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Contacting Challenges for 5G

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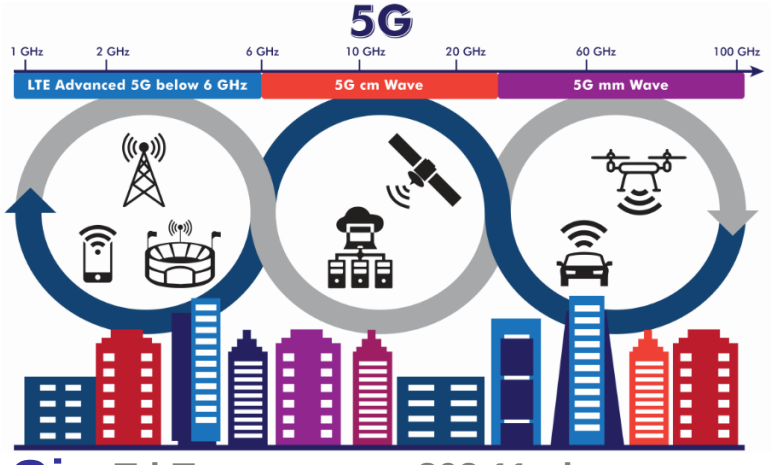


UltraGig Tri-Temp HetNet 802.11ad URLLC Antenna
802.11ax Calibration Coax
Module BeamForming WiGig LTE-WAN R15
Thermal
OTA Spectral mMTC IoT LPWAN
Wide BW
WaveGuide Efficiency R14 Carrier
MMIMO R13 eMBB V2X Small Cell Aggregation

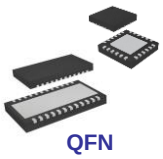
Overwhelmed by 5G Test Considerations?

Evolving 5G standards and protocols are driving the need for production contactor solutions that provide performance previously only seen in engineering labs for testing RF signals through both contacted and over the air (OTA) test.

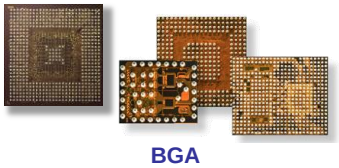
These solutions need to combine broadband RF performance for cmWave and mmWave bands with the robustness needed for production test floors, while meeting reasonable Cost of Test (CoT) targets.

Contacting Challenges for 5G

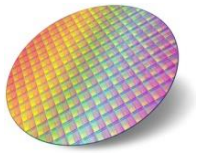
Package Trends:



QFN

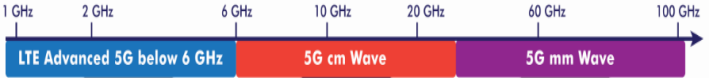


BGA

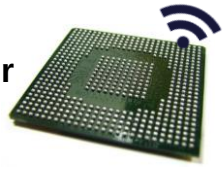


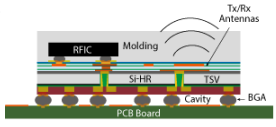
WLCSP

Frequency Bands:

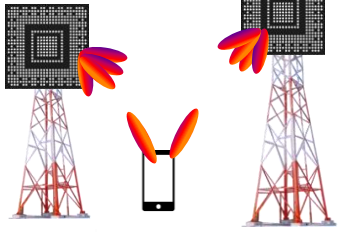


DUT / Tester Interfaces:





Antenna in Package (AiP)



MIMO (Multiple In Multiple Out) Antenna Arrays

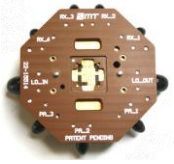
WaveGuide and Coax Tester Interfaces

Variety of Contact Technologies Required:

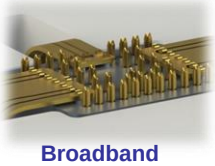
5G Contacting Building Blocks

Short Scrub for Singulated QFN

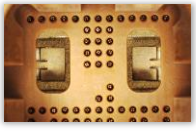
Short Pogo for BGA / QFN / WLCSP



Broadband Singulated Solution to 100GHz



Broadband Wafer Solution to 100GHz



Antenna Technology

5G Contactor Solutions Need to be Modular & Robust

Advanced RF Contacting Building Blocks are often combined to meet evolving package and test requirements for 5G applictions.

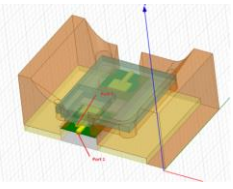
Assuming technical requirements are met, a variety of contact technologies can reduce CoT.

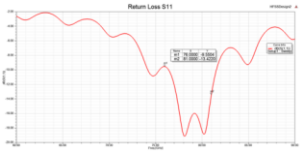
Contacting Challenges for 5G

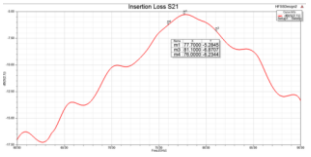
Conclusions

5G RF Contacting Solutions must be integrated with the entire test cell between the tester and handler/prober for production environments. A variety of modular contact technology solutions allow for the solution to be adapted to the unique test requirements.

Below is an example of an OTA contactor solution for an AiP device that addressed poor patch antenna quality achieved when antenna was built into PCB.

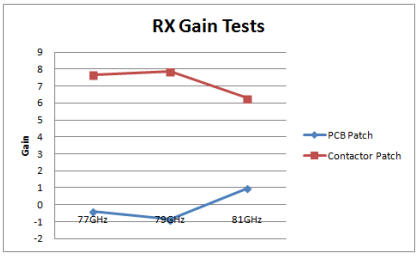




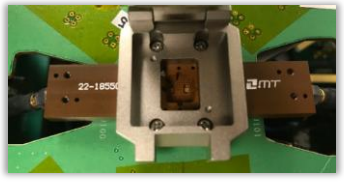


Modeled OTA Solution w/ Patch Antenna in Contactor

	RX Gain Tests		
	Low Band	Mid Band	High Band
Test Fixture	77GHz	79GHz	81GHz
PCB Patch	-0.37	-0.87	0.96
Contactor Patch	7.65	7.85	6.27

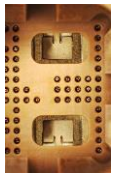


Test Results Superior with Patch Integrated in Contactor vs PCB



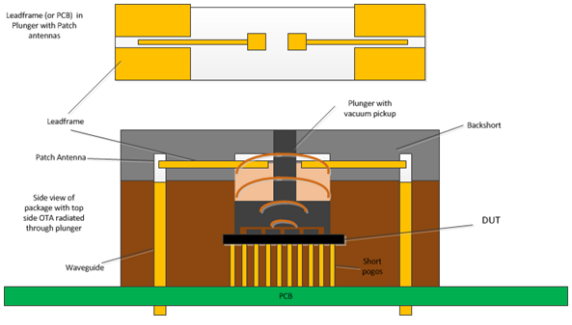
Broadband Contactor + Patch for 76-81GHz BGA AiP

PCB Patch



Contactor LeadFrame Patch

Provide solutions ready for the production test floor



Re-configure building blocks to fit evolving requirements