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The 6Э5П output high-frequency tetrode of improved reliability is designed for broadband amplification of hf voltage and power.

The 6Э5П output high-frequency tetrodes are miniature devices enclosed in glass bulb and provided with nine rigid leads and an indirectly heated oxide-coated cathode.

The 6Э5П output high-frequency tetrodes are resistant to ambient temperature from -60 to $+85^{\circ}\text{C}$ and relative humidity of 95 to 98% at $+40^{\circ}\text{C}$, as well as to mechanical loads: linear loads up to 100 g, vibration loads up to 10 g, multiple impact loads up to 75 g and single impact loads up to 500 g.

Maximum weight: 20 gr.

Service life guarantee: 500 hr.

ELECTRICAL CHARACTERISTICS

U_h	6,3 V	R_k^1	30 Ω	S	$30,5 \pm 6,5$ mA/V
I_h	600 ± 40 mA	I_a	43 ± 10 mA	R_i	8 k Ω
U_a	150 V	I_{az}^2	≤ 10 μA	R_{eqv}	350 Ω
U_{g2}	150 V	I_{g2}	≤ 14 mA	U^3	120 mV

1) For self-bias.

2) At $U_a = 250$ V, $U_{g2} = 250$ V, $U_{g1} = -12$ V.

3) Vibration noise, at $f = 50$ Hz and acceleration 6 g.

INTERELECTRODE CAPACITANCES

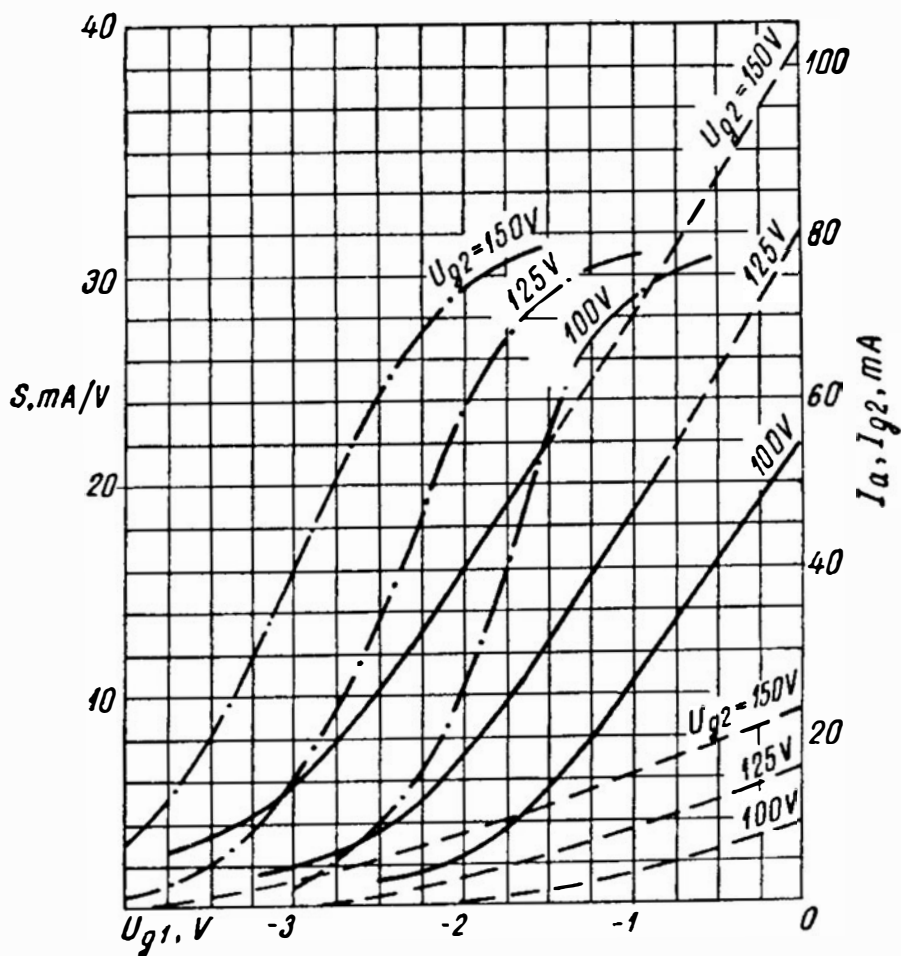
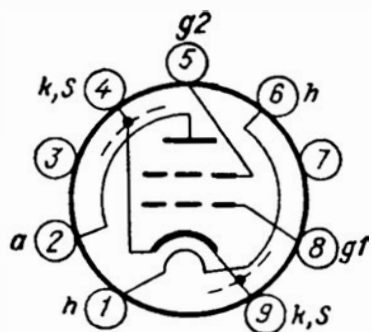
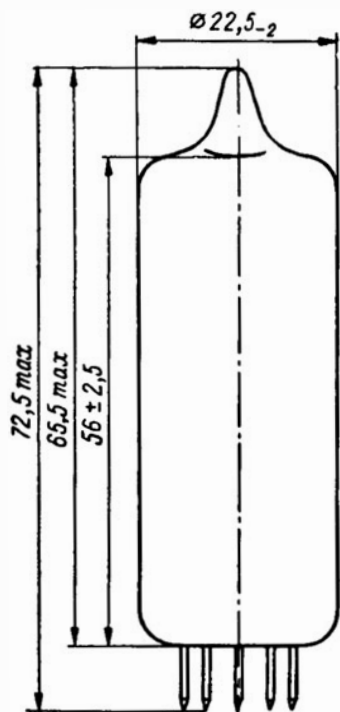
C_{q1k}	15 ± 2 pF
C_{g1a}	$\leq 0,065$ pF
C_{ak}	$2,55^{+0,25}_{-0,3}$ pF
C_{kh}	$\leq 13,5$ pF

