



## ELECTRONIC TUBE REFERENCE

## ECH83

Voltage - Triode (with diode, heptode or hexode) electronic tube

CONSOLIDATED TECHNICAL  
DATA

**2 SECTIONS**  
CONSTRUCTION  
**HEXODE-TRIODE**

Low-voltage triode-heptode for frequency-changing and amplification from unusually small electrode supplies. The triode provides oscillator action while the multi-grid section performs receiver frequency conversion.

## GENERAL CHARACTERISTICS

|                     |                   |                      |               |
|---------------------|-------------------|----------------------|---------------|
| BASE DESIGNATION    | 9C12              | BASE PINS            | 9             |
| NOMINAL HEATER      | 6.3 V / 300 mA    | PARALLEL HEATER      | – / –         |
| HEATING             | Indirect          | SERIES OPERATION     | Not specified |
| CATHODE ARRANGEMENT | Separate cathodes | SECTION CONSTRUCTION | Dissimilar    |

## SECTION RATINGS

| SECTION1 Hexode                                                                                                           |                  |
|---------------------------------------------------------------------------------------------------------------------------|------------------|
| PLATE RESISTANCE                                                                                                          | 5000000 $\Omega$ |
| TRANSCONDUCTANCE                                                                                                          | 0.0015 S         |
| AMPLIFICATION FACTOR                                                                                                      | 20               |
| MAXIMUM PLATE VOLTAGE                                                                                                     | 50 V             |
| MAXIMUM SCREEN VOLTAGE                                                                                                    | 50 V             |
| MAXIMUM PLATE DISSIPATION                                                                                                 | 0.8 W            |
| MAXIMUM SCREEN DISSIPATION                                                                                                | 0.5 W            |
| MAXIMUM CATHODE CURRENT                                                                                                   | 5 mA             |
| <i>Heptode section; values semantically promoted from published characteristics/maximum-ratings tables where present.</i> |                  |

|                                                                                                                          |               |
|--------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>SECTION2</b> Triode                                                                                                   |               |
| <b>PLATE RESISTANCE</b>                                                                                                  | 9000 $\Omega$ |
| <b>TRANSCONDUCTANCE</b>                                                                                                  | 0.0022 S      |
| <b>AMPLIFICATION FACTOR</b>                                                                                              | 20            |
| <b>MAXIMUM PLATE VOLTAGE</b>                                                                                             | 250 V         |
| <b>MAXIMUM PLATE DISSIPATION</b>                                                                                         | 0.8 W         |
| <b>MAXIMUM CATHODE CURRENT</b>                                                                                           | 6.5 mA        |
| <i>Triode section; values semantically promoted from published characteristics/maximum-ratings tables where present.</i> |               |

Triode-heptode for frequency-changing or combined RF/AF amplification in equipment operating directly from 6, 12, or 24 V batteries.

## SOURCE OPERATING CONDITIONS

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# 1953 La Radiotechnique

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

## 1953 LA RADIOTECHNIQUE

## Section 1 · Hexode

| CHARACTERISTIC                             |                 |                  |
|--------------------------------------------|-----------------|------------------|
| PARAMETER                                  | PUBLISHED VALUE | CONDITION / NOTE |
| Indirect (cathode isolee du filament)      | 63 V            | Heptode          |
| Alimentation en parallele ou en serie. ! f | 300 mA          | Heptode          |

| OTHER                                 |                 |                  |
|---------------------------------------|-----------------|------------------|
| PARAMETER                             | PUBLISHED VALUE | CONDITION / NOTE |
| Tension de l'anode Va                 | 25 V            | Heptode          |
| Tension des grilles 2 et 4            | 25 V            | Heptode          |
| Tension efficace d'oscillat           | 35 V            | Heptode          |
| grille 3                              | 47 kohm         | Heptode          |
| Resistance interne                    | 5 Mohm          | Heptode          |
| Pente de conversion                   | 450 uA          | Heptode          |
| Tension de l'anode                    | 25 V            | Heptode          |
| Tension des griiles 2,3 et 4 Vg243:4a | 25 V            | Heptode          |
| Courant anodique                      | 1.25 mA         | Heptode          |
| Courant des grilles 2, 3, 4 . lÿ2:3+4 | 0.85 mA         | Heptode          |
| Resistance interne                    | 2 Mohm          | Heptode          |
| Pente                                 | 1.5 mA/V        | Heptode          |
| Resist. equival. de souffle. Req      | 5 kohm          | Heptode          |
| Capacite de l'anode                   | 7.9 pF          | Heptode          |
| Capacite de la grille 1               | 48 pF           | Heptode          |

