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| U.S. Radiocommunications Sector  Fact Sheet | |
| **Working Party:** ITU-R WP1A | **Document No:** USWP1A-06\_FD\_Rec\_SM.2129 (WPT Non-Beam Freq) |
| **Ref:** Annex 3 to WP1A Chairman’s Report (1A/226-E) | **Date:** 1 March 2023 |
| Document Title: Proposed revisions to Preliminary Draft Revision of Recommendation ITU-R SM.2129-0 | |
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| **Purpose/Objective:** Elevate to Draft Revision in anticipation of consideration at SG1 | |
| **Abstract:** This contribution proposes to make improvements to the Recommendation in response to feedback received at the last WP1A meeting and to elevate it to Draft Revision status. Since a liaison statement from WP7A raises concerns about the use of 30-50 kHz for WPT and proponents of the band have not addressed those concerns, this contribution will propose the deletion of that band from Table 1. Proposed editorial changes include removing “Preliminary” from the title and removing all remaining square brackets from the document. | |

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| **Radiocommunication Study Groups** | Logo  Description automatically generated |
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| Received: Date 20xx  Subject: Recommendation ITU-R [SM.2129-0](https://www.itu.int/rec/R-REC-SM/recommendation.asp?lang=en&parent=R-REC-SM.2129) | **Document XX/-E** |
| **Date 20xx** |
| **Original: English** |
| United States of America | |
| draft revision of  RecomMendation ITU-R SM.2129-0 | |
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**Background**: Recommendation ITU-R SM.2129-0 was approved in 2019 to provide administrations with guidelines for the use of frequencies by non-beam wireless power transmission applications for mobile and portable device charging. Since that time consumer demand for wireless charging has increased, leading to rapid adoption of wireless charging capabilities within several frequency bands integrated into mobile and portable devices including smartphones, tablets and wearables.

Participants in recent meetings of WP1A have proposed multiple updates and improvements to Recommendation ITU-R SM.2129-0 to reflect the evolution of the technology, including the addition of new frequencies and emerging frequencies of interest for future non-beam WPT applications for mobile and portable devices. Through these contributions the document has now reached a mature state and was elevated to Preliminary Draft Revision status at the June-July 2022 meeting of WP1A.

In the course of the discussions in WP1A, concerns have been raised about inclusion of the 30–50 kHz band, specifically by WP7A. In order to progress the document, the United States proposes to remove this band from Recommendation ITU-R SM.2129-0.

**Proposal**: The United States proposes that the 30–50 kHz band be removed from Table 1 of *recommends* 1 and that minor editorial changes included in the Attachment be adopted. It further proposes that Working Party 1A elevate the amended Recommendation ITU-R SM.2129 to Draft Revision status and forward to Study Group 1 for further consideration and approval.

**Attachment**: Draft Revision to Recommendation ITU-R SM.2129-0 (Proposed changes highlighted in yellow).

Attachment

DRAFT revision of   
RECommendation ITU-R SM.2129-0

Guidance on frequency ranges for the operation of non-beam   
wireless power transmission systems for mobile and portable devices

(Question ITU-R 210-4/1)

(2019)

Scope

This Recommendation provides guidelines for the use of frequency ranges for the operation of non-beam wireless power transmission (WPT) for charging mobile and portable devices.

Keywords

Wireless power transmission, short-range devices, ISM, non-beam, mobile, portable

Abbreviations/Glossary

CISPR: In French “Comité International Spécial des Perturbations Radioélectriques”,   
International Special Committee on Radio Interference

ICNIRP: International Commission on Non‑ionizing Radiation Protection

IEC: International Electrotechnical Commission

ISO: International Organization for Standardization

ISM: Industrial, Scientific, Medical

RR: Radio Regulations

WHO: World Health Organization

WPT: wireless power transmission

Related ITU Recommendations, Reports

Recommendation ITU-R [SM.1056](https://www.itu.int/rec/R-REC-SM.1056); Recommendation ITU-R [SM.1896](https://www.itu.int/rec/R-REC-SM.1896); Report ITU-R [SM.2153](https://www.itu.int/pub/R-REP-SM.2153); Report ITU-R [SM.2303](https://www.itu.int/pub/R-REP-SM.2303); Report ITU-R [SM.2449-0](https://www.itu.int/pub/R-REP-SM.2449)

The ITU Radiocommunication Assembly,

considering

*a)* that wireless power transmission (WPT) is defined as the transmission of power from a power source to an electrical load wirelessly using the electromagnetic field;

*b)* that WPT technologies utilize various mechanisms, such as transmission via radio frequency radiated transmissions in the far field (WPT beams) and near-field inductive, resonant and capacitive coupling (WPT non-beam);