MAXIMUM AND MINIMUM PERMISSIBLE RATINGS

	Max	Min		Max
U_h	7 V	5,7 V	P_a	8,3 W
U_a	250 V		P_{g2}	2,3 W
U_a^1	500 V		I_k	100 mA
U_{g2}	250 V		U_{kh}	$^{+100}_{-150}$ V
$U_{g2}^{1,2}$	500 V		R_{g1}	0,5 M Ω
U_{g1}	-100 V		T_{bulb}	210 $^{\circ}$ C

1) With the tube cutoff.

2) At $I_a \leq 5$ μA .

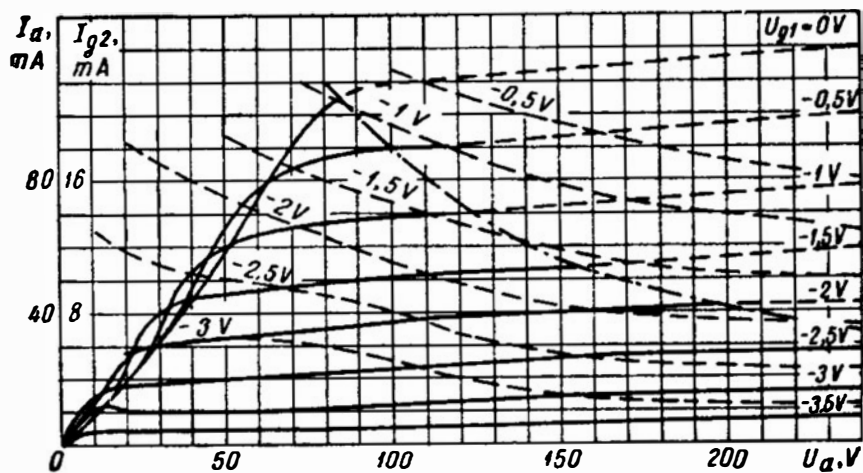


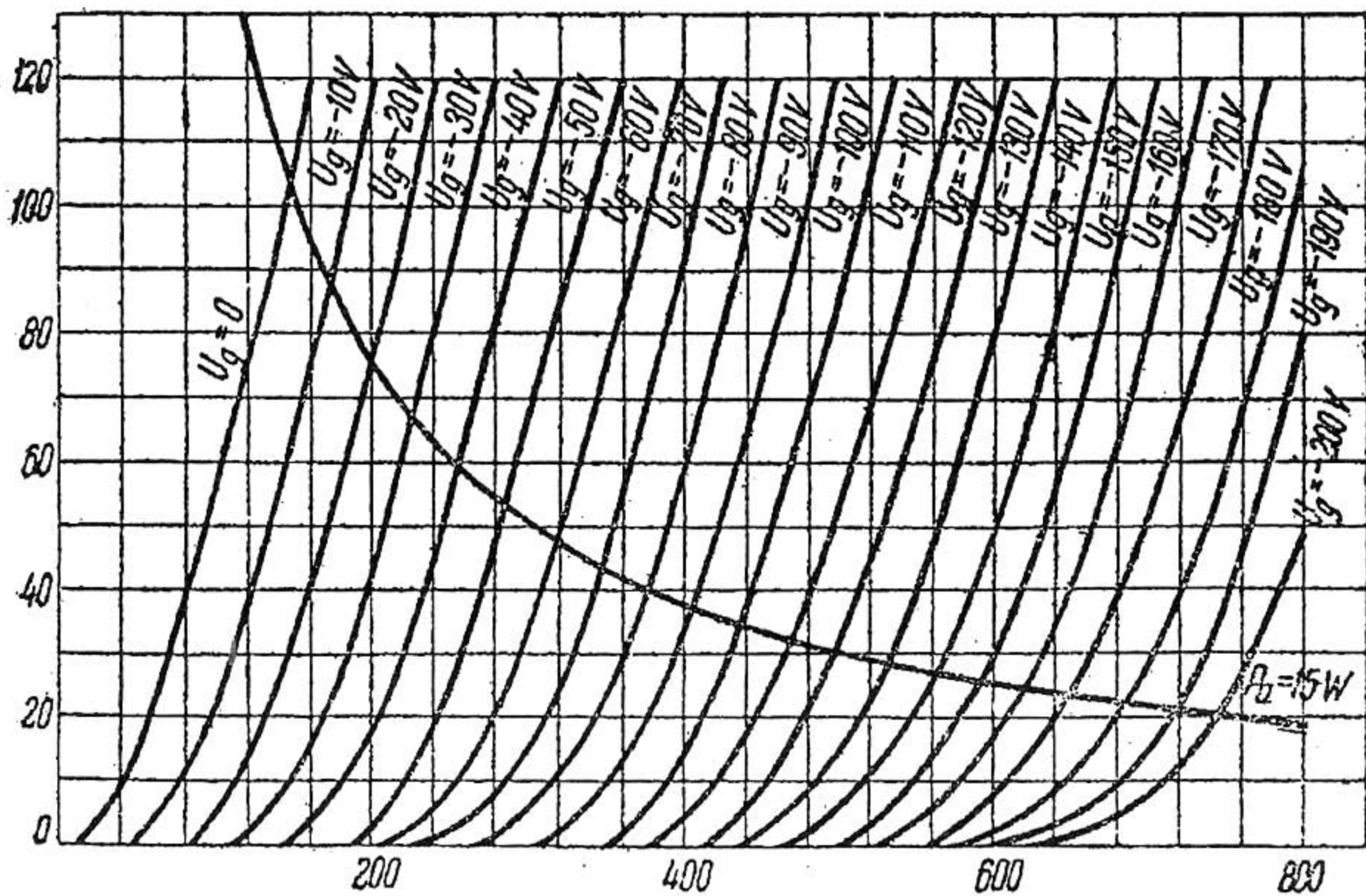
$$I_a, I_{g2}, S = f(U_{g1})$$

————— I_a $U_h = 6,3 \text{ V}$
 - - - - - I_{g2} $U_a = 150 \text{ V}$
 - - S

$$I_a, I_{g2} = f(U_a)$$

————— I_a $U_h = 6,3 \text{ V}$
 - - - - - I_{g2} $U_{g2} = 150 \text{ V}$
 - - $P_a \text{ max}$

