R.F. POWER TETRODE

QY5-800

PRELIMINARY DATA

QUICK REFERENCE DATA

Radiation and convection cooled tetrode intended for use as a linear amplifier in single side band suppressed carrier applications.

	Class 'C' telegraphy	Class 'AB1' SSB.	
f max.	30	30	Mc/s
V_a max.	5.5	5.5	kV
p_a max.	800	800	W
Performance			
f	30	30	Mc/s
P_{out}	2.4	1.3	kW

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

FILAMENT

Thoriated tungsten

V_f	7.5	V
I_f	22.6	A
$I_{f(surge)}$ max.	45	A

MOUNTING POSITION

Vertical

CAPACITANCES

c_{in}	47.6	pF
c_{out}	9.5	pF
c_{a-g1}	100	mpF

CHARACTERISTICS

V_a	4.0	kV
V_{g2}	600	V
I_a	200	mA
g_m	10	mA/V
μ_{g1-g2}	5.1	

COOLING

In order to keep the temperature below the maximum permitted values it may be necessary to direct an air flow on to the seals.

$T_{anode\ seal}$ max.	220	°C
$T_{base\ seals}$ max.	180	°C
T_{bulb} max.	350	°C

CLASS 'C' TELEGRAPHY OR F.M. TELEPHONY

Absolute maximum ratings

f max.	30	Mc/s
V_a max.	5.5	kV
p_a max.	800	W
V_{g2} max.	800	V
p_{g2} max.	120	W
$-V_{g1}$ max.	500	V
I_{g1} (max.)	35	mA
I_k max.	925	mA
$i_{k(pk)}$ max.	4.5	A
R_{g1-f} max.	20	kΩ

Typical operation

f	30	Mc/s
V_a	5.0	kV
V_{g2}	600	V
V_{g1}	−240	V
I_a	600	mA
I_{g2}	185	mA
I_{g1}	20	mA
$v_{in(pk)}$	300	V
$P_{load\ (driver)}$	10	W
p_a	600	W
η_a	80	%
P_{out}	2.4	kW
P_{load}	2.0	kW

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CLASS 'AB1' SINGLE SIDEBAND SUPPRESSED CARRIER

Absolute maximum ratings

f max.	30	Mc/s
V_a max.	5.5	kV
V_{g2} max.	800	V
p_a max.	800	W
p_{g2} max.	120	W
I_k max.	700	mA
$i_{k(pk)}$ max.	2.25	A
$-V_{g1}$ max.	500	V

Typical operation

Envelope peak to average $\geqslant 1$ and < 2

f	30	Mc/s
V_a	4.0	kV
V_{g2}	600	V
*V_{g1}	−110	V
$I_{a(o)}$	150	mA

'Single tone' modulation, maximum signal conditions

I_a	465	mA
I_{g2}	85	mA
I_{g1}	0	mA
$V_{in(pk)}$	100	V
$P_{load\ (driver)}$	3.0	W
p_a	560	W
p_{g2}	51	W
P_{out}	1.3	kW
η_a	69	%
P_{load}	1.11	kW

'Two tone' modulation, maximum signal conditions

I_a	330	mA
I_{g2}	40	mA
I_{g1}	0	mA
$V_{in(pk)}$	100	V
$P_{load\ (driver)}$	1.5	W
p_a	670	W
p_{g2}	24	W
P.E.P_{out}	1.3	kW
P_{out} (mean)	650	W
η_a	49	%
P.E.P_{load}	1.11	kW
†D_{im}	35	dB

*V_{g1} is set to give the $I_{a(o)}$ and will vary slightly from valve to valve.

†The voltage amplitude of all intermodulation products are below this level which is referred to the amplitude of either of the two tone frequencies. Relative to the peak envelope power these figures will be increased by 6dB. The figures are measured at full drive.

