DOUBLE TETRODES

Double tetrodes for use as linear single side band amplifier.

The YL1071 is electrically identical to the YL1070 except for the heater, and has been designed to fit into heatsink cooling equipment.

QUICK REFERENCE DATA				
AB1 linear S.S.B. amplifier, sections in parallel				
Freq. (Mc/s)	C.C.S.		I.C.A.S.	
	V_a (V)	$W_{o\,PEP}$ (W)	V_a (V)	$W_{o\,PEP}$ (W)
7	1000	141	1000	158

HEATING:

Indirect by A.C. or D.C.; parallel supply; oxide coated cathode

		Pins	5-(1+7)	1-7	
YL1070:	Heater voltage	V_f =	6.3	12.6	V
	Heater current	I_f =	1.8	0.9	A
YL1071:	Heater voltage	V_f =	13.25	26.5	V
	Heater current	I_f =	0.866	0.433	A

CAPACITANCES (each section)

Anode to all other elements except grid No.1	C_a	= 3.15	pF
Grid No.1 to all other elements except anode	C_{g_1}	= 10.6	pF
Anode to grid No.1	C_{ag_1}	< 0.09	pF

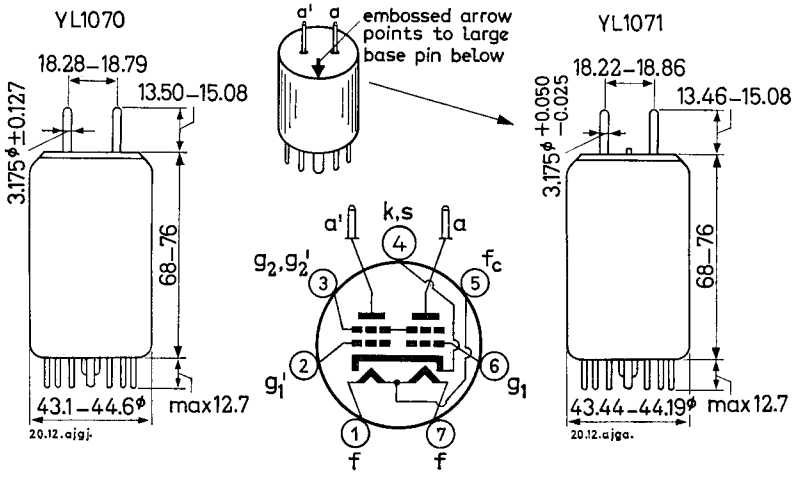
7Z2 2883

TYPICAL CHARACTERISTICS (each section)

Anode voltage	V_a	=	600	V
Grid No.2 voltage	V_{g_2}	=	250	V
Anode current	I_a	=	40	mA
Amplification factor of grid No.2 with respect to grid No.1	$\mu_{g_2g_1}$	=	7	

MECHANICAL DATA

Dimensions in mm



Base:	Septar	
Accessories:	Anode connector clip	40681
	Socket	40202
Mounting position:	Vertical with base up or down Horizontal with anode pins in a horizontal plane	
Net weight:	70 g	

COOLING: Radiation and convection

When the tube is used at maximum permissible values it may be necessary to direct an air flow of approx. 0.6 m^3/min to the bulb and to the anode seals. The YL1071 has a calibrated bulb held to close tolerances. This permits an accurate fit into heatsink cooling equipment. 7Z2 2884

TEMPERATURE LIMITS (Absolute limits)

Temperature of bulb and all seals max. 250 °C

R.F. CLASS C TELEGRAPHY AND F.M. TELEPHONY

LIMITING VALUES (Absolute limits) (each section)

Frequency	f		up to 60	up to 175	Mc/s
Anode voltage	V_a	=	max. 850	max. 750	V
Anode input power	W_{ia}	=	max. 90	max. 75	V
Anode dissipation	W_a	=	max. 30	max. 30	W
Anode current	I_a	=	max. 110	max. 110	mA
Grid No.2 voltage	V_{g_2}	=	max. 300	max. 300	V
Grid No.2 dissipation	W_{g_2}	=	max. 7	max. 7	W
Negative grid No.1 voltage	$-V_{g_1}$	=	max. 175	max. 175	V
Grid No.1 current	I_{g_1}	=	max. 5	max. 5	mA
Cathode to heater voltage	V_{kf}	=	max. 100	max. 100	V

