

ELECTRONIC TUBE REFERENCE

4648

Power - Tetrode (NOT beam) (over 1000V 100W) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
TETRODE

High-power RF tetrode designed for continuous-wave and pulsed amplification to approximately 1 GHz. Its transmitting construction supports substantial UHF power under both steady and pulsed operation.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	—
NOMINAL HEATER	3.7 V / 1600 A	PARALLEL HEATER	— / —
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Tetrode	
AMPLIFICATION FACTOR	9
MAXIMUM PLATE VOLTAGE	32000 V
MAXIMUM SCREEN VOLTAGE	1500 V
MAXIMUM PLATE DISSIPATION	250000 W
MAXIMUM CATHODE CURRENT	45 A
Published maximum ratings/general electrical characteristics promoted directly; pulse, RF, capacitance, cooling, and service-specific values retained in TUBE_SECTION_PARAMETER.	

High-power RF tetrode for CW and pulsed amplification to 1000 MHz; type 4648. The RCA source was reviewed for heater/filament data, maximum ratings, RF and pulse operating conditions, capacitances, cooling requirements, and application-specific limits.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

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

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Section 1 · Tetrode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum plate voltage	32000 V	PromotedValue
Maximum screen-grid voltage	1500 V	PromotedValue
Maximum plate dissipation	40000 W	PromotedValue
Maximum cathode/plate current	3.4 A	PromotedValue
Maximum Ceramic-Insulator Temperature	150 degC	Published datasheet value
Maximum Metal -Surface Temperature	100	Published datasheet value
Peak Positive-Pulse Grid-No.2 Voltage1.k . . 1500	1.5 A	Pulse
Grid-No.t Voltage	400 mA	Published datasheet value
Peak Plate Current	55 mA	Published datasheet value
Peak Grid-No.2 Current	4 mA	Published datasheet value
Peak Rectified Grid-No.t Current	5 mA	Published datasheet value
DC Plate Current	3.4 mA	Published datasheet value
DC Grid-No.2 Current	250 mA	Published datasheet value
DC Grid-No.1 Current	310 mA	Published datasheet value
In Class 8 service at 425 kHz with a rectangular waveshape pulse at a	425	Pulse
DC Plate Voltage	22000 V	Published datasheet value
DC Grid-No.1 Voltage	400 mA	Published datasheet value
DC Plate Current	45 mA	Published datasheet value

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Dissipationm	250000 W	Published datasheet value
Grid-No.2 Dissipationm	3500 W	Published datasheet value
, , , , ~ Grid-No.t Dissipationm	3000 W	Published datasheet value
DC Grid-No.2 Voltage	1.1 A	Published datasheet value
DC Plate Current	25 mA	Published datasheet value
Plate Dissipationm	150000 W	Published datasheet value
Grid-No.2 Dissipationm	2500 W	Published datasheet value

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Mu / amplification factor	9	PromotedValue
Heater/filament voltage	3.7 V	Nominal operating value
Heater/filament current	1600 A	Nominal operating value
■ Pulsed Output up tc: 500 kW peak (4647)	4647000 W	Pulse
■ Full Input to 1000 MHz (Each Type)	1000 MHz	Published datasheet value
■ Power Gain up to 28 d6 (Each Type)	28	Published datasheet value
Current, do operating,	1600	Published datasheet value
Voltage at 840 A	3.7 V	Published datasheet value
Operating Voltage	60 V	Published datasheet value
Voltage Before Applying Plate Voltage	60 V	Published datasheet value
Mu-Factor (grid No.2 to grid No.1)	9	Published datasheet value
Grid No.1 to plate	0.6 pF	Published datasheet value
Grid No.1 to grid No.2 and cathode	1200 pF	Published datasheet value
Plate to cathode and grid No.2	85 pF	Published datasheet value
Grid No.2 to cathode	140 pF	Published datasheet value
Grid No.2 to grid No.t	775 pF	Published datasheet value
Grid No.1 to cathode	425 pF	Published datasheet value
Minimum Storage Temperatureb	65	Published datasheet value

