

## A.F. OUTPUT PENTODE

Pentode intended for use as A.F. power amplifier.

| QUICK REFERENCE DATA  |                |      |      |
|-----------------------|----------------|------|------|
| Anode current         | $I_a$          | 100  | mA   |
| Transconductance      | $S$            | 12.5 | mA/V |
| Amplification factor  | $\mu_{g_2g_1}$ | 11   |      |
| Output power, class B |                | 100  | W    |

**HEATING:** Indirect by A.C. or D.C.; parallel supply

Heater voltage  $V_f$  6.3 V

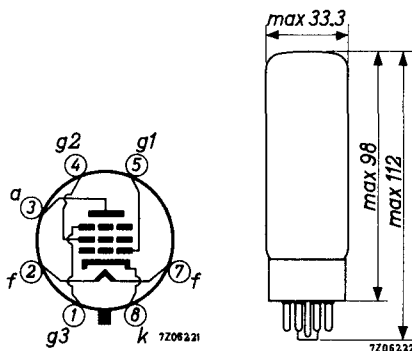
Heater current  $I_f$  1.5 A

### DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Octal

Socket: 5903/13



**CAPACITANCES**

|                               |              |          |    |
|-------------------------------|--------------|----------|----|
| Anode to all except grid No.1 | $C_{a(g_1)}$ | 8.4      | pF |
| Grid No.1 to all except anode | $C_{g_1(a)}$ | 15.2     | pF |
| Anode to grid No.1            | $C_{ag_1}$   | max. 1.1 | pF |
| Grid No.1 to heater           | $C_{g_1f}$   | max. 1.0 | pF |
| Cathode to heater             | $C_{kf}$     | 10       | pF |

**OPERATING CHARACTERISTICS**
Class A

|                                                |                |       |       |                  |
|------------------------------------------------|----------------|-------|-------|------------------|
| Supply voltage                                 | $V_b$          | 265   | 265   | V                |
| Anode voltage                                  | $V_a$          | 250   | 250   | V                |
| Grid No.2 series resistor                      | $R_{g_2}$      | 2     | 0     | k $\Omega$       |
| Grid No.3 voltage                              | $V_{g_3}$      | 0     | 0     | V                |
| Grid No.1 voltage                              | $V_{g_1}$      | -14.5 | -13.5 | V                |
| Anode current                                  | $I_a$          | 70    | 100   | mA               |
| Grid No.2 current                              | $I_{g_2}$      | 10    | 14.9  | mA               |
| Transconductance                               | $S$            | 11    | 12.5  | mA/V             |
| Amplification factor                           | $\mu_{g_2g_1}$ | 11    | 11    |                  |
| Internal resistance                            | $R_i$          | 20    | 17    | k $\Omega$       |
| Load resistance                                | $R_{a\sim}$    | 3.0   | 2.0   | k $\Omega$       |
| Grid No.1 driving voltage                      | $V_i$          | 9.3   | 8.7   | V <sub>RMS</sub> |
| Output power                                   | $W_o$          | 8     | 11    | W                |
| Distortion                                     | $d_{tot}$      | 10    | 10    | %                |
| Grid No.1 driving voltage<br>for $W_o = 50$ mW | $V_i$          | 0.65  | 0.5   | V <sub>RMS</sub> |

