



# **Power Measurement KDB Update**

**Steven Jones**

**Technical Research Branch**

**Federal Communications Commission  
Office of Engineering and Technology  
Laboratory Division**



# Background

- This presentation is intended to present information regarding recent measurement-related publications made through the FCC laboratory knowledge database (KDB)
- All KDBs discussed herein can be accessed at:  
<https://fjallfoss.fcc.gov/oetcf/kdb/index.cfm>



# KDB Publication 771134

- Power measurement procedure for transmitting devices operating within the Medical Device Radiocommunication (MedRadio) Service under Part 95 I
- Presents a procedure for demonstrating compliance of a MedRadio device to the fundamental output power limit
- Utilizes the integrated band power method for determining the average power level



# KDB Publication 965270

- Offers guidance for performing fundamental output power measurement on Part 90Z wireless broadband devices operating in the 3650-3700 MHz band
- Specifies an integrated band power procedure to demonstrate compliance to the EIRP limit
- Presents a procedure to demonstrate compliance to the power spectral density (per MHz) limit



# KDB 971168 Draft Publication

- General guidance for measuring the fundamental output power of licensed broadband digital transmission systems
- Presents guidance on measuring the signal bandwidth, average power over the fundamental bandwidth, power spectral density (PSD) and peak-to-average power ratio (PAPR)
- Utilizes the occupied bandwidth (OBW) feature of contemporary spectrum/signal analyzers to determine signal bandwidth
- Specifies the integrated band power function to determine the average power over a wide bandwidth
- Utilizes the complimentary cumulative distribution function (CCDF) for determining the PAPR on a statistical basis
- Specifies a method for determining the statistical peak power utilizing the measured average power and PAPR
- Procedures currently being reviewed within C63 Working Group



# KDB 412172 Draft Publication

- Presents a methodology for determining the Effective Radiated Power (ERP) and the Equivalent (or Effective) Isotropically Radiated Power from measured output power data
- Equations provided to determine ERP/EIRP from measured data expressed in either linear or logarithmic terms



# KDB 449343 Draft Publication

- Addresses inquiries regarding the use of a pre-calibrated field methodology as an adjunct to signal/antenna substitution methods prescribed in TIA-603-C
- The pre-calibrated field methodology is not presently well understood by the FCC
  - Only limited information has been provided to FCC in inquiries
  - The methodology has not been recognized in any known industry standards
- Therefore, at this time, FCC cannot accept data utilizing this method for demonstration of compliance to the limits



# KDB 966099 Draft Publication

- Addresses a recurring question of whether a log average detector can be used to perform measurements on intentional radiators operating above 1 GHz
- 15.209 specifies the use of an average detector for measuring emissions above 1 GHz (and in the 9-90 kHz & 110-490 kHz bands)
- The use of a linear average detector is required (i.e., no log averaging).
- In particular, the power average (RMS) detector is recommended, particularly for measuring modern complex-modulated signals





# KDB 714737 Draft Publication

- Addresses the question of what average detector should be used to measure radiated emissions from an unintentional radiator to demonstrate compliance with the limits specified in Section 15.109
- A linear average detector should be used to demonstrate compliance to the limits



# Summary

- The KDB publications presented herein are intended to clarify recurring questions submitted to the FCC regarding acceptable methods for performing power measurements to demonstrate compliance to the rules requirements
- Those identified as “Draft” publications are currently open for comment.
- Encourage interested parties to review these draft publications and submit appropriate comments



## C63.26 Update

- Progress has been slowed somewhat due to the push to complete revision of C63.10
- STM1 is reviewing the KDB 971168 proposed standard procedure for measuring fundamental emission power
  - Discussions currently ongoing regarding alternative methods
- STM5 has released an early draft of a standard procedure for measuring the field strength of spurious emissions
- WG meeting scheduled for Oct. 25<sup>th</sup>-29<sup>th</sup>



# Questions and Answers

**Thanks!**