

NSA.10

NFC Antenna Integration with an NFC IC



Service name:

NSA.10 NFC Antenna Integration with an NFC IC

Deliverables

Antenna Integration and Performance Report

Duration:

3 weeks

Items:

- A. Selection of the best NFC antenna to use on the device
- B. Matching circuit diagram (if needed)
- C. Cable routing diagram, antenna placement and mounting as well as any relevant information about antenna integration
- D. Selection of ferrite flux director material to improve interrogation distance when placing antenna on metal
- E. NFC Antenna installed on a customer device prototype board
- F. Documentation of interrogation distances tests

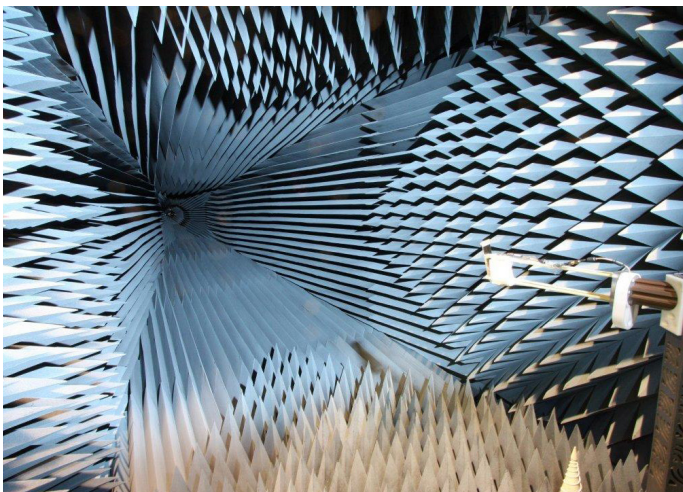
What is the problem or concern we are addressing?

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.

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 form and dimensions as well as the available space for the NFC antenna placement so we can determine which one is the best antenna 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.



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, EMC filters and matching components selection for the best antenna performance.

What does Taoglas need?

In all cases, Taoglas will require the following:

- Two 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.
- 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. 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 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.
- 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 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 will 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 changes 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 including device sample with implemented changes.
- Details of the flux director type, dimensions and placement (if needed).

