

March 21, 2022

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Acting Chief Engineer  
Office of Engineering and Technology  
Federal Communications Commission  
Washington, DC 20554

Re: Comments of GuRu Wireless, Inc.  
Draft KDB 680106 Exposure Charging Apps DR04 44611

Dear Ron,

Thank you for the opportunity to respond to the Office of Engineering and Technology (“OET”) draft of suggested revisions to the KDB Guidance 680106 regarding RF Exposure Wireless Charging. GuRu Wireless, Inc. (“GuRu”) is appreciative of the Federal Communications Commission’s (“FCC” or “Commission”) consideration of the needs of the wireless power transfer (“WTP”) industry. We all share common goals of ensuring that high-quality WTP devices enter the U.S. market in full compliance with the FCC’s rules.

### **General Considerations**

*The KDB should be technologically neutral.* In line with Commission practices, the KDB should endeavor to provide equal treatment to all types of WPT technologies to provide a level playing field for all parties. For example, some WTP technologies transfer power using fixed antenna patterns while others use beam forming technologies that focus power. As a result, the area and location of intensity differs for each type of WPT technology. WPT systems with the ability to dynamically focus power can limit most power density from the transmitter to a focal point at the client device. The language used in the KDB, and in particular for conditions of operations beyond 1 meter, should be general and broad enough to account for these differences.

*The KDB should serve to add to case-by-case approvals.* WPT manufacturers require regulatory certainty to engage in successful financing and to guide product development, especially for products that power at distances beyond 1 meter. A well-considered KDB can meet these needs. The conditions for operations under Section 5.2, therefore, should be modified to provide for the most likely use cases in demand by customers today. The Commission also should be cognizant that it will need to develop future versions of this KDB to account for additional use cases that will come to have greater demand. For example, at present, the greatest demand for WPT appears to be for consumer devices (*i.e.*, smartphones, wearable devices, and similar products). The KDB

should be robust enough to provide for greater regulatory certainty for these products. Current FCC Part 18 rules address both RF safety and EMC issues. The KDB could similarly address both issues in technologically neutral ways with provisions applicable for both fixed antenna patterns and other beamforming technologies so they can each show they meet the intent of the codified RF safety and EMC provisions.

*The KDB should be precise about measurements.* While GuRu recognizes that all WPT devices presently must go through the pre-approval guidance (“PAG”) process, the KDB should not add confusion by setting out one-size-fits all measurement procedures that do not correspond to all WPT technologies. Any specified measurement or procedure should be reproducible and provide direction regarding assumptions to be used.

## Specific Comments

*RF field demonstration (i.e., Section 5.2(e)).* GuRu finds the proposed language in Section 5.2(e) ambiguous.

- What does measuring in all locations anywhere mean?
- Is the proposal that emissions as measured at 1 meter should not be greater at further distances?
- Is the RF field in all locations at or beyond one meter compared against the maximum RF field within one meter when all devices being charged are within 1 meter of the transmitter?
- GuRu interprets this section as to not prohibit or limit the use of focused power/focal point technology, which would be biased towards systems that do not use that technology.
- For beam focused technologies, as the client device is placed further away from the transmitter, the shape of field intensity changes. Therefore, the use of the word “anywhere” seems inappropriate, as the maximum measurement is sufficient.
- The second sentence of this condition could be read as prohibiting a decrease in RF emissions, which is not in the public interest as manufacturers should be able to decrease RF to meet Section 2.1093.
- What if the RF emissions needs to be reduced due to placement of the target device near or behind human body, for example? Such reductions in emissions should be allowed. Moreover, RF power flux density only decreases with distance for certain types of antennas, but not all antennas.

- Does “RF emissions” in this sentence refer to total radiated power? If so, what do you mean by total radiated power? GuRu is concerned that the sentence could be read to require that adaptive multielement antennas act just like traditional dish and cone antennas, which would not be technically neutral.

