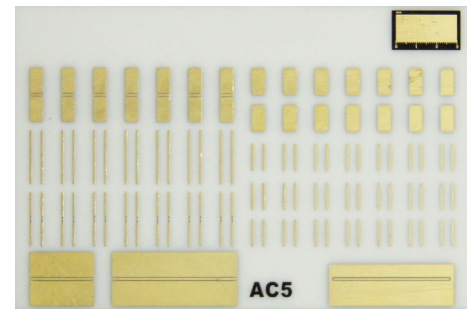


AC-5 Calibration Substrate

AC-5 calibration substrate is designed to provide accurate probe tip calibration of MPI TITAN™ RF probe family with ground-signal-ground (GSG), ground-signal (GS) and signal-ground (SG) probe tips configuration and accommodates 150 to 1250 μm probe pitch variation.

It supports industry standard the short-open-load-thru (SOLT) calibration method, as well as advanced line-reflect-match (LRM), and thru-reflect-line (TRL). AC-5 contains 7 groups of the lumped standard elements for each probe type, as well as a set of coplanar transmission lines for multiline TRL calibration and calibration accuracy verification.



AC-5 substrate

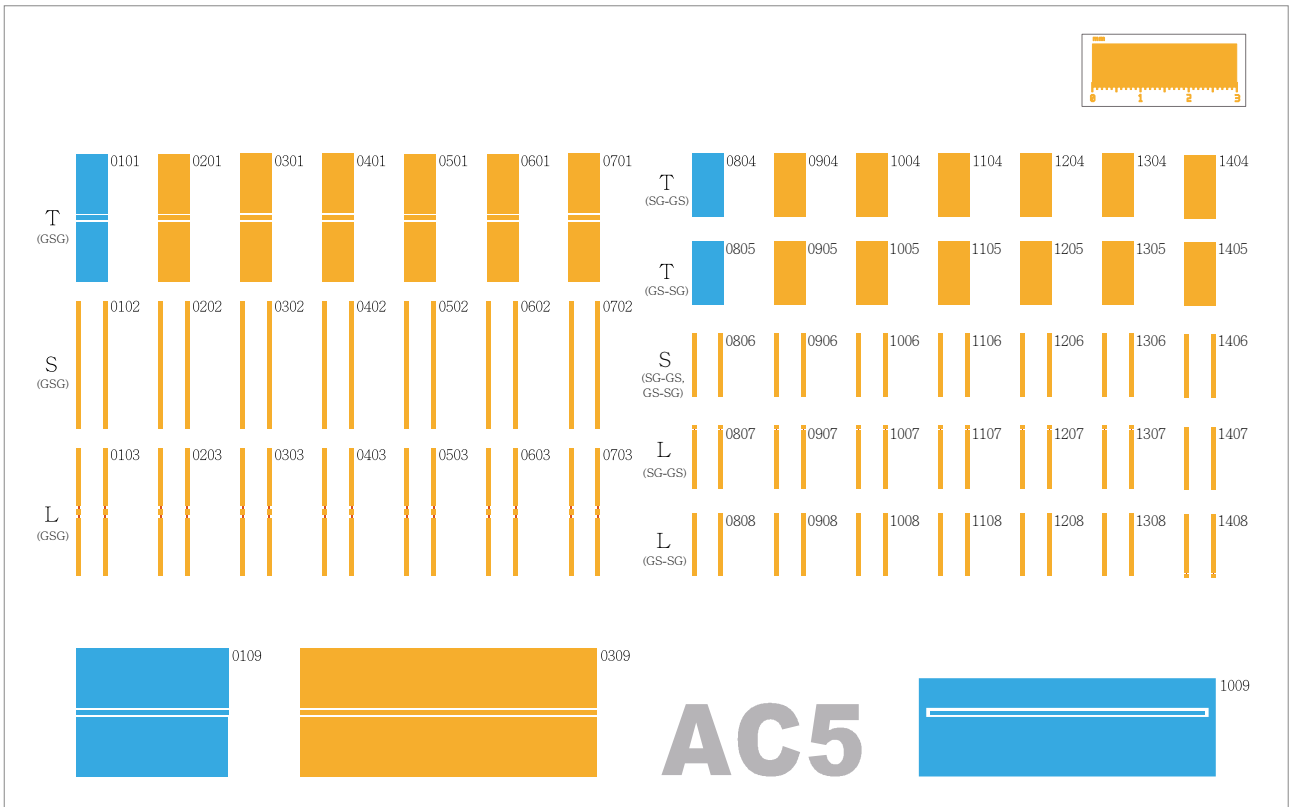
Substrate Characteristics

Material	Alumina
Size	22.5 mm x 15 mm
Thickness	635 μm
Design or standards	Coplanar
Probe configuration	GSG, GS and SG
Supported probe pitch	250 to 1250 μm
Number of lumped standard groups	GSG:7 GS:7 SG:7
Number of calibration and verification lines	GSG:2 SG-GS:1
Calibration verification elements	yes
Supported calibration methods	SOLT, LRM, TRL and multiline TRL
Typical resistance of the load	50 Ω
Typical load trimming accuracy error	$\pm 0.3\%$
Open standard	Au pads on substrate
Ruler scale	0 to 3 mm
Ruler step size	100 μm
Recommended overtravel for TITAN™ probes	10 μm

