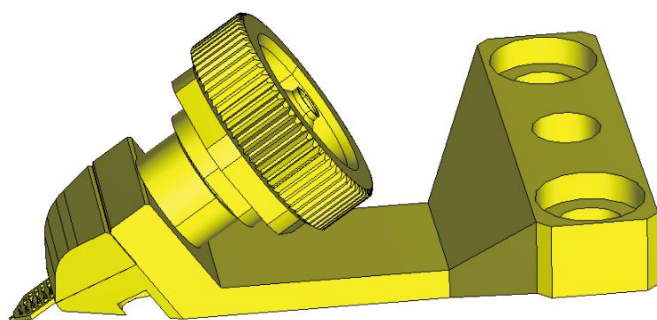
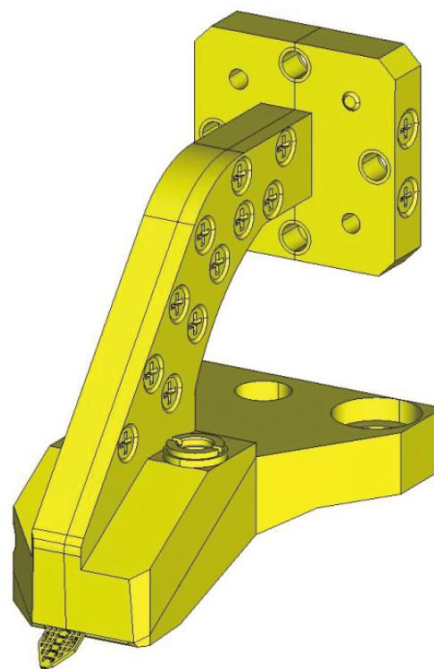




Terahertz Probe Series

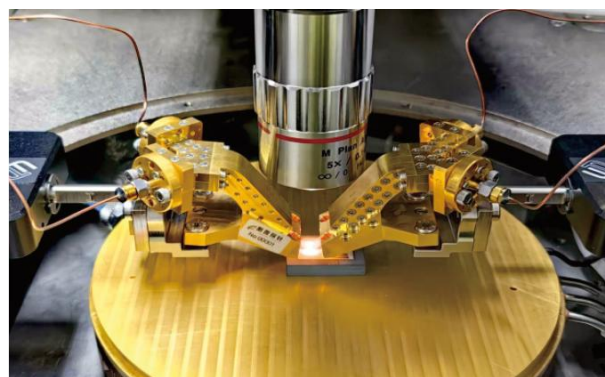
PRODUCT MANUAL

Terahertz Probe Series>>



Product Introduction

To address the high cost of high-frequency probes and supply-chain challenges in terahertz chip testing, a research team at a higher education institution in China achieved a major breakthrough after five years of dedicated research and development. Supported by two projects funded by the National Natural Science Foundation of China and a national young-talent program, the team pioneered a multi-material micro-additive manufacturing process and successfully developed high-frequency probes covering DC-145GHz and 75-400GHz.



This high-frequency probe series fills a gap in international academic research and has been granted an invention patent. Its outstanding RF performance meets diverse testing needs in the defense industry, research institutes and universities. It provides an efficient, economical testing solution, overcomes barriers imposed by foreign technology and advances terahertz testing technology in China.

Accutera probes cover DC-145GHz and the 75-400GHz waveguide bands (with expansion to DC-220GHz and 75-500GHz planned for late 2025 to early 2026). They support flexible multiport expansion and are available in various specifications, with precise customization to customer requirements and excellent durability. Compatibility with standard calibration substrates ensures broad applicability. Rigorous testing confirms that key RF performance metrics are comparable to those of commercial probes, meeting diverse testing needs for passive and active devices. Accurate extraction of parasitic parameters and support for calibration methods such as SOLT and TRL make them an ideal choice for efficient testing.

Product Highlights: Lower Cost, Superior Performance

Cost Savings

Substantially lower purchase costs and overall expenditure.

Faster Service

Rapid repair response. Maintenance in China takes just one week.

Broad Selection

Multiple frequency bands for a wide range of measurement applications.

Versatile Testing

Comprehensive testing of passive and active devices and on-chip antennas.

