Cascade

|Z| Probe

High-Frequency Wafer Probe (GS/SG 20 GHz)

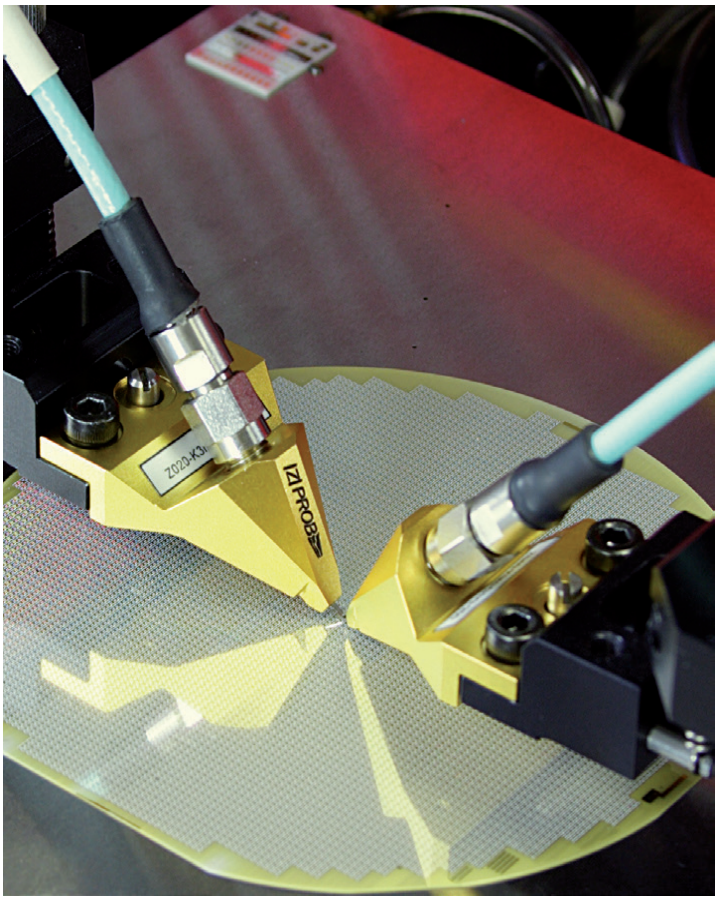
Overview

A Ground-Signal (GS) configuration is the most cost-effective RF design, as less wafer space is taken up with contact pads. FormFactor's Cascade |Z| Probe® in a GS/SG configuration enables wafer-level testing with the highest accuracy and throughput available, while maintaining excellent electrical behavior regardless of footprint size.

It is ideal for reliable high-volume production testing, providing proven unsurpassed contact repeatability. The |Z| Probe GS/SG 20 GHz has been further enhanced with the revolutionary 1MX™ technology, ensuring superior electrical performance, especially insertion and return loss. In addition, isolation (crosstalk) has been significantly improved resulting in a probe that delivers the highest accuracy for your wafer-level RF and microwave measurements.

Independent, long contact springs touch down precisely yet gently even on metal layer thicknesses down to an ultra-thin 50 nm. The unique |Z| Probe design with its independent spring contacts minimizes the impact between tips and pads.

Therefore, by design the |Z| Probe overcomes the limitations of the traditional micro-coax and thin-film style HF probes which typically cause damage after multiple contacts and over travel. The |Z| Probe has an extremely low contact resistance on gold and aluminum pads.



Features and Benefits

Durability	• Incredibly long lifetime • Unparalleled repeatable and reliable contact quality • Suitable for automated testing
Flexibility	• Probe on most pad material with minimal damage • Independent, long contact springs easily overcome pad height differences up to 50 µm • Small structures such as 40 µm x 40 µm pads can be tested • Excellent performance in vacuum environments and temperatures from 10 K to 300°C
RF performance	• Lowest insertion loss • New 1MX technology ensures low insertion loss, high isolation and accurate measurements

Mechanical Specifications

Electrical Characteristics

• Characteristic impedance	50 Ω
• Frequency range	DC to 20 GHz
• Return loss	> 20 dB DC to 20 GHz**
• Insertion loss	< 0.6 dB DC to 20 GHz**
• Maximum RF power	5 W at 20 GHz
• Maximum DC current	1 A
• Maximum DC voltage	75 V
• Contact resistance on Au	< 6 mΩ**

Mechanical characteristics

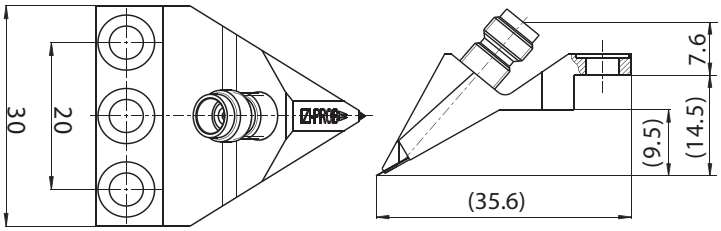
• Contacts	Solid nickel springs
• Insulator	RF dielectric
• Contact cycles on Al	> 1,000,000
• Contact spring pressure	4 N/mm
• Available standard pitches	50 µm to 200 µm with 25 µm increments, 200 µm to 500 µm with 50 µm increments

RF connector

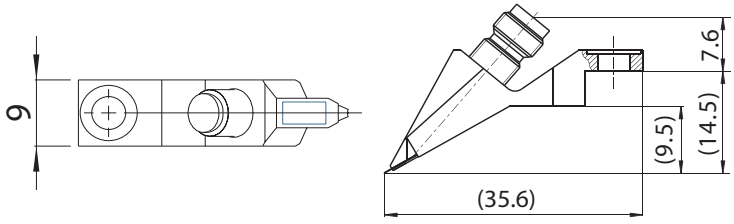
• Type	PC 2.92 mm
• Coupling torque	0.8 Nm to 1.1 Nm (Recommended)
• Outer contact	Stainless steel
• Center contact	CuBe with Au plating
• Insulator	PS

*Data, design and specification depend on individual process conditions and can vary according to equipment configurations. Not all specifications may be valid simultaneously.
**Typical for probes with pitches from 50 µm to 200 µm
***1MX technology is available for pitches up to 500 µm.

