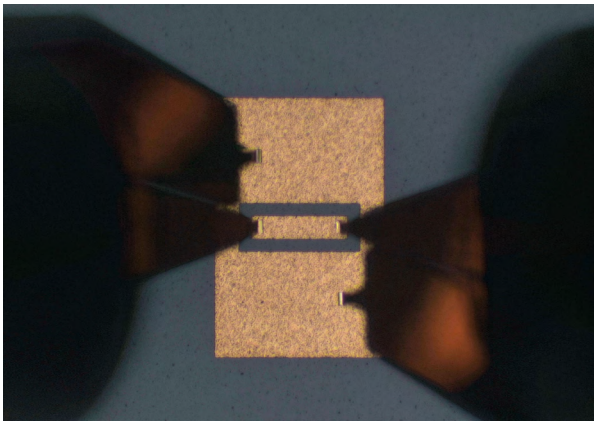
TCS-GSG-100-250-THRU Calibration Substrate

The MPI TITAN™ TCS-GSG-100-250-THRU Calibration Substrate offers 104 GSG THRU structures with connected grounds.

The wrap-around ground design of the THRU permits the use of single-ended GSG probes as well as GS/GS, SG/SG, GS/SG and SG/GS TITAN™ RF probes. The ability to use many probe footprints brings cost-savings to the customer and ease of use to the operator.



Two opposing GS/GS TITAN™ probes in separation after touching the Thru Standard and using 10 µm vertical overtravel.

SUBSTRATE CHARACTERISTICS

Material	Alumina
Size	16.5 x 12.5 mm
Thickness	635 µm
Design or standards	Coplanar
Probe configuration	GSG, GS/GS, SG/SG, GS/SG and SG/GS
Supported probe pitch	100 to 250 µm
Calibration verification elements	yes
Ruler scale	0 to 3 mm
Ruler step size	100 µm
Recommended overtravel for TITAN™ probes	10 µm

ELECTRICAL CHARACTERISTICS OF CPW LINE STANDARD

Nominal capacitance per unit length, pF/cm	1.492
Nominal characteristic impedance @20 GHz	50 Ω
Effective dielectric constant @20 GHz, real part	4.94
Effective velocity factor @20 GHz	0.45
Parameters of the simplified model of line losses	
Reference loss, dB	0.34
Reference delay, ps	25.5
Reference frequency, GHz	20
Electrical length, ps	
Thru	1.10

PROBE PLANARIZATION

MPI TITAN™ RF probes deliver excellent and real time visibility of the tip contacts, due to the unique protrusion tip design. Accurate positioning of the RF probe on calibration standards or DUT pads is even possible for inexperienced operators.

TITAN™ probes are very robust, however, excessive over travel can damage them. Use care when lowering the probe onto the pad surface. To planarize the probe, we recommend using the bare gold area of the calibration substrate or the dedicated contact substrate PN TCS-1 (Figure 1).

While monitoring the probe tips under a high resolution microscope, adjust the Z height to bring the probe tips into contact with the surface. The probe is in contact with the pad surface when the probe tips begin to skate forward. After contacting the surface, raise the probe and check the probe marks. If the probe tips are parallel to the pad surface, you should see a uniform probe mark for each tip (Figure 2). If the probe tips are not parallel to surface (Figure 3), rotate planarity knob on positioner and recheck probe marks (Figure 4). This may take several attempts.

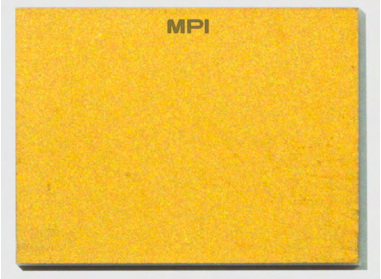


Figure 1. TITAN™ Probe contact substrate TCS-1.

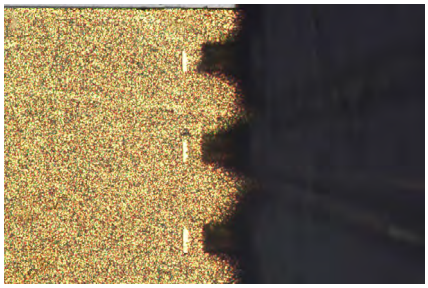


Figure 2. Image of probe marks of Planarized probe.

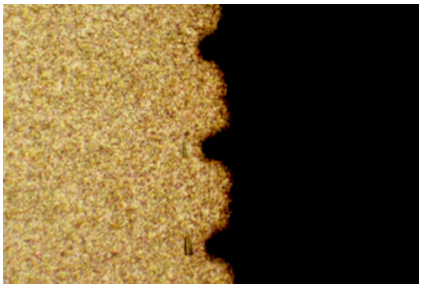


Figure 3. Image of probe that is not parallel to surface.

