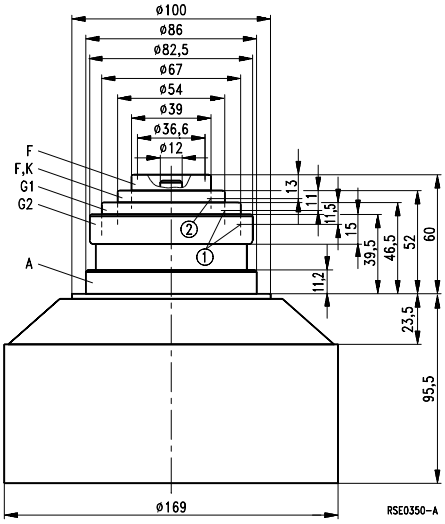
Coaxial metal-ceramic tetrode, forced-air-cooled or vapor-condensation-cooled, for frequencies up to 1000 MHz, particularly suitable for TV transmitters, band IV/V.

Forced-air-cooled version

RS 1092 L (TH 382)

Ordering code Q51-X1092



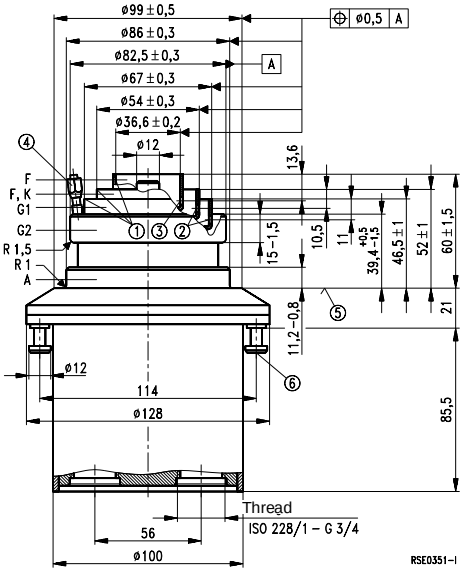
① 24 tapholes Ø 3
② 18 tapholes Ø 3

Approx. weight 7,2 kg

Vapor-condensation-cooled version

RS 1092 SK (TH 582)

Ordering code Q53-X1092



① R 0,5
② 24 tapholes Ø 3
③ 18 tapholes Ø 3
④ G2 cooling water connector
⑤ Tube support
⑥ Connection for tube handle

Approx. 5 kg

Heating

Heater voltage	U_F	3,9	V [1])
Heater current	I_F	≈ 134 / [2])	A
Heating: direct			
Cathode: thoriated tungsten			

Characteristics

Emission current at $U_A = U_{G2} = U_{G1} = 300$ V	I_{em}	40	A
Amplification factor of screen grid at $U_A = 2$ kV, $U_{G2} = 500$ to 800 V, $I_A = 3$ A	μ_{g2g1}	6,0	
Transconductance at $U_A = 2$ kV, $U_{G2} = 800$ V, $I_A = 2$ to 4 A	s	70	mA/V

Capacitances

Cathode/control grid	c_{kg1}	≈ 65	pF
Cathode/screen grid	c_{kg2}	≈ 3,30	pF
Cathode/anode	c_{ka}	≈ 0,07	pF [3])
Control grid/screen grid	c_{g1g2}	≈ 100	pF
Control grid/anode	c_{g1a}	≈ 0,39	pF [3])
Screen grid/anode	c_{g2a}	≈ 17,2	pF [4])

Accessories

RS 1092 L		Ordering code
Cavity band IV/V	TK8241	upon request

RS 1092 SK

Gasket	RöZub110	upon request

1) The heater voltage will be determined by the tube manufacturer for each individual application taking into account the respective operating conditions. The heater data specified above are guideline values.
2) For RS 1092 SK ≈ 138 A.
3) Measured by a Ø 50 cm screening plate in the screen-grid terminal plane.
4) Measured by a Ø 50 cm screening plate in the anode ceramic plane: $c_{g2a} = 14{,}0$ pF.

