

R.F. BEAM POWER TETRODES

QUICK REFERENCE DATA

freq. MHz	class-C				class-B			
	telegraphy		ag2 modulator		single side band		modulator*	
	V _a V	W _o W	V _a V	W _o W	V _a V	W _o ** W	V _a V	W _o W
30	750	200	600	130	750	220	750 600	300 200

HEATING: indirect, cathode oxide-coated

Heater voltage

	QE08/200	QE08/200H
V _f =	6,3	26,5 V
I _f =	3,9	0,85 A

Heater current

COOLING: radiation and convection

CAPACITANCES

Anode to all other elements except grid 1

C_a = 12,7 pF

Grid 1 to all other elements except anode

C_{g1} = 30 pF

Anode to grid 1

C_{ag1} < 0,9 pF

TYPICAL CHARACTERISTICS

Anode voltage

V_a = 750 V

Grid 2 voltage

V_{g2} = 250 V

Anode current

I_a = 100 mA

Mutual conductance

S = 9 mA/V

Amplification factor of grid 2 with respect to grid 1

μ_{g1g2} = 5,7

* Two tubes.

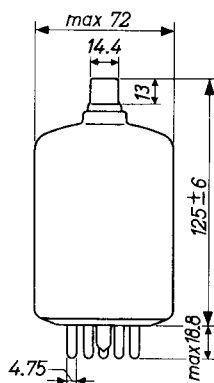
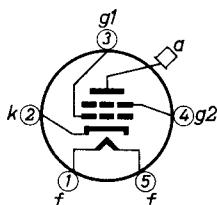
** Peak envelope power with double tone signal.

TEMPERATURE LIMITS (Absolute limits)

Anode seal temperature	max.	220 °C
Pin temperature	max.	180 °C
Bulb temperature	max.	300 °C

MECHANICAL DATA

Base	: giant 5p
Socket	: 2422 512 01001
Top cap	: IEC 67-III-1b, type 3
Anode connector	: 40619
Net mass	: 220 g



Mounting position: vertical, or horizontal with plane of anodes vertical.

R.F. CLASS-C TELEGRAPHY

LIMITING VALUES (Absolute maximum rating system)

Frequency	f	up to	30 MHz
Anode voltage	V_a	= max.	1100 V
Anode input power	W_{ia}	= max.	400 W
Anode dissipation	W_a	= max.	100 W
Anode current	I_a	= max.	400 mA
Grid 2 voltage	V_{g2}	= max.	300 V
Grid 2 dissipation	W_{g2}	= max.	12 W
Negative grid 1 voltage	$-V_{g1}$	= max.	150 V
Grid 1 current	I_{g1}	= max.	30 mA
Grid 1 circuit resistance	R_{g1}	= max.	25 k Ω
Heater to cathode voltage	V_{kf}	= max.	125 V

OPERATING CONDITIONS

Frequency	f	= 30	30 MHz
Anode voltage	V_a	= 750	1000 V
Grid 2 voltage	V_{g2}	= 250	250 V
Grid 1 voltage	V_{g1}	= -90	-90 V
Anode current	I_a	= 385	385 mA
Grid 2 current	I_{g2}	= 20	20 mA
Grid 1 current	I_{g1}	= 7	6 mA
Peak grid 1 a.c. voltage	V_{g1p}	= 120	120 V
Anode input power	W_{ia}	= 285	385 W
Grid 1 input power	W_{ig1}	= 1,0	1,0 W
Grid 2 dissipation	W_{g2}	= 5	5 W
Anode dissipation	W_a	= 85	95 W
Output power	W_o	= 200	290 W
Efficiency	η	= 70	75 %



R.F. CLASS-C ANODE AND SCREEN GRID MODULATION

LIMITING VALUES (Absolute maximum rating system)

Frequency	f	up to	30 MHz
Anode voltage	V_a	= max.	650 V
Anode input power	W_{ia}	= max.	200 W
Anode dissipation	W_a	= max.	67 W
Anode current	I_a	= max.	350 mA
Grid 2 voltage	V_{g2}	= max.	300 V
Grid 2 dissipation	W_{g2}	= max.	10 W
Negative grid No. 1 voltage	$-V_{g1}$	= max.	150 V
Grid 1 current	I_{g1}	= max.	30 mA
Grid 1 circuit resistance	R_{g1}	= max.	25 k Ω
Heater to cathode voltage	V_{kf}	= max.	125 V

