

V.H.F. POWER TETRODE

QV03-12

R.F. beam power tetrode rated for a maximum anode dissipation of 12W and intended for use at frequencies up to 175 Mc/s.

PRELIMINARY DATA

This data should be read in conjunction with "Operating Notes. Part 1—Power Valves" included in this volume of the Handbook.

CATHODE Indirectly heated.

V_h	6.0	V
I_h	0.75	A

MOUNTING POSITION

Any

CAPACITANCES (Measured without external shield)

C_{a-g1}	< 0.3	μF
C_{in}	9.5	μF
C_{out}	4.5	μF

CHARACTERISTICS (Measured at $I_a = 45 \text{ mA}$)

g_m	7.0	mA/V
μ_{g1-g2}	16	

COOLING

Natural cooling
Maximum bulb temperature

250 °C

OPERATING CONDITIONS AS ANODE AND SCREEN MODULATED R.F. POWER AMPLIFIER (CLASS "C" TELEPHONY)

Limiting Values

$V_a \text{ max.}$	250	V
$p_a \text{ max.}$	8.0	W
$V_{g2} \text{ max.}$	250	V
$p_{g2} \text{ max.}$	1.5	W
$I_k \text{ max.}$	60	mA
$I_{k(pk)} \text{ max.}$	550	mA
$-V_{g1} \text{ max.}$	125	V
$I_{g1} \text{ max.}$	5.0	mA
$R_{g1-k} \text{ max.}$	100	k Ω
$v_{h-k(pk)} \text{ max.}$	± 100	V

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Typical Operating Conditions

f	<30	Mc/s
V _a	250	V
*V _{g2}	250	V
†V _{g1}	-39	V
I _a	40	mA
I _{g2}	5.5	mA
I _{g1} (approx.)	1.0	mA
V _{in(pk)}	47	V
P _{drive}	0.2	W
P _{out}	6.4	W
‡P _{load}	5.1	W

*Obtained preferably from a separate source modulated with the anode supply or from the modulated anode supply through a series resistor.

†May be obtained by grid resistor or from a combination of grid resistor with either fixed supply or cathode resistor.

‡With a circuit transfer efficiency of 80%.

OPERATING CONDITIONS AS R.F. POWER AMPLIFIER OR OSCILLATOR (CLASS "C" TELEGRAPHY OR F.M. TELEPHONY)

Limiting Values

V _a max.	300	V
P _a max.	12	W
V _{g2} max.	250	V
P _{g2} max.	2.0	W
I _k max.	70	mA
I _{k(pk)} max.	350	mA
-V _{g1} max.	125	V
I _{g1} max.	5.0	mA
R _{g1-k} max.	100	k Ω
V _{h-k(pk)} max.	±100	V

Typical Operating Conditions

f	<30	<50	Mc/s
V _a	300	300	V
V _{g2}	250	250	V
*V _{g1}	-29	-60	V
R _{g1-k}	18	22	k Ω
V _{in(pk)}	38	80	V
I _a	50	50	mA
I _{g2}	6.5	5.0	mA
I _{g1}	1.5	3.0	mA
P _{drive}	0.15	0.4	W
P _{out}	10	8.0	W
†P _{load}	8.0	6.4	W

*May be obtained from a fixed supply or by the grid resistor shown.

†With a circuit transfer efficiency of 80%.

R.F. beam power tetrode rated for a maximum anode dissipation of 12W and intended for use at frequencies up to 175 Mc/s.

