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Made in Germany.

EN



Sonic 4000 RF

220 Hz to 4 GHz High Frequency Probe

Datasheet



Ihr Ansprechpartner /
Your Partner:

dataTec AG
E-Mail: info@datatec.eu

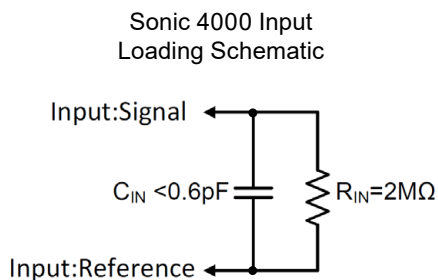
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About Sonic 4000 RF

The Sonic 4000 RF active probe offers best-in-class performance and is easy to use to make in-circuit measurements. With the Sonic 4000 RF's 220 Hz to >4 GHz bandwidth, high input impedance, low noise and $\pm 8\text{V}$ dynamic range makes it the ideal probe to use spectrum, network, RF analyzers or other 50Ω measurement system. The input capacitance of $<0.6\text{pF}$ parallel $2\text{M}\Omega$ between probe tip and probe reference ($1\text{M}\Omega$ to the oscilloscope ground) provides the highest impedance in its class to allow the probing of sensitive circuits without adversely loading the circuit under test.

The high impedance probe tip reference connection is a key feature of the Sonic 4000 RF. Unlike traditional single-ended, with their probe tip reference connected to earth ground that can damage the customer's circuit if it is accidentally connected to any non-ground test point, the Sonic 4000 RF probe tip reference impedance to earth ground is $1\text{M}\Omega$. This feature allows for safe in-circuit browsing of an energized circuit without the possibility for shorting the probe tip reference connection directly to earth ground to prevent damage of the probe.



The Sonic 4000 RF active probe uses a PMK custom high speed FET input amplifier with active cladding wave compensation to provide a superior high frequency response as well as a low noise and low distortion to accurately measure the customer signals. The output signal of the probe has no DC component, so it can be connected to DC sensitive measurement equipment.

Specifications

	Sonic 4000 RF
Order Number	885-400-000
Electrical Specifications	
Attenuation Ratio ($\pm 2\%$)	10:1
Bandwidth (-3 dB)	220 Hz to 4 GHz
Dynamic Range	$\pm 8\text{V}$ (guaranteed)
Input Voltage DC (max.)¹	$\pm 20\text{V}$ (guaranteed)
Input Impedance²	$2\text{M}\Omega \parallel 0.6\text{pF}$
Output Impedance	50Ω
Rise Time	123 ps
Noise (Input)	$70\text{nV}/\sqrt{\text{Hz}}$, $f > 10\text{MHz}$

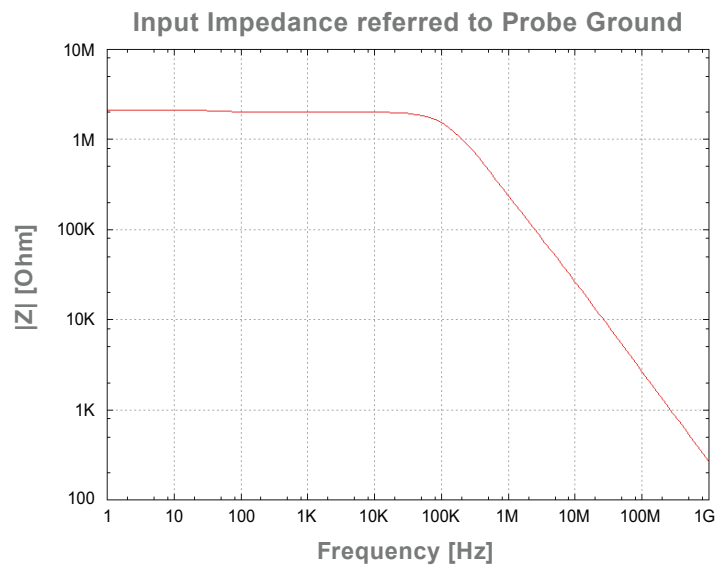
Mechanical Specifications	
Weight (probe only)	110g
Cable Length	1.3m
Probe input sockets	0.64 mm square / 0.8 mm round
Output connector	SMA (male)

Environmental Specifications

Altitude	operating	up to 2000 m
	non-operating	up to 15000 m
Temperature Range	operating	0 °C to +50 °C
	non-operating	-40 °C to +71 °C
Maximum Relative Humidity	operating	80 % relative humidity for temperatures up to +31 °C, decreasing linearly to 40 % at +50 °C
	non-operating	95 % relative humidity for temperatures up to +40 °C

Input Impedance referred to Probe Ground

Note that the input impedance of the probe decreases as the frequency of the applied signal increases. The high impedance probe tip reference connection allows safe in-circuit browsing of an energized circuit without the possibility for shorting the probe tip reference connection directly to earth ground to prevent damage of the probe.



