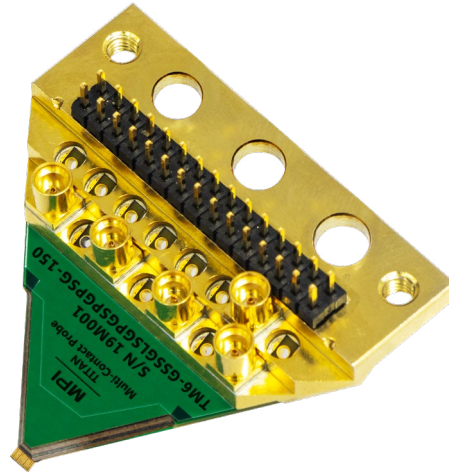


TITAN™ Multi-Contact Probe



TITAN™ Multi-Contact Probe advances MPI proprietary TITAN™ RF probing technology for characterization of RF ICs. Its up to 15 contacts which can be individually configured as either RF, logic signal and bypass power supply of RF IC. All of these are delivered with full list of advantages of TITAN™ Probe technology: excellent impedance matching, electrical characteristics, unique tip visibility and unsurpassed lifetime.

Furthermore, TITAN™ Multi-Contact Probe is the shortest of its kind. It enables a wide-temperature range characterization of large ICs in shielded environment and supports most challenging test configurations.

Feature	Benefit
TITAN™ MEMS contacts	<ul style="list-style-type: none"> • Perfectly match RF channels • Mechanical characteristics comparable with TITAN™ RF Probes • Minimal mechanical and electrical degradation over the probe lifetime and temperature range • Small pad probing in mmWave range in combination with TITAN™ RF Probes on other IC sites
Unique tip visibility	<ul style="list-style-type: none"> • Ease of use even on small DUT pads • Fastest probe-to-pad alignment and time-to-data • Repeatable and reliable data
6 GHz bandwidth and up to 15 contacts	<ul style="list-style-type: none"> • Accurate test results for wireless RF ICs • Test of high-speed digital circuits • Power supply and control of modern multi-stage PAs
Contact resistance < 45 mΩ on Al	<ul style="list-style-type: none"> • Accurate, repeatable and consistent test results on all pad metallization materials: Au, Cu, and Al
Contact width of 20 μm and wide pitch range starting from 50 μm	<ul style="list-style-type: none"> • Probing of pads as small as 30 μm x 25 μm • Test of highly-integrated ICs • Reduced cost of test
Shortest probe of its kind	<ul style="list-style-type: none"> • Characterization of large ICs in ShieldEnvironment™ • Easy and fast changeover • Positioner re-adjustment is not required
Over 1 Million touchdowns on Al pads	<ul style="list-style-type: none"> • Lowest cost of test for Si RF ICs
Quadrant compatibility	<ul style="list-style-type: none"> • Flexibility in IC pad layout • Efficient use of wafer real estate
Built-to-order	<ul style="list-style-type: none"> • Short lead time

SPECIFICATIONS

Number of contacts	3 - 15
Pitch	50 µm to 150 µm, 25 µm step 150 µm to 300 µm, 50 µm step
Temperature range	-40 to 150 °C
Contact width	20 µm
Quadrant compatible (allowing corner pads)	Yes
ShieldEnvironment™ compatible	Yes
Recommended overtravel	25 µm
Contact resistance ¹	< 45 mΩ
Lifetime ²	> 1,000,000 touchdowns

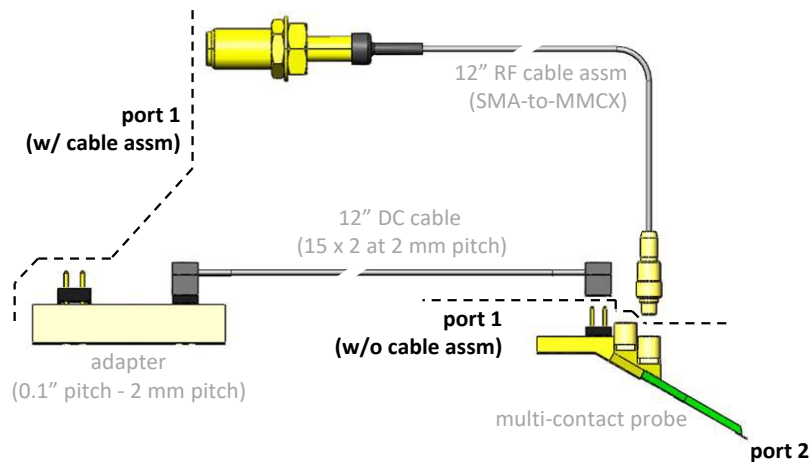
¹On Al at 20 °C with 25 µm overtravel

²On Al at 20 °C with 50 µm overtravel

Types of contact

G	Ground
S	RF signal (6 GHz)
L	Logic signal (500 MHz)
P	Bypass power (DC)
X	No contact