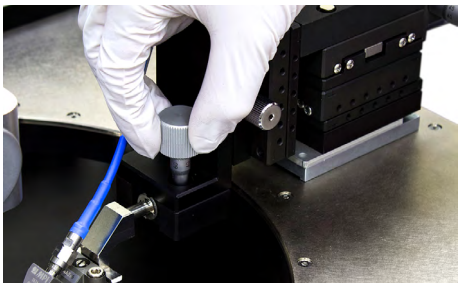
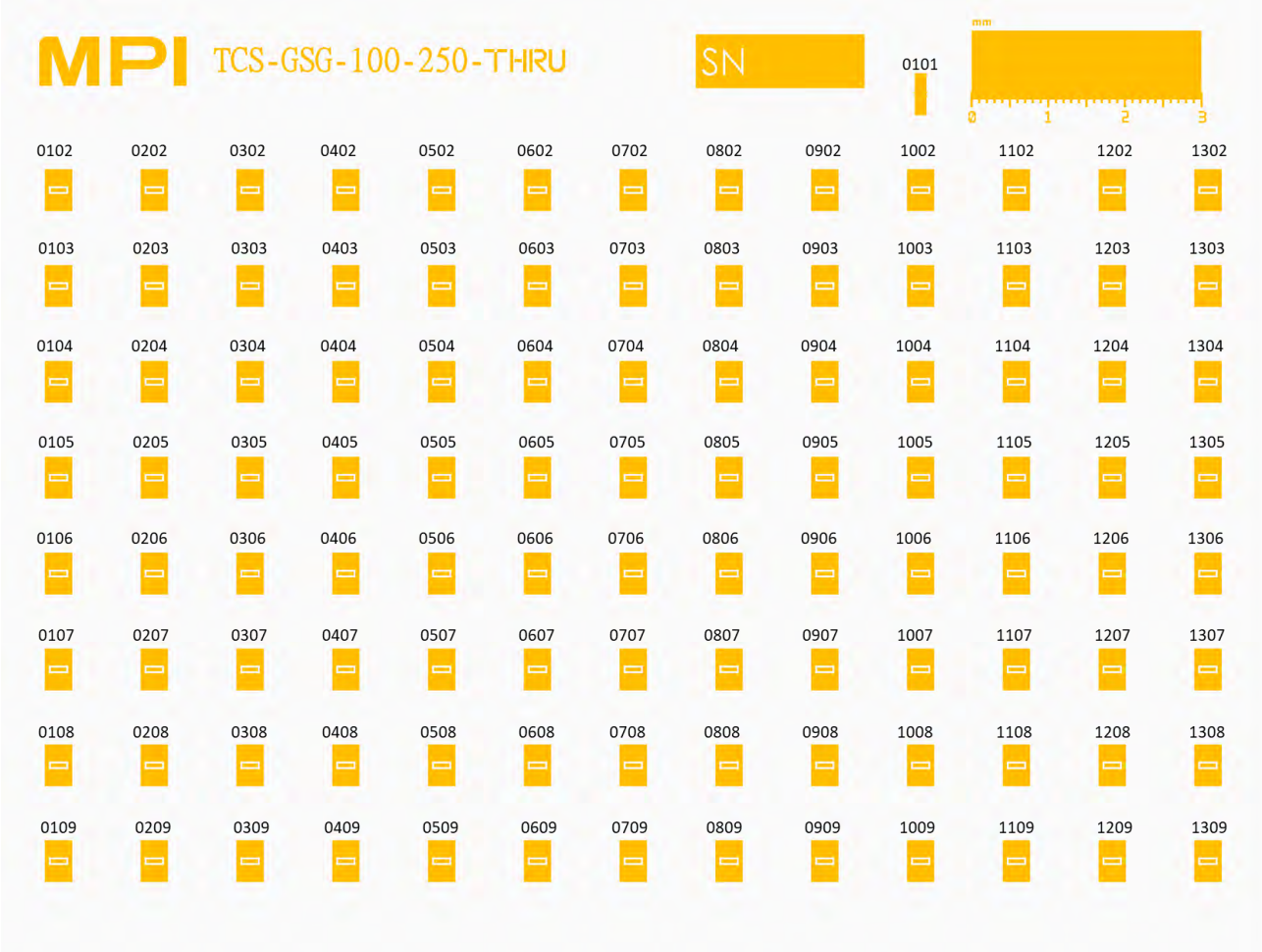


Figure 4. Planarization of TITAN™ Probes.

