

Report No. 9003

Measurement of the electromagnetic
shielding effectiveness

RFI Tecnorack cabinet 38U/600x800

(with connection plate, shortened reardoor and ventilation louvers in front- and reardoor)

Report submitted by: Dipl.-Ing. C. Binder

Summary

This report contains the results of measurements of the shielding effectiveness of a *38U Tecnorack "HF" cabinet* (with connection plate, shortened reardoor and ventilation louvers in front- and reardoor) manufactured by Schroff GmbH in Straubenhardt. The test setup and measurement methods were based on the VG specification 95373 part 15. Shielding effectiveness was determined for the frequency range 30MHz to 1GHz.

In the frequency range 30 MHz to 50 MHz shielding of the case is above 70dB. In the frequency range 50 MHz to 300 MHz the levels average about 60dB. Above 300 MHz, shielding effectiveness falls just below 20dB. Above 900MHz, shielding effectiveness drops to 20dB.

Test setup

The tests were carried out in a shielded anechoic chamber lined with absorbers of 1m length (useful volume approx. $12 \times 4.5 \times 5 \text{ m}^3$). The test equipment used was test receiver ESVP, signal generator SMS, and spectrum monitor EZM from Rohde & Schwarz used as a control and a power amplifier 10W1000 from Amplifier Research. The biconical antenna BBA 9106 (30-300MHz) and the logarithmic-periodical antenna UHALP 9107 (300-1000MHz) from Schwarzbeck used as transmitting antenna. Fig. 1 (page 4) is a diagramm of the test setup used for measuring the shielding performance.

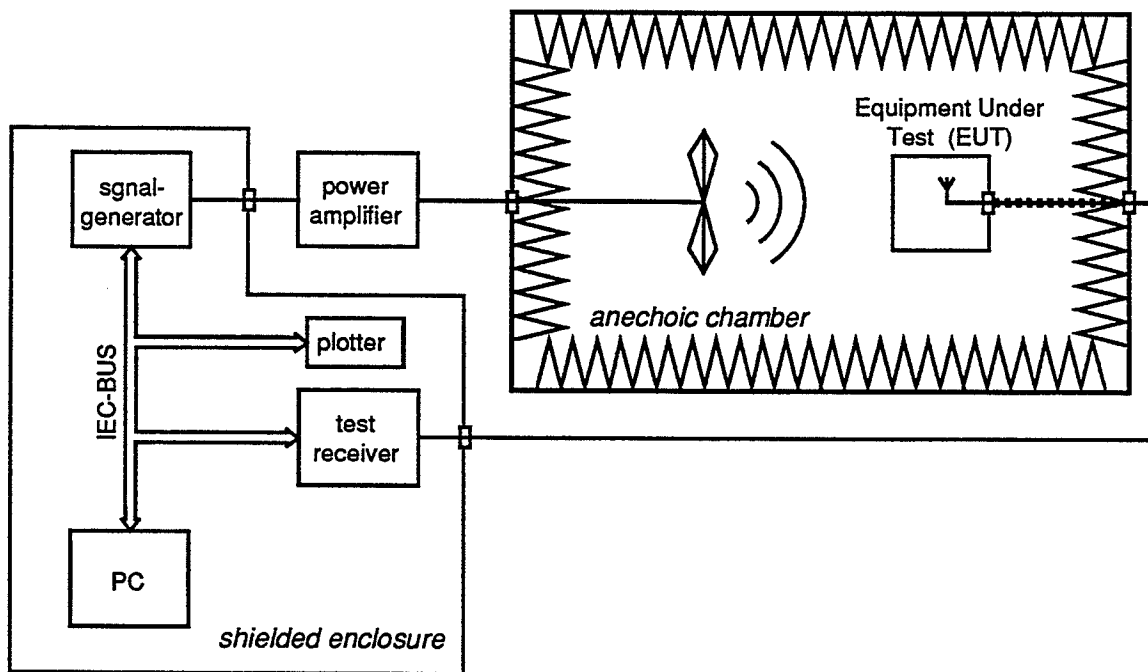


Fig. 1: Diagramm of test setup

The Equipment Under Test (EUT) was placed on a turnable table of 45cm height. The distance of the EUT from the antenna was 3m; the transmitting antenna was vertically polarized. A receiving antenna which was small compared with the cabinet was mounted in the center of the test object.

