

A.F. OUTPUT PENTODE

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

QUICK REFERENCE DATA

Anode current	I_a	48 mA
Transconductance	S	11.3 mA/V
Amplification factor	$\mu_{g_2g_1}$	19
Output power	W_o	6.0 W

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

Heater voltage

V_f 6.3 V

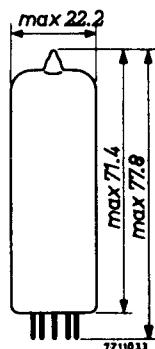
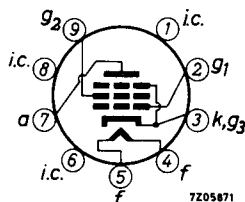
Heater current

I_f 760 mA

DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Noval



CAPACITANCES

Anode to all except grid No.1

$C_{a(g_1)}$ 6.5 pF

Grid No.1 to all except anode

$C_{g_1(a)}$ 10.8 pF

Anode to grid No.1

C_{ag_1} max. 0.5 pF

Grid No.1 to heater

C_{g_1f} max. 0.25 pF

OPERATING CHARACTERISTICS

Class A

Anode voltage	V_a	250	V
Grid No.2 voltage	V_{g2}	250	V
Grid No.1 voltage	V_{g1}	-7.3	V
Cathode resistor	R_k	135	Ω
Load resistance	$R_{a\sim}$	5.2	k Ω
Grid No.1 driving voltage	V_i	0 0.3 3.4 4.3 4.7 ²⁾	V_{RMS}
Anode current	I_a	48 - - 49.5 49.2	mA
Grid No.2 current	I_{g2}	5.5 - - 10.8 11.6	mA
Transconductance	S	11.3 - - - -	mA/V
Amplification factor	μ_{g2g1}	19 - - - -	
Internal resistance	R_i	38 - - - -	k Ω
Output power	W_o ¹⁾	0 0.05 4.5 5.7 6.0	W
Distortion, total	d_{tot} ¹⁾	- - 6.8 10 -	%
second harmonic	d_2 ¹⁾	- - 3.0 2.0 -	%
third harmonic	d_3 ¹⁾	- - 5.8 9.5 -	%
Anode voltage	V_a	250	V
Grid No.2 voltage	V_{g2}	250	V
Grid No.1 voltage	V_{g1}	-7.3	V
Cathode resistor	R_k	135	Ω
Load resistance	$R_{a\sim}$	4.5	k Ω
Grid No.1 driving voltage	V_i	0 0.3 3.5 4.4 4.8 ²⁾	V_{RMS}
Anode current	I_a	48 - - 50.6 50.5	mA
Grid No.2 current	I_{g2}	5.5 - - 10 11	mA
Transconductance	S	11.3 - - - -	mA/V
Amplification factor	μ_{g2g1}	19 - - - -	
Internal resistance	R_i	38 - - - -	k Ω
Output power	W_o ¹⁾	0 0.05 4.5 5.7 6.0	W
Distortion, total	d_{tot} ¹⁾	- - 7.5 10 -	%
second harmonic	d_2 ¹⁾	- - 5.7 5.0 -	%
third harmonic	d_3 ¹⁾	- - 4.5 8 -	%

¹⁾ Measured with fixed bias²⁾ At $I_{g1} = +0.3 \mu A$

OPERATING CHARACTERISTICS (continued)

Class A (continued)