OPERATING CONDITIONS AS FREQUENCY MULTIPLIER

Limiting Values

V_a max.	300	V
p_a max.	12	W
V_{g2} max.	250	V
p_{g2} max.	2.0	W
I_k max.	70	mA
$i_{k(pk)}$ max.	450	mA
$-V_{g1}$ max.	125	V
I_{g1} max.	5.0	mA
R_{g1-k} max.	100	k Ω
$V_{h-k(pk)}$ max.	± 100	V

TYPICAL OPERATING CONDITIONS AS A FREQUENCY MULTIPLIER

	Treble	Doubler	Mc/s
f_{out}	175	175	
V_a	300	300	V
$*V_{g2}$	238	250	V
R_{g2}	12.5	12.5	k Ω
$\dagger V_{g1}$	-100	-75	V
R_{g1-k}	100	75	k Ω
I_a	35	40	mA
I_{g2}	5.0	4.0	mA
I_{g1} (approx.)	1.0	1.0	mA
$V_{in(pk)}$	120	95	V
P_{drive}	0.6	0.6	W
P_{out}	2.8	3.6	W
$\ddagger P_{load}$	1.5	2.0	W

*Obtained from anode supply voltage of 300 V through a series resistor of 12.5 k Ω .

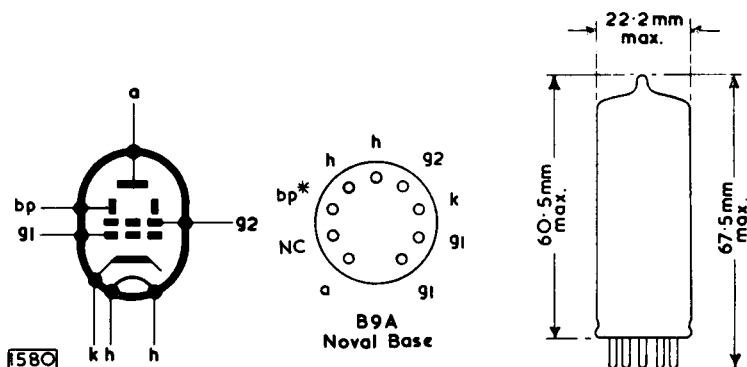
$\dagger$ May be obtained from a fixed supply or by the grid resistor shown.

$\ddagger$ With a typical circuit arrangement.

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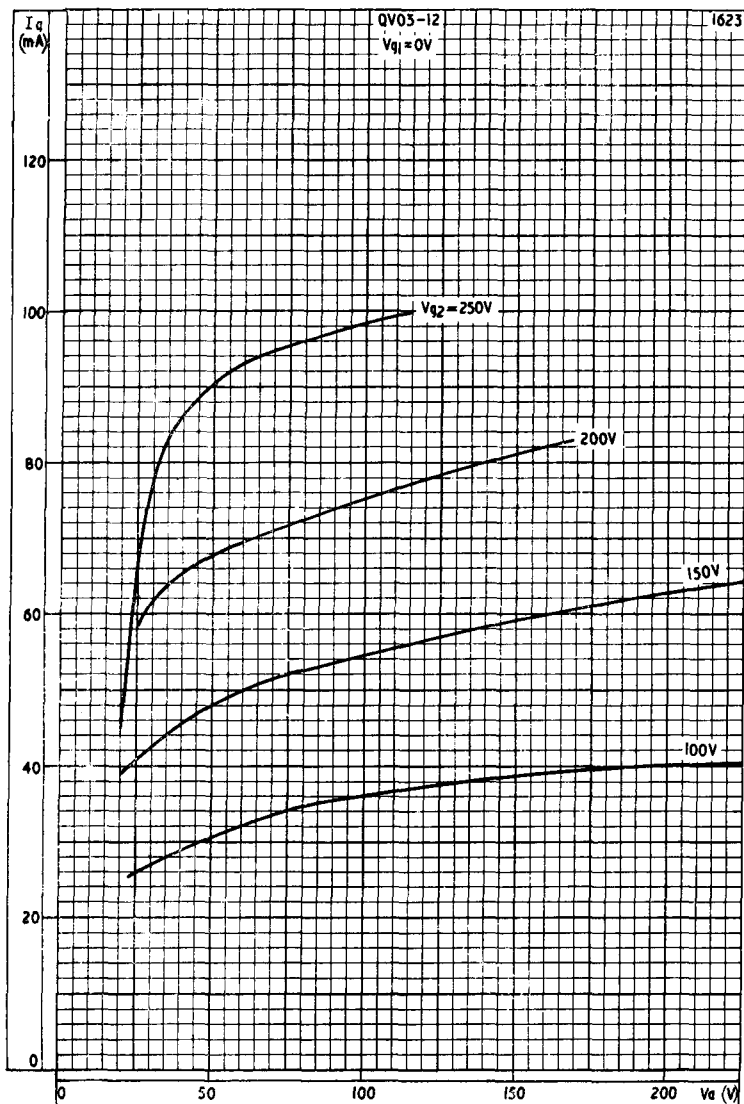


