

AIR-FILLED SLOT ANTENNA FOR ANTENNA-IN-PACKAGE SOLUTIONS

6G



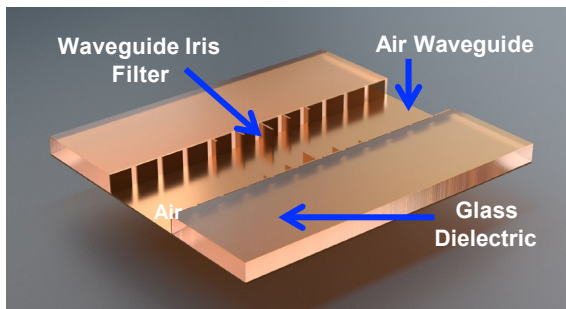
Abstract:

3D Glass Solutions (3DGS) provides an ultra-low-loss platform for both Radio Frequency Integrated Circuit (RFIC) and antenna integration i.e. Antenna-in-Package (AiP). By utilizing 3DGS' patented air-cavity manufacturing process, millimeter-wave (mmWave) antenna and transmission-line-based structures achieve superior performance compared to conventional packaging technologies.

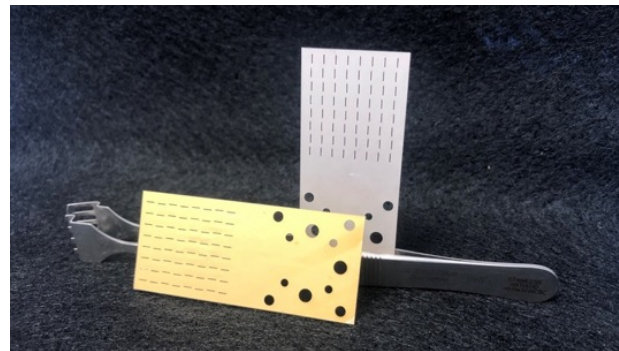
3DGS and Nokia Bell Labs have teamed together to create a novel 64-element air-filled slot array antenna operating from 77 to 81GHz; however, the technology is scalable for frequencies ranging from 40 to 300 GHz.

3DGS' manufacturing technology creates an air-filled Substrate Integrative Waveguide (SIW) with an effective $Dk \approx 1.0$. Micron-scale precision manufacturing enables ultra-low-loss with high manufacturing repeatability. Results show excellent return loss and gain across the antenna bandwidth.

IN-PACKAGE FILTERING



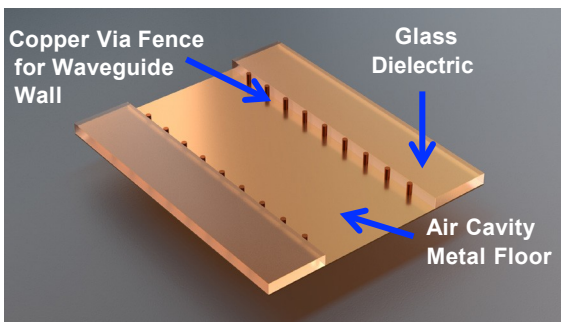
64-Element 79GHz Antenna



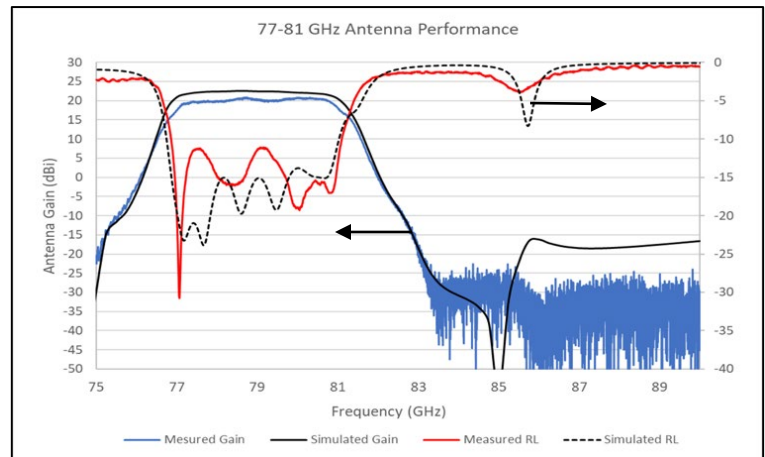
Approach:

Air-Filled Substrate Integrative Waveguide (SIW).

Antenna-in package (AiP) Building Blocks Using Air-Filled SIW



Antenna Performance Simulation vs. Measurement



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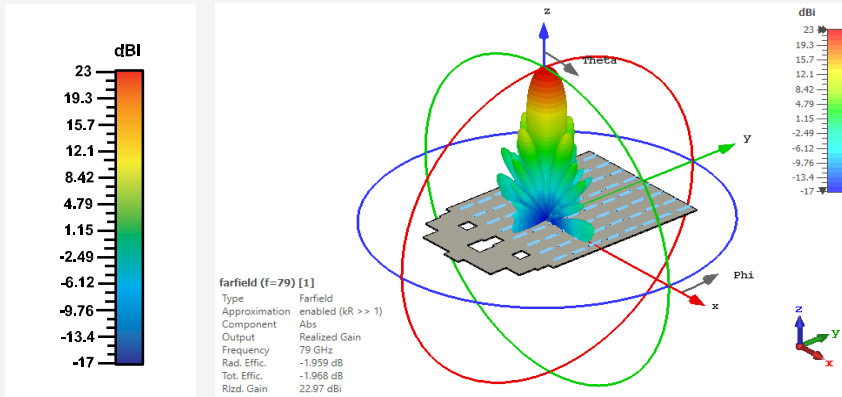
Enabling the GHz Generation

6G



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64-Element 79GHz Antenna



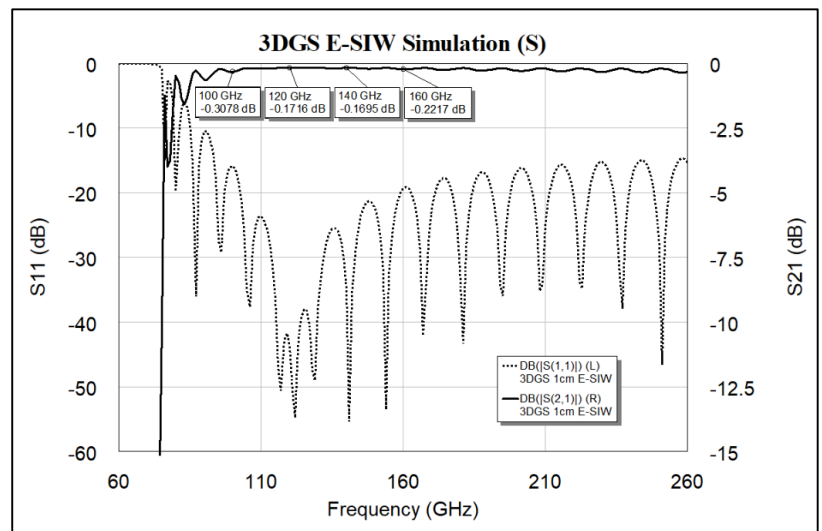
Applications:

- Antenna
- Transmission Lines
- Filters
- Splitters
- RFIC-to-SIW Transitions
- Complete RFFE

Markets:

- Automotive Radar
- 6G Cellular
- mmWave Radios
- 5G Cellular
- Wi-Gig
- Satellite communications
- Mil/Aero

Low Loss Performance above 100GHz (dB / cm Transmission Line Length)



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