



**Probing Solutions.
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EN



SONIC Series

Robust Single-Ended Active Probes

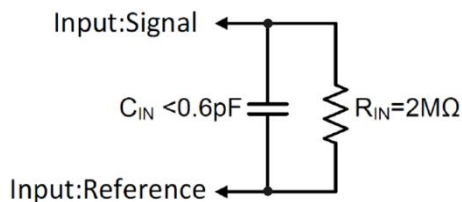
1 GHz to 4 GHz, < 1 pF, up to ± 15 V

About the SONIC Probe Series

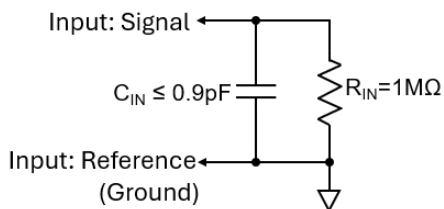
The SONIC active probe series offers best-in-class performance, robustness and is easy to use to make in-circuit measurements. With the SONIC series different bandwidth models up to 4GHz, very low $< 1\text{pF}$, input capacitance, low noise and wide dynamic input range of $\pm 8\text{V}$ or $\pm 15\text{V}$ (model depended) makes the SONIC series ideal for a variety of applications.

The 2.5GHz SONIC2500 and 4GHz SONIC4000 input capacitance of $< 0.6\text{pF}$ parallel $> 2\text{M}\Omega$ between probe tip and probe reference (1 M Ω to the oscilloscope ground) provides the best input impedance in its class. Unlike traditional single-ended probes, both models are ideal for in-circuit browsing of an energized circuit without the possibility for shortening to earth ground, because of their high impedance probe tip reference connection.

SONIC4000/2500 Input Loading Schematic

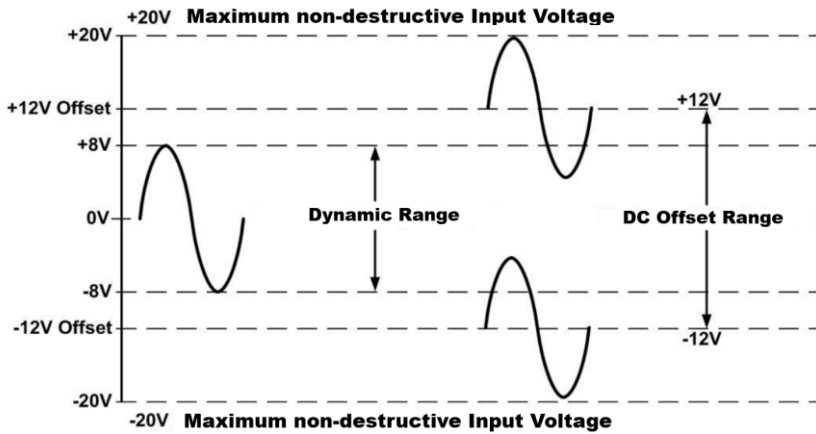
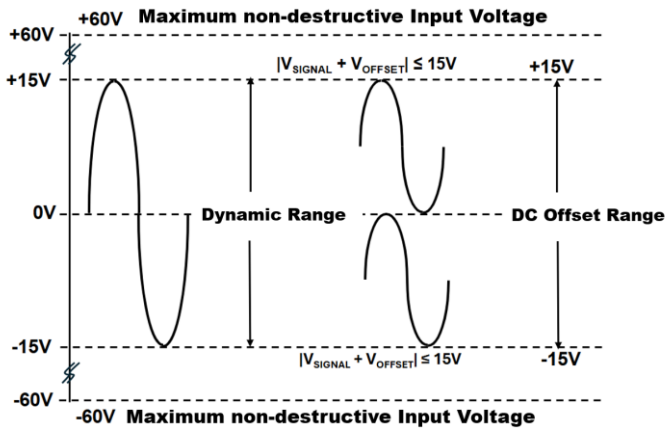


SONIC1500/1000 Input Loading Schematic



The 1GHz SONIC1000 and 1.5GHz SONIC1500 probes also have a very low input capacitance of $< 1\text{pF}$ parallel $> 1\text{M}\Omega$ between probe tip and probe reference. Both models are ideal as general-purpose single-ended probe, with the probe reference connected to the oscilloscope ground. They do not have the $1\text{M}\Omega$ reference protective impedance to ground like the SONIC2500 and SONIC4000 models.

When used with one of PMK's multi-channel power supplies, the remote-controllable input offset range capability of SONIC series is $\pm 12\text{V}$ or $\pm 15\text{V}$, depending on model type, extending the input dynamic voltage range of each probe model.