GuRu suggests the following modification to this condition:

The applicant must demonstrate that the **maximum** RF field ~~in all locations anywhere~~ at or beyond one meter is at or below the **maximum** level that would be present within 1 meter when all devices being charged are within 1 meter of the transmitter. ~~In other words, the RF emissions must be unaffected by the placement of the load/target device.~~

*Indoor operations:* A limitation on indoor operations unnecessarily prohibits use cases and does not appear to have a discernable purpose. In GuRu’s view, this condition hampers the development of the WPT industry. And to the extent that “indoors” is meant to serve as a proxy for “local use,” it is not a particularly apt surrogate. For example, operations within a warehouse floor could be less “local” than those between a transmitter and security camera set up outdoors 10 feet away. In fact, GuRu has demonstrated that the volume of RF energy distribution would be a far more relevant proxy for “local,” to the extent one is needed.<sup>1</sup> This condition, therefore, could unfairly favor one technology or use case over another, for no valid policy reason. GuRu suggests that this condition be removed from the draft.

*Adding Part 15 limits to Part 18 devices.* The draft KDB provides that emissions on non-ISM frequencies comply with Part 15 limits when measured outdoors. WPT manufacturers have been designing their systems to comply with Part 18 rules and have not anticipated needing to meet Part 15 rules outdoors, particularly out-of-band emissions (“OOBE”), which have been long-established in Part 18. As GuRu understands, this condition is not in accord with other regulators, or even with the U.S. position being taken at ITU-R. To the extent the goal is to manage EMI, use of a Part 15 rule is unnecessarily limited.

In any event, any measurement requirement should be unambiguous and repeatable, and should specifically provide the assumptions to be used – in this instance, for building attenuation losses and reflective loss. It is unclear how a testing laboratory should perform the test specified in Section 5.2(g) for “for evaluating field strength ... to be measured from the outer surface of the

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<sup>1</sup> Letter from Laura Stefani to Marlene H. Dortch, Secretary, Federal Communications Commission, at 2, ET Docket No. 19-83 (Aug. 8, 2019) (explaining that the generation of energy in the radiative near field, the volume of RF energy distribution, and control over energy location can constitute “local” use).

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structure delimiting the indoor operations.” While it is clear how this could be measured on an installed piece of equipment at a specific location, it is unclear how it could be measured as part of the FCC’s Equipment Authorization Program for a consumer device EUT prior to its marketing. Therefore, GuRu interprets this condition as allowing use of building attenuation estimates, such as ITU-R Recommendations, in lieu of actual measurements.

The KDB should eliminate the Section 15.209 requirement.

*Professional installation.* GuRu recognizes that it suggested professional installation as a condition to its long-pending waiver request. That request was devised for specific non-consumer use cases and GuRu did not intend that the suggested conditions should apply broadly to a wide array of WTP consumer technologies. Given the additional requirements in the KDB, including those set out in Section 5.1, 5.2(e), and the 5.2(g), it is unclear how a professional installation condition would serve the public interest. Moreover, to the extent that the entire guidance is meant to apply to consumer devices (which from the title of the KDB appears to be the case), it is highly unusual and restrictive to require professional installation – including additional testing – of consumer devices. Indeed, GuRu is unsure how professional installation would work for most any consumer device.

GuRu suggests that 5.2(h) be eliminated. Condition 5.2(e) can be demonstrated through the submission of test results and software information; condition 5.2(f), if adopted, can be met through labeling and user manual requirements, a requirement of A/C connection for the transmit device, and review of the device casing during the certification process; and condition 5.2(g) can be demonstrated through a combination of actual measurements for Part 18 operations coupled with calculations based upon commonly accepted attenuation figures for the relevant frequency range.

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GuRu looks forward to working with the Commission to develop a reasonable and robust means forward for the WPT industry. Please address any questions to the undersigned.

Sincerely,

/s/

Laura A. Stefani  
Counsel for GuRu Wireless, Inc.

cc: Ethan Lucarelli