| PARAMETER                            | PUBLISHED VALUE | CONDITION / NOTE |
|--------------------------------------|-----------------|------------------|
| Capacite anode-grille 1              | <b>0.012 pF</b> | Heptode          |
| Capacite de la grille 3              | <b>6 pF</b>     | Heptode          |
| Capacite grille 1 – grille 3         | <b>3 pF</b>     | Heptode          |
| Tension de l'anode                   | <b>50 V</b>     | Heptode          |
| Tension des grilles 2 et 4           | <b>50 V</b>     | Heptode          |
| Courant cathodique                   | <b>5 mA</b>     | Heptode          |
| Resistance du circuit de la grille 3 | <b>50 kohm</b>  | Heptode          |
| Tension entre filament et cathode    | <b>150 V</b>    | Heptode          |

#### 1953 LA RADIOTECHNIQUE

### Section 2 · Triode

| OTHER                                        |                 |                  |
|----------------------------------------------|-----------------|------------------|
| PARAMETER                                    | PUBLISHED VALUE | CONDITION / NOTE |
| Tension de l'anode                           | <b>25 V</b>     | Triode           |
| Courant anodique                             | <b>2 mA</b>     | Triode           |
| Tension de l'anode                           | <b>250 V</b>    | Triode           |
| Puissance dissipee sur l'anode               | <b>8 W</b>      | Triode           |
| 0 S                                          | <b>6.5 mA</b>   | Triode           |
| Resistance du circuit de la grille           | <b>3 Mohm</b>   | Triode           |
| Resistance du circuit filament-cathode . Rkf | <b>20 kohm</b>  | Triode           |
| Tension entre filament et cathode            | <b>150 V</b>    | Triode           |
| (3) Composante continue, 100 V               | <b>100 V</b>    | Triode           |
| EUHHVa,, 4                                   | <b>6.3 V</b>    | Triode           |

| CAPACITANCE           |                 |                  |
|-----------------------|-----------------|------------------|
| PARAMETER             | PUBLISHED VALUE | CONDITION / NOTE |
| Capacite de l'anode   | <b>21 pF</b>    | Triode           |
| Capacite de la grille | <b>26 pF</b>    | Triode           |
| Capacite anode-grille | <b>1 pF</b>     | Triode           |
|                       |                 |                  |

| PARAMETER                                       | PUBLISHED VALUE | CONDITION / NOTE |
|-------------------------------------------------|-----------------|------------------|
| Caxn – oT < 0,09 pF CaixH<br>(gT + 3) < 0,45 pF | 0.45 pF         | Triode           |
| Coixn– aT < 0,06 pF Cax (gT<br>– 3) < 0,35 pF   | 0.35 pF         | Triode           |
| (1) Obtenue par polarisation<br>avec Rg,        | 1 Mohm          | Triode           |
| (2) Obtenue par polarisation<br>avec Rg         | 47 kohm         | Triode           |



SOURCE DATA APPENDIX

## SOURCE OPERATING CONDITIONS

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# 1963 Philips Electron Tubes Handbook V1a