TV vision transmitter,
grounded control-grid screen-grid circuit, negative modulation, standard G

Maximum ratings

Frequency		f	1000	MHz
Anode voltage (dc)	(RS 1092 L)	U_A	6,5	kV
Anode voltage (dc)	(RS 1092 SK)	U_A	7,5	kV
Screen grid voltage (dc)	(RS 1092 L)	U_{G2}	800	V
Screen grid voltage (dc)	(RS 1092 SK)	U_{G2}	900	V
Control grid voltage (dc)		U_{G1}	– 200	V
Cathode current (dc)	(RS 1092 L)	I_K	4,5	A
Cathode current (dc)	(RS 1092 SK)	I_K	5,5	A
Peak cathode current		$I_{K\,M}$	22	A
Anode dissipation	(RS 1092 L)	P_A	12,5	kW
Anode dissipation	(RS 1092 SK)	P_A	25	kW
Screen grid dissipation		P_{G2}	120	W
Control grid dissipation		P_{G1}	50	W

Operating characteristics [1])

Frequency	f	800	800	MHz
Bandwidth (1 dB)	B	12	12	MHz
Output power, sync level	$P_{2\,SY}$	22	11	kW [2])
Gain	V_p	16	15	dB
Anode voltage (dc)	U_A	7,0	5,5	kV
Screen grid voltage (dc)	U_{G2}	800	600	V
Zero-signal anode current (dc)	$I_{A\,0}$	1,6	1,2	A [3]) [4])
Anode current (dc), black level	$I_{A\,SW}$	4,7	3,3	A
Screen grid current (dc), black level	$I_{G2\,SW}$	80	30	mA
Control grid current (dc), black level	$I_{G1\,SW}$	20	5,0	mA

1) Only for RS 1092 SK.
2) At cavity output.
3) For RS 1092 SK: Set with U_{G1} approx. – 110 V.
4) For RS 1092 L: Set with U_{G1} approx. – 100 V.

Amplifier for TV transmitters with common vision and sound carrier transmission, grounded control-grid screen-grid circuit, vision-to-sound ratio 10:1, standard G

Maximum ratings

Frequency		f	1000	MHz
Anode voltage (dc)	(RS 1092 L)	U_A	6,5	kV
Anode voltage (dc)	(RS 1092 SK)	U_A	7,5	kV
Screen grid voltage (dc)	(RS 1092 L)	U_{G2}	800	V
Screen grid voltage (dc)	(RS 1092 SK)	U_{G2}	900	V
Control grid voltage (dc)		U_{G1}	– 200	V
Cathode current (dc)	(RS 1092 L)	I_K	4,5	A
Cathode current (dc)	(RS 1092 SK)	I_K	5,5	A
Peak cathode current		$I_{K\,M}$	22	A
Anode dissipation	(RS 1092 L)	P_A	12,5	kW
Anode dissipation	(RS 1092 SK)	P_A	25	kW
Screen grid dissipation		P_{G2}	120	W
Control grid dissipation		P_{G1}	50	W

Operating characteristics [1])

Frequency	f	800	800	MHz
Bandwidth (1 dB)	B	12	12	MHz
Output power, sync level	$P_{2\,SY}$	10,5/1,05	5,25/0,525	kW [2])
Gain	V_p	15	15	dB
3-tone intermodulation ratio	a_{IM3}	48	52	dB
Anode voltage (dc)	U_A	6,0	5,5	kV
Screen grid voltage (dc)	U_{G2}	600	600	V
Zero-signal anode current (dc)	$I_{A\,0}$	1,0	1,2	A [3]) [4])
Anode current (dc), black level	$I_{A\,SW}$	3,3	2,6	A
Screen grid current (dc), black level	$I_{G2\,SW}$	50	30	mA
Control grid current (dc), black level	$I_{G1\,SW}$	30	10	mA

1) Only for RS 1092 SK.
2) At cavity output.
3) For RS 1092 SK: Set with U_{G1} approx. – 110 V.
4) For RS 1092 L: Set with U_{G1} approx. – 100 V.

Tube mounting

Axis vertical, anode up or down.

Spring contact rings are suitable connectors for cathode, control grid, screen grid and anode. The spring tension must be dimensioned such that the required power for inserting and withdrawing the tube remains below 150 N. Recommended pull-off power per spring contact ring is approx. 20 N.

Maximum tube surface temperature

The temperature of the electrode terminals and ceramic insulators must not exceed 300 °C (RS 1092 SK: 220 °C). For keeping below this maximum temperature an air flow is required to cool the terminal rings. For this purpose the terminal contacts must be designed for providing a uniform cooling effect.

Forced-air cooling (RS 1092 L)

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

Vapor condensation cooling (RS 1092 SK)

The cooling water diagram gives the minimum water flow rate (distilled or deionized water) for maximum anode dissipation, as well as pressure drop and water outlet temperature at 75 °C water inlet temperature. The diagram applies to a hermetically sealed cooling system with 1,5 bar overpressure at the tube’s cooling water outlet and with a maximum permissible water outlet temperature of 100 °C.

Operation with open cooling cycle (without overpressure) is also possible if the maximum outlet temperature remains below 70 °C (sea level, air pressure ≈ 1 bar) with lower inlet temperature and, if required, increased water flow rate.