Measurement methods

The shielding effectiveness was determined in the frequency range 30MHz to 1GHz and thus serves to assess the shielding performance of the cabinet against electromagnetic fields.

The first results were the maximum measurable shielding effectiveness with above mentioned test setup.

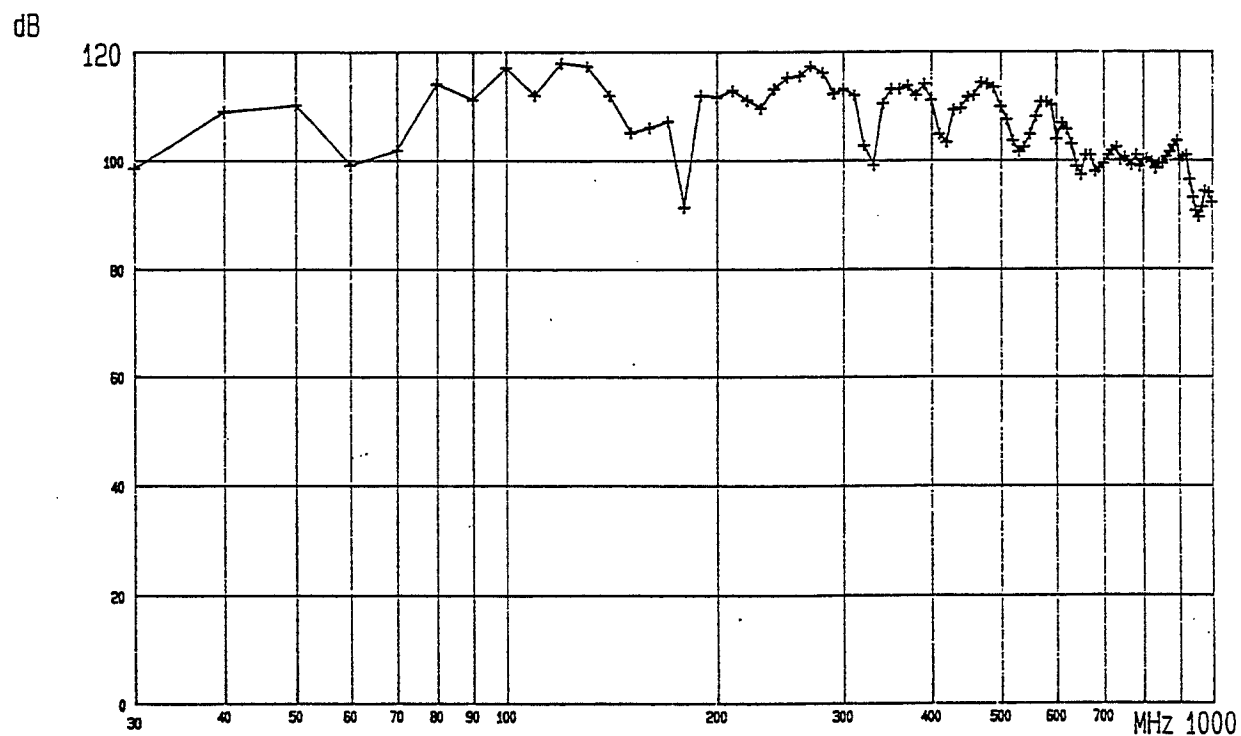


Fig. 2: Dynamic range

The (higher) field intensity level E_{dB} without *EUT* was tested with the test receiver. Then the (lower) field intensity level E_{dB}^* was measured in the *EUT* at the same frequencies and the same transmitter levels. The difference between field intensity level E_{dB} and field intensity level E_{dB}^* represents the shielding effectiveness:

$$a_S = E_{dB} - E_{dB}^* \quad \text{in dB.}$$

The *EUT* was measured from all sides. The results are summarized on pages 7 to 10.

