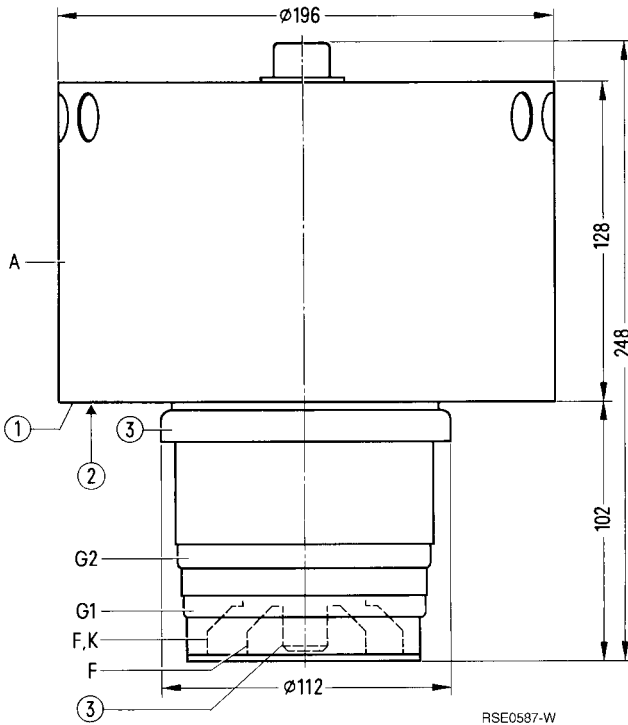


Ordering code Q51-X1500

Coaxial metal-ceramic tetrode, forced-air-cooled, for frequencies up to 110 MHz, particularly suitable for anode-modulated broadcast transmitters up to 20 kW.



Dimensions in mm

- ① Tube support
- ② Air inlet
- ③ Do not use as terminal

Approx. weight 11,5 kg

**Heating**

Heater voltage	$U_F$	7,5	V
Heater current	$I_F$	≈ 115	A
Heating: direct			
Cathode: thoriated tungsten			

**Characteristics**

Emission current at $U_A = U_{G2} = U_{G1} = 400\text{ V}$	$I_{em}$	28	A
Amplification factor of screen grid at $U_A = 3\text{ kV}$ , $U_{G2} = 1250\text{ to }1500\text{ V}$ , $I_A = 1,8\text{ A}$	$\mu_{g2g1}$	4,8	
Transconductance at $U_A = 3\text{ kV}$ , $U_{G2} = 1250\text{ V}$ , $I_A = 2\text{ A}$	s	35	mA/V

**Capacitances**

Cathode/control grid	$C_{kg1}$	≈ 70	pF
Cathode/screen grid	$C_{kg2}$	≈ 8,0	pF
Cathode/anode	$C_{ka}$	≈ 0,18	pF 1)
Control grid/screen grid	$C_{g1g2}$	≈ 85	pF
Control grid/anode	$C_{g1a}$	≈ 1,2	pF 1)
Screen grid/anode	$C_{g2a}$	≈ 28	pF

**Accessories**

**Ordering code**

Socket (header connector)	RöFsg2795	Q1001-X28
Tube protective device	RöKt2	Q81-X1302

1) Measured by means of a 50 cm diameter screening plate in the screen grid terminal plane.

**Anode and screen grid modulation,  
class C operation, grounded cathode circuit**

**Maximum ratings**

Frequency	$f$	30	MHz
Anode voltage (dc)	$U_A$	8	kV
Screen grid voltage (dc)	$U_{G2}$	1000	V
Control grid voltage (dc)	$U_{G1}$	- 600	V
Cathode current (dc)	$I_K$	6,5	A
Peak cathode current	$I_{KM}$	28	A
Anode dissipation	$P_A$	15	kW
Screen grid dissipation	$P_{G2}$	350	W
Control grid dissipation	$P_{G1}$	75	W
Control grid resistance	$R_{G1}$	10	k $\Omega$

