PCBite SQG series

high-frequency handsfree probes

sensepeek

ES France - Département Tests & Mesures
127 rue de Buzenval BP 26 - 92380 Garches

Tél. 01 47 95 99 45
Fax. 01 47 01 16 22

e-mail : tem@es-france.com
Site Web : www.es-france.com

Flexible, High-Frequency Probing Without Soldering

Meet the SQG-Series

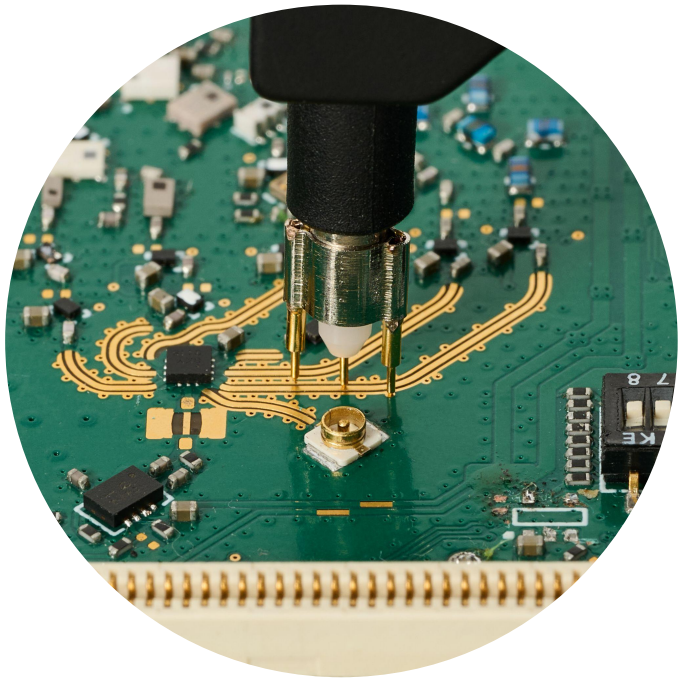
Introducing the new **SQG-series** of high-frequency handsfree probes from Sensepeek, featuring a range of GHz probes designed for both AC and DC applications. This groundbreaking series enables engineers to perform repetitive measurements in the GHz range without the need for complex setups or soldering onto the measurement object.

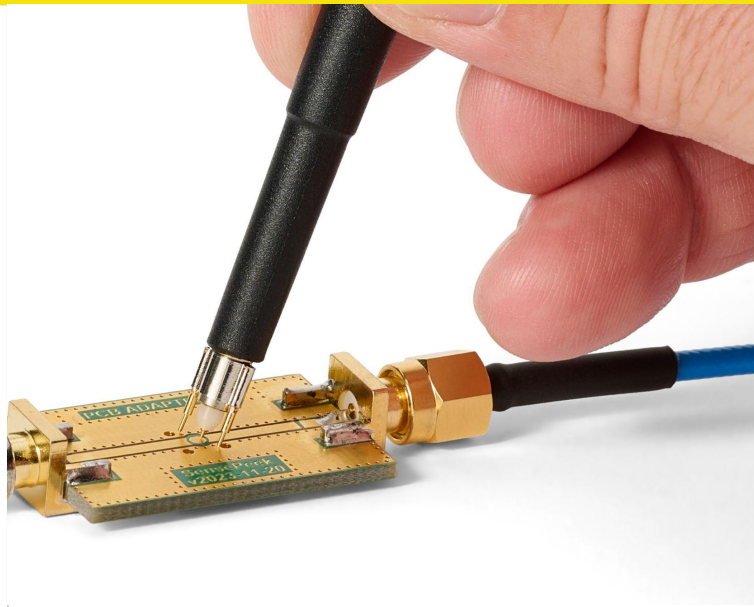
With exceptionally low probe tip capacitance, the SQG-series minimizes signal distortion and prevents capacitive loading, making it ideal for sensitive circuits where maintaining signal integrity is crucial. Whether working in high-frequency environments measuring RF traces or handling fast data rates, these probes are engineered to manage high data rates while keeping your signals crisp and precise. Additionally, they offer an exceptionally flat frequency response, providing unparalleled accuracy across a wide frequency range.

Instruments
The SQG-series is suitable for use with any measurement instrument featuring a 50 Ω input impedance, making them versatile across various applications, including:

- Oscilloscopes
- Sampling Oscilloscopes
- Network Analyzers
- Spectrum and Modulation Analyzers
- Receivers
- Power Meters
- Millivoltmeters

Unlike many other probes on the market, all performance data is delivered straight out of the box, eliminating the need for extra accessories or soldering attachments, saving you time and hassle.