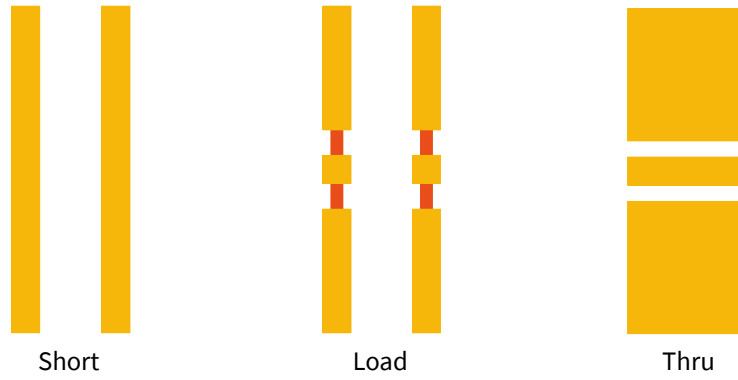
Electrical Characteristics of CPW Line Standards

Effective dielectric constant @10 GHz, real part	6.13
Effective velocity factor @10 GHz	0.40
Parameters of the simplified model of line losses	
Reference loss, dB	0.21
Reference delay, ps	42
Reference frequency, GHz	10
Electrical length of line, ps	
Thru	5
Line 1 (0109)	26
Line 2 (0309)	42
Line 3 (1009)	47

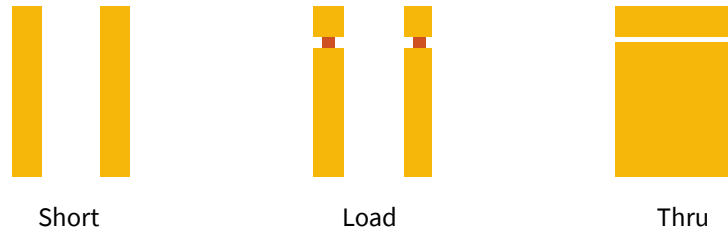
Substrate Layout



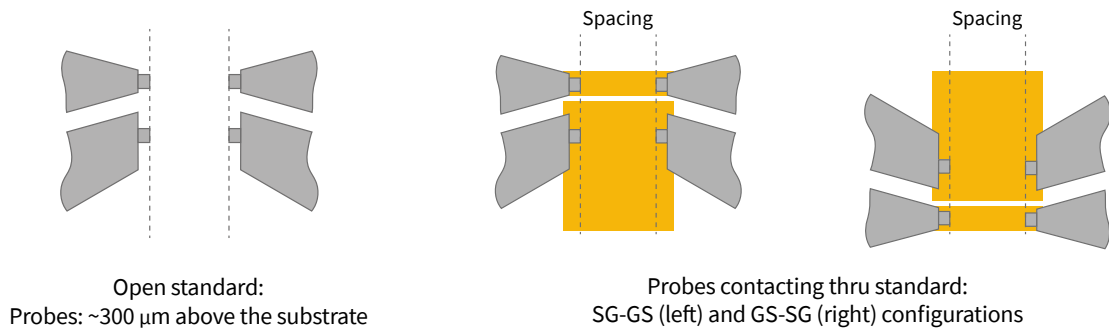
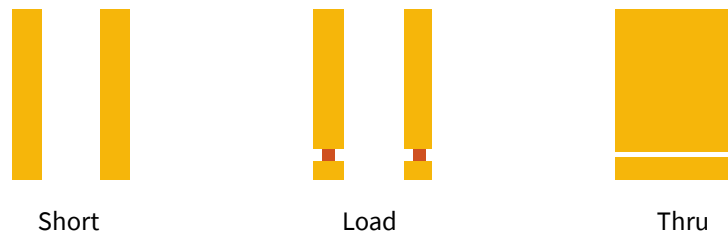
GSG Elements



GS-SG Elements



GS-SG Elements



Reference Elements

Name	X μm	Y μm	Location Reference	Spacing μm	Note
0101	0	0	0101	600	Reference for SOLT/LRM GSG elements
0804	10850	0	0101	600	Reference for SOLT/LRM SG-GS elements
0805	0	-1810	0101	600	
0109	0	-9050	0101	3100	Reference for TRL line elements
1009	14650	0	0110	5650	Verification element

GSG Standard Groups

Line Standard

Name	Type	X μm	Y μm	Location Reference	Spacing μm	Length μm
0101	THRU(GSG)	0	0	0102	600	650
0201	THRU(GSG)	1550	0	0102	600	650
0301	THRU(GSG)	3100	0	0102	600	650
0401	THRU(GSG)	4650	0	0102	600	650
0501	THRU(GSG)	6200	0	0102	600	650
0601	THRU(GSG)	7750	0	0102	600	650
0701	THRU(GSG)	9300	0	0102	600	650