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

## 1963 PHILIPS ELECTRON TUBES HANDBOOK V1A

### Section 2 · Triode

| CHARACTERISTIC              |                 |                         |
|-----------------------------|-----------------|-------------------------|
| PARAMETER                   | PUBLISHED VALUE | CONDITION / NOTE        |
| Heater voltage              | 6.3 V           | Published heater rating |
| Heater current              | 300 mA          | Published heater rating |
| Triode transconductance     | 2200 μS         | TriodeSection           |
| Triode amplification factor | 20              | TriodeSection           |

| OTHER                          |                 |                  |
|--------------------------------|-----------------|------------------|
| PARAMETER                      | PUBLISHED VALUE | CONDITION / NOTE |
| Triode plate voltage           | 25 V            | TriodeSection    |
| Triode plate current           | 2 mA            | TriodeSection    |
| Triode maximum plate voltage   | 250 V           | TriodeSection    |
| Heptode maximum plate voltage  | 50 V            | HeptodeSection   |
| Heptode maximum screen voltage | 50 V            | HeptodeSection   |

## SOURCE OPERATING CONDITIONS

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# 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 · Hexode

| OTHER                                        |                 |                     |
|----------------------------------------------|-----------------|---------------------|
| PARAMETER                                    | PUBLISHED VALUE | CONDITION / NOTE    |
| Plate Current                                | 0.11 mA         | BatterySupply=6.3V  |
| Screen Current                               | 0.08 mA         | BatterySupply=6.3V  |
| Transconductance                             | 350 uS          | BatterySupply=6.3V  |
| Plate Resistance                             | 600000 ohm      | BatterySupply=6.3V  |
| Plate Current                                | 0.4 mA          | BatterySupply=12.6V |
| Screen Current                               | 0.25 mA         | BatterySupply=12.6V |
| Transconductance                             | 750 uS          | BatterySupply=12.6V |
| Plate Resistance                             | 850000 ohm      | BatterySupply=12.6V |
| Plate Current                                | 1.25 mA         | BatterySupply=25V   |
| Screen Current                               | 0.85 mA         | BatterySupply=25V   |
| Transconductance                             | 1500 uS         | BatterySupply=25V   |
| Plate Resistance                             | 200000 ohm      | BatterySupply=25V   |
| Maximum Plate Voltage                        | 30 V            | —                   |
| Maximum Screen Voltage                       | 30 V            | —                   |
| Maximum Cathode Current                      | 5 mA            | —                   |
| Interelectrode Capacitance<br>Data Published | 1               | SourceTablePresent  |

| CHARACTERISTIC   |                 |                  |
|------------------|-----------------|------------------|
| PARAMETER        | PUBLISHED VALUE | CONDITION / NOTE |
| Plate Resistance | 200000 ohm      | —                |
| Transconductance | 1500 uS         | —                |

Section 2 · Triode

| OTHER                                        |                 |                    |
|----------------------------------------------|-----------------|--------------------|
| PARAMETER                                    | PUBLISHED VALUE | CONDITION / NOTE   |
| Plate Voltage                                | 12.6 V          | BatteryService     |
| Plate Current                                | 0.75 mA         | BatteryService     |
| Transconductance                             | 1400 uS         | BatteryService     |
| AF Voltage Gain                              | 8               | BatteryService     |
| AF Output Voltage                            | 1.8 V           | BatteryService     |
| Maximum Plate Voltage                        | 30 V            | —                  |
| Maximum Cathode Current                      | 3 mA            | —                  |
| Interelectrode Capacitance<br>Data Published | 1               | SourceTablePresent |

| CHARACTERISTIC   |                 |                  |
|------------------|-----------------|------------------|
| PARAMETER        | PUBLISHED VALUE | CONDITION / NOTE |
| Transconductance | 1400 uS         | —                |



SOURCE DATA APPENDIX

SOURCE OPERATING CONDITIONS

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1972 Philips Receiving Tubes