SONIC4000/2500 Input Voltage Range exampleSONIC1500/1000 Input Voltage Range example

Specifications

Read the Instruction Manual before first use, and keep it for future reference. A digital copy of the latest Instruction Manual revision can be downloaded at www.pmk.de

Specifications that are not marked with (*) as guaranteed are typical. Warm-up time is 20 minutes.

The electrical specifications are determined when using a PS2 power supply at +23 °C ambient temperature. This probe comes with 2 years warranty.

Electrical Specifications

Order Numbers	SONIC4000-BUN1 SONIC4000	SONIC2500-BUN1 SONIC2500	SONIC1500-BUN1 SONIC1500	SONIC1000-BUN1 SONIC1000
Attenuation Ratio	10:1	10:1	10:1	10:1
Attenuation Accuracy (DC) *	±1 %	±1 %	±1 %	±1 %
Bandwidth (- 3 dB)	> 4 GHz	> 2.5 GHz	> 1.5 GHz	> 1 GHz
Input Dynamic Range*	±8 V	±8 V	±15 V	±15 V
Input DC Offset ¹⁾	±12 V	±12 V	±15 V	±15 V
Non-destructive Input Voltage *	±20 V ²⁾	±20 V ²⁾	±60 V ²⁾	±60 V ²⁾
Input Impedance ³⁾	2 MΩ 0.6 pF	2 MΩ 0.6 pF	1 MΩ 0.9 pF	1 MΩ 0.9 pF
Output Impedance	50 Ω	50 Ω	50Ω	50 Ω
Propagation Delay	approx. 7 ns	approx. 7 ns	approx. 6ns	approx. 6 ns
Noise ⁴⁾ (referred to input)	3 mV _{RMS}	2.7 mV _{RMS}	1.6 mV _{RMS}	1.2 mV _{RMS}
Zero Offset Error (referred to output)	<± 200 µV	<± 200 µV	<± 200 µV	<± 200 µV

Notes:

¹⁾ Only available when used with a recommended power supply with remote control capabilities.

²⁾ See Maximum Input Voltage frequency derating on page 9.

ESD protected, IEC 61000-4-2 Contact Discharge Level 2, IEC 61000-4-2 Air Discharge Level 3.

³⁾ Referred to probe reference input.

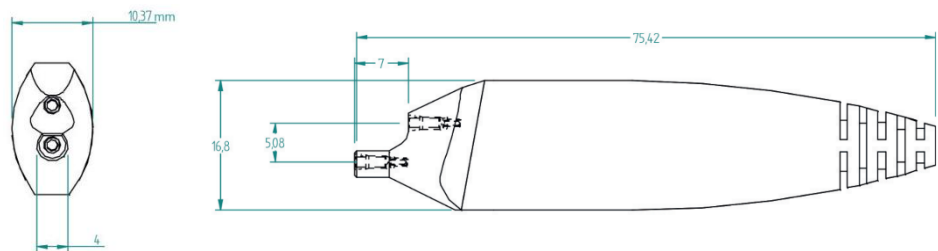
⁴⁾ Measured at full probe bandwidth

Mechanical Specifications

Order Number	SONIC4000	SONIC2500	SONIC1500	SONIC1000
Weight (Probe only)	110 g			
Output Connector ¹	BNC (male)			
Probe Input Sockets	0.64 mm square/ 0.8 mm round			
Cable Length	1.3 m		1.2 m	

¹ SMA output is available on request.

Probe Dimensions



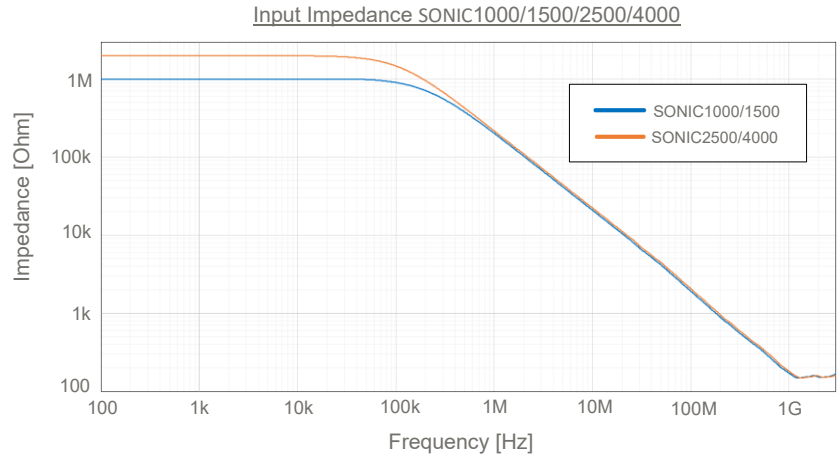
Environmental Specifications

		SONIC4000	SONIC2500	SONIC1500	SONIC1000
Altitude	operating	up to 2000 m			
	non-operating	up to 15000 m			
Temperature Range	operating	0 °C to +45 °C		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 +45°C			
	non-operating	95% relative humidity for temperatures up to +40°C			

