

September 24, 2013

**Federal Communications Commission  
Office of Engineering and Technology  
Laboratory Division**

**SAR Listings on Equipment Authorization Grants**

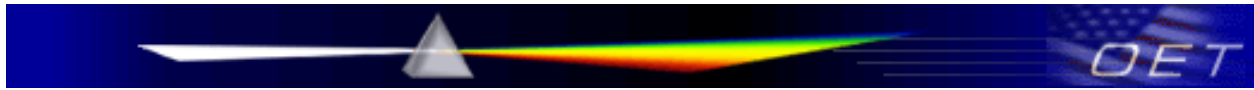
This document provides guidance for Telecommunication Certification Bodies (TCBs) to include uniform listings of specific absorption rate (SAR) numbers in the comments field of grants of equipment certification. For FCC IDs consisting of multiple FCC Form 731 applications (i.e., multiple equipment classes, and/or permissive change filings), each Form 731 (FCC 731A grant) may require different stand-alone SAR numbers to be listed, as described by the applicable provisions in this document. The SAR numbers listed must be consistent with the highest *reported* test results required by the *published RF exposure KDB procedures*.<sup>1</sup> When the measured SAR is not at the maximum tune-up tolerance limit or maximum output power allowed for production units, the measured results are scaled to the maximum conditions to determine compliance; the scaled results are referred to as the *reported* SAR. Please contact the FCC Laboratory concerning other guidance for any devices where listing variations might apply.

**1) General SAR listing provisions for grants of equipment authorization**

- a) Equipment approvals with multiple frequency bands and wireless modes must list the highest *reported* SAR for each of the evaluated operating configurations and exposure conditions across the frequency bands listed on a grant. The highest *reported* SAR for each equipment class (e.g., PCE, DTS, etc.) approved under an FCC ID must be listed on each grant according to head, body-worn accessories, product specific, simultaneous transmission, and extremity exposure conditions, etc.
- b) The SAR values listed on grants should be rounded to two decimal places. All SAR values less than 0.10 W/kg, after rounding, should be listed using the less-than symbol; for example, “The highest reported SAR value is < 0.10 W/kg.”
- c) Class II permissive change filings should list the highest *reported* SAR values for each equipment class across all filings under an FCC ID.
- d) When simultaneous transmission applies, SAR test exclusion and simultaneous transmission SAR measurements are applied separately according to the *published RF exposure KDB procedures*. The *reported* simultaneous transmission SAR should be a single SAR value that corresponds to the highest SAR value for all combinations of simultaneous transmission configurations, operating and exposure conditions, transmitting modes, and frequency bands applicable to each grant of equipment authorization. The SAR of multiple equipment classes under the same FCC ID may need consideration to determine the highest *reported* simultaneous transmission SAR for listing on individual grants, according to the following guidelines. When modules are included in the simultaneous transmission configurations, the SAR used to determine simultaneous transmission exclusion may involve multiple FCC IDs.

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<sup>1</sup> See KDB Publication 447498 for *published RF exposure KDB procedures* and *reported* SAR.



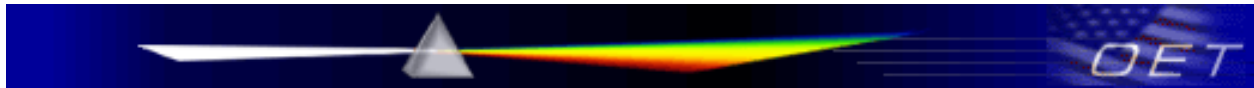
- i) When the sum of 1-g SAR applies for simultaneous transmission SAR test exclusion, the highest sum of 1-g SAR according to the highest reported stand-alone SAR values is used.
- ii) When SAR to peak location separation ratio is applied to determine simultaneous transmission SAR test exclusion, the highest of the reported stand-alone SAR and estimated SAR is used.<sup>2</sup>
- iii) When simultaneous transmission SAR measurement is required, the highest reported SAR according to the enlarged zoom scan and volume scan post-processing procedures is used.
- iv) When combinations of simultaneous transmission SAR test exclusion and measurements are used, the highest of the simultaneous transmission SAR from the preceding i), ii) and iii) is the reported simultaneous transmission SAR for listing on the grant. Abbreviations such as SPLSR should not be used in grant comments, neither should the ratio values. Under no circumstances should any reported SAR be higher than the SAR limit.

