

Please clarify when a 0mm separation versus a 5mm separation is required for device approvals?

Page 3: "If submitted to a TCB for approval, devices that are categorically excluded from routine RF exposure evaluation must apply the published KDB procedures."

Question: Based upon section 2.1093, Part 15 subpart E/UNII device is NOT categorically excluded from routine RF exposure evaluation. Shall portable UNII device be subject to SAR evaluation regardless of output power and separation distance?

C. Mobile and portable exposure conditions and host platform approval requirements include:

Question: In this section, the following three exposure conditions have been clearly stated:

C2: Mobile exposure condition.

C3: Portable exposure condition.

C4: Mixed mobile and portable exposure condition.

However, it is very difficult for the grantee or general public to know exactly the exposure condition by looking at the grant condition. Shall the exposure condition to be clearly stated in the grant in the future?

F. Transmitters and modules approved for use in simultaneous transmission operations must be restricted to the host platform and product configurations tested or evaluated for equipment approval. When simultaneous transmission applies, approval for standalone operations is required.

Question: If I understand this requirement correctly, if the simultaneous evaluation is required, then approval (via Class II permissive change) is required on the standalone operation approval (original grant). If this is the case, shall class II permissive change be made on one of standalone approval or all standalone transmitters?

I. Operating and installation instructions are required by §§ 2.1033(b)(3) and 2.1033(c)(3).

Question: Can OEM integration instructions be protected via permanent confidential protection? These oftentimes have information that the end user should not have access to.

SAR exclusion formula is based on antenna-to-user separation distance of $\geq 5 \text{ mm}$ and $\leq 50 \text{ mm}$
 $[(\text{max. power of channel, including tolerance, mW}) / (60 \cdot f(\text{GHz}) \text{ mW})] \cdot [20 \text{ mm} / (\text{min. separation distance, mm})] \leq 1.0;$

Question: Please clarify what should be done when the separation distance is between 50mm and 20cm or when separation is less than 5mm. Please also confirm that the separation distance is interpreted correctly as antenna-to-person and not device-to-person separation distance.

IV, A, 3: Antenna gain is a far-field parameter. Depending on the operating frequency and antenna separation distance required, this usually does not apply to portable exposure conditions. In general, antenna gain is not directly related to near-field exposure conditions, which are highly dependent on the RF current distribution characteristics of individual transmitters, antennas and host device configurations. It would be inappropriate to assume lower gain antennas always produce lower SAR.

Question: When multiple antennas are submitted in the application, it has been a gray area to determine which antenna shall be selected during SAR/ near filed measurement. Since antenna gain is not the main contribute to the SAR value, in order to provide a consistent review process, we have utilized the following process to determine proper antenna selection during SAR evaluation:

- 1. Photos of all antennas must be provided to identify the differences in term of mechanical design and ground plant area. Reviewer will exercise their own judgment on the similarity of antennas.**
 - 2. If the constructions of antennas are similar with identical antenna-to-user separation distance, select the one with highest antenna gain for SAR evaluation. Often time the antenna gain is different based upon frequency band; use the antenna with highest antenna gain among all frequency bands.**
- If above procedure that we used is not sufficient to address multiple antennas, please let us know what is the review guideline shall be deployed.**

B, 2, i, b: Body-worn accessory exposure conditions: A conservative minimum separation distance for supporting off-the-shelf body-worn accessories that may be acquired by users should be used to test for body-worn accessory SAR compliance for consumer handsets. The distance should be determined according to the device form-factor and types of body-worn accessories users may acquire and fully justified in the SAR report

Questions:

There are many off-the-shelf body-worn accessories or protective cover available for cellular handset / tablet devices. We can understand that if the body-worn accessory is supplied by the grantee the device and accessory must be tested when the accessory contains metal and/or with the most conservative separation distance created by using such accessory(ies). However, we do believe it is not possible for manufacturers to test all off-the-shelf body worn accessories with knowledge of which one contains metal or which one does not. If third parties are offering body-worn accessories which are not approved by the grantee, and grantee has included all necessary warning statement in the user manual, the Grantee should not be expected to test off-the-shelf accessories based upon section 15.21.