## OPERATING CHARACTERISTICS

## Class B, two tubes in push-pull

Common grid No.2

series resistor

|                           |              |       |       |       |       |       |                |
|---------------------------|--------------|-------|-------|-------|-------|-------|----------------|
| (non decoupled)           | $R_{g2}$     | 1000  |       |       | 470   |       | $\Omega$       |
| Grid No.1 voltage         | $V_{g1}$     | -38   |       |       | -32   |       | V              |
| Grid No.3 voltage         | $V_{g3}$     | 0     |       |       | 0     |       | V              |
| Grid No.1 driving voltage | $V_i$        | 0     | 27    | 27    | 0     | 22.7  | 22.7 $V_{RMS}$ |
| Load resistance           | $R_{aa\sim}$ | -     | 3.4   | 4.0   | -     | 2.8   | 3.8 $k\Omega$  |
| Supply voltage            | $V_b$        | 425   | 425   | 400   | 375   | 375   | 350 V          |
| Anode voltage             | $V_a$        | 420   | 400   | 375   | 370   | 350   | 325 V          |
| Anode current             | $I_a$        | 2x30  | 2x120 | 2x100 | 2x35  | 2x120 | 2x93 mA        |
| Grid No.2 current         | $I_{g2}$     | 2x4.4 | 2x25  | 2x25  | 2x4.7 | 2x25  | 2x25 mA        |
| Output power              | $W_o$        | 0     | 55    | 45    | 0     | 44    | 36 W           |
| Distortion                | $d_{tot}$    | -     | 5     | 6     | -     | 5     | 6 %            |

Common grid No.2

series resistor

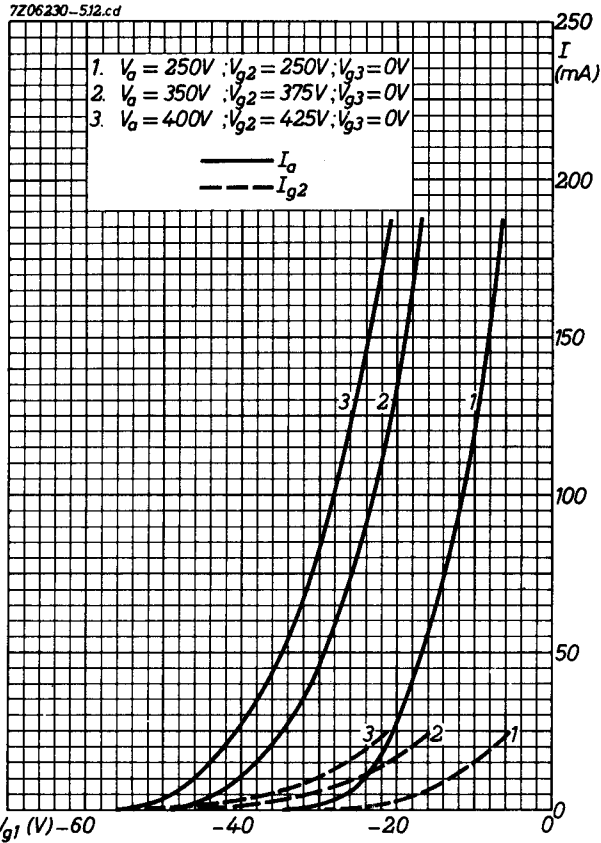
|                           |              |      |       |       |      |      |                |
|---------------------------|--------------|------|-------|-------|------|------|----------------|
| (non decoupled)           | $R_{g2}$     | 750  |       |       | 750  |      | $\Omega$       |
| Grid No.1 voltage         | $V_{g1}$     | -36  |       |       | -39  |      | V              |
| Grid No.3 voltage         | $V_{g3}$     | 0    |       |       | 0    |      | V              |
| Grid No.1 driving voltage | $V_i$        | 0    | 25.8  | 25.8  | 0    | 23.4 | 23.4 $V_{RMS}$ |
| Load resistance           | $R_{aa\sim}$ | -    | 4     | 5     | -    | 11   | 11 $k\Omega$   |
| Anode supply voltage      | $V_{ba}$     | 500  | 500   | 475   | 800  | 800  | 750 V          |
| Anode voltage             | $V_a$        | 495  | 475   | 450   | 795  | 775  | 725 V          |
| Grid No.2 supply voltage  | $V_{bg2}$    | 400  | 400   | 375   | 400  | 400  | 375 V          |
| Anode current             | $I_a$        | 2x30 | 2x125 | 2x102 | 2x25 | 2x91 | 2x84 mA        |
| Grid No.2 current         | $I_{g2}$     | 2x4  | 2x25  | 2x25  | 2x3  | 2x19 | 2x19 mA        |
| Output power              | $W_o$        | 0    | 70    | 58    | 0    | 100  | 90 W           |
| Distortion                | $d_{tot}$    | -    | 5     | 6     | -    | 5    | 6 %            |

