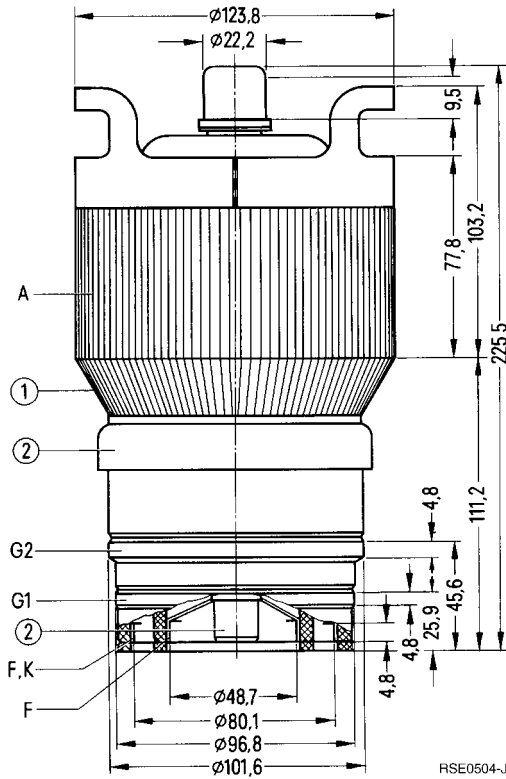**Especially for communications transmitters, P_2 approx. 10 kW**   Ordering code Q51-X2014

Coaxial metal-ceramic tetrode for frequencies up to 110 MHz, forced-air-cooled; particularly suitable for use as RF amplifier, AF amplifier and linear amplifier in single-sideband transmitters.

RSE0504-J

Dimensions in mm

① Air inlet
② Do not use as terminal

Approx. weight 4,3 kg

Siemens Aktiengesellschaft

Transmitter Tetrode

Heating

Heater voltage	U_F	7,5	V
Heater current	I_F	≈ 78	A
Heating: direct			
Cathode: thoriated tungsten			

Characteristics

Amplification factor of screen grid	μ_{g2g1}	4,5	
Transconductance	s	21	mA/V
at U_A = 3 kV, U_{G2} = 750 V, I_A = 0,9 to 1,2 A			

Capacitances

Cathode/control grid, screen grid	$c_{k/g1g2}$	≈ 47	pF
Control grid/screen grid, cathode	$c_{g1/g2k}$	≈ 106	pF
Anode/cathode	c_{ak}	≈ 0,14	pF [1]
Anode/control grid	c_{ag1}	≈ 0,75	pF [1]
Anode/screen grid, cathode	$c_{a/g2k}$	≈ 18	pF
Anode/control grid, screen grid, cathode	$c_{a/g1g2k}$	≈ 18	pF

Accessories

Accessories		Ordering code
Header socket	RöFsg2793	Q81-X28
Air duct	RöAnst214	Q81-X826

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[1] Measured by means of a 30 cm diameter screening plate in the screen grid terminal plane.

**RF amplifier,
class C operation**

Maximum ratings

Frequency	f	30	60	110	MHz
Anode voltage (dc)	U_A	7,5	7,0	6,5	kV
Screen grid voltage (dc)	U_{G2}	1500	1500	1500	V
Anode current (dc)	I_A	3,0	2,8	2,6	A
Anode dissipation	P_A	5,0	5,0	5,0	kW
Screen grid dissipation	P_{G2}	250	250	250	W
Control grid dissipation	P_{G1}	75	75	75	W

Operating characteristics

Frequency	f	≤ 30	≤ 110	MHz
Output power	P_2	16	10	kW [1]
Anode voltage (dc)	U_A	7,5	6,5	kV
Screen grid voltage (dc)	U_{G2}	500	750	V
Control grid voltage (dc)	U_{G1}	– 350	– 350	V
Peak control grid voltage (ac)	$U_{g1\,m}$	590	430	V
Anode current (dc)	I_A	2,8	2,3	A
Screen grid current (dc)	I_{G2}	0,50	0,20	A
Control grid current (dc)	I_{G1}	0,25	0,05	A
Anode input power	$P_{B\,A}$	21	15	kW
Drive power	P_1	150	25	W [1]
Anode dissipation	P_A	5,0	5,0	kW
Efficiency	η	77	67	%

[1] Circuit losses are not included.