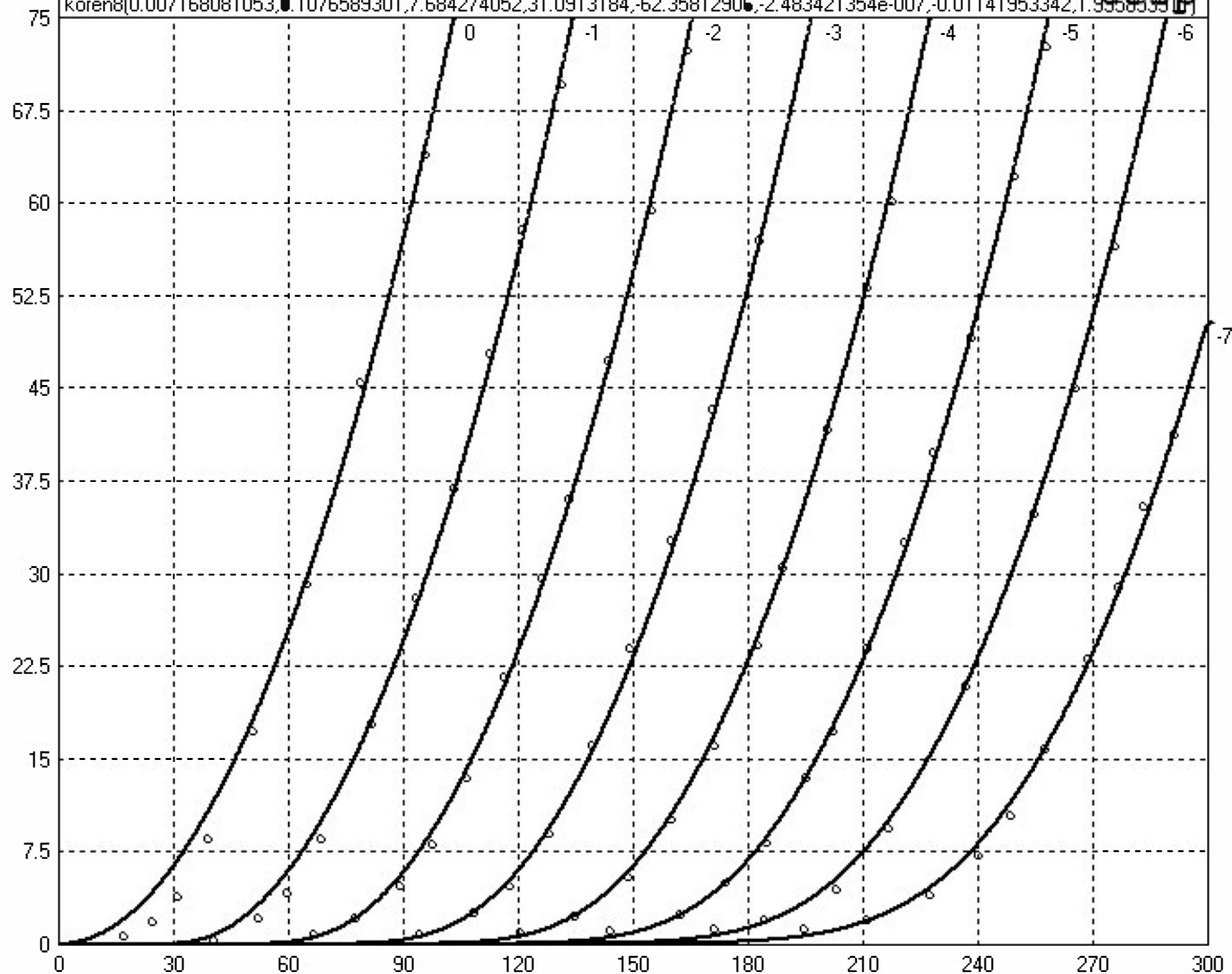




Modified Koren model (8 parameters): mean fit error 0.874008 mA

koren8(0.007168081053,0.1076589301,7.684274052,31.0913184,-62.35812906,-2.483421354e-007,-0.01141953342,1.995553911)

