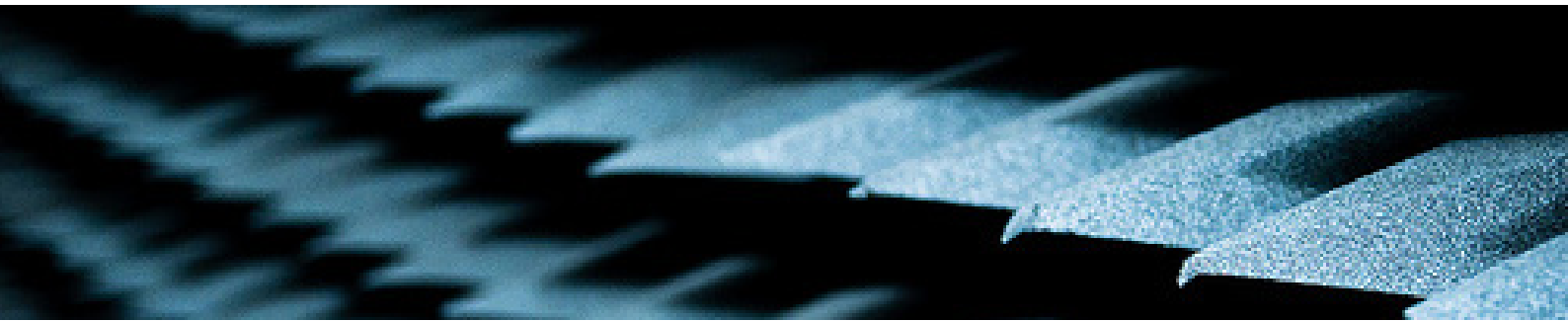


NSA.20

Custom NFC Antenna Design



Service name:

NSA.20 Custom NFC Antenna Design

Deliverables

Custom NFC Antenna Design

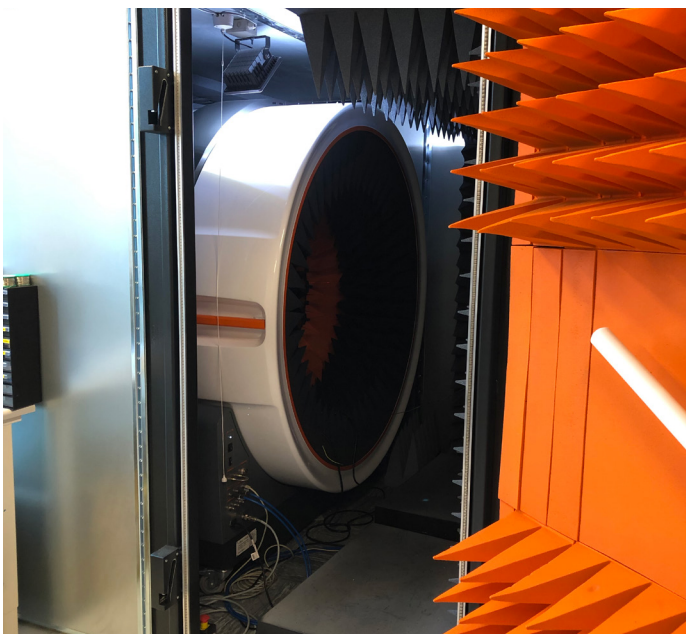
Duration:

NSA.20.1: 6-8 weeks

NSA.20.2: 12 weeks

Items:

- A. 5 custom antenna prototypes
- B. Mechanical drawing
- C. Final antenna position and integration method
- D. Active NFC performance testing in Taoglas lab
- E. Test against multiple targets
- F. Test report of device performance



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.

For NFC-enabled devices, Taoglas offers two types of custom antennas: embedded flexible (NSA.20.1) and embedded bobbin coil (NSA.20.2). Taoglas sales and engineering can assist with selecting the best type for your device.

While our off-the-shelf offerings are available only at 13.56MHz, a custom antenna can be designed for other near-field applications or frequencies.

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, improper integrations, etc. could detune the antenna and hence reduce the magnetic field strength, causing deficient interrogation distances.

Taoglas can evaluate the device's forms and dimensions as well as the available space for the NFC 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 the metallic plates/parts present in the device that could reduce the magnetic field strength, reducing as a consequence the interrogation distances.

To achieve the best performance of an NFC antenna, the antenna matching network must be customized to the selected NFC IC and integration environment. This matching consists of a network of lumped element components to ensure a proper electrical interface and maximum power transfer.

The Processes

Part 1

A full review of the following is performed:

- PCB, existing RF radiator components, battery and enclosure analysis to find the best location to place the antenna, also to determine the need of a ferrite sheet between the antenna and any metallic part.
- Antenna is designed, simulated, and prototyped as required.
- Antenna, EMC filters and matching components selection for the best antenna performance.

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 fully functional, but the NFC does need to function.
- Things like any battery, LCD displays, peripherals, cables, especially metallic parts, etc. all mounted in the enclosure that is close to what the final enclosure will be. SLA or FDM proto enclosures are sufficient but the final plastic material can yield slight differences in performance.
- We need the schematic for all the boards in the device. PDF format at a minimum and native Altium files if you happen to use Altium.
- PDFs of your PCB layout for each board, all layers. Again if you use Altium, then native Altium files would also be helpful. Please include a document defining the PCB stackup, layer thicknesses, materials and finishes for the PCB.
- 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.
- A spreadsheet of your bill of material for each PCB in the design.

Part 2

Taoglas will analyze the mechanical/electronic integration of your device to determine the best antenna type as well as its best location and also will implement all the needed modifications to the device to get the best antenna performance. These modifications could be adding matching components, EMC filters and ferrite flux director sheets.

This procedure may be done with different physical feasible antennas to determine which one has the best performance and larger interrogation distances. Taoglas will provide a fully detailed integration and matching documentation so you can implement the custom antenna in your final design.

Deliverables

Taoglas will compile a report on the antenna measurements including:

- Details of the antenna selection and placement.
- Details of any electrical or mechanical tuning techniques.
- Matching network diagram and values.
- Device sample with implemented changes (if needed).

Details of the flux director type, dimensions and placement (if needed). 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

