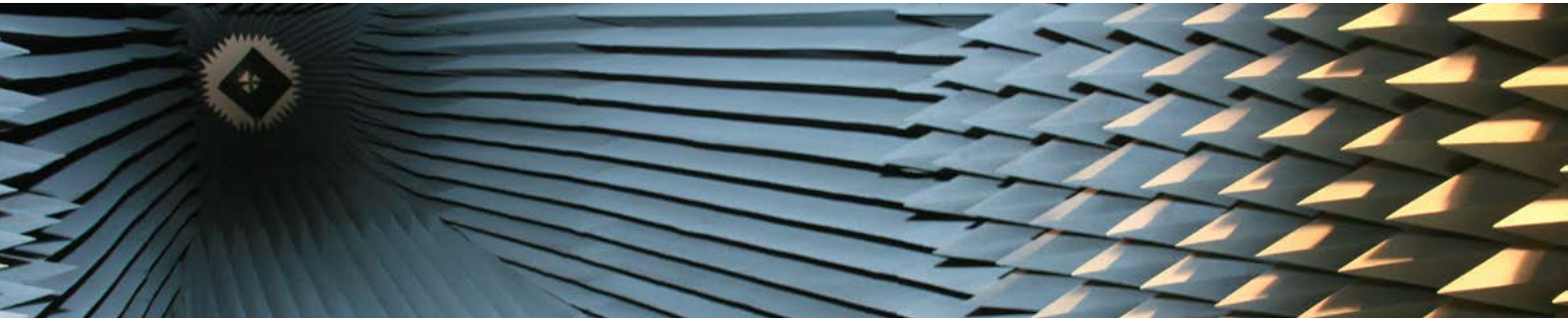


CSA.52

5G mmWave Array Sub-System Development



Service name:

CSA.52 5G mmWave Array Sub-System Development

Deliverables:

Report, Interactive Technical Support, and Detailed Array Design

Duration:

4 weeks to 5 months depending on project scope

Items:

- A Full set of array simulations reviewed
- B Beamformer RFIC selection
- C Multi-layer PCB design
- D Prototype and Test
- E Beam steering algorithm developed (optional)

What is the problem or concern we are addressing?

With the advent of 5G applications and system requirements, there is a need for the specification, design, and development of 2D Hybrid array sub-systems for use in high data rate millimetre-wave communication systems. This sub-system contains the antenna array, beamformer RFICs, and a multi-layer PCB to support a mix of power, digital, and RF signalling. This configuration, termed a hybrid array, provides the capability to beam steer the array in one or two-dimensions to ensure good communication link performance.

What are we going to do?

With the completion of a ISA.10 Millimeter Wave Array Sub-system Review, the first step in the process will be EM (Electromagnetic) simulations to determine array element count and transmit power requirements, along with receive gain and sensitivity of the array. In parallel with this simulation phase we will review beamformer RFIC options to find a good fit for the project at hand in terms of RF port count, transmit power, and noise figure of the beamformer module. We will work with you early in the project design phase to determine that array sub-system size, performance, and cost attributes fit well within the overall project goals.

As the project progresses, a prototype array with beamformer RFICs will be assembled and tested to verify system performance. Taoglas has measurement facilities in-house to carry-out fast and accurate millimetre wave array measurements. We can work with your team to integrate an algorithm or look-up table to control array beam scanning or we can develop the beam steering algorithm as part of the project scope.

A millimetre wave array sub-system design will require input from multiple engineering disciplines, and Taoglas has the experience and expertise to carry the project forward. The Taoglas team will consist of a mix of antenna, RF system, mechanical, and thermal management engineering to bring the various pieces of the design together.



Taoglas engineering, in consultation with the customer on the final report, will determine if the measured performance factors are sufficient for the product to meet its performance and certification requirements. Taoglas will be available for further questions on the array sub-system integration as needed until the initial design files are completed.

At the conclusion of the design, prototype, and test phase Taoglas team is well prepared to take the array sub-system into production. Taoglas will leverage manufacturing and test capabilities to provide high volume production of the array sub-system at high yield rates. Years of experience in multi-layer PCB manufacturing along with radome tooling development and production will be brought to the table to ensure high quality, high volume deliveries into production contracts. To support quality production of the array sub-system, materials, processes, and components are selected from day one of the project engagement to meet requirements and compensate for variations in the manufacturing process.

What does Taoglas need from you?

Input from the ISA.10 Millimeter Wave Array Sub-system Report conducted prior to a project design engagement will be a starting point for the Taoglas team to launch the project. Any changes to transceiver interface or changes to the specifications since conclusion of the ISA.10 study will be reviewed and included in the project scope. If a radome is required, then insight into the environmental aspects targeted for the final product will be needed. Taoglas has years of experience in radome design and environmental testing to bring to the project. If the radome is customer supplied, then we will need CAD for the enclosure to assist in array integration.

What happens next?

An array sub-system being a complex design, we anticipate a series of meetings and an interactive approach with you to verify objectives are met as the design takes shape. Reports containing simulations and measured data on prototypes will be shared and reviewed with your engineering team on a regular basis. We will work with your team each step of the way to make sure the array sub-system design integrates well into the rest of the communication system.

Deliverables:

Deliverables will vary depending on the scope and complexity of the project, with a simple array study phase consisting of simulations and description in a report, while a more complete project development will result in a prototype and samples of a millimetre array sub-system along with full report containing measured performance data.

Visit www.taoglas.com/solutions/design/ or contact Taoglas sales for further information.