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

Maximum ratings

Frequency	f	30	MHz
Anode voltage (dc)	U_A	5,5	kV
Screen grid voltage (dc)	U_{G2}	1000	V
Anode current (dc)	I_A	2,5	A
Anode dissipation	P_A	6,0	kW
Screen grid dissipation	P_{G2}	250	W
Control grid dissipation	P_{G1}	75	W

Operating characteristics

Frequency	f	≤ 30	MHz
Carrier power	P_{trg}	5,8	kW [1]
Anode voltage (dc)	U_A	5,0	kV
Screen grid voltage (dc)	U_{G2}	500	V
Control grid voltage (dc)	U_{G1}	– 400	V
Peak control grid voltage (ac)	$U_{g1\,m}$	520	V
Anode current (dc)	I_A	1,4	A
Screen grid current (dc)	I_{G2}	0,26	A
Control grid current (dc)	I_{G1}	0,05	A
Drive power	P_1	25	W [1]
Anode dissipation	P_A	1,1	kW [2]
Modulation factor	m	100	%
Peak screen grid voltage (ac)	$U_{g2\,m}$	450	V
Anode dissipation during modulation	$P_{A\,mod}$	1,7	kW

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

AF amplifier and modulator,
class B operation, 2 tubes in push-pull circuit, $I_{G1} = 0$

Maximum ratings

Anode voltage (dc)	U_A	7,5	kV
Screen grid voltage (dc)	U_{G2}	1500	V
Anode current (dc)	I_A	4,0	A
Anode dissipation	P_A	6,0	kW
Screen grid dissipation	P_{G2}	250	W
Control grid dissipation	P_{G1}	75	W

Operating characteristics

Output power	P_2	11,5	13,5	17	17,5	kW
Anode voltage (dc)	U_A	4,0	5,0	6,0	7,0	kV
Screen grid voltage (dc)	U_{G2}	1250	1250	1250	1250	V
Control grid voltage (dc)	U_{G1}	− 270	− 280	− 310	− 325	V
Peak control grid voltage (ac) between the 2 tubes	$U_{gg\,m}$	500	480	540	470	V
Anode current (dc)	I_A	$2 \times 2,55$	$2 \times 2,20$	$2 \times 2,10$	$2 \times 1,80$	A
Zero signal anode current (dc)	$I_{A\,0}$	$2 \times 0,75$	$2 \times 0,50$	$2 \times 0,41$	$2 \times 0,35$	A
Screen grid current (dc)	I_{G2}	$2 \times 0,17$	$2 \times 0,16$	$2 \times 0,15$	$2 \times 0,12$	A
Anode dissipation	P_A	$2 \times 4,20$	$2 \times 4,20$	$2 \times 4,20$	$2 \times 4,20$	kW
Effective load resistance (anode to anode)	R_{AA}	1500	2370	2940	4100	Ω

Tube mounting

Axis vertical, anode up or down.

The header socket RöFsg2793 as listed under "Accessories" should be used for connection of cathode and grid.

The air duct RöAnst214 is intended to support the cooling of the electrode terminals.

Maximum tube surface temperature

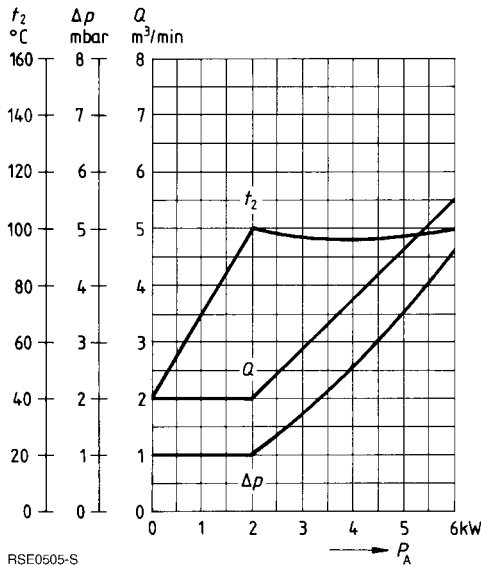The temperature of the ceramic-metal parts must not exceed 250 °C at any point.