R. F. CLASS AB1 LINEAR S. S. B. AMPLIFIER suppressed carrier

LIMITING VALUES (Absolute limits) (each section)

Frequency	f		up to 60		Mc/s
			C.C.S.	I.C.A.S.	
Anode voltage	V_a	=	max. 1000	max. 1000	V
Anode input power	W_{ia}	=	max. 100	max. 110	W
Anode dissipation	W_a	=	max. 30	max. 34	W
Anode current	I_a	=	max. 110	max. 110	mA
Grid No.2 voltage	V_{g_2}	=	max. 360	max. 360	V
Grid No.2 dissipation	W_{g_2}	=	max. 3.5	max. 4	W
Negative grid No.1 voltage	$-V_{g_1}$	=	max. 175	max. 175	V
Grid No.1 current	I_{g_1}	=	max. 5	max. 5	mA
Cathode to heater voltage	V_{kf}	=	max. 100	max. 100	V

7Z2 2885

OPERATING CONDITIONS (two sections in parallel)

Table A			C.C.S.			
Frequency	f	=		7		Mc/s
Anode voltage	V_a	=		1000		V
Grid No.2 voltage	V_{g_2}	=		250		V
Grid No.1 voltage	V_{g_1}	=		-34		V [1]
Load resistance	$R_{a\sim}$	=		3100		Ω
			zero signal	single tone	two tone	
Peak grid No.1 driving voltage	$V_{g_{1\sim p}}$	=	0	34	34	V
Anode current	$I_{a+a'}$	=	50	195	131	mA
Grid No.2 current	$I_{g_2+g_2'}$	=	1.2	26	11.5	mA
Grid No.1 current	$I_{g_1+g_1'}$	=	0	0.01	0.01	mA
Anode input power	$W_{ia+a'}$	=	50	195	131	W
Anode dissipation	$W_{a+a'}$	=	50	54	61	W
Output power	W_o	=	–	141	141 [2]	W
Intermodulation distortion						
of the third order	d_{i_3}	=	–	–	< -30	dB [3]
of the fifth order	d_{i_5}	=	–	–	< -45	dB [3]

1) Adjust to obtain the stated zero signal anode current.

2) Peak envelope power value.

3) Distortion level, referred to the amplitude of either of the tones, at full drive; also highest distortion encountered at any driving level up to full drive.

7Z2 2886

OPERATING CONDITIONS (two sections in parallel) (continued)

Table B

Frequency	f	=		7		Mc/s
Anode voltage	V_a	=		800		V
Grid No.2 voltage	V_{g_2}	=		250		V
Grid No.1 voltage	V_{g_1}	=		−34		V [1]
Load resistance	R_a	=		2300		Ω
			zero signal	single tone	two tone	
Peak grid No.1 driving voltage	$V_{g_{1\sim p}}$	=	0	34	34	V
Anode current	$I_{a+a'}$	=	50	197	130	mA
Grid No.2 current	$I_{g_2+g_2'}$	=	1.2	26	12.5	mA
Grid No.1 current	$I_{g_1+g_1'}$	=	0	0.01	0	mA
Anode input power	$W_{ia+a'}$	=	40	158	104	W
Anode dissipation	$W_{a+a'}$	=	40	46	43	W
Output power	W_o	=	–	112	112 [2]	W
Intermodulation distortion						
of the third order	d_{i_3}	=	–	–	< −30	dB [3]
of the fifth order	d_{i_5}	=	–	–	< −45	dB [3]

[1]) Adjust to obtain the stated zero signal anode current.

[2]) Peak envelope power value

[3]) Distortion level, referred to the amplitude of either of the tones, at full drive; also highest distortion encountered at any driving level up to full drive.

