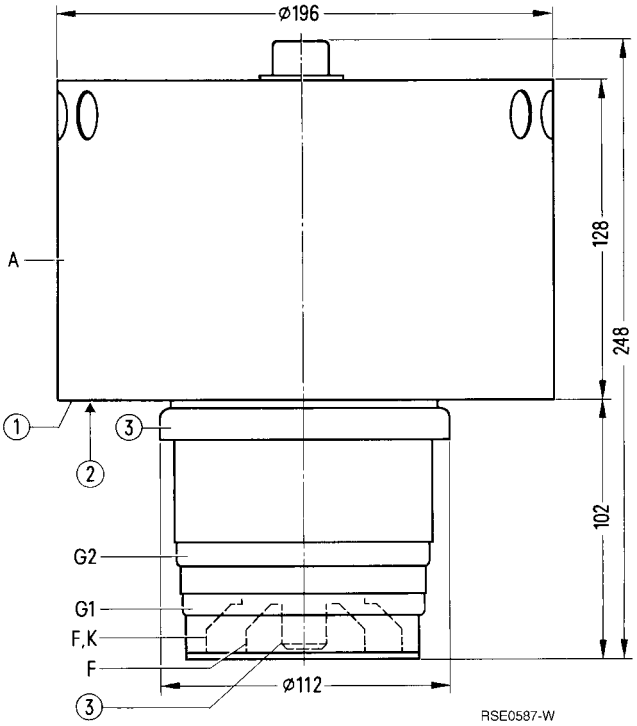
Ordering code Q51-X1500

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 $U_A = U_{G2} = U_{G1} = 400$ V	I_{em}	28	A
Amplification factor of screen grid at $U_A = 3$ kV, $U_{G2} = 1250$ to 1500 V, $I_A = 1,8$ A	μ_{g2g1}	4,8	
Transconductance at $U_A = 3$ kV, $U_{G2} = 1250$ V, $I_A = 2$ 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	$I_{K\,M}$	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	kΩ

Operating characteristics

Frequency	f	≤ 30	MHz
Carrier power	P_{trg}	22	kW [1]
Anode voltage (dc)	U_A	7,5	kV
Screen grid voltage (dc)	U_{G2}	800	V
Control grid bias (dc), fixed	$U_{G1\,fix}$	– 250	V
Control grid resistance	R_{G1}	4,5	kΩ
Peak control grid voltage (ac)	$U_{g1\,m}$	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 [1]
Anode dissipation	P_A	5,7	kW [2]
Screen grid dissipation	P_{G2}	240	W
Control grid dissipation	P_{G1}	2,3	W
Efficiency	η	79,5	%
Anode load resistance	R_A	1080	Ω
Modulation factor	m	100	%
Peak screen grid voltage (ac)	$U_{g2\,m}$	400	V [3]
Modulation power	P_{mod}	13,8	kW
Control grid current (dc)	I_{G1}	74	mA [4]
Drive power	P_1	35	W [1][4]
Anode dissipation at modulation	$P_{A\,mod}$	8,5	kW [5]
Screen grid dissipation at modulation	$P_{G2\,mod}$	295	W [5]

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.

