R.F. POWER DOUBLE TETRODE

QQV02-6

Application: R.F. amplifier or frequency multiplier.
Power output: 5.8W at 500Mc/s.
Frequency: 500Mc/s at full ratings.
Construction: All-glass, natural cooling.

This data sheet should be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS – TRANSMITTING VALVES which precede this section 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	300	600	mA

*Emergency operation of the heater down to 5.7V (11.4V) and up to 7.0V (14V) is permissible.

MOUNTING POSITION

Any

For reasons of cooling and the performance of the valve at v.h.f. the use of a closed screening can is not permissible.

CAPACITANCES

*c_{a-g1} (each section)	< 160	mpF
c_{g1-all} (each section)	6.4	pF
c_{a-all} (each section)	1.6	pF
c_{out} (two sections in push-pull)	950	mpF
c_{in} (two sections in push-pull)	3.8	pF

*Internally neutralised for push-pull operation

CHARACTERISTICS (each section) measured at $V_a = V_{g2} = 150V$, $I_a = 25mA$

g_m	10.5	mA/V
μ_{g1-g2}	31	

COOLING

Radiation and convection

T_{bulb} max.	225	°C
T_{pin} max.	120	°C

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CLASS "C" TELEGRAPHY OR F.M. TELEPHONY

Limiting values

f max.	500	Mc/s
V_a max.	250	V
p_a max.	2 × 3.0	W
I_a max.	2 × 45	mA
V_{g2} max.	200	V
p_{g2} max.	2 × 1.5	W
$-V_{g1}$ max.	50	V
p_{g1} max.	2 × 100	mW
I_{g1} max.	2 × 3.0	mA
V_{h-k} max.	100	V

Typical operation

f	500	Mc/s
V_a	180	V
V_{g2}	180	V
V_{g1}	−20	V
R_{g1-k} (each section)	27	kΩ
I_a	2 × 27.5	mA
I_{g2}	2 × 6.25	mA
I_{g1}	2 × 1.0	mA
$v_{in(g1-g1)pk}$	50	V
$P_{load(driver)}$	1.2	W
p_a	2 × 2.1	W
p_{g2}	2 × 1.13	W
P_{out}	5.8	W
P_{load} ($\eta_{transfer}$ = 77%)	4.5	W
η_a	58	%

CLASS "C" ANODE AND SCREEN-GRID MODULATION

Limiting values (carrier condition for use with a modulation factor of 1)

f max.	500	Mc/s
V_a max.	200	V
p_a max.	2 × 2.0	W
I_a max.	2 × 32	mA
V_{g2} max.	200	V
p_{g2} max.	2 × 1.0	W
$-V_{g1}$ max.	50	V
p_{g1} max.	2 × 100	mW
I_{g1} max.	2 × 3.0	mA
V_{h-k} max.	100	V

Typical operation

f	500	Mc/s
V_a	180	V
$V_{g2(b)}$	180	V
R_{g2}	100	Ω
V_{g1}	−25	V
R_{g1-k} (each section)	68	kΩ
I_a	2 × 20	mA
I_{g2}	2 × 4.75	mA
I_{g1}	2 × 0.4	mA
$v_{in\ (g1-g1)\ pk}$	55	V
$P_{load(driver)}$	1.0	W
p_a	2 × 1.5	W
p_{g2}	2 × 850	mW
P_{out}	4.2	W
P_{load} ($\eta_{transfer}$ = 71%)	3.5	W
η_a	58	%
For 100% modulation		
$v_{g2(pk)mod}$	175	V
P_{mod}	4.5	W

FREQUENCY MULTIPLIER

Limiting values

f max.	500	Mc/s
V_a max.	250	V
p_a max.	2 × 3.0	W
I_a max.	2 × 30	mA
V_{g2} max.	200	V
p_{g2}	2 × 1.5	W
$-V_{g1}$ max.	100	V
p_{g1} max.	2 × 100	mW
I_{g1} max.	2 × 3.0	mA
V_{h-k} max.	100	V

Typical operation

f_{in}	166.6	Mc/s
f_{out}	500	Mc/s
V_a	180	V
$V_{g2(b)}$	180	V
R_{g2}	1.2	kΩ
R_{g1-k} (each section)	82	kΩ
I_a	2 × 20	mA
I_{g2}	2 × 4.85	mA
I_{g1}	2 × 0.9	mA
$v_{in(g1-g1)pk}$	165	V
$P_{load(driver)}$	1.1	W
p_a	2 × 2.45	W
p_{g2}	2 × 830	mW
P_{out}	2.4	W
P_{load} ($\eta_{transfer}$ = 83%)	2.0	W
η_a	33	%

