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Data Sheet

Pro Series

RadiSense® 10

Electric Field Probe

Models - RSB2110I | RSB2110S

Accurate | High Speed | Wide Band

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The most accurate E-field probe

Accurate | **Best Isotropy** | **Wide Band**

Built on patented technology that significantly improves isotropic performance, the RadiSense® RSB2110 Series is the world's most accurate E-field probe. The probe enables precise E-field strength measurements across a wide frequency range from 9 kHz to 10 GHz.

Why is accuracy important? To perform correct radiated immunity (susceptibility) tests, the absolute electrical field strength must be measured accurately. This is important during actual testing, as well as during verification (substitution test) and during 1-, 4- or 16-point calibrations. Based on these measurements, the power to be provided by the signal generators and power amplifiers is determined. If the E-Field probe measurements are too high or too low, the system is either over-testing or, worse, under-testing. As a result, the required test level defined by the standard is not met. If EUT /product issues then occur in the field, this can lead to significant costs for recalls and re-testing.

What influences accuracy? Firstly, the size of the probe, the smaller the probe the better. Secondly, the shape of the probe. The spherical shape of the probes improves the isotropic response and in turn the accuracy. Furthermore, aspects like amplitude linearity, frequency response and temperature drift of the probe, are important parameters. But, most of all the accuracy is determined by the anisotropy of the probe.

How does anisotropy cause inaccuracy? Anisotropy of E-field probes is rather underexposed. The isotropic response is the dependency of the measured field strength in relation to the position of the probe in the electric field. The lower this dependency, the better. During testing even in an fully anechoic chamber (certainly in a semi-anechoic chamber), the surrounding walls, floor and ceiling will cause reflections. These reflections arrive at the probe from different angles resulting in large and unpredictable measurement errors. These errors can be significant when a probe has a high anisotropic behaviour. This behaviour is often specified below 1 GHz, while the anisotropic behaviour will cause substantial measurement errors specifically at higher frequencies. Due to its superior design, the anisotropic behaviour of the RadiSense® 10 is the lowest in the world, making it the most accurate E-field probe available on the market.

How is accuracy achieved? The RadiSense® 10 uses a spherical design with six antenna elements and a laser power supply, providing an extremly small measuring volume. Patented technology is used to optimize the anisotropic behaviour.

Due to its unique antenna design, the RadiSense® 10 covers a wide frequency range from 9 kHz (20 MHz) to 10 GHz and is usable up to 12 GHz. This makes the RadiSense® 10 ideal for nearly all radiated immunity test applications. The RadiSense® 10 offers a maximum speed of 100 isotropic measurements per second, enabling fast measurements for all EMC test applications like: automotive, military/aerospace, industrial and telecom testing in anechoic or reverberation chambers.

Internal calibration data The frequency response calibration data of the X, Y and Z axis can be stored as user correction data within the probe. As a result there is no need to apply frequency dependent corrections for individual axes in software anymore. This feature results in a high accuracy and ease-of-use.

Performance[*]	RSB2110I	RSB2110S
Measuring range	0.1 to 750 V/m	
Damage Level (Max.)	1000 V/m	
Frequency range	9 kHz to 10 GHz (usable up to 12 GHz)	20 MHz to 10 GHz (usable up to 12 GHz)
Resolution	0.01 V/m	
Measurement speed (X,Y, Z & E_{tot})	100 measurements per second	
Accuracy[1,2]		
Frequency response	±1 dB (9 kHz to 10 GHz)	±1 dB (20 MHz to 10 GHz)
Anisotropy (IEEE 1309)[3]	< ±0.25 dB (9 kHz to 1 GHz) < ±0.5 dB (1 to 3 GHz) < ±1.0 dB (3 to 6 GHz) < ±2.0 dB (6 to 10 GHz)	
Linearity[4]	±0.5 dB | ±0.5 V/m	
Dimensions		
Shape of housing	Spherical	
Total electrical dimensions	4.9 * 4.9 * 4.9 cm (117 cm^3)	
Diameter of spherical housing	2.5 cm	
Environmental conditions (operating)		
Temperature range	0 to 40 °C	
Relative humidity	10 to 90% (non-condensing)	
Power consumption		
Optical laser power	Max. 500 mW λ 808 nm	
Laser safety class	Class 1M	
Calibration		
Calibration	According to ISO/IEC 17025 Optional: accredited calibration certificate	
Fibre optic interfaces & cables		
Connector laser	FC/PC fibre	
Connector data	ST/PC fibre	
Extension fibre length [5]	10, 20 or 30 m (up to 100 m on request)	
Safety		
Interlock	External Interlock & closed loop safety system	
Warranty	3 Years	

Specifications measured after 30 minutes warm-up time.

1) The overall measurement accuracy of a field probe is primarily determined by the measurement uncertainty of the calibration laboratory. This calibration uncertainty varies significantly between different calibration labs. Therefore, the specified accuracy of the probe does not include the measurement uncertainty of the calibration laboratory but refers solely to the accuracy and stability of the probe itself. To determine the overall measurement uncertainty, the root sum square of the specified accuracy of the probe and the stated measurement uncertainty of the calibration report must be calculated.

2) The specified accuracy is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

3) Anisotropy is the maximum deviation from the geometric mean as defined by IEEE 1309-2013.

4) Specified linearity is defined over a range of ± 6 dB from the reference point as defined in the IEC61000-4-3 standard.

5) The probe is delivered with 2.5 m fibre and a FC/ST in-line coupling set. Extension fibres sold seperately.