



**FCC OET BULLETIN 65 SUPPLEMENT C  
IC RSS-102 ISSUE 4**

**SAR EVALUATION REPORT**

*For*

**CDMA/ 1x EVDO Phone with 802.11b/g and Bluetooth**

**MODEL: P102EWW**

**FCC ID: O8F-ROAE**

**IC: 3905A-ROAE**

**REPORT NUMBER: 10U13270-6A**

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**NVLAP LAB CODE 200065-0**

Revision History

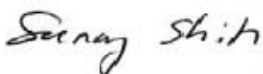
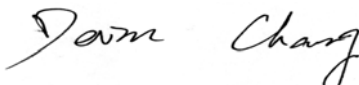
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# 1. ATTESTATION OF TEST RESULTS

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                    |                                                                                      |              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------|
| Applicant:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | PALM<br>950 MAUDE AVENUE<br>SUNNYVALE, CA. 94085, UNITED STATES    |                                                                                      |              |
| EUT description:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | CDMA/ 1x EVDO phone with 802.11b/g and Bluetooth                   |                                                                                      |              |
| Model number:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | P102EWW<br>Serial number: RD1AS65A4010 (CDMA); RD1AS65A4024 (WiFi) |                                                                                      |              |
| Device category:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Portable                                                           |                                                                                      |              |
| Exposure category:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | General Population/Uncontrolled Exposure                           |                                                                                      |              |
| Date tested:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | June 29 – July 7, 2010                                             |                                                                                      |              |
| FCC / IC Rule Parts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Freq. Range [MHz]                                                  | Highest 1-g SAR (mW/g)                                                               | Limit (mW/g) |
| 22H / RSS-132                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 824 - 849                                                          | Head: 0.962 (LHS touch open)<br>Body: 1.04 (Face down)                               | 1.6          |
| 24E / RSS-133                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1850 - 1910                                                        | Head: 0.960 (RHS touch closed)<br>Body: 0.871 (Face down)                            |              |
| 15.247 / RSS-102                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 2412 - 2472                                                        | Head: 0.261 (LHS touch open)<br>Body: 0.015 (Face up)                                |              |
| Applicable Standards                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                    |                                                                                      | Test Results |
| FCC OET Bulletin 65 Supplement C 01-01<br>IC RSS 102 Issue 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                    |                                                                                      | Pass         |
| <p>Compliance Certification Services, Inc. (CCS) tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.</p> <p><b>Note:</b> The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.</p> |                                                                    |                                                                                      |              |
| Approved & Released For CCS By:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                    | Tested By:                                                                           |              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                    |  |              |
| SUNNY SHIH<br>ENGINEERING SUPERVISOR<br>COMPLIANCE CERTIFICATION SERVICES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                    | DEVIN CHANG<br>EMC ENGINEER<br>COMPLIANCE CERTIFICATION SERVICES                     |              |

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC OET Bulletin 65 Supplement C 01-01, IC RSS 102 Issue 4 and the following specific FCC Test Procedures.

- ☒ - KDB 941225 D01 SAR test for 3G devices v02
- ☒ - KDB 648474 D01 SAR Handsets Multi Xmitter and Ant, v01r05
- ☒ - KDB 248227 D01 SAR meas for 802 11abg v01r02

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

| Name of Equipment            | Manufacturer  | Type/Model  | Serial No. | Cal. Due date               |    |      |
|------------------------------|---------------|-------------|------------|-----------------------------|----|------|
|                              |               |             |            | MM                          | DD | Year |
| Robot - Six Axes             | Stäubli       | RX90BL      | N/A        |                             |    | N/A  |
| Robot Remote Control         | Stäubli       | CS7MB       | 3403-91535 |                             |    | N/A  |
| DASY4 Measurement Server     | SPEAG         | SEUMS001BA  | 1041       |                             |    | N/A  |
| Probe Alignment Unit         | SPEAG         | LB (V2)     | 261        |                             |    | N/A  |
| SAM Phantom (SAM1)           | SPEAG         | QD000P40CA  | 1185       |                             |    | N/A  |
| SAM Phantom (SAM2)           | SPEAG         | QD000P40CA  | 1050       |                             |    | N/A  |
| Oval Flat Phantom (ELI 4.0)  | SPEAG         | QD OVA001 B | 1003       |                             |    | N/A  |
| Electronic Probe kit         | HP            | 85070C      | N/A        |                             |    | N/A  |
| S-Parameter Network Analyzer | Agilent       | 8753ES-6    | MY40001647 | 11                          | 22 | 2010 |
| Signal Generator             | Agilent       | 8753ES-6    | MY40001647 | 11                          | 22 | 2010 |
| E-Field Probe                | SPEAG         | EX3DV3      | 3531       | 2                           | 22 | 2011 |
| Thermometer                  | ERTCO         | 639-1S      | 1718       | 4                           | 30 | 2011 |
| Data Acquisition Electronics | SPEAG         | DAE3 V1     | 500        | 9                           | 15 | 2010 |
| System Validation Dipole     | SPEAG         | D835V2      | 4d002      | 4                           | 22 | 2011 |
| System Validation Dipole     | SPEAG         | D1900V2     | 5d043      | 11                          | 23 | 2011 |
| System Validation Dipole     | SPEAG         | D2450V2     | 706        | 4                           | 18 | 2013 |
| ESG Vector Signal Generator  | Agilent       | E4438C      | US44271090 | 9                           | 17 | 2010 |
| Power Meter                  | Giga-tronics  | 8651A       | 8651404    | 5                           | 13 | 2012 |
| Power Sensor                 | Giga-tronics  | 80701A      | 1834588    | 5                           | 13 | 2012 |
| Amplifier                    | Mini-Circuits | ZVE-8G      | 90606      |                             |    | N/A  |
| Amplifier                    | Mini-Circuits | ZHL-42W     | D072701-5  |                             |    | N/A  |
| Simulating Liquid            | CCS           | H1900       | N/A        | Within 24 hrs of first test |    |      |
| Simulating Liquid            | CCS           | M1900       | N/A        | Within 24 hrs of first test |    |      |
| Simulating Liquid            | CCS           | H835        | N/A        | Within 24 hrs of first test |    |      |
| Simulating Liquid            | CCS           | M835        | N/A        | Within 24 hrs of first test |    |      |
| Simulating Liquid            | SPEAG         | H2450       | N/A        | Within 24 hrs of first test |    |      |
| Simulating Liquid            | SPEAG         | M2450       | N/A        | Within 24 hrs of first test |    |      |

**Note:** Per KDB 450824 D02 requirements for dipole calibration, CCS has adopted three years calibration intervals. On annual basis, each measurement dipole has been evaluated and is in compliance with the following criteria:

1. There is no physical damage on the dipole
2. System validation with specific dipole is within 10% of calibrated value.
3. Return-loss is within 20% of calibrated measurement ( test data on file in CCS)
4. Impedance is within 5Ω of calibrated measurement (test data on file in CCS)