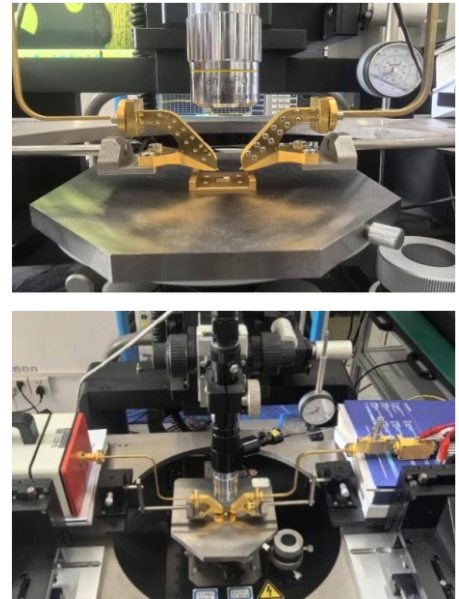


Fig. 1: Accutera probe appearance and use in a measurement system

Accutera probes use advanced additive manufacturing technology to transform conventional production. They offer significant cost advantages, especially at frequencies of 75GHz and above. See Figs. 1-3.

Carefully selected specialty metals combine excellent RF performance with high hardness, allowing the probe tips to readily penetrate oxide films on contact pads. Precision visualization-based tip optimization delivers performance comparable to high-end probes, with easy operation and accurate measurements for an improved user experience. Designed for high-frequency waveguide measurements, the probes provide measured performance across the bands shown in Figs. 4-7.

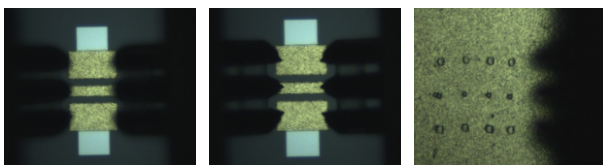
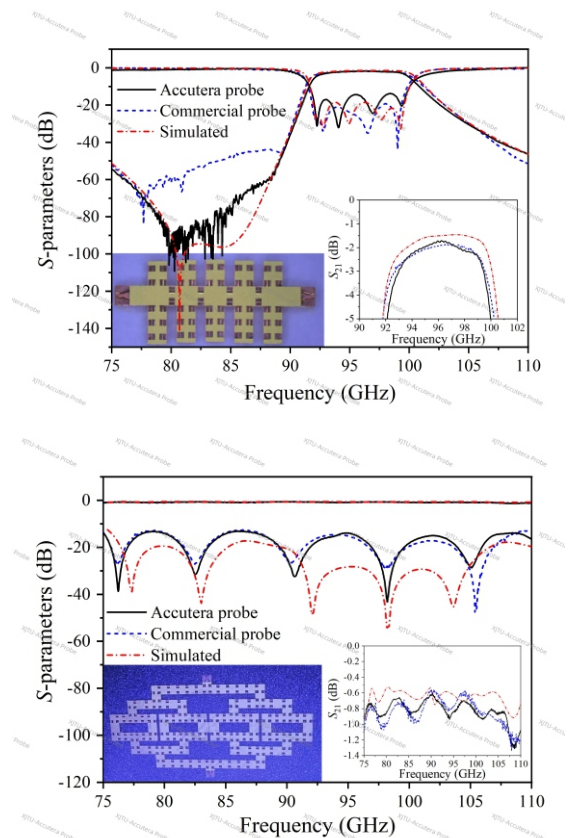


Fig. 2: Accutera probe tips and contact marks, with measured comparisons against commercial probes

Suitable for active-chip measurements, with small contact marks and minimal damage to the chip.