ELECTRICAL SPECIFICATION (AT 20 °C)



DC

Contact type	I _{MAX}	V _{MAX}	Series resistance (excluding contact resistance)	
			Without cable assembly	With cable assembly
S	1.2 A	300 V	0.2 Ω	0.7 Ω
L	1.2 A	300 V	0.2 Ω	0.4 Ω
P	1.2 A	50 V	0.2 Ω	0.4 Ω

Standard RF (GSG, GS) up to 6 GHz

Configuration	Without cable assembly	With cable assembly
Insertion loss	3 dB	5 dB
Return loss	10 dB	10 dB

Bandwidth for logic & nonstandard RF

Configuration	Without cable assembly	With cable assembly
L (any)	500 MHz	70 MHz
S without adjacent G	500 MHz	500 MHz

Isolation up to 6 GHz

Configuration	50 μm to 150 μm pitch	200 μm to 300 μm pitch
SGS	20 dB	25 dB
SS	15 dB	15 dB

Measured at the SMA interfaces with tips landing on 50 Ω's

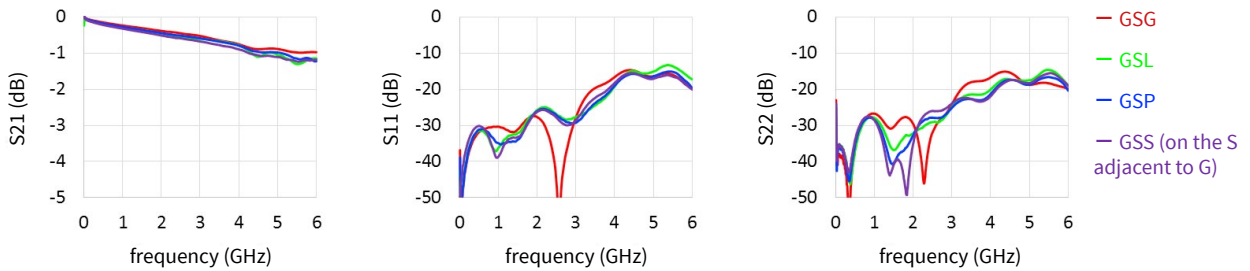
Bypass power (DC)

Configuration	Z22 peak (0.1 to 1 GHz)	Series Inductance (1 to 6 GHz)
GPG, G * P * G	6 Ω	0.4 nH
GP, G * P	7 Ω	0.7 nH

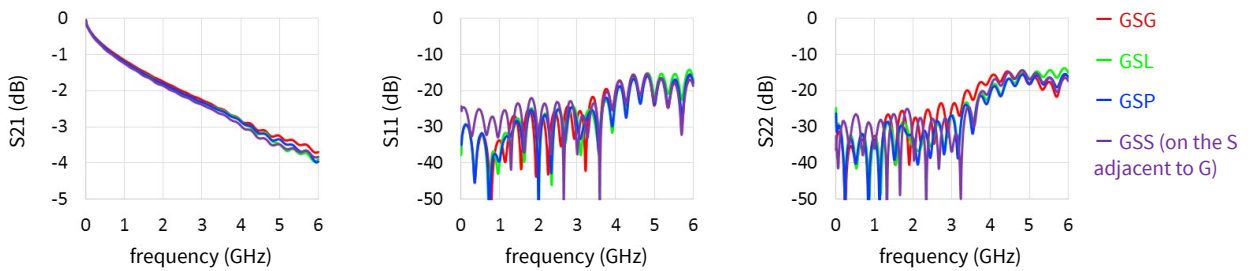
* Represents series of P's up to 3 counts i.e. P, PP, or PPP

TYPICAL PERFORMANCE (AT 20 °C FOR 200 μm PITCH)

