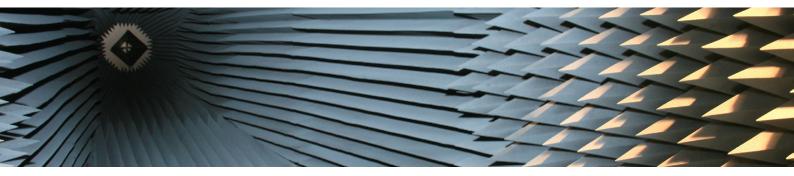# ISA.20
Detailed Performance and CertificationReadiness Review

TAOGLAS ®

Service name:

ISA.20	Detailed Performance & Certification Readiness Review

Deliverables:

Report and interactive technical support

Duration:

3 weeks

Items:

A Detailed analysis of design documents including schematic, PCB layout, BOM & mechanical models.

B Specific recommendations from the component level up to the system architecture level in order to minimize the risk of performance and certification problems for all radios in the system.

✓ Schematic recommendations

✓ PCB layout recommendations

✓ BOM recommendations

✓ Mechanical recommendations

C High level certification test plan, what certification tests will be needed and what order to do them in.

What is the problem or concern we are addressing?

Taoglas can evaluate and solve issues that relate to the antenna and RF performance, receiver interference and spurious transmitter emissions that cause performance and certification issues.

All wireless, and particularly cellular devices face common performance and certification challenges, regardless of the types of radios being used. These challenges are never obvious and different types of wireless systems and products exacerbate different issues more than others. This service offering is a means to apply the extensive antenna and RF experience of Taoglas to your product.

We can not only identify the source of the problem, but eliminate the problem - or at least suppress the problem enough so it takes out the risk of certification failure or poor performance.

Specifically radio systems require an effective antenna, they are subject to radiated interference with the receiver and they can emit strong spurious, unintended RF signals when transmitting. These issues can happen with cellular, WiFi, narrow-band radios, GPS, any sort of radio. The ISA-20 service can address any type of radio issue but PTCRB certification for LTE and GSM/UMTS devices are a very common problem.

Radio certification is a standalone test simply showing compliance as per the regulating organization standards (e.g. PTCRB or carrier certification). Many of the network operators in North America have specific tests and metrics for radiated performance on transmit (TRP), receive (TIS) and coexistence/ interference (RSE).

These tests enforce a minimum level of performance on the wireless product. This is done to ensure end customer useexperience expectations are met, thus protecting the carrier's network brand.

Product performance itself however is not the responsibility of a certification body. FCC in the US has no test standards for the quality of a receiver. You can build a WiFi or GPS product that passes FCC's requirements but does not actually function efficiently as a WiFi or GPS product.

The problem however will be identified in the market when users experience "poor range" and/or "no GPS fix" etc. It's not enough to pass certification; the radio elements of the product have to actually work well.

Taoglas engineering understands these issues at the deeper levels and at the source. We have experience in resolving not just antenna issues or noise issues but system issues. What the problems are, what causes them, how to avoid most of them in the first place and how to mitigate the few that get through.

We can get you to market faster and in a cost effective way by supporting your engineering team dealing with these issues.

The Processes

Part 1

A full review of the following is performed:

- Schematics for each board in the product, component by component and make specificrecommendations to minimize the factors that cause the problems discussed above.
- PCB layouts, layer by layer, trace by trace and make specific recommendations to minimize the factors that cause issues. The most effective tool for avoiding performance and certification problems is adjustments to the PCB layout.
- Bill of materials, part by part, and make specific recommendations to minimize these problems as well as opportunities for part consolidation and cost reduction.
- Mechanical design files to help you understand the physical interactions and trade-offs involved with location of major system elements in the product.

What does Taoglas need?

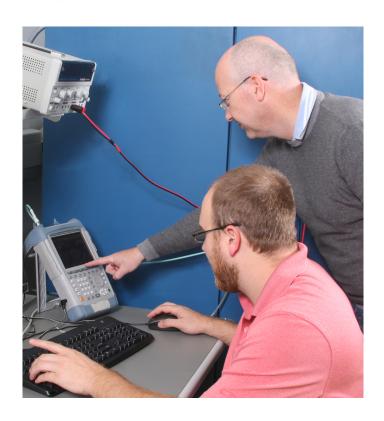In all cases Taoglas will require the following:

- PDF format copies of your schematics for each board in the design — the best format is native Altium files.
- PDFs of your PCB layout for each board, all layers. The best format is native Altium files.
- Please include a document defining the PCB stackup, layer thicknesses, materials and finishes for the PCB.
- A spreadsheet of the bill of material for each PCB in the design.
- An eDrawing files for the mechanical assembly. The ability for Taoglas to hide parts, do cross sections and make measurements etc., an eDrawing is essential.
- In the situation where a product that has already had prototypes built, then testing on those prototypes is done to identify the baseline. If testing has been already been performed (e.g. prescans) Taoglas requires all the test data gathered including summary reports, raw data and pictures of the test setup.

Part 2

- Your engineering team will implement the recommended changes in a new set of design files.
- All the changes are equally important and need to be executed. Most failing products have several factors causing the same failure mode and they all have to be addressed without compromise or the risk of failure remains.
- Taoglas will review the changes to the design files. Output from this review will be appended to the initial design report and distributed to you and your engineering team. This is included as part of this service.
- Then prototype build of the updated design is performed. Taoglas can then perform passive antenna performance testing, active mode receiver sensitivity testing as well as active mode intentional and unintentional radiator testing. This testing is offered as separate service offerings to allow for different types of testing to the needs of different types of radios.
- Taoglas also offers a number of other testing services which can address the design verification test needs of your project.

Deliverables

- The output from this effort will be presented in a written report with major sections for each of the design file types mentioned above as well as subsections on a per page basis. (i.e. CPU page, power supply page, etc.)
- There will be an appendix with any comments from the post-implementation review.