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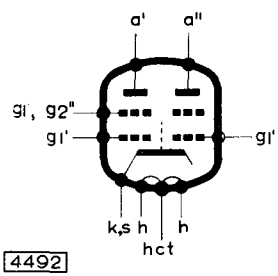
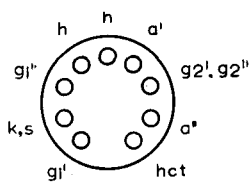
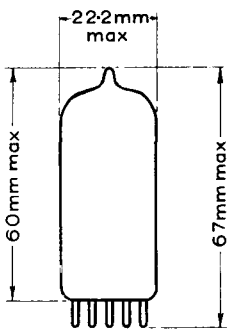
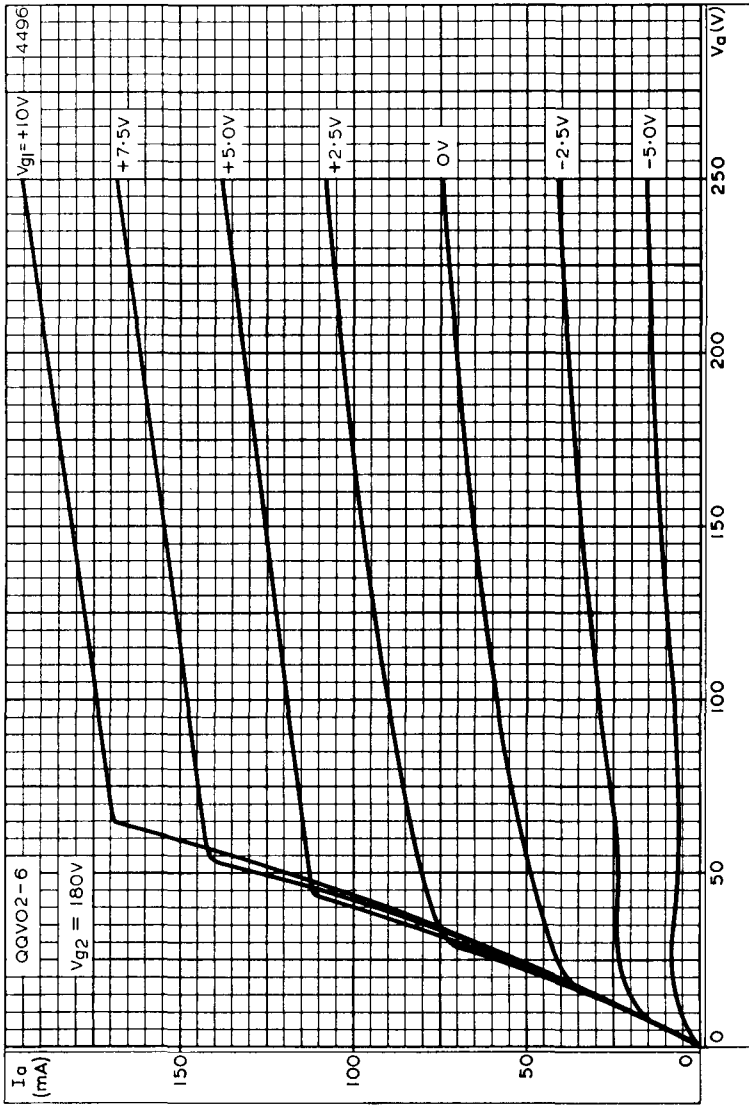