**Operating characteristics**

Frequency	$f$	$\leq 30$	MHz
Carrier power	$P_{trg}$	22	kW <sup>1)</sup>
Anode voltage (dc)	$U_A$	7,5	kV
Screen grid voltage (dc)	$U_{G2}$	800	V
Control grid bias (dc), fixed	$U_{G1\text{ fix}}$	- 250	V
Control grid resistance	$R_{G1}$	4,5	k $\Omega$
Peak control grid voltage (ac)	$U_{g1\text{ m}}$	520	V
Anode current (dc)	$I_A$	3,7	A
Screen grid current (dc)	$I_{G2}$	0,3	A
Control grid current (dc)	$I_{G1}$	33	mA
Anode input power	$P_{B\ A}$	27,7	kW
Drive power	$P_1$	16	W <sup>1)</sup>
Anode dissipation	$P_A$	5,7	kW <sup>2)</sup>
Screen grid dissipation	$P_{G2}$	240	W
Control grid dissipation	$P_{G1}$	2,3	W
Efficiency	$\eta$	79,5	%
Anode load resistance	$R_A$	1080	$\Omega$
Modulation factor	$m$	100	%
Peak screen grid voltage (ac)	$U_{g2\text{ m}}$	400	V <sup>3)</sup>
Modulation power	$P_{mod}$	13,8	kW
Control grid current (dc)	$I_{G1}$	74	mA <sup>4)</sup>
Drive power	$P_1$	35	W <sup>1)4)</sup>
Anode dissipation at modulation	$P_{A\ mod}$	8,5	kW <sup>5)</sup>
Screen grid dissipation at modulation	$P_{G2\ mod}$	295	W <sup>5)</sup>

1) Circuit losses are not included.

2) Even during modulation the indicated maximum ratings must not be exceeded. It has to be observed that during 100 % modulation the anode dissipation increases to about 1,5 times the power dissipation stated for the carrier value.

3) Modulation of screen grid via separate transformer winding.

4) Maximum values at  $U_A = 0$  V.

5) Average values at  $m = 100$  %.

**Tube mounting**

Axis vertical, anode up or down.

For connection of the tube use the connectors listed under "Accessories".

**Maximum tube surface temperature**

The temperature of the metal-ceramic seals must not exceed 200 °C at any point and the temperature of the anode body must not exceed 220 °C. If an appropriate air duct is provided the cooling air or part of it can be used to keep the maximum permissible temperature of the metal-ceramic seals.

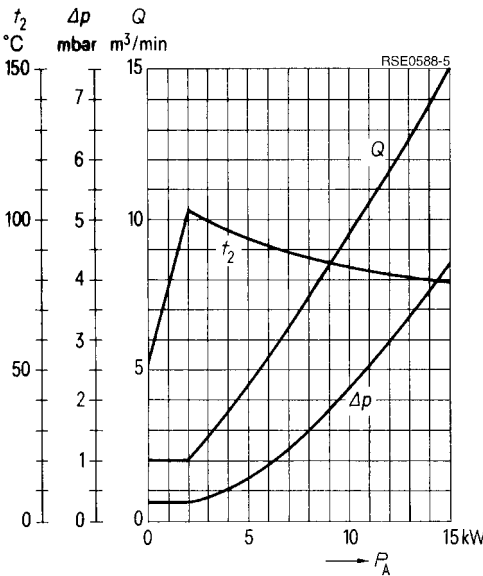
**Forced-air cooling**

The minimum air flow rate required for maximum anode dissipation is given in the cooling air diagram valid for 25 °C inlet temperature at a normal air pressure of 1 bar (sea level). The cooling air must be supplied from the side of the electrode terminals. For further information on forced-air cooling refer to "Explanations on Technical Data".

**Safety precautions**

The section "Safety precautions" under "Explanations on Technical Data" describes how the tube is to be protected against damage due to electric overload or insufficient cooling. A copper wire with 0,20 mm diameter should be used to test the anode overcurrent trip circuit.