The SQG-series includes exchangeable fine-pitch spring-tipped test needles, ensuring reliable contact with small or delicate components.

The dual ground options, a dual needle ground with a 2.3mm tip pitch, perfect for PCB-mounted RF connectors, and a solid single ground with a 6.5mm tip pitch, designed for when ground points are farther away, make this probe adaptable to a wide variety of setups, offering flexibility no engineer should be without.

sensepeek

ES France - Département Tests & Mesures
127 rue de Buzenval BP 26 - 92380 Garches

Tél. 01 47 95 99 45
Fax. 01 47 01 16 22

e-mail : tem@es-france.com
Site Web : www.es-france.com

PCBite SQG series

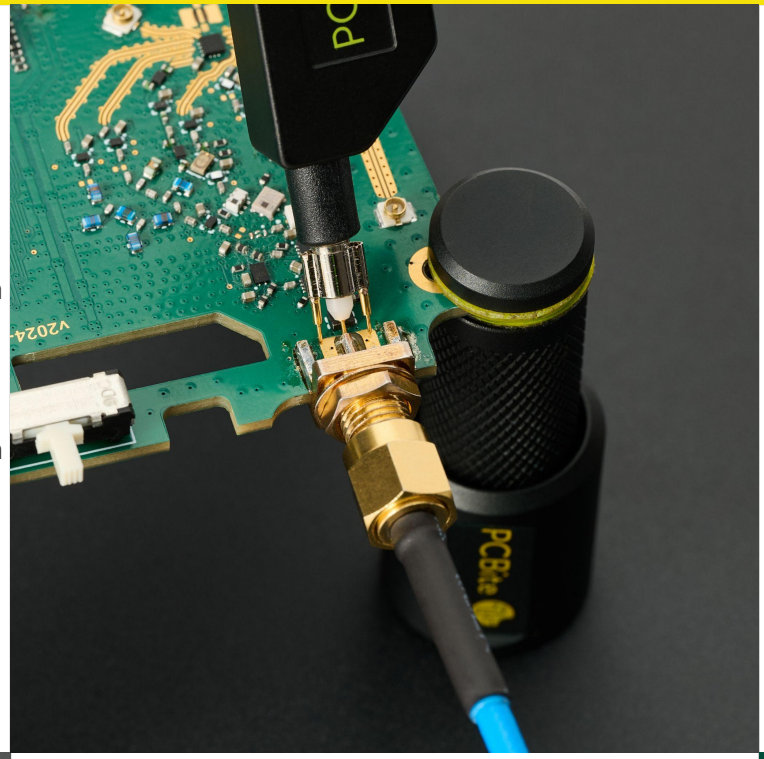
Flexible, High-Frequency Probing Without Soldering

AC or DC Coupled Probe

Sensepeek provides both AC and DC-coupled probes, designed for engineers who need precise signal integrity across a wide range of applications.

Low-impedance probes inherently load the signal being probed, slightly reducing its amplitude. In the case of signals with a DC bias, these probes may source or sink current from the signal source, potentially affecting the operating bias of sensitive devices.

AC-coupled probing is particularly advantageous when working with DC-biased data streams, such as those found in high-speed interfaces like USB, HDMI, and SATA, or differential signaling standards like ECL and PECL. AC-coupled probes are also ideal for examining small, high-frequency signals on supply lines or control circuits, critical for diagnosing issues such as power supply noise, current ripple, or decoupling inefficiencies.