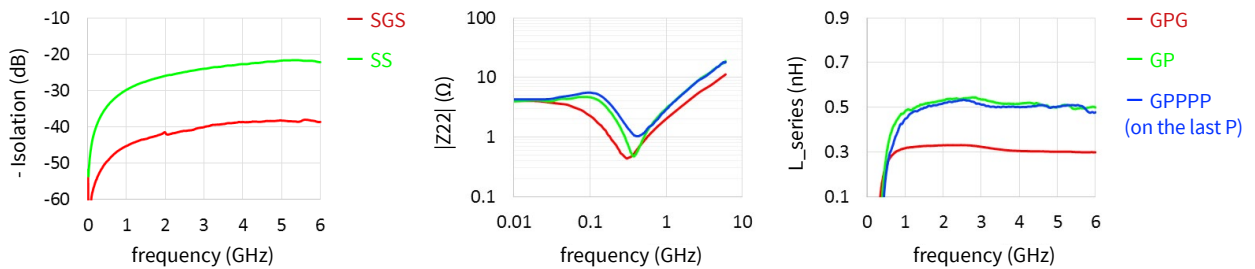
Standard RF without cable assembly



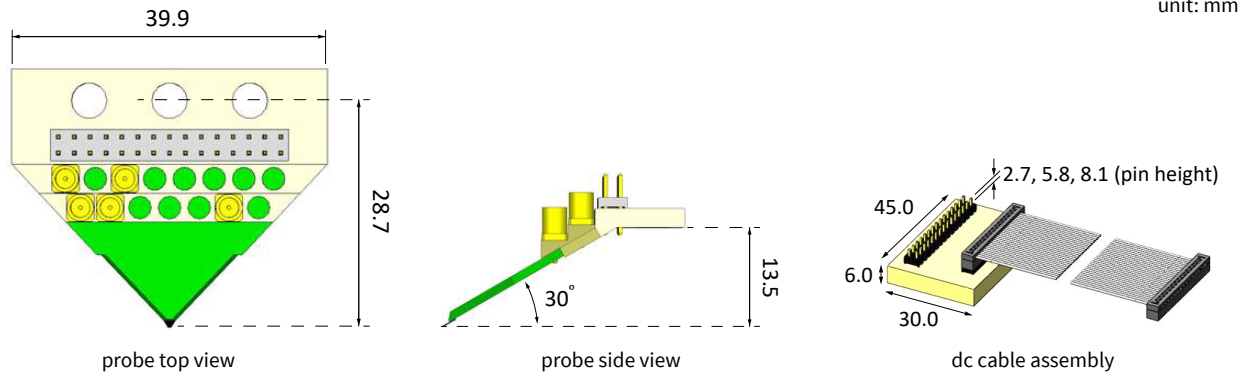
Standard RF with cable assembly



Other characteristics



DIMENSIONS



RECOMMENDED IC PAD SIZE

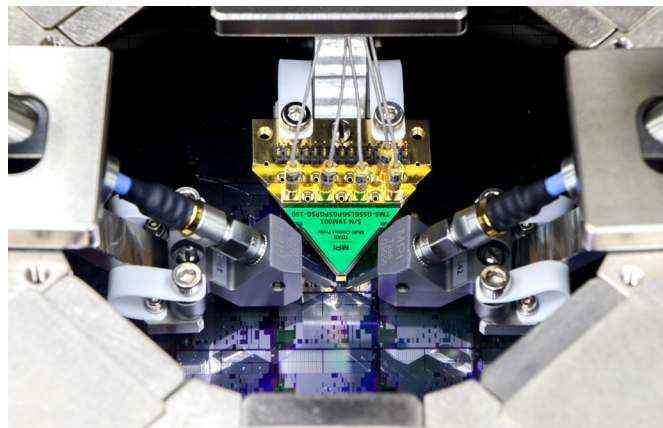
The table below shows minimum IC pad size required to work over the specified temperature range. The length is parallel to the probing direction.

MINIMUM IC PAD SIZE IN WIDTH (µm) x LENGTH (µm)

