CSA.50

Custom Antenna Design

Outcomes and Deliverables

- Custom antenna design and integration solution.
- Integration files, such as mechanical drawings and 3D CAD files.
- Evaluation of custom antenna solution compared to off the shelf options.
- 5 physical samples for your internal testing.
- Report detailing antenna design and measurements results.

Duration

6 – 8 weeks (this is a typical estimated duration – actual duration on quote may differ).

What We Need

- 3D CAD files – preferably STEP files.
- Mechanical drawings.
- PCB files and circuit schematics – preferably native Altium files.
- 3 samples of your device/PCB.

What is the problem or concern we are addressing?

Taoglas strives to provide the highest-performing off-the-shelf internal and external antennas in the industry. Our internal antennas meet the needs of many customers, enabling compact, reliable, high-performance devices. But what if one of our off-the-shelf antennas doesn't fit into your device, or your application is pushing the boundaries of technology or size? For these applications, Taoglas can offer you our custom antenna development service.

Taoglas' custom antenna solutions offers a method for you to utilize our antenna, certification, and manufacturing expertise. Taoglas engineers work directly with your engineers to develop the optimal solution.

Regardless of the stage of your development, Taoglas can engage with you to find the best solution.

The Process

Part 1 – Design and Test

- Taoglas engineers engage with your design team to develop required performance metrics based on industry certification requirements and/or our expertise.
- Our engineers test and/or simulate different antenna designs, technologies, topologies, materials, and locations to identify the optimal performance solution.
- Our engineers work with your engineers to integrate the custom antenna design into your device.
- Passive testing will be performed to ensure the custom antenna meets the defined performance metrics.
- Taoglas develops the mechanical drawing.
- Active testing (if applicable) is not part of this service and can be performed using other services such as CSA.30, CSA 31, GSA.30 and GSA.40.

Taoglas can design custom antenna solutions using a variety of manufacturing technologies. These are listed below for embedded and external antenna types.

Embedded antennas:

- FPCB (Flexible Printed Circuit Board)
- SMD (Surface Mount Device)
- Stamped metal
- Ceramic antenna
- LDS (Laser Direct Structuring)

- Others

External antennas:

- Screw mount
- Magnetic mount
- Adhesive mount
- Pole mount
- Others

What does Taoglas need?

Taoglas needs to know which radio technologies and modules you are integrating into your device. This allows us to work with you to develop appropriate performance requirements.

If prototypes are available, we require three samples of your device, including as many of the components present in the final design as possible. Components like batteries, LCD displays, peripherals, cables, etc., all mounted in some sort of enclosure to approximate the final design.

The board does not need to be a functioning device, as we will be performing passive testing (unless OTA testing has been specified as a performance target). We will be modifying the device and as such it will not be suitable for use after.

We require any 3D CAD and 2D design files you may have. We require these files to do cross sections, hide components and make accurate measurements. We accept a variety of 3D files formats, but STEP files are preferred.

We also require any documents you have relating to the PCB of the device. These documents should define the PCB stack-up, later thicknesses, materials and finishes for the PCB. A bill of materials for each PCB is also recommended. Ideally these files should be native Altium files.

Circuit schematics of all the PCBs in your device are also required. This is to better understand the RF paths in your design. Once again, these files should ideally be native Altium files.

Part 2 – Samples and Reporting

Taoglas will generate a report detailing the antenna design, the integration process and the measurement results. Taoglas engineers, in consultation with the your design team on the final report, will determine if the measured performance is sufficient for the product to meet its performance requirements.

If the antenna performance is acceptable, custom antenna samples will be provided to you for further testing and validation. Taoglas will also provide you with a part number so that the custom antenna can be ordered through our sales channels.

Part 3 – Next Steps

Taoglas offers a number of services which would typically follow on from this service. These services are intended to optimize the RF performance and maximize likelihood of certification for your design.

These services include:

- **CSA.30:** Cellular OTA TRP Testing
- **CSA.31:** Cellular OTA TIS Testing
- **GSA.30**: GPS Acquisition & Tracking Sensitivity
- **GSA.40**: GNSS Field Testing

Visit Taoglas Website or contact Taoglas sales for further information.

Please note - devices, systems and equipment falling within the scope of Annex I of the EU Dual Use Regulation 821/2021 are not eligible for this service. For queries, please consult your legal department or contact exportcompliance@taoglas.com.