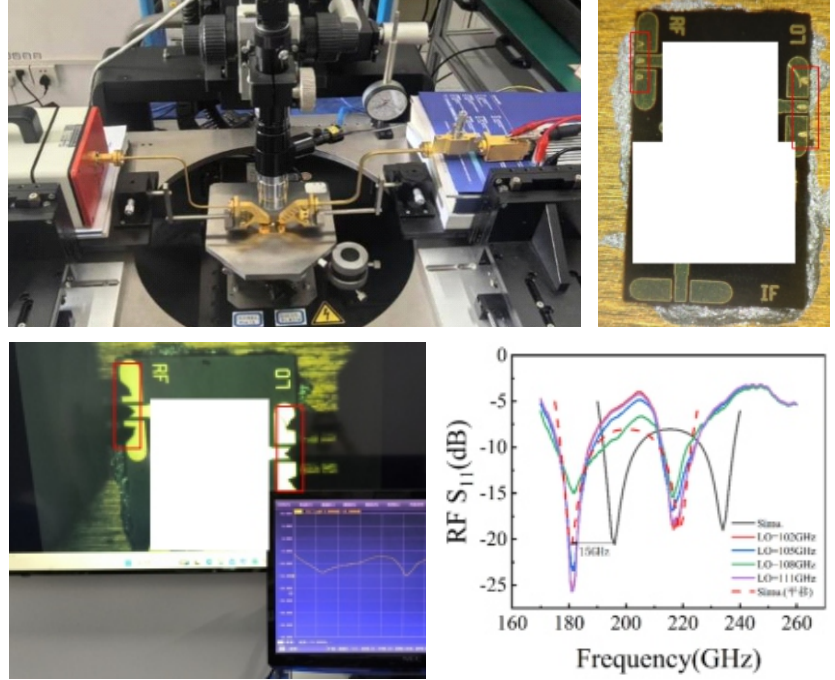


Fig. 3: Measurements on an active chip

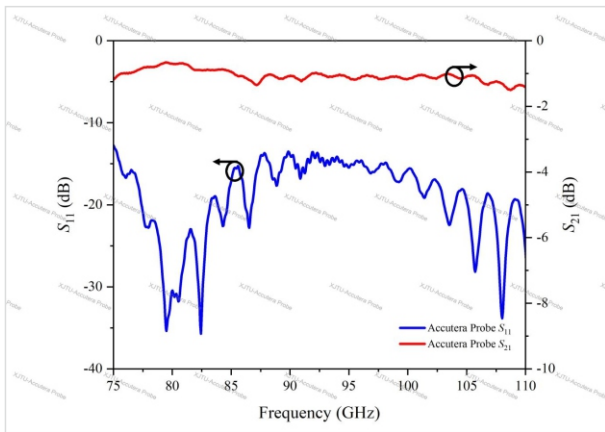


Fig. 4: Measured data for the 75-110-GSG-125 probe

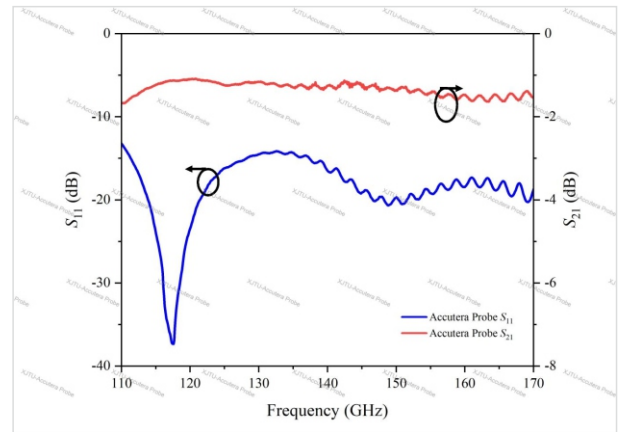


Fig. 5: Measured data for the 110-170-GSG-100 probe

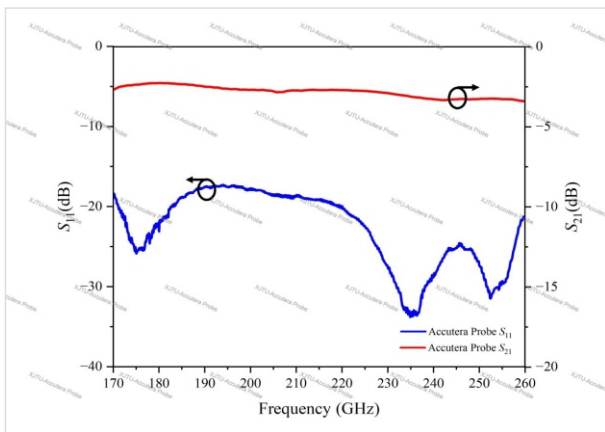


Fig. 6: Measured data for the 170-260-GSG-75 probe

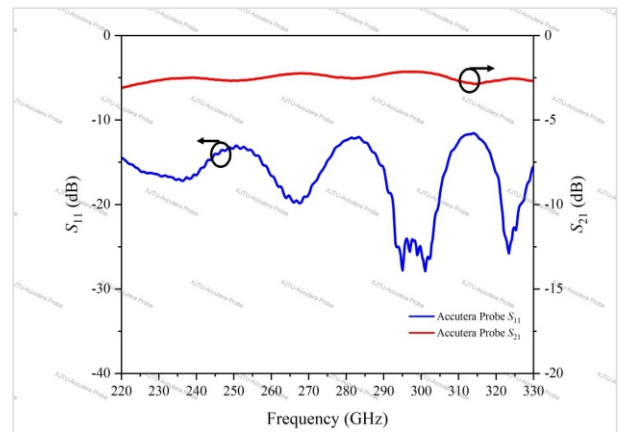
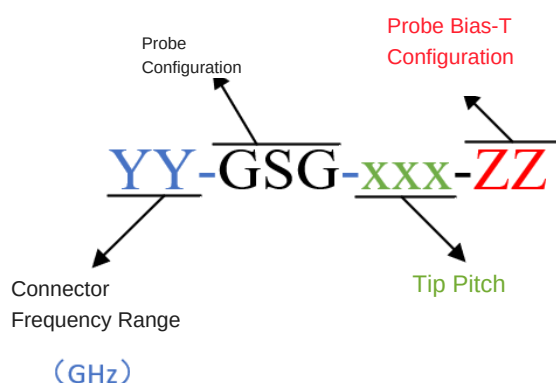


Fig. 7: Measured data for the 220-330-GSG-50 probe

Accutera Probe Model Designation



Property	Specification
Connector Frequency Range	75-110=WR-10,110-170=WR-6,140-220=WR-5 170-260=WR-4,220-330=WR-3
Probe Configuration	GSG
Tip Pitch	50-250μm
Probe Bias-T Configuration	BT: Bias-T Included

Note: Not all combinations are available.

Accutera Probe: Basic Specifications

Housing Material	Copper
Tip Angle	30°
Operating Temperature	-45°C to +85°C

Accutera Probe: Test Capabilities and Product Specifications

Frequency/GHz	Recommended Pitch/μm	Test Capabilities	
		Standard Probe	Cryogenic Probe
DC-110	50-250	Yes	/
DC-145	50-150	Yes	/
DC-220	50-100	Yes	/
75-110	100-150, 250	Yes	Yes
90-140	50-100	Yes	Yes
110-170	100-150	Yes	Yes
140-220	50-150	Yes	Yes
170-260	50-100	Yes	Yes
220-330	50-100	Yes	Yes
260-400	50	Yes	Custom-made
330-500	50	Yes	Custom-made

Note 1: Lead time depends on the frequency band, tip pitch and test capabilities. Contact sales for details.

Note 2: 260-400GHz and 330-500GHz GSG probes are at the trial stage and require custom manufacture.

Note 3: For other tip pitches, please contact sales.

Note 4: Standard waveguide probes can be customized with DC bias capability. Contact sales for details.

Note 5: Thermal insulation for cryogenic probes must be provided by the user. These probes contain no dielectric material, so G and S are DC-shortened and DC bias is unavailable. They offer excellent mechanical performance.