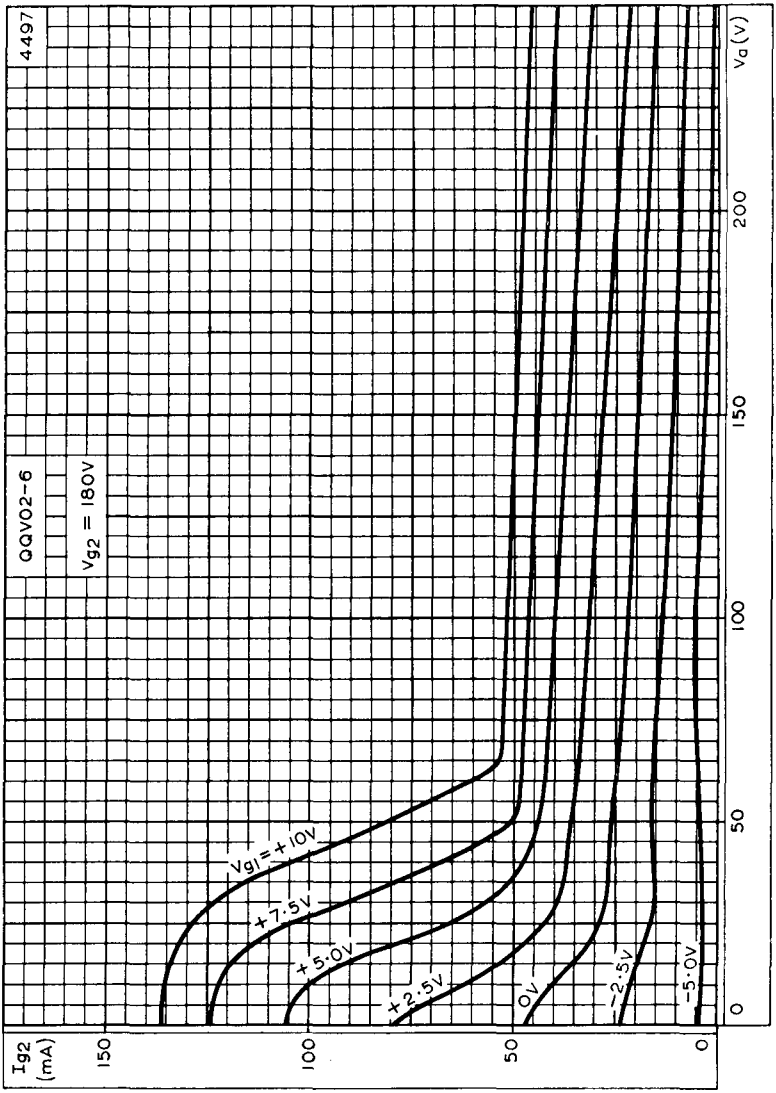


B9A Base

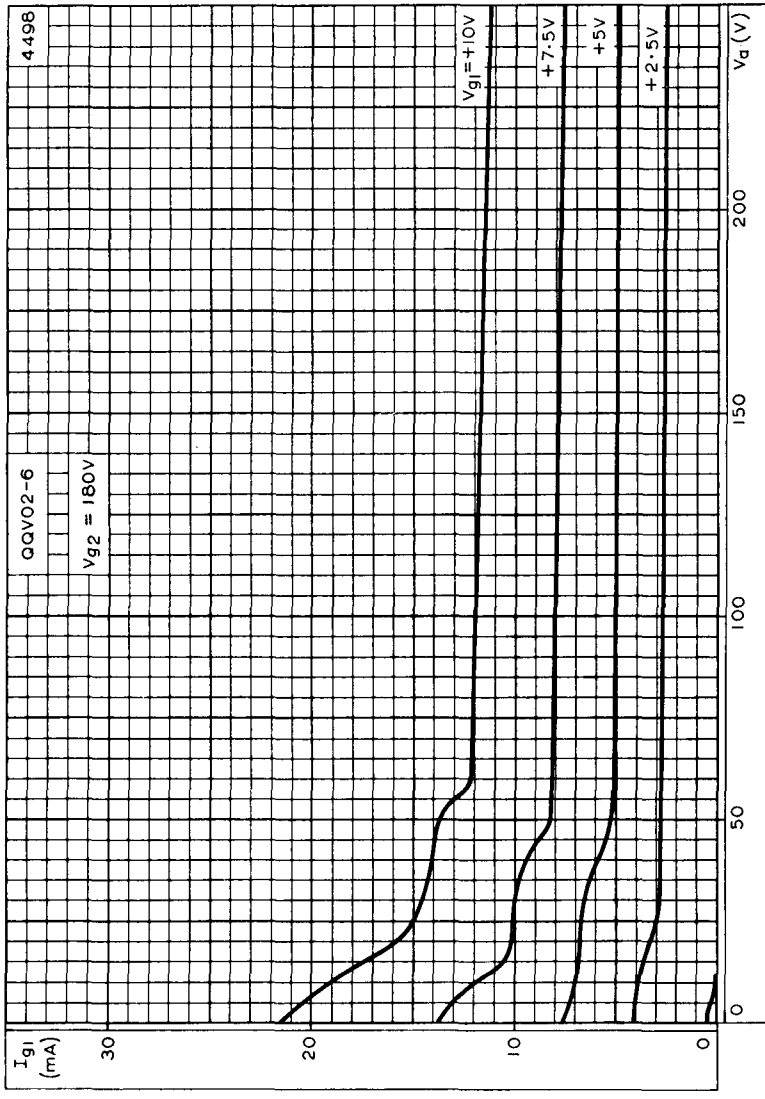




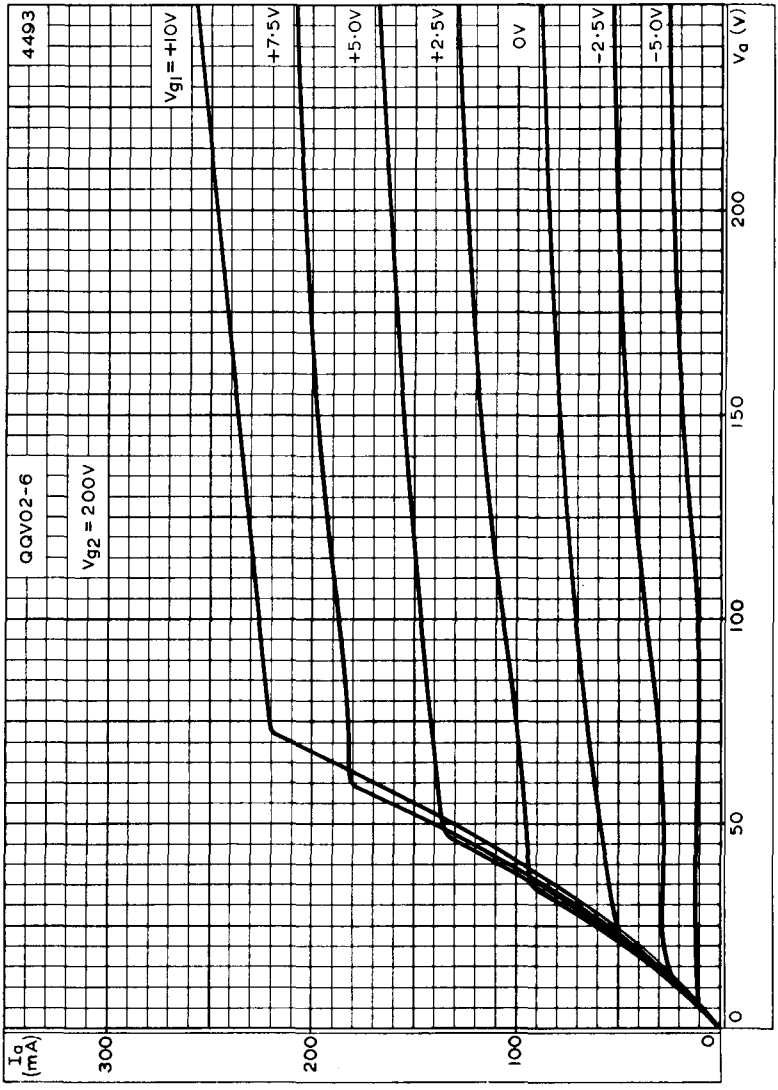
ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE, $V_{g2} = 180V$



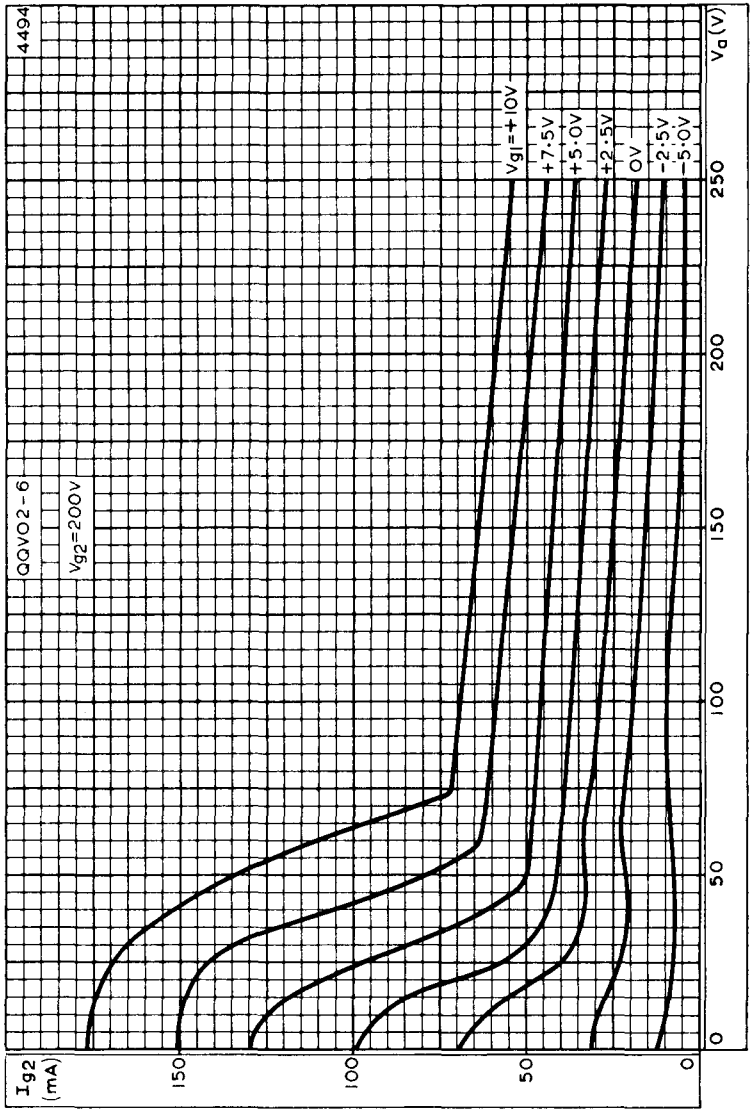
SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE, V_{g2} = 180V



