

ELECTRONIC TUBE REFERENCE

CONSOLIDATED TECHNICAL DATA
2 SECTIONS
CONSTRUCTION
TRIODE-TRIODE

1642

Voltage - Dual Triode (similar) electronic tube

Medium-mu twin triode, co-designated with 2C21, intended for Class-A amplifier service and providing two similar triode units in a compact envelope.

GENERAL CHARACTERISTICS

BASE DESIGNATION	7BH	BASE PINS	7
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 Triode	
PLATE RESISTANCE	7600 Ω
TRANSCONDUCTANCE	0.001375 S
AMPLIFICATION FACTOR	10.4
MAXIMUM PLATE VOLTAGE	250 V
Promoted from the printed maximum-rating/characteristic columns; additional operating-point and capacitance data are retained in TUBE_SECTION_PARAMETER.	

SECTION2 Triode	
PLATE RESISTANCE	7600 Ω
TRANSCONDUCTANCE	0.001375 S
AMPLIFICATION FACTOR	10.4
MAXIMUM PLATE VOLTAGE	250 V
Physical section restored under current one-row-per-physical-section policy.	

1642 — Medium-Mu Twin Triode Vacuum Tube

The **1642** (also designated as the **2C21/1642**) is an indirectly heated, medium-mu twin triode vacuum tube designed for use in amplifier applications, particularly as a Class A voltage amplifier. Featuring two independent triode sections within a single envelope, the device provides a compact solution for dual-stage amplification or independent signal processing.

Physical Construction and Basing

The 1642 is constructed with an indirectly heated cathode configuration, utilizing a common heater for both triode sections. The physical layout of the tube is designated by the 12-6 outline drawing.

The electrical connections are routed through a specialized 7-pin base configuration designated as **7BH** (or **2C21**). This basing arrangement features a unique asymmetrical layout where the plate of the first triode section is brought out to a top cap, while all other electrodes are connected to the base pins. The pinout configuration, viewed from the bottom of the base, is as follows:

Pin / Connection	Electrode Assignment
Pin 1	Plate, Triode 2 (<u>P2</u>)
Pin 2	Grid, Triode 2 (<u>G2</u>)
Pin 3	Cathode, Triode 2 (<u>K2</u>)
Pin 4	Heater (H)
Pin 5	Heater (H)
Pin 6	Cathode, Triode 1 (<u>K1</u>)
Pin 7	Grid, Triode 1 (<u>G1</u>)
Top Cap	Plate, Triode 1 (<u>P1</u>)

This physical separation of the first plate via the top cap helps minimize capacitive coupling and provides excellent isolation between the two triode sections.

Heater and Maximum Ratings

The heater of the 1642 is designed for AC or DC operation with the following nominal ratings:

- **Heater Voltage:** 6.3 V
- **Heater Current:** 0.6 A
- **Calculated Heater Power:** 3.78 W

Under standard operating conditions, the tube is rated for a maximum plate voltage of **250 V**.

Electrical Characteristics and Class A Operating Points

The 1642 is characterized by a moderate amplification factor and relatively low plate resistance, making it highly suitable for general-purpose Class A amplification. The typical operating parameters for each individual triode section under Class A amplifier service are detailed below:

- **Plate Voltage:** 250 V
- **Negative Grid Bias Voltage:** 16.5 V
- **Plate Current:** 8.3 mA
- **Plate Resistance (r_p):** 7,600 Ω
- **Transconductance (g_m):** 1,375 μ mhos
- **Amplification Factor (μ):** 10.4

Parameter Relationship Verification

The fundamental relationship between the triode's amplification factor (μ), transconductance (g_m), and plate resistance (r_p) is expressed by the formula:

$$\mu = g_m \times r_p$$

Using the typical operating values as inputs for this calculation:

$$\mu = 0.001375 \text{ S} \times 7,600 \Omega \approx 10.45$$

This calculated value closely aligns with the published nominal amplification factor of 10.4, confirming the consistency of the electrical specifications.

Technical Summary

The **1642** (2C21/1642) is a versatile **medium-mu twin triode** featuring a **6.3 V, 0.6 A heater** and an unusual **7BH** basing configuration that utilizes a top cap for the first plate connection. With an amplification factor of **10.4**, a transconductance of **1,375 μ mhos**, and a plate resistance of **7,600 Ω** , per section at a plate voltage of **250 V**, the tube delivers reliable performance in Class A voltage amplifier circuits. Its independent cathode connections and top-cap plate design provide circuit designers with flexible layout options and excellent section isolation.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

195X General Electric Essential Characteristics

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

195X GENERAL ELECTRIC ESSENTIAL CHARACTERISTICS

Section 1 · Triode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	250 V	ClassA;EachSection
Control-grid voltage	-16.5 V	ClassA;EachSection
Plate current	8.3 mA	ClassA;EachSection

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	7600 Ω	EachSection
Transconductance	1375 μS	EachSection
Amplification factor	10.4	EachSection

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