Cascade

|Z| Probe

High-Frequency Wafer Probe (GS/SG 67 GHz)

Overview

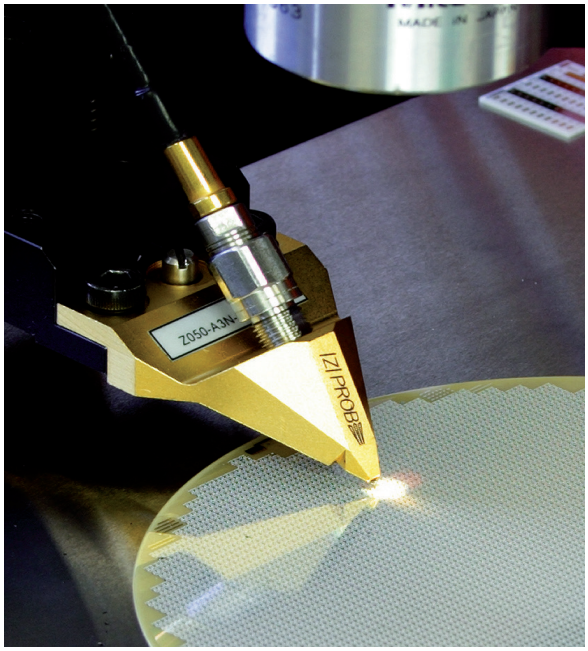
For wafer-level test of RF and microwave devices, there is no better solution than FormFactor's Cascade |Z| Probe. The patented technology used in the |Z| Probe assures high-accuracy measurements with low contact resistance and superior impedance control. The RF/microwave signal makes only one transition to the coplanar contact structure within the shielded, air-isolated probe body. This maintains the signal integrity with stable performance over a wide temperature range.

With the revolutionary 1MX™ technology, the |Z| Probe 67 GHz provides 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.

Contacting the device under test (DUT) with the |Z| Probe is simple, highly repeatable and requires minimum overtravel. Additionally, the contacts can move independent of each other, allowing you to probe on three-dimensional structures and on wafers with pad-height deviation of up to 50 µm.

Used in conjunction with FormFactor's HF probing system including ProbeHeads™, powerful SussCal® Calibration Software and highly-accurate CSR family of calibration substrates, the |Z| Probe becomes the ultimate tool for all your HF wafer-level probing needs.

Thanks to the proven |Z| Probe technology, the probe also has an extremely long lifetime. It guarantees a useful life of at least 1,000,000 contact cycles under standard use and overtravel.



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	• Low contact resistance • New 1MX technology ensures low insertion loss, high isolation and accurate measurements

Mechanical Specifications

Electrical Characteristics

• Characteristic impedance	50 Ω
• Frequency range	DC to 67 GHz
• Return loss	> 17 dB DC to 67 GHz**
• Insertion loss	< 1.0 dB DC to 67 GHz**
• Maximum RF power	4W at 67 GHz,9 W at 20 GHz, 16 W at 5 GHz
• Maximum DC current	1.5 A
• Maximum DC voltage	100 V
• Contact resistance on Au	< 4 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 250 µm with 50 µm increments

RF connector

• Type	PC 1.85 mm, female
• Coupling torque	0.8 Nm to 1.1 Nm (Recommended)
• Outer contact	Stainless steel
• Center contact	CuBe with Au plating
• Insulator	PEEK

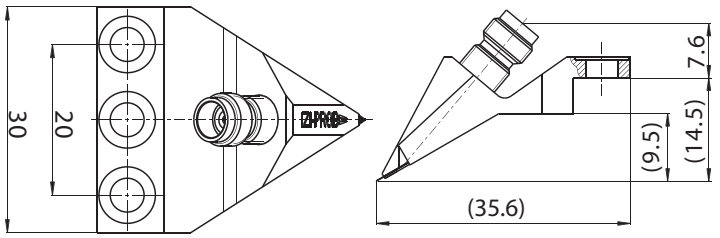
Environmental Data

• Temperature range	-100 °C to 200 °C (Type V, standard), 10 K to 300 °C (Type C, extreme temperature)

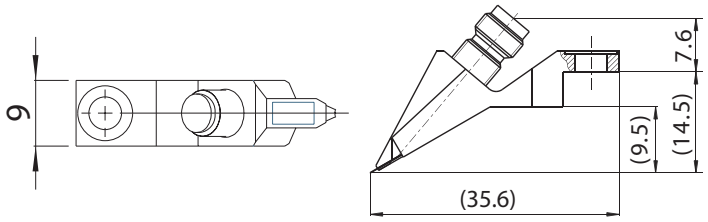
*Data, design and specification depend on individual process conditions and can vary according to equipment configurations. Not all specifications may be valid simultaneously.

