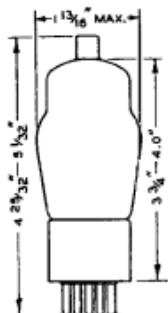


3634 Amplifier

36 Pre and EL34 Power



RCA-24-A

SCREEN-GRID RADIO-FREQUENCY AMPLIFIER

The 24-A is a screen-grid amplifier tube of the heater-cathode type for use primarily as a radio-frequency amplifier in a-c receivers. The 24-A may also be used as a screen-grid detector or audio amplifier.



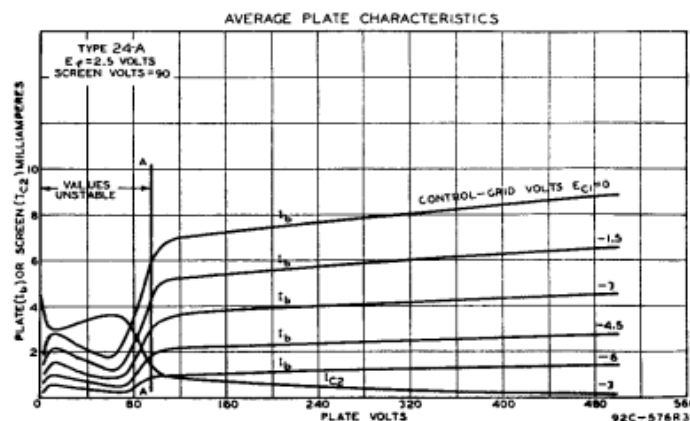
CHARACTERISTICS

HEATER VOLTAGE (A. C. or D. C.)	2.5	Volts
HEATER CURRENT	1.75	Amperes
PLATE VOLTAGE*	180 250	Volts
SCREEN VOLTAGE (Grid No. 2)	90 max. 90 max.	Volts
GRID VOLTAGE (Grid No. 1)	-3 -3	Volts
PLATE CURRENT	4 4	Milliamperes
SCREEN CURRENT (Maximum)	1.7 1.7	Milliamperes
PLATE RESISTANCE	0.4 0.6	Megohm
AMPLIFICATION FACTOR	400 630	
TRANSCONDUCTANCE	1000 1050	Micromhos
GRID-PLATE CAPACITANCE (With shield-can)	0.007 max.	μf
INPUT CAPACITANCE	5.3	μf
OUTPUT CAPACITANCE	10.5	μf
BULB		ST-14
CAP		Small Metal
BASE		Medium 5-Pin

* Maximum plate voltage = 275 volts.

INSTALLATION AND APPLICATION

The base pins of the 24-A fit the standard five-contact socket. The socket may be installed to hold the tube in any position. For heater operation and cathode connection, refer to type 2A5. The screen voltage for the 24-A may be obtained from a fixed or variable tap on a voltage divider across the high-voltage supply, or across a portion of the supply. Complete shielding in all stages of the circuit is necessary if maximum gain per stage is to be obtained.



