Quality features of the near-field probes from Langer EMV-Technik GmbH

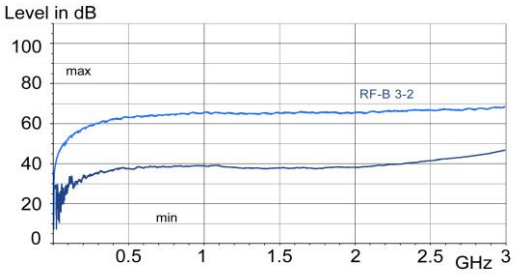
The near-field probes from Langer EMV-Technik GmbH are of a consistently high quality. Two characteristics are crucial for a reliable assessment of a near-field probe's quality:

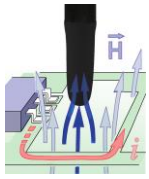
1. Constant sensitivity over a wide range of frequencies

A probe's constant (defined) sensitivity ensures the correct representation of the frequency spectrum of the magnetic field emitted by the device under test. Points of resonance and other irregularities in the frequency curve of the near-field probe falsify the measurement results and mislead the developer. A near-field probe must have a consistent, almost constant frequency response to allow the developer to find and implement expedient EMC measures for the device under test as a prerequisite for successful interference suppression in modules.

2. Great ability to suppress electric fields (magnetic-field probes)

The near-field probes must allow the clear and separate measurement of a module's electric fields (which are generated at switching transistors in the power supply unit, for example) and magnetic fields (which are caused by currents in blocking capacitors, for example). Thanks to the magnetic-field probe's design, the impact of electric fields is suppressed (E-field suppression). The quality of E-field suppression is decisive for a magnetic field probe.





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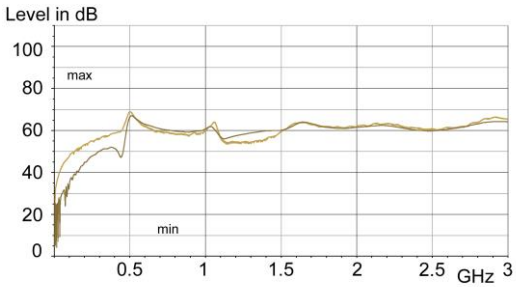

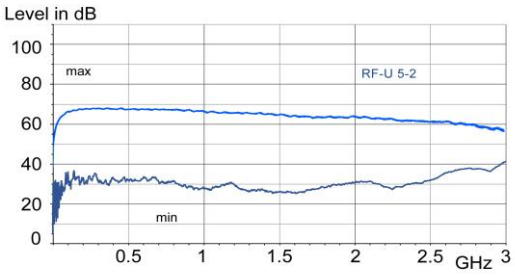

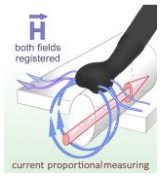

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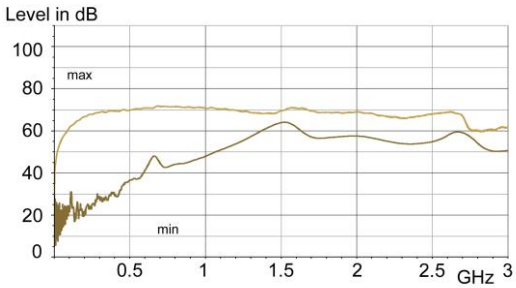

Test set-up

The frequency responses of two near-field probes of the same type are measured on a micro-stripline (2 mm wide, 50 Ohm termination, 50 µm gap between the near-field probe and the micro-stripline, 100 dBµV supply) by way of example. The micro-stripline generates both electric and magnetic fields so that its E-field suppression can be tested along with the probe's frequency response. During the test, the magnetic field probes are placed in the maximum and in the zero point of the magnetic field.

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Evaluation

When comparing the maximum curves, near-field probes from Langer EMV-Technik GmbH show a consistent curve while the curves of comparable probes of the same type show irregularities.

The maximum curve results from turning the probe's opening so that it takes up the maximum number of magnetic-field lines (maximum of the stripline's magnetic field).

The minimum curve results if no magnetic field lines enter the probe opening and the magnetic field can practically no longer be measured. What is then measured is caused by the electric field (the stripline's magnetic field has no effect on the magnetic field probe).

The quality of E-field suppression is characterised by the difference between the maximum and minimum curve. The near-field probes from Langer EMV-Technik GmbH ensure an E-field suppression of at least 20 dB over the entire frequency range.

Correction curves are available to compensate any residual deviations of the Langer EMV near-field probes. These correction characteristics are delivered together with the near-field probes from Langer EMV-Technik GmbH. They are used to convert the probe's output voltage to the corresponding magnetic field or to the current flowing through the conductor.

The near-field probes from Langer EMV-Technik GmbH prevent the developer from being misled by electric fields.

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