



## F3 Wireless Antenna Review

The antenna review deliverable is a written list of specific feedback so you can understand potential risks and mitigate poor wireless range, unintentional RF spurious emissions or receiver interference.

### MS11: Antenna Review

Antenna performance is easier to address the closer you are to the start of your project. A quick antenna review by an experienced RF engineer can save you weeks or months of work later; especially if mechanical redesign is required. Ideally, one designs the device around the antenna and not the antenna around the device. This is required for optimal antenna performance because the antenna efficiency/gain is based on physics and the volume available for the antenna and any nearby conductors/absorbers. Any wireless device needs a well performing antenna to ensure long range, higher throughput and better battery life. A compromised antenna will negate all three, thus the importance to get the antenna right.

Device review for antenna suitability includes a report that reviews antenna design and associated circuitry in relation to antenna design best practices and the specific device use case. Engineers will be looking at pictures, design files and use case details of the product.

Use-case of the device, portable (< 20cm from user), mobile or fixed as it relates to optimal radiation pattern and polarization. Special discussion of GPS antenna, when to use circular polarization, linear polarization and why the radial pattern matters.

This service includes a report that will detail:

- Commentary on antenna choice based on radiation pattern including an explanation if there is a better recommended choice.
- Commentary on antenna choice based on likelihood to get sufficient efficiency based on use-case, enclosure details, implementation details. This includes explanations and if there is a better recommended choice.
- Commentary on antenna matching circuit, sufficient elements, feed point for VNA to the antenna, a feed point to radio for conducted testing, whether it is DC blocked, support for antenna diagnostics (Taoglas AntD or GPS power feed detect) GPS bias regulation/noise, and failure modes.

## Process & Requirements

- We can start on your microservice as soon as you send the required documentation.
- We will need schematics to review in the form of a pdf (native Altium files if possible) along with bill of materials and PCB layout file.
- We will need photographs of the device.
- We will need use cases of the device and which mobile network operators are used (if any).
- We will need step files and/or e-drawing files of the complete device.
- Once we have processed the service, we will deliver your report (example below) within seven business days.

### Some examples that cause problems:

- Metal underneath the antenna
- Battery too close to the antenna
- Traces/tracks near the antenna
- EMI sources near the antenna
- Poor antenna matching
- Poor antenna selection
- Poor antenna placement
- Poor transmission line design
- Poor isolation between multiple antennas

### This service will help you:

- Know your sources of risk before you build your first prototype
- Have specific mitigations in place from the start to minimize what has to be fixed later
- Have an unbiased source for assistance for your whole device, not just specific parts



## MS11: Antenna Review Report Example

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