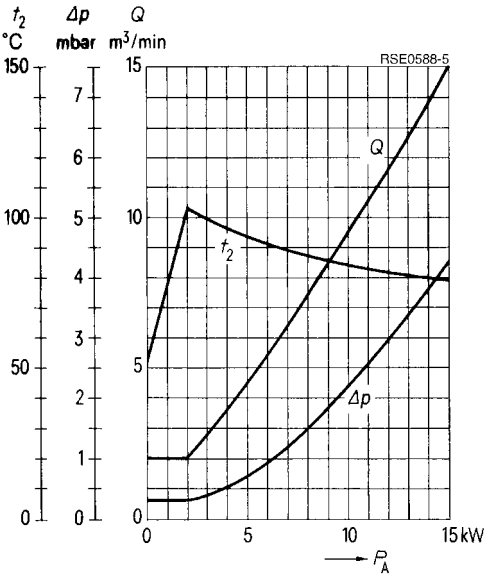
Forced-air cooling

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

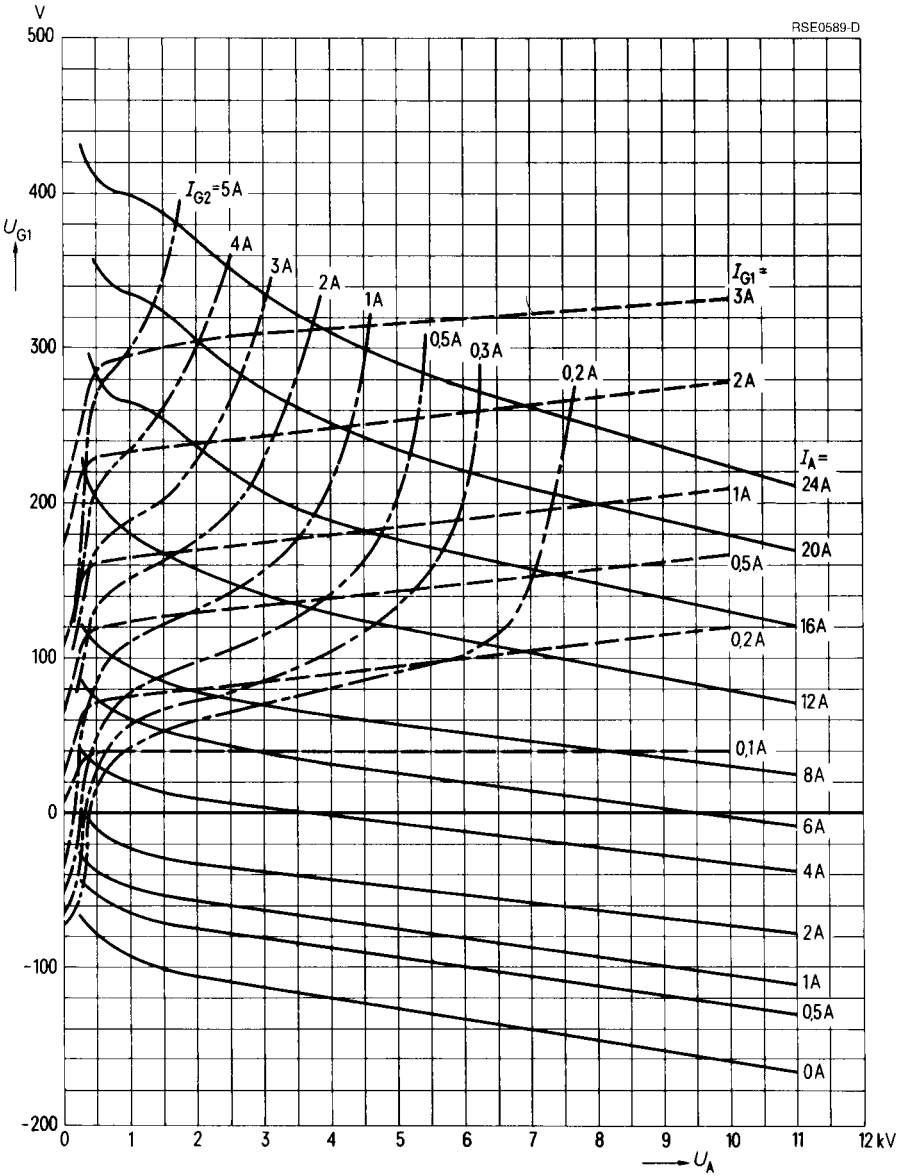


The cooling air is supplied from the electrode terminal side.