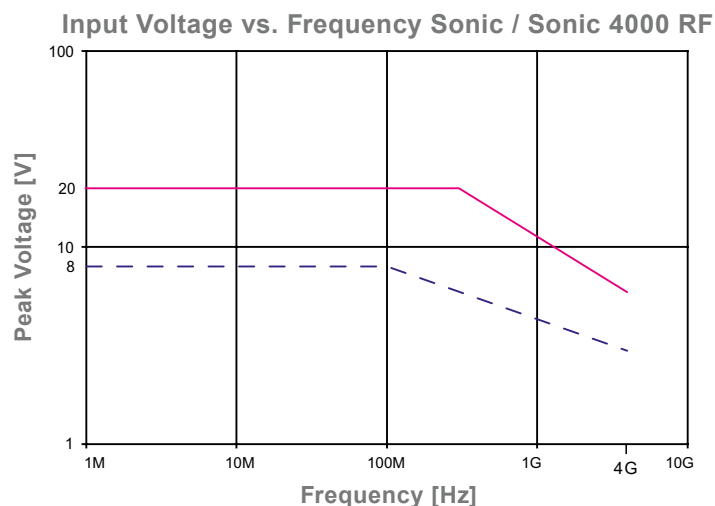
Maximum Input Voltage



The maximum amplitude of the applied signal may not exceed the limits of the graph below, to avoid input linearity errors and damage to the probe.

