



ELECTRONIC TUBE REFERENCE

813

Power - Beam (NOT sweep) (over 1000V 100W) electronic tube

CONSOLIDATED TECHNICAL
DATA

1 SECTION
CONSTRUCTION
BEAMPOWER

Beam-power transmitting pentode designed for RF power-amplifier and oscillator service in medium- and high-power radio equipment.

GENERAL CHARACTERISTICS

BASE DESIGNATION	—	BASE PINS	7
NOMINAL HEATER	10 V / 5 A	PARALLEL HEATER	— / —
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Beam Power	
TRANSCONDUCTANCE	0.00375 S
AMPLIFICATION FACTOR	8.5
MAXIMUM PLATE VOLTAGE	2250 V
MAXIMUM SCREEN VOLTAGE	750 V
MAXIMUM PLATE DISSIPATION	125 W
MAXIMUM CATHODE CURRENT	225 mA
Maximum ratings and characteristic constants promoted where reliably published in the approved sheet.	

Beam-power pentode intended for RF power-amplifier and oscillator service.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1940 RCA

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

1940 RCA

Section 1 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Thoriated-Tungsten Filament U0	2 W	Thoriated-Tungsten Filament U00Watts Input on Phone (ICAS) upto30Mc 7-1/2" Max. Length
High Power Sensitivity	6 W	High Power Sensitivity 500 Watts Input on CW (ICAS)up to 30 Mc 2-9- 6" Max. Diameter
power amplifier and modu-- ces®	1045 A	power amplifier and modu-- ces® 1045°®
tator. The	2500 V	tator. The 813 has a maximum DC PLATE VOLTAGE 2250 max. 2500 max. volts
DC GR!D-No	1100 V	DC GR!D-No.2 (SCREEN) VOLTAGE. . . 1100 max, 1100 max, volts
plate dissipation of	225 mA	plate dissipation of 125 MAX.-SIGNAL DC PLATE CURRENT®. . . 180 mex. 225 max. ma
watts under [CAS conditions MAX.-SIGNAL PLATE INPUT*	450 W	watts under [CAS conditions MAX.-SIGNAL PLATE INPUT* 360 max, 450 max., watts
MAX.-SIGNAL GRID-No	22 W	MAX.-SIGNAL GRID-No.2 INPUT* . . . 22 max. 22 max, watts
PLATE DISSIPATION* « «	125 W	PLATE DISSIPATION* « « 100 max. 125 max., watts
with full input to	2500 MHz	with full input to 30 Mc and DC Plate voltage 1500 2000 2250 2500 volts
to 120 Mc. DC Grid-No.3	3 MHz	to 120 Mc. DC Grid-No.3
(Suppressor)Vo]taget. [+	0 V	(Suppressor)Vo]taget. [+ 0 0 0 volts
of its high power DC Grid-No	750 V	of its high power DC Grid-No.2 Vvoltage™ . 7500 750 750 750 volts
sensitivity, the	813 V	sensitivity, the 813 requires Grid) voltage:
very little driving power to From fixed-bias source -g5 ~	95 V	very little driving power to From fixed-bias source -g5 ~90 -95 ~95 volts