Input Impedance referred to Probe Ground



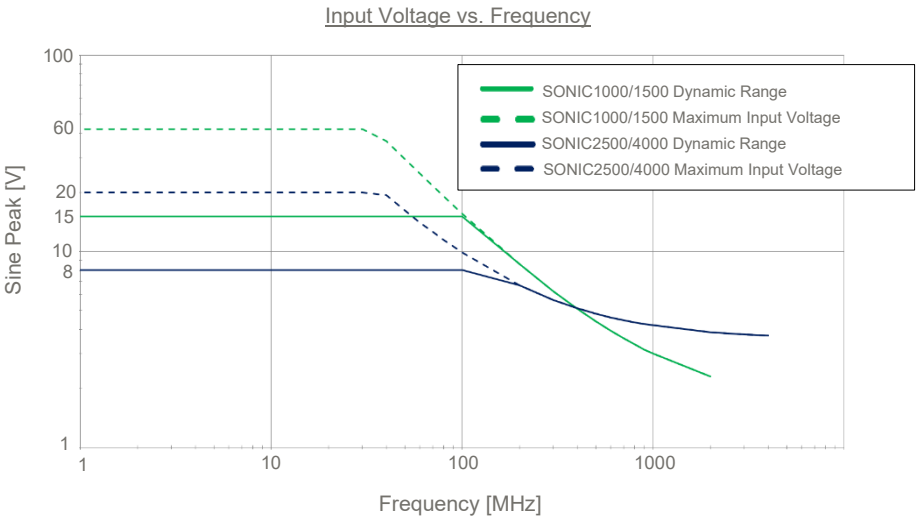
The input impedance of the probe decreases as the frequency of the applied signal increases.
The SONIC2500/4000 high impedance probe tip reference connection allows safe in-circuit browsing of an energized circuit without the possibility for shorting the probe tip reference connection directly to earth ground to prevent damage of the probe.



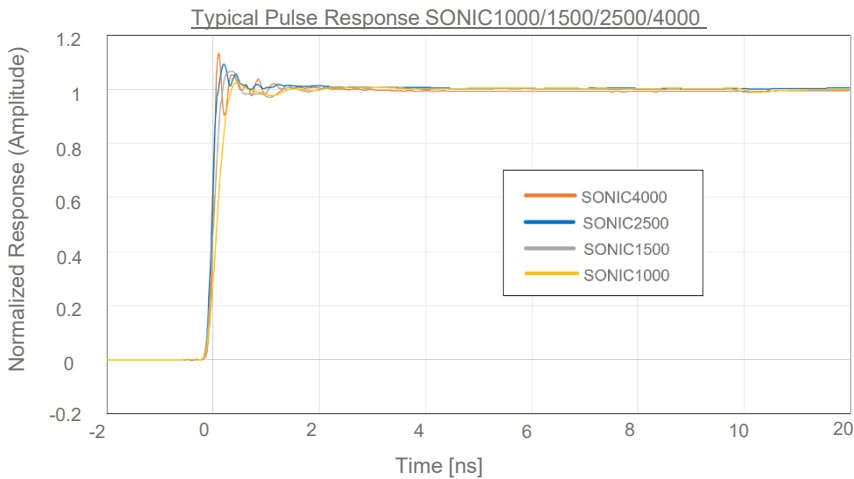
Maximum Input Voltages



The SONIC active probes are protected against electro-static-discharge voltage (ESD). 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.