7Z2 2887

OPERATING CONDITIONS (two sections in parallel) (continued)

Table C			C.C.S.			
Frequency	f	=		7		Mc/s
Anode voltage	V_a	=		600		V
Grid No.2 voltage	V_{g_2}	=		250		V
Grid No.1 voltage	V_{g_1}	=		−32.5		V [1]
Load resistance	R_a	=		1410		Ω
			zero signal	single tone	two tone	
Peak grid No.1 driving voltage	$V_{g_{1\sim p}}$	=	0	32.5	32.5	V
Anode current	$I_{a+a'}$	=	60	212	144	mA
Grid No.2 current	$I_{g_2+g_2'}$	=	1.9	25	13.5	mA
Grid No.1 current	$I_{g_1+g_1'}$	=	0	0.01	0	mA
Anode input power	$W_{ia+a'}$	=	36	127	86	W
Anode dissipation	$W_{a+a'}$	=	36	88	48	W
Output power	W_o	=	–	76	76 [2]	W
Intermodulation distortion						
of the third order	d_{i_3}	=	–	–	< −30	dB [3]
of the fifth order	d_{i_5}	=	–	–	< −45	dB [3]

1) Adjust to obtain the stated zero signal anode current.

2) Peak envelope power value.

3) Distortion level, referred to the amplitude of either of the tones, at full drive; also highest distortion encountered at any driving level up to full drive.

7Z2 2888

OPERATING CONDITIONS (two sections in parallel) (continued)

Table D

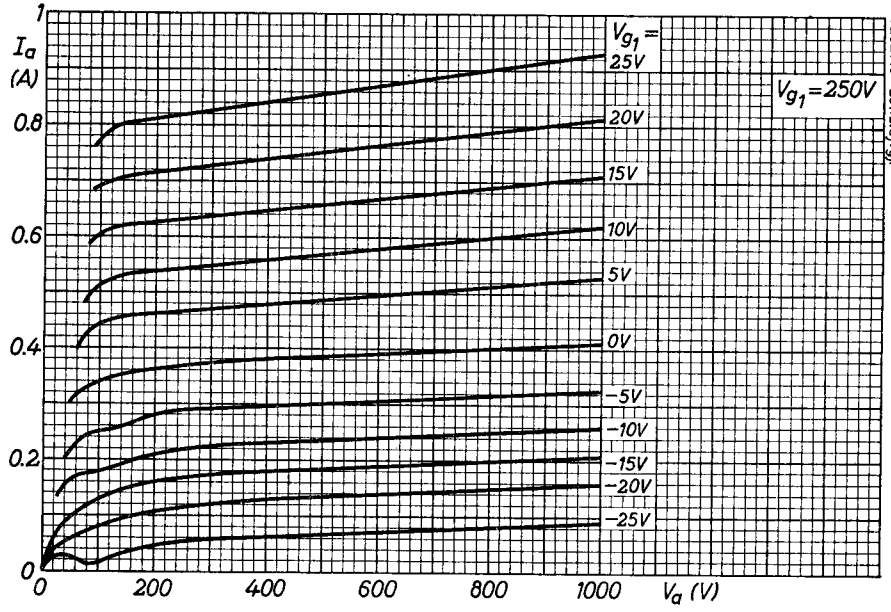
			I.C.A.S.			
Frequency	f	=	7			Mc/s
Anode voltage	V_a	=	1000			V
Grid No.2 voltage	V_{g_2}	=	250			V
Grid No.1 voltage	V_{g_1}	=	−36			V [1]
Load resistance	R_a	=	3000			Ω
			zero signal	single tone	two tone	
Peak grid No.1 driving voltage	$V_{g_{1\sim p}}$	=	0	36	36	V
Anode current	$I_{a+a'}$	=	55	216	144	mA
Grid No.2 current	$I_{g_2+g_2'}$	=	1	25	13	mA
Grid No.1 current	$I_{g_1+g_1'}$	=	0	0.05	0.02	mA
Anode input power	$W_{ia+a'}$	=	55	216	144	W
Anode dissipation	$W_{a+a'}$	=	55	58	65	W
Output power	W_o	=	–	158	158 [2]	W
Intermodulation distortion						
of the third order	d_{i_3}	=	–	–	< −30	dB [3]
of the fifth order	d_{i_5}	=	–	–	< −45	dB [3]

1) Adjust to obtain the stated zero signal anode current.

2) Peak envelope power value.

3) Distortion level, referred to the amplitude of either of the tones, at full drive; also highest distortion encountered at any driving level up to full drive.