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

Section 1 · Hexode

| OTHER                      |                 |                  |
|----------------------------|-----------------|------------------|
| PARAMETER                  | PUBLISHED VALUE | CONDITION / NOTE |
| HeaterVoltageNominal       | 6.3 V           | Nominal          |
| HeaterCurrentNominal       | 300 mA          | Nominal          |
| Maximum Plate Voltage      | 550 V           | —                |
| Maximum Screen Voltage     | 250 V           | —                |
| Maximum Plate Dissipation  | 0.8 W           | —                |
| Maximum Screen Dissipation | 0.5 W           | —                |
| Maximum Cathode Current    | 20 mA           | —                |

| CHARACTERISTIC   |                    |                  |
|------------------|--------------------|------------------|
| PARAMETER        | PUBLISHED VALUE    | CONDITION / NOTE |
| Transconductance | 1500 $\mu\text{S}$ | Typical          |
| Plate Resistance | 500000 ohm         | Typical          |

1972 PHILIPS RECEIVING TUBES

## Section 2 · Triode

| OTHER                     |                 |                  |
|---------------------------|-----------------|------------------|
| PARAMETER                 | PUBLISHED VALUE | CONDITION / NOTE |
| HeaterVoltageNominal      | 6.3 V           | Nominal          |
| HeaterCurrentNominal      | 300 mA          | Nominal          |
| Maximum Plate Voltage     | 550 V           | —                |
| Maximum Plate Dissipation | 0.8 W           | —                |
| Maximum Cathode Current   | 12 mA           | —                |

| CHARACTERISTIC       |                    |                  |
|----------------------|--------------------|------------------|
| PARAMETER            | PUBLISHED VALUE    | CONDITION / NOTE |
| Transconductance     | 2200 $\mu\text{S}$ | Typical          |
| Amplification Factor | 20                 | Typical          |
| Plate Resistance     | 9000 ohm           | Typical          |



**TUBE TINKER**  
ELECTRON TUBE DATABASE

SOURCE DATA APPENDIX

### SOURCE OPERATING CONDITIONS

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# 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 2 · Triode

| CHARACTERISTIC           |                 |                           |
|--------------------------|-----------------|---------------------------|
| PARAMETER                | PUBLISHED VALUE | CONDITION / NOTE          |
| Anode voltage 25 12.6    | 6.3 V           | Published datasheet value |
| Anode current 2 0.75     | 0.3 mA          | Published datasheet value |
| Transconductance 2,2 1.4 | 0.8 mA/V        | Published datasheet value |
| Grids No.2 and           | 4 v             | Published datasheet value |

| PARAMETER                        | PUBLISHED VALUE  | CONDITION / NOTE          |
|----------------------------------|------------------|---------------------------|
| Grids No.2 and 4 voltage 25 12.6 | <b>6.3 V</b>     | Published datasheet value |
| Conversion conductance 450 220   | <b>90 w</b>      | Published datasheet value |
| Anode voltage Va 25 12.6         | <b>6.3 V</b>     | Published datasheet value |
| Transconductance S 1.5 0.75      | <b>0.35 mA/V</b> | Published datasheet value |
| Heater voltage Vg                | <b>6.3 V</b>     | Published datasheet value |
| Heater current I,                | <b>300 mA</b>    | Published datasheet value |

| CAPACITANCE                                 |                 |                           |
|---------------------------------------------|-----------------|---------------------------|
| PARAMETER                                   | PUBLISHED VALUE | CONDITION / NOTE          |
| Anode to all except grid Ca(g)              | <b>2.1 pF</b>   | Published datasheet value |
| Grid to all except anode Cg(a)              | <b>2.6 pF</b>   | Published datasheet value |
| Anode to grid Cag                           | <b>1 pF</b>     | Published datasheet value |
| Anode to all Cy                             | <b>7.9 pF</b>   | Published datasheet value |
| Grid No.1 to all Cgl                        | <b>4.8 pF</b>   | Published datasheet value |
| Anode to grid No.1 Cagl max. §              | <b>12 pF</b>    | Published datasheet value |
| Grid No.3 to all Cg3                        | <b>6 pF</b>     | Published datasheet value |
| Grid No.1 to grid No.3 Cglg                 | <b>3 ma</b>     | Published datasheet value |
| Grid No.1 to grid No.3 Cglg3 max            | <b>0.3 pF</b>   | Published datasheet value |
| Anode heptode to anode triode CaHaT         | <b>0.2 pF</b>   | Published datasheet value |
| Anode heptode to grid triode CaHgT max      | <b>0.09 pF</b>  | Published datasheet value |
| Grid No.1 heptode to anode triode CngaT max | <b>0.06 pF</b>  | Published datasheet value |
| Grid No. 1 heptode to grid triode CnggT max | <b>0.17 pF</b>  | Published datasheet value |
| and grid No.3 Cng/ng                        | <b>3 ma</b>     | Published datasheet value |
| and grid No.3 Cng/ng3 max                   | <b>0.45 pF</b>  | Published datasheet value |
| and grid No.3 CaH/ng                        | <b>3 ma</b>     | Published datasheet value |
| and grid No.3 CaH/ng3 max                   | <b>0.35 pF</b>  | Published datasheet value |