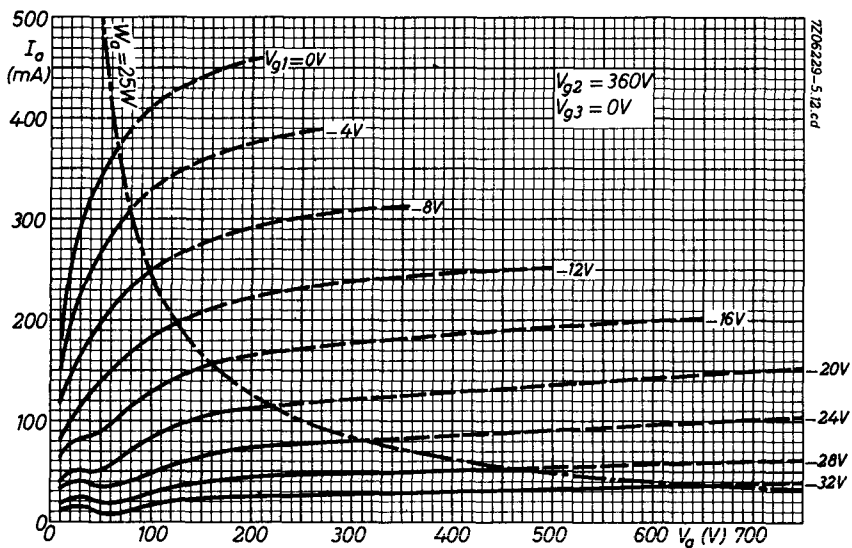
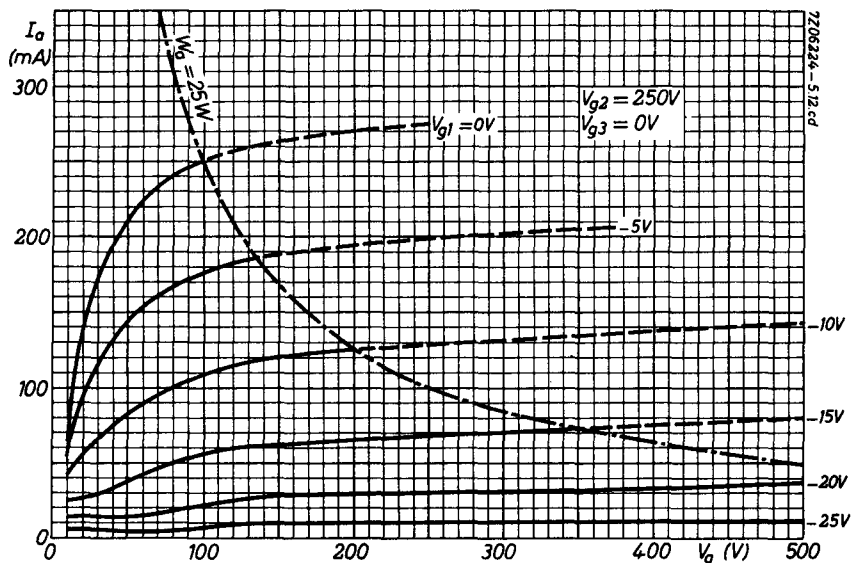
**OPERATING CHARACTERISTICS**
Class AB, two tubes in push-pull

|                                                     |                |        |              |
|-----------------------------------------------------|----------------|--------|--------------|
| Load resistance                                     | $R_{aa\sim}$   | 3.4    | $k\Omega$    |
| Common grid No.2 series resistor<br>(non decoupled) | $R_{g2}$       | 470    | $\Omega$     |
| Common cathode resistor                             | $R_k$          | 130    | $\Omega$     |
| Grid No.3 voltage                                   | $V_{g3}$       | 0      | V            |
| Grid No.1 driving voltage                           | $V_i$          | 0      | 21 $V_{RMS}$ |
| Supply voltage                                      | $V_b$          | 375    | 375 V        |
| Anode to earth voltage                              | $V_a + V_{Rk}$ | 355    | 350 V        |
| Anode current                                       | $I_a$          | 2x75   | 2x95 mA      |
| Grid No.2 current                                   | $I_{g2}$       | 2x11.5 | 2x22.5 mA    |
| Output power                                        | $W_o$          | 0      | 35 W         |
| Distortion                                          | $d_{tot}$      | -      | 5 %          |