* Connect contact 3 to contact 7 at socket.
Contacts 8 and 9 should be connected to external circuit with leads of equal length.

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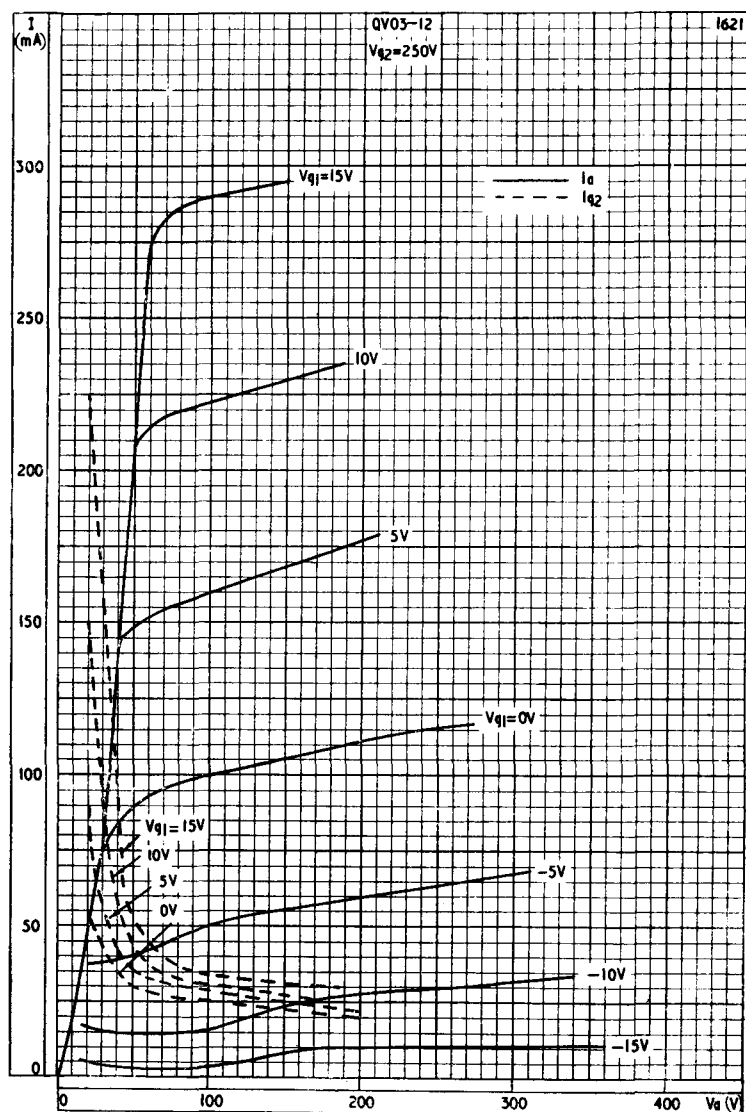


ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE FOR VARIOUS SCREEN-GRID VOLTAGES

