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       To: fcoperic@fcc.gov
     From: Bill Moyer x8-3542 <wmoyer@qualcomm.com>
  Subject: Requested Information: FCC ID: J9CGSSM1
       Cc: pguckian, sgalati, mcarosel, pcoan, bwallace
      Bcc:
X-Attachments:
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Frank Coperich:

This e-mail will be printed to disk using PDFWriter and submitted as an attachment pdf file via the filing submissions webpage. It is also being sent to you directly in parallel so that we will have a record of what was submitted, that being something the Webpage does not always provide due to time-out problems. My responses to your specific questions and comments are interleaved below in blue italics so that they may be more readily discerned.

> Date: Fri, 10 Mar 2000 13:11:27 -0500
> From: oetech@fccsun07w.fcc.gov (OET)
> To: wmoyer
> Subject:
>
> To: William Moyer, Qualcomm Incorporated
> From: Frank Coperich
> fcoperic@fcc.gov
> FCC Application Processing Branch
>
> Re: FCC ID J9CGSSM1
> Applicant: Qualcomm Incorporated
> Correspondence Reference Number: 12665
> 731 Confirmation Number: EA96254
> Date of Original E-Mail: 03/10/2000
>
> 1. The SAR values reported in the Table on page 28 of the SAR report do not match the values on all the SAR plots submitted, please clarify.

The SAR Report change page, newly submitted as Exhibit E.7 change page, is consistent with the SAR values reported in Exhibits E.7 color SAR plot 01 through 013, which present the color SMP UT SAR data plots. It replaces page 28 of the SMP UT SAR Report, Exhibit E.7 SMP SAR TR. The table summarizes all SMP UT SAR test results, except those for the System Validation measurement with the calibrated dipole antenna. Only SAR magnitudes are given in the table; measurement tolerances are provided in each data plot.

> 2. Several plots indicated more than 6 dB power drift during the SAR measurement, while others have minimal drift. Please clarify such effects on SAR and also take into consideration following issues on peak SAR locations. Is this type of drift typical for this device or is it due to a prototype ?

The reported power drift values are a test artifact. The artifact appears to be due to the combination of two factors, the extremely small SAR values measured in Globalstar mode, relative to the reported nominal dynamic range of the DASY3 system (5 uW/g to 100 uW/g), and the probe position where the power drift measurements are made. The SMP UT Globalstar mode SAR values ranged from 2.5 to 24.6 uW/g averaged over 1.0 gram tissue and 0.6 to 13.2 uW/g averaged over 10 grams tissue, values at and below the nominal dynamic range of the system. Power drift measurements are (typically and in accordance with the DASY3 manual) made at a point 1.0 cm further removed from the phone in the z axis direction of the phantom (closer to the phantom fluid surface). All other things being equal, the measured SAR at the power drift measurement point will in general be substantially smaller than the maximum SAR

values within the scan volume.

That places the power drift measurement SMP UT SAR values outside the nominal working range of the DASY3 system. This is corroberated by the fact that the reported Globalstar mode power drift values are almost random in nature, with the following values reported by the DASY3: 6.12 dB, -5.77 dB, 5.08 dB, Reference value below zero, 1.28 dB, 0.05 dB, -1.32 dB, -9.56 dB, Reference value below zero, Reference value below zero, Reference value below zero, and -0.02 dB. The messages stating the Reference value is below zero imply some form of digital underflow problem in the software, consistent with the hypothesis that extremely small SAR values were being used in the power drift calculations.

Even if the reported power drift values were real, due to reduced power output from the UT over the course of the measurement scan, applying that power drift value as a correction factor to the SAR data would only result in a slight absolute increase in the reported Globalstar SAR values. Numerically, the effect would be an increase in the maximum measured SAR value from 24.6 uW/g to 167 uW/g averaged over 1.0 gram tissue, only a bit greater than 1/10 the SAR limit value. (The reported power drift value of -9.56 dB is associated with the measured peak SAR values of 18.5 uW/g averaged over 1.0 g tissue and 10.3 uW/g averaged over 10 grams tissue, yielding the new maximum SAR value of 167 uW/g. The reported maximum value of 24.6 uW/g is associated with a reported power drift of only -1.32dB, which would yield a corrected maximum SAR value of 33.34 uW/g averaged over 1.0 gram tissue.) Thus at worst, correcting for the reported power drift (however inappropriately) would only reduce the SMP UT's substantial SAR margin with respect to the limit.

