


SIEMENS

RS 2024 CL
10 kW
Metal-Ceramic Tetrode



A new forced-air cooled power tetrode
power gain 25 dB operation up to 100 MHz
with solid-state driver

Properties

The RS 2024 CL is a metal-ceramic power tetrode designed for frequencies up to 300 MHz. The screen grid, control grid and cathode terminals are arranged in coaxial form. Its low grid-plate capacitance makes the RS 2024 CL especially suitable for grounded cathode circuits up to 110 MHz in frequency-modulated VHF broadcast transmitters.

The RS 2024 CL features a rugged electrode construction especially resistant to vibration. The use of seamless drawn molybdenum tubes with punched apertures for the control and screen grids allows precise grid manufacture. This type of grid design offers the tube user the following important advantages:

1. With a suitable combination of grid apertures and stiffening struts, the stability and hence reliability of the punched grid considerably exceeds that of conventional wire grids.
2. The punched holes of the screen and control grids are exceptionally true to size and can be reproduced in fabrication. This results in constant characteristic curves and consequently very small spreads.

The RS 2024 CL contains the well-proven mesh cathode used for many years in Siemens power tubes. Together with its tubular molybdenum supports, this cathode represents a very robust construction. Fig. 1 shows the grid-cathode structure.

Application

As a typical application for the tetrode RS 2024 CL, fig. 3 shows the circuit diagram of a 10 kW power amplifier for a VHF FM broadcast transmitter covering the frequency range 87 to 108 MHz.

Because of its low grid-plate capacitance, the RS 2024 CL can be operated in the grounded cathode configuration up to 110 MHz. The required drive power of only 30 W can be supplied from a solid-state source.

The grid circuit can be tuned with the inductance L1. The capacitor C1 matches the grid circuit to the characteristic impedance of the input line. L2 tunes the plate circuit, and with L3 the output coupling can be adjusted.

The grid and plate circuits can take the form of a cavity. At VHF frequencies, the use of lecher lines and discrete components is also possible. As the RS 2024 CL requires relatively low drive power, little heat develops in the grid circuit. This allows the use of small components. One particularly good technical and economic solution is to use printed circuits for the grid circuit as shown in fig. 4. The complete input circuit for a 10 kW VHF output stage is located on a circular disc 30 cm in diameter. The lower part of the unit contains the RS 2024 CL.

Technical data RS 2024 CL

General data (preliminary)

Filament Characteristic values

$E_f = 10\text{ V}$	$I_e = 35\text{ A}$ at $E_b = E_{c2} = E_{c1} = 300\text{ V}$
$I_f = 86\text{ A}$	$\mu_{g1g2} = 8$ at $E_b = 2\text{ kV}$, $E_{c2} = 600$ to 1000 V , $I_b = 2\text{ A}$
	$S = 53,000\ \mu\text{mhos}$ at $E_b = 2\text{ kV}$, $E_{c2} = 800\text{ V}$, $I_b = 1.5$ to 2.5 A

Directly heated thoriated tungsten cathode

Capacitances

C_{ag2}	22	pF
C_{g1g2}	115	pF
C_{kg2}	5.5	pF
C_{kg1}	78	pF
C_{ag1}	0.32	pF
C_{ak}	0.04	pF

Fig. 1 Grid-cathode structure of the RS 2024 CL

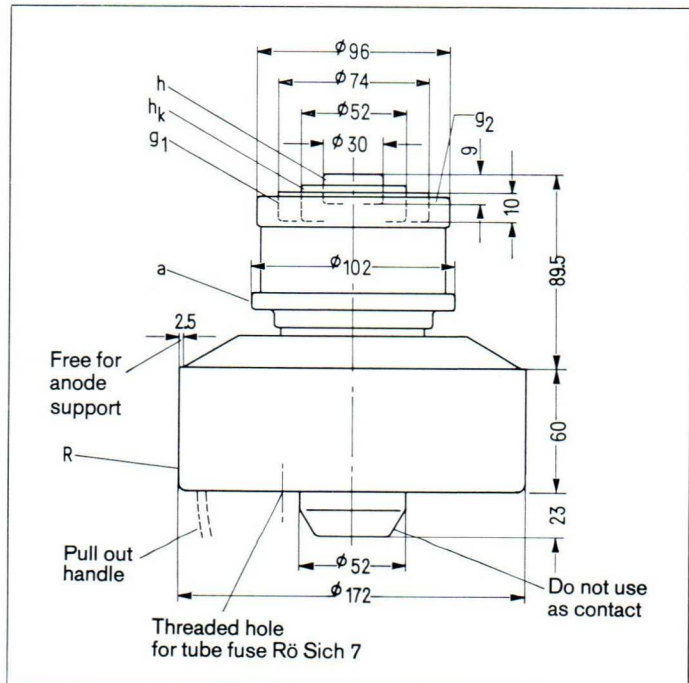


Fig. 2
Outline drawing RS 2024 CL
Dimensions in mm