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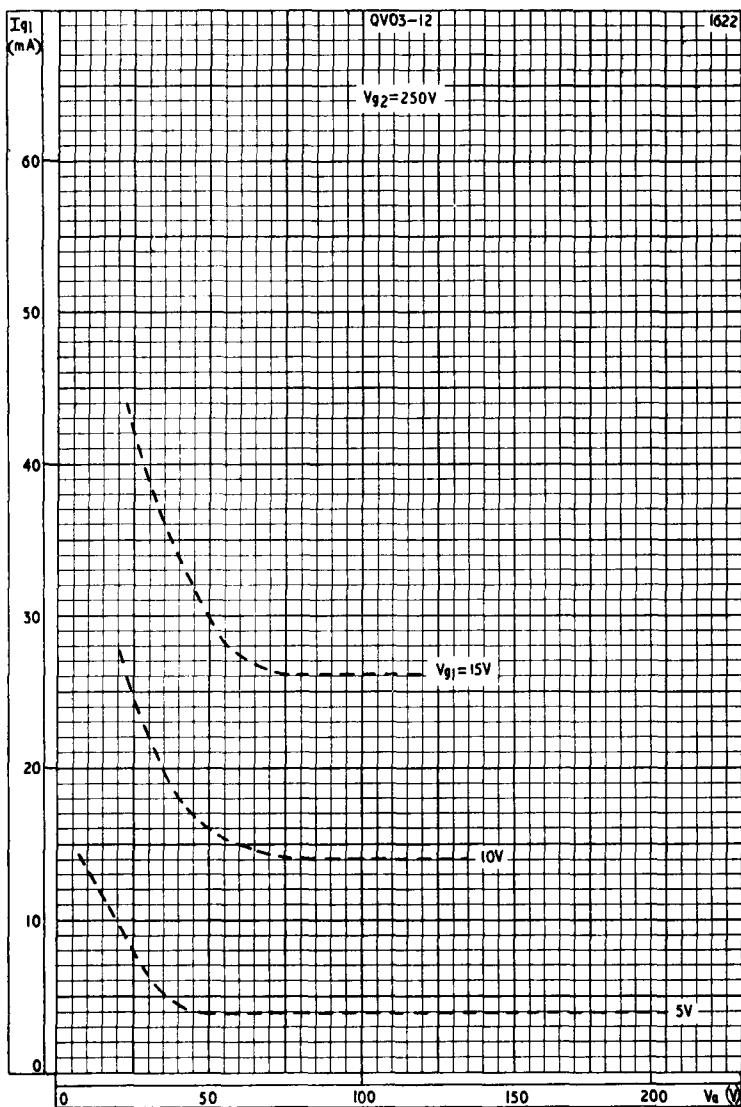


ANODE AND SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE

V.H.F. POWER TETRODE

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CONTROL-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE

V.H.F. POWER TETRODE

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Application: V.H.F. power amplifier
Power output: 10W
Frequency: 175Mc/s at full ratings
Construction: Glass, natural cooling

This data should be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS – TRANSMITTING VALVES which precede this section of the handbook.

CATHODE

Indirectly heated

V_h	6.0	V
I_h	750	mA

MOUNTING POSITION

Any

CAPACITANCES (measured without external shield)

C_{a-g1}	< 300	mpF
C_{in}	9.5	pF
C_{out}	4.5	pF

CHARACTERISTICS (measured at $I_a = 45mA$)

g_m	7.0	mA/V
μ_{g1-g2}	16	

COOLING

Natural cooling

$T_{bulb \text{ max.}}$	250	°C
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CLASS 'C' TELEGRAPHY OR F.M. TELEPHONY

Limiting values (absolute ratings)

$V_a \text{ max.}$	300	V
$p_a \text{ max.}$	12	W
$V_{g2} \text{ max.}$	250	V
$p_{g2} \text{ max.}$	2.0	W
$-V_{g1} \text{ max.}$	125	V
$I_{g1} \text{ max.}$	5.0	mA
$I_k \text{ max.}$	70	mA
$i_{k(pk)} \text{ max.}$	350	mA
$R_{g1-k} \text{ max.}$	100	k Ω
$V_{h-k(pk)} \text{ max.}$	100	V

Operating conditions

f	< 30	< 50	Mc/s
V_a	300	300	V
V_{g2}	250	250	V
$\dagger V_{g1}$	-29	-60	V
R_{g1-k}	18	22	k Ω
I_a	50	50	mA
I_{g2}	6.5	5.0	mA
I_{g1}	1.5	3.0	mA
$V_{in(pk)}$	38	80	V
P_{drive}	150	400	mW
P_{out}	10	8.0	W
P_{load}	8.0	6.4	W
$\eta_{transfer}$	80	80	%

$\dagger$ May be obtained by a fixed bias or by the grid resistor shown.

