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TestConX™

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Hotel

Mesa, Arizona

Archive

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www.testconx.org

Spring probe pin design good for -1db@60Ghz and far beyond

AJ Park
IWIN Co., Ltd

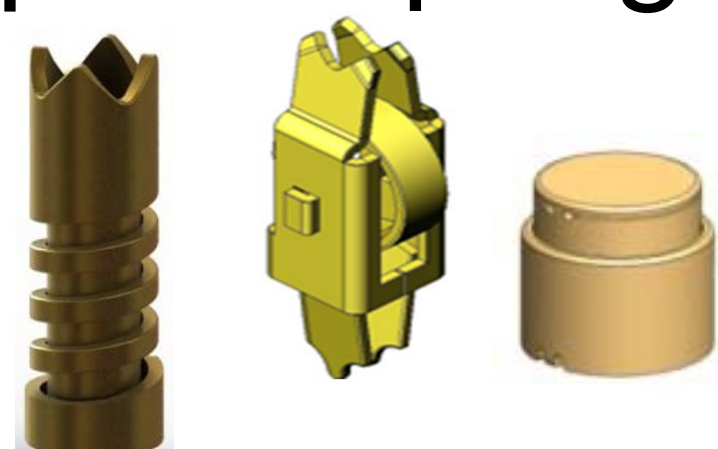
Introduction

Testing environment requires advanced technologies to support those demands, while the test industry and test socket for semiconductor process are one of the most challenging interconnect applications in electronics due to the combination of harsh operating conditions, high performance requirements at finer pitch.

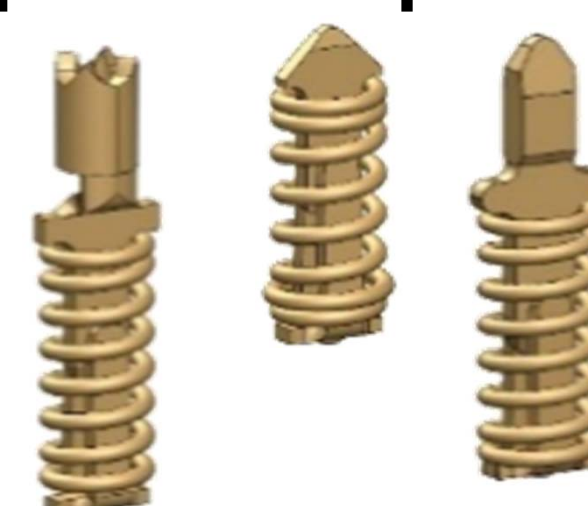
The research and development efforts presented, describe new technologies for spring probe pins enabling performance to 60 GHz and far beyond.