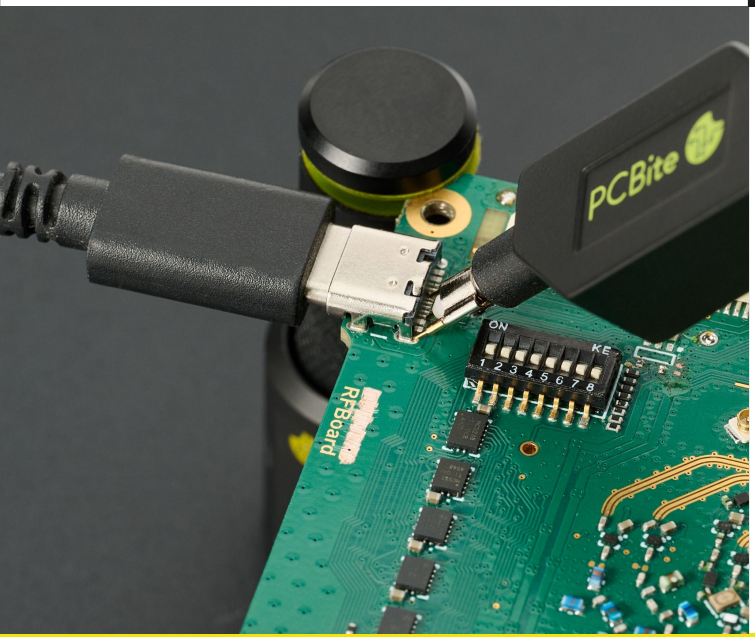


Compatibility with the PCBite-series

Both the length and weight of the SQG probes are perfectly balanced for use with PCBite holders, ensuring optimal performance for handsfree applications. The SQG-series probes are designed for superior stability with a low point of gravity, enhancing reliability.

All probes are insulated and can be used handheld like traditional probes, but they truly excel when utilized in handsfree mode. Additionally, the probe and its accessories are delivered in a specially designed case for safe transport and storage.

The SQG-series is the ideal solution for engineers looking for precision, stability, and ease of use in high-frequency measurements. Whether you're troubleshooting power integrity problems or analyzing signal fidelity in high-speed digital designs, Sensepeek's range of AC and DC-coupled probes offers the versatility and precision that high-frequency and electronics engineers demand.

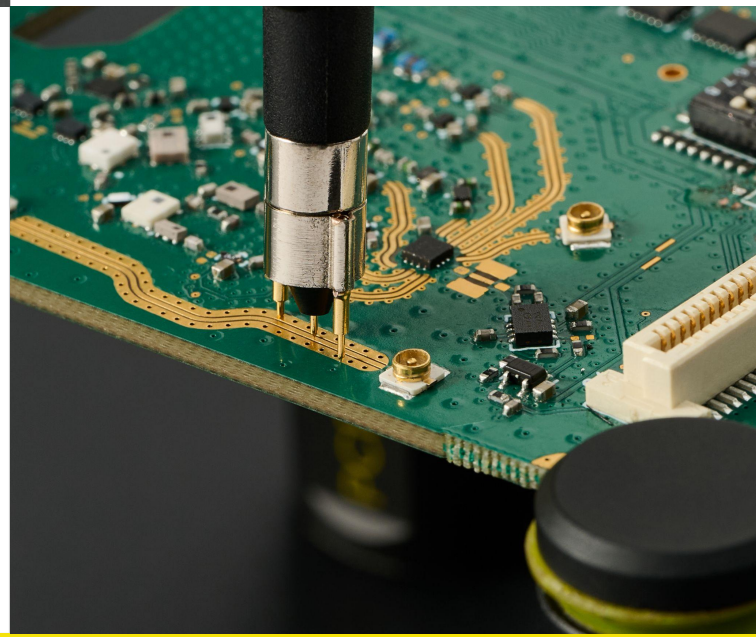


Minimizing Signal Disruption in High-Frequency Probing

Probing microwave transmission lines presents a significant challenge, as adding conductor material can introduce capacitance and disrupt the line's geometry and impedance. This interference can lead to inaccuracies at the contact point.

However, by reducing the probe's loading effect and ensuring consistent performance across all relevant frequencies, the primary impact is a slight reduction in signal amplitude at the probe tip. Importantly, this reduction doesn't alter the waveform or its spectral content and phases.

By adjusting the probe or instrument gain, or scaling the measurement data, the small amplitude loss can be compensated for, ensuring precise and accurate measurements.

