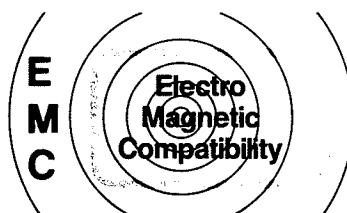


Measurement of electromagnetic screening

RFI in pac case 4 U/280 deep

(Part no. 10828-082 without RFI screening)



These investigations were carried out on behalf of
Schroff GmbH, Straubenhardt.

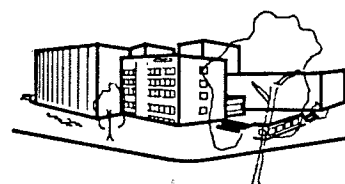
Summary

This report contains the results of the measurement of screening levels of a *4 U inpac case* (part no. 10828-082 without RFI screening) manufactured by Schroff GmbH in Straubenhardt. The test set-up and measurement procedure were based on the VG specification 95373 part 15. The screening level was determined for the frequency range 30 MHz to 1 GHz.

The screening of the case is above 90 dB at 30 MHz and reduces to approx. 70 dB at 200 MHz. In the frequency range 200 MHz to 950 MHz the levels average between 30 dB and 70 dB. Above 950 MHz the screening levels fall just below 20 dB.

Test arrangement

The test were carried out in a screened test room lined with 1 m long absorbers (usable volume approx. $12 \times 4 \times 4 \text{ m}^3$). The test equipment used was test receiver ESVP, signal generator SMS, a spectrum monitor EZM from Rohde & Schwarz used as a control and a performance amplifier 10W1000 from Amplifier Research. The double-cone antenna BBA 9106 (30 - 300 MHz) and the logarithmic-periodic antennae UHALP 9107 (300 - 1000 MHz) from Schwarzbeck served as transmitter antennae. Fig. 1 (page 4) is a diagram of the test set-up used for measuring the screening effect.



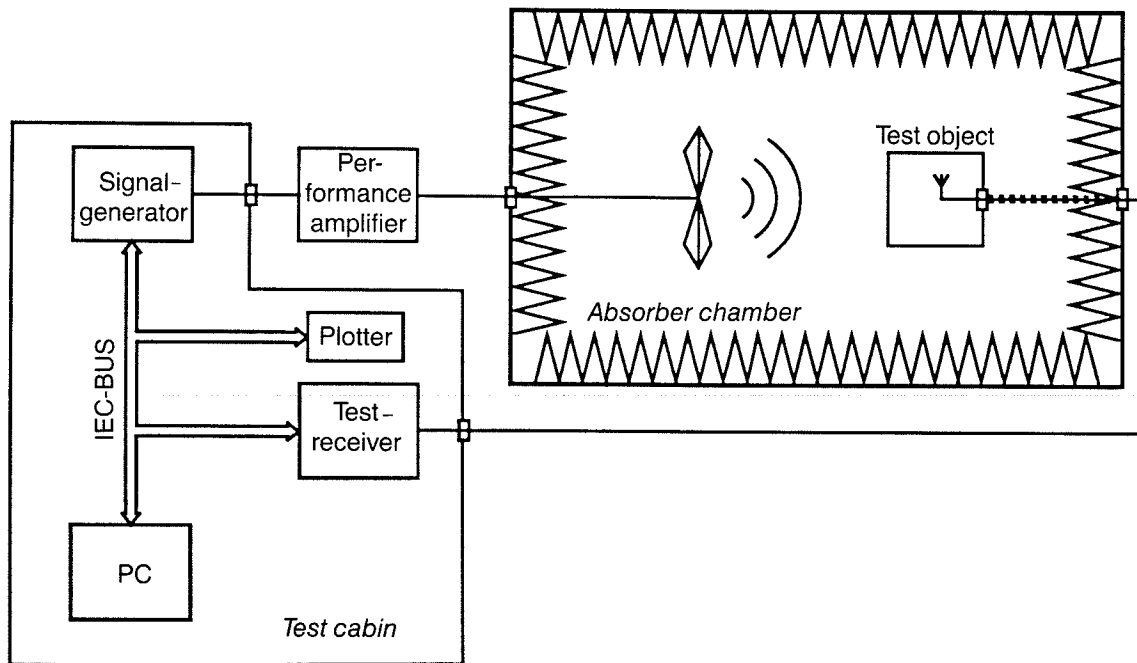
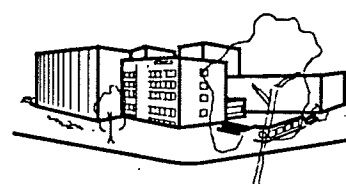