24-A Driver



Ale Moglia

January 16, 2022

Valves & Hi-Fi

24, 24 driver, 24 tetrode,
24a, 24a driver, 24a tetrode,
24a tube

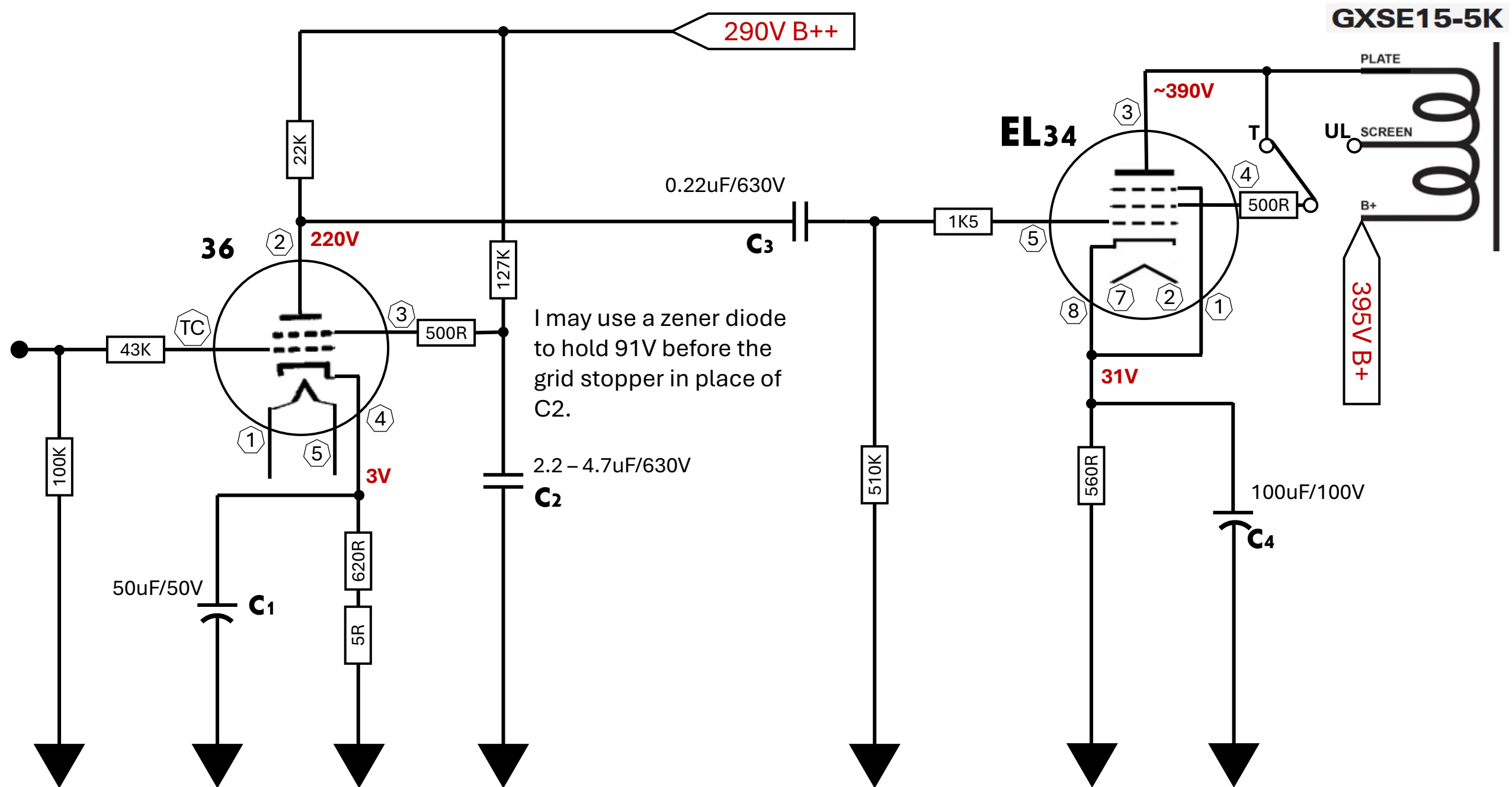
About 10 years ago I used this [tetrode driver](#) which I loved. The 24a. It has hungry filaments, albeit a lovely sound. I probably lost a few readers by now, but don't care. The 24a into the 45 Single ended, was a great choice, no wonder why Torsten praised this valve.

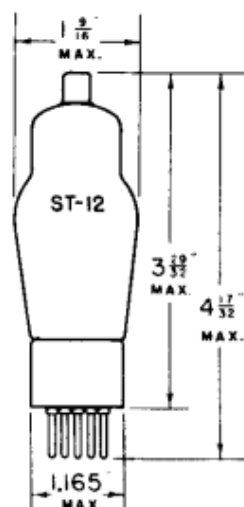
I settled with the following driver which worked well for me. The 24a is carefully operated at 8mA and 80V on the screen to minimise distortion. This way you can get about 35.5dB (x60) gain stage with about 160Vpp output at 0.5% THD. Yes, more H3 component than a triode, but sounds really nice:

Simple and effective gain stage for a 2-stage amplifier. The output valve could be anything of your choice: 2A3, 45 or even 300B.

The hybrid mu-follower use R1 to set the gain of the tetrode stage (I covered this before many times) and the stable mu-output also feed the screen regulator (Reg 1). I made also a PCB for this regulator, so the driver footprint is very small.

<https://www.bartola.co.uk/valves/2022/01/16/24-driver/?unapproved=54004&moderation-hash=a2d7bdce9b4a8b707318e3550d71add1#comment-54004>



TUNG-SOL**TETRODE AMPLIFIER**

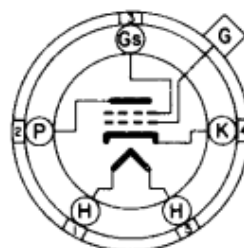
UNIPOTENTIAL CATHODE

HEATER

6.3 VOLTS 0.3 AMPERE
AC OR DC

GLASS BULB

SMALL 5 PIN BASE



5E

BOTTOM VIEW

THE TUNG-SOL 36 IS DESIGNED FOR USE AS AN RF AMPLIFIER OR DETECTOR.

OPERATING CONDITIONS AND CHARACTERISTICS

CLASS A AMPLIFIER

PLATE VOLTAGE	100	135	180	250 ^{MAX.}	VOLTS
SCREEN VOLTAGE	55	67.5	90 ^{MAX.}	90 ^{MAX.}	VOLTS
CONTROL GRID VOLTAGE	-1.5	-1.5	-3	-3	VOLTS
PLATE CURRENT	1.8	2.8	3.1	3.2	MA.
SCREEN CURRENT	-	-	-	1.7 ^{MAX.}	MA.
PLATE RESISTANCE	0.55	0.475	0.50	0.55	MEGOHM
TRANSCONDUCTANCE	850	1000	1050	1080	μMHOS
AMPLIFICATION FACTOR	470	475	525	595	