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
give full power output. For Grid-No	180 V	give full power output. For Grid-No.1 Voltage\$. 160 160 170 180 volts
example, inclass C telegraph Current	50 A	example, inclass C telegraph Current 50 50 50 50 ma
. . . 305 265 255 290 ma	290 mA	. . . 305 265 255 290 ma
capable of giving a power No	2 mA	capable of giving a power No.2 Current . . . 2 2 2 2 ma
output of approximately	53 W	output of approximately 375 watts with a driving No.2 Current . . . 45 43 53 S5U m
power of only about	4 W	power of only about 4 watts. Effective Load Resis—
tance (Plate toplate)	19000 ohm	tance (Plate toplate) 9300 16000 20000 {19000 ohms
Power (Approx.?)	0 W	Power (Approx.?. 0 0 0 0 watts
Electrical: put (Approx.)	490 W	Electrical: put (Approx.) . . . 260 335 380 490 watts
voltage (AC or DC) . . . + « V «	5 V	voltage (AC or DC) . . . + « v « . . 10.0%5% volts
Transconductance (Approx.) for plate with fixed bias e	30000 ohm	Transconductance (Approx.) for plate with fixed bias e 4 e s 4 s e s e s « 30000 max. ohms
volts =	100 V	volts = 2000, grid-No.2 volts =100, With cathode bias . & . « « v v « v o o W Not recommended
and plate current=	3750 mA	and plate current=50ma . . « . . . 3750 pmhos
for plate volts=	2 V	for plate volts= 2000, grid-No.2
volts =	8.5 V	volts =400, and plate current =50 ma. 8.5 Carrier conditions per tube for use with
DC PLATE VOLTAGE . . . +» + « »	2250 V	DC PLATE VOLTAGE . . . +» + « » . 2000 max. 2250 max. volts
and grid No	400 pF	and grid No.3 . . « . . « b . o s 14 upf DC GRID~No.2 (SCREEN) VOLTAGE. . . 400 max, 400 max. volts
DC PLATE CURRENT . . & & v & & &	125 mA	DC PLATE CURRENT . . & & v & & & & 100 max. 125 max. ma
Mechanical: PLATE INPUT o & & v « o o s o o &	200 W	Mechanical: PLATE INPUT o & & v « o o s o o & 150 max, 200 max, watts
Mounting Position. . vertical, Base up or down; Horizontal, GRID=N0	20 W	Mounting Position. . vertical, Base up or down; Horizontal, GRID=N0.2 INPUT & & o « o « o « 15 max, 20 max, watts

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
with pins	125 W	with pins 2 & 6 in vertical plane PLATE DISSIPATION . « . & o v 4 & 100 max. 125 max, watts
Maximum Diameter . « . v « & v &+ &+ o o « s o o o	2250 V	Maximum Diameter . « . v « & v &+ &+ o o « s o o o 2-9/16" DC Plate voltage » 1500 2000 2250 volts
BUTD & v & v v v e e e e e e e e e . . . T=	0 V	BUTD & v & v v v e e e e e e e e e . . . T=20 DC Grid-No.3 (Suppressor) voltage. 0 0 0 volts
CBP + = « + s s	0 V	CBP + = « + s s 4 » e s « s « s o Medium (JETEC No.C1-5) DC Grid-No.2 Voltage . . . « . . . %00 %001 u00 volts
DC Grid-No	4.3 W	DC Grid-No.1 (Control— Driving Power (Approx.)B&, 2.9 2.7 4.3 watts
Grid) Voltage®® ~	300 V	Grid) Voltage®® ~60 =75 =60 volts Power Output (Approx.) 140 180 300 watts
Peak RF Grid-No	70 V	Peak RF Grid-No.1 voltage 70 80 70 volts
DC Plate Current « . . «	85 mA	DC Plate Current « . . « . 100 75 85 ma Maximum Circuit Values {(CCS or ICAS):
DC Grid-No	30000 mA	DC Grid-No.2 Current 4 3 3 ma Grid-No.1-Circuit Resistance 30000 max. ohms
00C Grid-No.1 Current X x X ma	1 mA	00C Grid-No.1 Current X x X ma
Power Output (Approx.)	70 W	Power Output (Approx.) 50 50 70 watts
Grid-No	30000 ohm	Grid-No.1 Circuit Resistance 30000 max. ohms
DC PLATE VOLTAGE . . . ,	2250 V	DC PLATE VOLTAGE . . . , ... 2000 max. 2250 max. volts
GRID-MODULATED RF POWER AMPLIFIER - DC GRID-No	400 A	GRID-MODULATED RF POWER AMPLIFIER - DC GRID-No.2 (SCREEN) VOLTAGE. . . 400 max. 400 max. volts
Class C Telephony DC GRID-No	300 V	Class C Telephony DC GRID-No.1 (CONTROL~GRID)VOLTAGE -300 max. —300 max, volts
Carrier conditions per tube for use with DC PLATE CURRENT	225 mA	Carrier conditions per tube for use with DC PLATE CURRENT 180 max. 225 max. ma
a max. modulation factor of	30 mA	a max. modulation factor of 1.0 DC GRiD-No.1 CURRENT 25 max. 30 max. ma
PLATE INPUT & & v & s & &	500 W	PLATE INPUT & & v & s & & 2 o o « 360 max, 500 max, watts