Extremely short spring probes by stamping

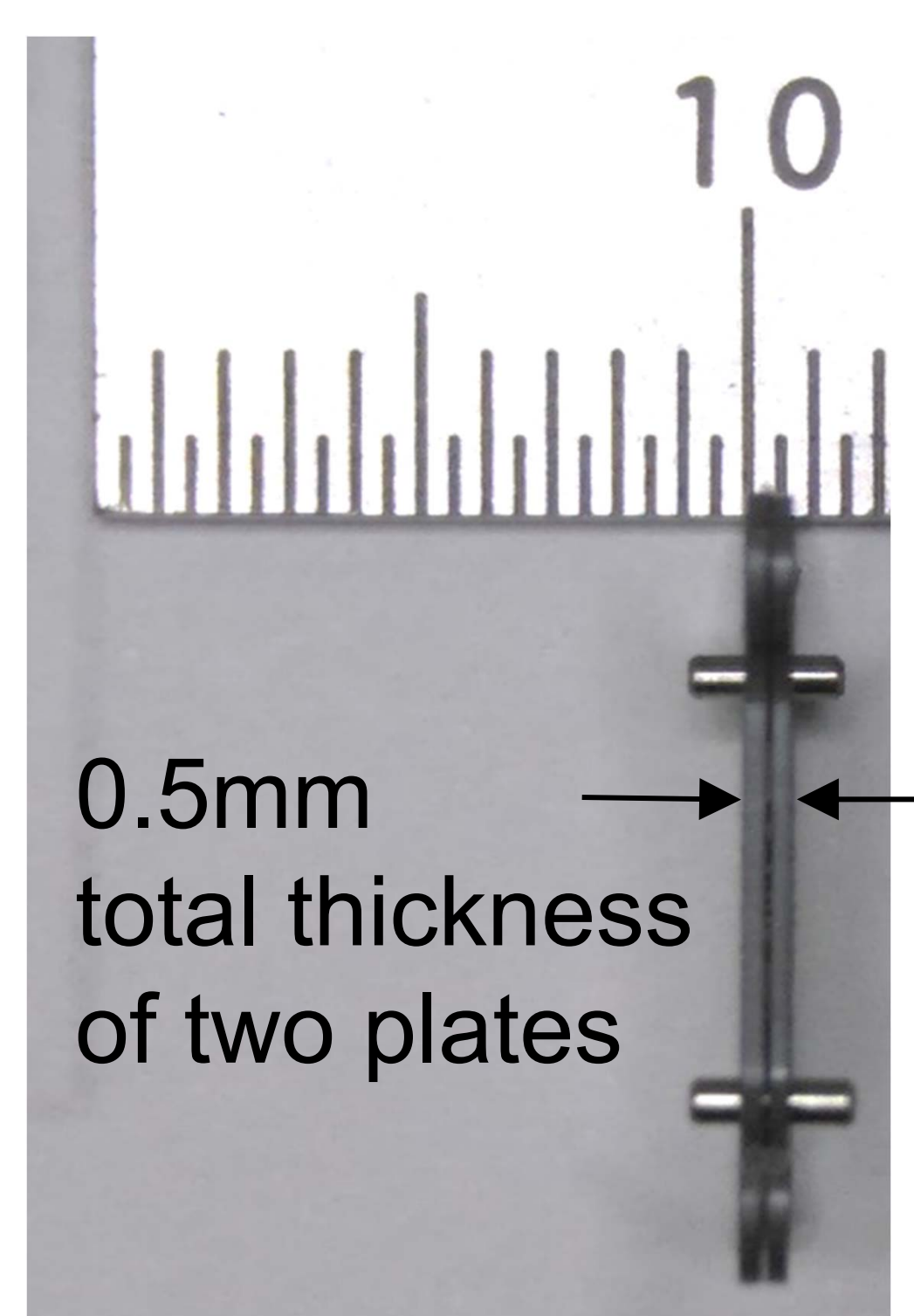