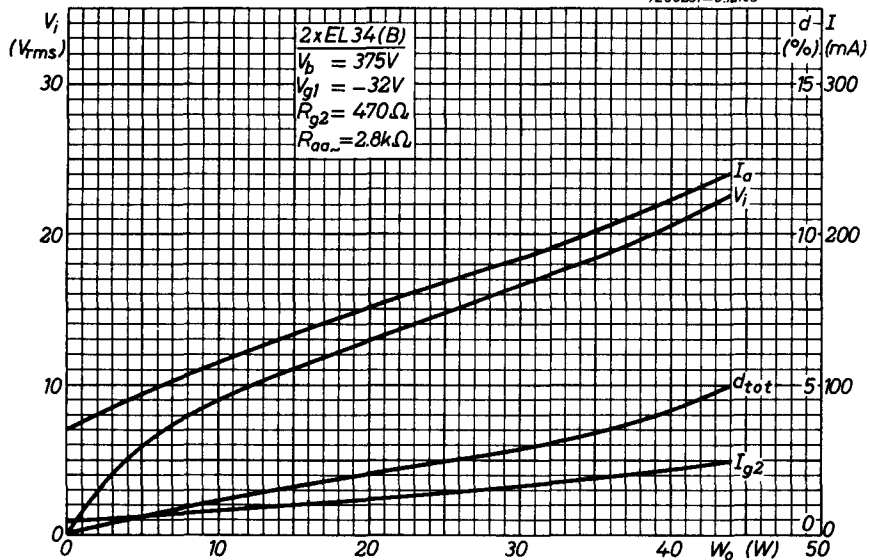
**LIMITING VALUES** (Design centre rating system)

|                           |           |      |               |
|---------------------------|-----------|------|---------------|
| Anode voltage             | $V_{a0}$  | max. | 2000 V        |
|                           | $V_a$     | max. | 800 V         |
| Grid No.2 voltage         | $V_{g20}$ | max. | 800 V         |
|                           | $V_{g2}$  | max. | 500 V         |
| Anode dissipation         |           |      |               |
| at $V_i = 0$              | $W_a$     | max. | 25 W          |
| at $V_i > 0$              | $W_a$     | max. | 27.5 W        |
| Grid No.2 dissipation     | $W_{g2}$  | max. | 8 W           |
| Cathode current           | $I_k$     | max. | 150 mA        |
| Grid No.1 resistor        |           |      |               |
| for class A and AB        | $R_{g1}$  | max. | 0.7 $M\Omega$ |
| for class B               | $R_{g1}$  | max. | 0.5 $M\Omega$ |
| Cathode to heater voltage | $V_{kf}$  | max. | 100 V         |