## 4.2. MEASUREMENT UNCERTAINTY

Measurement uncertainty for 300 MHz to 3 GHz averaged over 1 gram

| Component                                                        | error, % | Probe Distribution | Divisor | Sensitivity | U (Xi), % |
|------------------------------------------------------------------|----------|--------------------|---------|-------------|-----------|
| <b>Measurement System</b>                                        |          |                    |         |             |           |
| Probe Calibration (k=1) @ 835, 1900 and 2450 MHz                 | 5.50     | Normal             | 1       | 1           | 5.50      |
| Axial Isotropy                                                   | 1.15     | Rectangular        | 1.732   | 0.7071      | 0.47      |
| Hemispherical Isotropy                                           | 9.20     | Rectangular        | 1.732   | 0.7071      | 3.76      |
| Boundary Effect                                                  | 0.90     | Rectangular        | 1.732   | 1           | 0.52      |
| Probe Linearity                                                  | 3.45     | Rectangular        | 1.732   | 1           | 1.99      |
| System Detection Limits                                          | 1.00     | Rectangular        | 1.732   | 1           | 0.58      |
| Readout Electronics                                              | 0.30     | Normal             | 1       | 1           | 0.30      |
| Response Time                                                    | 0.80     | Rectangular        | 1.732   | 1           | 0.46      |
| Integration Time                                                 | 2.60     | Rectangular        | 1.732   | 1           | 1.50      |
| RF Ambient Conditions - Noise                                    | 3.00     | Rectangular        | 1.732   | 1           | 1.73      |
| RF Ambient Conditions - Reflections                              | 3.00     | Rectangular        | 1.732   | 1           | 1.73      |
| Probe Positioner Mechanical Tolerance                            | 0.40     | Rectangular        | 1.732   | 1           | 0.23      |
| Probe Positioning with respect to Phantom                        | 2.90     | Rectangular        | 1.732   | 1           | 1.67      |
| Extrapolation, Interpolation and Integration                     | 1.00     | Rectangular        | 1.732   | 1           | 0.58      |
| <b>Test Sample Related</b>                                       |          |                    |         |             |           |
| Test Sample Positioning                                          | 2.90     | Normal             | 1       | 1           | 2.90      |
| Device Holder Uncertainty                                        | 3.60     | Normal             | 1       | 1           | 3.60      |
| Output Power Variation - SAR Drift                               | 5.00     | Rectangular        | 1.732   | 1           | 2.89      |
| <b>Phantom and Tissue Parameters</b>                             |          |                    |         |             |           |
| Phantom Uncertainty (shape and thickness)                        | 4.00     | Rectangular        | 1.732   | 1           | 2.31      |
| Liquid Conductivity - deviation from target                      | 5.00     | Rectangular        | 1.732   | 0.64        | 1.85      |
| Liquid Conductivity - measurement @ head 835 MHz                 | 3.61     | Normal             | 1       | 0.64        | 2.31      |
| Liquid Permittivity - deviation from target                      | 5.00     | Rectangular        | 1.732   | 0.6         | 1.73      |
| Liquid Permittivity - measurement @ head 2400 MHz                | 3.57     | Normal             | 1       | 0.6         | 2.14      |
| Combined Standard Uncertainty Uc(y) =                            |          |                    |         |             | 10.60     |
| Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = |          |                    |         | 21.19       | %         |
| Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = |          |                    |         | 1.67        | dB        |

Measurement uncertainty for 300 MHz to 3 GHz averaged over 10 gram

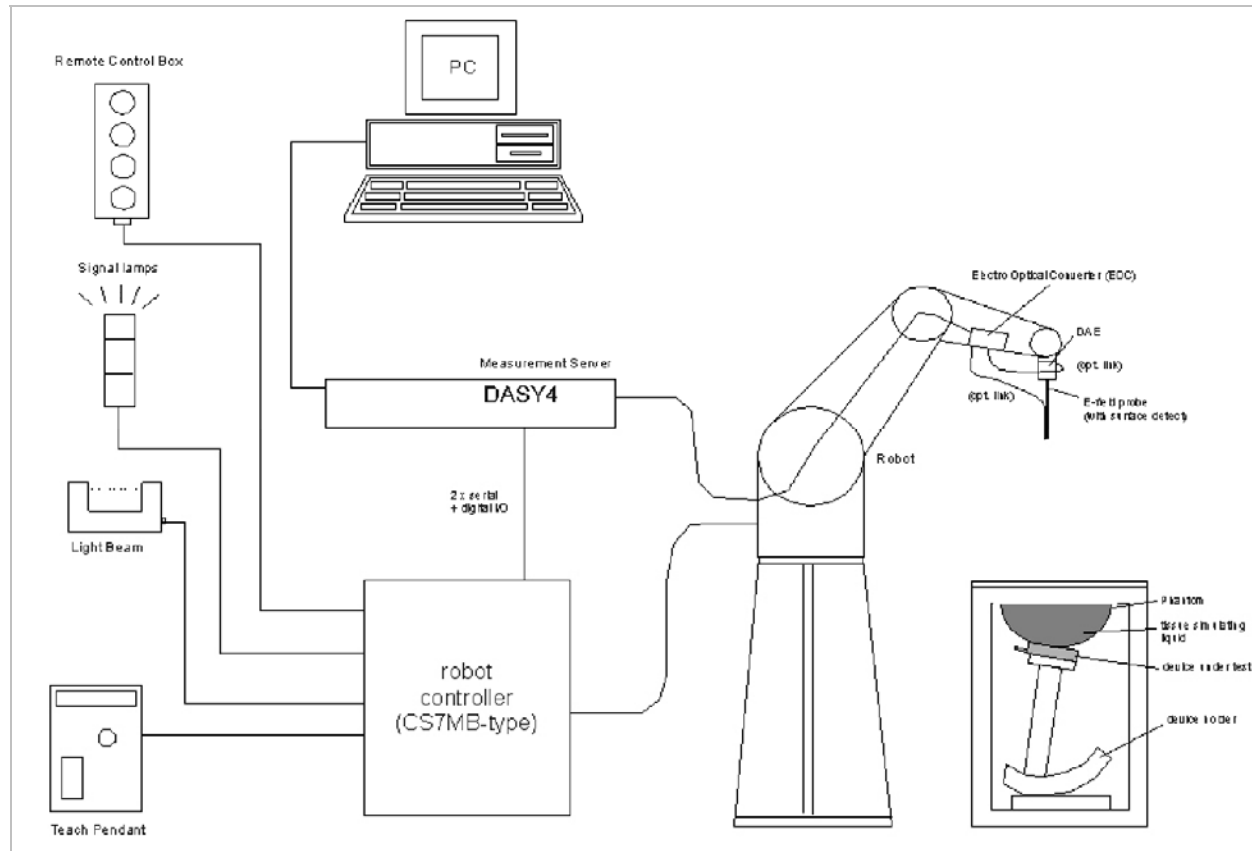
| Component                                                        | error, % | Probe Distribution | Divisor | Sensitivity | U (Xi), % |
|------------------------------------------------------------------|----------|--------------------|---------|-------------|-----------|
| <b>Measurement System</b>                                        |          |                    |         |             |           |
| Probe Calibration (k=1) @ 835, 1900 and 2450 MHz                 | 5.50     | Normal             | 1       | 1           | 5.50      |
| Axial Isotropy                                                   | 1.15     | Rectangular        | 1.732   | 0.7071      | 0.47      |
| Hemispherical Isotropy                                           | 9.20     | Rectangular        | 1.732   | 0.7071      | 3.76      |
| Boundary Effect                                                  | 0.90     | Rectangular        | 1.732   | 1           | 0.52      |
| Probe Linearity                                                  | 3.45     | Rectangular        | 1.732   | 1           | 1.99      |
| System Detection Limits                                          | 1.00     | Rectangular        | 1.732   | 1           | 0.58      |
| Readout Electronics                                              | 0.30     | Normal             | 1       | 1           | 0.30      |
| Response Time                                                    | 0.80     | Rectangular        | 1.732   | 1           | 0.46      |
| Integration Time                                                 | 2.60     | Rectangular        | 1.732   | 1           | 1.50      |
| RF Ambient Conditions - Noise                                    | 3.00     | Rectangular        | 1.732   | 1           | 1.73      |
| RF Ambient Conditions - Reflections                              | 3.00     | Rectangular        | 1.732   | 1           | 1.73      |
| Probe Positioner Mechanical Tolerance                            | 0.40     | Rectangular        | 1.732   | 1           | 0.23      |
| Probe Positioning with respect to Phantom                        | 2.90     | Rectangular        | 1.732   | 1           | 1.67      |
| Extrapolation, Interpolation and Integration                     | 1.00     | Rectangular        | 1.732   | 1           | 0.58      |
| <b>Test Sample Related</b>                                       |          |                    |         |             |           |
| Test Sample Positioning                                          | 2.90     | Normal             | 1       | 1           | 2.90      |
| Device Holder Uncertainty                                        | 3.60     | Normal             | 1       | 1           | 3.60      |
| Output Power Variation - SAR Drift                               | 5.00     | Rectangular        | 1.732   | 1           | 2.89      |
| <b>Phantom and Tissue Parameters</b>                             |          |                    |         |             |           |
| Phantom Uncertainty (shape and thickness)                        | 4.00     | Rectangular        | 1.732   | 1           | 2.31      |
| Liquid Conductivity - deviation from target                      | 5.00     | Rectangular        | 1.732   | 0.43        | 1.24      |
| Liquid Conductivity - measurement @ head 835 MHz                 | 3.61     | Normal             | 1       | 0.43        | 1.55      |
| Liquid Permittivity - deviation from target                      | 5.00     | Rectangular        | 1.732   | 0.49        | 1.41      |
| Liquid Permittivity - measurement @ head 2400 MHz                | 3.57     | Normal             | 1       | 0.49        | 1.75      |
| Combined Standard Uncertainty Uc(y), % =                         |          |                    |         |             | 10.24     |
| Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = |          |                    |         | 20.49       | %         |
| Expanded Uncertainty U, Coverage Factor = 2, > 95 % Confidence = |          |                    |         | 1.62        | dB        |