Forced-air cooling

The cooling air diagram is valid for frequencies up to 30 MHz at an air inlet temperature of 25 °C and a normal air pressure of 1 bar. The cooling air on the anode radiator must be supplied via the recommended air duct (accessories) from the side of the electrode terminals.

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.
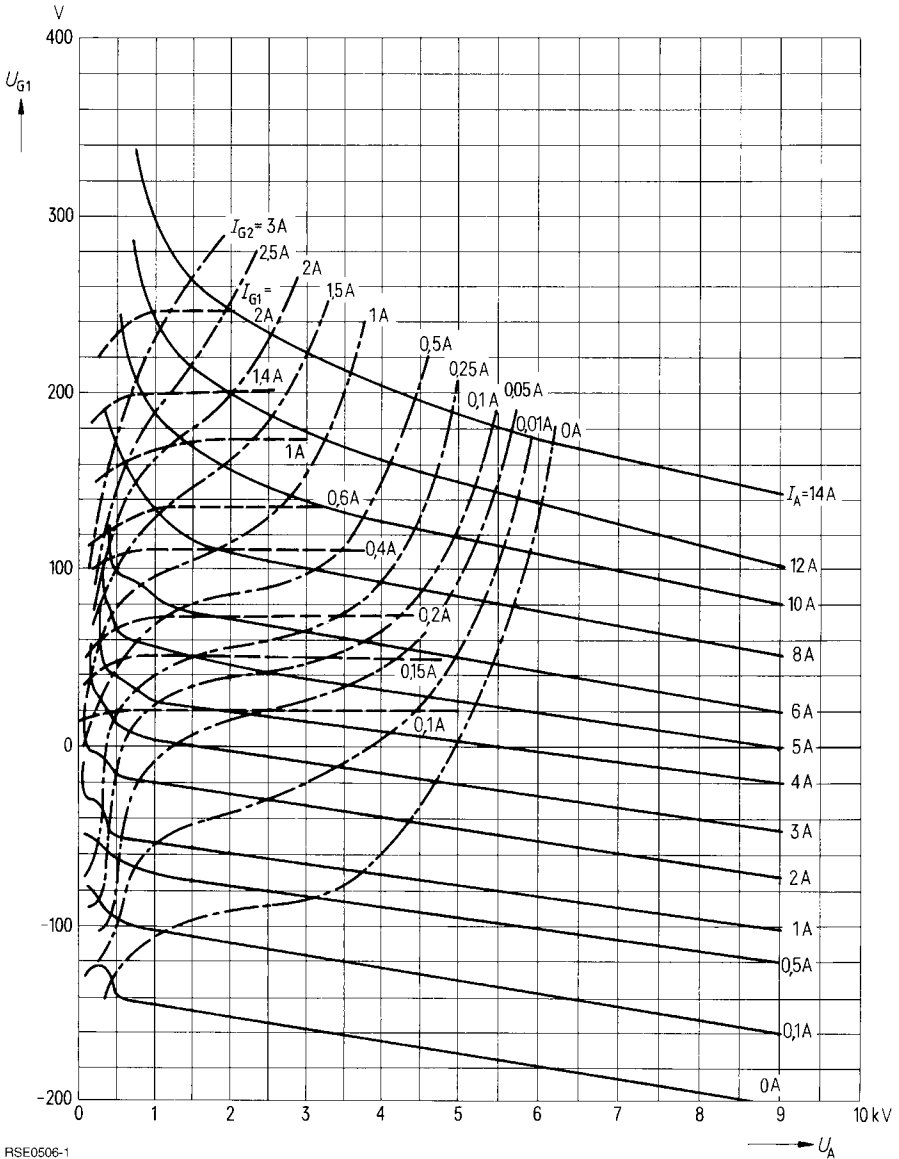
Cooling air diagram

The cooling air is supplied from the electrode terminal side.

Air pressure = 1 bar
t_1 = 25 °C

RSE0505-S

$U_{G1} = f(U_A)$ Parameter = I_A

$U_{G2} = 500$ V   Parameter = I_{G2}

Parameter = I_{G1}

RSE0506-1

$U_{G1} = f(U_A)$ Parameter = I_A
$U_{G2} = 1250$ V   Parameter = I_{G2}
                 Parameter = I_{G1}

RSE0507-9