OPERATING CONDITIONS

Frequency	f	=	30 MHz
Anode voltage	V_a	=	600 V
Grid 2 voltage	V_{g2}	=	250 V
Grid 1 voltage	V_{g1}	=	-100 V
Anode current	I_a	=	300 mA
Grid 2 current	I_{g2}	=	20 mA
Grid 1 current	I_{g1}	=	4 mA
Peak grid No. 1 a.c. voltage	V_{g1p}	=	110 V
Anode input power	W_{ia}	=	180 W
Grid 1 input power	W_{ig1}	=	0,4 W
Grid 2 dissipation	W_{g2}	=	5 W
Anode dissipation	W_a	=	50 W
Output power	W_o	=	130 W
Efficiency	η	=	72 %
Modulation factor	m	=	100 %
Peak grid 2 a.c. voltage	V_{g2p}	=	220 V*
Modulation power	W_{mod}	=	90 W

* Obtained from a separate winding on the modulation transformer

R.F. CLASS-B SINGLE SIDE BAND AMPLIFIER**LIMITING VALUES (Absolute maximum rating system)**

Frequency	f	up to	30 MHz
Anode voltage	V_a	= max.	825 V
Anode input power	W_{ia}	= max.	250 W
Anode dissipation	W_a	= max.	100 W
Anode current	I_a	= max.	400 mA
Grid 2 voltage	V_{g2}	= max.	350 V
Grid 2 dissipation	W_{g2}	= max.	12 W
Grid 1 circuit resistance	R_{g1}	= max.	25 k Ω
Heater to cathode voltage	V_{kf}	= max.	125 V

OPERATING CONDITIONS, with double tone modulation

The R.F. voltage is modulated with two sinusoidal A.F. signals of equal strength but different frequency.

Frequency	f	=	30	MHz
Anode voltage	V_a	=	750	V
Grid 2 voltage	V_{g2}	=	310	V
Grid 1 voltage	V_{g1}	=	-45	V (note 1)
Peak grid No. 1 a.c. voltage	V_{g1p}	=	0	45 V (note 2)
Anode current	I_a	=	130	270 mA
Grid 2 current	I_{g2}	=	< 5	26 mA
Grid 1 current	I_{g1}	=	0	0 mA
Anode input power	W_{ia}	=	98	200 W
Grid 1 dissipation	W_{g1}	=	0	0 W
Grid 2 dissipation	W_{g2}	=	1,5	8 W
Anode dissipation	W_a	=	98	90 W
Output power	W_o	=	0	220 W (note 3)
Efficiency	η	=	-	55 %

Notes

1. To be adjusted so that $I_a = 130$ mA at $V_{g1p} = 0$.
2. To be adjusted so that $I_{g1} = 0$.
3. Peak envelope power.

A.F. CLASS-B AMPLIFIER

LIMITING VALUES (Absolute maximum rating system)

Anode voltage	V_a	= max.	825 V
Anode dissipation	W_a	= max.	100 W
Anode current	I_a	= max.	400 mA
Grid 2 voltage	V_{g2}	= max.	300 V
Grid 2 dissipation	W_{g2}	= max.	12 W
Negative grid No. 1 voltage	$-V_{g1}$	= max.	150 V
Grid 1 current	I_{g1}	= max.	30 mA
Grid 1 circuit resistance	R_{g1}	= max.	15 k Ω
Heater to cathode voltage	V_{kf}	= max.	125 V

OPERATING CONDITIONS, two tubes

Anode voltage	V_a	=	750	600	V
Grid 2 voltage	V_{g2}	=	250	250	V
Grid 1 voltage	V_{g1}	=	-45	-45	V
Load resistance	$R_{aa\sim}$	=	3600	3500	Ω
Peak grid to grid voltage	V_{g1g1p}	=	0 110	0 105	V
Anode current	I_a	=	2x45 2x280	2x25 2x235	mA
Grid 2 current	I_{g2}	=	0 2x40	2x0,5 2x24	mA
Grid 1 current	I_{g1}	=	0 2x1	0 2x0,5	mA
Anode input power	W_{ia}	=	2x34 2x210	2x15 2x140	W
Grid 2 dissipation	W_{g2}	=	0 2x10	0 2x6	W
Anode dissipation	W_a	=	2x34 2x60	2x15 2x40	W
Output power	W_o	=	0 300	0 200	W
Total harmonic distortion	d_{tot}	=	- 6,5	- 5	%
Efficiency	η	=	- 71,5	- 71,5	%