Fig. 1: Diagram of the test set-up

The test object was placed on a 1 m high wooden table (table surface). The distance of the test object from the antenna was 3 m; the transmitter antenna was vertically polarised. A receiver antenna which was small compared with the case was mounted in the centre of the test object.



Test procedure

The screening was determined in the frequency range 30 MHz to 1 GHz and thus serves as an assessment of the screening effect of the case against electromagnetic fields.

The first results were the maximum measurable screening with the above-mentioned test equipment. Fig. 2 shows the test dynamics obtained.

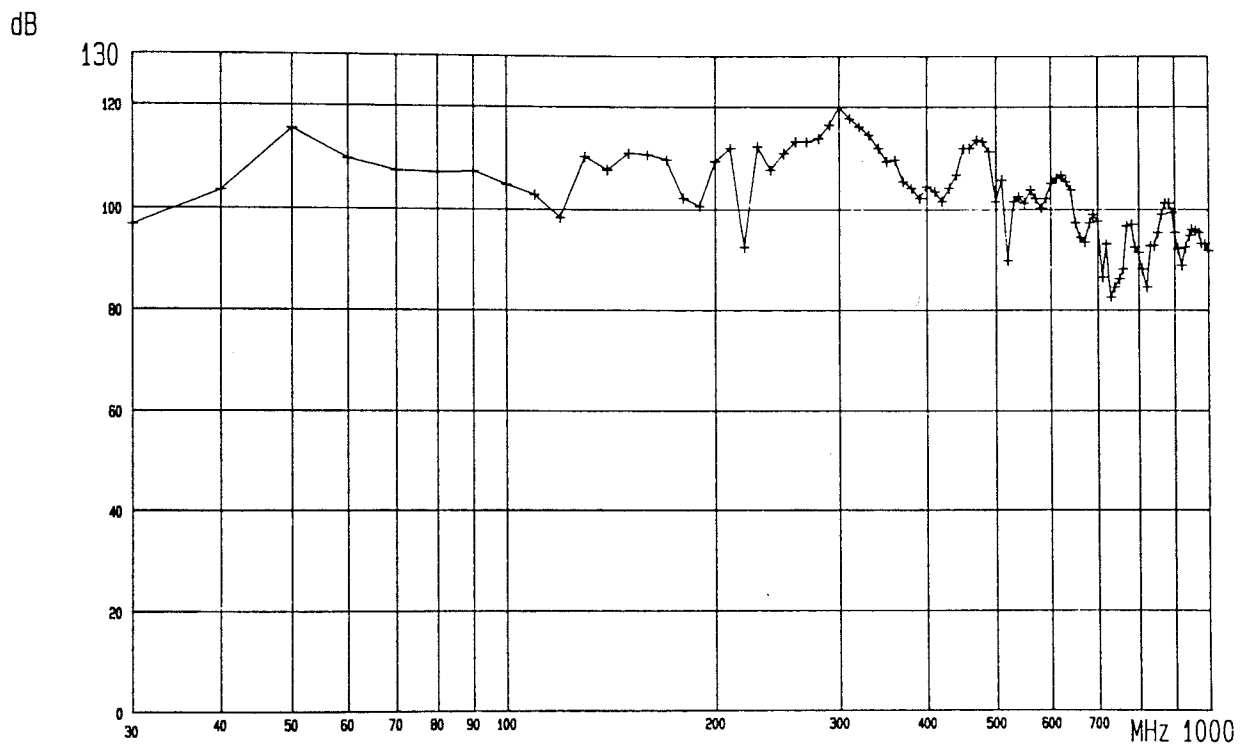
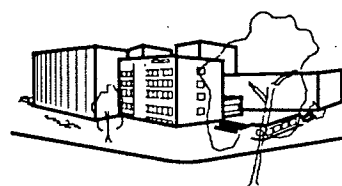