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R.F. POWER TETRODE

PHYSICAL DATA

Weight of valve	1.4	lb
	620	g
Weight of valve plus carton	5.0	lb
	2.25	kg

ACCESSORIES

Socket	40216
Anode clip	40665

DIMENSIONS

	Inches	*Millimetres*	
A	6.02	153	max.
B	0.374	9.5	
C	0.98	25	
D	8.46 ± 0.24	215 ± 6	
E	1.75	44.5	
F	1.06	27	
G	0.374	9.5	
H	3.19	81	max.
J	1.50	38.1	

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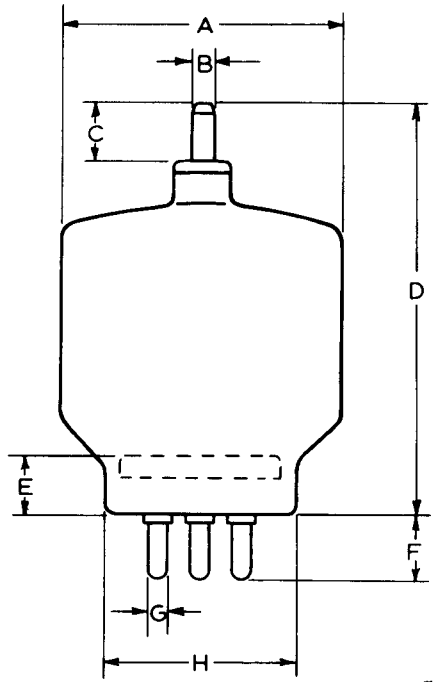