Test results

Test report no.: 9003

Date: 22. 07.1992

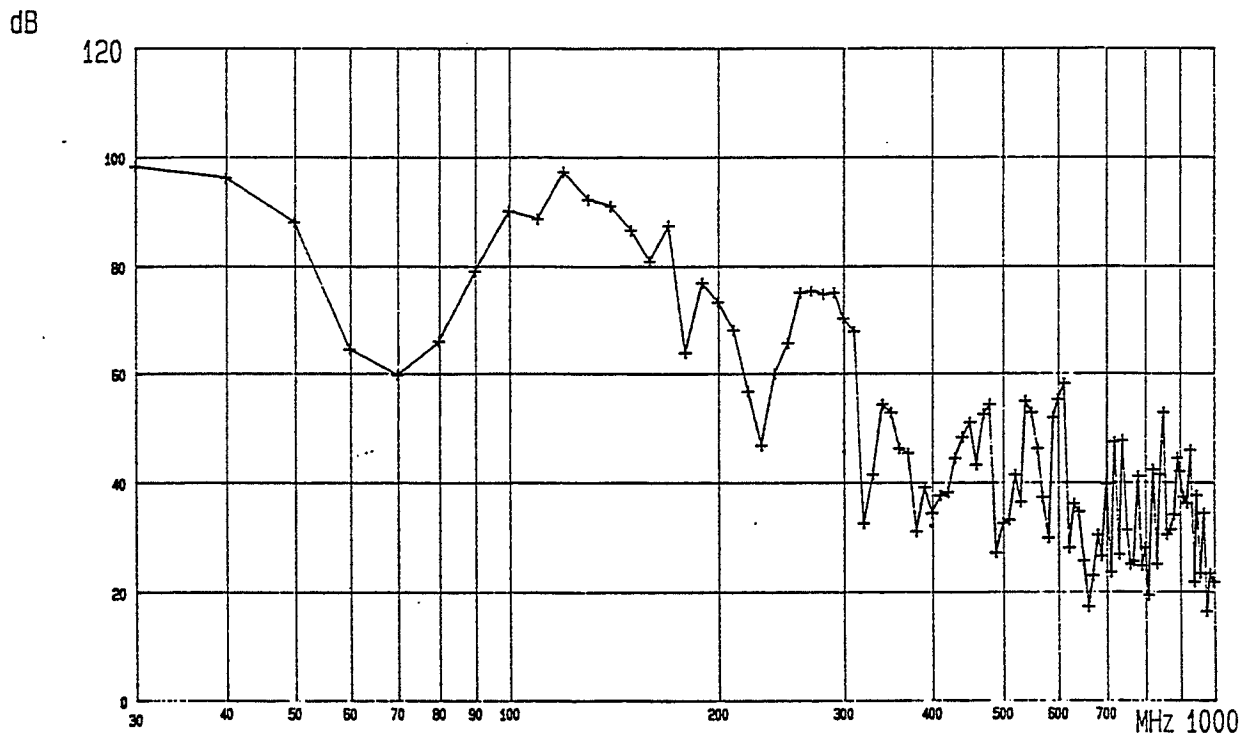
For: Schroff GmbH, Straubenhardt

EUT: 38U Tecnorack "HF" cabinet

Test description: Measurement of electromagnetic shielding effectiveness

Test specification: based on VG 95373 part15

Orientation of EUT: front



Test results

Test report no.: 9003

Date: 22. 07.1992

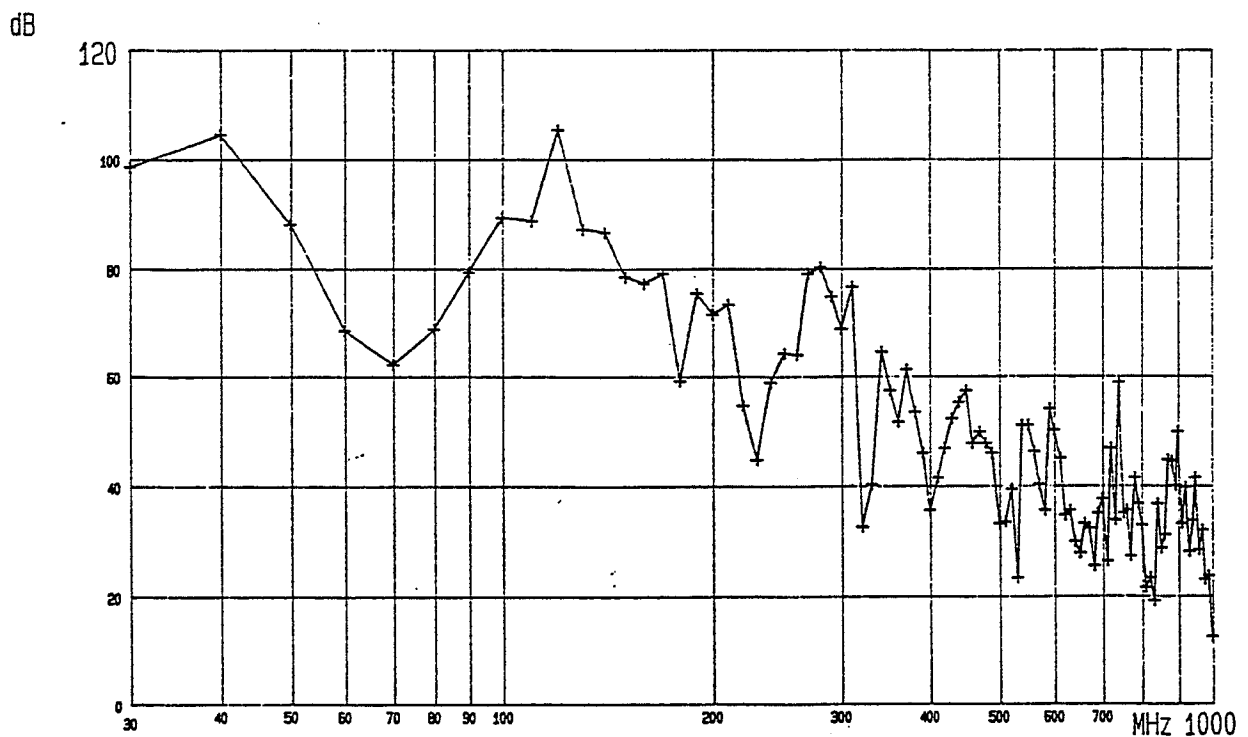
For: Schroff GmbH, Straubenhardt