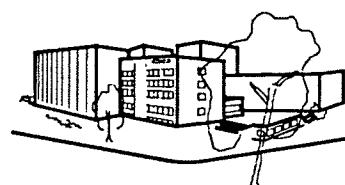
Fig. 2: Test dynamics



Then with the test receiver the (higher) field intensity level E_{dB} without the test object was tested. At the same frequencies and the same transmitter levels the (lower) field intensity level E_{dB}^* was measured with the test object. The values of the screening level a_S are the difference in the receiver levels:

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

The test object was measured from all six sides. The results are summarised on pages 7 to 12.



Test results

Test report no.: 8916

Date: 04. 07. 1989

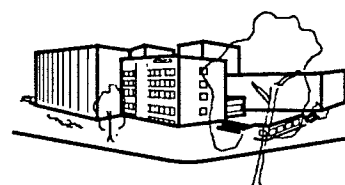
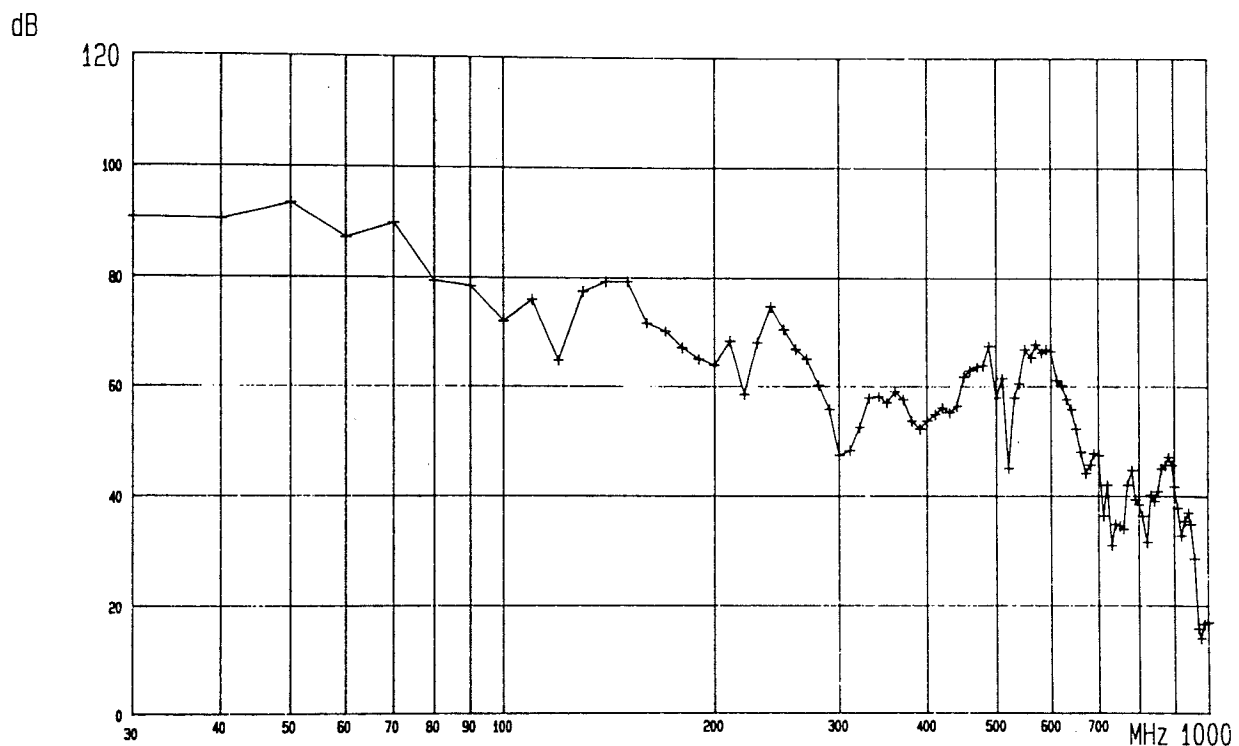
For: Schroff GmbH, Straubenhardt