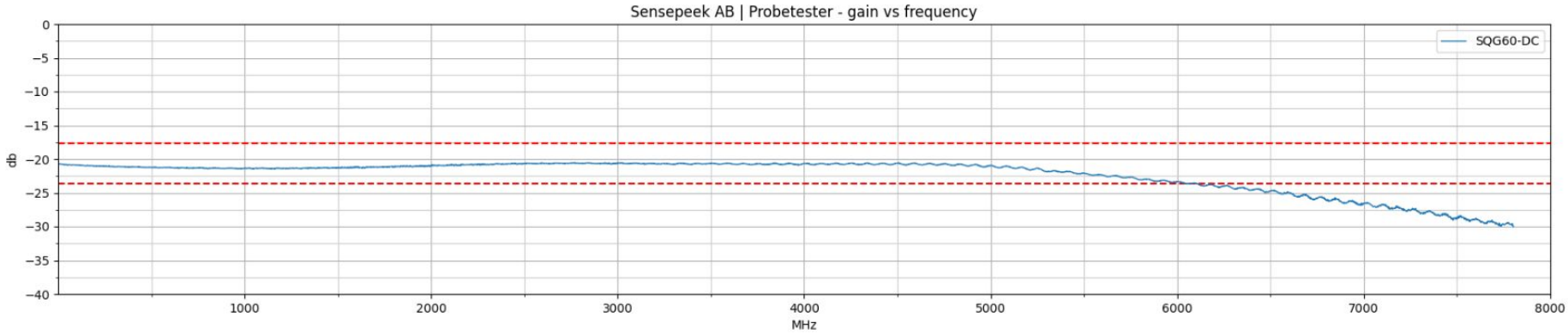


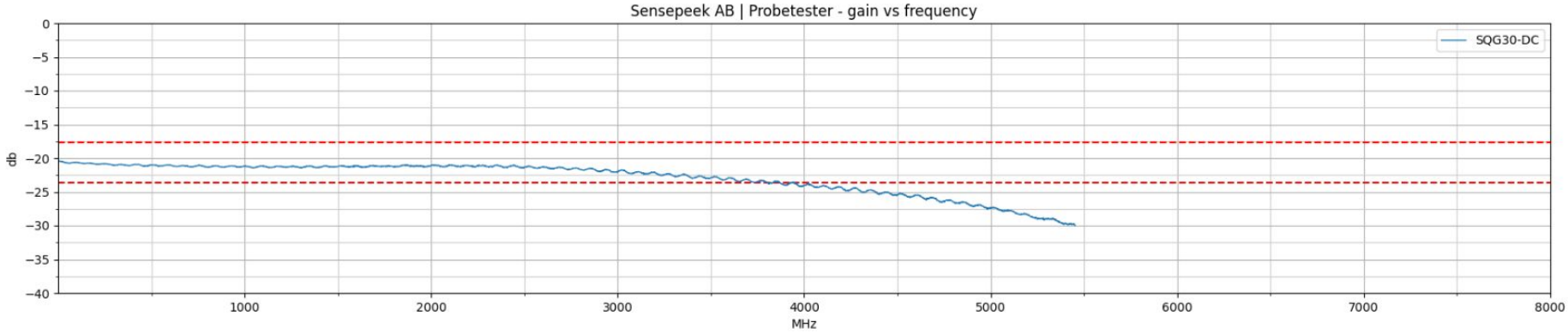
sensepeek

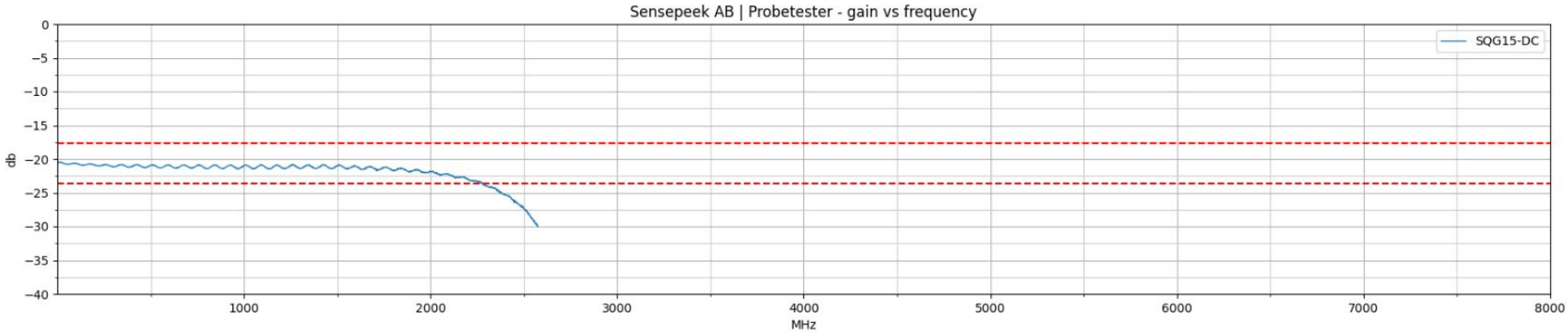
ES France - Département Tests & Mesures
127 rue de Buzenval BP 26 - 92380 Garches
Tél. 01 47 95 99 45
Fax. 01 47 01 16 22
e-mail : tem@es-france.com
Site Web : www.es-france.com

PCBite SQG series

PERFORMANCE







*Graphs shows typical performance of an actual measured probes from volume production.