Air pressure = 1 bar
t_1 = 25 °C

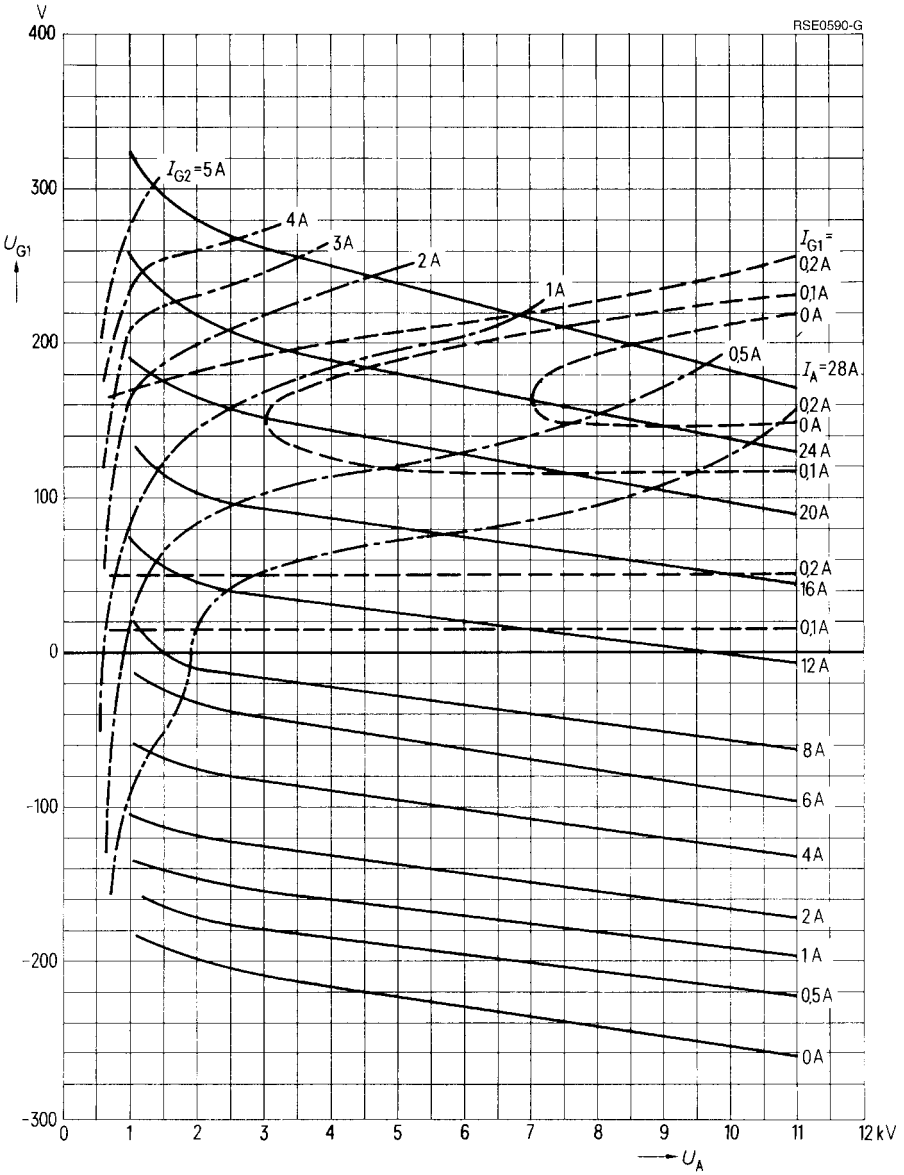
$U_{G1} = f(U_A)$
U_{G2} = 400 V

Parameter = I_A ——————
Parameter = I_{G2} —·—·—·—·—·—
Parameter = I_{G1} — — — — — — —

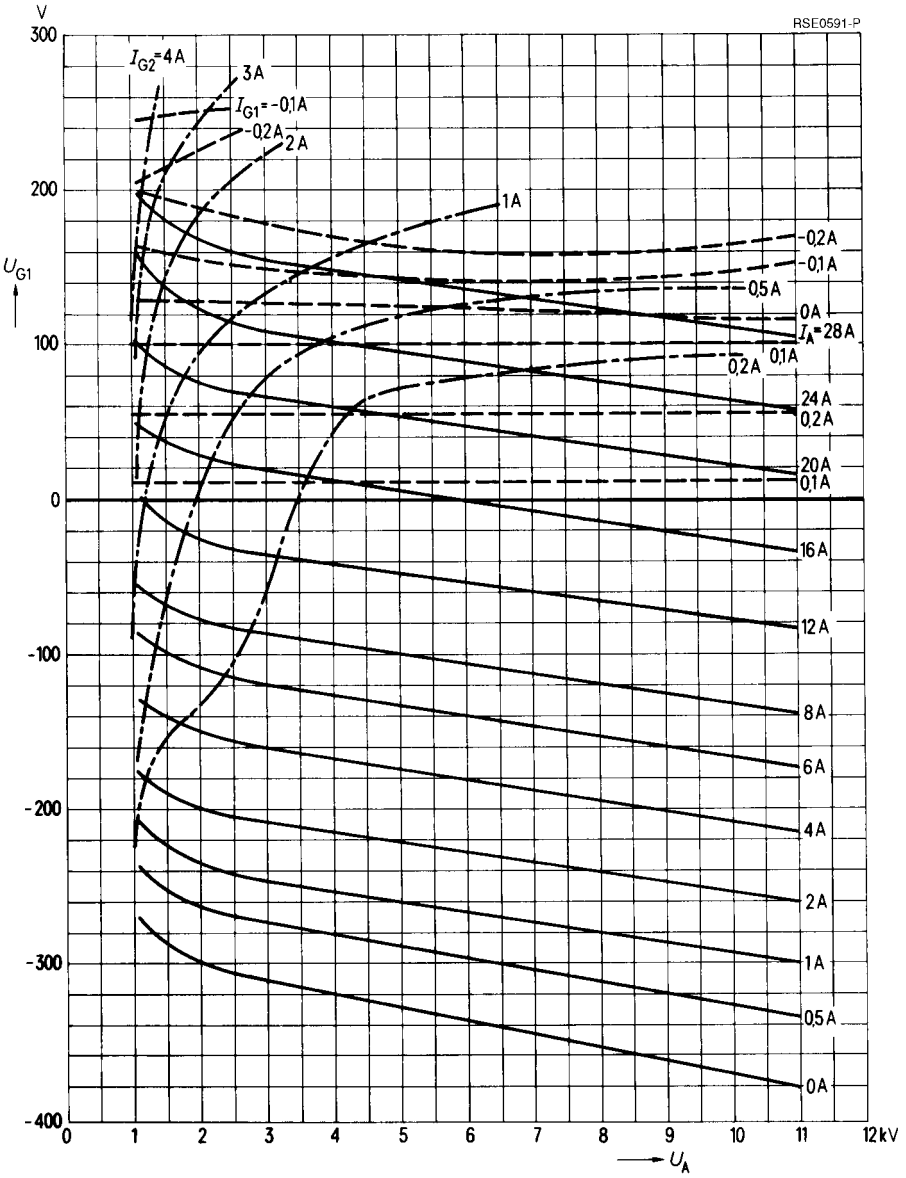


$U_{G1} = f(U_A)$
U_{G2} = 800 V

Parameter = I_A ——————
Parameter = I_{G2} —·—·—·—·—·—
Parameter = I_{G1} — — — — — — —



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



$U_{G1} = f(U_A)$ Parameter = I_A ——————
U_{G2} = 1500 V Parameter = I_{G2} —·—·—·—·—·—
Parameter = I_{G1} — — — — — — —