7Z2 2889



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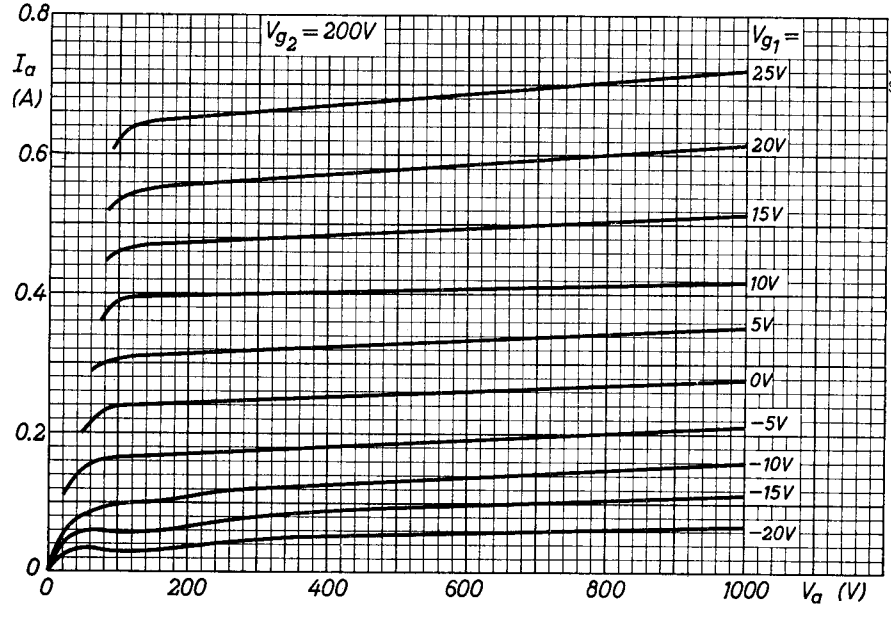