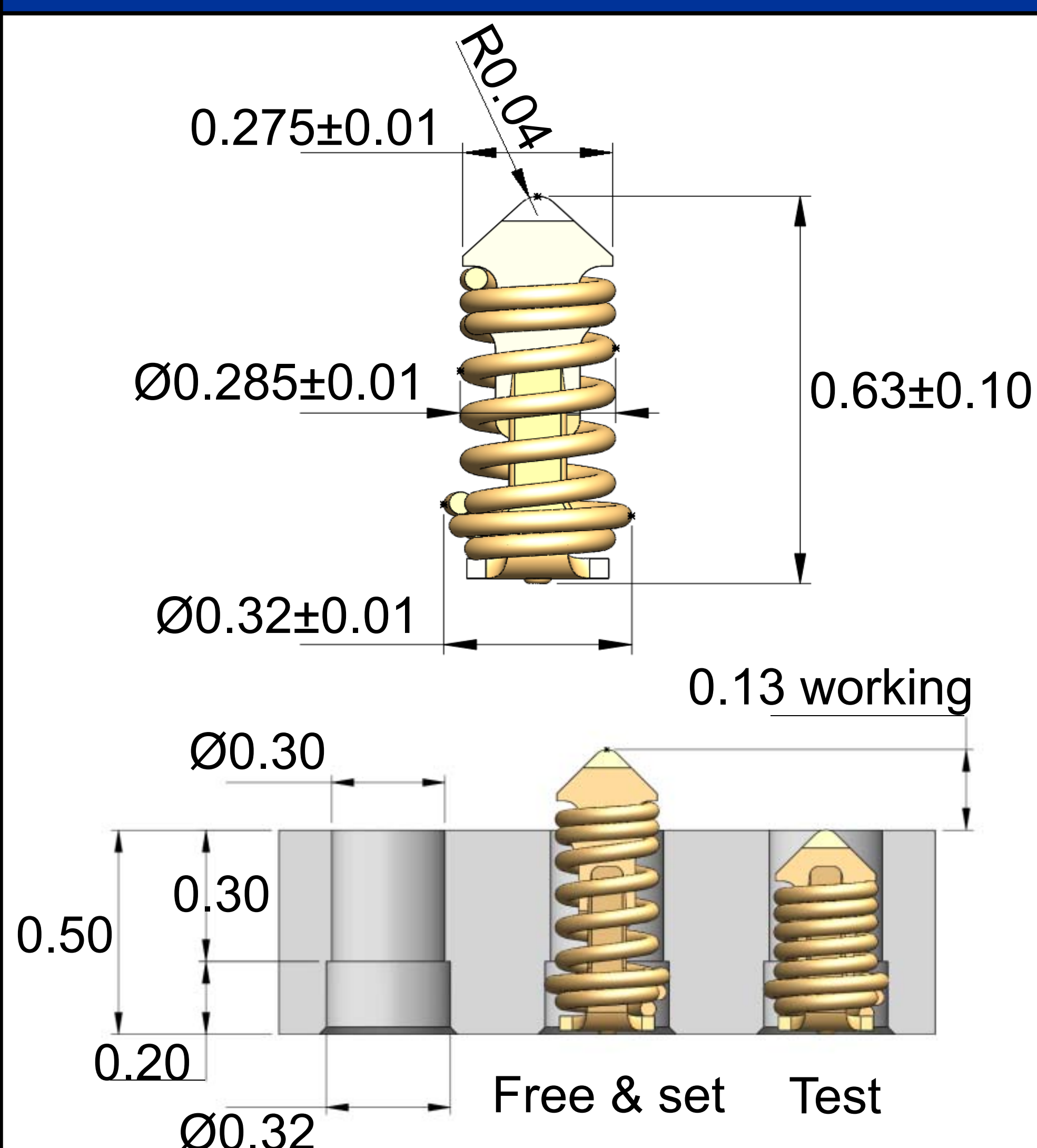
One piece spring probe