Test object: 4 U/280 deep RFI inpac case
(Part no. 10828-082 without RFI screening)

Type of test: Measurement of electromagnetic screening

Test specification: based on VG 95373 part 15

Direction on test object: front



Test results

Test report no.: 8916

Date: 04. 07. 1989

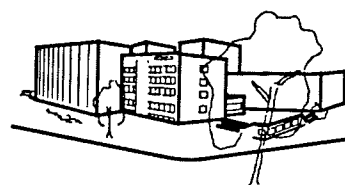
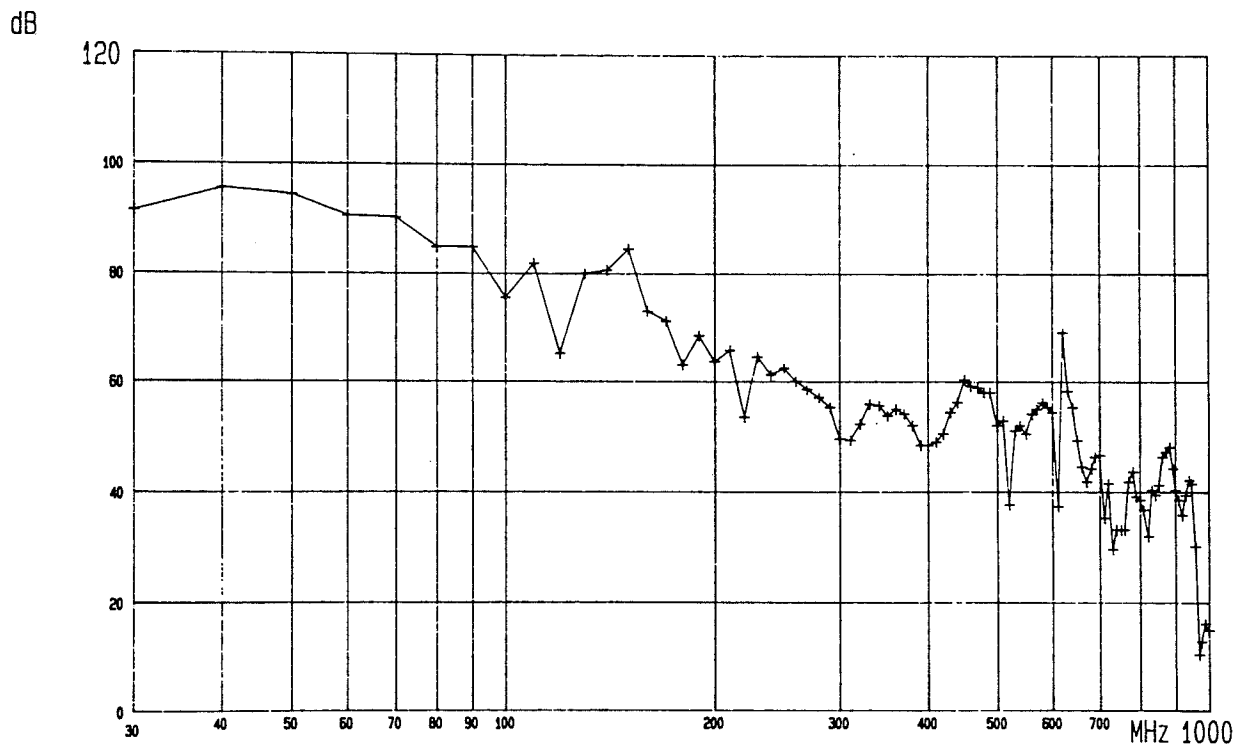
For: Schroff GmbH, Straubenhardt