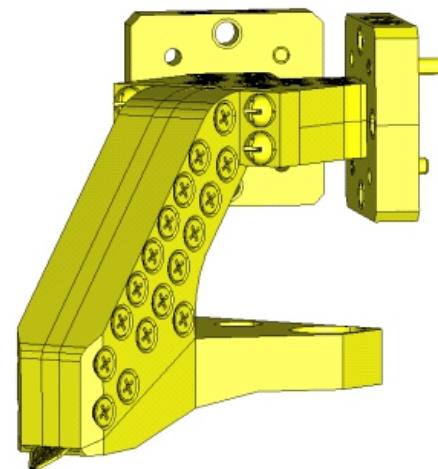
Performance Specifications of Selected Probes

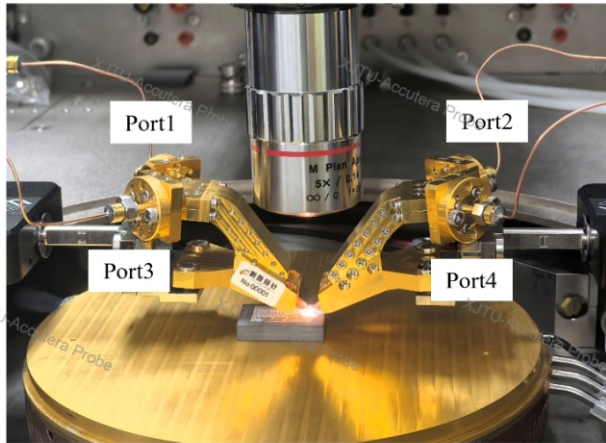
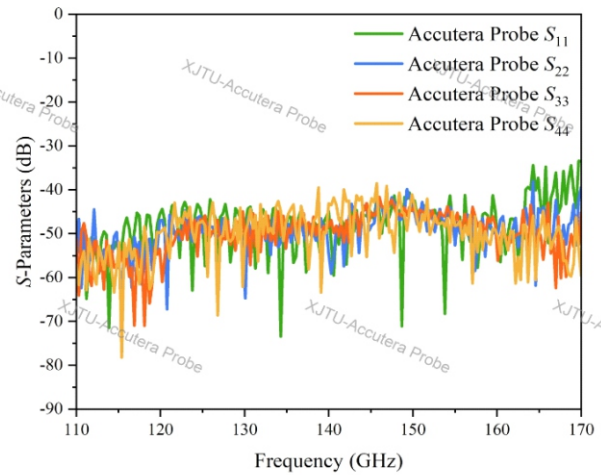
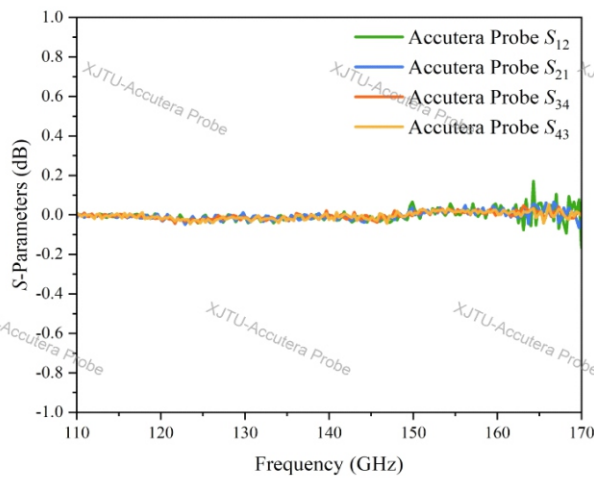
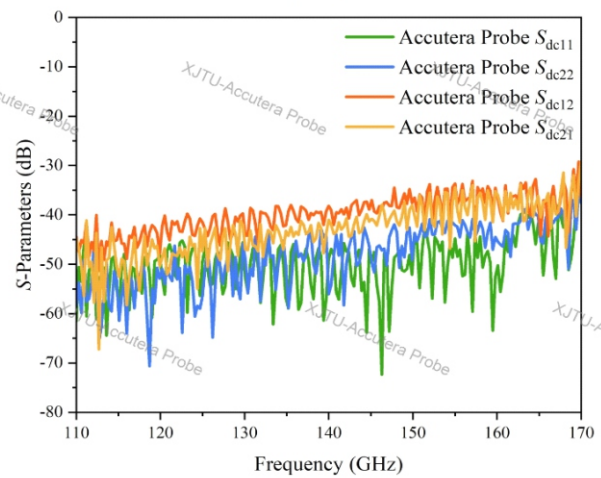
Probe Model	Frequency/GHz	Tip Pitch/ μm	Crosstalk	Typical Insertion Loss (dB)	Typical Return Loss (dB)	Contact Life/Cycles
75-110-GSG-125	75-110	125	-36dB@92.5GHz	1.2	15	>50,000
110-170-GSG-100	110-170	100	-32dB@140GHz	1.5	15	>50,000
110-170-GSG-100-BT	110-170	100	/	2	15	>50,000
140-220-GSG-75	140-220	75	-35dB@180GHz	2.5	15	>50,000
170-260-GSG-75	170-260	75	-30dB@215GHz	3	15	>50,000
220-330-GSG-50	220-330	50	-43dB@275GHz	3	15	>50,000
DC-110-GSG-125	DC-110	125	-33dB@55GHz	1.5	15	>50,000