Three piece spring probe



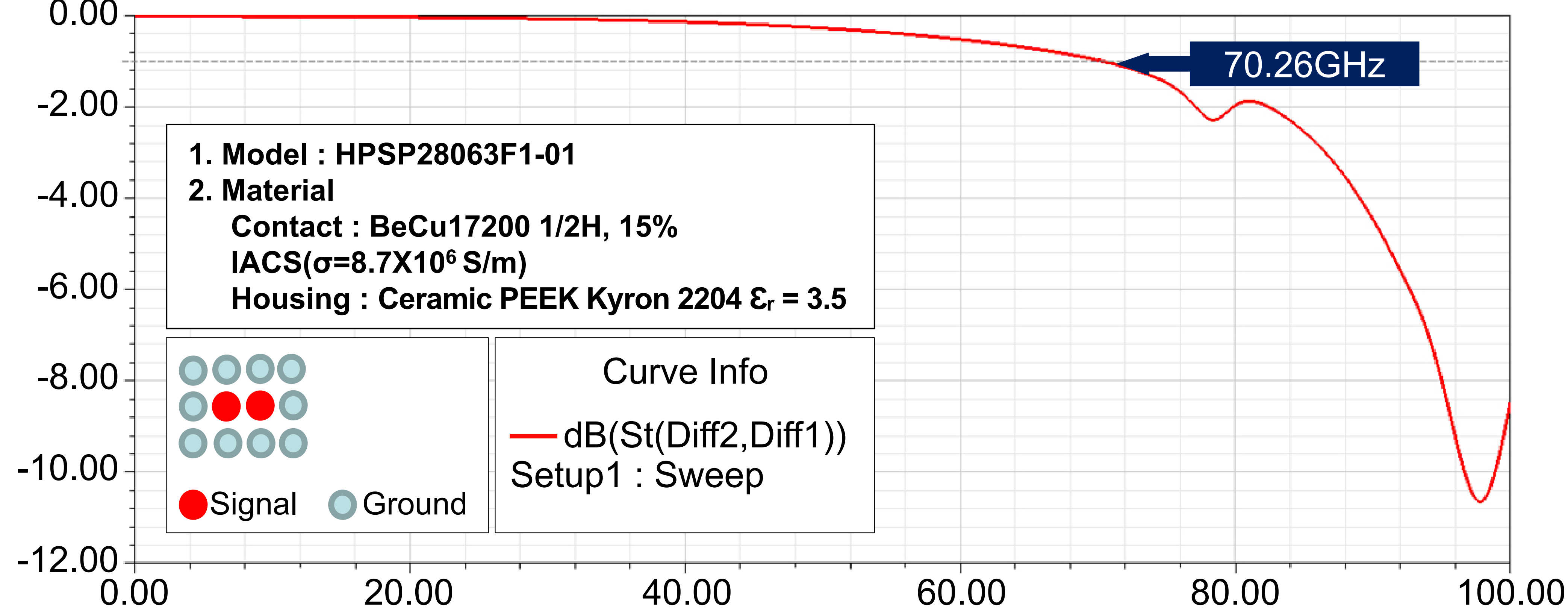
Design approach



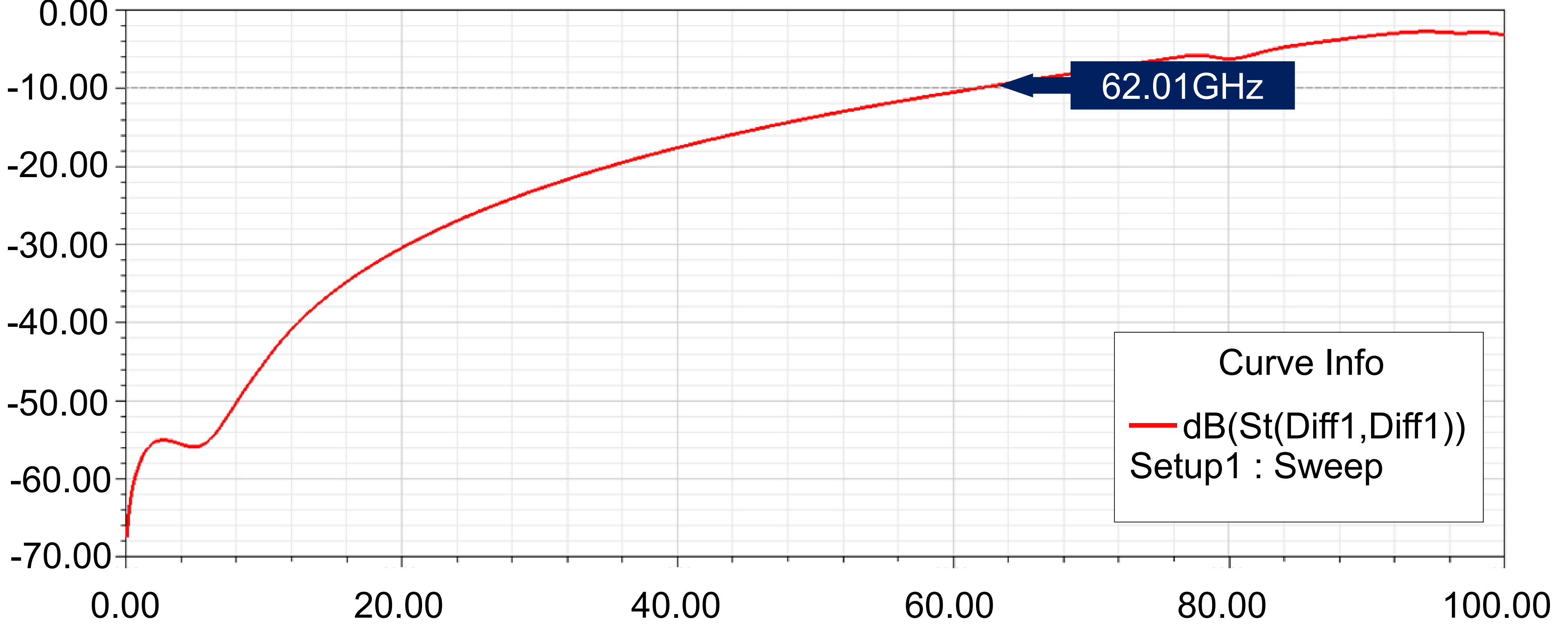
HPSP28063F1-01, spring probe pin
0.5mm test height, Gold plated BeCu