CLASS 'C' ANODE AND SCREEN-GRID MODULATION

Limiting values (absolute ratings)

V_a max.	250	V
p_a max.	8.0	W
V_{g2} max.	250	V
p_{g2} max.	1.5	W
$-V_{g1}$ max.	125	V
I_{g1} max.	5.0	mA
I_k max.	60	mA
$i_{k(pk)}$ max.	550	mA
R_{g1-k} max.	100	k Ω
$V_{h-k(pk)}$ max.	100	V

Operating conditions

f	< 30	Mc/s
V_a	250	V
$*V_{g2}$	250	V
V_{g1}	-39	V
I_a	40	mA
I_{g2}	5.5	mA
I_{g1}	1.0	mA
$v_{in(pk)}$	47	V
P_{drive}	200	mW
P_{out}	6.4	W
P_{load}	5.1	W
$\eta_{transfer}$	80	%

*Obtained preferably from a separate modulated supply, or from the modulated anode supply.

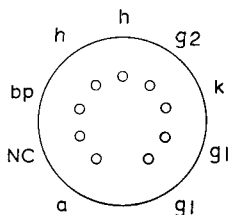
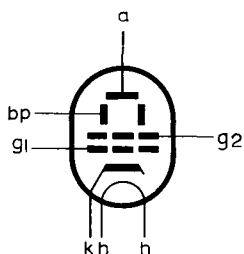
CLASS 'C' FREQUENCY MULTIPLIER

Limiting values (absolute ratings)

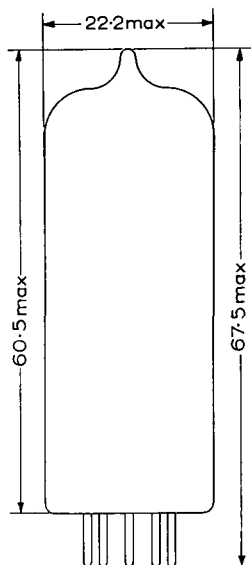
V_a max.	300	V
p_a max.	12	W
V_{g2} max.	250	V
p_{g2} max.	2.0	W
$-V_{g1}$ max.	125	V
I_{g1} max.	5.0	mA
I_k max.	70	mA
$i_{k(pk)}$ max.	450	mA
R_{g1-k} max.	100	k Ω
$V_{h-k(pk)}$ max.	100	V

Operating conditions

	Doubler	Trebler	Mc/s
f_{out}	175	175	V
V_a	300	300	V
V_{g2}	250	238	k Ω
R_{g2}	12.5	12.5	V
V_{g1}	-75	-100	k Ω
R_{g1-k}	75	100	mA
I_a	40	35	mA
I_{g2}	4.0	5.0	V
I_{g1}	1.0	1.0	mW
$V_{in(pk)}$	95	120	W
P_{drive}	600	600	W
P_{out}	3.6	2.8	%
P_{load}	2.0	1.5	
$\eta_{transfer}$	56	54	