## 5. EQUIPMENT UNDER TEST

|                                                                    |                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CDMA/ 1x EVDO phone with 802.11b/g and Bluetooth<br>Model: P102EWW |                                                                                                                                                                                                                                                                                                             |
| Normal operation:                                                  | <ul style="list-style-type: none"><li>• Held to head (open and closed – by sliding)</li><li>• Worn on body (Facing-up and Facing-down) with 1.5 cm separation distance</li></ul>                                                                                                                            |
| Body worn accessory:                                               | Headset, part #: 180-10632-00                                                                                                                                                                                                                                                                               |
| Battery option that could affect the SAR results:                  | Rechargeable Li-ion Battery<br>- Standard: 3.7 Vdc, 1150 mAh, 4.3 Wh<br>- Extended: N/A                                                                                                                                                                                                                     |
| Antenna-to-antenna separation distances:                           | See section 15 - Photos with antenna-to-antenna separation distances. <ul style="list-style-type: none"><li>○ 7.5 cm from WWAN antenna-to-WiFi/BT antenna when slide closed</li><li>○ 11.0 cm from WWAN antenna-to-WiFi/BT antenna when slide open</li><li>○ 0 cm from WiFi antenna-to-BT antenna</li></ul> |
| Simultaneous transmission:                                         | - WWAN can transmit simultaneously with WiFi<br>- WWAN can transmit simultaneously with Bluetooth<br>- WiFi can transmit simultaneously with Bluetooth<br>See Section 13 - KDB 648474 Simultaneous transmission consideration                                                                               |

## 6. SYSTEM SPECIFICATIONS



### The DASY4 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000 or Windows XP.
- DASY4 software.
- Remote controls with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing validating the proper functioning of the system.

## 7. LIQUID PARAMETERS CHECK

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine if the dielectric parameters are within the tolerances of the specified target values. For frequencies in 300 MHz to just under 2 GHz, the measured conductivity and relative permittivity should be within  $\pm 5\%$  of the target values. For frequencies in the range of 2–3 GHz and above the measured conductivity should be within  $\pm 5\%$  of the target values. The measured relative permittivity tolerance can be relaxed to no more than  $\pm 10\%$ .

### Reference Values of Tissue Dielectric Parameters for Head and Body Phantom

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in IEEE Standard 1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations and extrapolated according to the head parameters specified in IEEE Standard 1528.

| Target Frequency (MHz) | Head         |                | Body         |                |
|------------------------|--------------|----------------|--------------|----------------|
|                        | $\epsilon_r$ | $\sigma$ (S/m) | $\epsilon_r$ | $\sigma$ (S/m) |
| 150                    | 52.3         | 0.76           | 61.9         | 0.8            |
| 300                    | 45.3         | 0.87           | 58.2         | 0.92           |
| 450                    | 43.5         | 0.87           | 56.7         | 0.94           |
| 835                    | 41.5         | 0.9            | 55.2         | 0.97           |
| 900                    | 41.5         | 0.97           | 55           | 1.05           |
| 915                    | 41.5         | 0.98           | 55           | 1.06           |
| 1450                   | 40.5         | 1.2            | 54           | 1.3            |
| 1610                   | 40.3         | 1.29           | 53.8         | 1.4            |
| 1800 – 2000            | 40           | 1.4            | 53.3         | 1.52           |
| 2450                   | 39.2         | 1.8            | 52.7         | 1.95           |
| 3000                   | 38.5         | 2.4            | 52           | 2.73           |
| 5800                   | 35.3         | 5.27           | 48.2         | 6              |

( $\epsilon_r$  = relative permittivity,  $\sigma$  = conductivity and  $\rho = 1000 \text{ kg/m}^3$ )

## 7.1. LIQUID CHECK RESULTS FOR 835 MHZ

Simulating Liquid Dielectric Parameters for Head 835 MHz

Room Ambient Temperature = 24°C; Relative humidity = 41%

Measured by: Devin Chang

| f (MHz) | Liquid Parameters |       |                                         | Measured | Target | Delta (%) | Limit (%) |
|---------|-------------------|-------|-----------------------------------------|----------|--------|-----------|-----------|
| 835     | e'                | 42.98 | Relative Permittivity ( $\epsilon_r$ ): | 42.980   | 41.5   | 3.57      | ± 5       |
|         | e''               | 19.25 | Conductivity ( $\sigma$ ):              | 0.894    | 0.90   | -0.63     | ± 5       |

Liquid Check

Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C

June 30, 2010 09:25 AM

| Frequency         | e'             | e''            |
|-------------------|----------------|----------------|
| 800000000.        | 43.3180        | 19.2388        |
| 805000000.        | 43.2661        | 19.2423        |
| 810000000.        | 43.2312        | 19.2644        |
| 815000000.        | 43.1735        | 19.2579        |
| 820000000.        | 43.1447        | 19.2067        |
| 825000000.        | 43.0873        | 19.2465        |
| 830000000.        | 43.0193        | 19.2369        |
| <b>835000000.</b> | <b>42.9797</b> | <b>19.2530</b> |
| 840000000.        | 42.9280        | 19.2373        |
| 845000000.        | 42.8379        | 19.2543        |
| 850000000.        | 42.7646        | 19.2199        |
| 855000000.        | 42.7050        | 19.1966        |
| 860000000.        | 42.6271        | 19.1654        |
| 865000000.        | 42.5435        | 19.1373        |
| 870000000.        | 42.5007        | 19.1085        |
| 875000000.        | 42.4367        | 19.0933        |
| 880000000.        | 42.3770        | 19.0766        |
| 885000000.        | 42.3575        | 19.0589        |
| 890000000.        | 42.3163        | 19.0350        |
| 895000000.        | 42.2954        | 18.9477        |
| <b>900000000.</b> | <b>42.2562</b> | <b>18.9433</b> |
| 905000000.        | 42.2185        | 18.9580        |
| 910000000.        | 42.1802        | 18.9691        |
| 915000000.        | 42.1051        | 18.9733        |
| 920000000.        | 42.0491        | 19.0003        |
| 925000000.        | 41.9648        | 18.9786        |
| 930000000.        | 41.8917        | 18.9449        |
| 935000000.        | 41.7801        | 18.9595        |
| 940000000.        | 41.7303        | 18.9393        |
| 945000000.        | 41.6603        | 18.9060        |
| 950000000.        | 41.6157        | 18.8768        |

The conductivity ( $\sigma$ ) can be given as:

$$\sigma = \omega \epsilon_0 e'' = 2 \pi f \epsilon_0 e''$$

where  $f = \text{target } f * 10^6$

$$\epsilon_0 = 8.854 * 10^{-12}$$

Simulating Liquid Dielectric Parameters for Body 835 MHz

Room Ambient Temperature = 24°C; Relative humidity = 41%

Measured by: Devin Chang

| f (MHz) | Liquid Parameters |       |                                         | Measured | Target | Delta (%) | Limit (%) |
|---------|-------------------|-------|-----------------------------------------|----------|--------|-----------|-----------|
| 835     | e'                | 55.12 | Relative Permittivity ( $\epsilon_r$ ): | 55.125   | 55.2   | -0.14     | ± 5       |
|         | e''               | 21.43 | Conductivity ( $\sigma$ ):              | 0.995    | 0.97   | 2.62      | ± 5       |