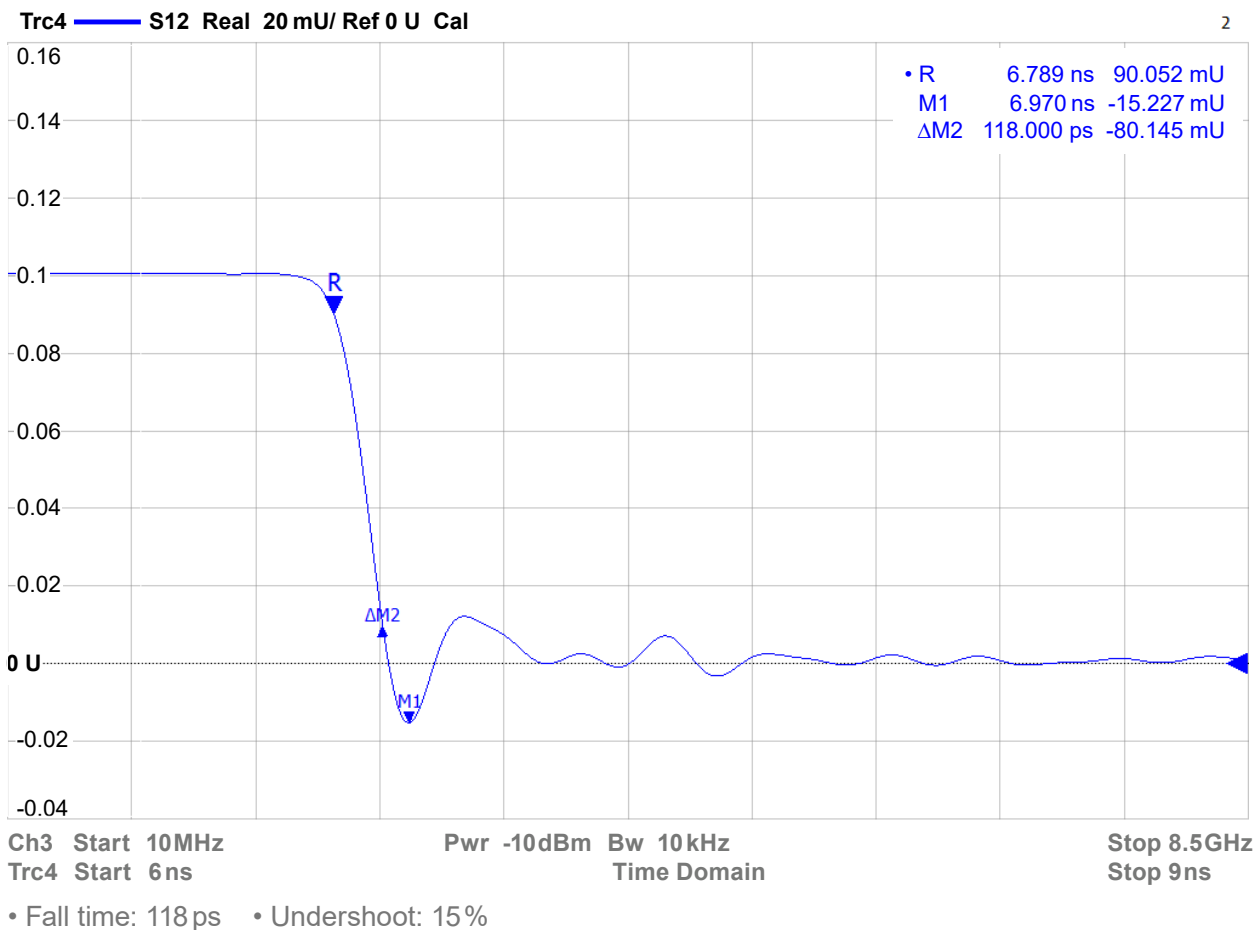


The Sonic 4000 RF active probe is protected against electrostatic discharge voltage (ESD). Applying input-voltages outside the specified limits can result in destruction of the probe's amplifier.