6e5p



ИМПУЛЬСНЫЙ ТЕТРОД PULSE TETRODE

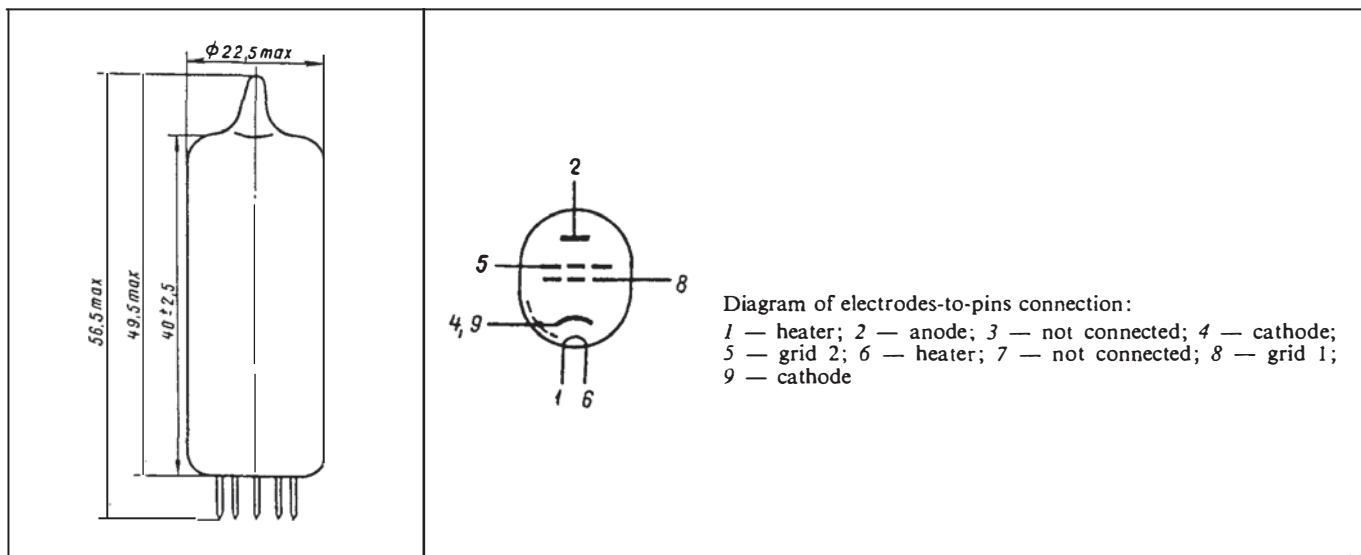
6Э5П-И

GENERAL

The 6Э5П-И pulse tetrode has been designed to amplify high-frequency voltage under pulse-operation conditions.

Cathode: indirectly heated, oxide-coated.

Mass: at most 20 g.



SERVICE CONDITIONS

Vibration: at frequencies from 10 to 600 Hz with acceleration up to 10 g. Ambient temperature: from -60 to $+90$ °C. Relative humidity: up to 98% at up to 40 °C. Ambient pressure: at least 18 mm Hg.

SPECIFICATION

Electrical Parameters

Voltage, V:

heater	6.3
anode	150
grid 2	150
anode current cutoff, at anode and grid 2 voltage 250 V and anode current 70 μ A, at most	-12
grid 1 current cutoff, at most	-1.5

Current, mA:

heater	700 \pm 40
anode	\geq 35
grid 2	\leq 18

Resistance in cathode circuit for automatic bias, Ohm	30
Internal resistance, MOhm	0.01
Equivalent resistance of internal noise, kOhm	0.35
Transconductance, mA/V	\leq 24
Emission pulse current, at pulse voltage 150 V, pulse repetition frequency 50 Hz and pulse duration 1—2 μ s, A	\geq 6
Emission pulse current under the same conditions as above and at heater voltage 5.7 V, A	\geq 3
Figure of merit, mA/V \cdot pF	1.5

Capacitance, pF:

