



Part 15 Antenna Update

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Note: The views expressed in this presentation are those of the author and may not necessarily represent the views of the Federal Communications Commission.



General Requirements

- Applies to all Part 15 certifications granted after August 25, 2022.
- Antenna Information required to show compliance with FCC requirements is not held confidential.
- If antenna gain information is not required, a justification statement is required.
 - Only radiated measurements are used to show compliance with FCC limits for fundamental and spurious emissions..
- A grantee performing own antenna characterization must submit an antenna test report (AUT Report).
- Antenna manufacturer data sheets/measurements are acceptable; Support information may be requested.
- If EIRP levels above the horizon are restricted, gain plots and configuration should be provided.

TCBs Should Validate Antenna Information



Required Information

- Per 353028 D01, all Part 15 antennas used must be listed.
- Antenna information may be required for future C2PC.
- Off-the-shelf antenna manufacturer datasheet is acceptable if antenna configuration does not alter parameters.
- The internal photos should clearly show and annotate the antenna(s) and ports if applicable.
- Proprietary antennas (or if datasheet is not available) must have a test report (AUT Report) to include detailed antenna gain description, performance specifications, table of calibrated equipment, test dates, names of test personnel, names of commercial test software being used, test setup photos and description of how measurements are made.
- When using an antenna built from a reference design, such as those provided in engineering application notes (Inverted F, meander, patch, spiral, etc.), the application for certification should include that section of the original engineering application notes along with close up detailed pictures of the circuit board.
- Proprietary information and photos not required to show conformance with FCC limits can be held in the confidential exhibit(s) with appropriate justification.
- Checklist for DRGAIN PAG is available in KDB 388624 D02 Appendix.
- All outliers require a KDB inquiry to address.

Use Engineering Judgement or Open a KDB Inquiry



Antenna Data sheet Requirements

- Data sheet should be from an antenna manufacturer that specializes in antenna construction
- TCB should verify information on datasheet as practically as possible
- The datasheet should at a minimum have the following:
 - i. Name and address of the antenna manufacturer
 - ii. Model number of the antenna
 - iii. Maximum gain of the antenna for the frequency band of operation
 - iv. Antenna patterns (2D or 3D) preferred.

- The datasheet should be placed in the test reports folder and cannot be held confidential



Antenna Under Test (AUT) Report Guidelines

- Although not required, ISO/IEC17025:2017 provides excellent reporting guidance.
- Report Outline – breakup large sections into smaller subsections to facilitate review.
- If applicable, test method, measurement standards, certification, traceability, site/equipment information, antenna/equipment calibration status, test setup up including photos, etc.
- AUT description addressing: (a) Full electrical and mechanical specifications, (b) Configuration and RF Chains as applicable, (c) How antenna information used for conformity with limits, (d) Method/source of antenna gain information, (e) Max gain, polarization, θ , ϕ and radiation plots for max gain plane.
- For multi-output devices, follow KDB 662911 D03 outline for measurement results.
- All formulas, calculations, units and conversions along with justifications, if necessary, should be shown without skipping steps.
- Measurement data presentation in properly divided and labeled sections, including any tabular summaries and plots, must annotate values of interest in viewable scale.
- Simulated Antenna characterization may be considered with technical justification through a KDB inquiry. Numerical simulation, require model validation.

Complete, Clear and Easy to Review



Summary

To satisfy our antenna information requirements the application for certification should include at least one of the following:

- i. Antenna manufacturer data sheet(s)
- ii. Antenna reference design specifications
- iii. Justification statement stating that all measurements were performed radiated and therefore additional antenna gain documentation is not required. Keep in mind that other documentation such as clear internal pictures showing antenna, dimensions maybe required.
- iv. AUT Report



Passive Reflectors

The use of passive antenna reflectors and/ or lenses is a major change to the antenna type and grant conditions of certification. A host provided antenna reflector/lens is a violation of part 15 rules. Changes to antenna gain characteristics may impact some or all: antenna type, EIRP, spurious emissions, Exposure conditions, module integration instructions, and operational/use restrictions. The use of after-the-fact antenna lenses/reflectors is a major change and may require a ***Class II Permissive Change*** or a new ***FCC ID***. Antenna lenses and/or reflectors require technical description, full electro-mechanical specifications, and full characterization of the overall antenna performance.



Questions?

THANK YOU