HPSP28063F1-01 - Signal integrity

Insertion Loss – HPSP28063F1-01

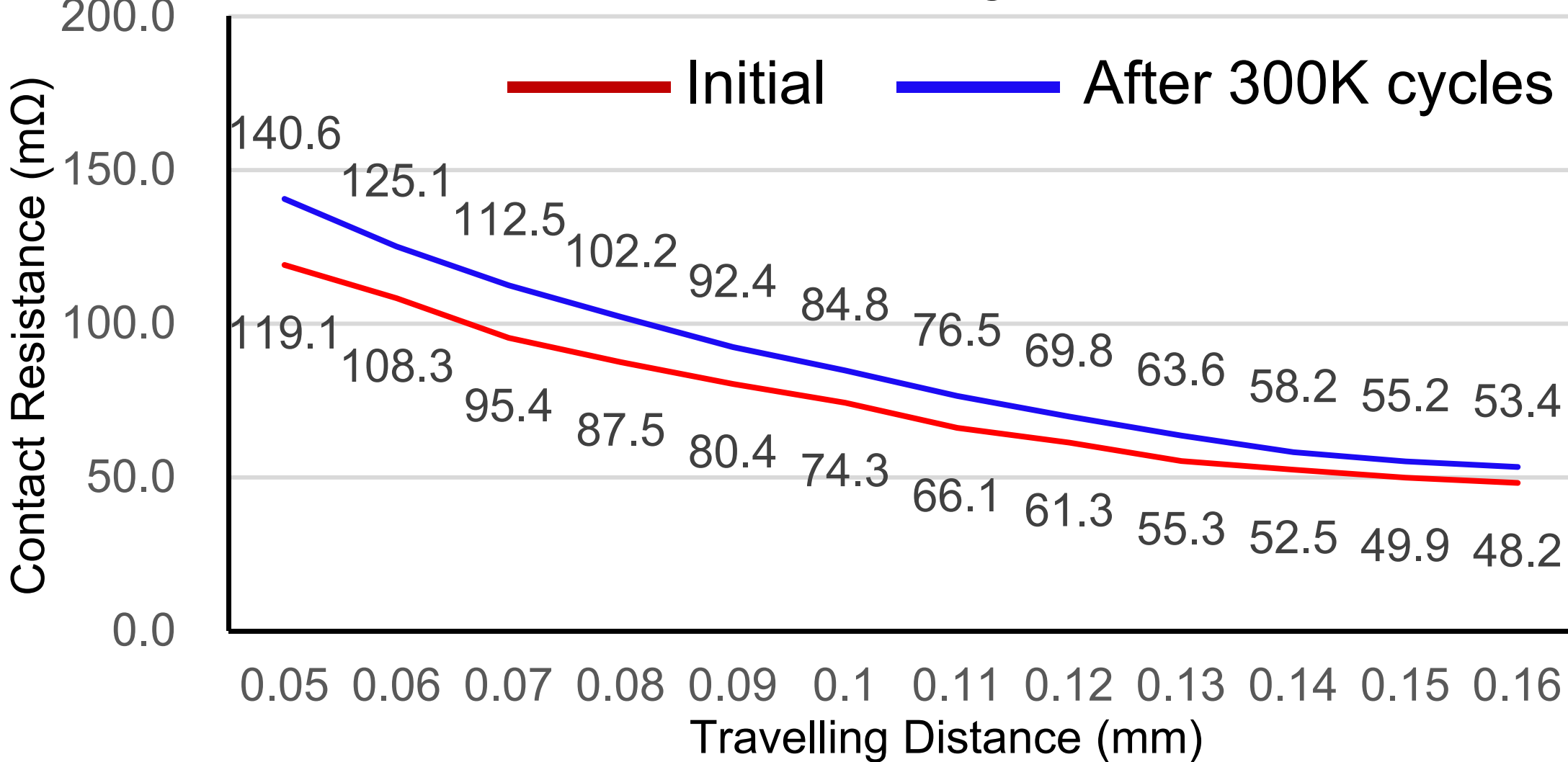


Return Loss – HPSP28063F1-01

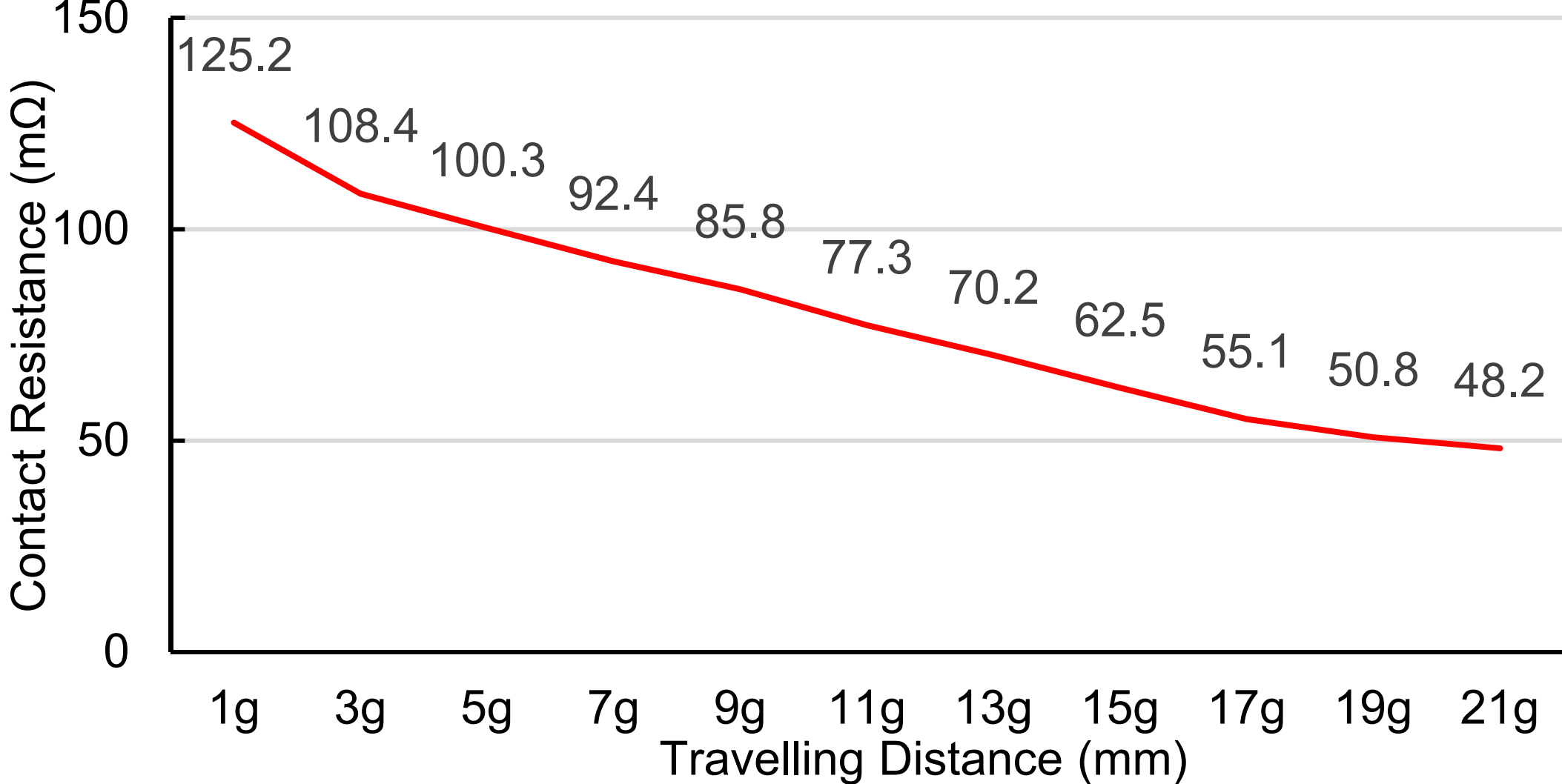


Mechanical performance

