



Mobile & Wireless Forum

October 13, 2022

MWF Comments Re Unintentional Radiators Testing Procedures in KDB 447498 v07

The Mobile & Wireless Forum (MWF)¹ submits these comments to raise our ongoing concern about the FCC Lab's new requirements for unintentional radiators in KDB 447498. MWF urges the Lab to reconsider its position regarding testing for unintentional radiators based on several factors, including the infeasibility of performing the tests. MWF's primary concern about a proposed testing regime is that FCC has not come forward with data showing that such a testing regime is needed. Indeed, given FCC's own statements in the KDB about the limited need for such testing it is premature for FCC to impose a testing regime without first coming forward with a showing that the testing is needed in any real-world situation.

MWF further notes that the lack of supporting data is particularly problematic in light of the research put forward by MWF showing that there is no need for the testing.²

I. FCC Has Recognized Unintentional Radiators Do Not Require Exposure Testing Except In Limited Cases But Has Not Substantiated Its Concern That Any Testing Is Needed

a. FCC should not impose tests without adequate scientific support

MWF understands that FCC is concerned that the emissions from a URS,³ especially in a composite device, could cause the device's SAR or MPE to exceed the FCC's limits. FCC, however, expressly notes in KDB 447498 Appendix E that such instances will be "a limited set of special cases".⁴ FCC goes on in Appendix E §3.3 to identify one important rationale for why the cases will be limited: standard SAR testing for the device will usually incorporate the URS emissions.⁵ In addition, the KDB's main text identifies a second important rationale for finding no need to separately calculate the URS contribution to RF exposure: §§2.3.2-2.3.4 recognize that emissions sources should be treated separately where separation exceeds a specified distance. Under this well-established procedure, URS emissions are treated as separate from the standard SAR measurement in cases where the separation distance applies.

From the foregoing, it is clear that once the two likely circumstances for URS emissions are taken into account – i.e., overlapping SAR/MPE measurements and different emissions spots separated by distance – there are few, if any, instances where URS measurements need to be made. Such a conclusion is in line with MWF's previous submission to FCC, which included the research study

¹ The MWF is a global association of mobile and wireless manufacturers with expertise in RF exposure matters. MWF members are experts in measurement and testing issues related to SAR, MPE and EMC.

² See § I, *infra*.

³ Unintentional Radiator Source (abbreviation used in KDB 447498 by FCC)

⁴ Draft KDB 448498v07, App. E §E.3.1 ("Only a very limited set of special cases is expected, in general, to require evaluation via RF exposure test data collection.").

⁵ Id. at §3.3, titled "URS Included in the Intentional Radiator Evaluation".

conducted by Dr. Vitas Anderson.⁶ What is not clear, therefore, is whether there are real-world instances where URS measurements are needed to determine compliance with the RF exposure limit. Indeed, Dr. Anderson expressly found to the contrary: that composite devices would be compliant without additional measurements.

For the above reasons, MWF believes that FCC's imposition of a requirement for measurements or other assessments is extremely premature. Before moving to impose additional tests or analyses of URS emissions, FCC should allow industry to study the analyze the limited cases it has determined could cause compliance issues. Such study will enable dialogue about the best way to resolve compliance concerns. For example, such cases may be limited to certain form factors so that any other devices can be excepted from further measurements.

b. The MWF has provided unrefuted documentation showing no additional testing is needed.

On June 24, the MWF submitted a KDB inquiry with the FCC Lab regarding the unintentional radiator issue.⁷ That inquiry included a research report by Dr. Vitas Anderson demonstrating the inherent SAR compliance of devices that emit unintentional radiation. MWF also submitted the report to FCC in a separate email sent on June 21, 2022.

The report contained an analysis of the FCC database. From that database, he very conservatively calculated the total radiated power of thirty randomly selected devices. The data demonstrates that the unintentional radiators are conservatively below the 1mW low power exemption threshold. The report further shows both that the total radiated power from an unintentional radiator is below the 1mW low power exemption threshold and that it will not contribute to a rise in the SAR level of a composite device to create a non-compliant device.

In addition to the report, MWF notes that the following are highly relevant facts regarding FCC's concern that composite devices could exceed the SAR threshold due to unintentional radiation. First, unintentional emissions around the antenna will be picked up by the SAR probe and included in the current measured SAR assessment. If the emission is not close enough to the device's antenna to be picked up by the probe, then the emission should be considered as separate and not calculated on its own rather than added to the measured SAR value. In such a case, the individual emission will be well below the SAR threshold.

In light of the work by Dr. Anderson, MWF made the following recommendations in its KDB submission and email:

- That FCC remove RF exposure testing requirements for Class A and Class B unintentional radiators.

⁶ See *infra* at §I(b)

⁷ The submission was assigned tracking number 735802.

- That FCC provide a statement that Class A and Class B unintentional radiators are inherently compliant with the RF exposure and, therefore, RF exposure testing or assessment is not needed.

c. The FCC Lab needs to show evidence of a need for the tests before they are made part of the Lab's procedure.