Automatic heating power regulation

Recommendations for automatic heating power stabilization are contained in the instruction “UHF TV Tetrodes, Heating Power Adjustment”, which is supplied upon request.

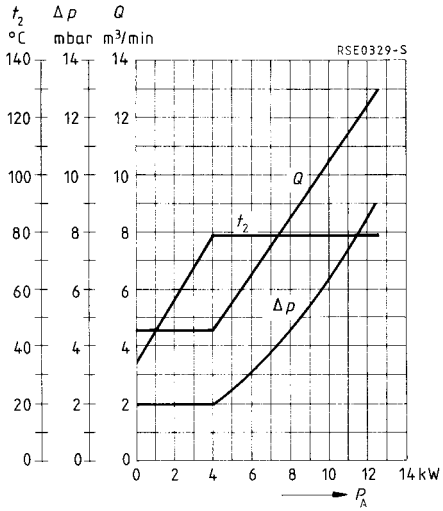
Safety precautions

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 Ø 0,18 mm should be used to test the anode overcurrent trip circuit.

Transmitter off-periods

Frequent switching of the heating reduces lifetime. So the heating (and cooling) should be left on during transmitter off-periods of up to two hours. Continuous heating with reduced power (black heating) should be provided for longer off-periods. Refer to “Explanations on Technical Data”.

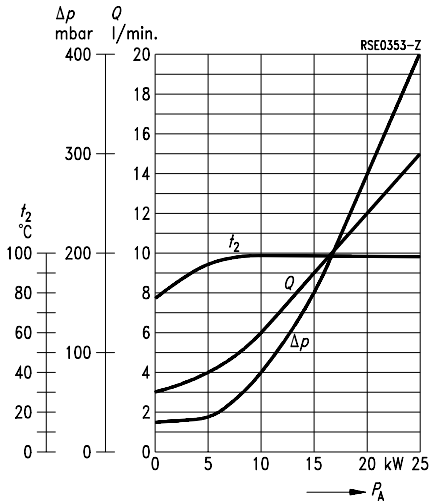
Cooling air diagram (RS 1092 L)



The cooling air is supplied from the electrode terminal side.