Cres vs Travelling Distance

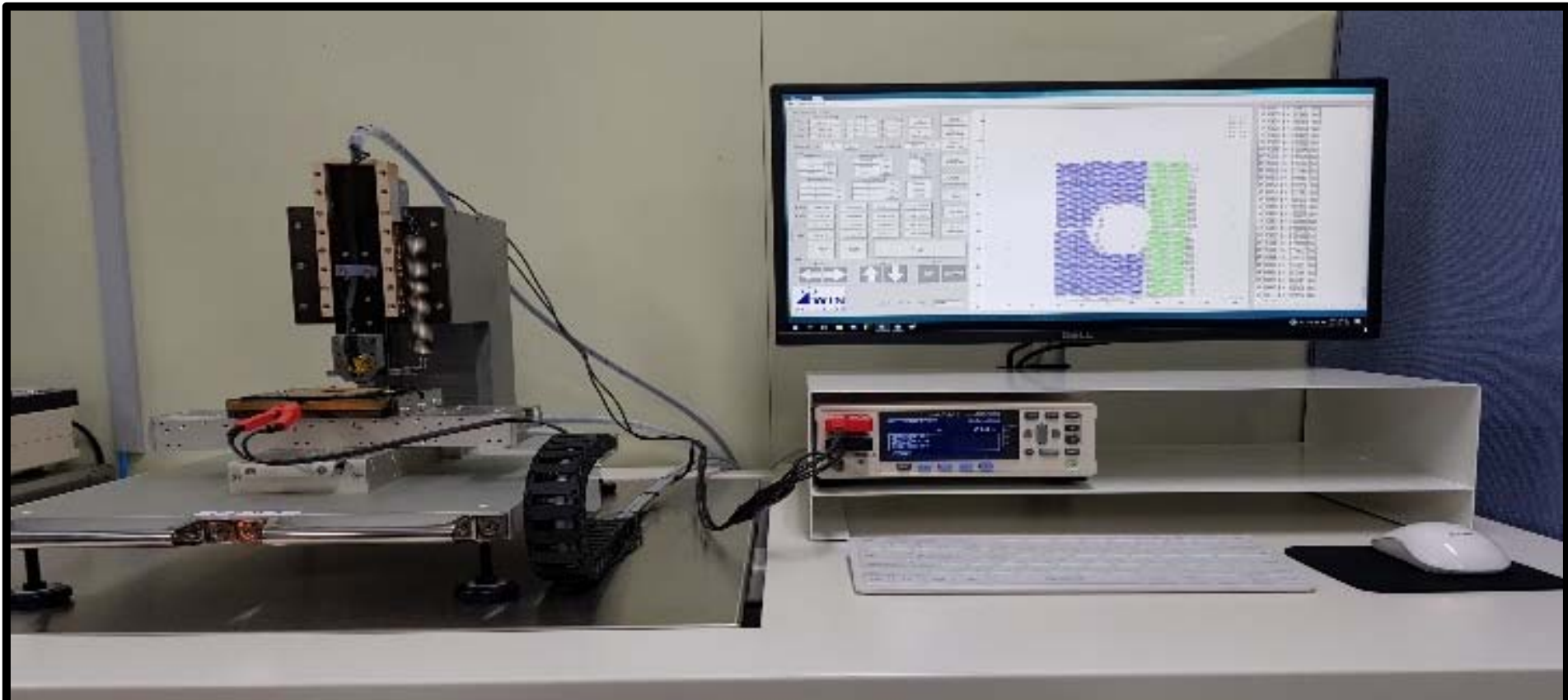


Contact Force vs Cres



Current Carrying Capacity

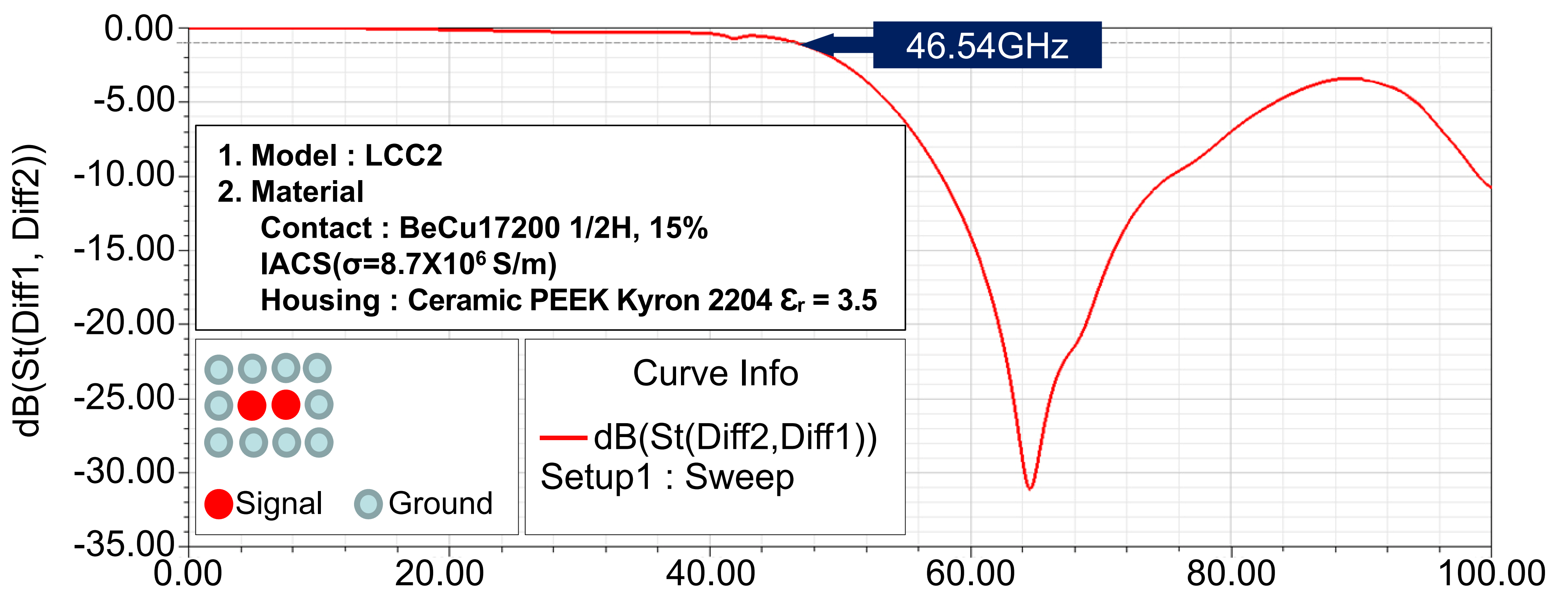
Current	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
1.0A	OK	OK	OK	OK	OK
1.5A	OK	OK	OK	OK	OK
2.0A	OK	OK	OK	OK	OK
2.5A	OK	OK	OK	OK	OK
3.0A	OK	OK	C/F Changed	C/F Changed	OK
3.5A	C/F Changed	C/F Changed			C/F Changed