Given the probable test artifact origin of the reported power drift values, the clear indication of software problems in computing some of those values, and the lack of significance to the end results relative to the SAR limit, no further testing of the SMP UT SAR characteristics and test power drift is deemed necessary.

| 3. The SAR plots indicated peak SAR locations are mostly at the top of the head,
| which were not fully included in the plots. Due to device and antenna design, the
| submitted plots can only confirm SAR compliance for the handset body portions.
| Please provide additional information and measurement results, if needed, to
| indicate the SAR due to portions of the antenna extending above the head does not
| exceed SAR limit. If necessary, measurements at the top of the head may be needed.
| Note: DASY3 has new software that would allow probe to be tilted up to 30 degrees
| for making measurements.

Peak Globalstar mode SAR is across the upper forehead side (the Globalstar phone antenna detent positions result in a forward-tilting Globalstar antenna when positioning the phone on the phantom per the procedure outlined in the SAR Test Report). Unlike terrestrial cellular phones with monopole antennas tightly coupled to the body of the phone (resulting in substantial induction region emissions from the body of the phone and the antenna feedpoint), the Globalstar antenna is an extensible balanced quadra-filar helix substantially decoupled from the body of the phone and with the radiating antenna elements' feed point well up the antenna stalk, above the top of the head. The transmit antenna is stacked above the receive antenna, the base of which is by design even with the top of an adult's head.

Given the large margins seen in the SAR testing using conventional scans and the relatively large separation distances between the surface of the head and the feedpoint, top of the head side-wall scanning was deemed unnecessary. Such scanning would be difficult to obtain useful results from, since the peak SAR region is not in a relatively low radius of curvature portion of the phantom, but in one of the smallest radius of curvature parts of the phantom. When we have obtained a copy of the new DASY3 software permitting such measurements, experiments will be performed with the next-generation Globalstar portable Tri-Mode Phone to work out how SAR measurements can best be performed in that part of the phantom (particularly initial coarse scan measurements to approximately locate the hot spot) and what additional

measurement uncertainties must be accounted for due to the additional DASY 3 armature movements required.

| 4. Manual describes a vehicle kit that allows external vehicle-mount antenna.
| Please verify if this kit is a part of this filing. If so, MPE compliance or
| categorical exclusion may need to be addressed.

As was the case with the previously-certified Tri-Mode Portable UT (FCC ID: J9CGSTM1), the external vehicle-mount antenna is provided by the Globalstar Hands-Free Car Kit (FCC ID: J9CGSCK1). The emissions characteristics and design of the Car Kit antenna are presented in that separately approved filing. Please note that unlike the Tri-Mode Portable UT, the Single-Mode Portable UT operates solely in Globalstar mode with the Car Kit, and makes no use of the Car Kit's terrestrial-mode antenna pigtail pass-through cable.

| 5. Safety Section of Manual describes this device has 0.4 W output. This does not
| agree with the output request in the filing, please clarify.

The Safety Section of the draft SMP UT User Manual did in fact incorrectly state the maximum power output of the SMP UT, using the spatial average peak or typical maximum value, rather than the higher zenithal peak EIRP value of 1.0 W, as the maximum output power of the UT. The User Manual is being corrected to state the correct output power, as per the errata sheet, Exhibit E.11a SMP User Guide Errata.

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| The items indicated above must be submitted before processing can continue on the
| above referenced application. Failure to provide the requested information within
| 60 days of the original e-mail date may result in application dismissal pursuant to
| Section 2.917 (c) and forfeiture of the filing fee pursuant to section 1.1108.
|
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| to be processed expeditiously, you must upload your response via the Internet at
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| a message which informs the processing staff that a new exhibit has been submitted
| must also be submitted via Submit Correspondence. Also, please note that partial
| responses increase processing time and should not be submitted.
|
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| e-mail address listed below the name of the sender.