AVERAGE PLATE CHARACTERISTICS

TYPE 36
 $E_f = 6.3$ VOLTS
SCREEN VOLTS=90

CONTROL-GRID VOLTS $E_{c1}=0$

Plate Current 3.2mA
Screen Current 1.6MA
Zener Current 4.1mA
Cathode Current 4.8mA
Cathode Voltage 3V
 $R_K = 625R$ Ideal

$200 \div 127000 = 0.00157$

$0.19939 \times 4 =$

$RGS = 127,000R$ 0.79756 W

$RSGS = 500R$

No Zener

$75 \div 3 =$

Gain = 25V/V

25

$E_{c1} = -3$

-4

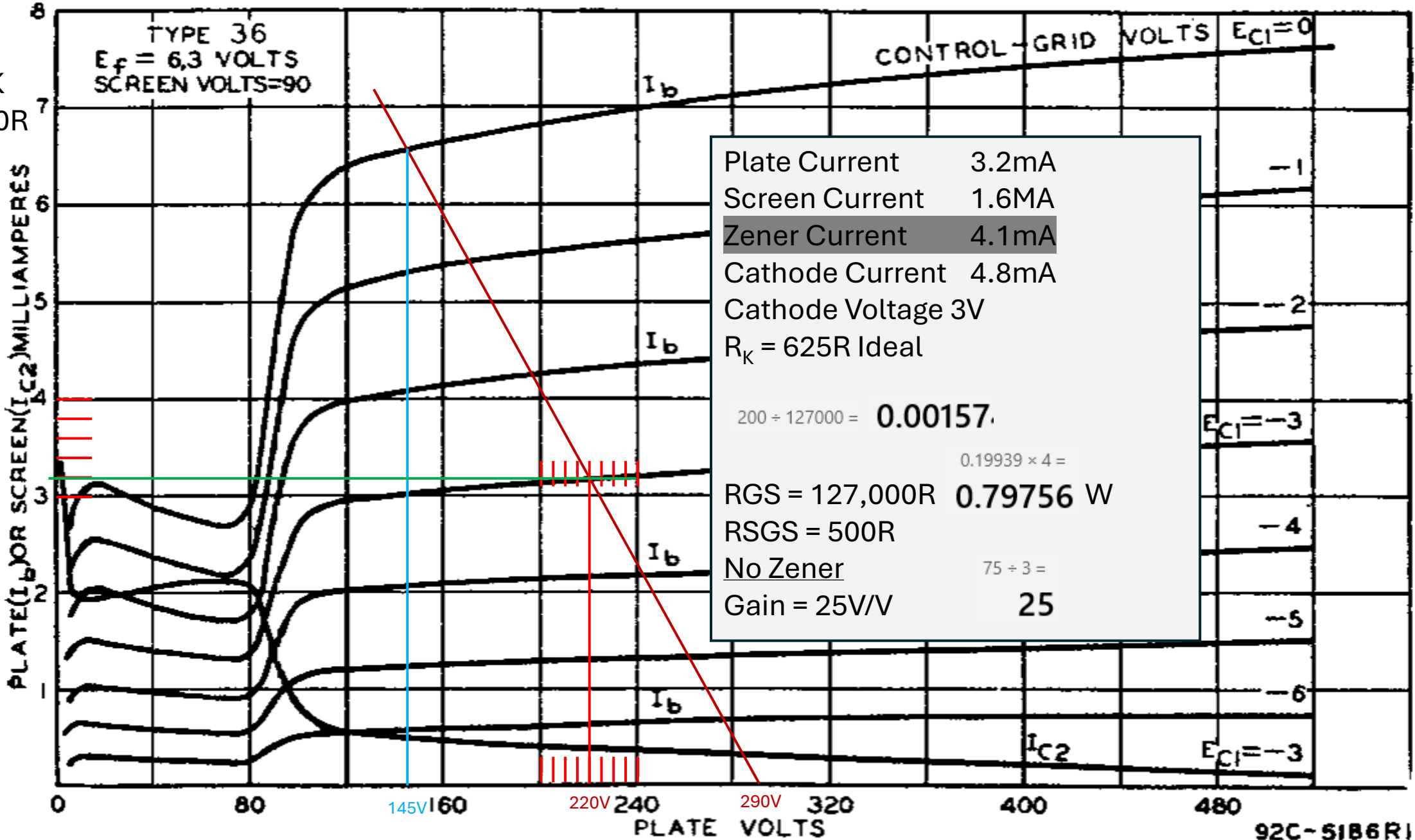
-5

-6

$E_{c1} = -3$

I_{c2}

92C-5186R1



$R_L = 22K$
 $R_K = 620R$

3.2mA

Select a Tube: [Check full list of available tubes](#)

Operating mode:

☒ Ultralinear
☐ Pentode
☐ Triode

PP/SE:

☐ PP ☒ SE

V+ (V):

Grid Bias Voltage (V):

Quiescent Operating Point:

Iq(mA):

Vq(V):

Output Power (W):
at max g1:13.39
at g1=0:13.39
at class A/A2:7.84
at headroom:12.96

Load (Ohm):