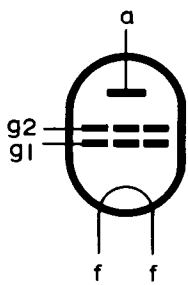

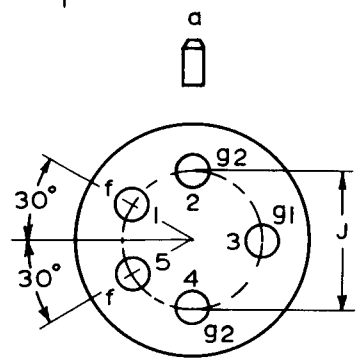

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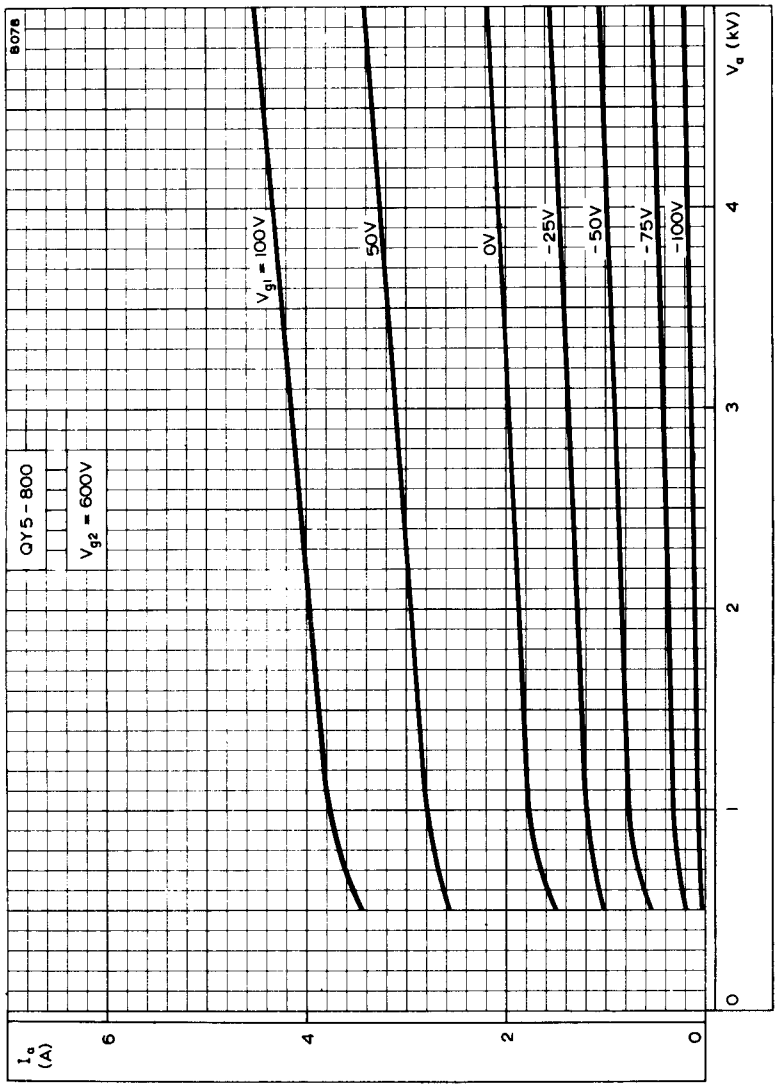
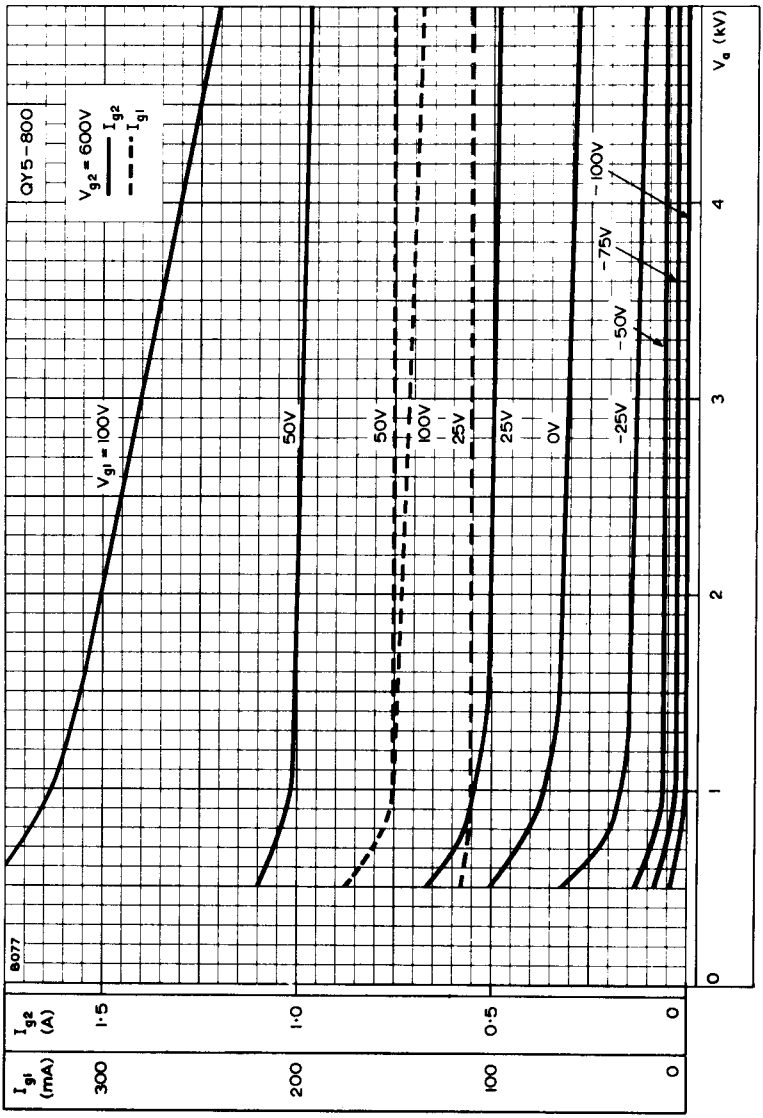
B5K Base