Test object: 4 U/280 deep RFI inpac case
(Part no. 10828-082 without RFI screening)

Type of test: Measurement of electromagnetic screening

Test specification: based on VG 95373 part 15

Direction on test object: rear



Test results

Test report no.: 8916

Date: 04. 07. 1989

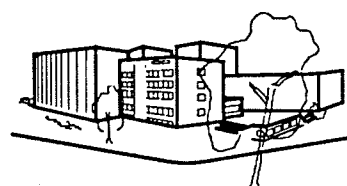
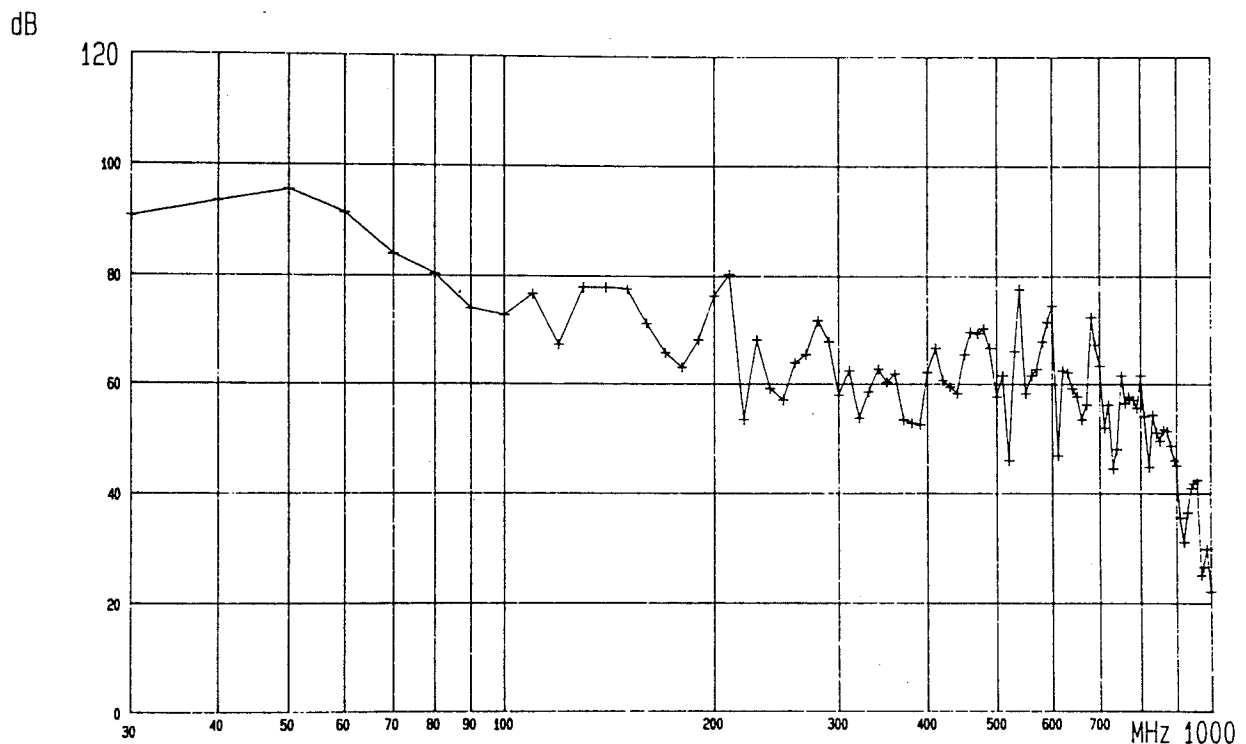
For: Schroff GmbH, Straubenhardt

Test object: 4 U/280 deep RFI inpac case
(Part no. 10828-082 without RFI screening)