Accutera Waveguide Differential Probes

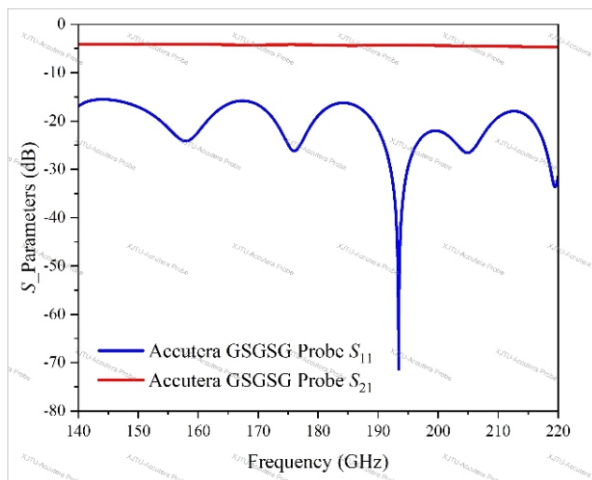
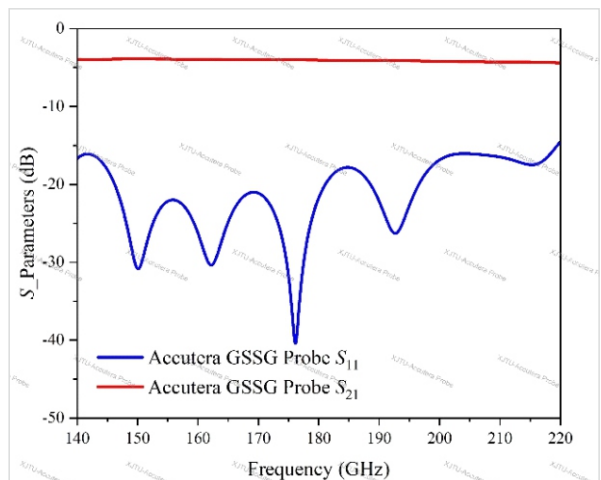
Frequency/GHz	Tip Configuration	Recommended Pitch/ μm	Stock Pitch/ μm
75-110	GSGSG, GSSG	100-150	Custom-made
90-140	GSGSG, GSSG	100-150	Custom-made
110-170	GSGSG, GSSG	100-150	100-150
140-220	GSGSG, GSSG	75-125	100
170-260	GSGSG	50-100	Custom-made
220-330	GSGSG	50-75	Custom-made

Note: DC bias capability can be customized (except for 220-330GHz).