SUBSTRATE LAYOUT



SUBSTRATE ELEMENTS

Thru

STANDARDS

Name	Type	X µm	Y µm	Location Reference	Spacing µm	Length µm
0101	Alignment Mark	11250	1250	0102	150	200
0102	Thru	0	0	0102	150	200
0103	Thru	0	-1250	0102	150	200
0104	Thru	0	-2500	0102	150	200
0105	Thru	0	-3750	0102	150	200
0106	Thru	0	-5000	0102	150	200
0107	Thru	0	-6250	0102	150	200
0108	Thru	0	-7500	0102	150	200
0109	Thru	0	-8750	0102	150	200
0202	Thru	1250	0	0102	150	200
0203	Thru	1250	-1250	0102	150	200
0204	Thru	1250	-2500	0102	150	200
0205	Thru	1250	-3750	0102	150	200
0206	Thru	1250	-5000	0102	150	200
0207	Thru	1250	-6250	0102	150	200
0208	Thru	1250	-7500	0102	150	200
0209	Thru	1250	-8750	0102	150	200
0302	Thru	2500	0	0102	150	200
0303	Thru	2500	-1250	0102	150	200
0304	Thru	2500	-2500	0102	150	200
0305	Thru	2500	-3750	0102	150	200
0306	Thru	2500	-5000	0102	150	200
0307	Thru	2500	-6250	0102	150	200
0308	Thru	2500	-7500	0102	150	200
0309	Thru	2500	-8750	0102	150	200
0402	Thru	3750	0	0102	150	200
0403	Thru	3750	-1250	0102	150	200
0404	Thru	3750	-2500	0102	150	200
0405	Thru	3750	-3750	0102	150	200
0406	Thru	3750	-5000	0102	150	200
0407	Thru	3750	-6250	0102	150	200
0408	Thru	3750	-7500	0102	150	200
0409	Thru	3750	-8750	0102	150	200
0502	Thru	5000	0	0102	150	200
0503	Thru	5000	-1250	0102	150	200
0504	Thru	5000	-2500	0102	150	200
0505	Thru	5000	-3750	0102	150	200
0506	Thru	5000	-5000	0102	150	200
0507	Thru	5000	-6250	0102	150	200
0508	Thru	5000	-7500	0102	150	200
0509	Thru	5000	-8750	0102	150	200
0602	Thru	6250	0	0102	150	200
0603	Thru	6250	-1250	0102	150	200

0604	Thru	6250	-2500	0102	150	200
0605	Thru	6250	-3750	0102	150	200
0606	Thru	6250	-5000	0102	150	200
0607	Thru	6250	-6250	0102	150	200
0608	Thru	6250	-7500	0102	150	200
0609	Thru	6250	-8750	0102	150	200
0702	Thru	7500	0	0102	150	200
0703	Thru	7500	-1250	0102	150	200
0704	Thru	7500	-2500	0102	150	200
0705	Thru	7500	-3750	0102	150	200
0706	Thru	7500	-5000	0102	150	200
0707	Thru	7500	-6250	0102	150	200
0708	Thru	7500	-7500	0102	150	200
0709	Thru	7500	-8750	0102	150	200
0802	Thru	8750	0	0102	150	200
0803	Thru	8750	-1250	0102	150	200
0804	Thru	8750	-2500	0102	150	200
0805	Thru	8750	-3750	0102	150	200
0806	Thru	8750	-5000	0102	150	200
0807	Thru	8750	-6250	0102	150	200
0808	Thru	8750	-7500	0102	150	200
0809	Thru	8750	-8750	0102	150	200
0902	Thru	10000	0	0102	150	200
0903	Thru	10000	-1250	0102	150	200
0904	Thru	10000	-2500	0102	150	200
0905	Thru	10000	-3750	0102	150	200
0906	Thru	10000	-5000	0102	150	200
0907	Thru	10000	-6250	0102	150	200
0908	Thru	10000	-7500	0102	150	200
0909	Thru	10000	-8750	0102	150	200
1002	Thru	11250	0	0102	150	200
1003	Thru	11250	-1250	0102	150	200
1004	Thru	11250	-2500	0102	150	200
1005	Thru	11250	-3750	0102	150	200
1006	Thru	11250	-5000	0102	150	200
1007	Thru	11250	-6250	0102	150	200
1008	Thru	11250	-7500	0102	150	200
1009	Thru	11250	-8750	0102	150	200
1102	Thru	12500	0	0102	150	200
1103	Thru	12500	-1250	0102	150	200
1104	Thru	12500	-2500	0102	150	200
1105	Thru	12500	-3750	0102	150	200
1106	Thru	12500	-5000	0102	150	200
1107	Thru	12500	-6250	0102	150	200
1108	Thru	12500	-7500	0102	150	200
1109	Thru	12500	-8750	0102	150	200

1202	Thru	13750	0	0102	150	200
1203	Thru	13750	-1250	0102	150	200
1204	Thru	13750	-2500	0102	150	200
1205	Thru	13750	-3750	0102	150	200
1206	Thru	13750	-5000	0102	150	200
1207	Thru	13750	-6250	0102	150	200
1208	Thru	13750	-7500	0102	150	200
1209	Thru	13750	-8750	0102	150	200
1302	Thru	15000	0	0102	150	200
1303	Thru	15000	-1250	0102	150	200
1304	Thru	15000	-2500	0102	150	200
1305	Thru	15000	-3750	0102	150	200
1306	Thru	15000	-5000	0102	150	200
1307	Thru	15000	-6250	0102	150	200
1308	Thru	15000	-7500	0102	150	200
1309	Thru	15000	-8750	0102	150	200

See MPI Corporation's Terms and Conditions of Sale for more details.

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