Type of test: Measurement of electromagnetic screening

Test specification: based on VG 95373 part 15

Direction on test object: right side



Test results

Test report no.: 8916

Date: 04. 07. 1989

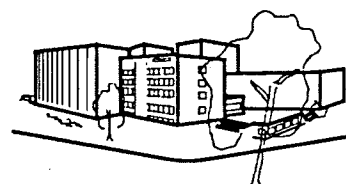
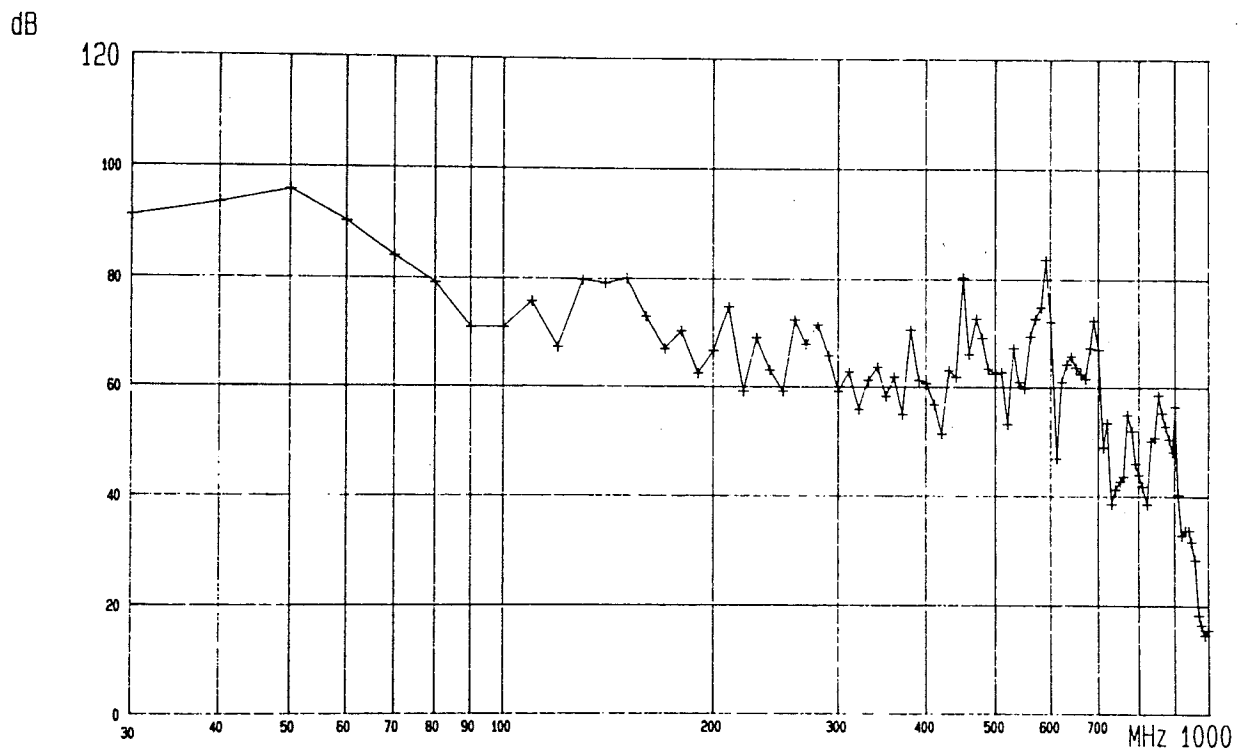
For: Schroff GmbH, Straubenhardt

Test object: 4 U/280 deep RFI inpac case
(Part no. 10828-082 without RFI screening)