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak Positive-Pulse Plate Voltage ^h	32000 V	Pulse
duty factor ⁹ of 0.06 and a pulse duration ⁹ of 2000 microseconds	2000 us	Pulse
Peak Positive-Pulse Plate Voltage ^h	30000 V	Pulse
Peak Positive-Pulse Grid-No.2 Voltage ^l	1400 V	Pulse
Peak Negative-Pulse Grid-No.1 Voltage ⁿ	225 V	Pulse
Peak Plate Current	50	Published datasheet value
Peak Grid-No.2 Current	2.5	Published datasheet value
Peak Rectified Grid-No.1 Current	5	Published datasheet value
DC Plate Current	3	Published datasheet value
DC Grid-No.2 Current	150 mA	Published datasheet value
DC Grid-No.1 Current	300 mA	Published datasheet value
Peak Driver Power Output (approx. ^l)	1500	Published datasheet value
Output Circuit Efficiency (approx.)	95	Published datasheet value
Useful Peak Power Output	1000000 W	Published datasheet value
DC Plate Voltage	20000 V	Published datasheet value
DC Grid-No.2 Voltage	1200 V	Published datasheet value
DC Plate Current	38	Published datasheet value
DC Grid-No.2 Current	1.3	Published datasheet value
DC Grid-No.1 Current	3.5	Published datasheet value
Driver Power (approx.)	1000	Published datasheet value
Circuit Efficiency (approx. ^l)	95	Published datasheet value
Useful Power Output (approx.)	500000 W	Published datasheet value
DC Plate Voltage	16000 V	Published datasheet value
DC Plate Voltage	14000 V	Published datasheet value
DC Grid-No.2 Voltage	1000 V	Published datasheet value
DC Grid-No.1 Voltage	250 V	Published datasheet value

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak RF Grid-No.1 Voltage	280 V	Published datasheet value
DC Plate Current	22	Published datasheet value
DC Grid-No.2 Current	1.3	Published datasheet value
DC Grid-No.1 Current	2.5	Published datasheet value
Driver Power Output (approx.)	750	Published datasheet value
Output-Circuit Efficiency (approx.)	95	Published datasheet value
Useful Power Output (approx.)	200000 W	Published datasheet value
RCA Power Tubes", ICE-279A. During shipment the tube	279	Published datasheet value
ring surrounding the grid-No.1 terminal using four 10-32	32	Published datasheet value
6; Remove the wooden mounting plate from the tube by	6	Published datasheet value
8. Reattach the wooden mounting plate to the spring sup	8	Published datasheet value
3. Set tube down resting on mounting plate	3	Published datasheet value
5. Lift tube using the eye-bolts on the mounting plate. It is	5	Published datasheet value
1. Visually inspect the coolant separator and tube anode	1	Published datasheet value
3. Carefully insert the AJ2196 Plate Coolant Separator into	3	Published datasheet value
Power Dissipation in kW = 0.264 (GPM) (Tout – Tin)	264 W	Published datasheet value
plication Guide for RCA Power Tubes" 10E-279	279	Published datasheet value
Filament, Grid No. 1 and Grid No. 2 (Type 4647)	4647	Published datasheet value
Filament	1.05	Published datasheet value
Filament Ground	1.05	Published datasheet value

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid No.1	1.19	Published datasheet value
Grid No.2	1.05	Published datasheet value
Filament, Grid No. 1 and Grid No. 2 (Type 4648)	4648	Published datasheet value
Filament	1.4	Published datasheet value
Filament Ground 2.0	1.4	Published datasheet value
Grid No.1	1.61	Published datasheet value
Grid No.2	1.4	Published datasheet value
FILAMENT TERMINAL d	8	Published datasheet value
RF GRID No. 1	1	Published datasheet value
DETAIL OF RF INPUT CATHODE AND RF GRID NO. 1 TERMINAL	1	Published datasheet value
NAL, CONTACT SURFACES AND DC GRID NO. 1 TERMINAL	1	Published datasheet value