B9A Base

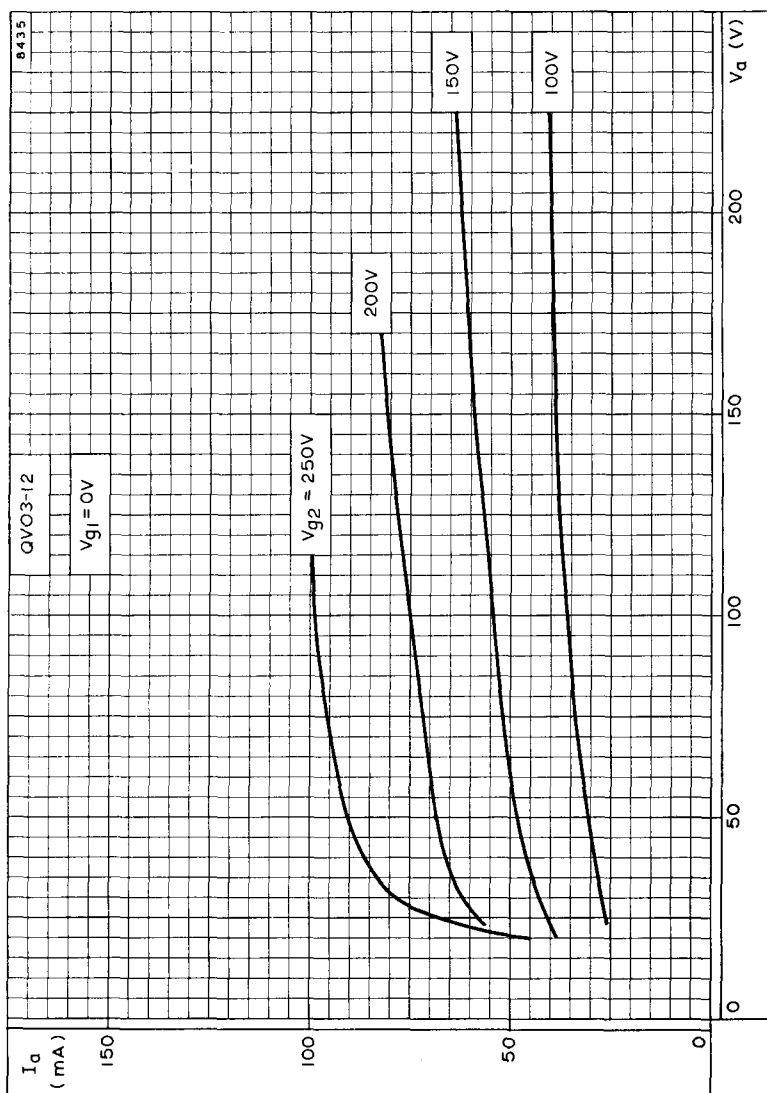


Contacts 3 and 7 should be connected together at the socket.

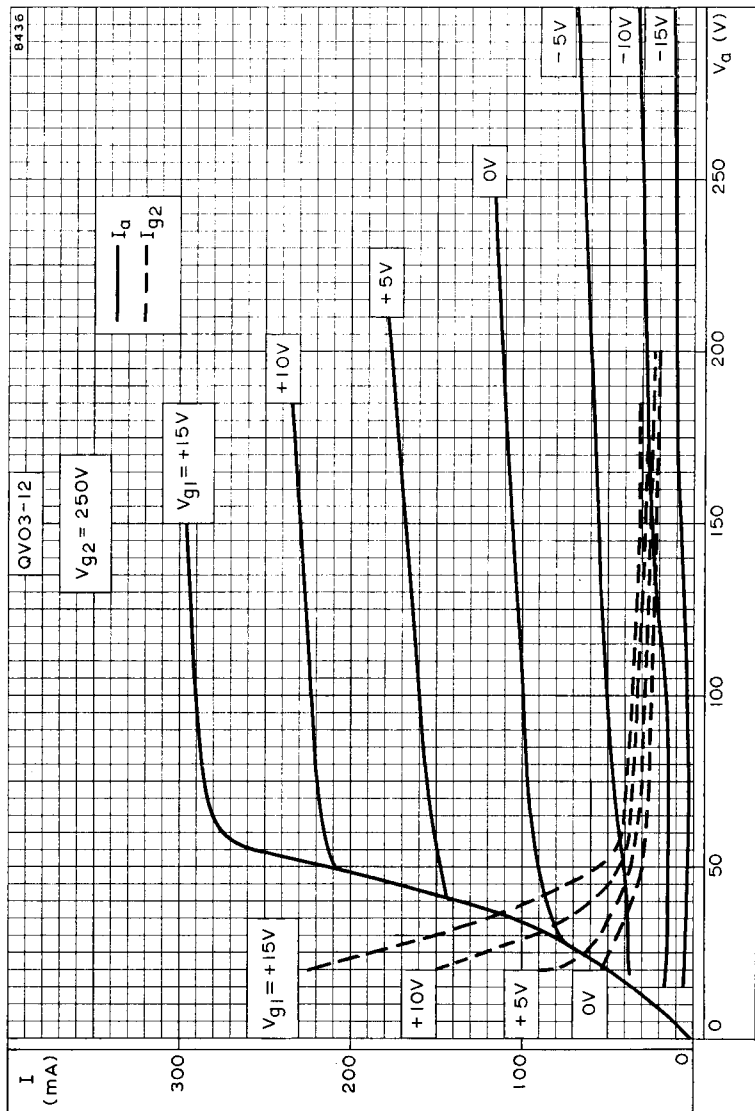
Contacts 8 and 9 should be connected to the external circuit with leads of equal length.

