GSA.20

Custom GPS/Satellite Antenna Design & Customization

Service name:

GSA.20 Custom GPS/Satellite Antenna Design & Customization

Deliverables

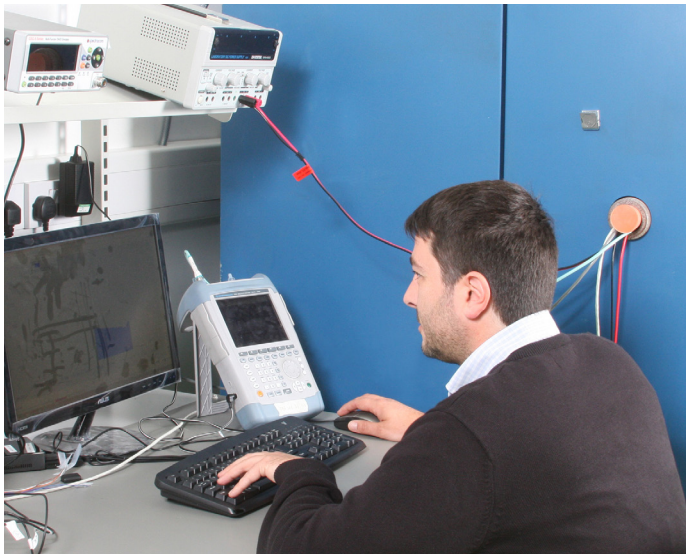
Report and prototypes

Duration:

6-12 weeks for development, 8 weeks for production following customer approval

Items:

A. 5 custom antenna prototypes
B. Mechanical drawing
C. Gerber review
D. Transmission line review
E. Final antenna positions and integration method
F. Matching circuit when applicable
G. Return Loss, VSWR, Average Gain, Efficiency, and Peak Gain



What is the problem or concern we are addressing?

Taoglas produces the highest-quality off-the-shelf antennas available. However, we recognize our standard product may not fit or be optimal for every device. To offer the best performance possible for your device, Taoglas offers custom antenna design and production. Taoglas provides a variety of off-the-shelf form factors and types of antennas.

Table 1 delineates the customization options available.

Variant	Description	Duration
GSA.20.1	Custom design of an embedded flex, metal or PCB antenna	6-8 weeks
GSA.20.2	Customization of an existing embedded ceramic antenna	6-8 weeks
GSA.20.3	Custom design of an embedded ceramic antenna in a new form factor	12 weeks
GSA.20.4	Customization of an existing external antenna	6-8 weeks
GSA.20.5	Custom design of a new form-factor external antenna	6-8 weeks

It is very important to know all the physical constraints that could affect in a negative way the performance of the antenna. Things like batteries, metal plates, additional PCBs, etc., could detune the antenna and hence change or reduce the performance from optimal.

Taoglas can evaluate the device's forms and dimensions as well as the available space for the GPS/satellite antenna placement so we can determine which one is the best antenna type for the device and its location. Taoglas can evaluate and solve issues that relate to the antenna and its surroundings in the device that could impact the performance.

As part of this service for embedded SMT and through-hole antennas, Taoglas will review the feeding transmission line and Gerber files of the PCB on which the antenna is mounted.

Note: a minimum order quantity (MOQ) of 3000 pieces is required for product orders.

The Processes

Part 1

- Taoglas engineering will meet with your engineers to learn about your system, and understand the constraints and design goals for your GPS/satellite system.
- A full review of the device and system are then performed in order to determine the likely optimal locations for the antenna. Taoglas will take into account PCBs, other radios, antennas, batteries, the enclosure, etc.
- After this review, Taoglas will design, simulate, and prototype as required to determine the best antenna type for your device. Multiple antenna types may be tested as part of this process. The most appropriate antenna prototypes are then tuned or matched in your device prototype to obtain optimal antenna performance.
- Once this prototyping is complete, performance and antenna details are compiled into a report. After delivery of the report, Taoglas engineering and sales discuss the results with you to determine whether the results meet your approval.
- As part of this report, Taoglas will provide a fully detailed integration and matching document so you can implement the custom antenna in your final design.
- After approval of the design, the custom designs are moved to production. This includes the creation of mechanical drawings and a custom ordering part number. Up to five (5) prototype samples can be delivered.

What does Taoglas need?

In all cases, Taoglas will require the following:

- 2 copies of your device including all the bits and pieces. The units do not need to be functional.
- Any metallic parts, such as batteries, LCDs, peripherals, cables, etc., all mounted in an enclosure similar to the final enclosure. SLA or FDM prototype enclosures are sufficient, but the final plastic material can yield slight differences in performance.
- 3D PDF or eDrawing files for your mechanical assembly. We really do need all the information that could help us to do the best integration possible. If you send to us the eDrawings files, we need the ability to hide parts, do cross sections and make measurements so an eDrawing file with these features turned on is highly recommended.
- We need schematics of any boards with GPS functionality. PDF format at a minimum and native Altium files if you happen to use Altium.
- PDFs of your PCB layout for any board with GPS functionality, all layers. If you use Altium, then native Altium files would also be helpful. Please include a document defining the PCB stack up, layer thicknesses, materials and finishes for the PCB.
- A spreadsheet of your bill of material for any PCB with GPS functionality in the design.

Part 2

After your engineering team has integrated the custom antenna into your design, Taoglas will review the integration. For PCB-mount (SMT and through-hole) antennas, Taoglas will review the feed transmission line and Gerber files of the PCB to which the antenna is mounted.

After full production samples are available, the custom antenna will be tested and fine-tuned as required.

Deliverables

Taoglas will compile a report on the antenna measurements including:

- Details of the custom antenna
- Integration position and methods of the antenna
- Details of any electrical or mechanical tuning techniques
- Matching network diagram and values

Taoglas engineering in consultation with the customer will determine if the measured performance is sufficient for the product. After the customer approves the design and performance, the following will be provided to the customer:

- Mechanical drawing of the antenna
- Up to 5 prototypes of the custom antenna
- Custom ordering part number