SPID (Sensepeek probe ID): SQG15-DC B26083, SQG30-DC E45F44 and SQG60-DC C50260

SPECIFICATION – PROBE MODEL OVERVIEW

Model	SQG15-AC	SQG15-DC	SQG30-AC	SQG30-DC	SQG60-AC	SQG60-DC
Coupling	AC	DC	AC	DC	AC	DC
Nominal division ratio	10:1					
Bandwidth (-3dB), (note 1)	> 1.5 GHz		> 3 GHz		> 6 GHz	
Output Connector	BNC		SMA		SMA	
Max. usable data rate (fundamental)	3 Gbps		6 Gbps		12 Gbps	
Max. usable data rate (3rd harmonic)	1 Gbps		2 Gbps		4 Gbps	
Max. usable data rate (5th harmonic)	0.6 Gbps		1.2 Gbps		2.4 Gbps	
Transition time (note 2)	< 190 ps		< 103 ps		< 52 ps	
Probe tip impedance, nominal	500 Ω		500 Ω		333 Ω	
Probe tip capacitance, typical, (note 3)	0.35 pF		0.35 pF		0.35 pF	
Probe tip capacitance, maximum (note 4)	1.36 pF	1.69 pF	1.31 pF	1.25 pF	0.69 pF	0.69 pF
Return loss for probed line	max < -10 dB typically -26 dB to -11.0 dB in the range 0 - 1.5 GHz	max < -10 dB typically -26 dB to -11.5 dB in the range 0 - 1.5 GHz	max < -3 dB typically -26 dB to -3.70 dB in the range 0 - 3 GHz	max < -4 dB typically -26 dB to -4.30 dB in the range 0 - 3 GHz	max < -6.1 dB typically -23 dB to -6.2 dB in the range 0 - 6 GHz	max < -5.8 dB typically -23 dB to -6 dB in the range 0 - 6 GHz
Accuracy for line Z0 = 36 ohm to 60 ohm (note 6)	0.2 dB	0.2 dB	0.2 dB	0.2 dB	0.3 dB	0.3 dB
Accuracy for line Z0 = 0 ohm to 100 ohm (note 6)	0.83 dB	0.83 dB	0.83 dB	0.83 dB	1.2 dB	1.2 dB
Nominal error for line Z0 = 50 ohm (note 6)	0.424 dB	0.424 dB	0.424 dB	0.424 dB	0.629 dB	0.629 dB
Nominal error for line Z0 = 75 ohm (note 6)	0.628 dB	0.628 dB	0.628 dB	0.628 dB	0.927 dB	0.927 dB
Continues voltage	6.6 V AC RMS	16.4 V RMS	6.0 V AC RMS	15.2 V RMS	6.3 V AC RMS	13.0 V RMS
DC blocking voltage (max)	50 V DC	-	50 V DC	-	50 V DC	-
Peak voltage (note 5)	±60 V DC, 30 V AC RMS, ± 42.4 V pk max.					
Pulse width at peak voltage	-	-	-	-	< 500 ns	
Duty cycle pulse at peak voltage	-	-	-	-	< 1:48 (2.08%)	
Low-frequency cut off (-3dB) (note 7)	377 Hz	-	359 Hz	-	536 Hz	-
Flatness (+/- 0.5dB)	1.0 kHz to 1.5 GHz	0 to 1.5 GHz	1.0 kHz to 2.6 GHz	0 to 2.7GHz	1.15 kHz to 4.8 GHz	0 to 5.2 GHz
Output impedance (nominal)	475 Ω		475 Ω		76 Ω	
Output return loss	-				< -10 dB up to 5.5 GHz -8 dB @ 6 GHz	
Ringing max (+/-)	0.33 dB @ 1.5 GHz	0.33 dB @ 1.5 GHz	0.14 dB @ 3 GHz	0.125 dB @ 3 GHz	0.065 dB @ 3 GHz, 0.15 dB @ 6 GHz	0.05 dB @ 3 GHz, 0.26 dB @ 6 GHz
Additive voltage noise @ 23 deg C (note 3)	110 µV	110 µV	156 µV	156 µV	180 µV	180 µV
Single GND Bandwidth (-3dB)	1.5 GHz	1.5 GHz	2 GHz	2 GHz	-	-
Nominal probe tip pitch	Dual GND 2.3 mm / Single GND 6.5 mm				Dual GND 3.5 mm	
Group delay (+/-)	-				6ns +/-1ns (+/-1.5ns up to 4GHz)	