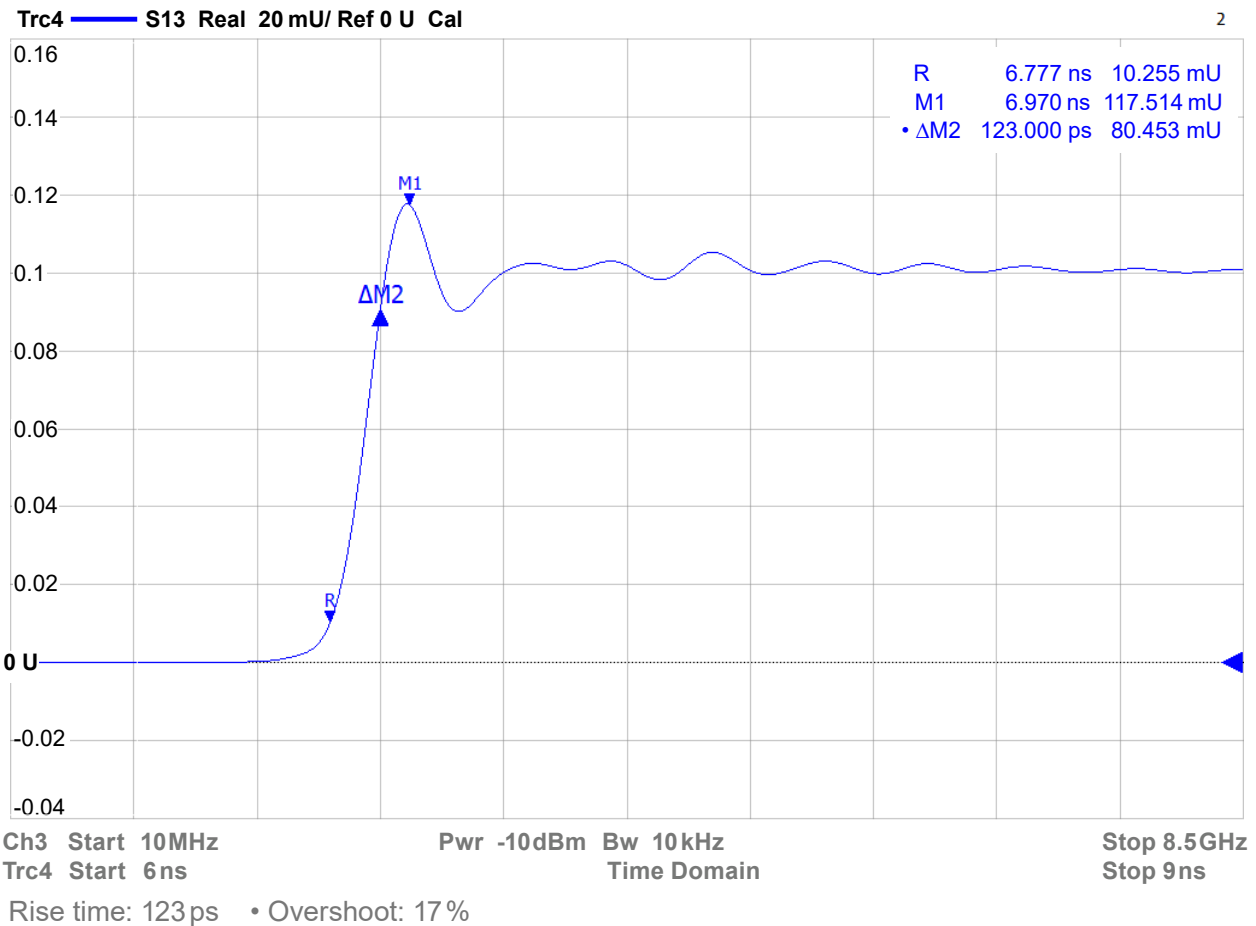


--- Dynamic Measurement Range
--- Maximum Input Voltage

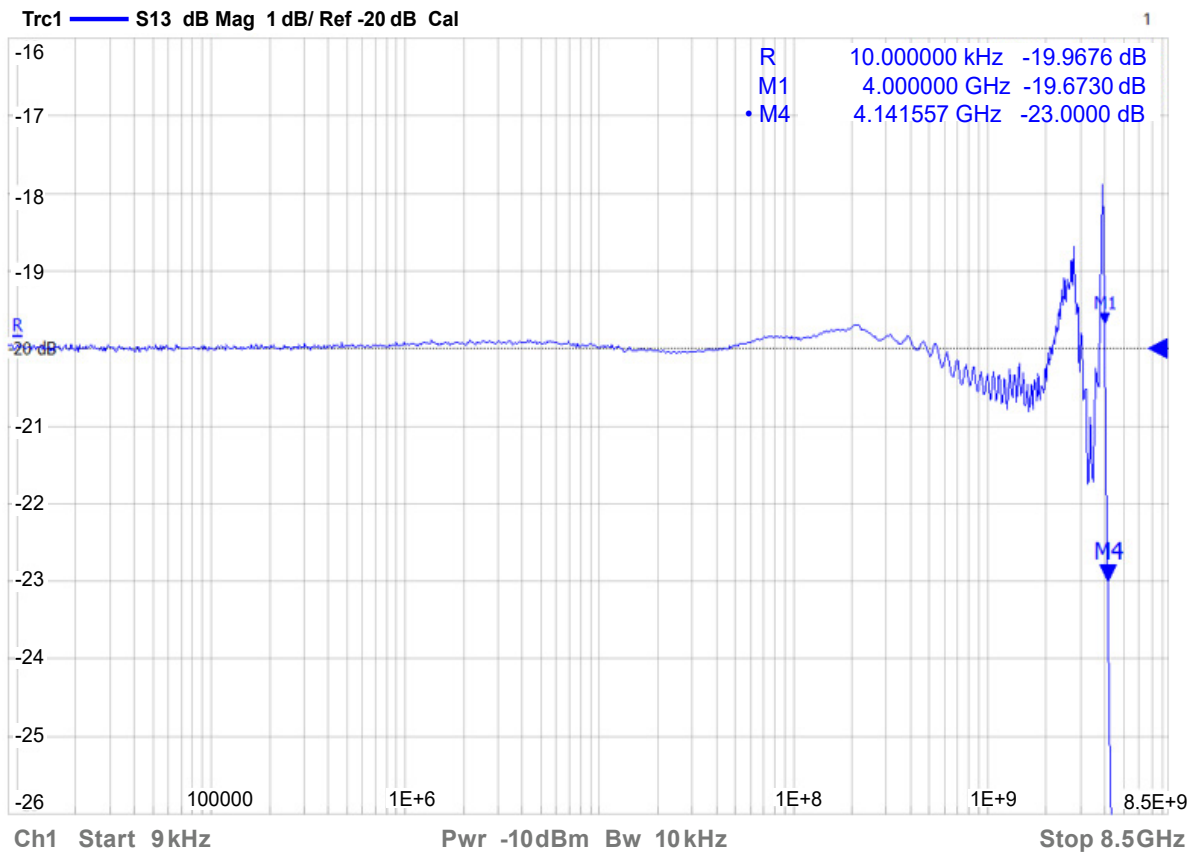
Step Responses