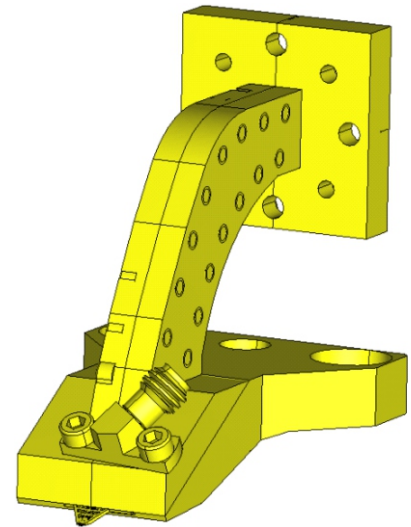
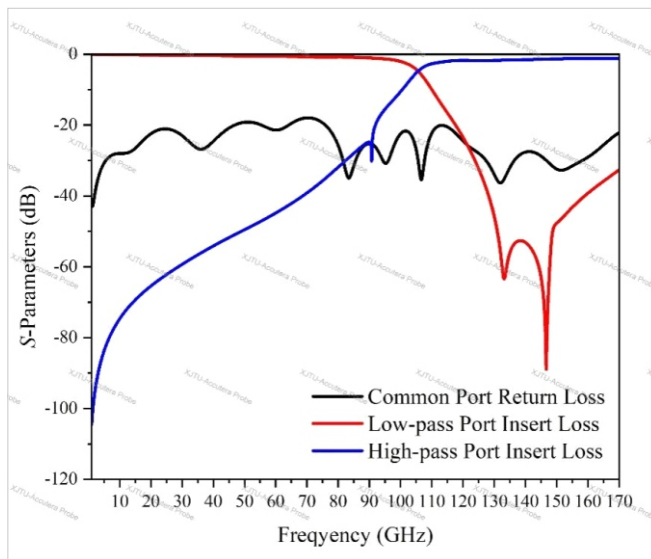
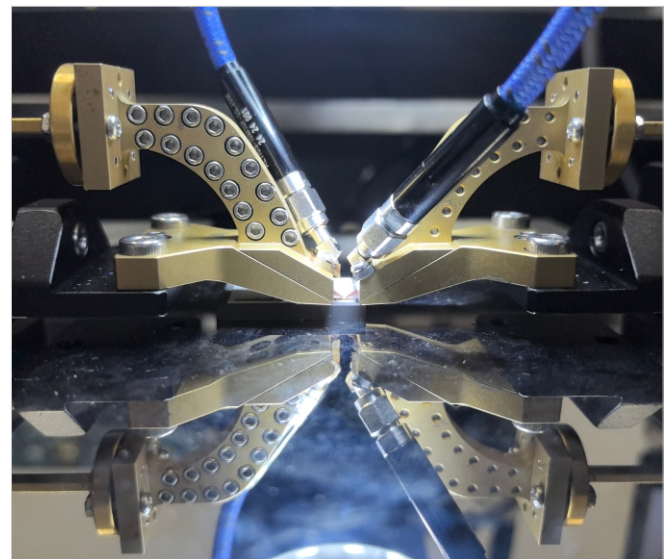
110GHz-170GHz-GSGSG-125: Differential Probe Measurement Results



140GHz-220GHz-GSGSG/GSSG-100: Differential Probe Simulation Validation Results (includes the 3dB loss associated with differential operation; additional loss is only 1-2dB)

