

ELECTRONIC TUBE REFERENCE

PL509

Power - TV Horizontal Output (sweep) electronic tube

CONSOLIDATED TECHNICAL DATA
1 SECTION
CONSTRUCTION
PENTODE

Power pentode designed for color-television line-output and horizontal-deflection amplification.

GENERAL CHARACTERISTICS

BASE DESIGNATION	38A	BASE PINS	9
NOMINAL HEATER	40 V / 300 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION1 Pentode	
MAXIMUM PLATE VOLTAGE	700 V
MAXIMUM SCREEN VOLTAGE	275 V
MAXIMUM PLATE DISSIPATION	30 W
MAXIMUM SCREEN DISSIPATION	7 W
MAXIMUM CATHODE CURRENT	500 mA
Published ratings and characteristics promoted where clearly stated; identical repeated sections compressed when applicable.	

Power pentode for color-television line-output/line-deflection amplification. The supplied French datasheet was translated to English for descriptive output.

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1967 Mullard Receiving and Amplifying Valves

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

1967 MULLARD RECEIVING AND AMPLIFYING VALVES

Section 1 · Pentode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak positive-pulse plate voltage	7000 V	HorizontalDeflection

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	160 V	ClassA
Screen-grid voltage	160 V	ClassA
Plate current	1400 mA	ClassA;RecurrentWaveform
Screen-grid current	45 mA	ClassA;RecurrentWaveform

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate-to-grid No.1 capacitance	2.5 pF	—
Grid No.1-to-heater capacitance	0.2 pF	—

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

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Tension filament sercecsernensenennmenennnmbenennnnnnnnnnnnnnnnnnnnnn V	40 V	—
Courant filament serensesçnnnnänensennnnnnnnnnnnnnnnnnnnnn . If	300 mA	—



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

SOURCE PDF

1972 Philips Receiving Tubes

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

1972 PHILIPS RECEIVING TUBES

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	40 V	Published nominal value
Heater current	300 mA	Published nominal value

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum plate dissipation	30 W	Published maximum rating
Maximum peak anode voltage	7 kV	Design-centre rating; 8 kV design-max



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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1973 Mazda Valves Binder 2

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

1973 MAZDA VALVES BINDER 2

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	40 V	Published nominal value
Heater current	300 mA	Published nominal value

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Maximum plate dissipation	40 W	Published maximum rating
Maximum positive peak anode voltage	8 kV	Design-centre rating

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SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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1975 RCA RC30

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

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Peak positive-pulse plate voltage	7000 V	HorizontalDeflection

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate voltage	160 V	ClassA
Screen-grid voltage	160 V	ClassA
Plate current	1400 mA	ClassA;RecurrentWaveform
Screen-grid current	45 mA	ClassA;RecurrentWaveform

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate-to-grid No.1 capacitance	2.5 pF	—

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Grid No.1-to-heater capacitance	0.2 pF	—



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1999 Philips E-Z

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

1999 PHILIPS E-Z

Section 1 · Pentode

CHARACTERISTICS		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	40 V	—
Heater current	300 mA	—
Heater current If 300 mA	300 a	Heater current If 300 mA
Heater voltage Ve 40 V	40 a	Heater voltage Ve 40 V
Anode voltage Va 160 50 VvV	50 A	Anode voltage Va 160 50 VvV
Grid No.3 voltage Vg3 0 0 Vv	3 v	Grid No.3 voltage Vg3 0 0 Vv
Grid No.2 voltage Vg2 160 175V	2 v	Grid No.2 voltage Vg2 160 175V
Grid No.1 voltage Vgl 0 -10 V	-10 v	Grid No.1 voltage Vgl 0 -10 V
Anode current I, 1400 800 mA	800 A	Anode current I, 1400 800 mA
Grid No.2 current Igz 45 70 mA	70 mA	Grid No.2 current Igz 45 70 mA
The minimum required cut-off voltage (_Vgl) during flyback at V,	7000 v	The minimum required cut-off voltage (_Vgl) during flyback at V, = 7000 V and
Supply voltages: See pages 4-5-6	-6 S	Supply voltages: See pages 4-5-6
Va min 2, provided a D.C. voltage of at least +20 V is applied tothe beamplate (g3)	20 V	Va min 2, provided a D.C. voltage of at least +20 V is applied tothe beamplate (g3).
Va min have to be increased with 10% of the anode supply voltage	10 V	Va min have to be increased with 10% of the anode supply voltage.