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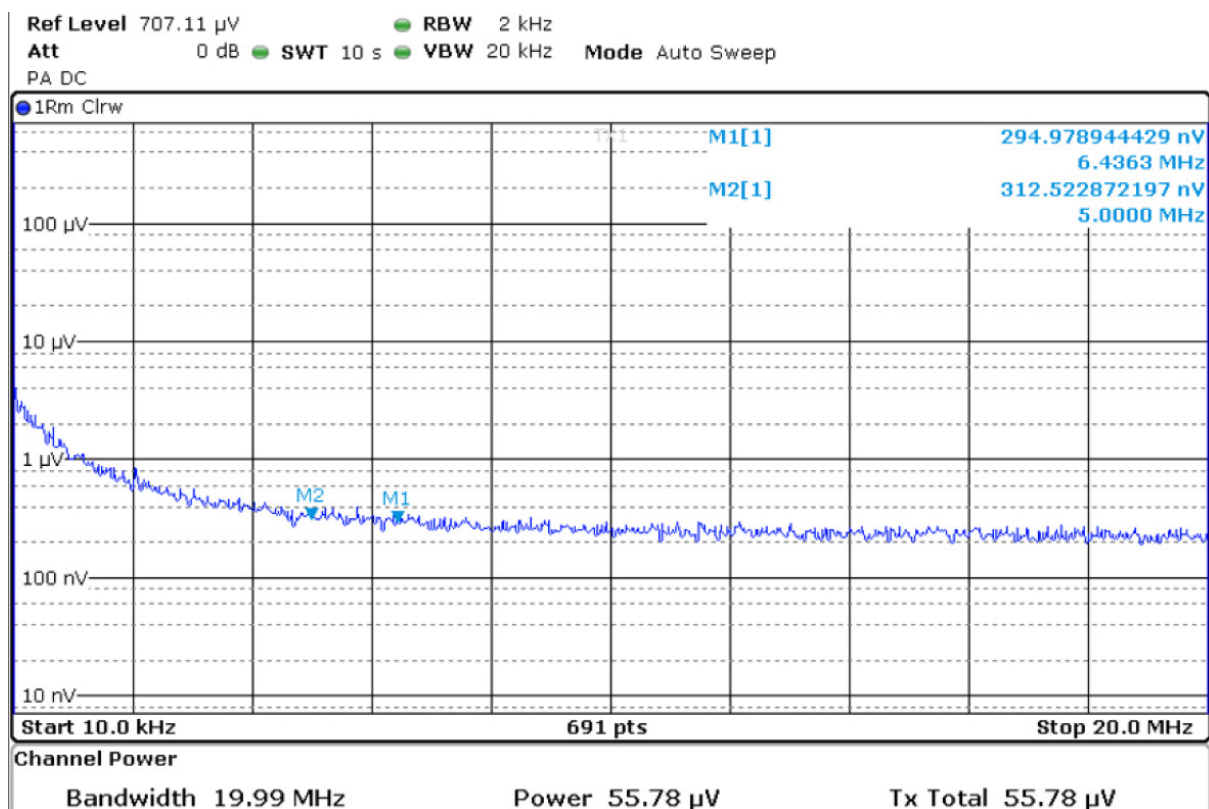
Frequency Response



Flat frequency response:

9 kHz - 100 MHz :	±0.1 dB
100 MHz - 2 GHz :	±1 dB
4 GHz :	< -3 dB

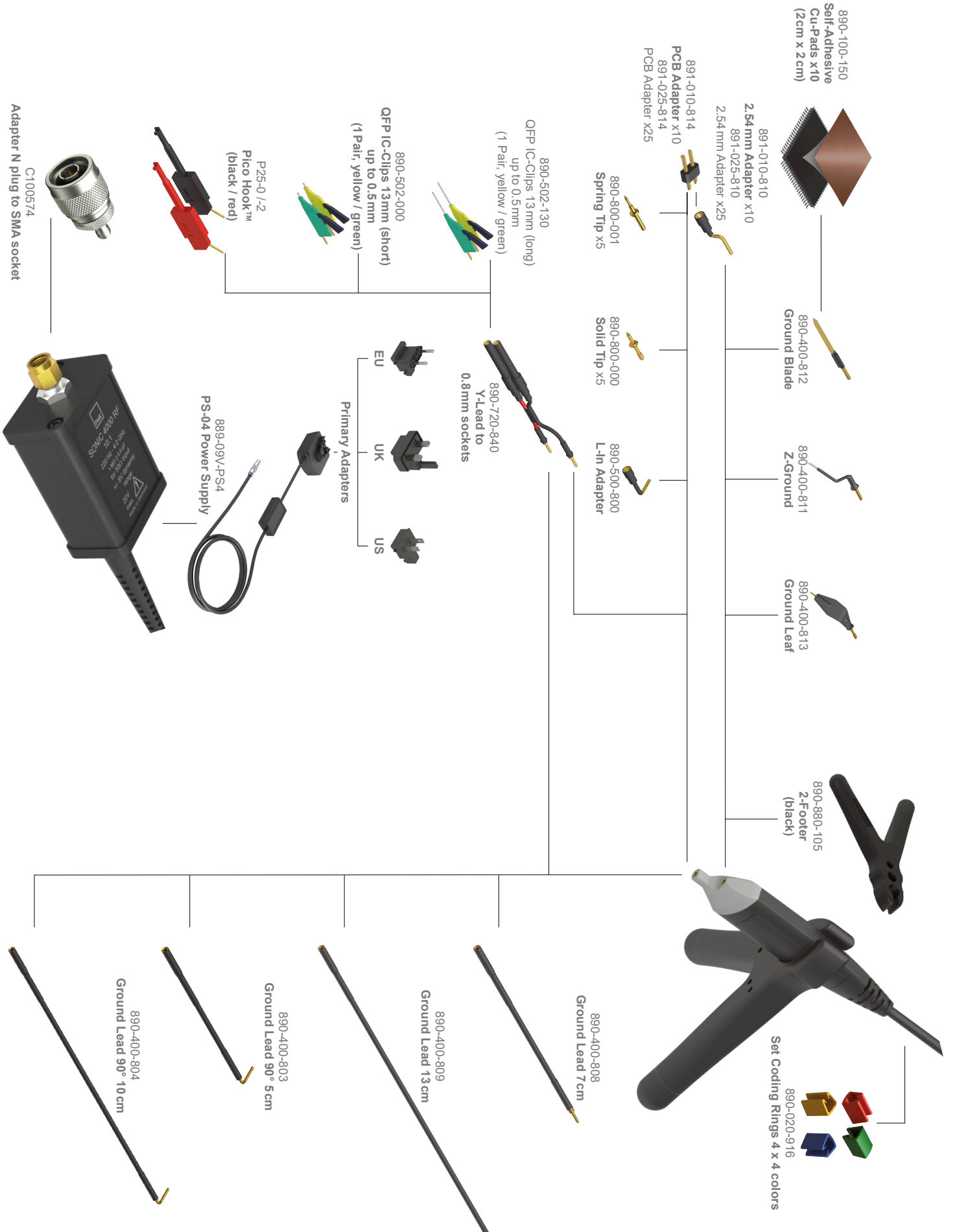
Noise at Probe Output



Low frequency noise: 10 kHz - 20 MHz: 56 μ V_{rms}

Probe Accessories

The parts supplied are „highlighted“, see also "Scope of Delivery".



Scope of Delivery

Accessories delivered with each probe are „**highlighted**“ in the graphical overview.

Item	Qty	Item	Qty
Probe Sonic 4000 RF	1	Ground Lead 90° 5 cm	1
Calibration Certificate	1	Ground Lead 90° 10 cm	1
Instruction Manual	1	Ground Leaf	3
Power Supply PS -04	1	L-In Adapter	1
Primary Adapter EU	1	Pair Picohooks™ (black & red)	1
Primary Adapter UK	1	Pair QFP IC-Clips (short, yellow & green)	1
Primary Adapter US	1	Pair SMD Test Grabbers (black & red)	1
Case	1	PCB Adapter	5
2-Footer (black)	1	Self adhesive Cu Pad (2 cm x 2 cm)	2
Adapter N-plug to SMA	1	Set Marker bands (4 x 4 Colors)	1
2.54 mm Adapter Sonic	2	Solid Tip	3
Ground Blade	1	Spring Tip	3
Ground Lead 7 cm	1	Y-Lead Adapter to 0.8 mm sockets	1
Ground Lead 13 cm	1	Z-Ground	1

Ordering Information

Article	Order number
Sonic 4000 RF	885-400-000



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E-Mail: info@datatec.eu

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Manufacturer

PMK Mess- und Kommunikationstechnik GmbH
Koenigsteinerstrasse 98
65812 Bad Soden am Taunus, Germany

Phone: +49 (0) 6196 5927 - 930

Fax: +49 (0) 6196 5927 - 939

Internet: www.pmk.de

E-Mail: sales@pmk.de

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