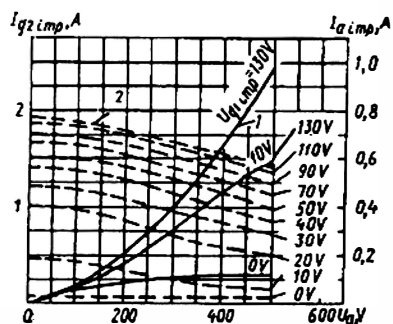
input	15 \pm 2
output	2.5 ^{+0.4} _{-0.3}
transfer	\leq 0.075
cathode-to-heater	\leq 13.5

Electrical parameters over 500 operating hours:

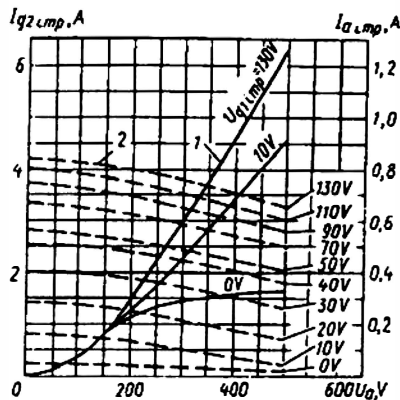
emission pulse current, A	\geq 6
emission pulse current at heater undervoltage, A	\geq 3
anode current cutoff voltage, V, at most	-12

Limit Values of Operating Conditions

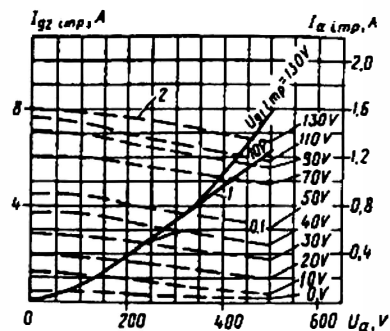
	Maximum	Minimum
Voltage, V:		
heater	7	5.7
anode	250	
anode in cut-off valve, at cathode current at most 5 μ A	470	
grid 2	250	
grid 2 in cut-off valve, at cathode current at most 5 μ A	470	
grid 1	-100	
between cathode and heater:		
with heater at positive potential	100	
with heater at negative potential	150	
Current, A:		
cathode	100 \cdot 10 ⁻³	
cathode (pulse)	9	
Sum of power dissipated at anode and grid 2, W	3	
Power dissipation at grid 2, W	2	
Resistance in grid 1 circuit, MOhm	0.5	



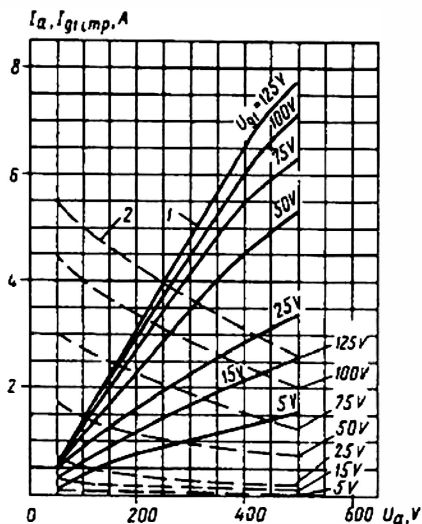
Averaged pulse characteristics:
1 — anode; 2 — grid-anode (for grid 2)
 $U_h = 6.3 \text{ V}$, $U_{g2} = 150 \text{ V}$



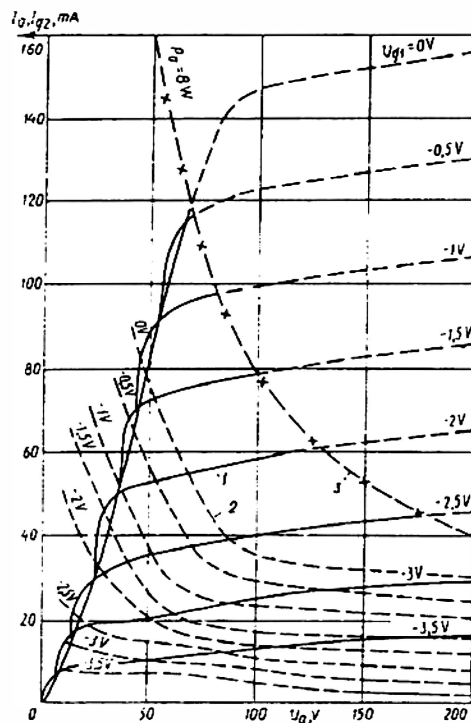
Averaged pulse characteristics:
1 — anode; 2 — grid-anode (for grid 2)
 $U_h = 6.3 \text{ V}$, $U_{g2} = 300 \text{ V}$