Anode voltage	V_a	250			V
Grid No.2 voltage	V_{g2}	250			V
Grid No.1 voltage	V_{g1}	-8.4			V
Cathode resistor	R_k	210			Ω
Load resistance	$R_{a\sim}$	7			k Ω
Grid No.1 driving voltage	V_i	0	0.3	3.5	5.5 ²⁾ V_{RMS}
Anode current	I_a	36	-	36.8	36 mA
Grid No.2 current	I_{g2}	4.1	-	8.5	14.6 mA
Transconductance	S	10	-	-	- mA/V
Amplification factor	μ_{g2g1}	19	-	-	-
Internal resistance	R_i	40	-	-	- k Ω
Output power	W_o ¹⁾	0	0.05	4.2	5.6 W
Distortion, total	d_{tot} ¹⁾	-	-	10	- %
second harmonic	d_2 ¹⁾	-	-	1.7	- %
third harmonic	d_3 ¹⁾	-	-	8.7	- %
Anode voltage	V_a	250			V
Grid No.2 voltage	V_{g2}	210			V
Grid No.1 voltage	V_{g1}	-6.4			V
Cathode resistor	R_k	160			Ω
Load resistance	$R_{a\sim}$	7			k Ω
Grid No.1 driving voltage	V_i	0	0.3	3.4	3.8 ²⁾ V_{RMS}
Anode current	I_a	36	-	36.6	36.5 mA
Grid No.2 current	I_{g2}	3.9	-	7.3	8.0 mA
Transconductance	S	10.4	-	-	- mA/V
Amplification factor	μ_{g2g1}	19	-	-	-
Internal resistance	R_i	40	-	-	- k Ω
Output power	W_o ¹⁾	0	0.05	4.3	4.7 W
Distortion, total	d_{tot} ¹⁾	-	-	10	- %
second harmonic	d_2 ¹⁾	-	-	1.8	- %
third harmonic	d_3 ¹⁾	-	-	9.3	- %

¹⁾ Measured with fixed bias²⁾ At $I_{g1} = +0.3 \mu A$

OPERATING CHARACTERISTICS (continued)

Class B, two tubes in push-pull

Anode voltage	V_a	250		300	V
Grid No.2 voltage	V_{g_2}	250		300	V
Grid No.1 voltage	V_{g_1}	-11.6		-14.7	V
Load resistance	$R_{aa\sim}$	8		8	k Ω
Grid No.1 driving voltage	V_i	0	8	0	10 V _{RMS}
Anode current	I_a	2x10	2x37.5	2x7.5	2x46 mA
Grid No.2 current	I_{g_2}	2x1.1	2x7.5	2x0.8	2x11 mA
Output power	W_o	0	11	0	17 W
Distortion	d_{tot}	-	3	-	4 %

Class AB, two tubes in push-pull

Anode voltage	V_a	250		300	V
Grid No.2 voltage	V_{g_2}	250		300	V
Common cathode resistor	R_k	130		130	Ω
Load resistance	$R_{aa\sim}$	8		8	k Ω
Grid No.1 driving voltage	V_i	0	8	0	10 V _{RMS}
Anode current	I_a	2x31	2x37.5	2x36	2x46 mA
Grid No.2 current	I_{g_2}	2x3.5	2x7.5	2x4	2x11 mA
Output power	W_o	0	11	0	17 W
Distortion	d_{tot}	-	3	-	4 %

OPERATING CHARACTERISTICS IN TRIODE CONNECTION

(g₂ connected to a)Class A

Anode voltage	V _a	250	V
Cathode resistor	R _k	270	Ω
Load resistance	R _{a~}	3.5	kΩ
Grid No.1 driving voltage	V _i	0 1.0 6.7	V _{RMS}
Anode current	I _a	34 - 36	mA
Output power	W _o	- 0.05 1.95	W
Distortion	d _{tot}	- - 9	%