Liquid Check

Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C

June 30, 2010 09:28 AM

| Frequency         | e'             | e''            |
|-------------------|----------------|----------------|
| 800000000.        | 55.3758        | 21.4834        |
| 805000000.        | 55.3617        | 21.4754        |
| 810000000.        | 55.3361        | 21.4780        |
| 815000000.        | 55.2785        | 21.4428        |
| 820000000.        | 55.2439        | 21.4141        |
| 825000000.        | 55.2333        | 21.4455        |
| 830000000.        | 55.1706        | 21.4186        |
| <b>835000000.</b> | <b>55.1245</b> | <b>21.4284</b> |
| 840000000.        | 55.0730        | 21.3920        |
| 845000000.        | 55.0212        | 21.3608        |
| 850000000.        | 54.9861        | 21.3254        |
| 855000000.        | 54.9322        | 21.3185        |
| 860000000.        | 54.8571        | 21.2705        |
| 865000000.        | 54.7717        | 21.2335        |
| 870000000.        | 54.7463        | 21.1992        |
| 875000000.        | 54.6795        | 21.1752        |
| 880000000.        | 54.6272        | 21.1436        |
| 885000000.        | 54.6395        | 21.0935        |
| 890000000.        | 54.6237        | 21.0767        |
| 895000000.        | 54.6134        | 20.9618        |
| <b>900000000.</b> | <b>54.5741</b> | <b>20.9461</b> |
| 905000000.        | 54.5465        | 20.9712        |
| 910000000.        | 54.5219        | 20.9989        |
| 915000000.        | 54.4364        | 21.0150        |
| 920000000.        | 54.3884        | 20.9756        |
| 925000000.        | 54.3297        | 20.9813        |
| 930000000.        | 54.2647        | 20.9741        |
| 935000000.        | 54.1761        | 20.9603        |
| 940000000.        | 54.1026        | 20.9129        |
| 945000000.        | 54.0859        | 20.8743        |
| 950000000.        | 54.0244        | 20.8715        |

The conductivity ( $\sigma$ ) can be given as:

$$\sigma = \omega \epsilon_0 e'' = 2 \pi f \epsilon_0 e''$$

where  $f = \text{target } f * 10^6$

$$\epsilon_0 = 8.854 * 10^{-12}$$

## 7.2. LIQUID CHECK RESULTS FOR 1900 MHz

Simulating Liquid Dielectric Parameters for Head 1900 MHz

Room Ambient Temperature = 25°C; Relative humidity = 35% Measured by: Devin Chang

| f (MHz) | Liquid Parameters |        | Measured Results                        |         | Target | Delta (%) | Limit (%) |
|---------|-------------------|--------|-----------------------------------------|---------|--------|-----------|-----------|
| 1900    | e'                | 41.177 | Relative Permittivity ( $\epsilon_r$ ): | 41.1771 | 40.0   | 2.94      | ± 5       |
|         | e''               | 13.373 | Conductivity ( $\sigma$ ):              | 1.41353 | 1.40   | 0.97      | ± 5       |

Liquid Check

Ambient temperature: 23 deg. C; Liquid temperature: 22 deg. C

June 29, 2010 11:38 AM

| Frequency          | e'             | e''            |
|--------------------|----------------|----------------|
| 1710000000.        | 42.0776        | 12.7345        |
| 1720000000.        | 41.9917        | 12.7187        |
| 1730000000.        | 41.9425        | 12.7280        |
| 1740000000.        | 41.8880        | 12.7548        |
| 1750000000.        | 41.8546        | 12.8267        |
| 1760000000.        | 41.7835        | 12.8996        |
| 1770000000.        | 41.7305        | 12.9737        |
| 1780000000.        | 41.6720        | 13.0305        |
| 1790000000.        | 41.6603        | 13.0547        |
| 1800000000.        | 41.6450        | 13.0945        |
| 1810000000.        | 41.6180        | 13.0993        |
| 1820000000.        | 41.5949        | 13.1066        |
| 1830000000.        | 41.5585        | 13.0691        |
| 1840000000.        | 41.5169        | 13.1075        |
| 1850000000.        | 41.4529        | 13.1541        |
| 1860000000.        | 41.3627        | 13.2220        |
| 1870000000.        | 41.2696        | 13.2530        |
| 1880000000.        | 41.2332        | 13.2892        |
| 1890000000.        | 41.2024        | 13.3351        |
| <b>1900000000.</b> | <b>41.1771</b> | <b>13.3731</b> |
| 1910000000.        | 41.1561        | 13.4248        |

The conductivity ( $\sigma$ ) can be given as:

$$\sigma = \omega \epsilon_0 e'' = 2 \pi f \epsilon_0 e''$$

where  $f = \text{target } f * 10^6$

$$\epsilon_0 = 8.854 * 10^{-12}$$

Simulating Liquid Dielectric Parameters for Body 1900 MHz

Room Ambient Temperature = 25°C; Relative humidity = 35% Measured by: Devin Chang

| f (MHz) | Liquid Parameters |        |                                         | Measured | Target | Delta (%) | Limit (%) |
|---------|-------------------|--------|-----------------------------------------|----------|--------|-----------|-----------|
| 1900    | e'                | 52.504 | Relative Permittivity ( $\epsilon_r$ ): | 52.5038  | 53.3   | -1.49     | ± 5       |
|         | e"                | 14.203 | Conductivity ( $\sigma$ ):              | 1.50123  | 1.52   | -1.24     | ± 5       |

Liquid Check

Ambient temperature: 23 deg. C; Liquid temperature: 22 deg. C

June 29, 2010 11:40 AM

| Frequency          | e'             | e"             |
|--------------------|----------------|----------------|
| 1710000000.        | 53.2514        | 13.4952        |
| 1720000000.        | 53.1759        | 13.4843        |
| 1730000000.        | 53.1438        | 13.4868        |
| 1740000000.        | 53.0910        | 13.5413        |
| 1750000000.        | 53.0548        | 13.6059        |
| 1760000000.        | 53.0003        | 13.7005        |
| 1770000000.        | 52.9391        | 13.7789        |
| 1780000000.        | 52.9202        | 13.8287        |
| 1790000000.        | 52.8979        | 13.8453        |
| 1800000000.        | 52.9034        | 13.8798        |
| 1810000000.        | 52.8847        | 13.8976        |
| 1820000000.        | 52.8521        | 13.8811        |
| 1830000000.        | 52.8357        | 13.8743        |
| 1840000000.        | 52.7703        | 13.9148        |
| 1850000000.        | 52.7154        | 13.9578        |
| 1860000000.        | 52.6279        | 14.0259        |
| 1870000000.        | 52.5654        | 14.0597        |
| 1880000000.        | 52.5201        | 14.1062        |
| 1890000000.        | 52.5102        | 14.1503        |
| <b>1900000000.</b> | <b>52.5038</b> | <b>14.2028</b> |
| 1910000000.        | 52.4815        | 14.2481        |

The conductivity ( $\sigma$ ) can be given as:

$$\sigma = \omega \epsilon_0 e'' = 2 \pi f \epsilon_0 e''$$

where  $f = \text{target } f * 10^6$

$$\epsilon_0 = 8.854 * 10^{-12}$$

### 7.3. LIQUID CHECK RESULTS FOR 2450 MHZ

Simulating Liquid Dielectric Parameters for Head 2450 MHz

Room Ambient Temperature = 24°C; Relative humidity = 42%

Measured by: Devin Chang

| f (MHz) | Liquid Parameters |       |                                         | Measured | Target | Delta (%) | Limit (%) |
|---------|-------------------|-------|-----------------------------------------|----------|--------|-----------|-----------|
| 2450    | e'                | 38.93 | Relative Permittivity ( $\epsilon_r$ ): | 38.930   | 39.2   | -0.69     | ± 5       |
|         | e''               | 13.68 | Conductivity ( $\sigma$ ):              | 1.865    | 1.80   | 3.61      | ± 5       |