EUT: 38U Tecnorack "HF" cabinet

Test description: Measurement of electromagnetic shielding effectiveness

Test specification: based on VG 95373 part15

Orientation of EUT: back



Test results

Test report no.: 9003

Date: 22. 07.1992

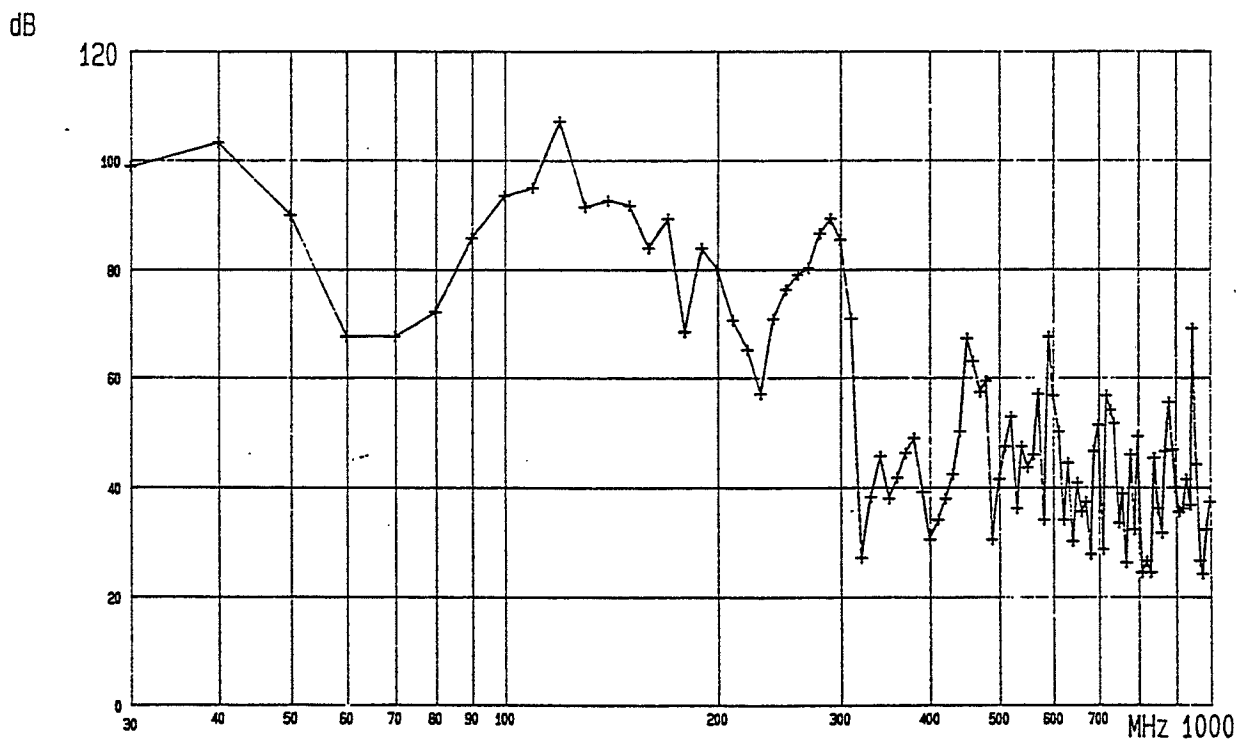
For: Schroff GmbH, Straubenhardt

EUT: 38U Tecnorack "HF" cabinet

Test description: Measurement of electromagnetic shielding effectiveness

Test specification: based on VG 95373 part15