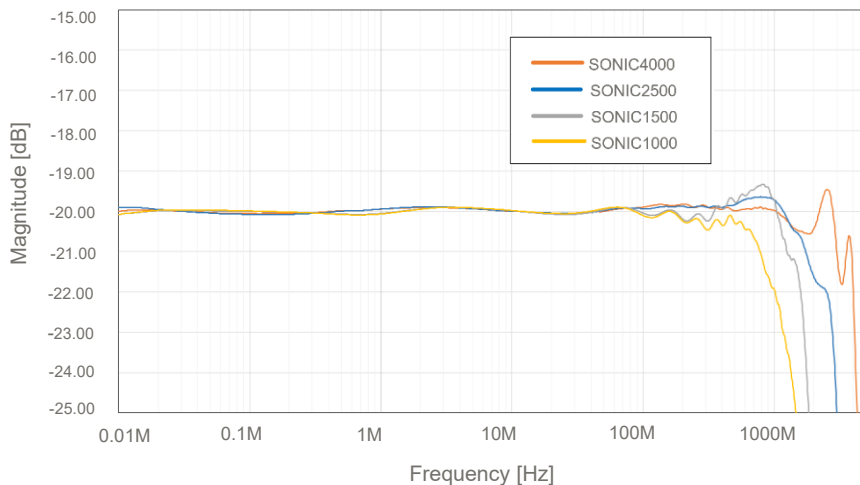


Typical Pulse Response



Typical Frequency Response

Frequency response SONIC1000/1500/2500/4000



Scope of Delivery

See also Ordering Information for more details on the accessories that are included or optional. If a bundle was ordered, a PS05 wall plug power supply is included too.

Item	Qty	Item	Qty
Probe SONIC Series	1	Ground Lead 90° 10 cm	1
Calibration Certificate	1	Ground Leaf	1
Instruction Manual	1	Z-Ground	1
White Case	1	Pair Picohook™ (black & red)	1
2-Footer (black)	1	PCB Adapter	2
2.54mm Adapter	1	Self-adhesive Cu Pad (2cm x 2cm)	2
Ground Blade	1	Set Coding Rings, 2x4 colors (installed on cable)	1
Ground Lead 7cm	1	Solid Tip	2
Ground Lead 13 cm	1	Spring Tip	1
Ground Lead 90° 5 cm	1	Y-Lead Adapter to 0.8mm sockets	1



The accessories for this probe series have been safety tested.
Do not use any other accessories or power supplies than what is recommended.

Handling



Handle with care especially when fitted with the extra thin and sharp spring contact tip to avoid any injury. Note that the probe cable is a sensitive part of the probe. Do not damage through excessive bending or pulling. Avoid mechanical shock to this product in general to guarantee accurate performance and protection.



Use ground leads only for connections to earth ground.



The accessories provided with the probe have been safety tested. Do not use any other accessories than those “originally” provided.

Maintenance

To clean the exterior of the probe, use a soft cloth moistened with either distilled water or Isopropyl alcohol. Before use allow the probe to dry completely.

Ordering Information

A power supply with remote control capabilities or a battery pack for portable use are required and optional. The standard accessories are listed in Step 3.

Step 1: Select Probe

If a bundle is selected, an high-quality wall plug power supply without remote control capabilities is already included and the probe bundle comes ready to use. Step 2 can be skipped. If remote control is of interest, select the probe only and move to Step 2.



Probe bundles with wall plug power supply:

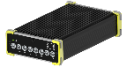
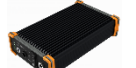
SONIC4000-BUN1	SONIC4000 bundle, 4 GHz single-ended active probe, ± 8 V, max 20 V non-destructive input voltage, with universal BNC output, international wall plug power supply PS-05 included, ready to use probe
SONIC2500-BUN1	SONIC2500 bundle, 2.5 GHz single-ended active probe, ± 8 V, max 20 V non-destructive input voltage, with universal BNC output, international wall plug power supply PS-05 included, ready to use probe
SONIC1500-BUN1	SONIC1500 bundle, 1.5 GHz single-ended active probe, ± 15 V, max 60 V non-destructive input voltage, with universal BNC output, international wall plug power supply PS-05 included, ready to use probe
SONIC1000-BUN1	SONIC1000 bundle, 1 GHz single-ended active probe, ± 15 V, max 60 V non-destructive input voltage, with universal BNC output, international wall plug power supply PS-05 included, ready to use probe

Probe ONLY, without wall plug power supply:

SONIC4000	SONIC4000, 4 GHz single-ended active probe. Power supply and supply cable to be selected
SONIC2500	SONIC2500, 2.5 GHz single-ended active probe. Power supply and supply cable to be selected
SONIC1500	SONIC1500, 1.5 GHz single-ended active probe. Power supply and supply cable to be selected
SONIC1000	SONIC1000, 1 GHz single-ended active probe. Power supply and supply cable to be selected

**Step 2: Select optional Power Supply**

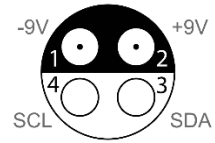
If a bundle was selected, a wall plug power supply is already included, and Step 2 can be skipped. A multi-channel power supply offers offset and remote control capabilities. If the single probe, without wall plug power supply, was selected, choose a multi-channel power supply and power supply cable.