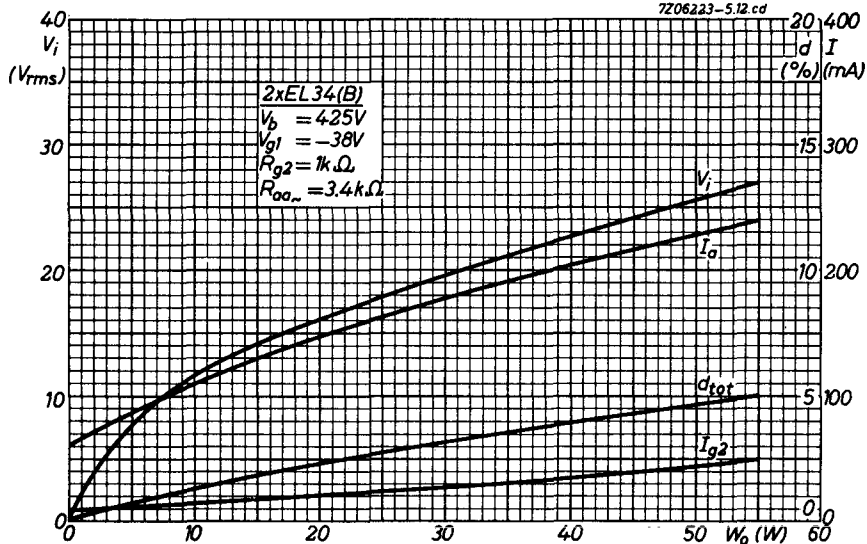


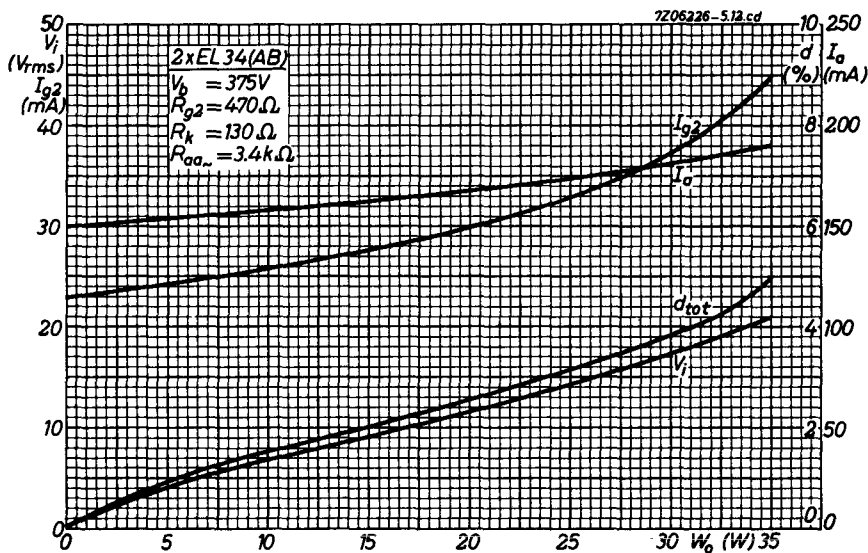
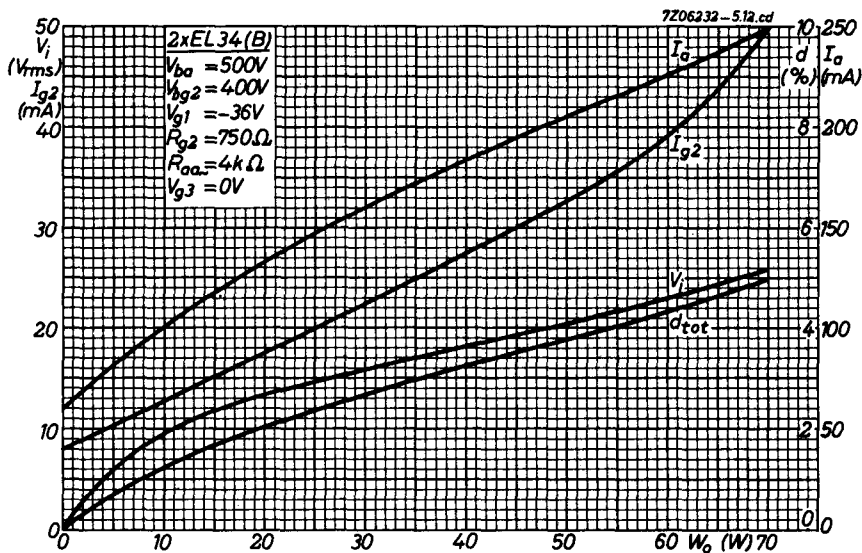


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# PHILIPS

## Data handbook



**Electronic  
components  
and materials**

### EL34

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| 2    | 2     | 1969.01  |
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| 5    | 5     | 1969.01  |
| 6    | 6     | 1969.01  |
| 7    | 7     | 1969.01  |
| 8    | 8     | 1969.01  |
| 9    | FP    | 19990319 |