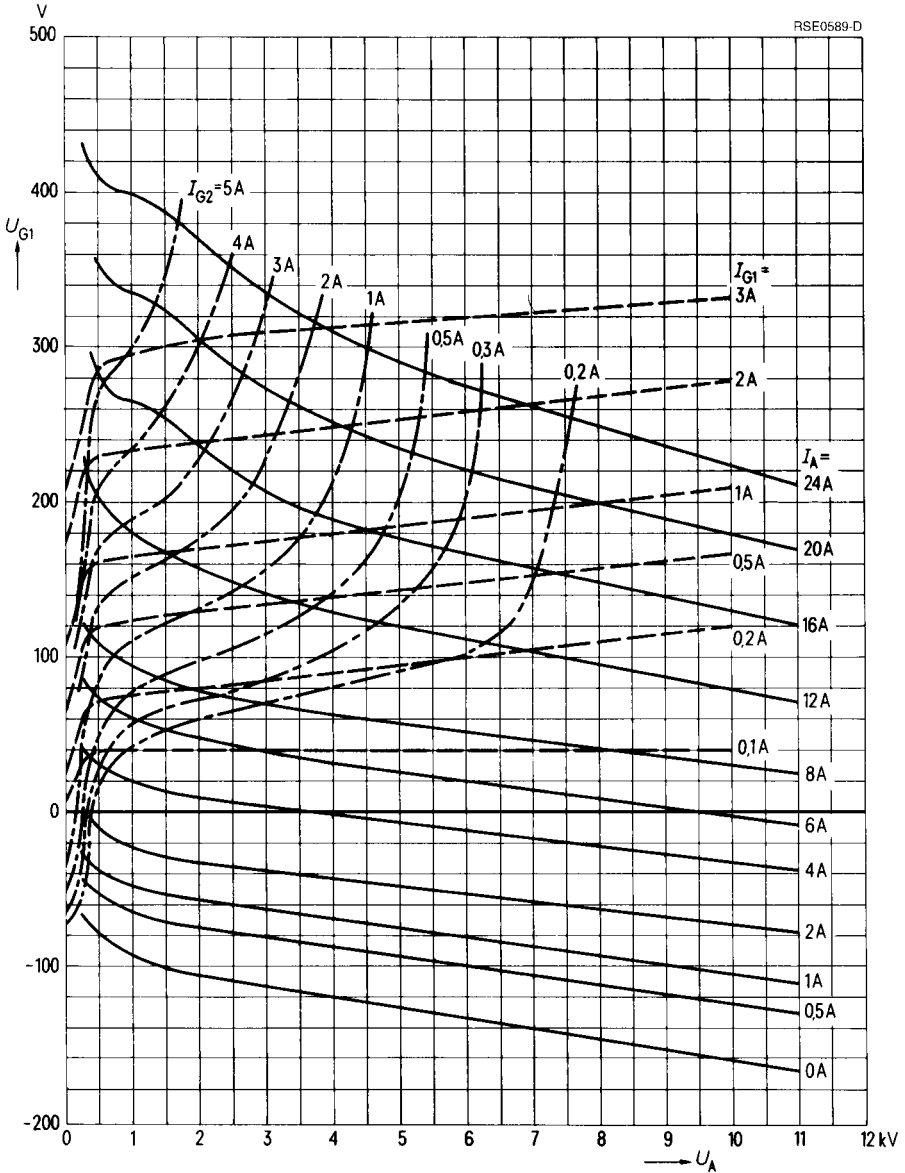
**Cooling air diagram**