**Typical for probes with pitches from 50 µm to 150 µm

Physical Dimensions (measurements in mm)

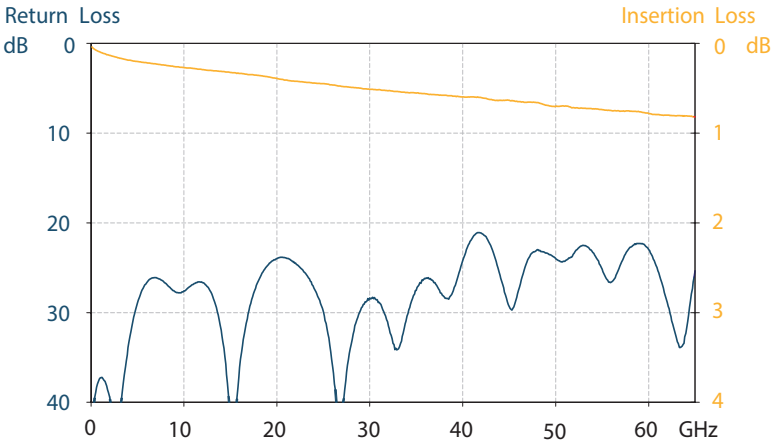


|Z| Probe standard case (all dimensions in mm).

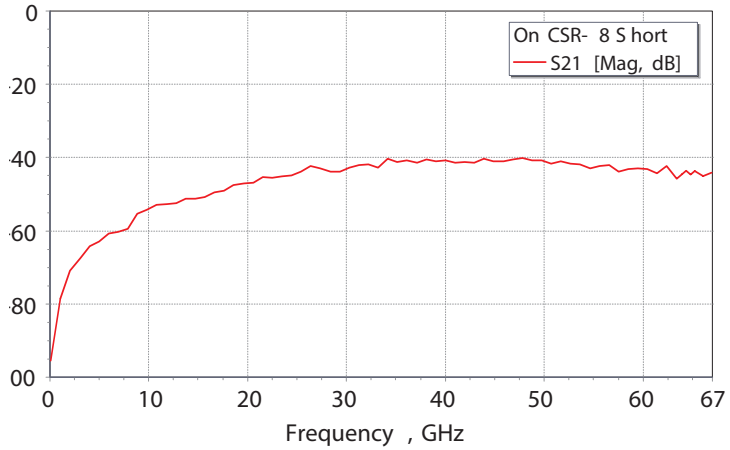


|Z| Probe slim case (all dimensions in mm).

Applications

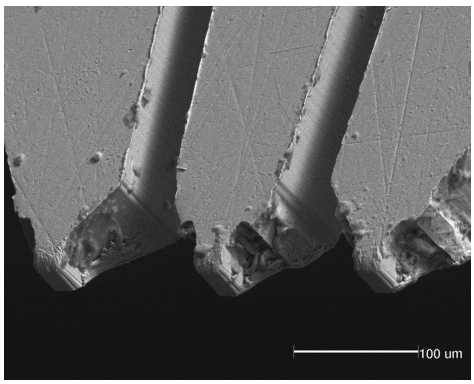


Uncalibrated performance of a |Z| Probe 67 V3N GSG 150.

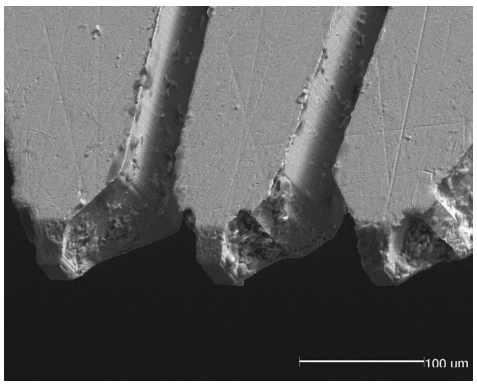


Signal isolation (crosstalk) of two |Z| Probes separated by a distance of 150 µm.

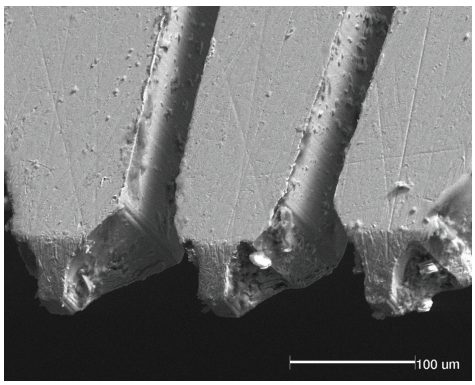
Long lifetime of |Z| Probe (Contact material: Al Overtravel: 75 µm)



New |Z| Probe (upside-down)



The same probe after 1.5 million touchdowns



The same probe after three million touchdowns

ZProbe67-ss-0620

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