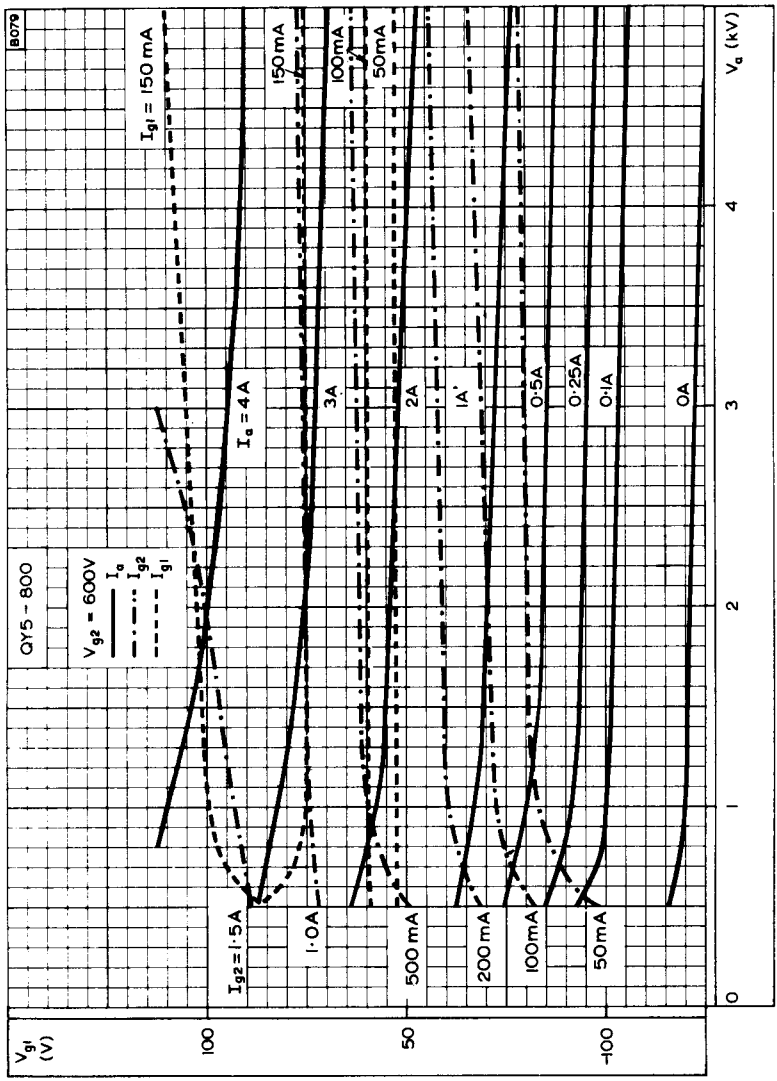
QY5-800



ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER



SCREEN-GRID AND CONTROL-GRID CURRENTS PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER



CONSTANT CURRENT CURVES

V.H.F. POWER TETRODE QY5-800

QUICK REFERENCE DATA

Radiation and convection cooled tetrode intended for use as a linear amplifier in single sideband suppressed carrier applications.

	Class 'AB1' Linear Amplifier for S.S.B. operation	Class 'C' Telegraphy or F.M. Telephony	
f	30	30	Mc/s
P_{out}	*1.3	2.4	kW
f max.	30	30	Mc/s
V_a max.	5.5	5.5	kV
p_a max.	800	800	W

*P.E.P_{out}

To be read in conjunction with

GENERAL OPERATIONAL RECOMMENDATIONS - TRANSMITTING VALVES

CLASS 'C' TELEGRAPHY OR F.M. TELEPHONY

Maximum operating conditions

f	30	Mc/s
P_{out}	2.4	kW
P_{load}	2.0	kW
η_a	80	%
V_a	5.0	kV
I_a	600	mA
V_{g2}	600	V
I_{g2}	185	mA
$-V_{g1}$	240	V
I_{g1}	20	mA
v_{in} pk	300	V
P_{load} (driver)	10	W
p_a	600	W

