

Cascade

I_{ZI} Probe Power

High-Power, High Performance Wafer Probe

Overview

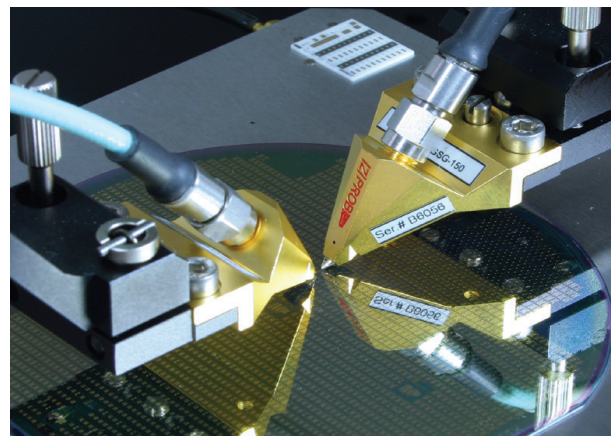
The demand for access to rich content anywhere in the world is driving the growth of wireless transmission of information. This increases the need for RF power devices in wireless systems and new technologies such as GaN and SiC. This in turn necessitates the characterization of these new technologies at wafer-level, which significantly reduces the time needed to develop new models. These models are used in new device designs, which are then further implemented in wireless transmission systems (base stations, satellites, etc.) to meet the demands of the content-hungry consumer.

To provide highly accurate characterization of RF power devices at wafer level, FormFactor has developed Cascade I_{ZI} Probe Power, based off proven I_{ZI} Probe technology, which can handle up to 66 W at 2.4 GHz and 43 W at 5 GHz. The I_{ZI} Probe Power provides excellent contact repeatability and extremely low contact resistance to deliver the most accurate results up to 40 GHz in load-pull measurement setups, which are typical for characterizing RF power devices.

The I_{ZI} Probe Power is optimized even further for load-pull and noise-parameter measurements. Insertion loss, a critical value in these measurements, must be kept low in order to

keep the reflection coefficient (Γ) high. The I_{ZI} Probe Power has a typical insertion loss of 0.4 dB up to 40 GHz – a more than 70% improvement over standard I_{ZI} Probe. This means you get more accurate measurements especially at non-50 Ω impedances.

Thanks to the proven I_{ZI} Probe technology, the probe also has an extremely long lifetime. FormFactor guarantees that the probe has a useful life of at least 1,000,000 contact cycles under standard use and overtravel. No other RF probe provides such outstanding electrical performance and long lifetime, both characteristics that are a result of FormFactor's pioneering work in developing nickel contact tips. As a result, the I_{ZI} Probe Power is perfect for probing on aluminum and gold pads, and the ideal choice for your on-wafer RF power device characterization needs.



Features and Benefits

High-power RF measurement

- Lowest DC resistance enables high power throughput
- Lowest insertion loss and highest possible return loss
- Unparalleled repeatable and reliable contact quality

Pulsed signal measurement

- More than twice the specified power rating (depending on pulse characteristics)

Small pads, structures and uneven surfaces

- 40 μm x 40 μm pads can be tested
- Pad height differences of up to 50 μm can easily be handled

Accurate load-pull measurements

- Very-low insertion loss makes the probes ideal for on-wafer load-pull measurements
- Nickel spring contacts enable safe and stable contact even on aluminum pads and under small vibrations

➤ Mechanical Specifications

Electrical Characteristics

• Characteristic impedance	50 Ω
• Frequency range	DC to 40 GHz
• Insertion loss	< 0.5 dB DC to 40 GHz (0.4 dB typical)
• Average maximum RF power DC current	9 W (40 GHz), 25 W (10 GHz), 60 W (2 GHz) (CW**)
• DC current	Maximum 2 A
• Contact resistance on Au	< 0.04 Ω