All dimensions in mm

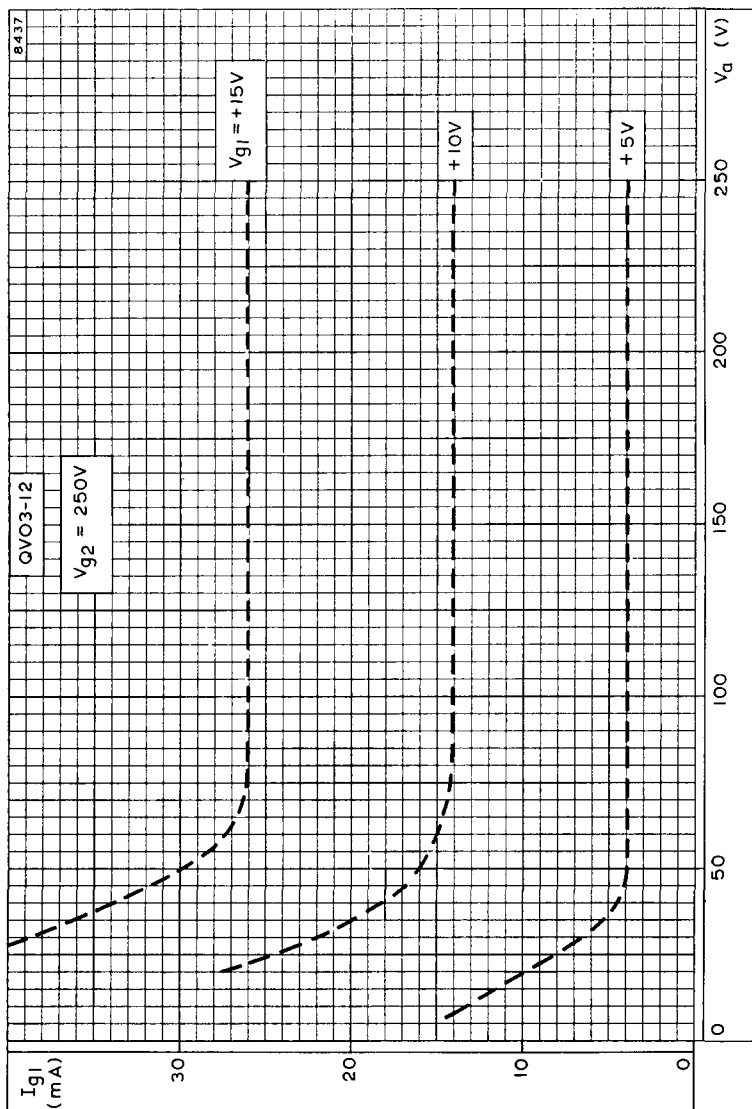
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ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE FOR VARIOUS
 SCREEN-GRID VOLTAGES



ANODE AND SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE



CONTROL-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE