V.H.F. POWER DOUBLE TETRODE

QQV06-40A

Beam power double tetrode rated for a maximum anode dissipation of 20W at each anode and intended for use at frequencies up to 500Mc/s.

This data should be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS – TRANSMITTING VALVES included in this volume of the handbook.

CATHODE

Indirectly heated. The heater is centre-tapped and the two sections may be operated in series or parallel with one another.

	Series	*Parallel*	
V_h	12.6	6.3	V
I_h	0.9	1.8	A

MOUNTING POSITION

Fixed station operation	Vertical – base up or down Horizontal – anode pins in horizontal plane
Mobile operation	Vertical – base up or down

CAPACITANCES

*c_{a-g1} (each section)	0.06	pF ←
c_{g1-all} (each section)	10.5	pF
c_{a-all} (each section)	3.2	pF
c_{out} (two sections in push-pull)	2.1	pF
c_{in} (two sections in push-pull)	6.7	pF

*Internally neutralised for push-pull operation

CHARACTERISTICS (each section) measured at I_a = 30mA

g_m	4.5	mA/V
μ_{g1-g2}	8.0	

COOLING

Max. base pin temperature	180	°C
Max. bulb and anode seal temperature	200	°C

Anode connectors providing a high degree of heat transfer by radiation or by conduction should be used.

Natural cooling is sufficient with –

V_a = 750V at frequencies up to 100Mc/s
V_a = 600V at frequencies up to 150Mc/s
V_a = 300V at frequencies up to 450Mc/s.

Above these limits or with high ambient temperatures it may be necessary to direct a flow of air (up to 5cu.ft. per min.) on the top of the bulb to keep the seal temperature within the stated limit.

QQV06-40A

V.H.F. POWER DOUBLE TETRODE

Beam power double tetrode rated for a maximum anode dissipation of 20W at each anode and intended for use at frequencies up to 500 Mc/s.

OPERATING CONDITIONS AS A PUSH-PULL R.F. POWER AMPLIFIER (CLASS "C" TELEGRAPHY OR F.M. TELEPHONY)

Limiting values

V_a max.	See page 15	
p_a max.	2×20	W
$V_{g2(b)}$ max.	600	V
V_{g2} max.	300	V
p_{g2} max.	2×3.5	W
p_{g1} max.	2×1.0	W
I_{g1} max.	2×5.0	mA
I_k max.	2×120	mA
$i_{k(pk)}$ max.	2×700	mA
$-V_{g1}$ max.	100	V
R_{g1-k} max. per section (fixed bias)	50	kΩ
R_{g1-k} max. per section (automatic bias)	100	kΩ
V_{h-k} max.	100	V

Typical operating conditions

f	200	200	400	400	Mc/s
V_a	400	600	400	540	V
V_{g2}	250	250	250	250	V
V_{g1}	−60	−80	−50	−55	V
I_a	2×100	2×100	2×100	2×100	mA
I_{g2}	2×8.0	2×9.0	2×5.0	2×7.0	mA
I_{g1}	2×3.0	2×3.5	2×2.0	2×1.5	mA
$P_{load(driver)}$	3.0	3.0	11	12	W
p_a	2×12	2×15	2×15	2×20	W
P_{out}	56	90	50	70	W
η_j	70	75	63	65	%
P_{load}	47	78	42	59	W

f	475	475	Mc/s
V_a	350	500	V
V_{g2}	250	250	V
V_{g1}	−45	−50	V
I_a	2×100	2×100	mA
I_{g2}	2×4.5	2×4.5	mA
I_{g1}	2×2.0	2×2.0	mA
$P_{load(driver)}$	10	12	W
p_a	2×15	2×20	W
P_{out}	40	60	W
η_j	57	60	%
P_{load}	33	51	W

V.H.F. POWER DOUBLE TETRODE

QQV06-40A

Beam power double tetrode rated for a maximum anode dissipation of 20W at each anode and intended for use at frequencies up to 500Mc/s.

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

Limiting values (carrier condition for modulation factor of 1)

V_a max.	See page 17	
p_a max.	2×14	W
$V_{g2(b)}$ max.	600	V ←
V_{g2} max.	300	V ←
p_{g2} max.	2×2.3	W ←
$-V_{g1}$ max.	175	V ←
I_{g1} max.	2×5.0	mA
p_{g1} max.	2×1.0	W
I_k max.	2×120	mA
$i_{k(pk)}$ max.	2×1.0	A
R_{g1-k} max. per section (fixed bias)	50	kΩ
R_{g1-k} max. per section (automatic bias)	100	kΩ
V_{h-k} max.	100	V

Typical operating conditions ←

f	60	200	200	250	Mc/s
V_a	600	400	600	600	V
V_{g2}	250	250	250	250	V
V_{g1}	−80	−70	−80	−80	V
I_a	2×75	2×75	2×75	2×75	mA
I_{g2}	2×10	2×9.0	2×9.0	2×9.0	mA
I_{g1}	2×4.0	2×2.0	2×2.0	2×1.5	mA
p_a	2×9.5	2×9.5	2×11.5	2×13	W
P_{out}	71	41	67	64	W
η	79	69	75	71	%
P_{load}	60	35	57	54	W
For 100% modulation					
P_{mod}	47	47	47	47	W
$v_{g2(pk)}$	185	185	185	185	V

f	400	475	Mc/s
V_a	400	400	V
V_{g2}	250	250	V
V_{g1}	−70	−70	V
I_a	2×75	2×75	mA
I_{g2}	2×8.0	2×7.5	mA
I_{g1}	2×1.5	2×1.5	mA
p_a	2×11.5	2×13	W
P_{out}	37	34	W
η	62	57	%
P_{load}	32	30	W
For 100% modulation			
P_{mod}	47	47	W
$v_{g2(pk)}$	185	185	V

QQV06-40A

V.H.F. POWER DOUBLE TETRODE

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OPERATING CONDITIONS AS FREQUENCY TREBLER

Limiting values

V_a max.	750	V
p_a max.	2×20	W
$V_{g2(b)}$ max.	600	V
V_{g2} max.	300	V
p_{g2} max.	2×3.5	W
p_{g1} max.	2×1.0	W
I_k max.	2×100	mA
$i_{k(pk)}$ max.	2×700	mA
$-V_{g1}$ max.	175	V
R_{g1-k} max. per section (fixed bias)	50	kΩ
R_{g1-k} max. per section (automatic bias)	100	kΩ
V_{h-k} max.	100	V

Typical operating conditions

f_{out}	150	150	230	Mc/s
V_a	400	500	400	V
V_{g2}	250	250	250	V
V_{g1}	−150	−150	−150	V
I_a	2×72	2×60	2×65	mA
I_{g2}	2×8.0	2×5.0	2×10	mA
I_{g1}	2×2.5	2×3.0	2×1.5	mA
$V_{in(g1-g1)pk}$	360	360	360	V
p_a	2×20	2×20	2×20	W
P_{out}	18	20	12	W
η_j	31	33	23	%
P_{load}	14.5	16	10	W

OPERATING CONDITIONS AS A.F. POWER AMPLIFIER AND MODULATOR (CLASS "B")

Limiting values

V_a max.	600	V
p_a max.	2×20	W
$V_{g2(b)}$ max.	600	V
V_{g2} max.	300	V
p_{g2} max.	2×3.5	W
p_{g1} max.	2×1.0	W
I_k max.	2×140	mA
$i_{k(pk)}$ max.	2×450	mA
R_{g1-k} max. per section (fixed bias)	50	kΩ
R_{g1-k} max. per section (automatic bias)	100	kΩ
V_{h-k} max.	100	V

V.H.F. POWER DOUBLE TETRODE

QQV06-40A

Beam power double tetrode rated for a maximum anode dissipation of 20W at each anode and intended for use at frequencies up to 500Mc/s.

Typical operating conditions (without grid current)

V_a	300	450	600	V
V_{g2}	250	250	250	V
V_{g1}	−26	−27	−27	V
$I_{a(o)}$	2×20	2×20	2×20	mA
I_a (max. sig.)	2×56	2×58	2×62	mA
$I_{g2(o)}$	2×1.0	2×0.7	2×0.45	mA
I_{g2} (max. sig.)	2×14	2×13.5	2×11.5	mA
$V_{in(g1-g1)r.m.s.}$	36	38	39	V
P_a	2×5.6	2×8.5	2×12	W
R_{a-a}	6.5	10	12.5	kΩ
P_{out}	22.5	35	50	W
η	67	67.5	67.5	%
D_{tot}	2.9	3.1	2.4	%

Typical operating conditions (with grid current)

V_a	300	450	600	V
V_{g2}	250	250	250	V
V_{g1}	−25	−25	−25	V
$I_{a(o)}$	2×25	2×25	2×25	mA
I_a (max. sig.)	2×94	2×97	2×100	mA
$I_{g2(o)}$	2×1.4	2×0.95	2×0.7	mA
I_{g2} (max. sig.)	2×14	2×14	2×13	mA
I_{g1}	2×2.6	2×2.6	2×2.6	mA
$V_{in(g1-g1)r.m.s.}$	52	54	55	V
P_a	2×9.7	2×13.5	2×17	W
R_{a-a}	4.0	6.0	8.0	kΩ
P_{out}	37	60	86	W
η	65.5	69	71.5	%
D_{tot}	5.0	5.0	5.0	%

ACCESSORIES

Information on these items can be obtained from the Industrial Technical Service Dept., Mullard Ltd.

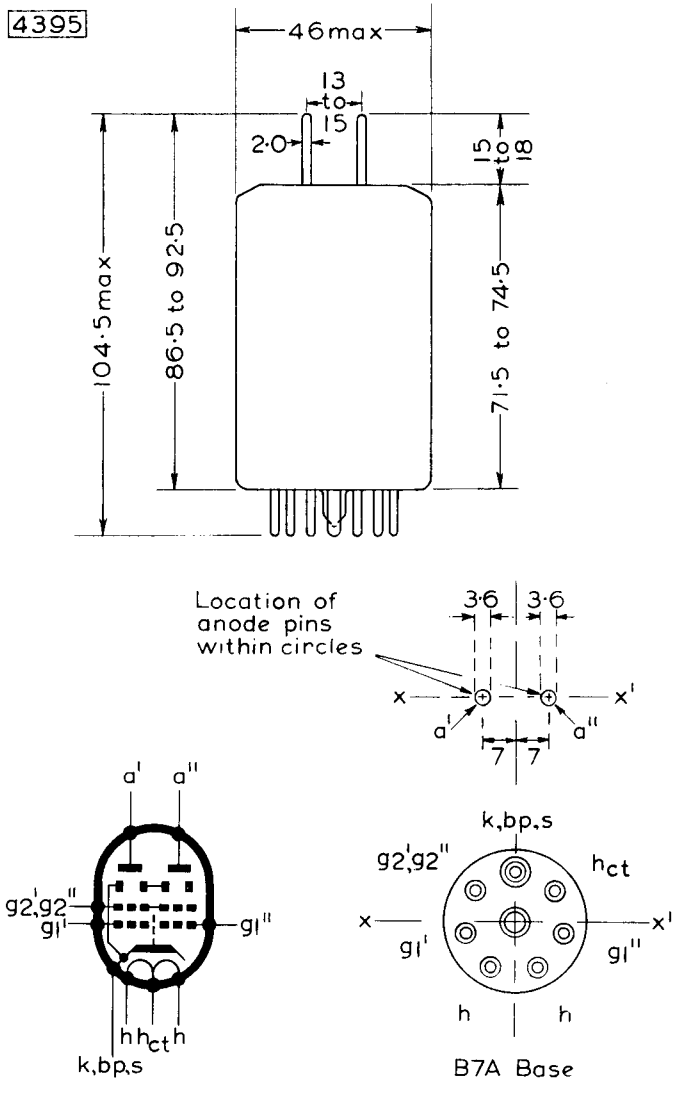
WEIGHT

Valve only — 2.3 oz / 65 g

QQV06-40A

V.H.F. POWER DOUBLE TETRODE

Beam power double tetrode rated for a maximum anode dissipation of 20W at each anode and intended for use at frequencies up to 500Mc/s.



All dimensions in mm

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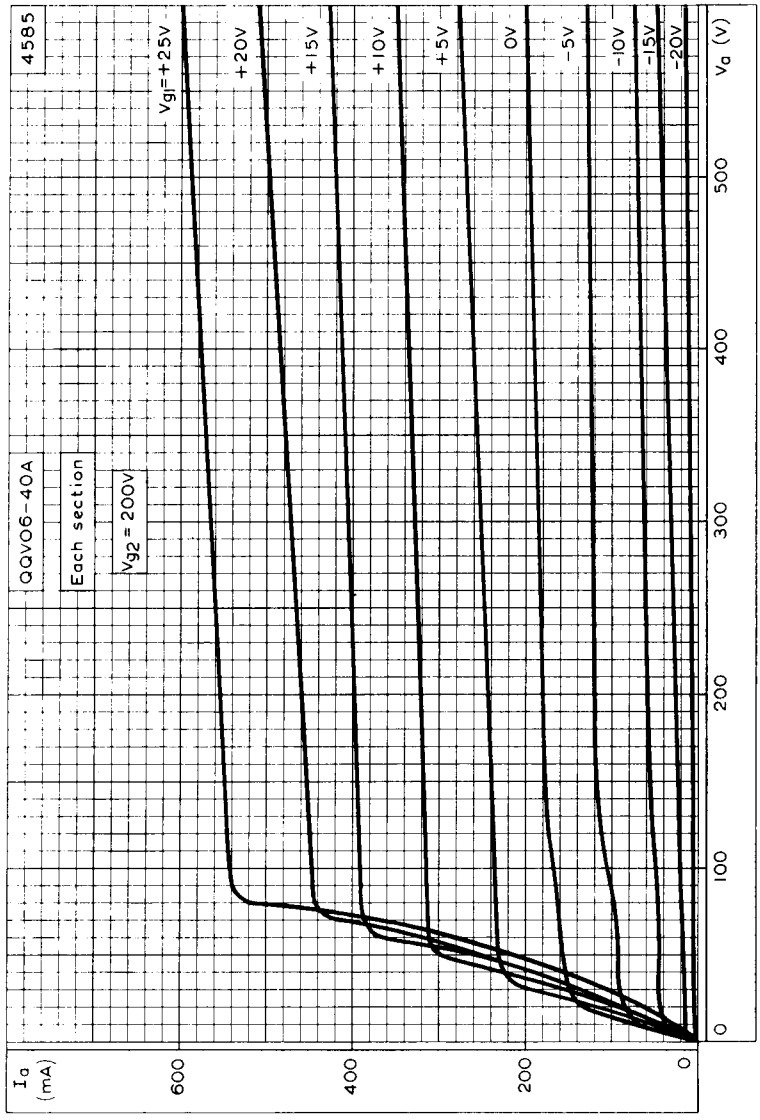

ANODE CURRENT FOR EACH SECTION PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER V_{g2} = 200V

QQV06-40A

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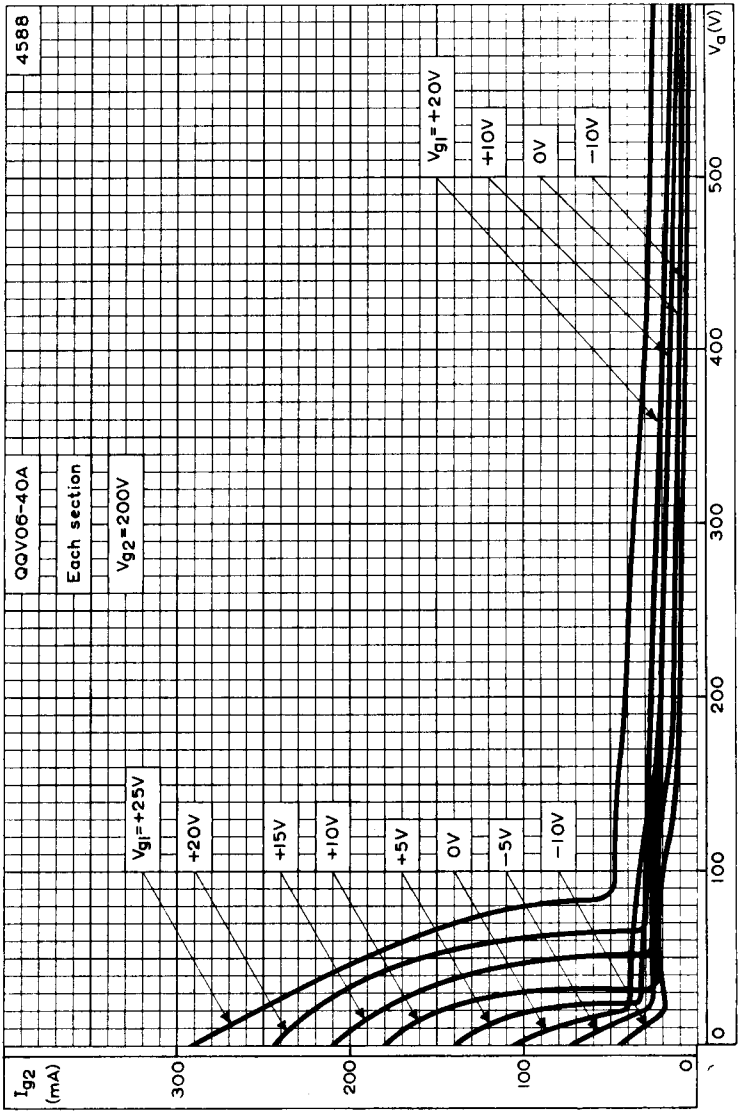
Beam power double tetrode rated for a maximum anode dissipation of 20W at each anode and intended for use at frequencies up to 500Mc/s.



SCREEN-GRID CURRENT FOR EACH SECTION PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER V_{g2} 200V

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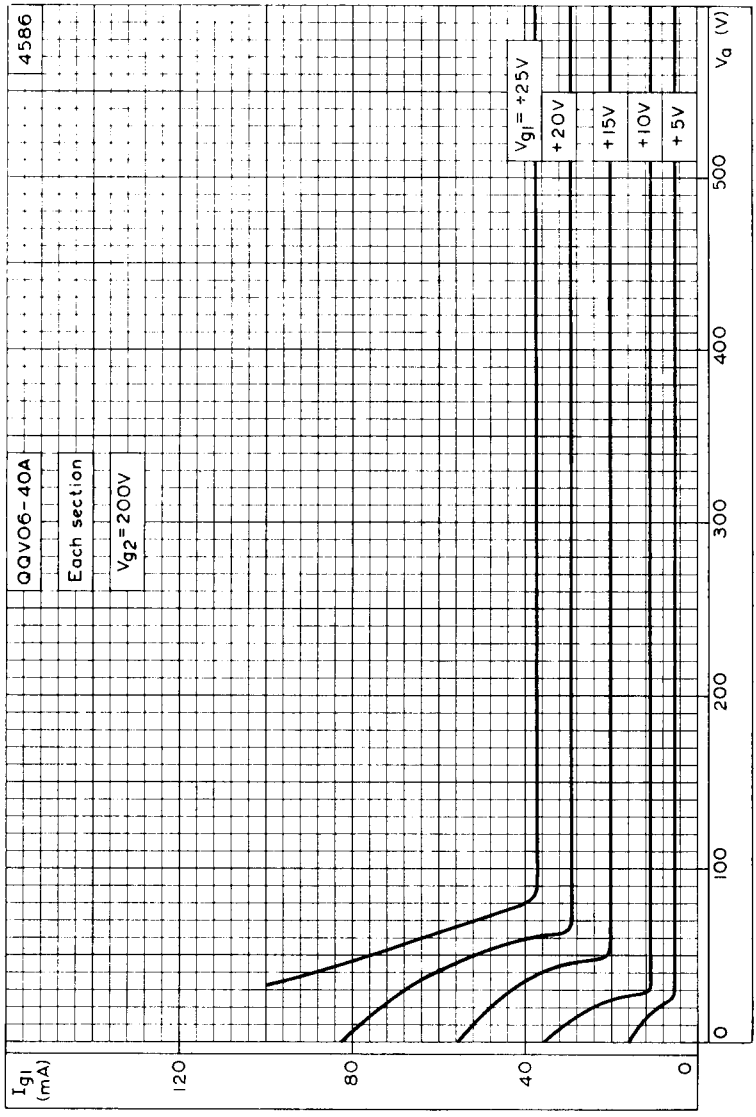
QQV06-40A

Beam power double tetrode rated for a maximum anode dissipation of 20W at each anode and intended for use at frequencies up to 500Mc/s.



CONTROL-GRID CURRENT FOR EACH SECTION PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER V_{g2} = 200V

QQV06-40A

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ANODE CURRENT FOR EACH SECTION PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER V_{g2} = 250V

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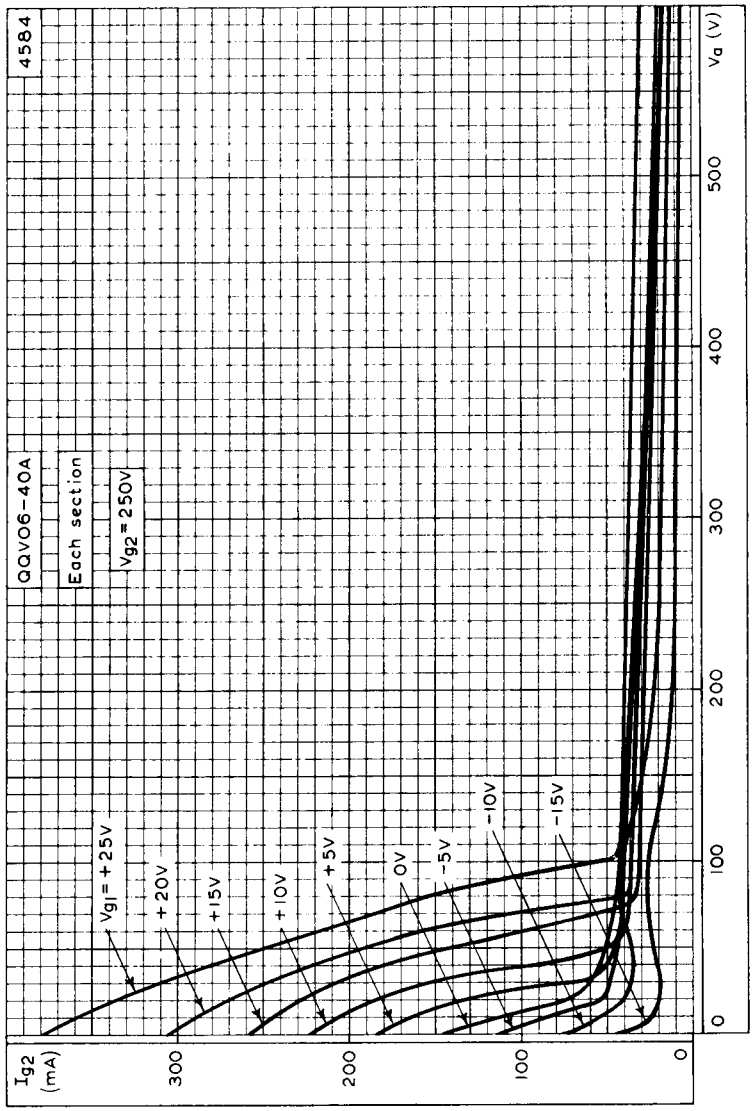

SCREEN-GRID CURRENT FOR EACH SECTION PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER V_{g2} = 250V

QQV06-40A

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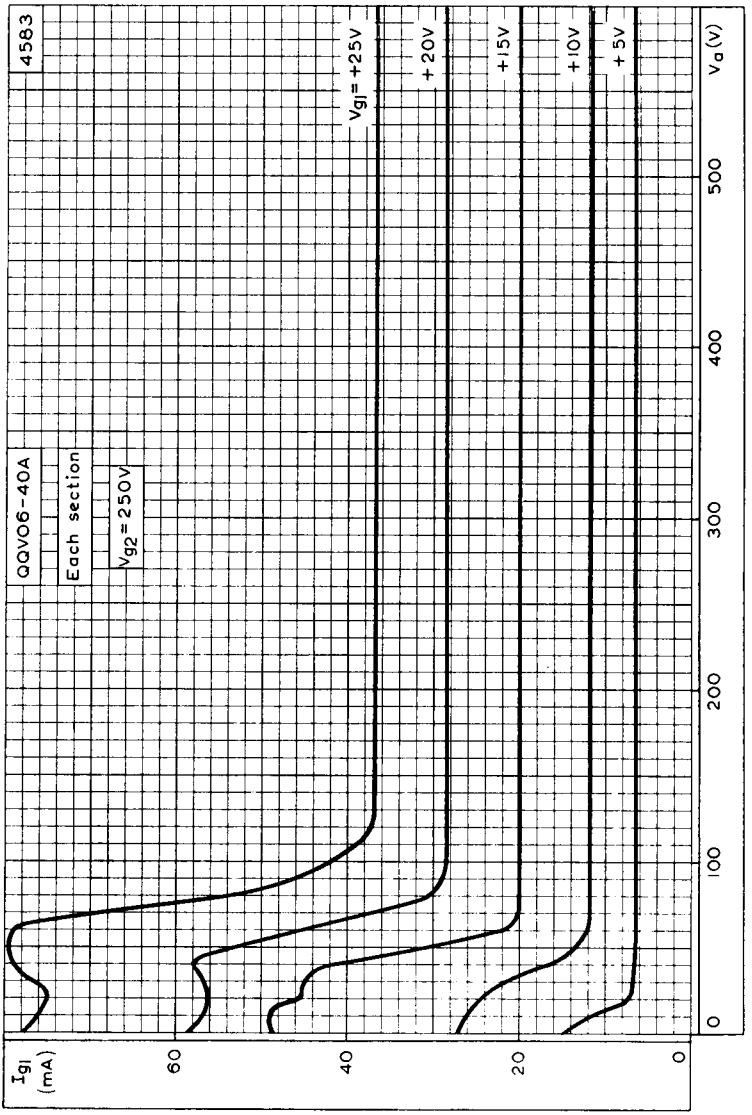

CONTROL-GRID CURRENT FOR EACH SECTION PLOTTED AGAINST ANODE VOLTAGE WITH CONTROL-GRID VOLTAGE AS PARAMETER
V_{g2} = 250V

V.H.F. POWER DOUBLE TETRODE

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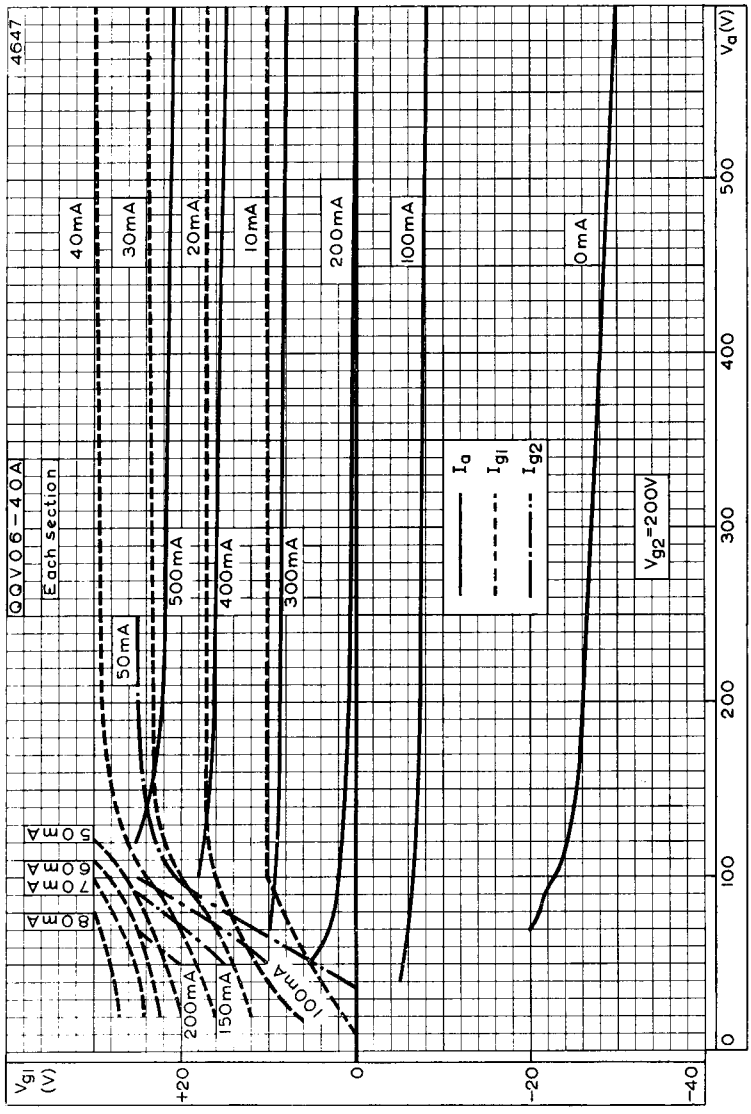

CONSTANT CURRENT CURVES FOR EACH SECTION V_{g2} = 200V

QQV06-40A

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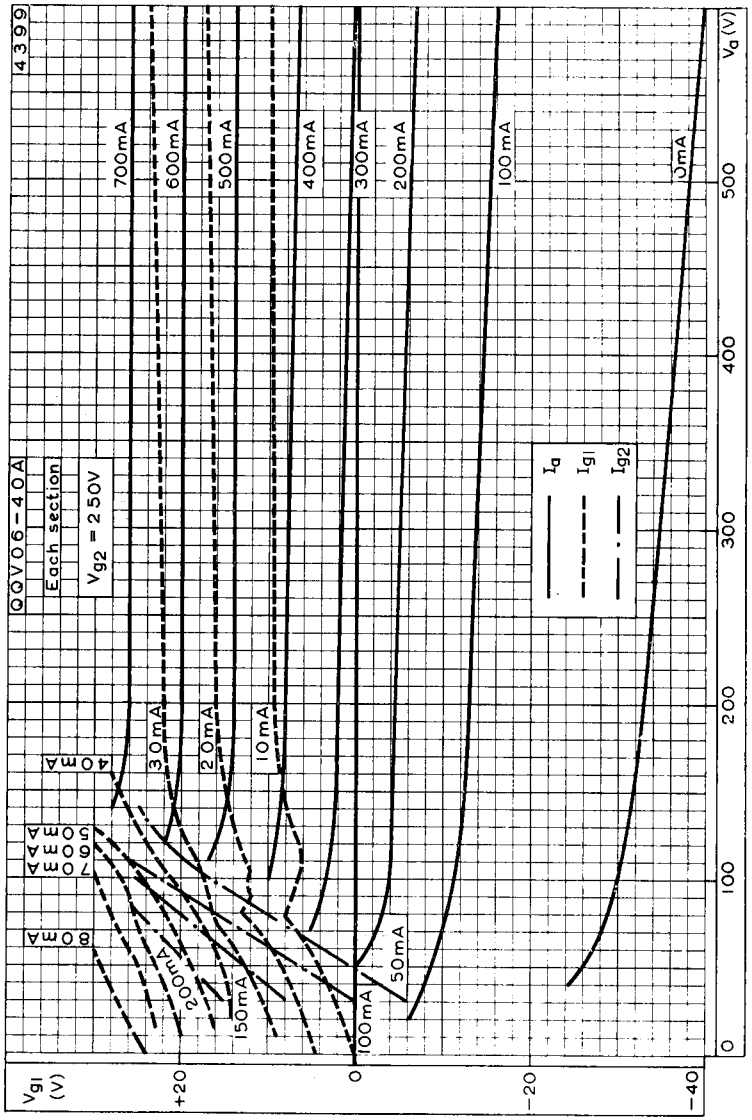