Type of test: Measurement of electromagnetic screening

Test specification: based on VG 95373 part 15

Direction on test object: left side



Test results

Test report no.: 8916

Date: 04. 07. 1989

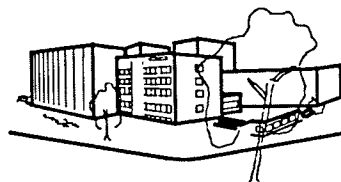
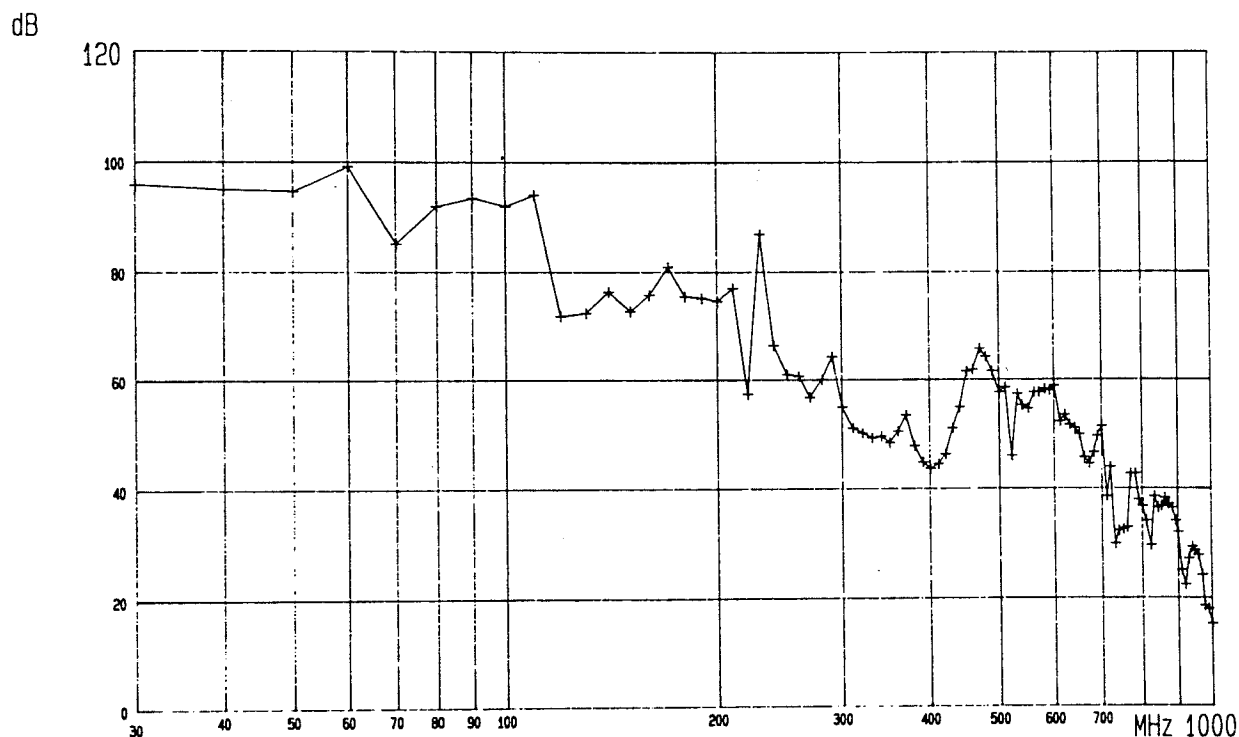
For: Schroff GmbH, Straubenhardt

Test object: 4 U/280 deep RFI inpac case
(Part no. 10828-082 without RFI screening)