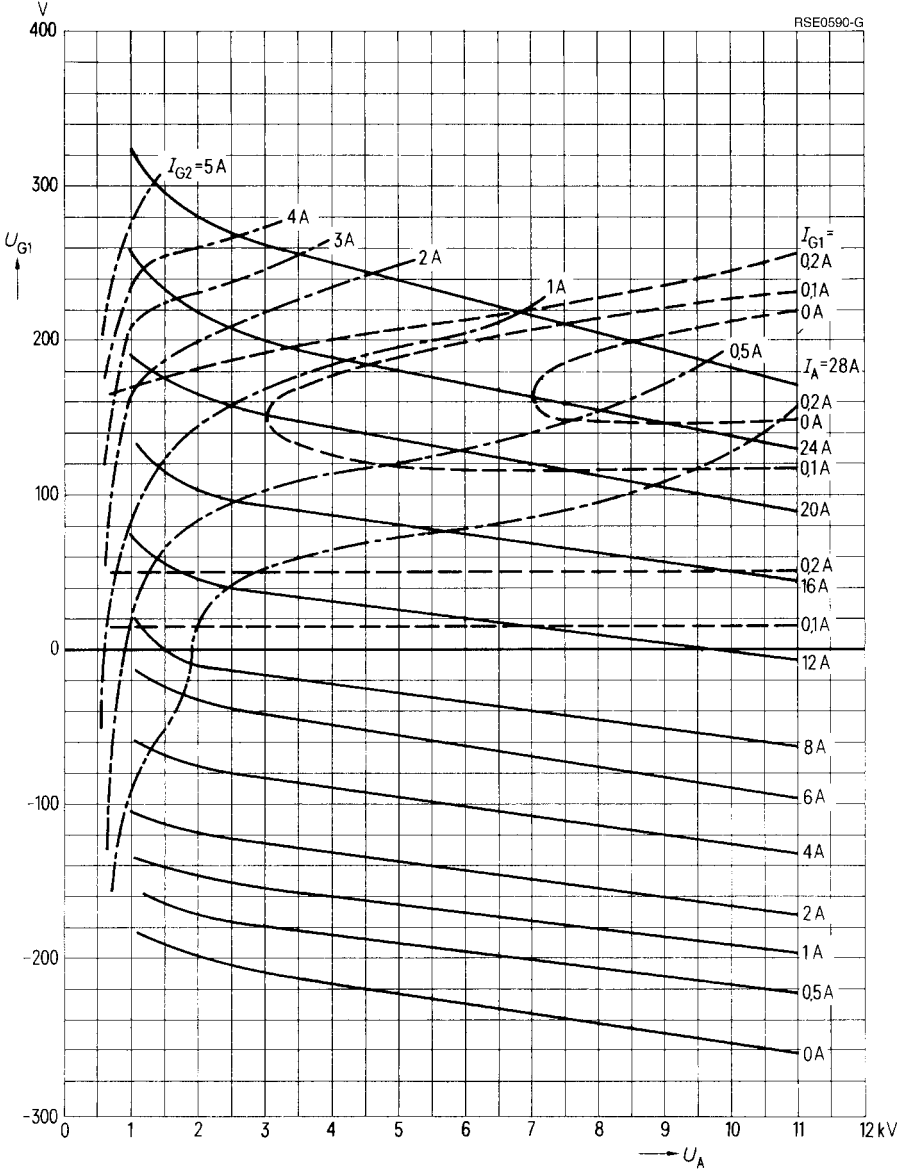
The cooling air is supplied from the electrode terminal side.