Liquid Check

Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C

July 06, 2010 10:02 AM

| Frequency          | e'             | e''            |
|--------------------|----------------|----------------|
| 2400000000.        | 39.1288        | 13.5538        |
| 2405000000.        | 39.1020        | 13.5645        |
| 2410000000.        | 39.0949        | 13.5763        |
| 2415000000.        | 39.0719        | 13.5735        |
| 2420000000.        | 39.0586        | 13.5938        |
| 2425000000.        | 39.0293        | 13.5995        |
| 2430000000.        | 39.0118        | 13.6139        |
| 2435000000.        | 39.0046        | 13.6178        |
| 2440000000.        | 38.9882        | 13.6462        |
| 2445000000.        | 38.9661        | 13.6701        |
| <b>2450000000.</b> | <b>38.9299</b> | <b>13.6831</b> |
| 2455000000.        | 38.9019        | 13.6975        |
| 2460000000.        | 38.8877        | 13.7176        |
| 2465000000.        | 38.8587        | 13.7399        |
| 2470000000.        | 38.8197        | 13.7635        |
| 2475000000.        | 38.7907        | 13.7651        |
| 2480000000.        | 38.7652        | 13.7893        |
| 2485000000.        | 38.7633        | 13.8152        |
| 2490000000.        | 38.7385        | 13.8329        |
| 2495000000.        | 38.7176        | 13.8576        |
| 2500000000.        | 38.6951        | 13.8787        |

The conductivity ( $\sigma$ ) can be given as:

$$\sigma = \omega \epsilon_0 e'' = 2 \pi f \epsilon_0 e''$$

where  $f = \text{target } f * 10^6$

$$\epsilon_0 = 8.854 * 10^{-12}$$



Simulating Liquid Dielectric Parameters for Body 2450 MHz

Room Ambient Temperature = 24°C; Relative humidity = 42%

Measured by: Devin Chang

| f (MHz) | Liquid Parameters |       |                                         | Measured | Target | Delta (%) | Limit (%) |
|---------|-------------------|-------|-----------------------------------------|----------|--------|-----------|-----------|
| 2450    | e'                | 52.73 | Relative Permittivity ( $\epsilon_r$ ): | 52.729   | 52.7   | 0.05      | ± 5       |
|         | e''               | 14.45 | Conductivity ( $\sigma$ ):              | 1.969    | 1.95   | 0.98      | ± 5       |

Liquid Check

Ambient temperature: 24 deg. C; Liquid temperature: 23 deg. C

July 06, 2010 10:05 AM

| Frequency          | e'             | e''            |
|--------------------|----------------|----------------|
| 2400000000.        | 52.8940        | 14.2547        |
| 2405000000.        | 52.8719        | 14.2741        |
| 2410000000.        | 52.8730        | 14.2822        |
| 2415000000.        | 52.8363        | 14.2996        |
| 2420000000.        | 52.8262        | 14.3140        |
| 2425000000.        | 52.8183        | 14.3291        |
| 2430000000.        | 52.8012        | 14.3562        |
| 2435000000.        | 52.7782        | 14.3646        |
| 2440000000.        | 52.7704        | 14.3926        |
| 2445000000.        | 52.7644        | 14.4167        |
| <b>2450000000.</b> | <b>52.7289</b> | <b>14.4467</b> |
| 2455000000.        | 52.6914        | 14.4711        |
| 2460000000.        | 52.6667        | 14.4868        |
| 2465000000.        | 52.6440        | 14.4986        |
| 2470000000.        | 52.6047        | 14.5239        |
| 2475000000.        | 52.5884        | 14.5378        |
| 2480000000.        | 52.5639        | 14.5619        |
| 2485000000.        | 52.5525        | 14.5932        |
| 2490000000.        | 52.5441        | 14.6120        |
| 2495000000.        | 52.5271        | 14.6361        |
| 2500000000.        | 52.5042        | 14.6872        |

The conductivity ( $\sigma$ ) can be given as:

$$\sigma = \omega \epsilon_0 e'' = 2 \pi f \epsilon_0 e''$$

where  $f = \text{target } f * 10^6$

$$\epsilon_0 = 8.854 * 10^{-12}$$

## 8. SYSTEM VERIFICATION

The system performance check is performed prior to any usage of the system in order to verify SAR system measurement accuracy. The system performance check verifies that the system operates within its specifications of  $\pm 10\%$ .

### System Performance Check Measurement Conditions

- The measurements were performed in the flat section of the SAM twin phantom filled with Head or Body simulating liquid of the following parameters.
- The DASY4 system with an Isotropic E-Field Probe EX3DV3 was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.  
For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 fine cube was chosen for cube
- Distance between probe sensors and phantom surface was set to 3 mm.  
For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was 100 mW
- The results are normalized to 1 W input power.

**Reference SAR Values** for HEAD & BODY-tissue from calibration certificate of SPEAG.

| System validation dipole | Cal. certificate #  | Cal. due date | SAR Avg (mW/g)       |      |      |
|--------------------------|---------------------|---------------|----------------------|------|------|
|                          |                     |               | Tissue:              | Head | Body |
| D835V2                   | D835V2-5d043_Nov09  | 04/22/11      | SAR <sub>1g</sub> :  | 9.64 | 9.96 |
|                          |                     |               | SAR <sub>10g</sub> : | 6.28 | 6.56 |
| D1900V2                  | D1900V2-4d002_Apr09 | 11/23/11      | SAR <sub>1g</sub> :  | 39.8 | 40.4 |
|                          |                     |               | SAR <sub>10g</sub> : | 20.7 | 21.4 |
| D2450V2                  | D2450V2-706_Apr10   | 04/18/13      | SAR <sub>1g</sub> :  |      | 52.4 |
|                          |                     |               | SAR <sub>10g</sub> : |      | 24.5 |

### 8.1. SYSTEM CHECK RESULTS FOR D835V2

Ambient Temperature = 24°C; Relative humidity = 41%

Measured by: Devin Chang

| System validation dipole | Date Tested | Measured (Normalized to 1 W) |      | Target | Delta (%) | Tolerance (%) |
|--------------------------|-------------|------------------------------|------|--------|-----------|---------------|
|                          |             | Tissue:                      | Head |        |           |               |
| D835V2                   | 06/30/10    | SAR <sub>1g</sub> :          | 9.70 | 9.64   | 0.62      | ±10           |
|                          |             | SAR <sub>10g</sub> :         | 6.37 | 6.28   | 1.43      |               |

**Note:** See attachment of System Check Plots for details.

### 8.2. SYSTEM CHECK RESULTS FOR D1900V2

Ambient Temperature = 24°C; Relative humidity = 35%

Measured by: Devin Chang

| System validation dipole | Date Tested | Measured (Normalized to 1 W) |      | Target | Delta (%) | Tolerance (%) |
|--------------------------|-------------|------------------------------|------|--------|-----------|---------------|
|                          |             | Tissue:                      | Head |        |           |               |
| D1900V2                  | 06/29/10    | SAR <sub>1g</sub> :          | 38.2 | 39.8   | -4.02     | ±10           |
|                          |             | SAR <sub>10g</sub> :         | 20.1 | 20.7   | -2.90     |               |

**Note:** See attachment of System Check Plots for details.

### 8.3. SYSTEM CHECK RESULTS FOR D2450V2

Ambient Temperature = 24°C; Relative humidity = 42%

Measured by: Devin Chang

| System validation dipole | Date Tested | Measured (Normalized to 1 W) |      | Target | Delta (%) | Tolerance (%) |
|--------------------------|-------------|------------------------------|------|--------|-----------|---------------|
|                          |             | Tissue:                      | Body |        |           |               |
| D2450V2                  | 07/06/10    | SAR <sub>1g</sub> :          | 54   | 52.4   | 3.05      | ±10           |
|                          |             | SAR <sub>10g</sub> :         | 25.2 | 24.5   | 2.86      |               |