☐ Resistive
☒ Reactive

Next stage AC Impedance (Ohm):

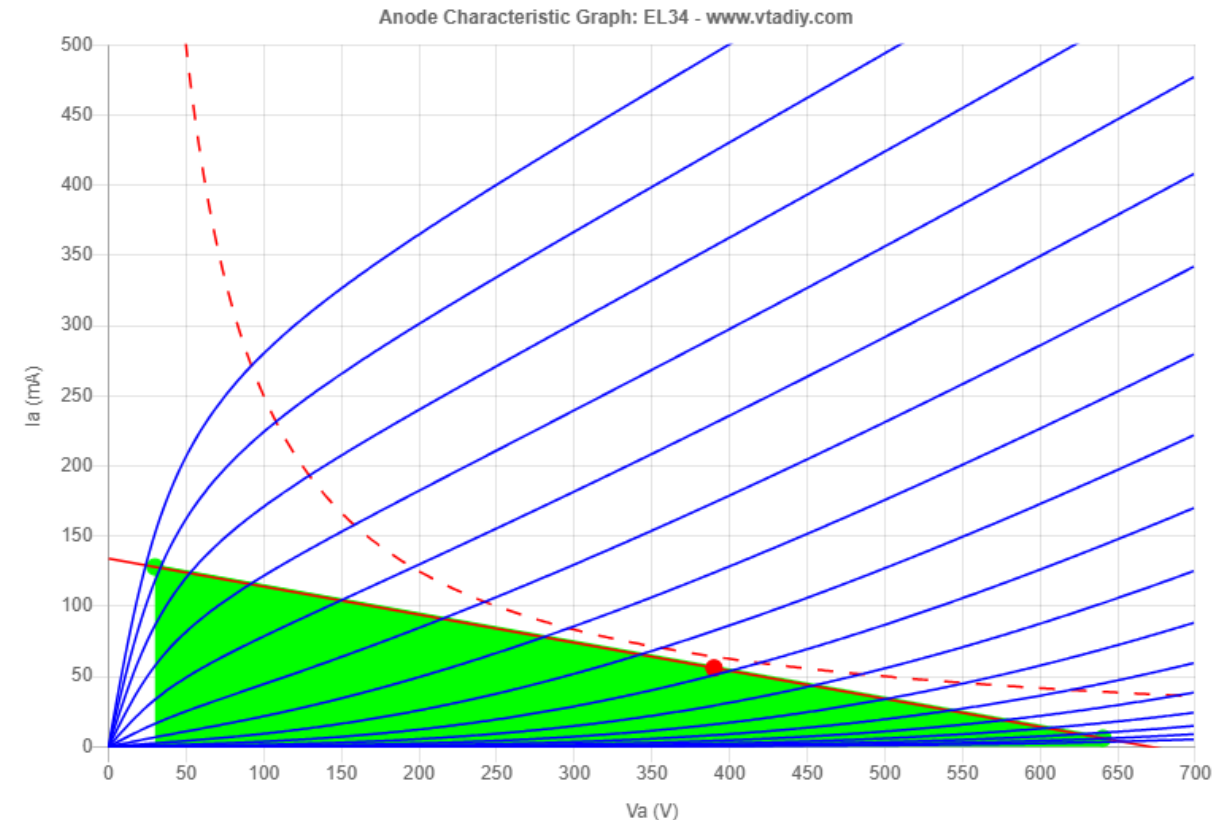
HD%:

2nd:8.22 3rd:8.39 4th:3.10
THD:12.15

Screen Voltage (V):

UltraLinear tap (%):

Out. headroom (+/-V):