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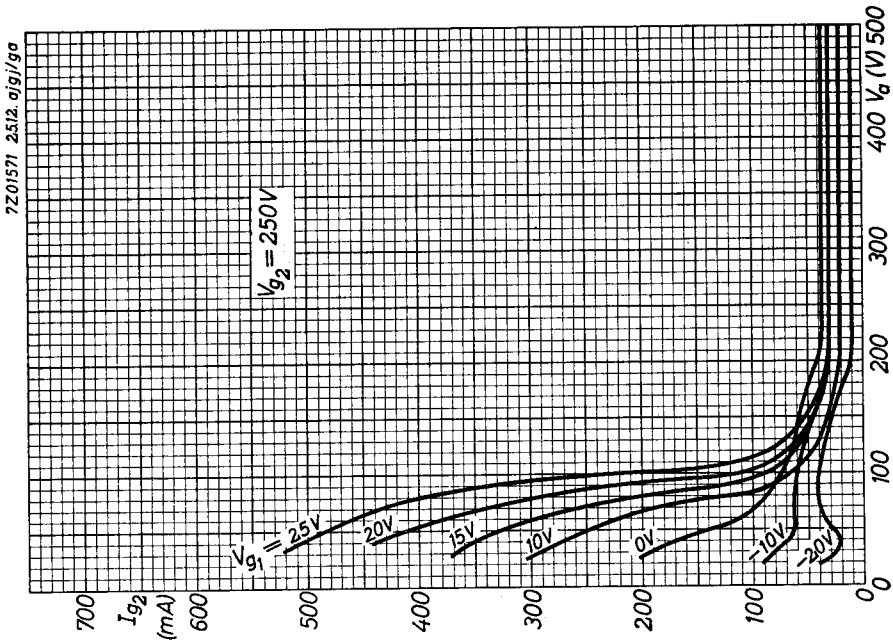
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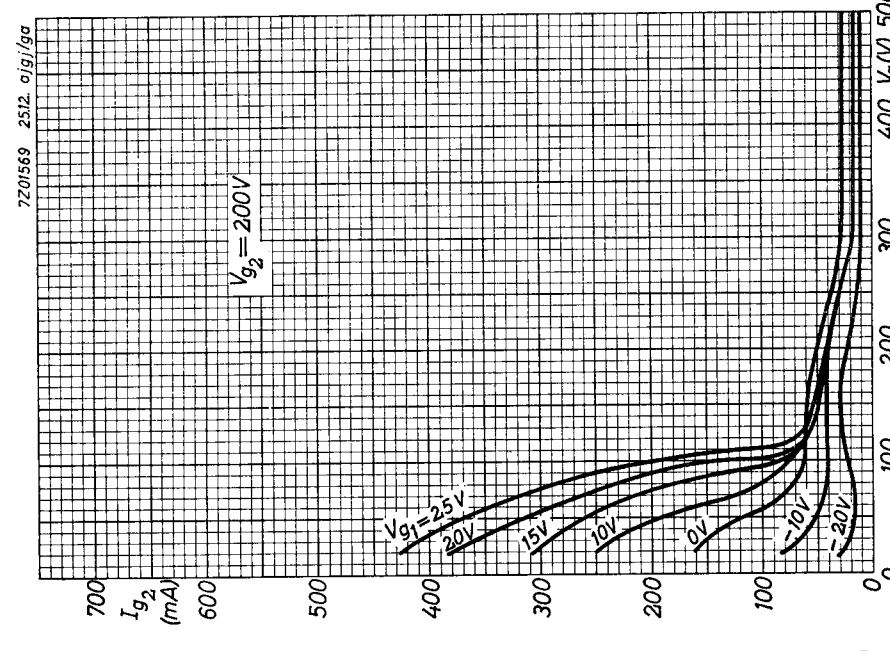
$V_{g_1} = -25V$
-20V
-15V
-10V
0V
+10V
+20V
I_{g_2} (mA)
700
600
500
400
300
200
100
0
0
100
200
300
400
V_a (V) 500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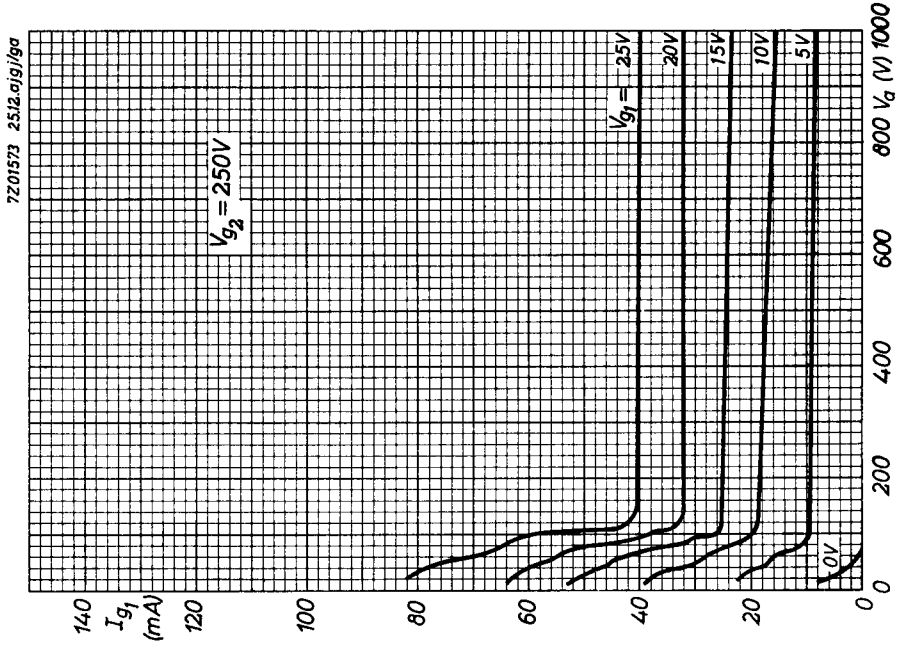
$V_{g_2} = 200V$
$V_{g_1} = -25V$
-20V
-15V
-10V
0V
+10V
+20V
I_{g_2} (mA)
700
600
500
400
300
200
100
0
0
100
200
300
400
V_a (V) 500