Order No.	Item	Picture
889-09V-PS2	2ch power supply PS-02 with USB for remote and offset control	
889-09V-PS2-L	2ch power supply PS-02-L with LAN and USB for remote and offset control	
889-09V-PS3	4ch power supply PS-03 with USB for remote and offset control	
889-09V-PS3-L	4ch power supply PS-03-L with LAN and USB for remote and offset control	
889-09V-PS6	8ch power supply PS-06 with USB for remote and offset control	
889-09V-PS6-L	8ch power supply PS-06-L with LAN and USB for remote and offset control	
889-09V-AP01	1ch Battery pack AP-01, no remote or offset control capabilities	
889-09V-PS5	International wall plug power supply PS-05, no remote or offset control capabilities, primary adapters for EU, UK und USA <i>Already included in the bundle</i>	
890-520-900	Power supply cable 0.6 m	
890-520-915	Power supply cable 1.5 m	



The power supply pin assignment is different from other power supplies.
Use only original PMK power supplies with PMK probes.

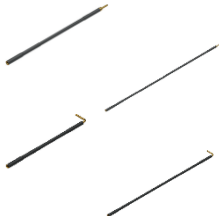
Observe Connector Pin-Out for PMK power supply cables:



Step 3: Select optional Accessories

Accessories that are already included with the scope of delivery of a probe are marked with x.

Order No.	Item	Scope of Delivery X = included	Picture
890-502-130	Pair QFP IC-clips 13 mm (long) up to 0.5mm (1 pair: red, blue)		
890-502-000	Pair QFP IC-clips (short) up to 0.5 mm (1 pair: red, blue)		
899-000-002	Pair SMD Test grabber 0.8 mm pin, flex nose (red/black)		
For re-ordering:			
890-100-150	self-adhesive Cu-pads x10 (2 cm x 2 cm)	x (2 pcs)	
890-400-812	Ground blade	x	
890-400-811	Z-ground	x	
890-400-813	Ground leaf	x	
891-010-810	2.54 mm adapter x10	x (1 pc)	
891-025-810	2.54 mm adapter x25		
891-010-814	PCB adapter x10	x (2 pcs)	
891-025-814	PCB adapter x25		
890-800-001	Spring tip x5	x (1 pc)	
890-800-000	Solid tip x5	x (2 pc)	
P25-0 /-2	Pico Hook™ (black, red)	x	
890-720-840	Y-adapter to 0.8 mm sockets	x	
890-880-105	2-Footer (black)	x	
n/a	Marker bands 2 x 4 colors (installed on probe cable)	x	

890-400-808	Ground lead 7 cm	x	
890-400-809	Ground lead 13 cm	x	
890-400-803	Ground lead 90° 5 cm	x	
890-400-804	Ground lead 90° 10 cm	x	

Step 4: Select optional 3D Positioning System

Select one of PMK's 3D probe positioning systems with the universal probe holder. The arms and probe holders are also compatible with PMK's SKID positioning systems for probes and PCBs, which are also available for temperature ranges from -55 °C to +155 °C. To review all 3D positioning solutions, visit us at www.pmk.de

Order No.	Item	Picture
893-350-006	Universal 3D Probe Positioner MSU1500 with steel base (893-100-001), arm with span width 200mm (893-200-200), universal probe holder (893-090-000)	
893-350-011	Universal 3D Probe Positioner with magnet foot (893-100-004), arm with span width 200 mm (893-200-200), universal probe holder (893-090-000)	
893-500-START	SKID-S Starter Kit: 3U Board Tester (160 x 160 mm) including SKID vertical adapter kit (893-291-501), universal probe holder (893-090-000), PMK probe holder 5-12 mm (893-050-000), arm with span width 130 mm (893-200-130) and with 200 mm (893-200-200)	
893-600-START	SKID-M Starter Kit: 6U Board Tester (240 x 160 mm) including SKID vertical adapter kit (893-291-501), universal probe holder (893-090-000), PMK probe holder 5-12 mm (893-050-000), arm with span width 130 mm (893-200-130) and with 200 mm (893-200-200)	
893-700-START	SKID-M Starter Kit: Board Tester (340 x 300 mm) including SKID vertical adapter kit (893-291-501), universal probe holder (893-090-000), PMK probe holder 5-12mm (893-050-000), arm with span width 130 mm (893-200-130) and with 200 mm (893-200-200)	

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