## 2) SAR listing provisions for specific device operating configurations and exposure conditions

- a) Head SAR is normally required for handsets. For handsets with an audio headset output or Bluetooth transmitter, body-worn accessory SAR is also required. In addition, smart phones can support personal wireless router capability (hotspot mode) and other product specific functions that require additional SAR measurements to determine compliance. The SAR numbers for handsets are generally listed on the grant of equipment certification for each equipment class according to variations of the following. Item 3) below gives basic examples.
  - The highest reported SAR for head, body-worn accessory, product specific (wireless router), and simultaneous transmission exposure conditions are ### W/kg, ### W/kg, ### W/kg, and ### W/kg, respectively.
- b) When a single exposure condition applies to a device (for example, head, body, or product specific, etc.), the highest SAR number should be listed without the exposure condition. These types of exposure conditions may include Bluetooth headsets or helmet-mounted transmitters where only head SAR is measured or other devices that are operated next to the user's body without requiring body-worn accessories. The SAR is typically measured using either head or body liquid according to the combinations of device use and exposure conditions. The SAR numbers for these cases should be listed similar to the following:
  - For devices that support only simultaneous transmission use modes – Device does not support stand-alone use; the highest reported SAR for simultaneous transmission exposure conditions is ### W/kg
  - For devices that support both stand-alone and simultaneous transmission – The highest reported SAR for stand-alone and simultaneous transmission exposure conditions are ### W/kg and ### W/kg, respectively.
- c) In situations where extremity SAR is required, either with or without other SAR requirements (head, body-worn accessories, product specific or simultaneous transmission, etc.), the extremity SAR must also be listed. Examples of how the SAR number for this type of exposure condition should be listed are as follows:

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<sup>2</sup> See KDB Publication 447498 for estimated SAR.



- The highest reported SAR for head, body-worn accessory, product specific, simultaneous transmission, and extremity (hand) exposure conditions are ### W/kg, ### W/kg, ### W/kg, ### W/kg and ### W/kg, respectively.
  - The highest reported SAR for head (or body) and extremity (wrist) exposure conditions are ### W/kg and ### W/kg, respectively.
  - The highest reported SAR for extremity (ankle) exposure condition is ### W/kg.
- d) Push-to-talk transmitters are normally tested for held to face and body-worn accessory exposure conditions using a flat phantom and the required head and body tissue-equivalent liquids. For consistency, the highest SAR across the device frequency bands should be listed on the grant as head (not face) and body-worn accessory, similarly as done for handsets.

### 3) SAR listing examples for handsets

a) EXAMPLE 1

- i) head: PCE 1 W/kg, DTS 0.58 W/kg; sum-SAR = 1.58 W/kg;
- ii) body-worn accessory: PCE 1 W/kg, DTS 0.57 W/kg; sum-SAR = 1.57 W/kg;
- iii) highest SAR across exposure conditions = 1.58 W/kg = grant listing.

b) EXAMPLE 2

- i) head: PCE 1 W/kg, DTS 0.58 W/kg; sum-SAR = 1.58 W/kg;
- ii) body-worn accessory: PCE 1 W/kg, DTS 0.61 W/kg; sum-SAR = 1.61 W/kg;  
SPLSR = 0.039;
- iii) highest SAR across exposure conditions = 1.58 W/kg = grant listing.

c) EXAMPLE 3

- i) head: PCE 1 W/kg, DTS 0.56 W/kg; sum-SAR = 1.56 W/kg;
- ii) body-worn accessory: PCE 1 W/kg, DTS 0.61 W/kg; sum-SAR = 1.61 W/kg;  
SPLSR = 0.041; volume-scan SAR = 1.57 W/kg;
- iii) highest SAR across exposure conditions = 1.57 W/kg = grant listing.

#### Change Notice

**10/24/2012:** 690783 D01 SAR Listings on Grants v01r01 has been changed to 690783 D01 SAR Listings on Grants v01r02 to reflect changes made to RF exposure guidance.

**09/24/2013:** 690783 D01 SAR Listings on Grants v01r02 has been changed to 690783 D01 SAR Listings on Grants v01r03 to correct values in section 3). Corrections illustrated in red for identification.