B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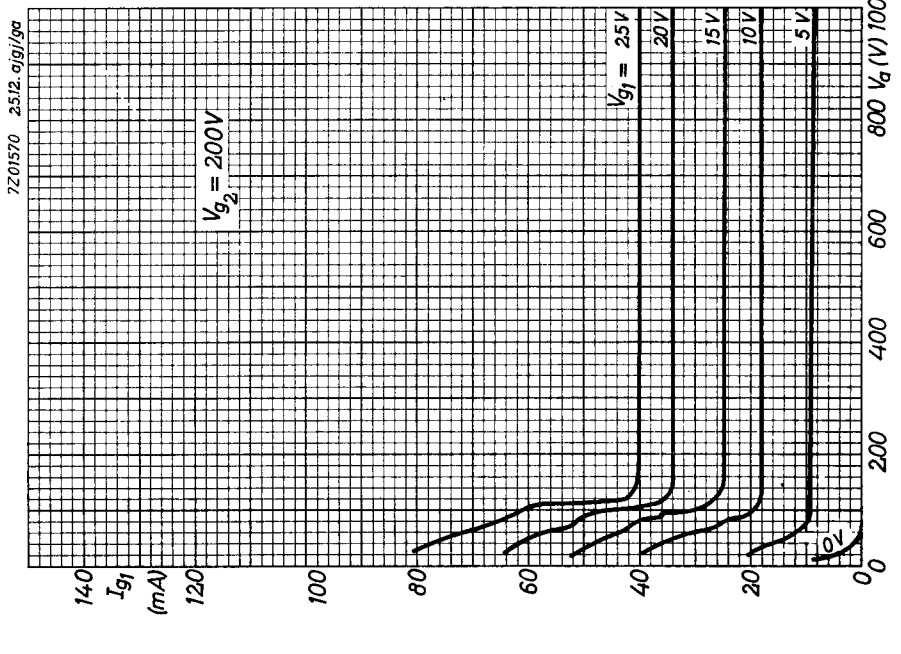
V_{g_2} = 250V
V_{g_1} = 25V
20V
15V
10V
5V
0V
I_{g_1} (mA)
140
120
100
80
60
40
20
0
0
200
400
600
800 V_a (V) 1000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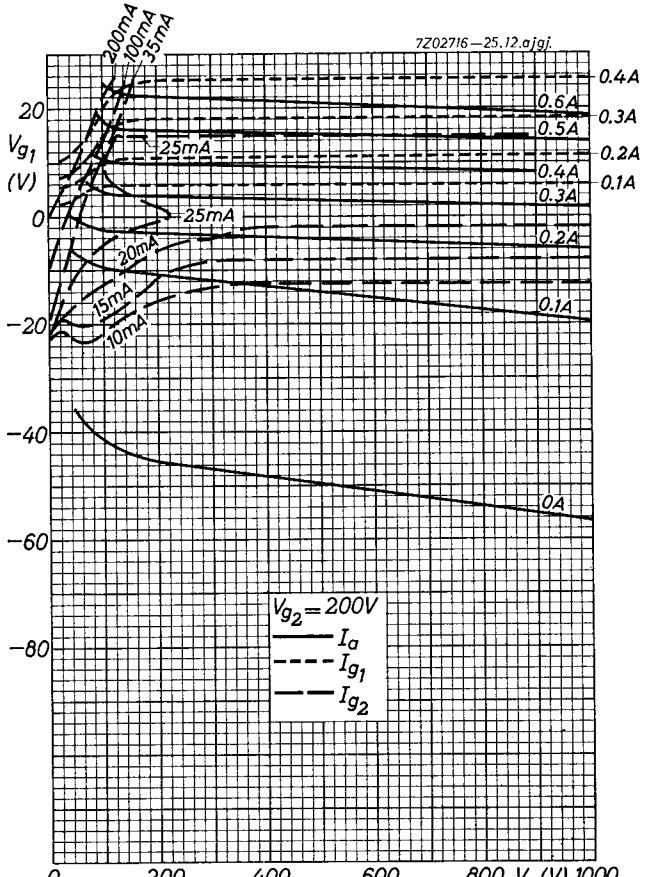
V_{g_2} = 200V
V_{g_1} = 25V
20V
15V
10V
5V
0V
I_{g_1} (mA)
140
120
100
80
60
40
20
0
0
200
400
600
800 V_a (V) 1000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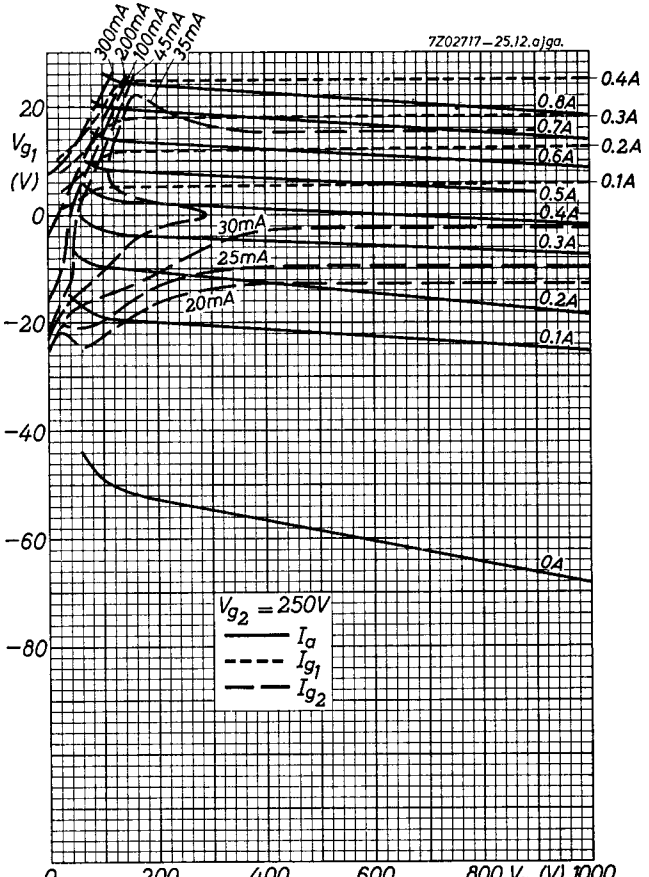
200mA
100mA
35mA
25mA
20mA
15mA
10mA
0.6A
0.5A
0.4A
0.3A
0.2A
0.1A
0A
V_{g_1} (V)
20
0
−20
−40
−60
−80
V_{g_2} = 200V
I_a
I_{g_1}
I_{g_2}
0
200
400
600
800