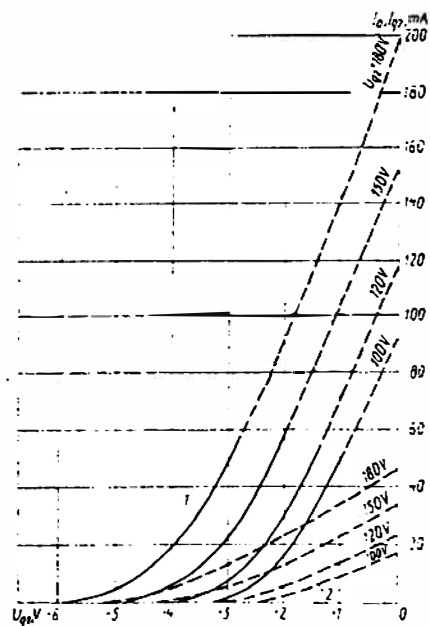
Averaged pulse characteristics:
1 — anode; 2 — grid-anode (for grid 2)
 $U_h = 6.3 \text{ V}$, $U_{g2} = 470 \text{ V}$



Averaged pulse characteristics
triode connected:
1 — anode; 2 — grid-anode
 $U_h = 6.3 \text{ V}$, $f = 200 \text{ Hz}$, $\tau = 2 \mu\text{s}$



Averaged characteristics:
1 — anode current; 2 — grid 2 current;
3 — maximum permissible anode dissipation
 $U_h = 6.3 \text{ V}$, $U_{g2} = 150 \text{ V}$



Averaged characteristics:
1 — anode current; 2 — grid 2
current
 $U_h = 6.3 \text{ V}$, $U_{g2} = 150 \text{ V}$