As noted above, the FCC Lab has not provided any data to support its assertion that a change in the procedures is needed.⁸ Indeed, despite the submissions by MWF following an earlier draft by the FCC, as well as a similar submission by the TCB Council, the current version of the requirement does not address the points raised in the submissions. It also is more complicated and contains procedures that are simply not plausible to conduct for efficient certifications (see below).

The core of the FCC's limits for RF exposure is that they are the result of a science-driven process.⁹ It follows that there should be a scientific basis for the testing requirements as well. That basis must rest on solid support for the need to conduct the test. In the present situation, the Lab has jumped from a general requirement to "evaluate"¹⁰ unintentional radiators to a requirement for testing.

MWF calls for a cessation of the testing requirement for unintentional radiators and urges the FCC Lab, instead, to engage in a dialog about the findings set forth in the Anderson report. That dialog should involve an evaluation of the findings and any contrary findings by the Lab.

II. Specific Comments And Recommended Text For Draft KDB 447498 v07

MWF strongly believes that the course of action most appropriate for FCC and for industry is the action set out in the above section. Given the status of the KDB, however, for the sake of a complete record MWF has set out below our position regarding specific text now in the KDB with recommendations for changes that would be needed if the the FCC moves forward despite the premature nature of doing so. Many of these comments are aligned with comments being separately submitted by the TCB Council.

- **Section 2.3.3**

Comment: Example 1, does not take into consideration the allowance that exemption thresholds for $d=5\text{mm}$ are valid for $d < 5\text{mm}$.

⁸ A separate basis for the FCC's position seems to be that the procedures are required due to a rule change to 47 CFR §1.1307(b)(2), which identified unintentional radiators as "RF sources" and resulted in the need to incorporate unintentional radiators in the KDB procedures. However, a fair reading of §1.1307(b)(1)(i)(B) indicates that while unintentional radiators need to be included as part of the evaluation there is no specific mandate for a testing procedure. Instead, reasonable treatment of unintentional radiators within the assessment process – for example, an acknowledgment that their emissions have been considered – would be enough to meet the requirement.

⁹ Insert IEEE standard.

¹⁰ Note 8, *supra*.

Proposal: Include two separate calculations, one based on a separation distance of 5mm or less and the other based on e.g., 10mm.

- **Section 3.1.2**

Comment: Please keep the previous guidance from 447498 D01 v6 for devices that do not have an antenna port for conducted measurements:

Proposed text to add from v6: "When an antenna port is not available on the device to support conducted power measurement, such as for FRS (Part 95) devices and certain Part 15 transmitters with built-in integral antennas, the maximum output power and tolerance allowed for production units should be used to determine RF exposure test exclusion and compliance."

- **Section E.1 General Considerations**

Proposed added text: "There may be situations, e.g., with emissions from multiple RF sources operating simultaneously, where the unintentional radiator(s) (URS) contributions may be sufficient to result in a device *with transmitters* being out of compliance with the RF exposure limits."

- **Section E.3.3**

Proposed added text: "For devices where the URS is outside of the scan area for transmitter SAR (i.e., larger platforms), when the URS is < 1 mW, the transmitter and URS energy will not overlap."

- **Section E.3/E.4**

There is an inconsistency between the text and the flow-chart (Figure E.1). In Section E3.3, Figure E.1 includes all URS and intentional radiators in the TER calculation regardless of test exemption (the last blue block). However, E3.4, references two exemption criteria that would exclude them from the TER calculation. ("In addition, due to the typically small total impact the URS of most devices has on RF exposure compliance, URS that qualify for a single source exemption are considered exempt from being included in the total TER evaluation when operating in simultaneous transmission scenarios.") The chart needs to be revised to reflect the text.

- **Section E3.4.1 Single-Source, Test Exemptions for URS**

Proposed text revision for the last sentence:

"When the conditions in Tables and formulas in Appendix B are met, the URS is exempt from being included in the RF exposure evaluation of the device **in standalone condition and simultaneous transmission (where TER formula applies).**"

- **Section E.3.4.2 Radiated Power Estimate for URS Exemptions**

Add the following text at the end (for the field strength condition):

"Alternatively, EMI measurements using a semi-anechoic or open field test site can be used, summing the peak levels, using the Friis equation to determine the ERP and comparing the calculated EIRP value to the 1 mW exemption. For composite devices (URS combined with

transmitter(s)), if the transmitter(s) RF exposure evaluation is < 95% of the limit no additional assessment is needed as long as EMI requirements are met.”

III. Conclusion

The FCC’s proposed requirements for testing URS devices will impose additional and unnecessary testing burdens on manufacturers. Such requirements are, at best, premature. They may be entirely redundant, a position MWF has presented to FCC together with research by Dr. Vitas Anderson that demonstrates the inherent compliance of a broad category of URS. Before they are put into place, the MWF urges the FCC to identify examples of cases where such testing would be useful and allow the manufacturers to study them in order to find reasonable ways to circumscribe the issue without engaging in unneeded testing.

In the event FCC moves forward with the KDB, MWF has provided substantive changes to the text that will clarify the requirements.

Respectfully Submitted,

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