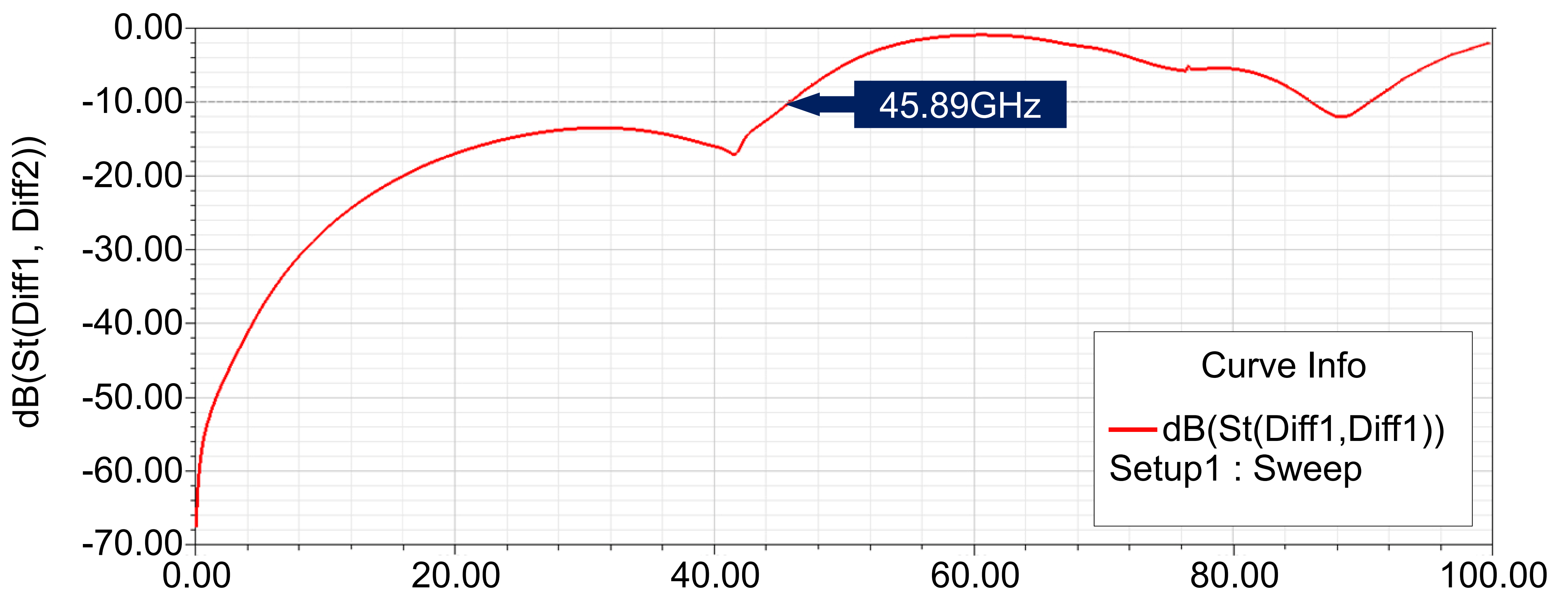
Automated Quality control system

One piece spring probe - Signal integrity

Insertion Loss – differential pair LCC2



Return Loss – differential pair LCC2



Summaries and the next plan

- 0.5mm test height proven Cres less than 54 miliohm, Spring force 21 grams, Current carrying 2.0 Amps, Mechanical touch down 300K times.
- 0.5mm test height pin was already introduced to “Reputed company-A”, the pins demonstrated high performance and long life, but not good for elimination of contamination coming out from chips to be tested.
- Investigating ideas to make shorter than 0.5mm test height.
- Auto pin assembly machine for 0.97mm test height is available, but need to develop the machine for 0.5mm test height pin for cost management.
- One piece probe pins are developed for high volume test and low cost connector applications.