

Federal Communications Commission
Office of Engineering and Technology
Laboratory Division Public Draft Review

Draft Laboratory Division Publications Report

Title: Evaluation and Approval Considerations for Handsets with Specific Wireless Charging Battery Covers

Short Title: Handset Wireless Battery Chargers

Reason: Revision of Attachment [D03 Handset Wireless Battery Chargers](#)

Publication: 648474

Keyword/Subject: 2.1093, SAR Evaluation for Handsets that Contain Multiple Transmitters and Antennas, Wireless Charging Battery Covers

First Category: Radio Frequency (RF) Exposure

Second Category: Measurement Procedures

Third Category:

Question: What are the test procedures for SAR evaluation for handsets that contain multiple transmitters and antennas or wireless charging battery covers?

Answer:

The attached documents:

648474 D03 Handset Wireless Battery Chargers v01r02 provides test and approval considerations for certain handsets with wireless charging capabilities

648474 D04 SAR Handsets Multi Xmitter and Ant v01r01 describes the SAR evaluation requirements for consumer cellphones operating with multiple transmitters and simultaneous transmitting antennas. See transition note period below.

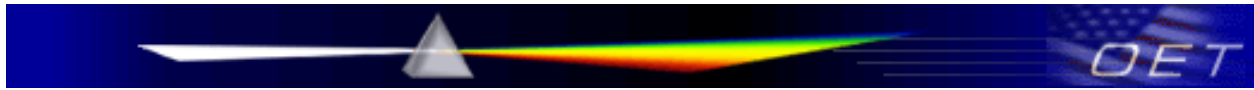
Attachment List:

[648474 D03 Handset Wireless Battery Chargers v01r02](#)¹

648474 D04 SAR Handsets Multi Xmitter and Ant v01r01²

¹ This draft is for attachment [D03 Handset Wireless Battery Chargers v01r02](#) which will be published by May 20, 2013. Prior to publication, applicants can use this draft guidance during the interim period for compliance testing

² 648474 D04 SAR Handsets Multi Xmitter and Ant v01r01 is also available for review (until May 15th 2013), posted as a separate draft publications: [648474 D04 SAR Handsets Multi Xmitter and Ant v01r01 DR04-41372](#). Comments to D04 must be filed under that separate draft posting and not under this draft posting



April 8, 2013

Attachment D03 Handset Wireless Battery Chargers v01r02

Federal Communications Commission
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Evaluation and Approval Considerations for Handsets with Specific Wireless Charging Battery Covers

This document identifies the test and approval considerations for certain handsets with wireless charging capabilities. In particular, the procedures discussed in this note are only applicable to implementations based on the Wireless Power Transfer Interface Definition and Protocol requirements established by the Wireless Power Consortium (WPC ~~standard~~protocol), without modification, including operating frequencies, receiving coil design, and communication requirements.¹ The charging hardware must be incorporated as an integral part of the battery cover, which is supplied by the manufacturer or can be acquired as an optional accessory for a specific handset model from the manufacturer. For other wireless battery covers using other wireless power transfer implementations, a KDB inquiry ~~should be submitted~~is required to confirm the test requirements and to avoid issues during equipment certification. When handsets are tested according to the procedures described in this document, a PBA is not required for TCB review and approval. General guidance for low power consumer wireless chargers implemented according to closely coupled inductive power transfer techniques is described in KDB 680106.

Equipment Authorization

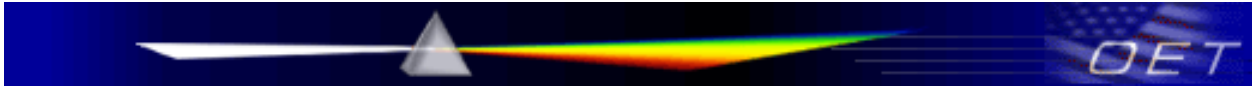
We require an accessory battery cover that allows a handset to charge its battery wirelessly according to the WPC ~~standard protocol~~or other equivalent wireless power transfer standards to be tested and approved as an integral part of the handset, under the FCC ID of the handset.² Once authorized as an integral part of the handset, the wireless charging battery cover may also be sold separately as an accessory for the handset. We do not permit a separate FCC ID for wireless battery charging covers implemented according to the WPC protocol or equivalent wireless power transfer standards.

If a wireless charging battery cover is designed for use with different handset models with unique FCC ID numbers, it must be tested independently with each handset model during equipment certification. For purposes of equipment authorization, the normal (without the wireless charging hardware) and wireless charging battery covers must be tested separately as an integral part of the handset for EMC, SAR and HAC requirements to ensure the handset is compliant. Manufacturers must ensure that wireless charging battery covers and all other accessories are identified in appropriate filings of the handset and permissive change requirements are applied to modifications made to wireless charging battery covers.