$31.26 \div 0.056 =$
558.21428571428571428571428571429

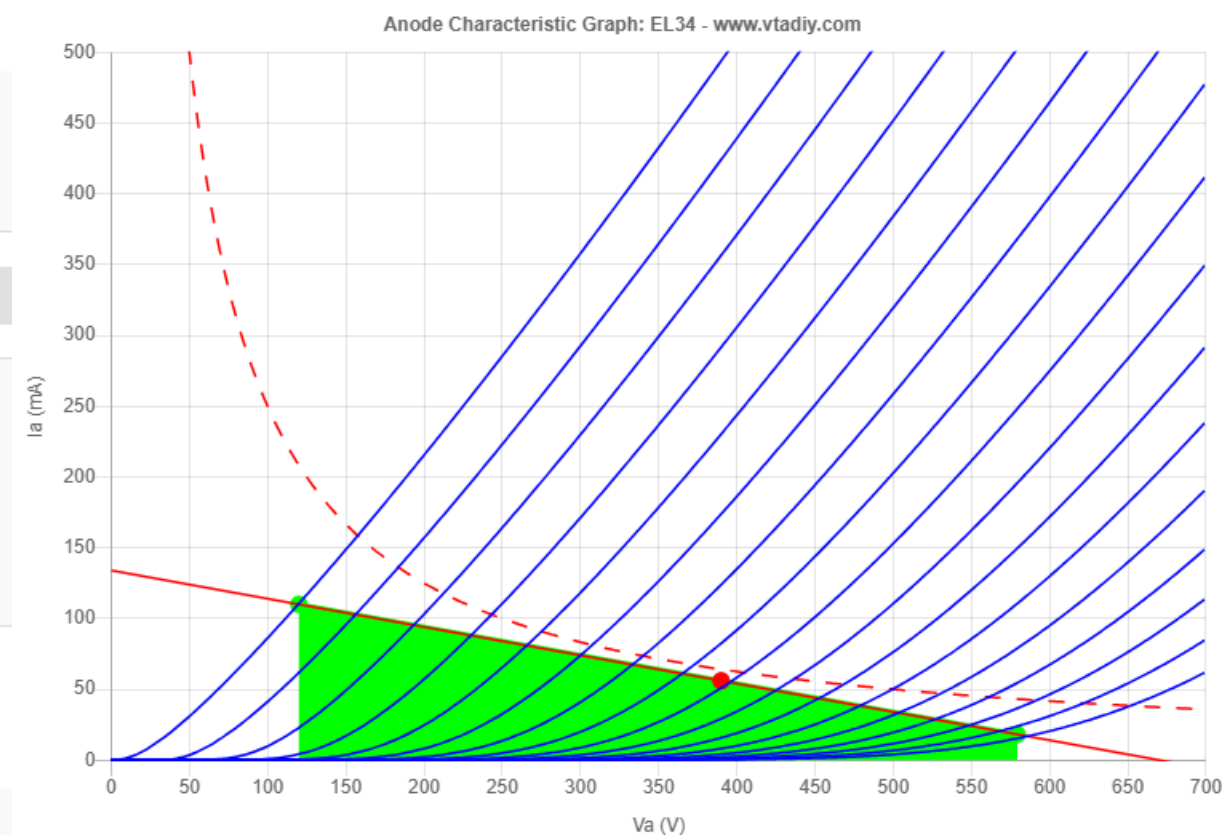
$31.26 \times 0.056 =$
1.75056

$1.75056 \times 4 =$
7.00224

RS010560R0FE73
RES 560 OHM 10W 1% WW AXIAL
Vishay Dale

Select a Tube: EL34 Print this Graph! Check full list of available tubes

Operating mode:	<input type="radio"/> Ultralinear <input type="radio"/> Pentode <input checked="" type="radio"/> Triode	PP/SE:	<input type="radio"/> PP <input checked="" type="radio"/> SE
V+ (V):	<input type="text" value="390"/>	Grid Bias Voltage (V):	<input type="text" value="-31.26"/>
Quiescent Operating Point:	Iq(mA): <input type="text" value="56"/> Vq(V): <input type="text" value="390.00"/>	Output Power (W):	at max g1:7.31 at g1=0:7.31 at class A/A2:7.84 at headroom:7.29
Load (Ohm): <input type="radio"/> Resistive <input checked="" type="radio"/> Reactive	<input type="text" value="5000"/>		
Next stage AC Impedance (Ohm):	<input type="text"/>	HD%:	2nd:8.74 3rd:0.63 4th:0.11 THD:8.76
Screen Voltage (V):	<input type="text" value="250"/>		
UltraLinear tap (%):	<input type="text" value="40"/>		
Out. headroom (+/-V):	<input type="text" value="270"/>		



$$31.26 \div 0.056 = 558.21428571428571428571428571429$$

$$31.26 \times 0.056 = 1.75056$$

$$1.75056 \times 4 = 7.00224$$



RS010560R0FE73
RES 560 OHM 10W 1% WW AXIAL
Vishay Dale

OUTPUT PENTODE

Output pentode rated for 25W anode dissipation,
intended for use in a.c. mains operated equipment.

EL34

DESIGN CENTRE RATINGS

$V_{a(b)}$ max.	2.0	kV
V_a max.	800	V
p_a max.	25	W
$V_{g2(b)}$ max.	800	V
V_{g2} max.	500	V
p_{g2} max.	8.0	W
I_k max.	150	mA
R_{g1-k} max.	500	k Ω
V_{h-k} max.	100	V
R_{h-k} max.	20	k Ω

HEATER

V_h	6.3	V
I_h	1.5	A

CAPACITANCES

C_{out}	8.4	pF
C_{in}	15.2	pF
C_{a-g1}	<1.0	pF
C_{g1-h}	<1.0	pF
C_{h-k}	11	pF

CHARACTERISTICS

Pentode connection

V_a	250	V
V_{g2}	250	V
V_{g3}	0	V
I_a	100	mA
I_{g2}	15	mA
V_{g1}	-12.2	V
g_m	11	mA/V
r_a	15	k Ω
μ_{g1-g2}	11	
V_{g1} max.		
$(I_{g1} = +0.3\mu A) -1.3$ V		

Triode connection
(g_2 connected to a)

