

HPD PQ500

Cryogenic Probe Socket Solution

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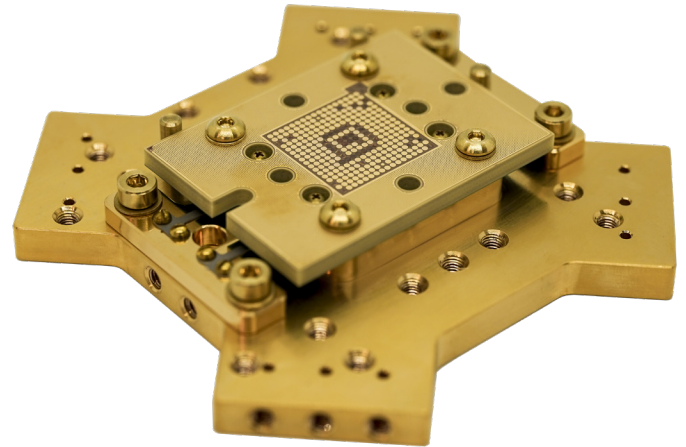
➤ Overview

The HPD PQ500, a first-of-its-kind, cryostat-agnostic, high-density RF and DC socket interface, enables researchers and developers to test chips without wire bonding and packaging.

The cryogenic probe socket solution can be used at mK temperatures, adaptable to an existing cryostat, accommodating small pitches, and capable of having an extremely high channel capacity.

➤ Advantages

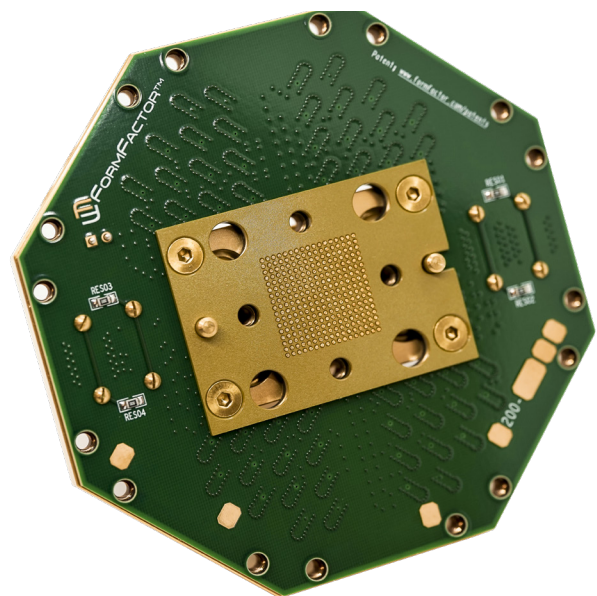
- Tests and validates performance directly on silicon without post-dicing packaging
- Dramatically reduces time to data and shortens development cycles
- Enables high scalability for high volume manufacturing
- Offers flexibility in chip design with full grid probing



PQ500 probe head with MLO space-transformer



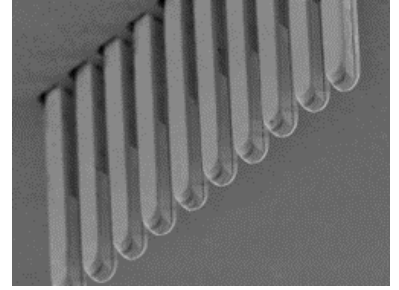
Complete PQ500 probe socket



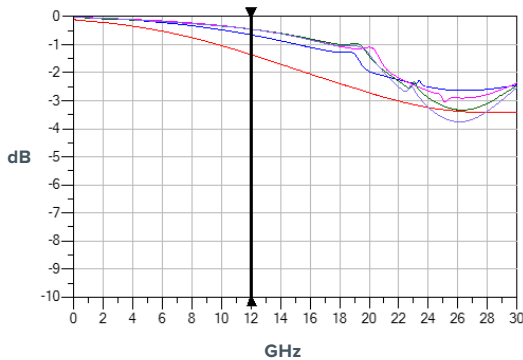
PQ500 receiver

➤ Design Specifications

Probe model	GC150 Vertical MEMS Probe
Probe metallurgy option	Non-ferromagnetic
Probe tip dimension	25 μm x 30 μm
Min. pad/bump pitch - grid	150 μm x 150 μm
Probe head deployment temperature	mK to 400 K
Number of probes	Up to 625
Signal type	DC and/or RF (<20 GHz)
RF insertion loss	<0.5 dB at 20 GHz @250 μm PAD/Bump Pitch GSG
Max. device size	50 mm x 50 mm
Compatible device pad material	Al, Au, Cu
Probe tip planarity	25-35 μm
Probe-to-pad/bump alignment precision	± 12.5 μm
Recommended overdrive	75-100 μm
Probe force within recommended overdrive	3 g force
Probe length	1.2 mm
ISMI current carry capability	1.4 A
Max. allowable current	11 A

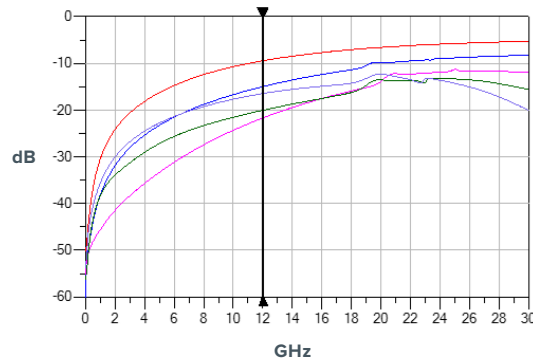


**Simulated insertion loss vs. frequency plot
45 degree angle, GSG**



At 12 GHz, insertion loss for 150 μm is at -1.4 dB, while for all other pitches at >200 μm , the insertion losses are well below -1 dB.

**Simulated return loss vs. frequency plot
45 degree angle, GSG**

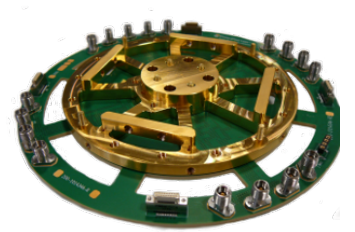
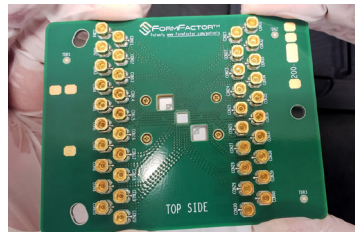


At 12 GHz, return loss for 150 μm is at -9.5 dB, while for all other pitches at >200 μm , the return losses fall in the range of -14 and -22 dB.

■ 350 μm pitch
■ 300 μm pitch
■ 250 μm pitch
■ 200 μm pitch
■ 150 μm pitch

➤ Available Options and Add-ons

- Cryogenic qualification testing service
- High probe count on custom interface
 - >800 pin count in a side loading style
- Custom magnetic shielding around probe sockets
- Customize geometry design: open windows, alignment features
 - Top-down opening allowing physical and/or optical accesses



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