Air pressure = 1 bar  
 $t_1 = 25\text{ °C}$

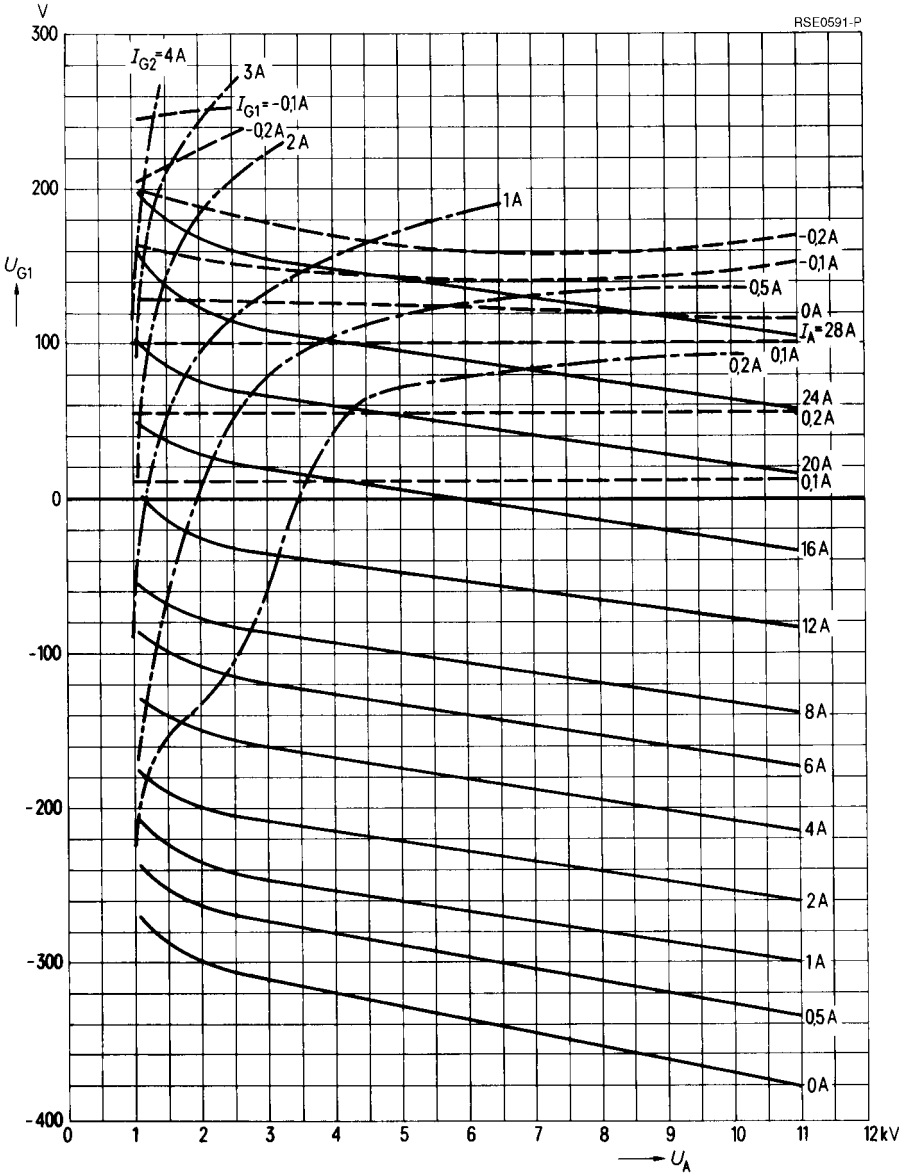
$U_{G1} = f(U_A)$   
 $U_{G2} = 400 \text{ V}$   
 Parameter =  $I_A$  —————  
 Parameter =  $I_{G2}$  - - - - -  
 Parameter =  $I_{G1}$  - - - - -



$U_{G1} = f(U_A)$   
 $U_{G2} = 800 \text{ V}$   
 Parameter =  $I_A$  \_\_\_\_\_  
 Parameter =  $I_{G2}$  - - - - -  
 Parameter =  $I_{G1}$  - - - - -



$U_{G1} = f(U_A)$   
 $U_{G2} = 1200 \text{ V}$   
 Parameter =  $I_A$  —————  
 Parameter =  $I_{G2}$  - - - - -  
 Parameter =  $I_{G1}$  - - - - -



$U_{G1} = f(U_A)$       Parameter =  $I_A$       \_\_\_\_\_  
 $U_{G2} = 1500 \text{ V}$     Parameter =  $I_{G2}$       - - - - -  
                                  Parameter =  $I_{G1}$       - · - · -

