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Safety Test Solutions

Datasheet | Probe EFD-1891

Isotropic measurement of electric fields from 2 MHz to 18 GHz

using the Field Meter FieldMan®

The probe detects electric fields from 2 MHz up to 18 GHz. This area covers the frequencies used for broadcasting, as well as applications for telecommunications, satellite communications and radar technologies. The probe's high linearity and sensitivity make it ideal for checking human safety limit values in the general public and occupational environments. Two variants are available. A normal version with higher 50/60 Hz immunity and a version with fast response time and switchable integration time for pulsed signals.

The probe's interface digitally transmits the measurement data to the base unit, which has no individual influence on the measured values and therefore does not need to be calibrated. Probe calibration is carried out at several frequencies and is accredited for the entire range. The calibration data is stored in the probe and is automatically taken into account during the measurement. If the frequency of the predominating field strength is known, a correction factor can additionally be applied to increase the measurement accuracy.



- Isotropic (non-directional) measurement
- Excellent sensitivity starting at 0.6 V/m
- Wide True RMS range up to 65 V/m
- Fast response version available
- Digital probe interface - no more meter calibration
- Self-test of the probe interface with integrated sensor function test
- Automatic offset correction, no zero adjustment required
- Wide temperature range from -20 °C to +50 °C
- Accredited calibration included

Specifications [1]

Product Features		
Frequency range [2]	2 MHz to 18 GHz	
Type of frequency response	Flat	
Measurement range (nom.)	0.6 to 800 V/m (CW) 0.6 to 65 V/m typ. (True RMS)	0.1 µW/cm² to 170 mW/cm² (CW) 0.1 µW/cm² to 1.12 mW/cm² typ. (True RMS)
Dynamic range (nom.)	62.5 dB	
CW damage level (nom.)	1100 V/m	320 mW/cm²
Peak damage level (nom.) [3]	1400 V/m	520 mW/cm²
Sensor type	Diode based system	
Directivity	Isotropic (Tri-axial)	
Spatial assessment	3 separate axes	
Sampling rate / integration time (nom.)	**Part no. 2462/02**: 5 Hz / 265 ms (with higher 50/60 Hz immunity) **Part no. 2462/23**: 5 Hz / 265 ms and 900 Hz / 2.3 ms switchable	
Temperature sensors	Integrated sensors for displaying the ambient temperature and for automatic offset compensation	
Self-test	Interface function test and sensor test for short circuit and interruption of diodes	

Uncertainty		
Flatness of frequency response [4, 5] Calibration uncertainty not included	+1/-1.5 dB (10 MHz to 3 GHz) +2/-1.5 dB (>3 GHz to 11 GHz)	
Linearity deviation (nom.) Referred to 0.2 mW/cm² (27.5 V/m)	±2 dB (0.6 to 4 V/m) ±0.5 dB (4 to 300 V/m) ±2 dB (300 to 800 V/m)	±2 dB (0.1 to 4.2 µW/cm²) ±0.5 dB (4.2 µW/cm² to 24 mW/cm²) ±2 dB (24 mW/cm² to 170 mW/cm²)
Isotropic deviation [5]	±1 dB (10 MHz to 5 GHz) ±2.25 dB (> 5 GHz to 18 GHz)	
Temperature response (nom.) Referred to 0.2 mW/cm² (27.5 V/m) @ 100 MHz	+0.1/ -0.3 dB (0 °C to +50 °C, related to 23 °C) +0.1/ -0.8 dB (-20 °C to +50 °C, related to 23 °C)	

General Specifications		
Accredited calibration		DAkkS, ILAC-MRA (DIN EN ISO/IEC 17025, IEEE Std. 1309) For measurands outside the scope, a factory calibration is performed.
Recommended calibration interval		24 months
Operating temperature		-20 °C to +50 °C
Humidity		< 29 g/m³ (< 93 % RH at +30 °C), non-condensing
Ingress protection		IP54 (probe screwed on)
Climatic conditions	Storage	1K5 (IEC 60721-3) -40 °C to +70 °C
	Transport	2K4 (IEC 60721-3) -40 °C to +70 °C
	Operating	7K2 (IEC 60721-3) extended to -20 °C to +50 °C
Size		308 mm x 66 mm Ø
Weight		< 100 g
Country of origin		Germany

1 Unless otherwise noted specifications apply at reference condition: device in far-field of source, ambient temperature 23±3 °C, relative air humidity 25% to 75%, sinusoidal signal, probe sampling rate 5 Hz.
2 Cutoff frequency at typ. -3 dB.
3 Pulse length 1µsec, duty cycle 1:100.
4 Frequency response can be compensated for by the use of correction factors stored in the probe memory.
5 Results are calculated from the maximum and minimum response obtained during the full revolution about the stem of the probe, oriented 54.7° to the electric field vector.

Definitions and Conditions

Conditions

Unless otherwise noted, specifications apply after 30 minutes warm-up time within the specified environmental conditions. The product is within the recommended calibration cycle.

Specifications with limits

These describe product performance for the given parameter covered by warranty. Specifications with limits (shown as <, ≤, >, ≥, ±, max., min.) apply under the given conditions for the product and are tested during production, considering measurement uncertainty.

Specifications without limits

These describe product performance for the given parameter covered by warranty. Specifications without limits represent values with negligible deviations, which are ensured by design (e.g. dimensions or resolution of a setting parameter).

Typical values (typ.)

These characterize product performance for the given parameter that is not covered by warranty. When stated as a range or as a limit (shown as <, ≤, >, ≥, ±, max., min.), they represent the performance met by approximately 80% of the instruments. Otherwise, they represent the mean value. The measurement uncertainty is not taken into account.

Nominal values (nom.)

These characterize expected product performance for the given parameter that is not covered by warranty. Nominal values are verified during product development but are not tested during production.

Uncertainties

These characterize the dispersion of the values attributed to the measurands with an estimated confidence level of approximately 95%. Uncertainty is stated as the standard uncertainty multiplied by the coverage factor k=2 based on the normal distribution. The evaluation has been carried out in accordance with the rules of the “Guide to the Expression of Uncertainty in Measurement” (GUM).

Ordering Information

Digital Broadband Probe	Part number
Probe EFD-1891, E-Field, 2 MHz–18 GHz	**2462/02**
Probe EFD-1891, E-Field, Fast Response, 2 MHz–18 GHz	**2462/23**

Optional Accessories	Part number
Cable, Digital Probe Extension, 2m [6]	**2460/90.02**

[6] The device specifications apply without an extension cable.

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