CLASS 'AB1' LINEAR AMPLIFIER FOR SINGLE SIDEBAND OPERATION

Maximum operating conditions

f	30	Mc/s
P.E.P_{out}	1.3	kW
P.E.P_{load}	1.1	kW
**d_3	35	dB
**d_5	40	dB
V_a	4.0	kV
V_{g2}	600	V
***$-V_{g1}$	110	V
$I_{a(o)}$	150	mA
$I_{g2(o)}$	8.0	mA

	Single tone	Double tone	
I_a	465	330	mA
I_{g2}	85	40	mA
I_{g1}	0	0	mA
$V_{in(pk)}$	100	100	V
P_{load} (driver)	3.0	-	W
p_a	560	670	W
η_a	69	49	%

**Third and fifth order intermodulation products. Maximum values encountered at any level of drive voltage referred to the amplitude of either of the two tones at that level.

***Adjust to give the desired value of $I_{a(o)}$.

ABSOLUTE MAXIMUM RATINGS

	Class 'AB1' S.S.B.	Class 'C' Telegraphy	
f max.	30	30	Mc/s
V_a max.	5.5	5.5	kV
V_{g2} max.	800	800	V
$-V_{g1}$ max.	500	500	V
I_k max.	700	925	mA
p_a max.	800	800	W
p_{g2} max.	120	120	W
I_{g1} max.	0	35	mA
p_{g1} max.	0	40	W
R_{g1-f} max.	20	20	kΩ

V.H.F. POWER TETRODE QY5-800

CATHODE

Directly heated, thoriated tungsten

V_f	7.5	V
I_f	22.6	A
$I_{f\ (surge)}$	45	A

CAPACITANCES

c_{a-g1}	100	nF
c_{out}	9.5	pF
c_{in}	47.6	pF

CHARACTERISTICS (measured at V_a = 4.0kV, V_{g2} = 600V, I_a = 200mA)

g_m	10	mA/V
μ_{g1-g2}	5.1	

MOUNTING POSITION

Vertical

COOLING

Radiation and convection.

Maximum temperatures

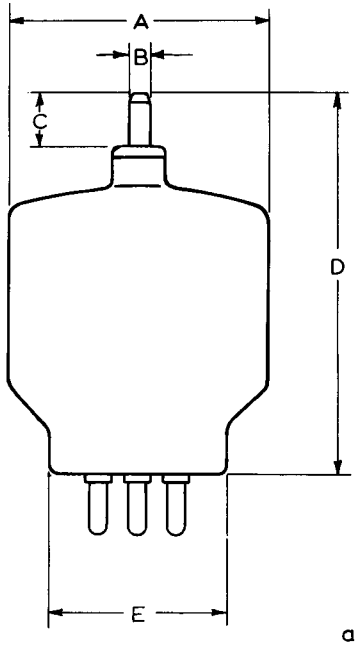
Anode seal	220	°C
Base seals	180	°C
Bulb	350	°C

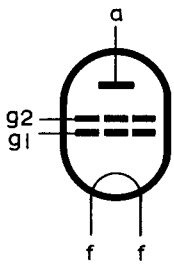
PHYSICAL DATA

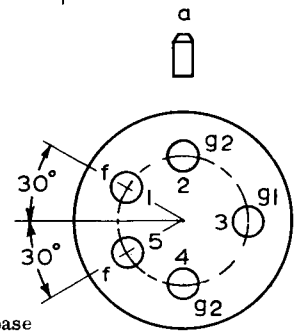
	lb	kg
Weight of valve	1.4	0.62
Weight of valve and carton	5.0	2.25

ACCESSORIES

Socket	40216
Anode clip	40665







B5K base
(according to BS448)