Accutera Dual-Band Probes

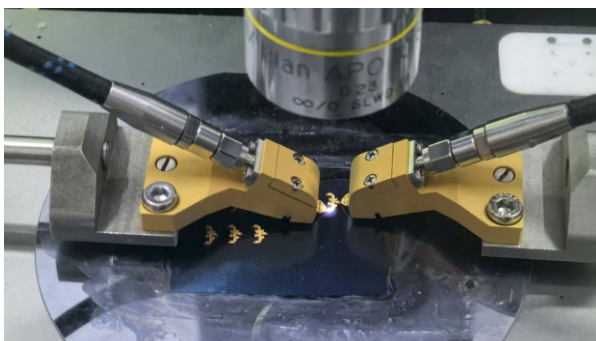
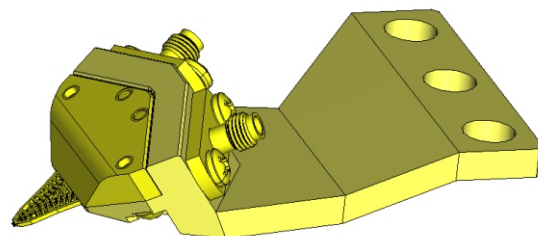
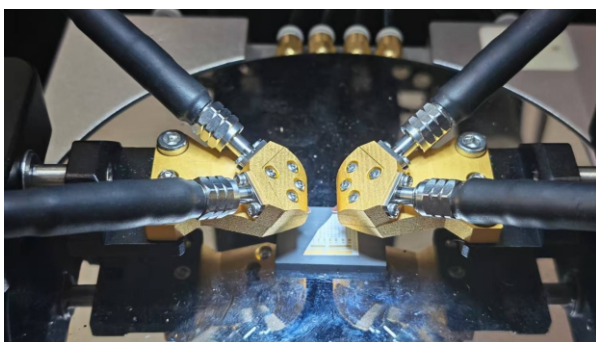
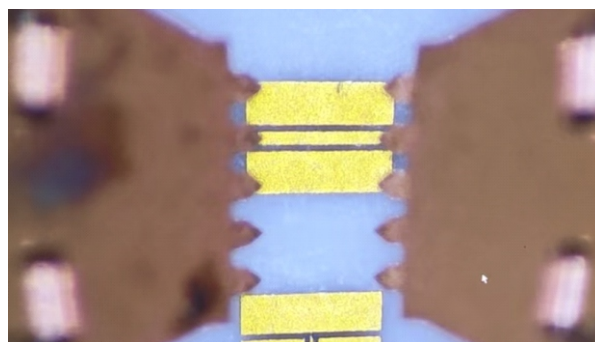
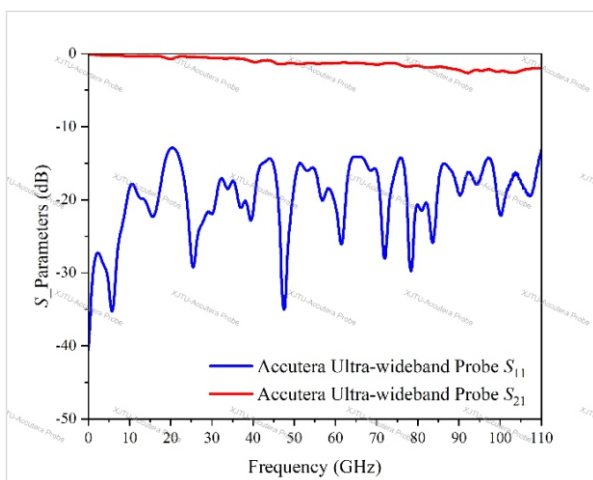
Frequency/GHz	DC-170	DC-220
Tip Configuration	GSG	GSG
Recommended Pitch/ μm	75-125	75-125
Stock Pitch/ μm	100	Custom-made
Connector Type	WR-6 Waveguide + 1.0 mm Coaxial	WR-5 Waveguide + 1.0/0.8 mm Coaxial



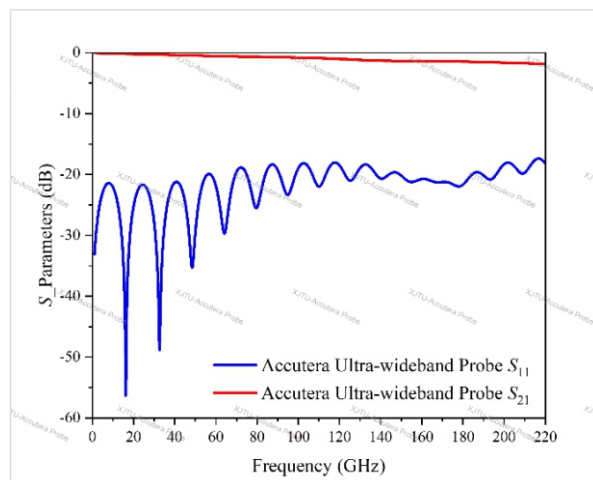
DC-170GHz-GSG-100: Dual-Band Probe Simulation Validation Results

Accutera Ultra-Wideband Coaxial Probes

Frequency/GHz	DC-110/145GHz			DC-175/220GHz		
Tip Configuration	GSG	GSGSG	GSSG	GSG	GSGSG	GSSG
Recommended Pitch/ μm	50-200	50-150	50-150	50-150	50-125	50-125
Stock Pitch/ μm	50-200	50-150	Custom-made	50-150	50-125	Custom-made
Connector Type	1.0/0.8 mm Coaxial Connector			0.6 mm Coaxial Connector		



DC-110GHz GSG Probe Measurement Results



DC-220GHz GSG Probe Simulation Results



Future Outlook

Continuous Innovation. A Promising Future.