V_a (V) 1000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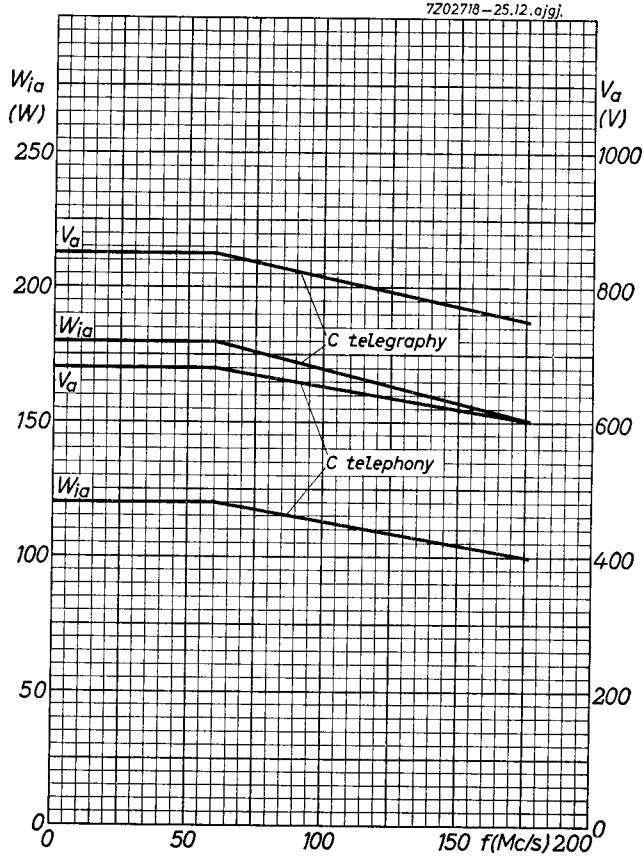
300mA
200mA
100mA
45mA
35mA
30mA
25mA
20mA
0.8A
0.7A
0.6A
0.5A
0.4A
0.3A
0.2A
0.1A
0A
V_{g_1} (V)
20
0
−20
−40
−60
−80
V_{g_2} = 250V
I_a
I_{g_1}
I_{g_2}
0
200
400
600
800
V_a (V) 1000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Wia
(W)
250
200
150
100
50
0
Va
(V)
1000
800
600
400
200
0
Va
Wia
C telegraphy
Va
Wia
C telephony
0
50
100
150 f(Mc/s) 200

PHILIPS

Data handbook

Electronic components and materials

YL1070 YL1071

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8	A	1965.01.01
9	B	1965.01.01
10	C	1965.01.01
11	D	1965.01.01
12	E	1965.01.01
13	FP	2001.04.21