SPECIFICATION – ALL PROBE MODELS

Environment	
Operating temperature range	0 - 50 °C
Storage temperature range	-20 to 70 °C
Temperature range for stated specifications	15 - 30 °C
Max. humidity, operating (non-condensing)	80 % to +30 °C, decreasing linearly to 40 % at +50 °C
Max. humidity, storage (non-condensing)	80 %
Max. altitude Operating	2 km
Pollution degree	2 (As defined in IEC 61010-031. Only non-conductive pollution. Occasionally, however, a temporary conductivity caused by condensation must be accepted.)
Safety	CAT 0, IEC 61010-31:2022
EMC approvals	Not applicable
Environmental approvals	WEEE, RoHS

General	
Supplied accessories	Probe holder for handsfree measurement, storage case, cable holders, replacement tip needle, dual ground needle, single ground spring (not included in 6.0 GHz models)
Cable length with probe and connector	1200 mm
Dimensions (probe head)	Length 90 mm, Ø 8.9mm
Weight with probe and cable	34 g

All specifications are subject to change without notice.

note 1, Measured, The probes can continue to measure above the rated bandwidth but with decreased signal, the probe will reach the f3dB limit above the rated bandwidth.

note 2, Calculated 10% - 90%

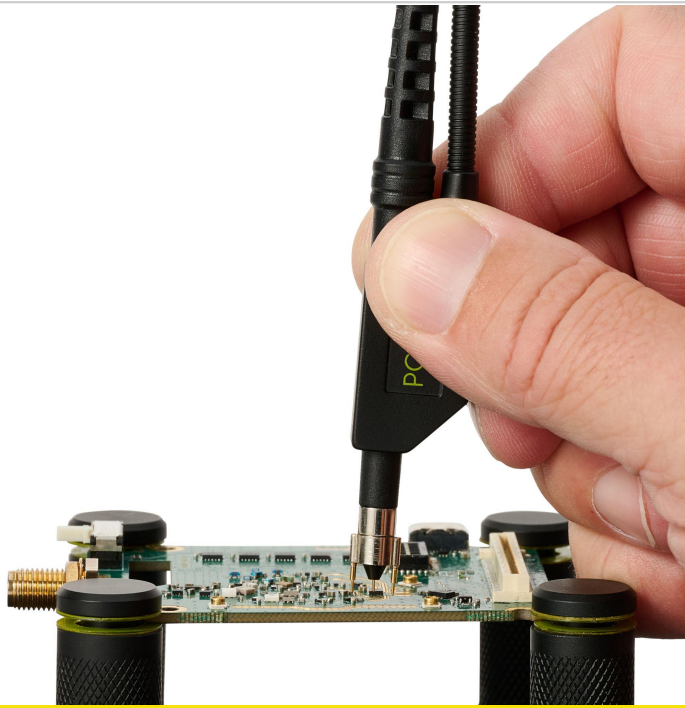
note 3, Calculated

note 4, Measured

note 5, WARNING Signals exceeding the voltage limits in the table below are defined as "hazardous live" by EN 61010.

note 6, Simulated

note 7,Limit with sinus, (square wave will be flat from kHz)



ORDERING INFORMATION – SQG SERIES

Article no	Article description	EUR*
PCBITE-7008	SQG15-AC - 1.5 GHz low impedance 10:1 passive AC probe	169
PCBITE-7009	SQG15-DC - 1.5 GHz low impedance 10:1 passive DC probe	169
PCBITE-7010	SQG30-AC - 3.0 GHz low impedance 10:1 passive AC probe	249
PCBITE-7011	SQG30-DC - 3.0 GHz low impedance 10:1 passive DC probe	249
PCBITE-7012	SQG60-AC - 6.0 GHz low impedance 10:1 passive AC probe	349
PCBITE-7013	SQG60-DC - 6.0 GHz low impedance 10:1 passive DC probe	349
PCBITE-7014	2x Dual ground spring needle 3,5mm	39
PCBITE-7015	2x Dual ground spring needle 5,0mm	39
PCBITE-7016	3x Ground spring 3,5mm	9
PCBITE-7017	5x Probe tip needle	19

***Prices may change. Prices listed are manufacturer's suggested retail price.**

Find all resellers at www.sensepeek.com