**Note:** See attachment of System Check Plots for details.

Maximum output power is verified on the Low, Middle and High channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E for 1xRTT, section 3.1.2.3.4 of 3GPP2 C.S0033-0/TIA-866 for Rel. 0 and section 4.3.4 of 3GPP2 C.S0033-A for Rev. A

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

- Protocol Rev > 6 (IS-2000-0)
- System ID: 8 (Cell) & 4183 (PCS); NID: 65535 (Cell & PCS); Reg. Ch. #: 384 (Cell) & 600 (PCS)
- Radio Config (RC) > Please see following table for details
- FCH Service Option (SO) Setup > Please see following table or details
- Traffic Data Rate > Full
- TDSO SCH Info > F-SCH Parameters > F-SCH Data Rate > 153.6 kbps  
                                > R-SCH Parameters > R-SCH Data Rate > 153.6 kbps
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) |       |                      |       |                      |       |
|--------------------------|---------------------|------------------------------|-------|----------------------|-------|----------------------|-------|
|                          |                     | Ch. 1013 / 824.7 MHz         |       | Ch. 384 / 836.52 MHz |       | Ch. 777 / 848.31 MHz |       |
|                          |                     | Average                      | Peak  | Average              | Peak  | Average              | Peak  |
| RC1                      | 1 (Voice)           | N/A                          | N/A   | N/A                  | N/A   | N/A                  | N/A   |
|                          | 2 (Loopback)        | 24.00                        | 28.90 | 24.30                | 28.87 | 23.48                | 28.67 |
|                          | 3 (Voice)           | 24.14                        | 29.12 | 24.28                | 28.92 | 23.86                | 29.00 |
|                          | 55 (Loopback)       | 24.07                        | 28.95 | 24.14                | 28.85 | 23.52                | 28.78 |
|                          | 68 (Voice)          | 24.09                        | 29.09 | 24.27                | 29.06 | 23.82                | 29.09 |
|                          | 70 (Voice)          | N/A                          | N/A   | N/A                  | N/A   | N/A                  | N/A   |
| RC2                      | 9 (Loopback)        | 24.13                        | 29.00 | 24.18                | 28.84 | 23.66                | 28.86 |
|                          | 17 (Voice)          | 24.11                        | 29.14 | 24.34                | 28.91 | 23.85                | 29.01 |
|                          | 55 (Loopback)       | 24.06                        | 28.98 | 24.19                | 28.83 | 23.56                | 28.84 |
|                          | 32768 (Voice)       | 24.11                        | 29.04 | 24.17                | 28.92 | 23.84                | 29.06 |
| RC3                      | 1 (Voice)           | N/A                          | N/A   | N/A                  | N/A   | N/A                  | N/A   |
|                          | 2 (Loopback)        | 24.08                        | 28.61 | 24.15                | 28.58 | 23.53                | 28.46 |
|                          | 3 (Voice)           | 24.00                        | 28.70 | 24.14                | 28.59 | 23.55                | 28.41 |
|                          | 55 (Loopback)       | 24.07                        | 28.61 | 24.17                | 28.68 | 23.56                | 28.41 |
|                          | 32 (+ F-SCH)        | 24.09                        | 28.57 | 24.18                | 28.54 | 23.53                | 28.35 |
|                          | 32 (+ SCH)          | 24.04                        | 28.66 | 24.17                | 28.62 | 23.60                | 28.41 |
|                          | 68 (Voice)          | 24.05                        | 28.65 | 24.19                | 28.54 | 23.52                | 28.39 |
| RC4                      | 1 (Voice)           | N/A                          | N/A   | N/A                  | N/A   | N/A                  | N/A   |
|                          | 2 (Loopback)        | 24.03                        | 28.56 | 24.19                | 28.53 | 23.59                | 28.40 |
|                          | 3 (Voice)           | 24.02                        | 28.56 | 24.15                | 28.52 | 23.54                | 28.47 |
|                          | 55 (Loopback)       | 24.12                        | 28.59 | 24.20                | 28.50 | 23.54                | 28.44 |
|                          | 32 (+ F-SCH)        | 24.08                        | 28.56 | 24.14                | 28.50 | 23.52                | 28.51 |
|                          | 32 (+ SCH)          | 24.06                        | 28.57 | 24.10                | 28.57 | 23.52                | 28.35 |
|                          | 68 (Voice)          | 24.02                        | 28.52 | 24.15                | 28.53 | 23.54                | 28.41 |
| RC5                      | 9 (Loopback)        | 24.03                        | 28.51 | 24.14                | 28.53 | 23.53                | 28.42 |
|                          | 17 (Voice)          | 23.99                        | 28.53 | 24.12                | 28.52 | 23.47                | 28.35 |
|                          | 55 (Loopback)       | 24.05                        | 28.55 | 24.13                | 28.61 | 23.50                | 28.35 |
|                          | 32768 (Voice)       | 24.01                        | 28.56 | 24.14                | 28.54 | 23.52                | 28.43 |

**RF Output Power for PCS Band**

| Radio Configuration (RC) | Service Option (SO) | Conducted Output Power (dBm) |       |                    |       |                        |       |
|--------------------------|---------------------|------------------------------|-------|--------------------|-------|------------------------|-------|
|                          |                     | Ch. 25 / 1851.25 MHz         |       | Ch. 600 / 1880 MHz |       | Ch. 1175 / 1908.75 MHz |       |
|                          |                     | Average                      | Peak  | Average            | Peak  | Average                | Peak  |
| RC1                      | 1 (Voice)           | N/A                          | N/A   | N/A                | N/A   | N/A                    | N/A   |
|                          | 2 (Loopback)        | 23.63                        | 28.25 | 23.70              | 27.93 | 23.56                  | 27.89 |
|                          | 3 (Voice)           | 23.80                        | 28.60 | 23.81              | 28.45 | 23.71                  | 28.34 |
|                          | 55 (Loopback)       | 23.56                        | 28.30 | 23.62              | 27.86 | 23.55                  | 27.93 |
|                          | 68 (Voice)          | 23.71                        | 28.56 | 23.85              | 28.31 | 23.73                  | 28.36 |
|                          | 70 (Voice)          | N/A                          | N/A   | N/A                | N/A   | N/A                    | N/A   |
| RC2                      | 9 (Loopback)        | 23.63                        | 28.48 | 23.68              | 28.12 | 23.58                  | 28.00 |
|                          | 17 (Voice)          | 23.86                        | 28.80 | 23.87              | 28.47 | 23.73                  | 28.37 |
|                          | 55 (Loopback)       | 23.60                        | 28.47 | 23.62              | 28.06 | 23.56                  | 28.00 |
|                          | 32768 (Voice)       | 23.74                        | 28.75 | 23.75              | 28.41 | 23.71                  | 28.39 |
| RC3                      | 1 (Voice)           | N/A                          | N/A   | N/A                | N/A   | N/A                    | N/A   |
|                          | 2 (Loopback)        | 23.56                        | 28.20 | 23.66              | 27.96 | 23.53                  | 27.69 |
|                          | 3 (Voice)           | 23.45                        | 27.95 | 23.61              | 27.79 | 23.53                  | 27.60 |
|                          | 55 (Loopback)       | 23.51                        | 28.00 | 23.65              | 27.84 | 23.52                  | 27.67 |
|                          | 32 (+ F-SCH)        | 23.48                        | 27.88 | 23.60              | 27.77 | 23.53                  | 27.64 |
|                          | 32 (+ SCH)          | 23.51                        | 27.86 | 23.57              | 27.77 | 23.51                  | 27.65 |
|                          | 68 (Voice)          | 23.50                        | 27.89 | 23.59              | 27.71 | 23.51                  | 27.67 |
|                          |                     |                              |       |                    |       |                        |       |
| RC4                      | 1 (Voice)           | N/A                          | N/A   | N/A                | N/A   | N/A                    | N/A   |
|                          | 2 (Loopback)        | 23.51                        | 27.86 | 23.55              | 27.70 | 23.50                  | 27.59 |
|                          | 3 (Voice)           | 23.49                        | 27.87 | 23.53              | 27.69 | 23.48                  | 27.56 |
|                          | 55 (Loopback)       | 23.50                        | 27.82 | 23.54              | 27.72 | 23.49                  | 27.61 |
|                          | 32 (+ F-SCH)        | 23.48                        | 27.93 | 23.55              | 27.72 | 23.50                  | 27.55 |
|                          | 32 (+ SCH)          | 23.49                        | 27.90 | 23.57              | 27.71 | 23.49                  | 27.57 |
|                          | 68 (Voice)          | 23.47                        | 27.82 | 23.53              | 27.72 | 23.50                  | 27.55 |
|                          |                     |                              |       |                    |       |                        |       |
| RC5                      | 9 (Loopback)        | 23.49                        | 27.85 | 23.53              | 27.65 | 23.50                  | 27.67 |
|                          | 17 (Voice)          | 23.48                        | 27.84 | 23.52              | 27.70 | 23.49                  | 27.52 |
|                          | 55 (Loopback)       | 23.48                        | 27.88 | 23.53              | 27.69 | 23.50                  | 27.56 |
|                          | 32768 (Voice)       | 23.49                        | 27.82 | 23.51              | 27.71 | 23.50                  | 27.54 |