| OTHER                                                  |                 |                           |
|--------------------------------------------------------|-----------------|---------------------------|
| PARAMETER                                              | PUBLISHED VALUE | CONDITION / NOTE          |
| Anode voltage $V_a$ 25 12.6                            | 6.3 V           | Published datasheet value |
| Anode current $I_a$ 2 0.75                             | 0.3 mA          | Published datasheet value |
| Transconductance $S$ 2.2 1.4                           | 0.8 mA/V        | Published datasheet value |
| Grids No.2 and                                         | 4 v             | Published datasheet value |
| Grids No.2 and 4 voltage $V_{g2+4}$ 25 12.6            | 6.3 V           | Published datasheet value |
| Grid No                                                | 1 v             | Published datasheet value |
| Oscillator voltage $V_{osc}$ 3.5 1.7                   | 1.1 V           | Published datasheet value |
| Grid No.3 current $I_{g3}$ 40 18                       | 7 $\mu$ A       | Published datasheet value |
| Anode current $I_a$ 550 170                            | 50 $\mu$ A      | Published datasheet value |
| Grids No.2 and 4 current $I_{g2+4}$ 1000 300           | 80 $\mu$ A      | Published datasheet value |
| Conversion conductance $S_c$ 450 220                   | 90 $\mu$ A      | Published datasheet value |
| Published value                                        | 100 pF          | Published datasheet value |
| Grids No.2, No.3 and No                                | 4 v             | Published datasheet value |
| Grids No.2, No.3 and No.4 voltage $V_{g2+3+4}$ 25 12.6 | 6.3 V           | Published datasheet value |
| Anode current $I_a$ 1.25 0.4                           | 0.11 mA         | Published datasheet value |
| Grids No.2, No.3 and 4 current $I_{g2+3+4}$ 0.85 0.25  | 0.08 mA         | Published datasheet value |
| Transconductance $S$ 1.5 0.75                          | 0.35 mA/V       | Published datasheet value |
| Anode voltage $V_{ao}$ max                             | 550 V           | Published datasheet value |
| $V_a$ max                                              | 250 V           | Published datasheet value |
| Anode dissipation $W_a$ max                            | 0.8 W           | Published datasheet value |
| Cathode current $I_c$ max                              | 6.5 mA          | Published datasheet value |
| Cathode to heater voltage $V_s$ max                    | 150 V           | Published datasheet value |
| D.C. component max                                     | 100 V           | Published datasheet value |
| $V_a$ max                                              | 50 V            | Published datasheet value |
| Grids No.2 and                                         | 4 v             | Published datasheet value |
| Grids No.2 and 4 voltage $V_{g2+}$                     | 4 ma            | Published datasheet value |
|                                                        |                 |                           |

| PARAMETER                             | PUBLISHED VALUE | CONDITION / NOTE          |
|---------------------------------------|-----------------|---------------------------|
| Grids No.2 and 4 voltage<br>Vg2+4 max | <b>50 V</b>     | Published datasheet value |
| Cathode current I max                 | <b>5 mA</b>     | Published datasheet value |
| Grid No.3 resistor Rg                 | <b>3 ma</b>     | Published datasheet value |
| Cathode to heater voltage Vi<br>max   | <b>150 V</b>    | Published datasheet value |

## TUBE TINKER

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