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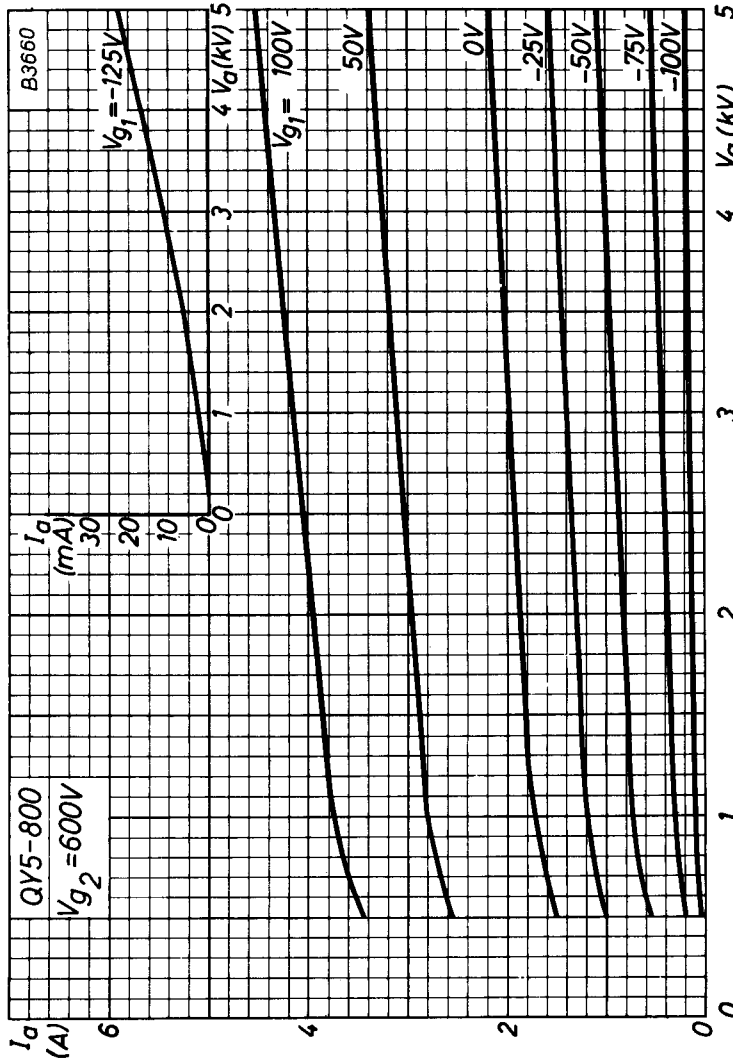
DIMENSIONS

	Inches	Millimetres	
A	6.023	153	max.
B	0.374	9.5	
C	0.984	25	
D	8.465 ± 0.236	215 ± 6.0	
E	3.189	81	max.

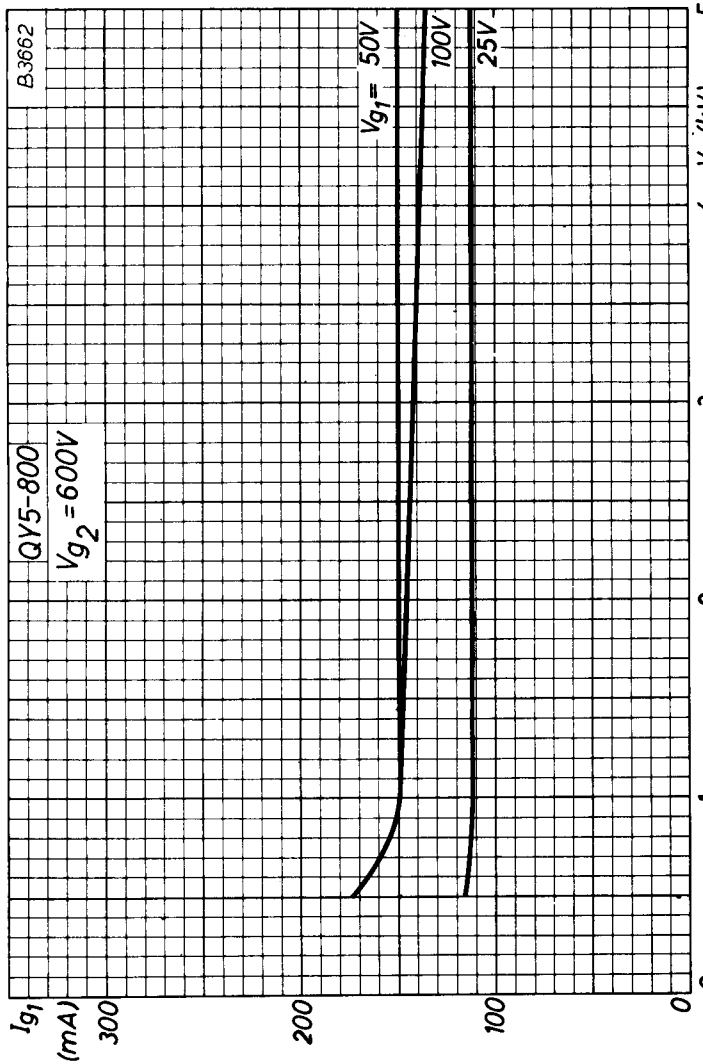
Inch dimensions derived from original millimetre dimensions.