Class AB, two tubes in push-pull

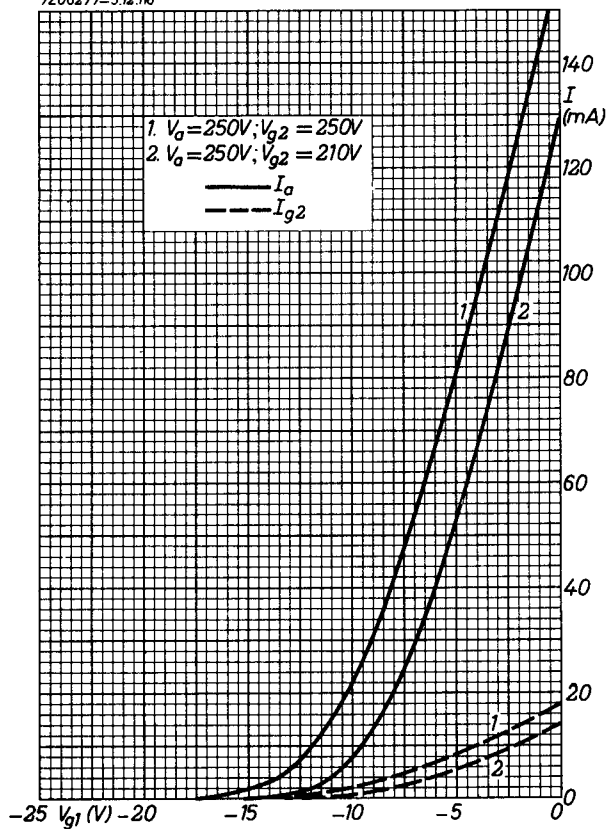
Anode voltage	V _a	250	300	V
Common cathode resistor	R _k	270	270	Ω
Load resistance	R _{aa~}	10	10	kΩ
Grid No.1 driving voltage	V _i	0 8.3	0 10	V _{RMS}
Anode current	I _a	2x20 2x21.7	2x24 2x26	mA
Output power	W _o	0 3.4	0 5.2	W
Distortion	d _{tot}	- 2.5	- 2.5	%
Grid No.1 driving voltage for W _o = 50 mW	V _i	0.95	0.9	V _{RMS}

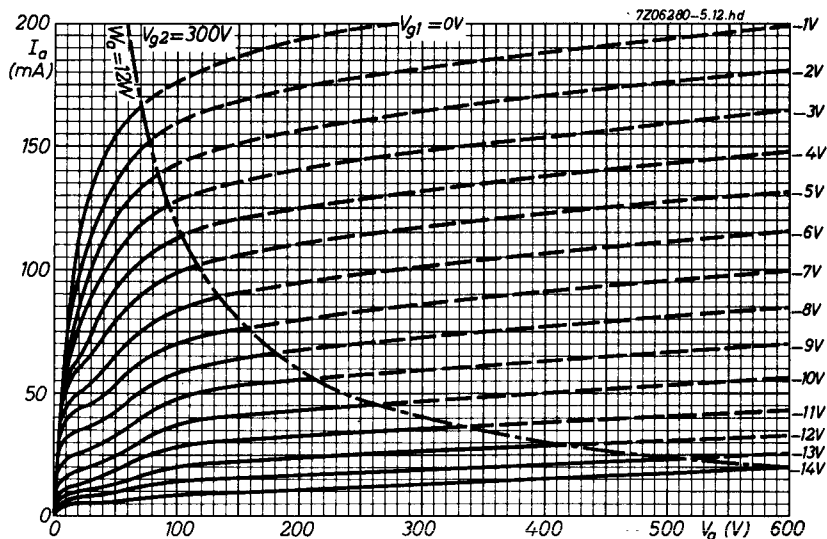
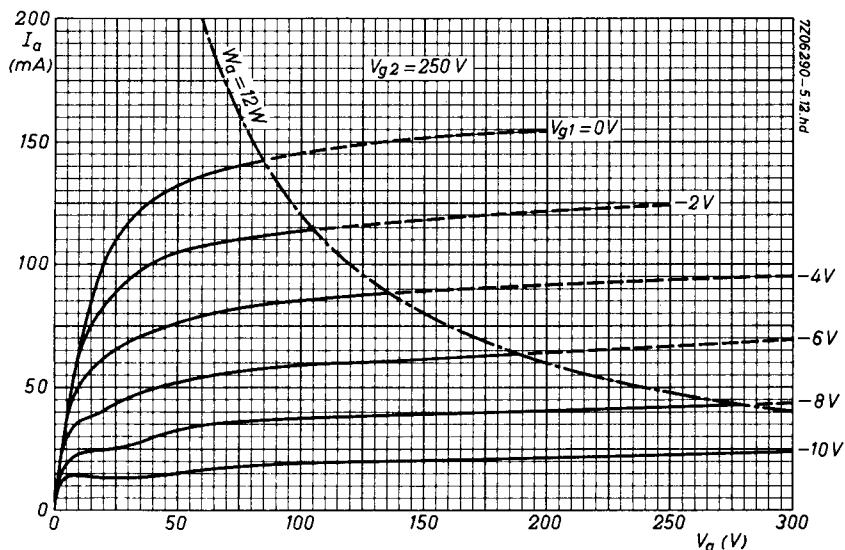
LIMITING VALUES (Design centre rating system)

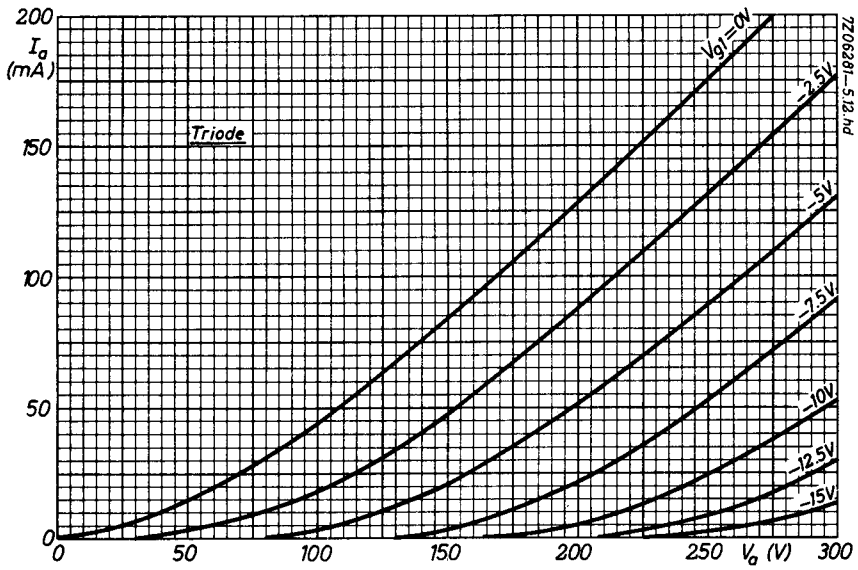
Anode voltage	V_{a0}	max.	550 V
	V_a	max.	300 V ¹⁾
Anode dissipation	W_a	max.	12 W ¹⁾
Grid No.2 voltage	V_{g20}	max.	550 V
	V_{g2}	max.	300 V ¹⁾
Grid No.2 dissipation	W_{g2}	max.	2 W
	W_{g2p}	max.	4 W
Grid No.1 voltage	$-V_{g1}$	max.	100 V
Cathode current	I_k	max.	65 mA
Grid No.1 resistor			
for automatic bias	R_{g1}	max.	1 M Ω
for fixed bias	R_{g1}	max.	0.3 M Ω
Cathode to heater voltage	V_{kf}	max.	100 V

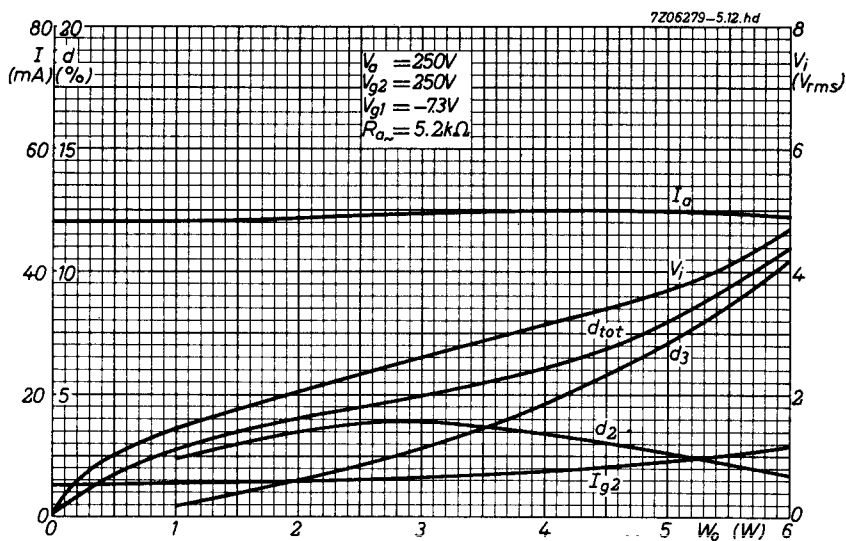
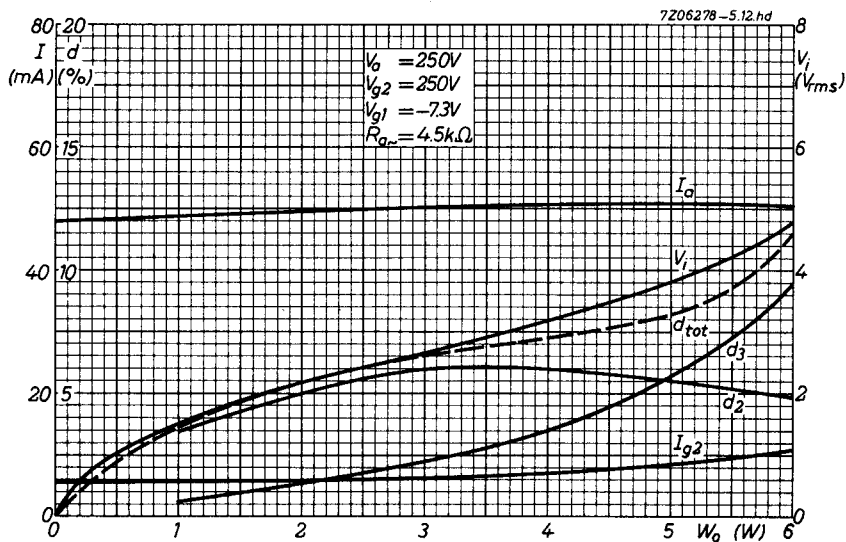
¹⁾ When the heater and positive voltages are obtained from a storage battery by means of a vibrator, the max. values of V_a and V_{g2} are 250 V and that of W_a is 9 W.

