Time (Average)	**11 seconds**	Published in approved 12FQ7 target entry; Section1
Grid to Plate 3.6	**3.8 pF**	Published in approved 12FQ7 target entry; Section1
Grid to Cathode and Heater 2.4	**2.4 pF**	Published in approved 12FQ7 target entry; Section1
Plate to Cathode and Heater 0.34	**0.26 pF**	Published in approved 12FQ7 target entry; Section1
Plate Voltage	**330 V**	Published in approved 12FQ7 target entry; Section1
Grid Voltage, Positive-bias value	**0 V**	Published in approved 12FQ7 target entry; Section1
Cathode Current	**22 mA**	Published in approved 12FQ7 target entry; Section1
For both plates with both units opex'ating	**5.7 W**	Published in approved 12FQ7 target entry; Section1
Plate Voltage 90	**250 V**	Published in approved 12FQ7 target entry; Section1
Grid Voltage 0	**-8 V**	Published in approved 12FQ7 target entry; Section1
Plate Resistance (Approx.) 6700	**7700 Ω**	Published in approved 12FQ7 target entry; Section1
DC Plate Voltage 330	**330 V**	Published in approved 12FQ7 target entry; Section1
Peak Negative-Pulse Grid Voltage 440	**660 V**	Published in approved 12FQ7 target entry; Section1
Peak Cathode Current 77	**330 mA**	Published in approved 12FQ7 target entry; Section1
Average Cathode Current 22	**22 mA**	Published in approved 12FQ7 target entry; Section1
For either plate 4	**4 W**	Published in approved 12FQ7 target entry; Section1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
For both plates with both units operating . . . 5.7	**6.7 W**	Published in approved 12FQ7 target entry; Section1
Grid-Circuit Resistance 2.2	**2.2 MΩ**	Published in approved 12FQ7 target entry; Section1
Heater Voltage (ac/dc) 2.4 2.9	**6.3 V**	Published in approved 12FQ7 target entry; Section1
Heater Current 0.6 0.45	**200 mA**	Published in approved 12FQ7 target entry; Section1
Heater Warm-up Time (Average) 11	**11 seconds**	Published in approved 12FQ7 target entry; Section1
Plate Voltage	**300 V**	Published in approved 12FQ7 target entry; Section1
Grid-No.3 (Screen-Grid) Voltage	**150 V**	Published in approved 12FQ7 target entry; Section1
Negative-bias value	**60 V**	Published in approved 12FQ7 target entry; Section1
Positive-bias value	**0 V**	Published in approved 12FQ7 target entry; Section1
Cathode Current	**20 mA**	Published in approved 12FQ7 target entry; Section1
Plate Dissipation	**3.25 W**	Published in approved 12FQ7 target entry; Section1
Grid-No.3 Input	**0.16 W**	Published in approved 12FQ7 target entry; Section1
Plate Voltage	**275 V**	Published in approved 12FQ7 target entry; Section1
Grid-No.3 Voltage	**135 V**	Published in approved 12FQ7 target entry; Section1
Grid-No.l Voltage	**-0.2 V**	Published in approved 12FQ7 target entry; Section1
Grid-No.l-Circuit Resistance, for fixed-bias operation	**0.5 MΩ**	Published in approved 12FQ7 target entry; Section1

CAPACITANCE

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate of Unit No.l to Plate of Unit No	**2 pF**	Published in approved 12FQ7 target entry; Section1
Grid No.l to Plate 0.03	**0.016 pF**	Published in approved 12FQ7 target entry; Section1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
No.3, and Grid No.4	**4.8 pF**	Published in approved 12FQ7 target entry; Section1
and Grid No	**4 pF**	Published in approved 12FQ7 target entry; Section1

CHARACTERISTIC

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Current 10	**9 mA**	Published in approved 12FQ7 target entry; Section1
Grid Voltage (Approx.) for plate current of 10 /iA. —7	**-18 V**	Published in approved 12FQ7 target entry; Section1
12.5 volts	**1.3 mA**	Published in approved 12FQ7 target entry; Section1
Plate Resistance (Approx.)	**0.24 MΩ**	Published in approved 12FQ7 target entry; Section1
Transconductance	**10000 µS**	Published in approved 12FQ7 target entry; Section1
Plate Current	**9 mA**	Published in approved 12FQ7 target entry; Section1
Grid-No.3 Current	**0.17 mA**	Published in approved 12FQ7 target entry; Section1
Grid-No.l Voltage (Approx.) for transconductance of	**100 µS**	Published in approved 12FQ7 target entry; Section1
Grid-No.l Voltage (Approx.) for transconductance of 100 /imhos	**-5 V**	Published in approved 12FQ7 target entry; Section1

Tube Tinker

An independent reference for electronic tubes, vacuum tubes, and their source documents.

Catalog Tube types Full books Blog Feedback & corrections

© 2026 Tube Tinker