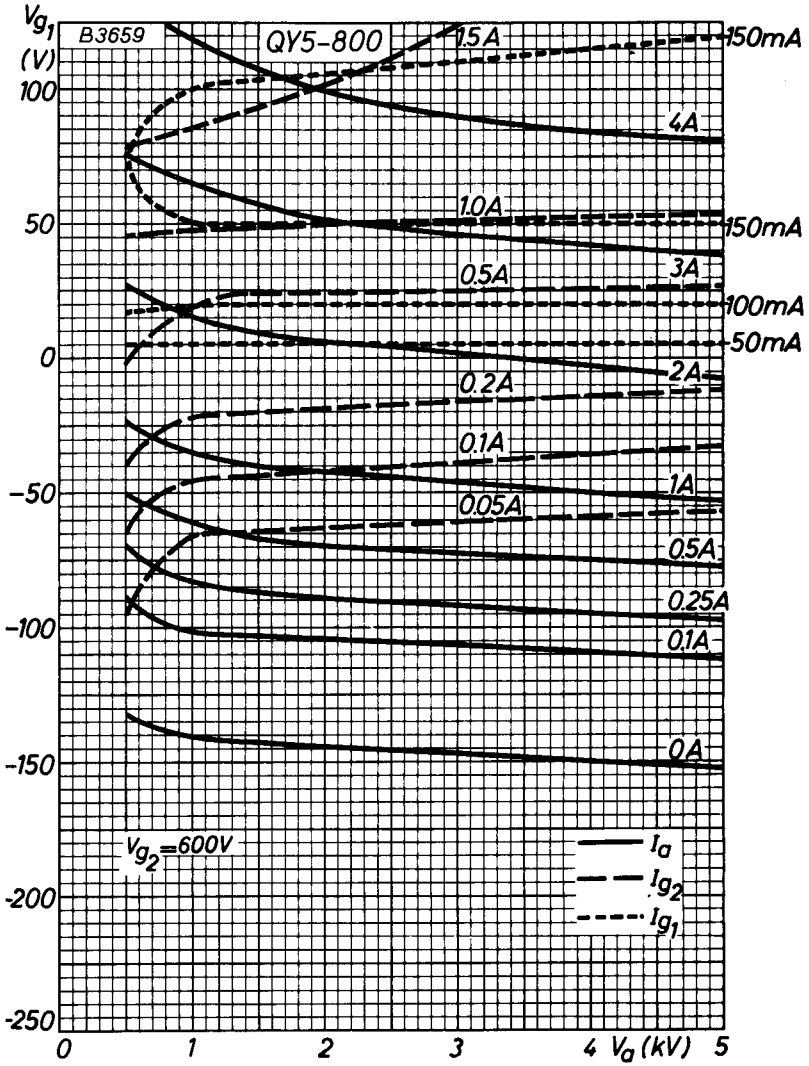
ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER, V_{g2} = 600V

SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER

V_{g2} = 600V



CONTROL-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER. V_{g2} = 600V



CONSTANT CURRENT CHARACTERISTICS. V_{g2} = 600V