Air pressure = 1 bar
t_1 = 25 °C

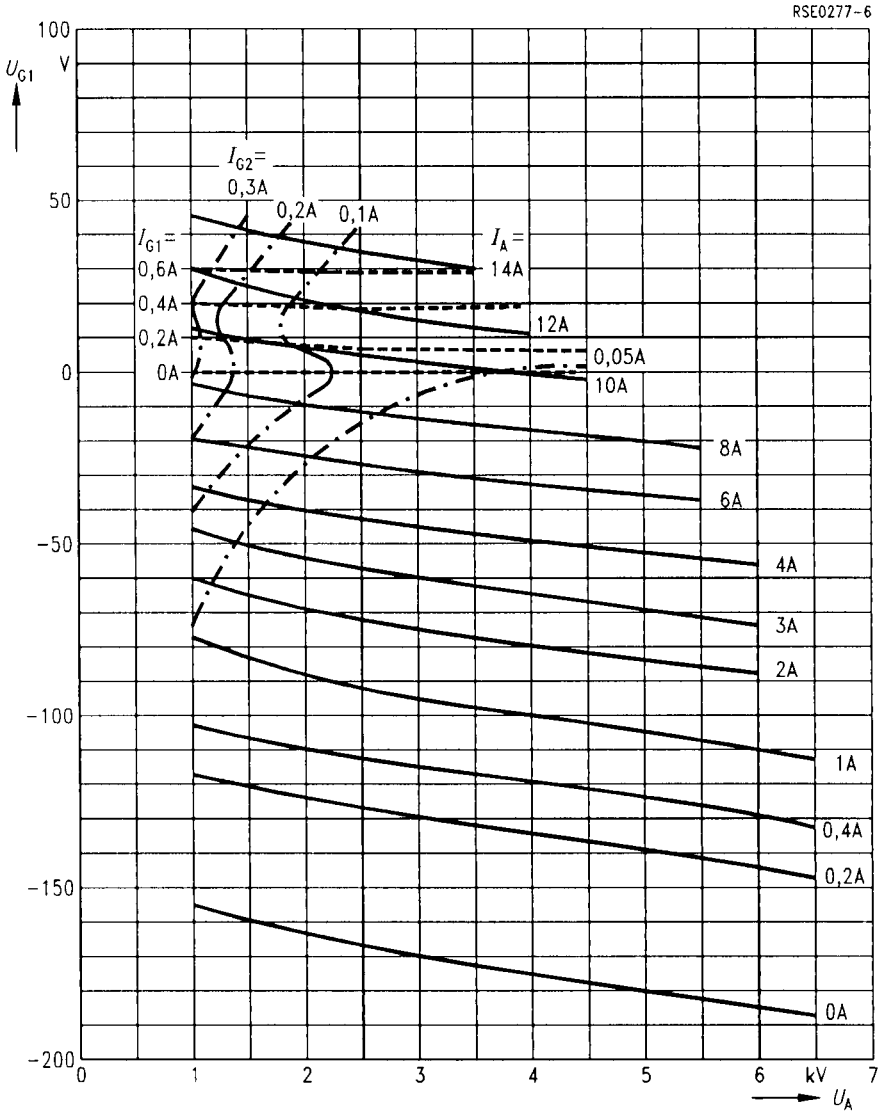
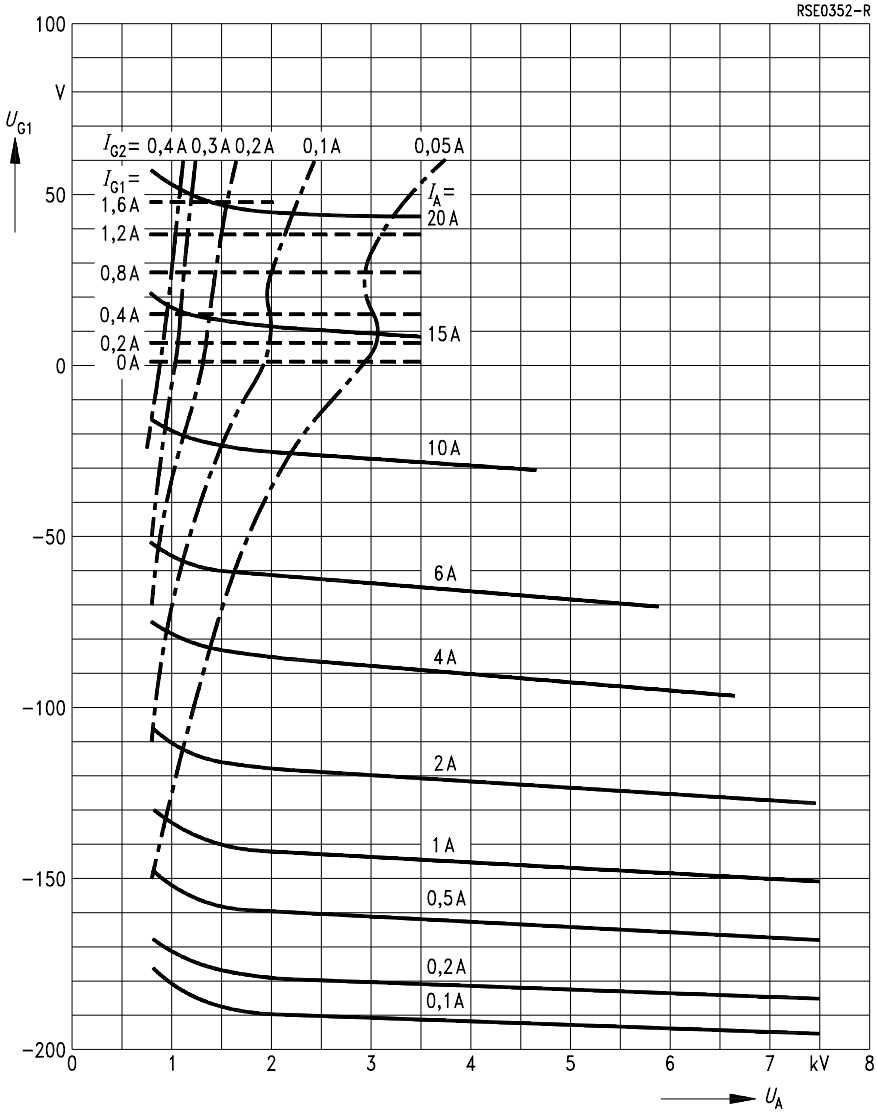
Cooling water diagram (RS 1092 SK)



Closed cooling cycle with distilled water.

Overpressure = 1,5 bar
t_1 = 75 °C

$U_{G1} = f(U_A)$ Parameter = I_A ————————
U_{G2} = 600 V Parameter = I_{G2} —∘—∘—∘—∘—∘—∘—
Parameter = I_{G1} — — — — — — —



$U_{G1} = f(U_A)$ Parameter = I_A ————————
U_{G2} = 800 V Parameter = I_{G2} —·—·—·—·—·—·—
Parameter = I_{G1} — — — — — — —