The application for equipment authorization must clearly identify the specific protocol and configurations defined in the WPC protocol or equivalent wireless power transfer standards documents. Thus, for example, the use of modes “A1”~~;~~... “A214”~~;~~or “B1” ~~or...~~ “B52” etc. have to be clearly specified. The test reports must clearly identify that the passive communication mechanism defined in the WPC protocol or equivalent wireless power transfer standards has been fully satisfied; that is, data message packets are

¹ The applicable specifications and documents are available at <http://www.wirelesspowerconsortium.com/developers/specification.html>

² The charger requires a separate equipment authorization approval (see KDB Publication 680106)



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conveyed back from the wireless charging battery cover to the charger (transmitter) by perturbing the magnetic field and load conditions sensed by the charger. According to the WPC ~~standard protocol~~, this type of limited power management to ensure safe charging operations communication must be accomplished according to through the defined capacitive or resistive switching mechanisms. This process is often called “load modulation”. We have noted that terms such as load modulation, impedance modulation, load switching or amplitude modulation etc. have been used to describe this type of wireless charging ~~communication power management and~~ as well as other wireless charging communication protocols. ~~h~~However, we require wireless charging battery covers to be implemented according to the specific protocols defined by the WPC or equivalent wireless power transfer standards to use the following procedures. We have determined that based on the limited communications protocol used for wireless charging power management in the WPC ~~standard protocol~~, the wireless charging battery cover must be tested as an integral part of a handset to satisfy Part 15 unintentional radiator requirements. ~~Due to the nature of the communication mechanism used by the WPC standard, the charger (transmitter) operating characteristics resemble that of a field disturbance sensor where the RF energy transmitted by the charger is perturbed by another object and sensed by the transmitter; therefore, Part 15 C applies. When other equivalent wireless power transfer standards are used, a KDB inquiry is required to determine if the WPC configurations may be applied.~~

Detailed descriptions and photos of the hardware incorporated in the wireless charging battery cover, including magnets, shields, coil locations and dimensions and other components intended for functions other than wireless charging must be included in the “Operational Description” exhibit for equipment authorization. The information on conditions that initiate, terminate, abort or establish a charging session to ensure chargers are not left unattended in undetermined operating conditions should also be included. Some description of the wireless charging function implemented by the handset is required in the test reports to support the test configurations and results.

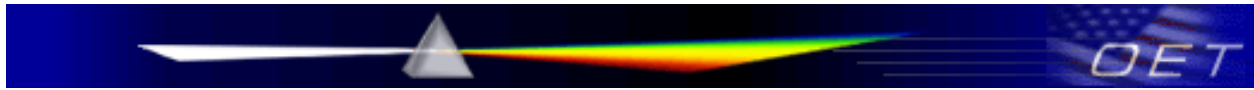
SAR

Initially, the handset must be tested according to all applicable SAR test procedures using the normal battery cover (without the wireless charging hardware). The highest SAR measured for each wireless technology (1xRTT, EVDO, WCDMA, GSM, Wi-Fi etc.), frequency band, operating mode (different modes/configurations within each wireless technology) and exposure condition (head, body-worn accessory, hotspot mode etc.) must be repeated using the wireless charging battery cover. In addition, for test cases where the measured SAR for a handset with normal battery cover is greater than 1.2 W/kg, these tests should be repeated with the wireless charging battery cover. If there are noticeable changes in SAR distribution between the normal and wireless charging covers, explanations for such changes should be included in the SAR report to support the test results.

EMC

The EMC test report for a handset must include transmitter spurious emissions measurement data, as required by Part 22, 24, 27 etc., with the normal battery cover and also with the wireless charging battery cover. For purposes of performing spurious emission measurements, the handset should be placed on a representative charging pad under normal charging conditions and in simulated call configurations; for example, through a Bluetooth connection, if applicable to the specific handset.

HAC



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If the specific handset model (with a wireless charging battery cover supplied with the handset or sold separately as an accessory for the handset) is rated as Hearing-aid-compatible (HAC) in accordance with Section 20.19, then the handset including the wireless charger cover must be evaluated with the battery cover to determine the worst case HAC rating. Further guidance for initial applications and permissive changes for adding wireless charging battery operation can be found in KDB Publication 285076.

Change Note:

04/05/2013 As indicated by **track changes** in the document.