

ELECTRONIC TUBE REFERENCE

1R5

Voltage Pentode or Tetrode (under 100V) electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION
CONSTRUCTION
HEPTODE

Widely used battery pentagrid converter for portable superheterodyne receivers. It combines local oscillator and mixer functions while its economical filament and modest supply requirements suit compact battery radios.

GENERAL CHARACTERISTICS

BASE DESIGNATION	7AT	BASE PINS	7
NOMINAL HEATER	1.4 V / 50 mA	PARALLEL HEATER	– / –
HEATING	Direct	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

7AT - TERMINAL PINOUT

TERMINAL	SECTION	ELEMENT	STATUS
PIN1 – G5	A	G5 – Fifth Grid	CONNECTED
PIN1 – F	–	F – Filament	CONNECTED
PIN2 – P	A	P – Plate (Anode)	CONNECTED
PIN3 – G2	A	G2 – Screen Grid	CONNECTED
PIN3 – G4	A	G4 – Fourth Grid	CONNECTED
PIN4 – G1	A	G1 – Control Grid	CONNECTED
PIN5 – G5	A	G5 – Fifth Grid	CONNECTED
PIN5 – F	–	F – Filament	CONNECTED
PIN6 – G3	A	G3 – Suppressor Grid	CONNECTED
PIN7 – F	–	F – Filament	CONNECTED

SECTION RATINGS

SECTION1 Heptode	
PLATE RESISTANCE	400000 Ω
TRANSCONDUCTANCE	0.00028 S
AMPLIFICATION FACTOR	6.5
MAXIMUM PLATE VOLTAGE	90 V
MAXIMUM SCREEN VOLTAGE	90 V
MAXIMUM CATHODE CURRENT	5.5 mA
<i>Promoted gm/mu are oscillator characteristics; conversion transconductance preserved as parameter.</i>	

Directly heated heptode frequency converter for battery radio receivers.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1948 Brimar Radio Valve Manual

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

1948 BRIMAR RADIO VALVE MANUAL

Section 1 · Heptode

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
HeaterOrFilamentVoltage	1.4 V	—
HeaterOrFilamentCurrent	50 mA	—
Conversion Conductance	300 μ S	PlateVoltage=90V;ScreenVoltage=67.5V



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1958 Brimar Radio Valve No 7

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

1958 BRIMAR RADIO VALVE NO 7

Section 1 · Heptode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Voltage	90 V	—
Plate Current	1.6 mA	—
Screen Voltage	67.5 V	—
Screen Current	3.2 mA	—

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate Resistance	600000 ohm	—
Conversion Conductance	300 μ S	—
Operating Frequency Maximum	20 MHz	—

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 · Heptode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	90 V	ClassA; OperatingPoint1
Screen voltage	67.5 V	ClassA; OperatingPoint1
Control-grid bias	0 V	ClassA; OperatingPoint1
Plate current	1.5 mA	ClassA; OperatingPoint1
Screen current	3.5 mA	ClassA; OperatingPoint1
Plate voltage	45 V	ClassA; OperatingPoint2
Screen voltage	45 V	ClassA; OperatingPoint2
Control-grid bias	0 V	ClassA; OperatingPoint2
Plate current	0.7 mA	ClassA; OperatingPoint2
Screen current	2.1 mA	ClassA; OperatingPoint2
Oscillator grid current	0.25 mA	V _p =90 V; Screen=67.5 V
Oscillator grid resistor	100000 ohm	V _p =90 V; Screen=67.5 V

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1961 Ferranti Technical Handbook

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

1961 FERRANTI TECHNICAL HANDBOOK

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
HeaterOrFilamentVoltage	1.4 V	—
HeaterOrFilamentCurrent	50 mA	—
MaximumOperatingFrequency	20 MHz	FrequencyChanger



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

SOURCE PDF

1966 Tung Sol Electronic Tubes 1 of 4

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

1966 TUNG SOL ELECTRONIC TUBES 1 OF 4

Section 1 · Heptode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	90 V	Converter
Screen voltage	67.5 V	Converter
Plate current	1.3 mA	Converter
Screen current	2.4 mA	Converter
Application	Pentagrid converter/oscillator-mixer for battery receivers	Section1

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Conversion transconductance	325 μS	Converter
Plate resistance	0.4 M Ω	Converter



SOURCE DATA APPENDIX

1968 General Electric Co

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

1968 GENERAL ELECTRIC CO

Section 1 · Heptode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	45 V	ConverterService;OperatingPoint1
Screen voltage	45 V	ConverterService;OperatingPoint1
Plate current	0.7 mA	ConverterService;OperatingPoint1
Screen current	2.1 mA	ConverterService;OperatingPoint1
Plate voltage	67.5 V	ConverterService;OperatingPoint2
Screen voltage	67.5 V	ConverterService;OperatingPoint2
Plate current	1.4 mA	ConverterService;OperatingPoint2
Screen current	3.5 mA	ConverterService;OperatingPoint2
Plate voltage	90 V	ConverterService;OperatingPoint3
Screen voltage	67.5 V	ConverterService;OperatingPoint3
Plate current	1.5 mA	ConverterService;OperatingPoint3
Screen current	3.5 mA	ConverterService;OperatingPoint3

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate resistance	500000 ohm	ConverterService;OperatingPoint1
Conversion transconductance	210 uS	ConverterService;OperatingPoint1
Plate resistance	400000 ohm	ConverterService;OperatingPoint2
Conversion transconductance	280 uS	ConverterService;OperatingPoint2
Plate resistance	400000 ohm	ConverterService;OperatingPoint3
Conversion transconductance	280 uS	ConverterService;OperatingPoint3
Oscillator transconductance	1400 uS	OscillatorNotOscillating
Oscillator amplification factor	6.5	OscillatorNotOscillating

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1968 Mazda Belvu

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

1968 MAZDA BELVU

Section 1 · Heptode

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater or filament voltage	1.4 V	Published nominal value
Heater or filament current	50 mA	Published nominal value
Conversion transconductance	280 $\mu\text{A/V}$	67.5 V operating condition