

**INSTRUMENTS** HIGH SPEED EMISSION MEASUREMENTS

Radio Frequency and Microwave Technology

Gauss Instruments ultra-high-speed analogue-to-digital converter systems incorporate impedance controlled multi-layered technology with up to 12 layers. This technology requires special high-performance analogue and mechanical components.

Such high performance systems are assembled in mechanically precise, environmentally controlled manufacturing enclosures and machined from a single piece of aluminium. This results in excellent heat dissipation performance and best long-term stability over many years of operation.

The TDEMI Measurement Systems in the upper GHz range use analogue circuits with excellent RF performance for the front-end.

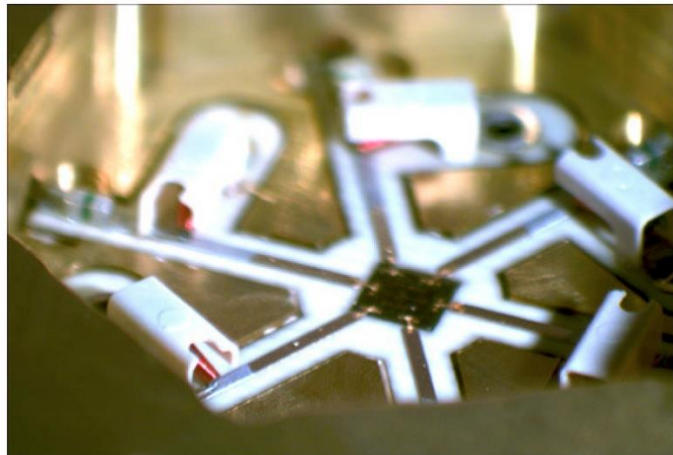


Fig. 40 – Switch for the frequency range up to 26.5 GHz.

Width of micro- strip line < 0.2mm, ribbon bond wire connecting the transmission line with the die.

Such circuits have been developed and optimised especially for the application in EMC measurements. In Fig. 40, a part of a multi-channel switch for the frequency range up to 26.5 GHz is shown. Special thin-film substrate and bare die monolithic integrated circuits enable the desired high performance.

The complete mounted circuits are assembled in enclosures made of gold-plated brass which provides excellent RF characteristics. In the upper frequency range filter, a specific mixer and set of switches are used which exhibit excellent RF performance. For example, the pre-selection up to 26.5GHz uses filters with a loss of less than 1 dB. Filters with low dispersion allow excellent impulse response for broadband signals.

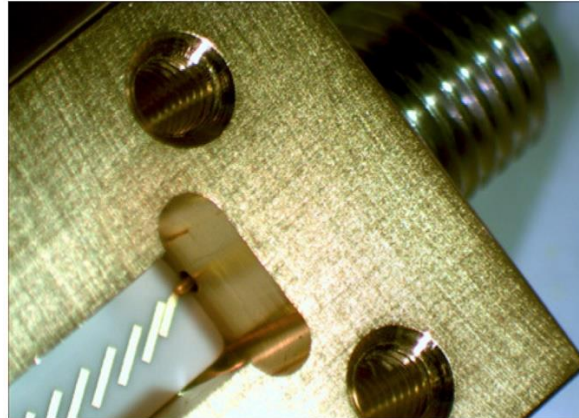


Fig. 41 – Bandpass filter in mm-wave rang.

Gaps between microstrip lines $< 20 \mu\text{m}$ compared to screw thread of size M2 and connector typ K in the upper corner on the right hand side.

Fig. 41 shows a bandpass filter. For the development of such circuits very powerful simulation tools are used. The filters are manufactured on special thin-film ceramic substrates which are assembled in gold-plated precision enclosures finally.

Emission measurements in the frequency range can be carried out on open area test sites (OATS) or in anechoic chambers. Fig. 42 shows a fully anechoic chamber for testing of frequencies up to 20 GHz. To compensate the missing tips of the absorbers the room is completely cladded with special ferrite tiles.

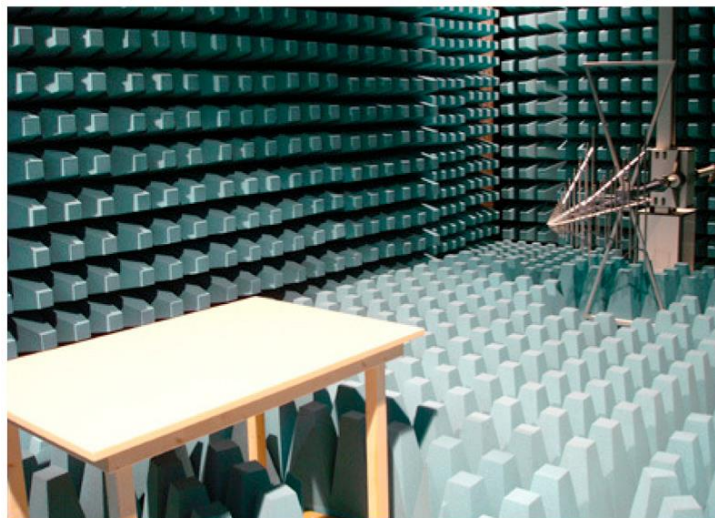


Fig. 42 – Fully anechoic chamber. The emission measurement is performed on a turntable in distance of 3 m. For diagnostic pre-investigation near field probes (E-Field probes and H-Field probes) can be used.