Load Standard

Name	Port 1	Port 2	X μm	Y μm	Location Reference	Spacing μm
0104	LOAD(GSG)	LOAD(GSG)	0	-6100	0102	600
0204	LOAD(GSG)	LOAD(GSG)	1550	-6100	0102	600
0304	LOAD(GSG)	LOAD(GSG)	3100	-6100	0102	600
0404	LOAD(GSG)	LOAD(GSG)	4650	-6100	0102	600
0504	LOAD(GSG)	LOAD(GSG)	6200	-6100	0102	600
0604	LOAD(GSG)	LOAD(GSG)	7750	-6100	0102	600
0704	LOAD(GSG)	LOAD(GSG)	9300	-6100	0102	600

GS-SG Standard Groups

Line Standard

Name	Port 1	Port 2	X μm	Y μm	Location Reference	Spacing μm	Length μm
0804	THRU SG	THRU GS	10850	0	0102	600	650
0904	THRU SG	THRU GS	1550	0	0804	600	650
1004	THRU SG	THRU GS	3100	0	0804	600	650
1104	THRU SG	THRU GS	4650	0	0804	600	650
1204	THRU SG	THRU GS	6200	0	0804	600	650
1304	THRU SG	THRU GS	7750	0	0804	600	650
1404	THRU SG	THRU GS	9300	0	0804	600	650
0805	THRU GS	THRU SG	10850	-1810	0102	600	650
0905	THRU GS	THRU SG	1550	-1810	0805	600	650
1005	THRU GS	THRU SG	3100	-1810	0805	600	650
1105	THRU GS	THRU SG	4650	-1810	0805	600	650
1205	THRU GS	THRU SG	6200	-1810	0805	600	650
1305	THRU GS	THRU SG	7750	-1810	0805	600	650
1405	THRU GS	THRU SG	9300	-1810	0805	600	650

Load Standard

Name	Port 1	Port 2	X μm	Y μm	Location Reference	Spacing μm
0807	LOAD SG	LOAD GS	0	-5635	0804	600
0907	LOAD SG	LOAD GS	1550	-5635	0804	600
1007	LOAD SG	LOAD GS	3100	-5635	0804	600
1107	LOAD SG	LOAD GS	4650	-5635	0804	600
1207	LOAD SG	LOAD GS	6200	-5635	0804	600
1307	LOAD SG	LOAD GS	7750	-5635	0804	600
1407	LOAD SG	LOAD GS	9300	-5635	0804	600
0808	LOAD GS	LOAD SG	0	-5635	0804	600
0908	LOAD GS	LOAD SG	1550	-5635	0804	600
1008	LOAD GS	LOAD SG	3100	-5635	0804	600
1108	LOAD GS	LOAD SG	4650	-5635	0804	600
1208	LOAD GS	LOAD SG	6200	-5635	0804	600
1308	LOAD GS	LOAD SG	7750	-5635	0804	600
1408	LOAD GS	LOAD SG	9300	-5635	0804	600

GSG / GS-SG / SG-GS Standard Groups

Line Standard

Name	Type	X μm	Y μm	Location Reference	Spacing μm	Length μm
0109	LINE (GSG)	0	-9050	0101	3100	3150
0309	LINE (GSG)	4000	0	0109	6100	6150
1009	LINE (GSG)	14650	0	0110	5650	5700

Short Standards (GSG)

Name	Port 1	Port 2	X μm	Y μm	Location Reference	Spacing μm
0102	SHORT	SHORT	0	-1250	0102	600
0202	SHORT	SHORT	1550	-1250	0102	600
0302	SHORT	SHORT	3100	-1250	0102	600
0402	SHORT	SHORT	4650	-1250	0102	600
0502	SHORT	SHORT	6200	-1250	0102	600
0602	SHORT	SHORT	7750	-1250	0102	600
0702	SHORT	SHORT	9300	-1250	0102	600

Short Standards (SG-GS / GS-SG)

Name	Port 1	Port 2	X μm	Y μm	Location Reference	Spacing μm
0806	SHORT	SHORT	0	-3720	0804	600
0906	SHORT	SHORT	1550	-3720	0804	600
1006	SHORT	SHORT	3100	-3720	0804	600
1106	SHORT	SHORT	4650	-3720	0804	600
1206	SHORT	SHORT	6200	-3720	0804	600
1306	SHORT	SHORT	7750	-3720	0804	600
1406	SHORT	SHORT	9300	-3720	0804	600

Disclaimer: TITAN Probe is a trademark of MPI Corporation, Taiwan. All other trademarks are the property of their respective owners.
Data subject to change without notice.

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

Direct contact:
 Asia region: ast-asia@mpi-corporation.com
 EMEA region: ast-europe@mpi-corporation.com
 America region: ast-americas@mpi-corporation.com

MPI global presence: for your local support, please find the right contact here:
www.mpi-corporation.com/ast/support/local-support-worldwide

MPI Global Presence