Orientation of EUT: right side



Test results

Test report no.: 9003

Date: 22. 07.1992

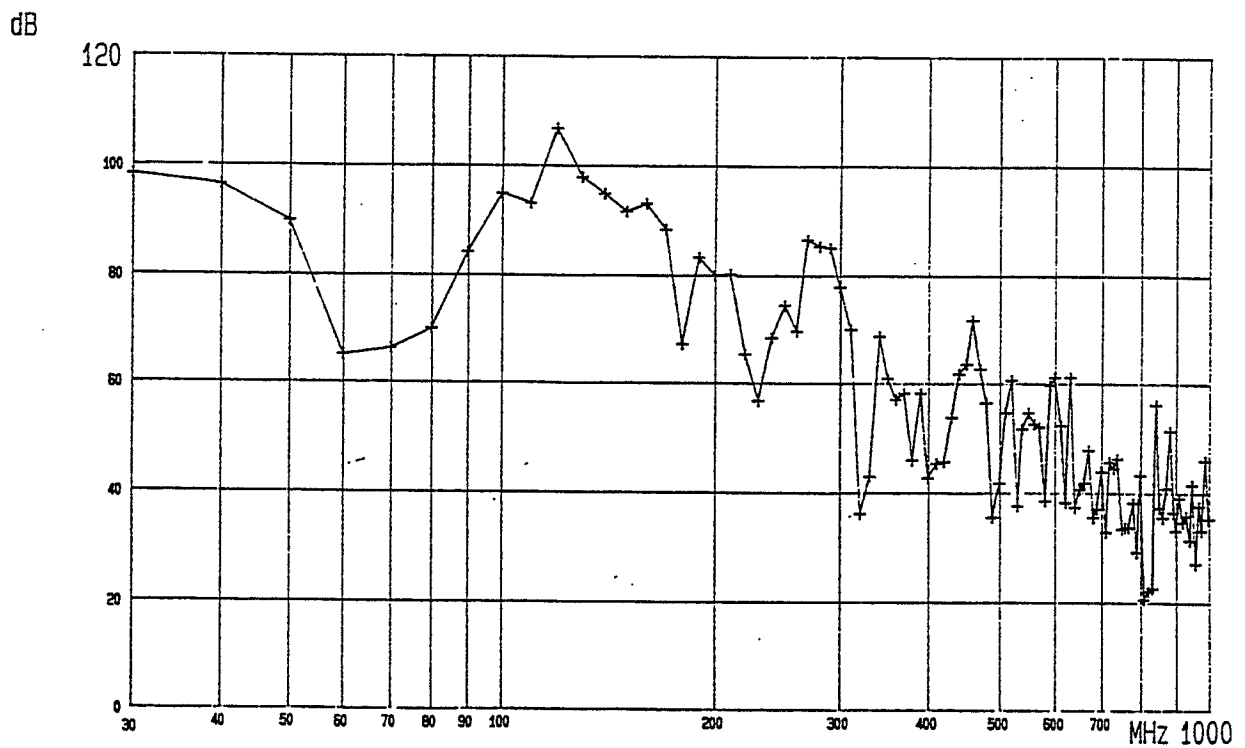
For: Schroff GmbH, Straubenhardt

EUT: 38U Tecnorack "HF" cabinet

Test description: Measurement of electromagnetic shielding effectiveness

Test specification: based on VG 95373 part15

Orientation of EUT: left side



Karlsruhe, 22th July 1992

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