Mechanical characteristics

• Contact springs	Nickel
• Insulator	RF dielectric
• Lifetime	> 1,000,000 contact cycles
• Maximum contact pressure	6 N/mm
• Available pitches (m)	100, 125, 150, 200, 250, 300, 350, 400, 450, 500 μ m

Connector

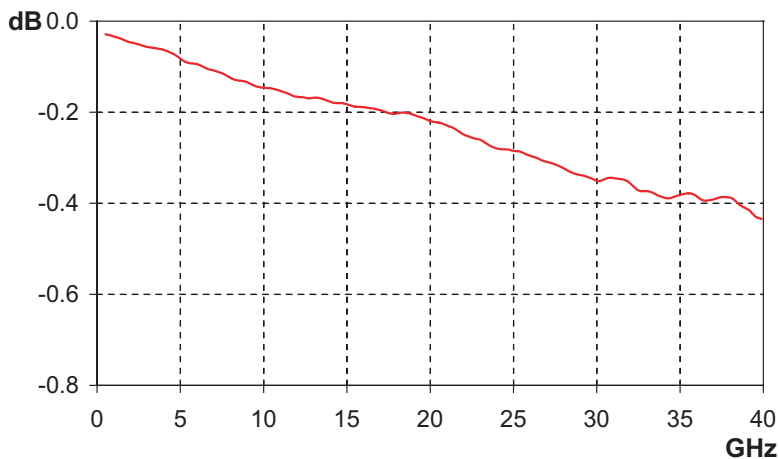
• Type	PC 2.92 mm, female
• Coupling torque	0.8 to 1.1 Nm (recommended)
• Outer contact	Stainless steel
• Center contact	CuBe with Au plating
• Insulator	PEEK

Environmental Data

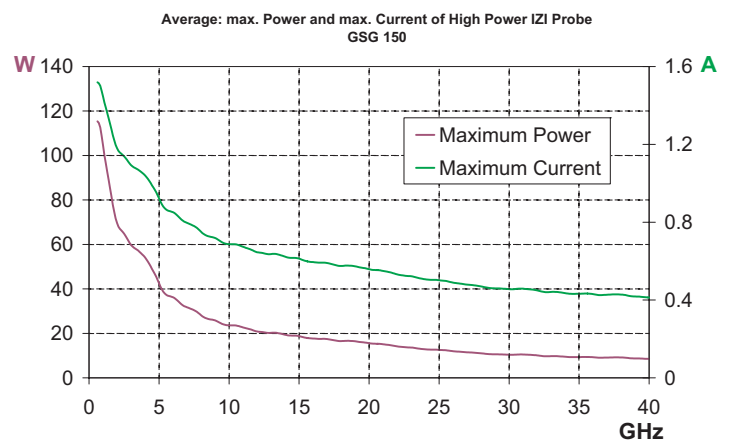
• Temperature range	- 100° C to 200° C
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* Data, design and specification depend on individual process conditions and can vary according to equipment configurations. Not all specifications may be valid simultaneously.

** Continuous Wave - An electromagnetic wave generated as an unbroken train of constant frequency and amplitude, rather than in pulses.

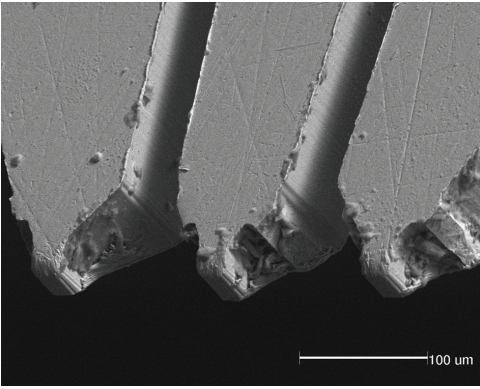


Low insertion loss of the IZI Probe Power.