V_a	250	V
I_a	70	mA
V_{g1}	-15.5	V
g_m	11.5	mA/V
r_a	910	Ω
μ	10.5	

OPERATING CONDITIONS AS SINGLE VALVE CLASS "A" AMPLIFIER

Pentode connection

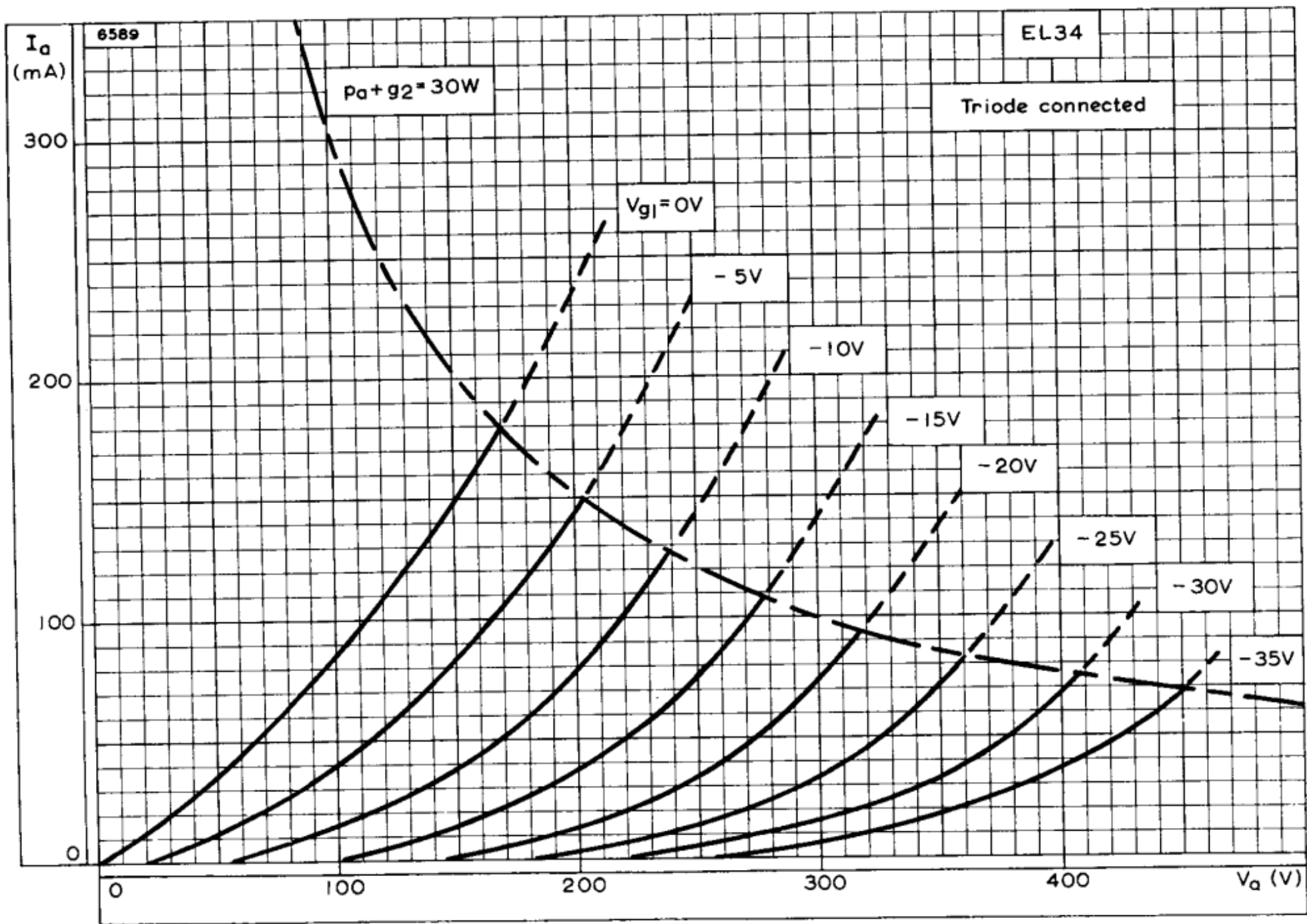
V_a	250	300	V
V_{g2}	250	300	V
V_{g3}	0	0	V
R_k	106	190	Ω
R_a	2.0	3.5	k Ω
I_a	100	83	mA
I_{g2}	15	13	mA
$V_{in(r.m.s.)}$ ($P_{out} = 50mW$)	500	450	mV
$V_{in(r.m.s.)}$	8.0	8.2	V
* P_{out}	11	11	W
* D_{tot}	10	10	%