If accessories are tested during SAR evaluation how should those accessories be documented in the application and in the grant? (Example – part numbers of each accessory, detailed photographs ...).

From the manufacturer's perspective these are some concerns we have heard:

- How should they handle a new accessory for existing approved products? Should they be handled as a Permissive Change and only require filing (C2PC) when SAR values are higher than previously reported or should they all be treated as C2PCs?**
- How will this be enforced?**
- What is manufacturer's liability with respect to 3rd party products which are being sold in locations outside of manufacturer's control?**

B, 3, ii, c): The minimum separation is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor and platform requirements, to any part of the extremity or body of a user or bystander.

Question: minimum separation distance has been refereed throughout this KDB so need to understand exactly how to determine the distance.

- **Could you please provide an example how the bystander distance shall be determined?**
- **If the antenna-to-outer surface of the device is 1 mm but such device can be tested with 5 mm device-to-phantom distance. What is the minimum separation distance? 1 mm or 6 mm?**

C, 2, II: SAR test reduction considerations

When multiple channels are required for SAR testing, where the 1-g SAR for the mid-band channel, or the channel with the highest output power, and the transmission bandwidth corresponding to all channels in the frequency band are satisfied for the following conditions, testing of the other channels in the band is not required.¹⁵

(a) ≤ 0.8 W/kg and transmission band ≤ 100 MHz

(b) ≤ 0.6 W/kg and, $100 \text{ MHz} < \text{transmission bandwidth} \leq 200 \text{ MHz}$

(c) ≤ 0.4 W/kg and transmission band $> 200 \text{ MHz}$

(d) These test reduction provisions are only applicable when: the highest maximum output power of all transmission channels in a frequency band is not higher than the channel tested for SAR, or the measured SAR is scaled to the upper tune-up tolerance limit to account for the highest maximum output expected for production units

Questions:

- 1) **Transmission band discussion: For UNII bands, can we consider 5.15-5.825 GHz as one transmission band? If the highest SAR value measured on the highest output power channel within 5.15-5.825 GHz is 0.3 W/kg; only single measurement is required. Please confirm.**

- 2) **(d) seems to be inconsistent:**

I test one device on the highest power channel across a 100MHz transmission band but it is 1.5dB below max power expected for production units and SAR = 0.76 W/Kg. Only one channel is required to be evaluated because I tested the highest power channel for SAR

I test a second device on a channel with power 0.25dB lower than max power expected for production units and 0.1dB lower than the highest power channel with a SAR of 0.76W/Kg. I have to test the second device on 3 channels because scaling by 0.25dB is required, which pushes SAR > 0.8 W/Kg.

The first device would be potentially much more likely to be a problem!! Perhaps the exclusion should just consider scaling the measured SAR based on tune-up power/max power, then it doesn't matter if it is the highest power channel or not.

- 3) **Please check the wording throughout the KDB to see that tolerance is always referred to as tune-up tolerance to avoid misunderstandings (example 3(ii)(a), C 1.(ii)(a) and footnote 12, C 1.(iii)(a)(i)**

V.B.1,l,a): When the highest measured 1-g SAR is ≤ 0.4 W/kg, transmitters and modules may be used in portable exposure conditions with no restriction for host platforms. This applies to both OEM installed and user accessible external peripheral transmitters.

(a)Unless the SAR Exclusion Threshold [IV.C.1.(ii)(a)] at 5 mm is satisfied, SAR evaluation is required. The antenna and radiating structures or the permanently integrated housing must be positioned at 5 mm from the phantom for all applicable test configurations.

Question: Looks like if module wants to be approved with no platform limitation, the most conservative distance shall be used during SAR evaluation is 5 mm with SAR value less than 0.4 W/kg. 5 mm conservative distance may be too stringent. In this KDB, FCC states very clearly the requirements for OEM installation instructions to be provided and reiterates that continued compliance is responsibility of Grantee and host Integrator. We do not think it is necessary to put a 5 mm distance requirement to discourage the module manufacturer in seeking mixed portable / mobile exposure condition in the initial application.