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
GRID=N0	22 W	GRID=N0.2 INPUT. & v ¢« v 4 + o « & 22 max. 22 max, watts
CCS®	125 W	ccs® 1045%® PLATE DISSIPATION « . . . 100 max. 125 max. watts
DC PLATE VOLTAGE	2250 V	DC PLATE VOLTAGE 2000 max. 2250 max, volts
DC GRID~No	400 V	DC GRID~No.2 (SCREEN) VOLTAGE. . 400 max, 400 max, volts Typical Operation:
DC GRID-No	2250 V	DC GRID-No.1 (CONTROL~ DC Plate Voltage 1250 1500 2000 2250 volts
GRID) VOLTAGE., . . « =	3 V	GRID) VOLTAGE., . . « =200 max. ~200 max. volts DC Grid—No.3 (Suppressor)
DC PLATE CURRENT	0 mA	DC PLATE CURRENT 100 max, 125 max. ma Voltage% C e e e e 0 0 0 0 volts
PLAFE INPUT « o o & & « o« «	400 W	PLAFE INPUT « o o & & « o« « . 150 max. 200 max. watts DC Grid-No.2 voltage®®. 300 300 300 400 volts

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Current at	1 V	Current at 10.0 volts . . , ... 5.0 amp Grid-No.,1—<Circuit Resistance:
Mu~Factor, grid No	1 A	Mu~Factor, grid No.2 to grid No.1 RF POWER AMPLIFIER - Class B Telephony



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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1945 United Electronics

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

1945 UNITED ELECTRONICS

Section 1 · Beam Power

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Filament voltage	10 V	—
Filament current	5 A	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum direct plate voltage	2250 V	—
Maximum plate dissipation	125 W	—


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SOURCE OPERATING CONDITIONS

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1950 General Electric Transmitting Types

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

1950 GENERAL ELECTRIC TRANSMITTING TYPES

Section 1 · Beam Power

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
HeaterOrFilamentVoltage	10 V	—
HeaterOrFilamentCurrent	5 A	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
FrequencyForMaximumRatings	30 MHz	—
Maximum Signal Power Output	650 W	ClassC


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1956 RCA Transmitting Tubes

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

1956 RCA TRANSMITTING TUBES

Section 1 · Beam Power

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Transconductance	3750 μ S	—
Amplification Factor	8.5	—

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum Plate Voltage	2500 V	—
Maximum Screen Voltage	1100 V	—
Maximum Plate Dissipation	125 W	—
Maximum Cathode Current	225 mA	—
Full-Input Operating Frequency Maximum	30 MHz	—
Power Output	490 W	ClassAB1,AF,TwoTubes
Typical Plate Voltage	2250 V	Representative published point
Typical Plate Current	255 mA	Representative published point



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1958 Amperex Industrial

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

1958 AMPEREX INDUSTRIAL

Section 1 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum plate voltage	1500 V	Published Amperex table
Maximum screen voltage	300 V	Published Amperex table
Power output	190 W	Published Amperex table
Plate dissipation	100 W	Published Amperex table
Plate current	180 mA	Published Amperex table
Grid bias	70 V	Published Amperex table

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid current	6 mA	Published Amperex table
Maximum frequency	30 MHz	Published Amperex table

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater/filament voltage	10 V	Published Amperex table
Heater/filament current	5 A	Published Amperex table



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1963 Amperex Condensed

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

1963 AMPEREX CONDENSED

Section 1 · Beam Power

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	2000 V	RFPower
Plate current	180 mA	RFPower
Power output	275 W	RFPower
Grid voltage	-120 V	RFPower
Grid current	10 mA	RFPower
Maximum frequency	120 MHz	RFPower

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid-to-plate capacitance	0.25 pF	—
Input capacitance	16.3 pF	—
Output capacitance	14 pF	—

TUBE TINKER

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