## 9.2. CDMA200 1xEv-Do

### 9.2.1. Release 0 (Rel. 0)

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

#### EVDO Release 0 - RTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00840AC0 : 00000000 : 00000000 : 00000000 > Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Params:
  - Cell Power > -105.5 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > RTAP
  - RTAP Rate > 153.6 kbps
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

#### EVDO Release 0 - FTAP

- Call Setup > Shift & Preset
- Call Control:
  - Access Network Info > Cell Parameters > Sector ID > 00840AC0 : 00000000 : 00000000 : 00000000 > Subnet Mask > 0
  - Generator Info > Termination Parameters > Max Forward Packet Duration > 16 Slots
- Call Params:
  - Cell Power > -105.5 dBm/1.23 MHz
  - Cell Band > (Select US Cellular or US PCS)
  - Channel > (Enter channel number)
  - Application Config > Enhanced Test Application Protocol > FTAP (default)
  - FTAP Rate > 307.2 kbps (2 Slot, QPSK)
  - Rvs Power Ctrl > Active bits
  - Protocol Rel > 0 (1xEV-DO)
- Press “Start Data Connection” when “Session Open” appear in “Active Cell”
- Rvs Power Ctrl > All Up bits (Maximum TxPout)

#### RF Power Output for EV-DO Rel 0

| Band     | FTAP Rate                    | RTAP Rate  | Channel | f (MHz) | Conducted power (dBm) |       |
|----------|------------------------------|------------|---------|---------|-----------------------|-------|
|          |                              |            |         |         | Average               | Peak  |
| Cellular | 307.2 kbps<br>(2 slot, QPSK) | 153.6 kbps | 1013    | 824.70  | 24.08                 | 28.72 |
|          |                              |            | 384     | 836.52  | 24.15                 | 28.71 |
|          |                              |            | 777     | 848.31  | 23.54                 | 28.64 |
| PCS      | 307.2 kbps<br>(2 slot, QPSK) | 153.6 kbps | 25      | 1851.25 | 23.50                 | 28.41 |
|          |                              |            | 600     | 1880.00 | 23.55                 | 28.02 |
|          |                              |            | 1175    | 1908.75 | 23.47                 | 27.95 |

### 9.2.2. Revision A (Rev. A)

This procedure assumes the Agilent 8960 Test Set has the following applications installed and with valid license.

| Application           | Rev, License |
|-----------------------|--------------|
| 1xEV-DO Terminal Test | A.09.13      |

#### EVDO Rev. A – RETAP

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > RETAP
- R-Data Pkt Size > 4096
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- > PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00840AC0: 00000000: 00000000: 00000000  
> Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots  
> ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

#### EVDO Rev. A - FETAP

- Call Setup > Shift & Preset
- Cell Power > -60 dBm/1.23 MHz
- Protocol Rev > A (1xEV-DO-A)
- Application Config > Enhanced Test Application Protocol > FETAP
- F-Traffic Format > 4 (1024, 2,128) Canonical (307.2k, QPSK)
- Protocol Subtype Config > Release A Physical Layer Subtype > Subtype 2
- > PL Subtype 2 Access Channel MAC Subtype > Default (Subtype 0)
- Access Network Info > Cell Parameters > Sector ID > 00840AC0: 00000000: 00000000: 00000000  
> Subnet Mask > 0
- Generator Info > Termination Parameters > Max Forward Packet Duration >16 Slots  
> ACK R-Data After > Subpacket 0 (All ACK)
- Rvs Power Ctrl > All Up bits (to get the maximum power)

| Band     | FETAP<br>Traffic Format                                         | RETAP<br>Data Payload Size | Channel | f (MHz) | Conducted power (dBm) |       |
|----------|-----------------------------------------------------------------|----------------------------|---------|---------|-----------------------|-------|
|          |                                                                 |                            |         |         | Average               | Peak  |
| Cellular | 307.2k, QPSK/ ACK<br>channel is transmitted<br>at all the slots | 4096                       | 1013    | 824.70  | 24.00                 | 28.73 |
|          |                                                                 |                            | 384     | 836.52  | 24.12                 | 28.66 |
|          |                                                                 |                            | 777     | 848.31  | 23.56                 | 28.57 |
| PCS      | 307.2k, QPSK/ ACK<br>channel is transmitted<br>at all the slots | 4096                       | 25      | 1851.25 | 23.52                 | 28.43 |
|          |                                                                 |                            | 600     | 1880.00 | 23.58                 | 27.92 |
|          |                                                                 |                            | 1175    | 1908.75 | 23.50                 | 27.83 |

### 9.3. WIFI RF OUTPUT POWER

| 802.11b   |             |                     |      |
|-----------|-------------|---------------------|------|
| Channel # | Freq. (MHz) | Conducted Avg Power |      |
|           |             | (dBm)               | (mW) |
| 1         | 2412        | 11.8                | 15.2 |
| 6         | 2437        | 11.9                | 15.4 |
| 11        | 2462        | 11.8                | 15.2 |
| 802.11g   |             |                     |      |
| 1         | 2412        | 9.8                 | 9.6  |
| 6         | 2437        | 10.1                | 10.3 |
| 11        | 2462        | 10.1                | 10.1 |

**Note:** KDB 248227 - SAR is not required for 802.11g channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.



## 10. KDB 941225 TEST REDUCTION CONSIDERATION

### CDMA2000 1x handsets Test configurations based on KDB 941225 SAR test for 3G devices v02

#### Head SAR

1. SAR for RC3 with the DUT configured to transmit at full rate using Loopback Service Option SO55.
2. SAR for RC1
  - 1) Not required when the maximum average output of each channel is less than 0.25 dB higher than as measured in RC3.
  - 2) Else SAR is measured on the maximum output channel in RC1, for exposure configuration that produced highest SAR for that channel in RC3.

Based upon the power measurement in section 9.1, SAR for RC1 is not required due to the output power is not ¼ dB higher than RC3. Thus **RC3/SO55** is used for Head SAR measurement.