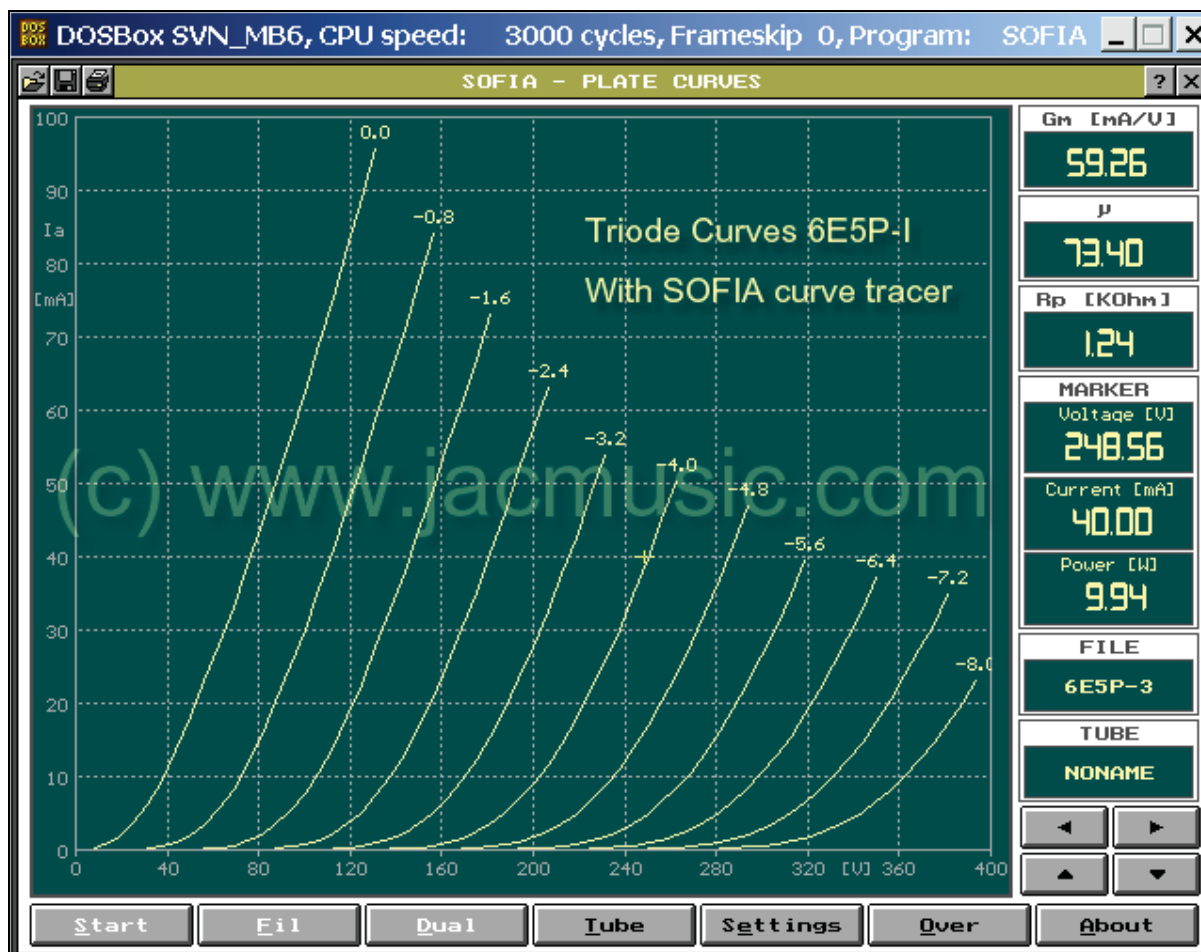
6E6P-1 Triode curves made with SOFIA curve tracer.

Jac van de Walle, 2016. April 24.

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If you need a secret tip... here it is! 6E5P-1 is a tetrode, but I list it here as triode, because that is the normal use at the moment. This is the most linear tube I have ever seen. Data Sheets can be found at www.4tubes.com under "Manufacturer Scans".

This tube has a fully flat (surface) cathode. Which is technically ideal for the curves, this was known before. Only such a cathode radiates a lot of heat to the anode, and the tube would get a terrible dissipation problem, a grid emission problem, and grid wires will sag over time by the intense heat. Particularly with miniature tubes this becomes a problem, because internal distance is small, whereas for big size tubes this technology would make no sense as the tube would become irrational due to crazy heater dissipation. Yet, for the 6E5P-1 it was done, overcoming the problems nicely. To get the cathode heat out, they used a very wide anode distance, and then it works. To get the grid precision, and make it stable, they used a GOLD plated frame grid, made of two sections. (One section would be too large). There is the largest frame grid in this tube, I have ever seen. Some military stock rooms are selling those for crap prices to dealers, because they do NOT KNOW what they have here, and market price is driven by this stupidity, which will surely not last for ever. They cost just a few Euro, as long as supply lasts, but they are real jewels. Triode Gain is high, at amazing linearity. A fantastic driver, or head phone tube, and you can get a few Watt out of it, single ended. Anode voltage just normal, like 250V or so. When I have time, I take one apart and post pictures here, so you can see the curious anode shape, and the double section frame grid.



Look in the above picture at 248V, 40mA. When you look carefully, you see a small marker "+" sign there. With the free Sofia software, you can move this marker over the curves, and read the tube

characteristics from every operating point to you like. The result comes in the boxes on the right. So it was done here for those values as you can see. Gain at the outer edge of the curve chart is becomes not precise, as the software needs to estimate how the curves proceed. So below you find some more precise results, measured more in the center of the chart.

6E5P-1 Triode Mode Data

Ua (V)	Ia (mA)	Gain	Rp (Ohms)
150	45	47	1120
200	30	50	1340
350	15	53	2120



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