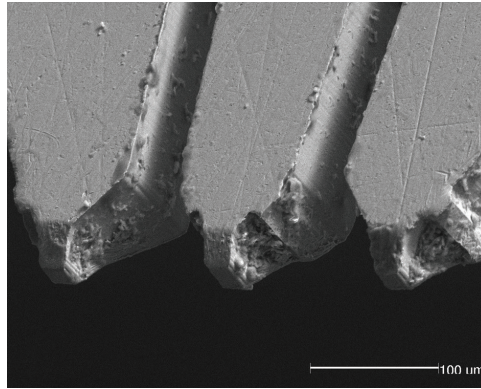


Average rating of maximum power and maximum current (CW) of the IZI Probe Power GSG.

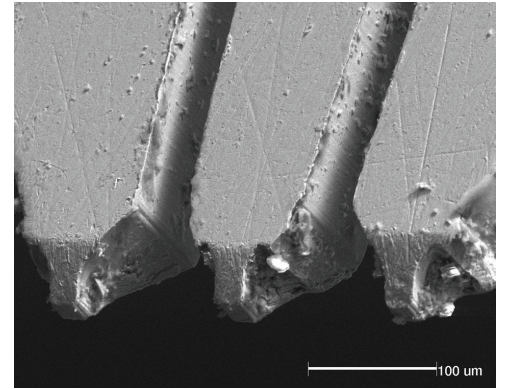
Long lifetime of IZI Probe (Contact material: Al Overtravel: 75 μm)



New IZI Probe (upside-down)

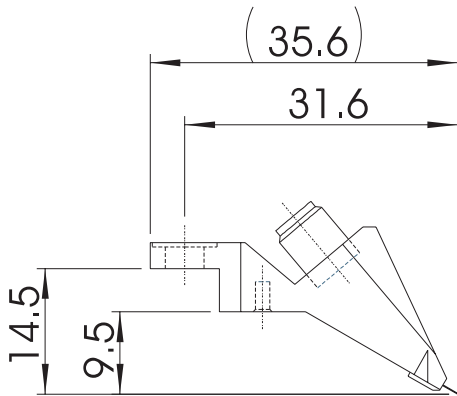
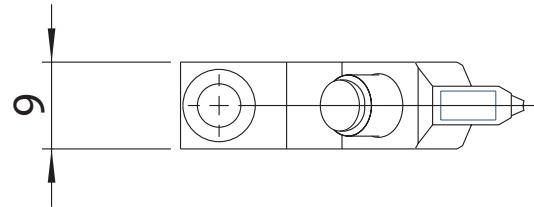
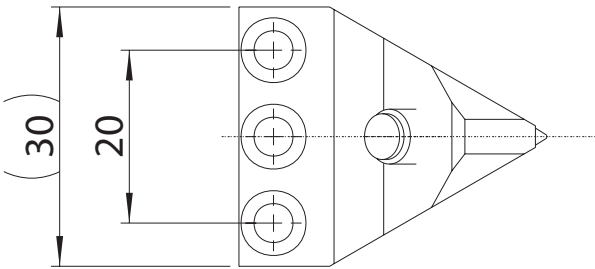


The same probe after 1.5 million touchdowns

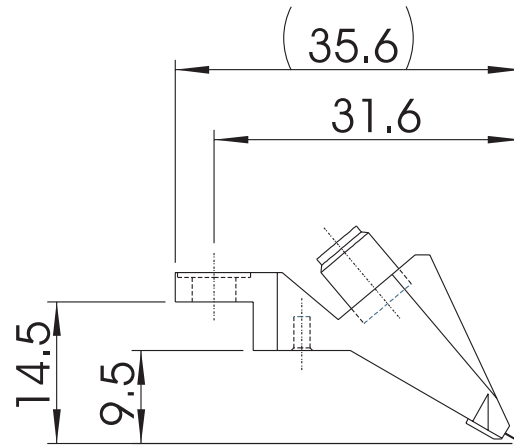


The same probe after three million touchdowns

➤ Physical Dimensions (measurements in mm)



IZI Probe Power standard case. (All dimensions in mm.)



IZI Probe Power slim case. (All dimensions in mm.)

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All information is subject to change without notice.

ZProbePower-SS-0620