*c)* that such WPT technologies are used in applications to charge mobile and portable devices;

*d)* that there is potential consumer demand for WPT technologies and associated applications used for mobile and portable devices;

*e)* that WPT standards are currently being developed at national, regional and international levels;

*f)* that industrial alliances, consortia, and academia have investigated several frequency bands for WPT technologies, including magnetic resonant and induction technology for mobile devices in several frequency ranges;

*g)* that for the purposes of WPT studies the standard frequency and time signal and the radio astronomy services are to be treated as radio communication service;

*h)* that studies have been conducted on the impact of non‑beam WPT applications for mobile and portable devices to radiocommunication services in the frequency range[s] 100-148.5 kHz [and 6 765‑6 795 kHz];

*i)* that as more WPT devices proliferate globally, ITU-R is developing guidance to minimize the impact of using WPT technologies on radiocommunication services including the standard frequency and time signal service and the radio astronomy service;

*j)* that the WPT devices should not cause interference to radiocommunication services in any frequency band;

*k)* that to mitigate the impact of WPT devices on the operation of radiocommunication services some solutions utilize frequency bands designated for Industrial, Scientific, Medical (ISM) applications;

*l)* that issues of non-ionizing radiation exposure are dealt with by international organizations such as the World Health Organization (WHO), the International Commission on Non‑ionizing Radiation Protection (ICNIRP), and International Electrotechnical Commission TC106, and that ICNIRP 2010 provides guidelines for limiting exposure (up to 10 MHz), and ICNIRP 1998 provides Guidelines for limiting exposure (up to 300 GHz),

recognizing

*a)* that WPT is not a radiocommunication service and has no status in the Radio Regulations (RR), but may be regarded as subject to Nos. **15.12** or **15.13** as the case may be;

*b)* that the criteria to protect various radiocommunication services from harmful interference are specified in existing ITU-R Recommendations;

*c)* that both consumers and manufacturers may benefit from harmonized frequency ranges and technical conditions for WPT technologies;

*d)* that frequency bands designated for ISM applications have been successfully used in the past for development and proliferation of innovative technologies in accordance with the RR;

*e)* that the band 6 765-6 795 kHz, which is designated for ISM use under RR No. **5.138** has been found to have advantages for WPT using magnetic resonance technologies in applications of charging of mobile/portable devices;

*f)* that the band 13 553-13 567 kHz, which is designated for ISM use under RR No. **5.150** has also been found to have advantages for WPT using magnetic resonance technologies in applications of charging of mobile/portable devices;

*g)* that some administrations classify the non-beam WPT energy transfer as an ISM application, even for operation outside bands designated for ISM use;

*h)* that some administrations classify non-beam WPT systems as radio applications such as Short-Range Devices;

*i)* that some non-ISM bands are taken into consideration for the global or regional harmonized use of specific WPT applications;

*j)* that the WPT energy transfer can be treated separately from data communications, especially when the receiving device receives data communications at a frequency different from that for the energy transfer;

*k)* that in the absence of a load, the WPT shuts off and only periodically polls or searches for the load, with very low duty cycle;

*l)* that for non-beam WPT, the radiated power is much lower than RF power transferred (most power is transferred to the receiver through mechanisms such as capacitive, resonant and inductive coupling);

*m)* that Recommendation ITU-R SM.1056 on the limitation of radiation from ISM equipment recommends that administrations consider the use of the latest edition of CISPR publication 11, and that these limits do not necessarily protect radio communication services,

noting

that the International Electrotechnical Commission (IEC) has published a Technical Report IEC/TR 62869 on Wireless Power Transfer for audio, video and multimedia systems and equipment developed by TC 100,

recommends

1 that administrations should consider as a guideline the use of the frequency ranges, or portions thereof, listed in Table 1 below for the operation of non-beam WPT systems for mobile and portable devices;

2 that necessary steps should be taken to ensure that non-beam WPT applications and equipment do not cause harmful interference to radiocommunication services, including the standard frequency and time signal service as well as the radio astronomy service, so that these remain protected from radio frequency energy emanating from WPT equipment and falling into all bands.

TABLE 1

Frequency ranges for operation of non-beam WPT systems for mobile and portable devices

|  |  |
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| Frequency range | Non-beam WPT technologies |
|  |  |
|  | and magnetic resonance |
| 315-405 kHz | Inductive and magnetic resonance technology |
| 1 700-1 800 kHz | Inductive and magnetic resonance technology |
| 2 000-2 170 kHz | Inductive and magnetic resonance technology |
| 6 765‑6 795 kHz Note: See RR No. **5.138** | Magnetic resonant technology |
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| 13 553-13 567 kHz  Note: See RR No. **5.150** | Magnetic resonant technology |