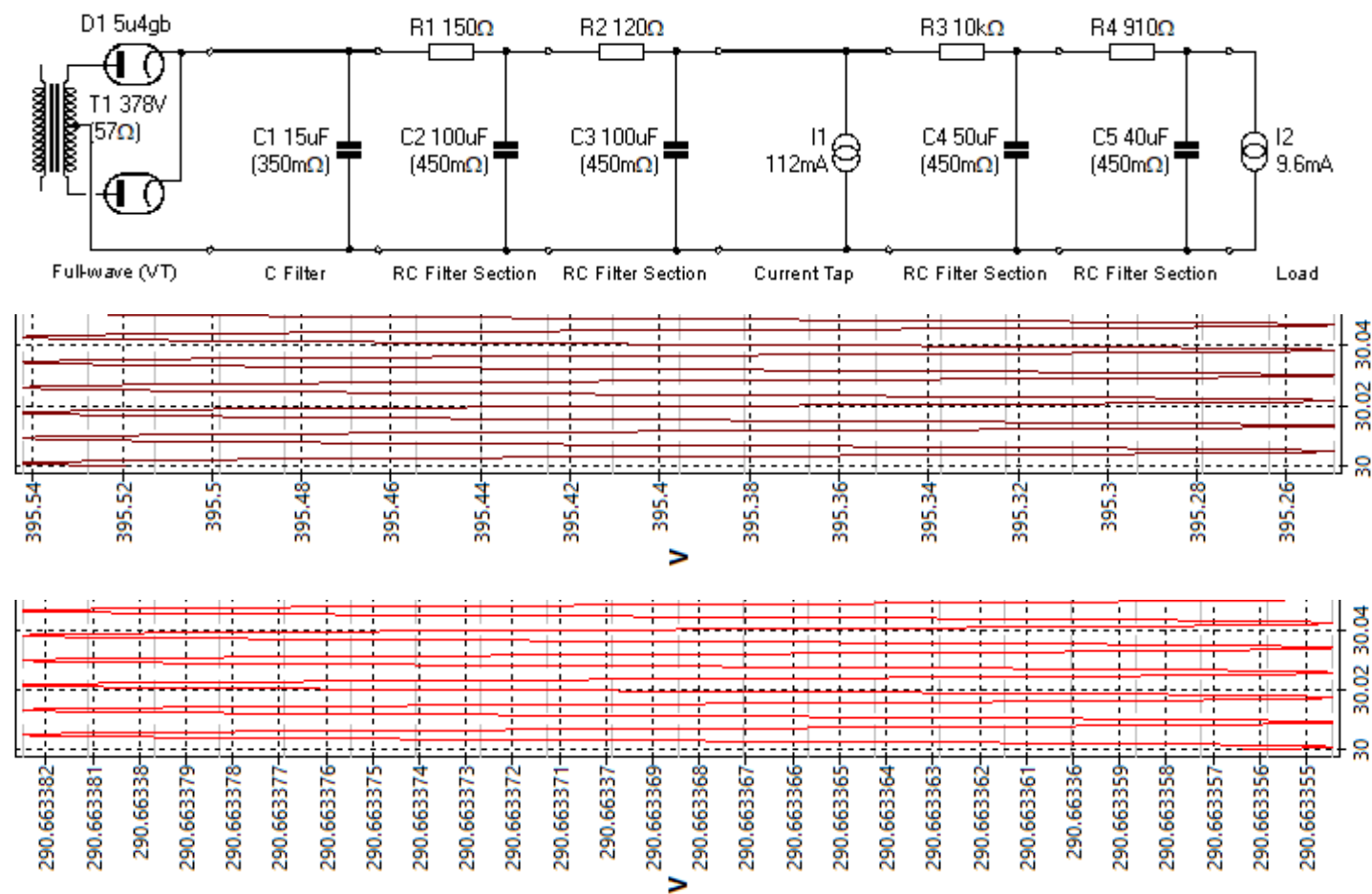
Triode connected

V_a max.	600	V
p_{a+g2} max. ($V_a = 500V$)	30	W
p_{h+g2} max. ($V_a = 600V$)	15	W

EL34

OUTPUT PENTODE





EDCOR ELECTRONICS CORPORATION

XPWR233 - 720V@300mA CT w/55V bias, 6.3V@5A CT, & 5V@4A

\$169.29 USD

Shipping calculated at checkout

SKU: XPWR233-100

Primary (p)













Voltage ①	100V	Current ①	2.809A
Impedance ①	0.238H	DC Resistance ①	0.784Ω
Operational Frequency ①	60Hz.	Inductance ①	0.238H

Secondary


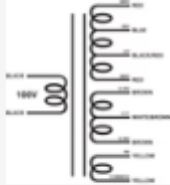
Tube Voltage ①	720V	Current(s) ①	0.3A, 5A, and 4A
Other Voltage(s) ①	6.3V and 5V	DC Resistance ①	57.272Ω, 0.035Ω, and 0.027Ω
Bias Voltage ①	55V	Inductance (Ls) ①	0.238H
Unloaded Voltage(s) ①	755.801V, 6.63V, and 4.972V		