CONSTANT CURRENT CURVES FOR EACH SECTION V_{g2} 250V

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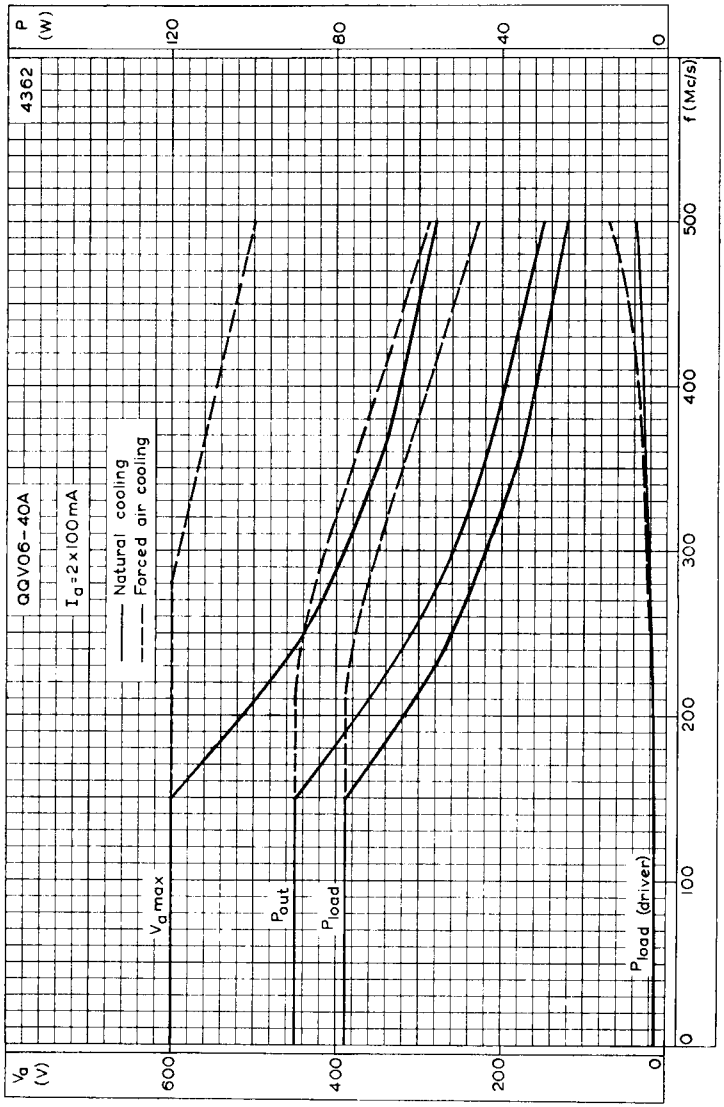

FREQUENCY CHARACTERISTICS FOR OPERATING CONDITIONS AS A PUSH-PULL R.F. POWER AMPLIFIER (CLASS "C" TELEGRAPHY OR F.M. TELEPHONY)

QQV06-40A

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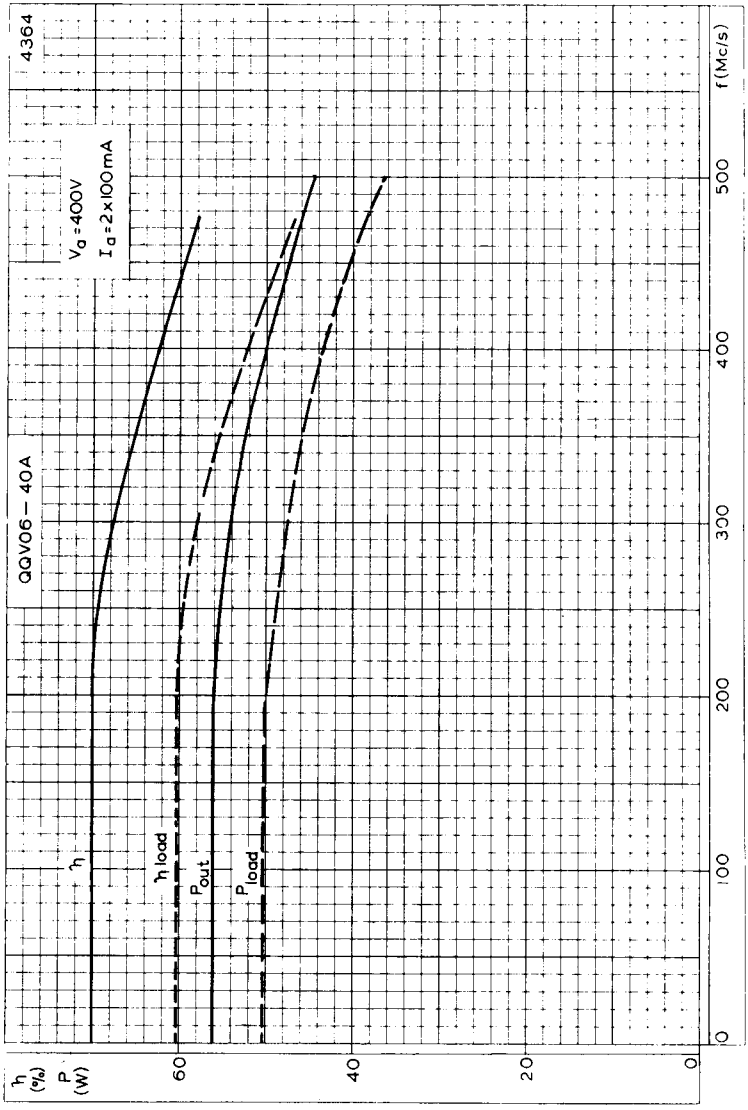