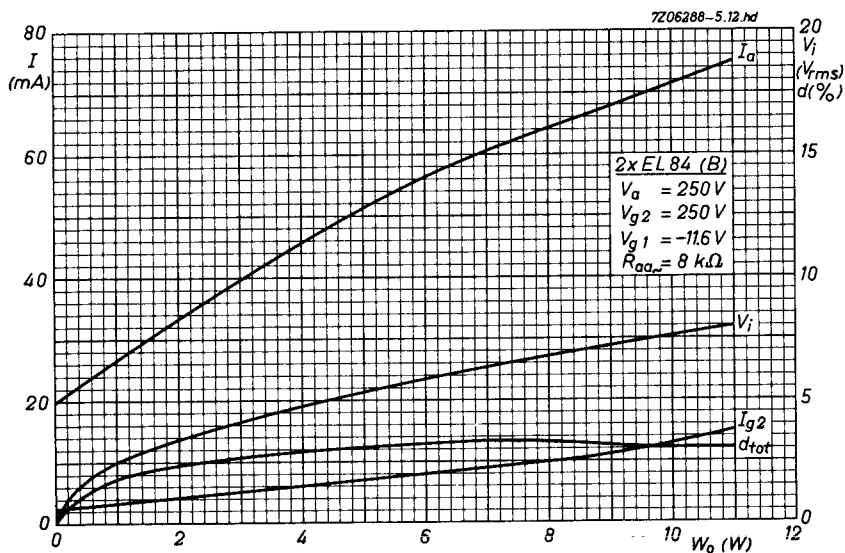
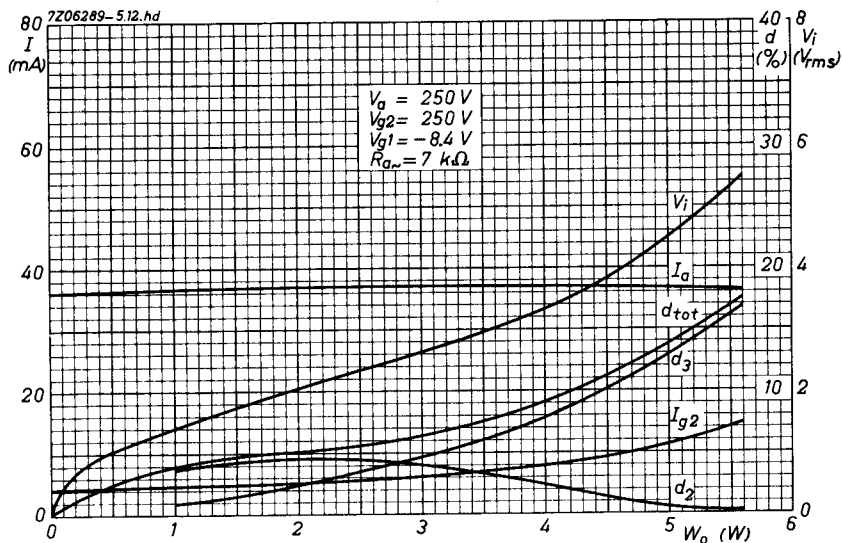
7206277-5.12.hd