Physical Dimensions (measurements in mm)

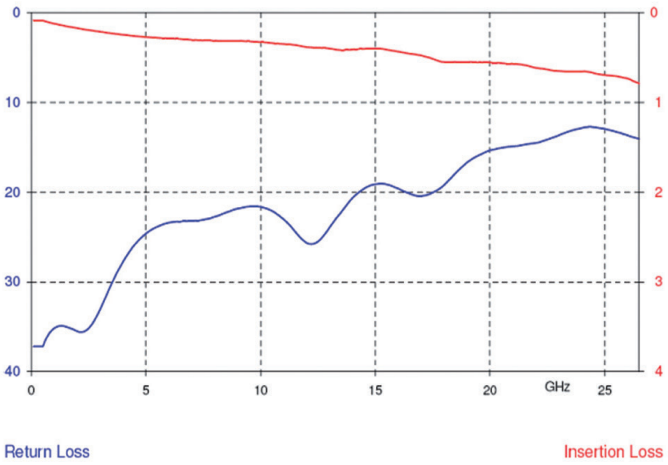


|Z| Probe standard case (all dimensions in mm).

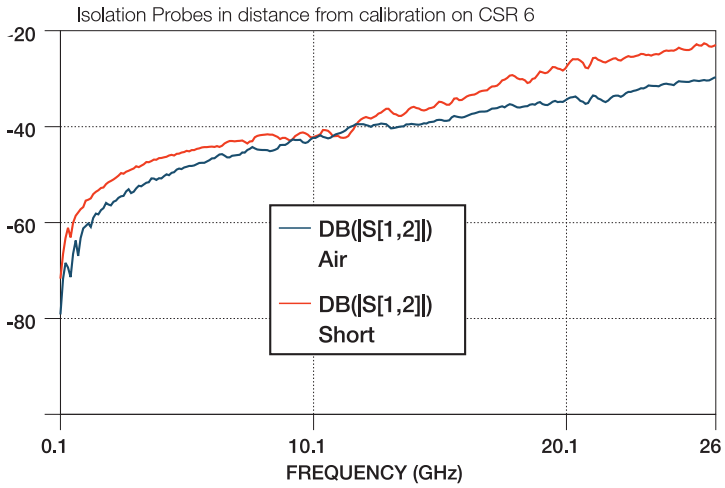


|Z| Probe slim case (all dimensions in mm).

Applications

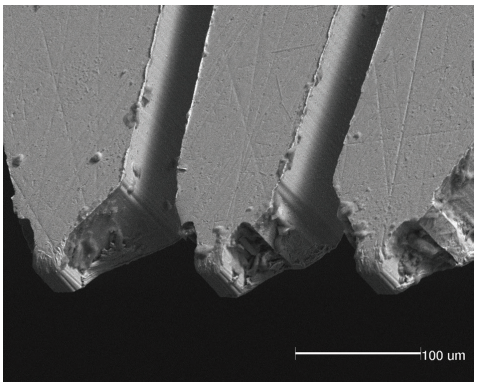


Uncalibrated performance of a |Z| Probe 20 K3N GS 150.

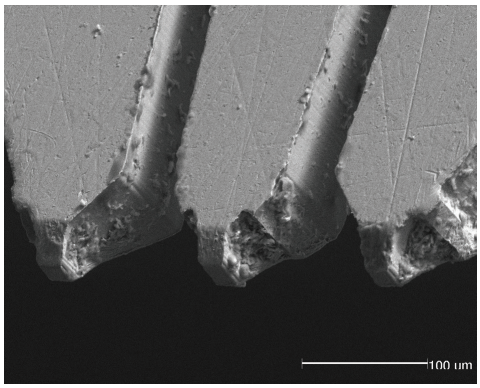


Signal isolation (crosstalk) of two |Z| Probes separated by a distance of 150 µm.

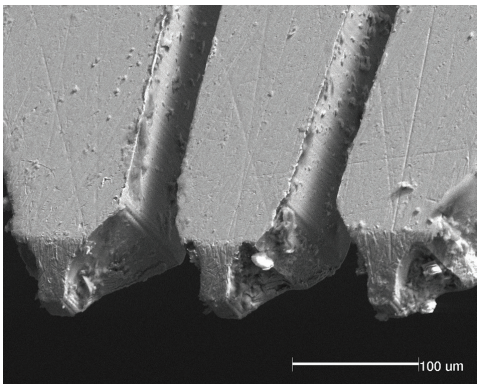
Long lifetime of |Z| Probe (Contact material: Al Overtravel: 75 µm)



New |Z| Probe (upside-down)



The same probe after 1.5 million touchdowns



The same probe after three million touchdowns

ZProbe20-ss-0620

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