Type of test: Measurement of electromagnetic screening

Test specification: based on VG 95373 part 15

Direction on test object: top



Test results

Test report no.: 8916

Date: 04. 07. 1989

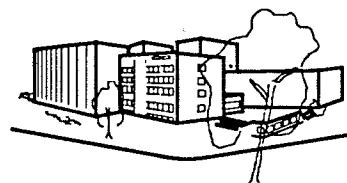
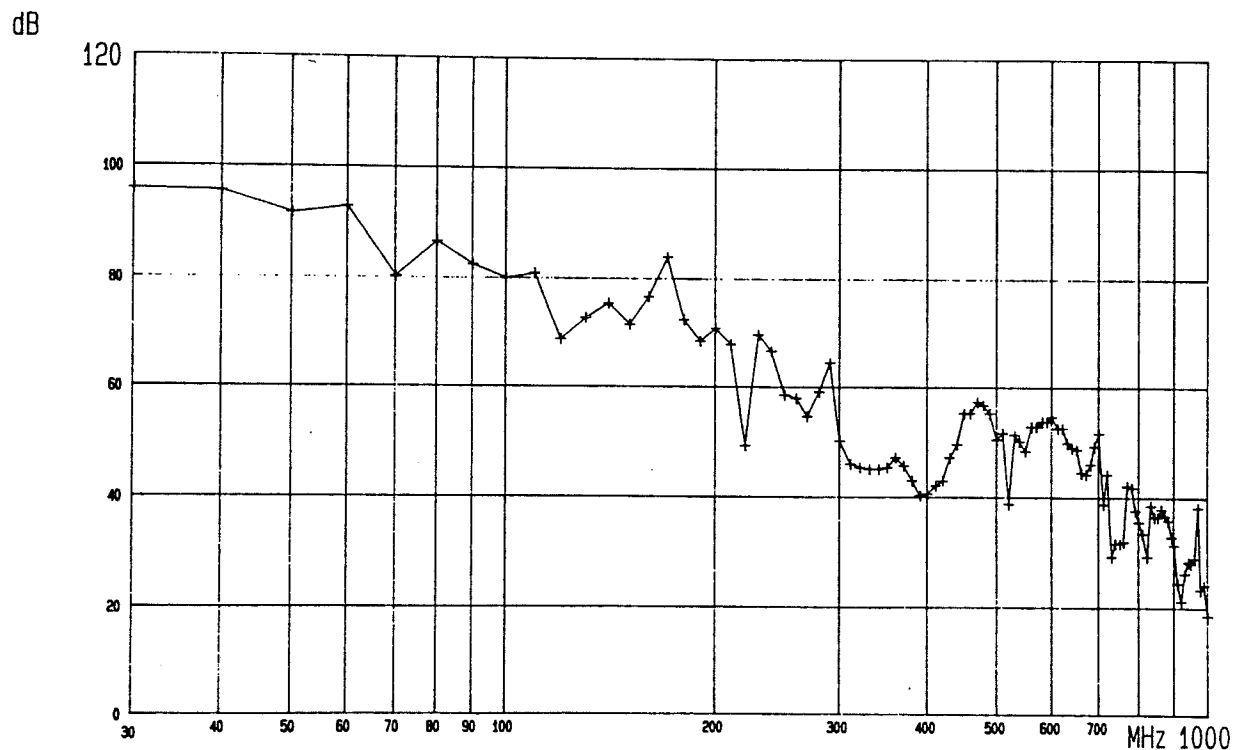
For: Schroff GmbH, Straubenhardt

Test object: 4 U/280 deep RFI inpac case
(Part no. 10828-082 without RFI screening)

Type of test: Measurement of electromagnetic screening

Test specification: based on VG 95373 part 15

Direction on test object: bottom



Karlsruhe, 4th July 1989

Thomas Benz

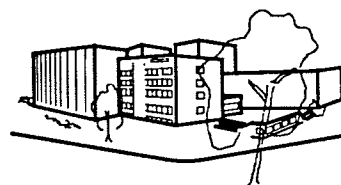
Dipl.-Ing. Th. Benz

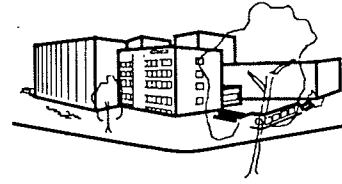
Carsten Binder

Dipl.-Ing. C. Binder

Alf. J. Schwab

Prof. Dr.-Ing. A. Schwab





Report no. 8916

*Measurement of electromagnetic
screening*

RFI in pac case 4 U/280 deep

(Part no. 10828-082 without RFI screening)

Report issued by: Dipl.-Ing. Th. Benz

Dipl.-Ing. C. Binder