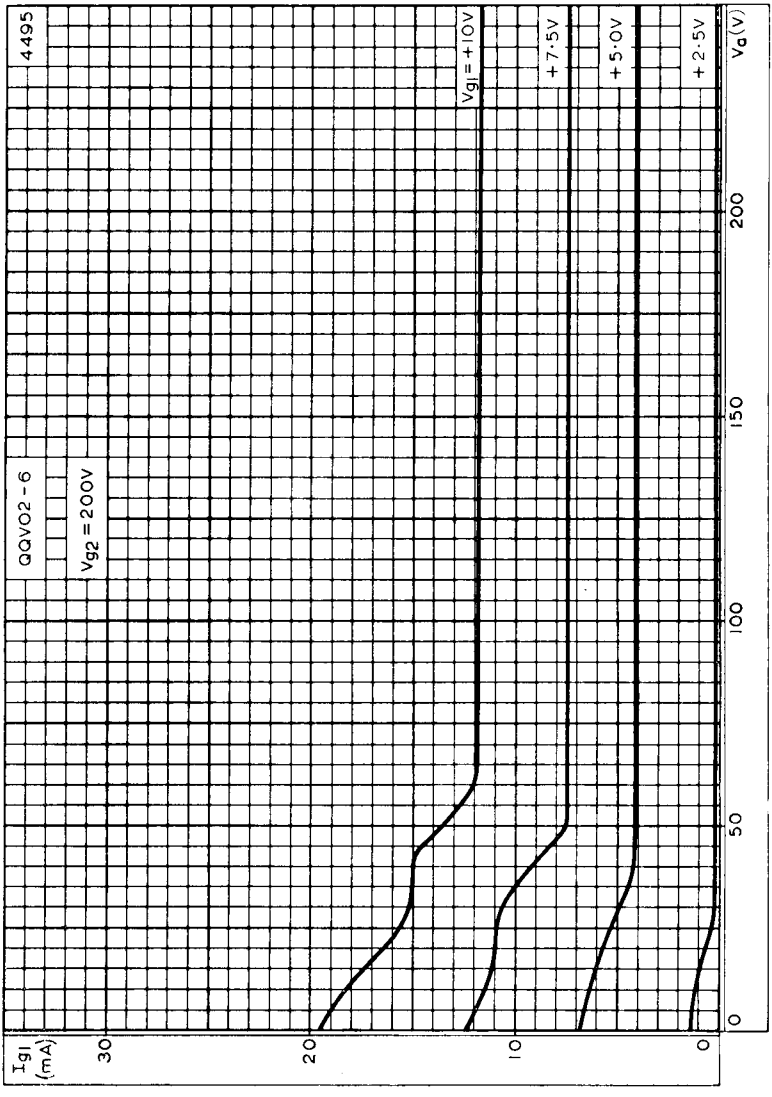
CONTROL-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE, $V_{g2} = 180V$



ANODE CURRENT PLOTTED AGAINST ANODE VOLTAGE, V_{g2} = 200V



SCREEN-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE, $V_{g2}=200V$



CONTROL-GRID CURRENT PLOTTED AGAINST ANODE VOLTAGE, $V_{g2} = 200V$