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
able throughout life of the tube at supply voltages 10% below nominal	10 a	able throughout life of the tube at supply voltages 10% below nominal.
In circuits where decoupling capacitors in the grid no2 or the grid no 3 circuits are	3 s	In circuits where decoupling capacitors in the grid no2 or the grid no 3 circuits are
means of an 100 Ohm resistance between g2 and the g2-bypass capacitance	100 a	means of an 100 Ohm resistance between g2 and the g2-bypass capacitance.
The 1000 Ohms resistance should be protected by a spark-gap connected between g3	1000 Ohm	The 1000 Ohms resistance should be protected by a spark-gap connected between g3
At Zg;	220 A	At Zg; = 200 k (f = 50 Hz), Vi/f = 220 VRMs and without wiring and socket capac-
4, With < 10 k Ω capacitive decoupling of g3 is not required	4 W	4, With < 10 k Ω capacitive decoupling of g3 is not required.
The specified values of Iu) are available at supply voltages 109 below nominal and	109 s	The specified values of Iu) are available at supply voltages 109 below nominal and
Remark: Rgs min for 400 V screen grid supply is 2.9 k Ω . (See page 3)	3 ma	Remark: Rgs min for 400 V screen grid supply is 2.9 k Ω . (See page 3)
The specified values of I, are available at supply voltages 10% below nominal and	10 s	The specified values of I, are available at supply voltages 10% below nominal and
Remark: Rg2 min for 350 V screen grid supply is 2.2 k Ω . (See page 3)	3 ma	Remark: Rg2 min for 350 V screen grid supply is 2.2 k Ω . (See page 3)
The specified values of Iy _ are available at supply voltages 109 below nominal and	109 s	The specified values of Iy _ are available at supply voltages 109 below nominal and
Remark: Rgz min for 280 V screen grid supply is 1.4 k Ω . (See page 3)	3 ma	Remark: Rgz min for 280 V screen grid supply is 1.4 k Ω . (See page 3)

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode peak voltage Vap 7000 V	7000 A	Anode peak voltage Vap 7000 V
Cathode current Ik max. 500 mA	500 a	Cathode current Ik max. 500 mA
Anode dissipation Wa max. 30 W	30 A	Anode dissipation Wa max. 30 W
Anode voltage in cold condition Vao max. 700 V	700 A	Anode voltage in cold condition Vao max. 700 V
Anode peak voltage Vap max. 7000 V 1)	1 A	Anode peak voltage Vap max. 7000 V 1)
Anode dissipation Wi max. 30 W	30 A	Anode dissipation Wi max. 30 W
Anode + grid No. 2 dissipation (triode-connected) Wa + Wgz max. 31 W	31 A	Anode + grid No. 2 dissipation (triode-connected) Wa + Wgz max. 31 W
GridNo. 3 voltage Vg3 max. 0 VvV	3 v	GridNo. 3 voltage Vg3 max. 0 VvV
Grid No.2 voltage in cold condition Vg20 max. 700 V	2 v	Grid No.2 voltage in cold condition Vg20 max. 700 V
Grid No.2 voltage v 2 max. 275 V	2 v	Grid No.2 voltage v 2 max. 275 V
GridNo.2 dissipation "Fgz max. 7 W 2)	2 s	GridNo.2 dissipation "Fgz max. 7 W 2)
Cathode current I max. 500 mA	500 a	Cathode current I max. 500 mA
Cathode peak current Ik max. 1200 mA	1200 a	Cathode peak current Ik max. 1200 mA
Cathode-to-heater voltage vfif max. 250 V	250 a	Cathode-to-heater voltage vfif max. 250 V
GridNo.1 resistor: fixed bias Rgl max. 0.5 MQ 3)	1 s	GridNo.1 resistor: fixed bias Rgl max. 0.5 MQ 3)
3 circuit resistance Rg3 max. 10 k2 4)	3 s	3 circuit resistance Rg3 max. 10 k2 4)
Bulb temperature thulb max. 300 °C 5)	5 a	Bulb temperature thulb max. 300 °C 5)
Anode dissipation Wy max. 40 W	40 A	Anode dissipation Wy max. 40 W

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode + grid No.2 dissipation (triode connected) Wy + Wg2 max. 42 W	42 A	Anode + grid No.2 dissipation (triode connected) Wy + Wg2 max. 42 W
Grid No.2 dissipation WgZ max. 9 W	2 s	Grid No.2 dissipation WgZ max. 9 W
Anode peak voltage Vap max. 8000 V l)	8000 A	Anode peak voltage Vap max. 8000 V l)
Neg. grid No.1 peak voltage -Vglp max. 550 V l)	1 a	Neg. grid No.1 peak voltage -Vglp max. 550 V l)
3. The circuit design has to be such that negative control grid currents up to 5	3 s	3. The circuit design has to be such that negative control grid currents up to 5
Care should be taken that with 5 micro-amperes grid current the limiting values	5 a	Care should be taken that with 5 micro-amperes grid current the limiting values
Rgy max @ max. permissible screen grid series resistance for 400 V screen grid	400 ma	Rgy max @ max. permissible screen grid series resistance for 400 V screen grid
Rg2 max : max. permissible screen grid series resistance for 350 V screen grid	350 ma	Rg2 max : max. permissible screen grid series resistance for 350 V screen grid
Rgs max.: max. permissible screen grid series resistance for 280 V screen grid	280 s	Rgs max.: max. permissible screen grid series resistance for 280 V screen grid

TUBE TINKER

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