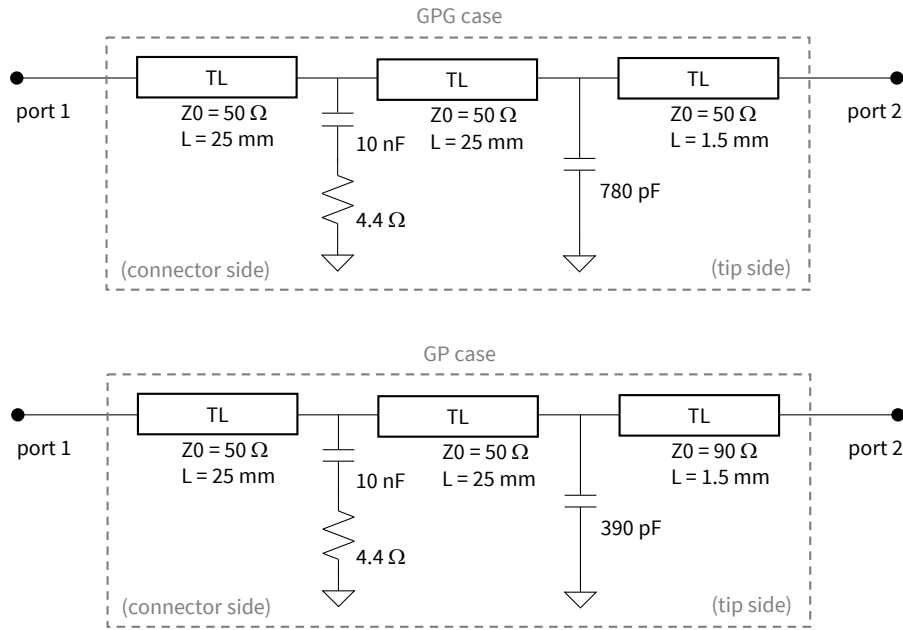
Number of contacts \ Pitch	50 µm	75 µm	100 µm	125 µm	150 µm	200 µm	250 µm	300 µm
3	25 x 20	30 x 20	30 x 20	30 x 20	30 x 20	30 x 20	30 x 20	30 x 20
4	30 x 25	30 x 25	30 x 25	30 x 25	30 x 25	35 x 25	35 x 25	35 x 25
5	30 x 25	30 x 25	30 x 25	35 x 25	35 x 25	35 x 25	35 x 25	40 x 25
6	30 x 25	35 x 25	35 x 25	35 x 25	35 x 25	40 x 25	40 x 25	40 x 25
7	35 x 25	35 x 25	35 x 25	40 x 25	40 x 25	40 x 30	45 x 30	45 x 30
8	35 x 25	35 x 25	40 x 25	40 x 30	40 x 30	45 x 30	45 x 30	50 x 30
9	35 x 25	40 x 30	40 x 30	40 x 30	45 x 30	45 x 30	50 x 30	50 x 30
10	40 x 30	40 x 30	40 x 30	45 x 30	45 x 30	50 x 30	50 x 35	55 x 35
11	40 x 30	45 x 30	45 x 30	45 x 30	50 x 30	50 x 35	55 x 35	60 x 35
12	40 x 30	45 x 30	45 x 30	50 x 30	50 x 35	55 x 35	60 x 35	60 x 35
13	40 x 30*	45 x 30	50 x 30	50 x 35	55 x 35	55 x 35	60 x 35	65 x 40
14	40 x 30*	50 x 35	50 x 35	55 x 35	55 x 35	60 x 35	65 x 40	70 x 40
15	40 x 30*	50 x 35	50 x 35	55 x 35	55 x 35	60 x 40	65 x 40	70 x 40

*Consult factory for thermal range

APPLICATION IN ShieldEnvironment™



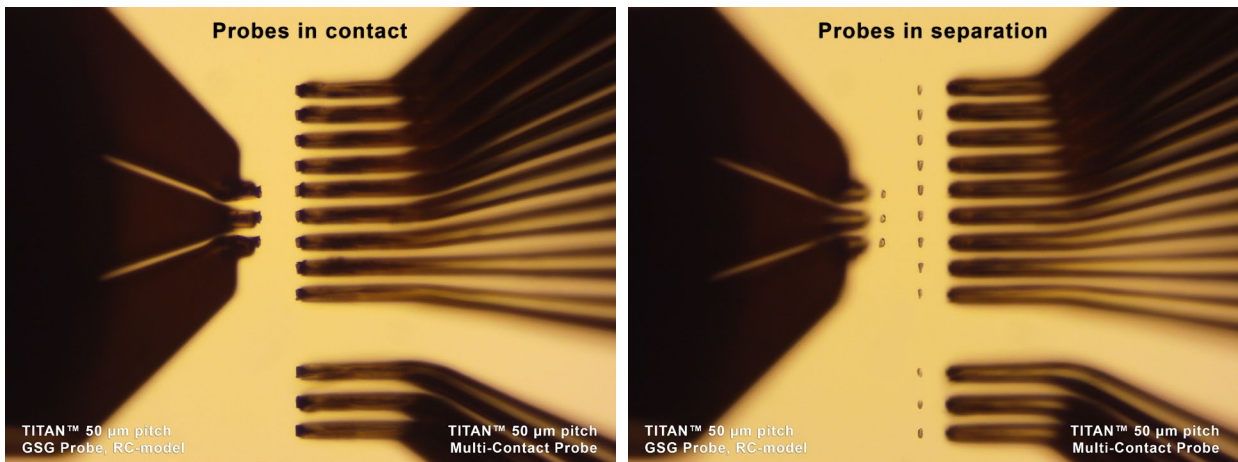
SIMPLIFIED CIRCUIT MODEL OF P LINES (EXCLUDING DC CABLE ASSM)



All transmission-lines (TL) are modeled as lossless with $\epsilon_r = 1$; shown electrical (not physical) lengths. To be used as reference only; NOT spec'ed.

TITAN™ CONTACT TECHNOLOGY

Like any other MPI RF Probes, TITAN™ Multi-Contact Probe delivers excellent and real time visibility of the tip contacts due to the unique protrusion tip design. With the 20 μm contact width and short forward skate, TITAN™ Multi-Contact Probe provides minimum pad damage of the ICs enabling small pad probing at wide temperature range.



MPI Global Presence

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