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Infinity Probes



Infinity Probe sets the benchmark for the device characterization and modeling community

The Infinity probe is truly unique in its architecture that delivers industry leading performance. This revolutionary probe combines extremely low contact resistance on aluminum pads with unsurpassed RF measurement accuracy to provide highly reliable, repeatable measurements. The Infinity Probe reaches this new performance level through the combination of FormFactor's proprietary thin-film technology and coaxial probe technology.

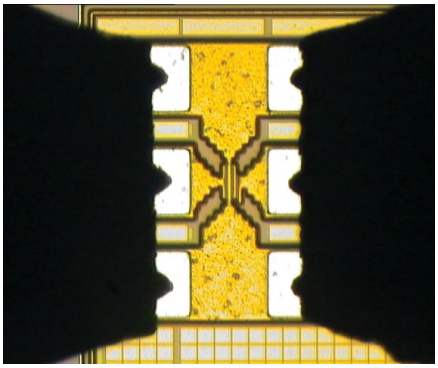
Infinity probes are compatible with FormFactor's Autonomous RF Measurement Assistant, which enables fully autonomous, hands-free RF and mmW calibrations and measurements over multiple temperatures (page 37).

Features

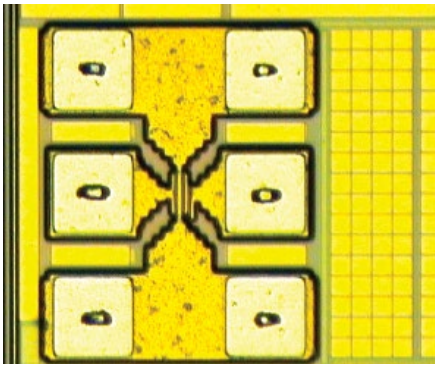
- Lithographic thin-film construction
- Non-oxidizing nickel alloy tips
- Innovative force delivery mechanism
- 40 to 500 GHz versions
- GSG, SG/GS, GSGSG, GSSG, SGS configurations
- Probe pitch as narrow as 50 µm
- High-current version (2 A) available
- Typical lifetime > 250,000 touchdowns on Al pads

Advantages

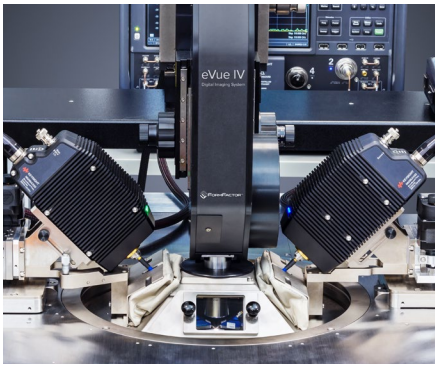
- Superior field confinement reduces unwanted couplings to nearby devices and transmission modes
- Low, stable contact resistance
- Superior measurement accuracy and repeatability
- Small scrub minimizes damage to aluminum pad
- Typical contact resistance: < 0.05 Ω on Al, < 0.02 Ω on Au
- Save valuable wafer space and reduce pad parasitics by being able to shrink pad geometries to 25 x 35 µm (best case)
- Reduction in modeling and design cycle time



Infinity Probe contacting silicon RF device



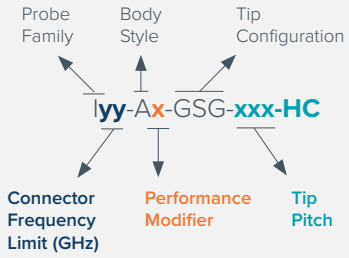
Small contact marks enable contact to small pads



Autonomous RF Measurement Assistant with Infinity probes

Infinity Probes

Part Number Key



Characteristic	Available values
Coaxial Conn. (Frequency)	40 GHz = 2.92 mm, 50 GHz= 2.4 mm, 65 GHz = 1.85 mm, 110 GHz = 1 mm
Body Style - Coaxial and Wave Guide	Blank = Vertical, A = Angled, D = Dual Vertical (Dual angled not avail.), S = Short Wave Guide, T = Tall Wave Guide
Performance Modifier	Blank = Standard, M = Modeling Version
Tip Configuration	GS, SG, GSG, GSSG, GSGSG (SSG, GSS)[1]
Tip Pitches	50-250 in 25 µm increments, larger values may be available (check with factory)
Suffix (Tip modifier)	Blank = Standard microstrip version, HC = High-current version (CPW tip structure)

Note: Not all combinations are available.

Contact configuration	GSG, SG, GS	Connector	GSGSG, GSSG, SGS
Frequency range for coaxial probes	I40 – DC to 40 GHz	I40 - 2.92 mm (f)	I40
	I50 – DC to 50 GHz	I50 - 2.4 mm (f)	I50
	I67 – DC to 67 GHz	I67 - 1.85 mm (f)	I67
	I110 – DC to 110 GHz (GSG)	I110 - 1 mm (f)	I110
	I145 - DC to 145 GHz (GSG)	I145 - 0.8 mm (f)	NA
Typical insertion loss (GSG, GSGSG versions only)			
DC to 40 GHz	0.7 dB		0.9 dB
40 to 50 GHz	0.8 dB		0.9 dB
50 to 67 GHz	1.1 dB		1.2 dB
67 to 110 GHz	1.4 dB		1.6 dB
110 to 145 GHz	2.5 dB		NA
Typical return loss (GSG, GSGSG versions only)			
DC to 40 GHz	20 dB		15 dB
40 to 50 GHz	17 dB		15 dB
50 to 67 GHz	16 dB		13 dB
67 to 110 GHz	14 dB		11 dB
110 to 145 GHz	14 dB		NA
Crosstalk	-50 dB @ 50 GHz		Typically -40 dB @ 40 GHz; GSGSG 150 Typically -25 dB @ 40 GHz ; GSSG 150
Electrical repeatability	-60 dB		-60 dB
Probe pitch (25 µm increments)	50 to 250 µm pitch (I40, I50 and I67) 50 to 150 µm pitch (I110)		100 to 250 µm pitch -
Recommended overtravel	75 µm		75 µm
Maximum safe overtravel	150 µm		150 µm
Maximum DC current	500 mA (2 A for -HC version)[2]		500 mA
Thermal range	-65 to 125°C		-65 to 125°C
Rc on aluminum (gold)	Typically < 0.05 Ω (< 0.02 Ω)		Typically < 0.05 Ω (< 0.02 Ω)
Rc variation during one 5-hour single contact cycle[3]	10 mΩ		10 mΩ
Min. probe pad size	25 x 35 µm (best case)		25 x 35 µm (best case)

Note: Probe S-Parameter files "s2p" are available at the following link. You will need the exact PN and SN of the probe to download the s2p file.

[1] Signal furthest from ground is not specified for SSG and GSS.

[2] High-current version (2 A) available up to 67 GHz (GSG only)

[3] Specifications applicable at 25°C operating temperature on clean aluminum

See page 35 for recommended Impedance Standard Substrates, and page 42 for a list of cables

Link to Drawings

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