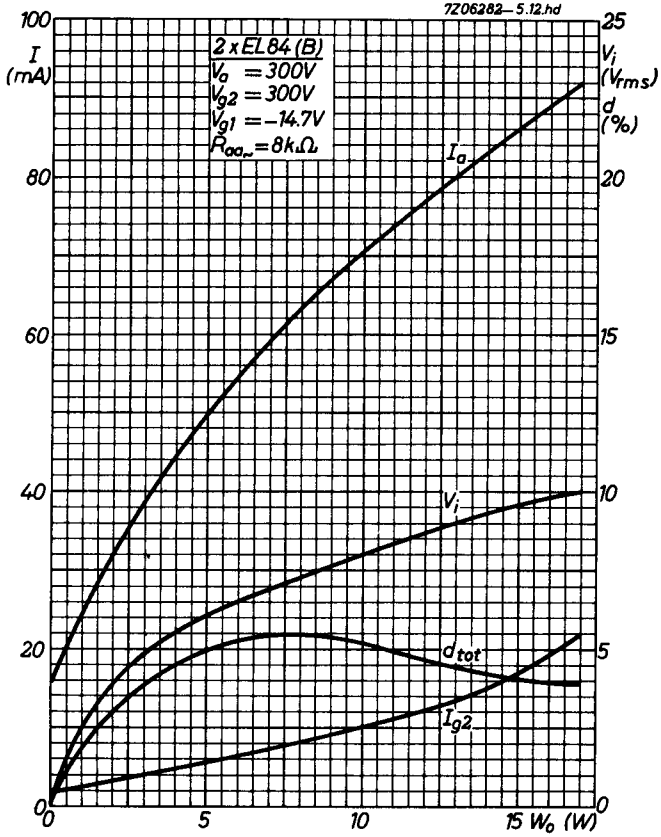


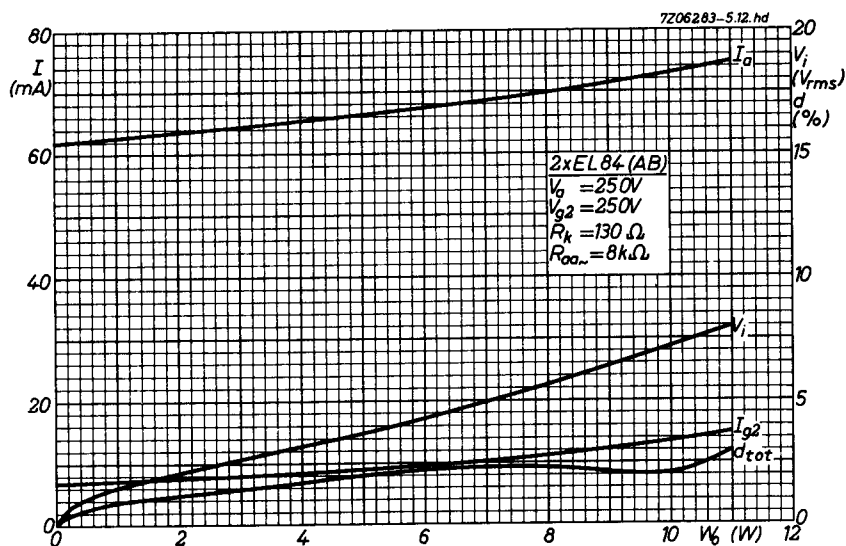


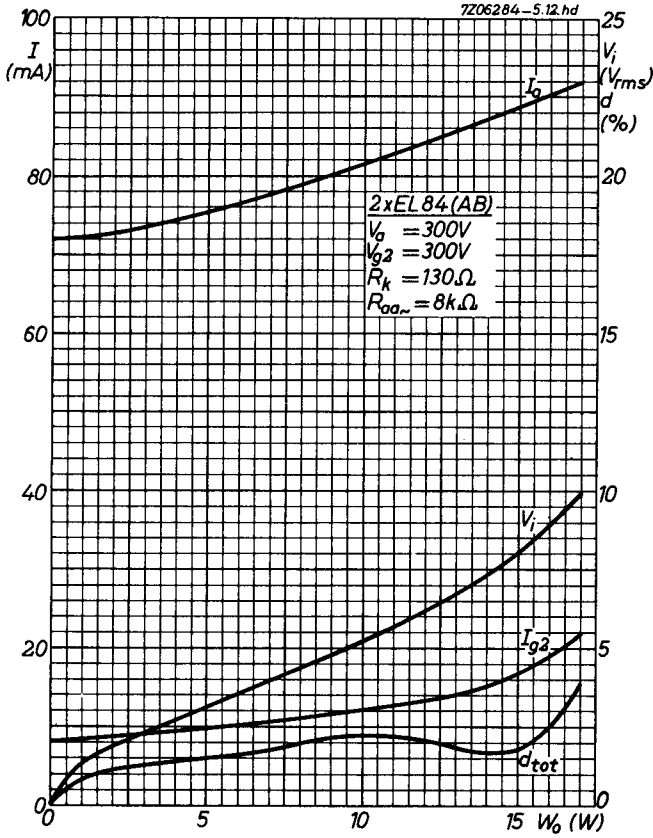












PHILIPS

Data handbook



**Electronic
components
and materials**

EL84

page	sheet	date
1	1	1969.12
2	2	1969.01
3	3	1969.01
4	4	1969.01
5	5	1969.01
6	6	1969.01
7	7	1969.01
8	8	1969.01
9	9	1969.01
10	10	1969.01
11	11	1969.01
12	12	1969.01
13	13	1969.01
14	14	1969.01
15	FP	1999.03.20