$$755.8 \div 2 =$$

377.9

EL34 Zen Amp		Add Parts From <div></div>		<div><div></div> Share Copy</div> <div><div></div> Download</div>	
<div></div>	Product Details	Quantity	Availability	Unit Price	Extended Price
<div><div></div>1</div>	<div><div></div><div>RSD-560RCT-ND RS010560R0FE73 Vishay Dale RES 560 OHM 10W 1% WW AXIAL <div>EL34 RK</div></div></div>	<div>2</div> <div>Cut Tape (CT) <div></div></div>	Immediate	4.14000	\$8.28
<div><div></div>2</div>	<div><div></div><div>BC4529CT-ND MBE04140C2202FC100 Vishay Beyschlag/Draloric/BC Components RES 22K OHM 1% 1W AXIAL <div>EL34 36 Plate</div></div></div>	<div>2</div> <div>Cut Tape (CT) <div></div></div>	Immediate	0.66000	\$1.32
<div><div></div>3</div>	<div><div></div><div>56-PR01000106202JR500CT-ND PR01000106202JR500 Vishay Beyschlag/Draloric/BC Components RES 62K OHM 5% 1W AXIAL <div>EL34 RSC</div></div></div>	<div>2</div> <div>Cut Tape (CT) <div></div></div>	Immediate	0.25000	\$0.50
<div><div></div>4</div>	<div><div></div><div>541-CPF1500R00FKE14-ND CPF1500R00FKE14 Vishay Dale RES 500 OHM 1% 1W AXIAL <div>EL34 Screen Grid Stopper</div></div></div>	<div>2</div> <div></div>	Immediate	0.99000	\$1.98
<div><div></div>5</div>	<div><div></div><div>56-PR01000104302JR500CT-ND PR01000104302JR500 Vishay Beyschlag/Draloric/BC Components RES 43K OHM 5% 1W AXIAL <div>36 Grid Stopper</div></div></div>	<div>2</div> <div>Cut Tape (CT) <div></div></div>	Immediate	0.25000	\$0.50
<div><div></div>6</div>	<div><div></div><div>BC4688CT-ND PR01000101003JA500 Vishay Beyschlag/Draloric/BC Components RES 100K OHM 5% 1W AXIAL <div>36 Grid Leak</div></div></div>	<div>10</div> <div>Cut Tape (CT) <div></div></div>	Immediate	0.15200	\$1.52
<div><div></div>7</div>	<div><div></div><div>1928-DCP4G054006JD2KSSD-ND DCP4G054006JD2KSSD WIMA CAP FILM 40UF 10% 400VDC RADIAL <div>EL34 PSU</div></div></div>	<div>1</div> <div></div>	Immediate	11.82000	\$11.82
<div><div></div>8</div>	<div><div></div><div>RSC-10KRCT-ND RS00510K00FE73 Vishay Dale RES 10K OHM 5W 1% WW AXIAL <div>EL34 PSU</div></div></div>	<div>1</div> <div>Cut Tape (CT) <div></div></div>	Immediate	3.21000	\$3.21
<div><div></div>9</div>	<div><div></div><div>56-PR02000209100JR500CT-ND PR02000209100JR500 Vishay Beyschlag/Draloric/BC Components RES 910 OHM 5% 2W AXIAL <div>EL34 PSU</div></div></div>	<div>1</div> <div>Cut Tape (CT) <div></div></div>	Immediate	0.38000	\$0.38
<div><div></div>10</div>	<div><div></div><div>56-PR01000105103JR500CT-ND PR01000105103JR500 Vishay Beyschlag/Draloric/BC Components RES 510K OHM 5% 1W AXIAL <div>EL34 Grid Leak</div></div></div>	<div>2</div> <div>Cut Tape (CT) <div></div></div>	Immediate	0.25000	\$0.50
<div><div></div>11</div>	<div><div></div><div>541-RS010150R0FE12-ND RS010150R0FE12 Vishay Dale RS-10 150 1% E12 E3 <div>EL34 PSU</div></div></div>	<div>1</div> <div></div>	Immediate	3.53000	\$3.53
<div><div></div>12</div>	<div><div></div><div>541-RS010120R0FS73CT-ND RS010120R0FS73 Vishay Dale RES 120 OHM 10W 1% WW AXIAL <div>EL34 PSU</div></div></div>	<div>1</div> <div>Cut Tape (CT) <div></div></div>	Immediate	5.07000	\$5.07

Cart

PRODUCT	QUANTITY	TOTAL
 GXSE15-5K - 15W, 5K Ohms single ended guitar tube output transformer. 8 Ω \$89.16	<div>- 2 +</div> <div>Remove</div>	\$178.32
 XPWR233 - 720V@300mA CT w/55V bias, 6.3V@5A CT, & 5V@4A 100Vrms, 50/60Hz. \$169.29	<div>- 1 +</div> <div>Remove</div>	\$169.29

ESTIMATE SHIPPING

Country

United States

Province

Tennessee

Zip code

37055

ESTIMATE

There is one shipping rate for your address:

- FedEx: \$78.50

☐ Certificate of Compliance (CoC)

[Add a PO Number](#)

Total

\$347.61 USD

Shipping & taxes calculated at checkout

If you have a tax-exempt certificate, please email it to sales@edcorusa.com before placing order. Once received we will set your account to tax-exempt.

NOTE: A 3% cancellation fee may be applied to cancelled orders.

By clicking the checkout button, you hereby agree to and accept EDCOR's [terms and conditions](#).



CHECKOUT

We accept