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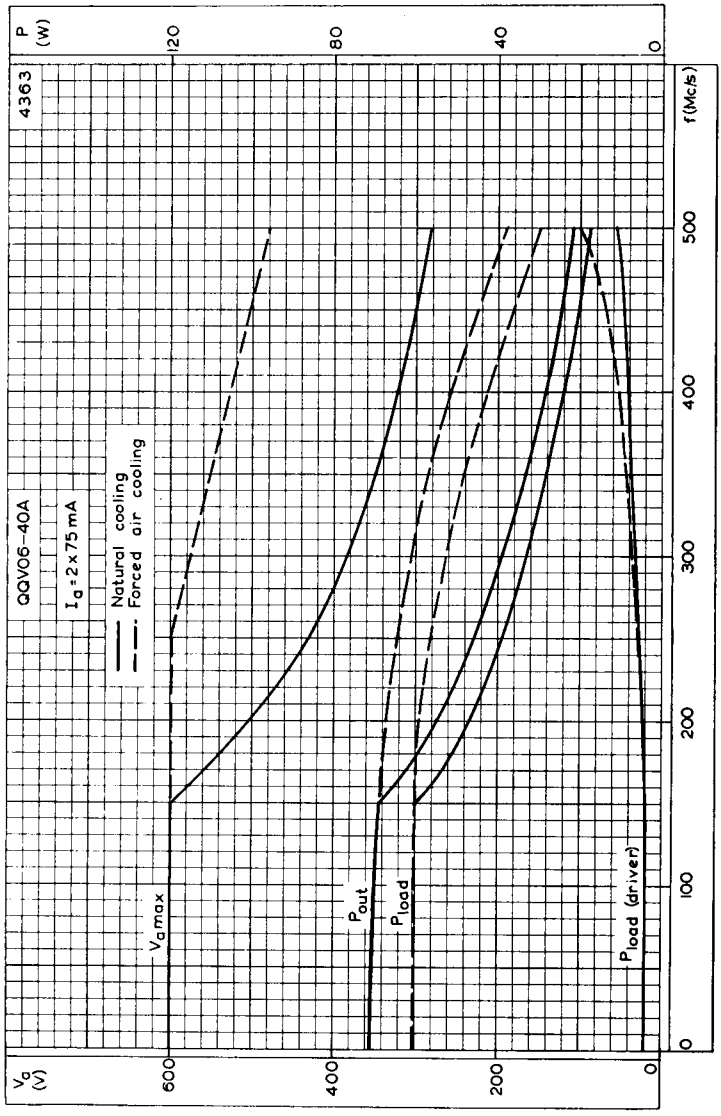

FREQUENCY CHARACTERISTICS FOR OPERATING CONDITIONS AS ANODE AND SCREEN-GRID MODULATED R.F. POWER AMPLIFIER (CLASS "C" TELEPHONY)

QQV06-40A

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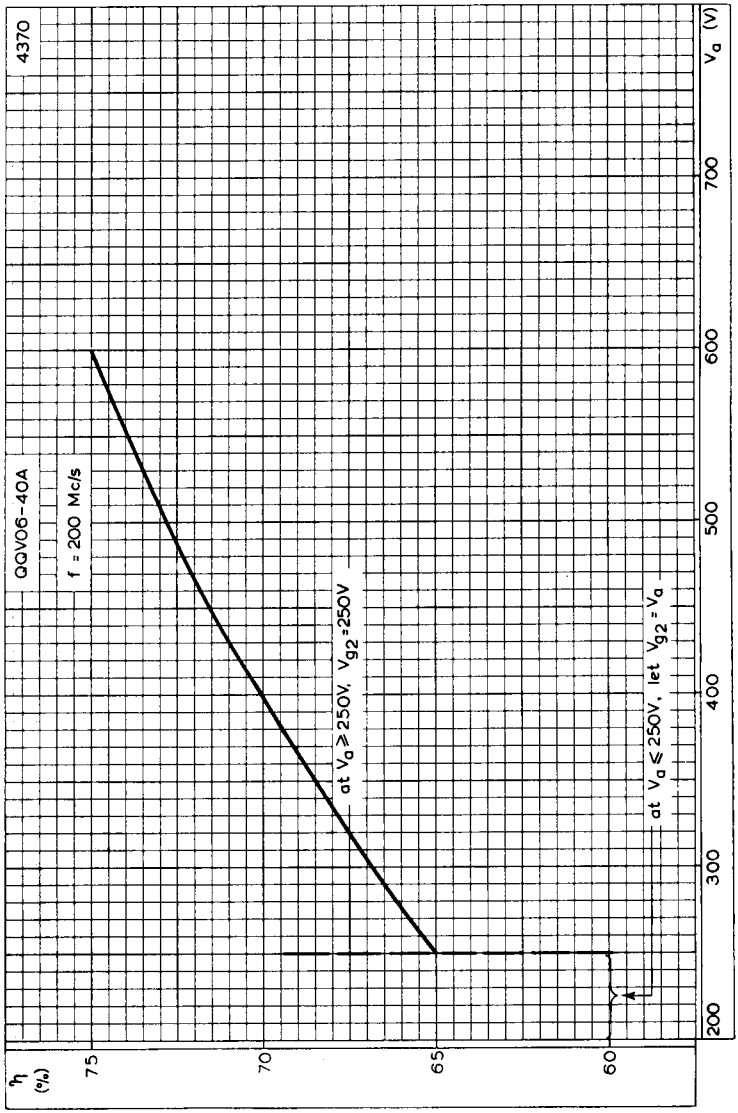

ANODE EFFICIENCY PLOTTED AGAINST ANODE VOLTAGE FOR CLASS "C" PUSH-PULL TELEGRAPHY