#### Body SAR

1. SAR for RC3
  - 1) With DUT configured using TDSO/SO32, to transmit at full rate on FCH with all other code channels disabled.
  - 2) For multiples code channels (FCH + SCH<sub>n</sub>)
    - (1) Not required when the maximum average output of each RF channel is less than 0.25 dB higher than as measured with FCH only.
    - (2) Else SAR is measured on the maximum output channel (FCH + SCH<sub>n</sub>) with FCH at full rate and SCH<sub>0</sub> enabled at 9600 bps, for exposure configuration that produced highest SAR for that channel with FCH only.
2. SAR for RC1
  - 1) Not required when the maximum average output of each channel is less than 0.25 dB higher than as measured in RC3.
  - 2) Else SAR is measured on the maximum output channel in RC1, with Loopback Service Option SO55, at full rate, for exposure configuration that produced highest SAR for that channel in RC3.
3. Handsets with Ev-Do
  - 1) SAR for Release 0 (Rel. 0)
    - (1) Not required when the maximum average output of each channel is less than 0.25 dB higher than as measured in RC3 (1xRTT)
    - (2) Else SAR is measured on the maximum output channel, at 153.6 kbps, for exposure configuration that produced highest SAR for that channel in RC3.
  - 2) SAR for Revision A (Rev. A)
    - (1) Not required when the maximum average output of each channel is less than as measured in Release 0, or is less than 0.25 dB higher than as measured in RC3 (1xRTT).
    - (2) Else SAR is measured on the maximum output channel, using a Reverse Data Channel payload size of 4096 bits and a Termination Target of 16 slots defined for Subtype 2 Physical Layer configurations (TBD: may be "for exposure configuration that produced highest SAR for that channel in RC3")

Based upon the power measurement in section 9.2, SAR for multiple code channel (FCH+SCH) is not required due to the output power is not  $\frac{1}{4}$  dB higher than RC3/SO32.

Based upon the power measurement in section 9.1.2 and 9.1.3, SAR for 1xEVDO Rel. 0 and Rev. A power measurement is not  $\frac{1}{4}$  dB higher than RC3.

Thus, **RC3/SO32** is used for all body SAR measurement.

## 11. SUMMARY OF TEST RESULTS

### 11.1. HEAD SAR

#### 11.1.1. Left hand side for (LHS) Cellular band

| Test position      | Mode               | Ch No. | f (MHz) | SAR (mW/g)   |       |
|--------------------|--------------------|--------|---------|--------------|-------|
|                    |                    |        |         | 1-g          | 10-g  |
| Touch (open)       | 1xRTT<br>SO55, RC3 | 1013   | 824.70  | 0.870        | 0.649 |
|                    |                    | 384    | 836.52  | <b>0.962</b> | 0.714 |
|                    |                    | 777    | 848.31  | 0.931        | 0.692 |
| Touch (close)      | 1xRTT<br>SO55, RC3 | 1013   | 824.70  | 0.760        | 0.561 |
|                    |                    | 384    | 836.52  | 0.876        | 0.647 |
|                    |                    | 777    | 848.31  | 0.779        | 0.574 |
| Tilt (15°) (open)  | 1xRTT<br>SO55, RC3 | 1013   | 824.70  |              |       |
|                    |                    | 384    | 836.52  | 0.379        | 0.288 |
|                    |                    | 777    | 848.31  |              |       |
| Tilt (15°) (close) | 1xRTT<br>SO55, RC3 | 1013   | 824.70  |              |       |
|                    |                    | 384    | 836.52  | 0.383        | 0.293 |
|                    |                    | 777    | 848.31  |              |       |

#### 11.1.2. Left hand side (LHS) for PCS band

| Test position      | Mode                 | UL Ch No. | f (MHz) | SAR (mW/g) |       |
|--------------------|----------------------|-----------|---------|------------|-------|
|                    |                      |           |         | 1-g        | 10-g  |
| Touch (open)       | 1xRTT<br>(RC3, SO55) | 25        | 1851.25 |            |       |
|                    |                      | 600       | 1880.00 | 0.590      | 0.369 |
|                    |                      | 1175      | 1908.75 |            |       |
| Touch (close)      | 1xRTT<br>(RC3, SO55) | 25        | 1851.25 |            |       |
|                    |                      | 600       | 1880.00 | 0.639      | 0.364 |
|                    |                      | 1175      | 1908.75 |            |       |
| Tilt (15°) (open)  | 1xRTT<br>(RC3, SO55) | 25        | 1851.25 |            |       |
|                    |                      | 600       | 1880.00 | 0.434      | 0.277 |
|                    |                      | 1175      | 1908.75 |            |       |
| Tilt (15°) (close) | 1xRTT<br>(RC3, SO55) | 25        | 1851.25 |            |       |
|                    |                      | 600       | 1880.00 | 0.244      | 0.152 |
|                    |                      | 1175      | 1908.75 |            |       |

**Note:** Based upon the power measurement in section 9.1, SAR for RC1 is not required due to the output power is not ¼ dB higher than RC3. Thus **RC3/SO55** is used for Head SAR measurement.

### 11.1.3. Right hand side (RHS) for Cellular band

| Test position      | Mode               | Ch No. | f (MHz) | SAR (mW/g) |       |
|--------------------|--------------------|--------|---------|------------|-------|
|                    |                    |        |         | 1-g        | 10-g  |
| Touch (open)       | 1xRTT<br>SO55, RC3 | 1013   | 824.70  |            |       |
|                    |                    | 384    | 836.52  | 0.782      | 0.578 |
|                    |                    | 777    | 848.31  |            |       |
| Touch (close)      | 1xRTT<br>SO55, RC3 | 1013   | 824.70  |            |       |
|                    |                    | 384    | 836.52  | 0.783      | 0.568 |
|                    |                    | 777    | 848.31  |            |       |
| Tilt (15°) (open)  | 1xRTT<br>SO55, RC3 | 1013   | 824.70  |            |       |
|                    |                    | 384    | 836.52  | 0.348      | 0.263 |
|                    |                    | 777    | 848.31  |            |       |
| Tilt (15°) (close) | 1xRTT<br>SO55, RC3 | 1013   | 824.70  |            |       |
|                    |                    | 384    | 836.52  | 0.381      | 0.287 |
|                    |                    | 777    | 848.31  |            |       |

### 11.1.4. Right hand side (RHS) for PCS band

| Test position      | Mode                 | UL Ch No. | f (MHz) | SAR (mW/g)   |       |
|--------------------|----------------------|-----------|---------|--------------|-------|
|                    |                      |           |         | 1-g          | 10-g  |
| Touch (open)       | 1xRTT<br>(RC3, SO55) | 25        | 1851.25 |              |       |
|                    |                      | 600       | 1880.00 | 0.573        | 0.382 |
|                    |                      | 1175      | 1908.75 |              |       |
| Touch (close)      | 1xRTT<br>(RC3, SO55) | 25        | 1851.25 | 0.871        | 0.484 |
|                    |                      | 600       | 1880.00 | <b>0.960</b> | 0.525 |
|                    |                      | 1175      | 1908.75 | 0.799        | 0.432 |
| Tilt (15°) (open)  | 1xRTT<br>(RC3, SO55) | 25        | 1851.25 |              |       |
|                    |                      | 600       | 1880.00 | 0.421        | 0.271 |
|                    |                      | 1175      | 1908.75 |              |       |
| Tilt (15°) (close) | 1xRTT<br>(RC3, SO55) | 25        | 1851.25 |              |       |
|                    |                      | 600       | 1880.00 | 0.379        | 0.230 |
|                    |                      | 1175      | 1908.75 |              |       |

#### Notes:

- SAR for RC3 with the DUT configured to transmit at full rate using Loopback Service Option SO55.
- SAR for RC1 is not required when the maximum average output of each channel is less than 0.25 dB higher than as measured in RC3.

## 11.2. BODY SAR

### 11.2.1. Cellular band with 15 mm separation distance

| Test position               | Mode                 | UL Ch No. | f (MHz) | SAR (mW/g)   |       |
|-----------------------------|----------------------|-----------|---------|--------------|-------|
|                             |                      |           |         | 1-g          | 10-g  |
| Face up                     | 1xRTT<br>(RC3, SO32) | 1013      | 824.70  |              |       |
|                             |                      | 384       | 836.52  | 0.660        | 0.475 |
|                             |                      | 777       | 848.31  |              |       |
| Face down                   | 1xRTT<br>(RC3, SO32) | 1013      | 824.70  | 0.969        | 0.663 |
|                             |                      | 384       | 836.52  | <b>1.040</b> | 0.721 |
|                             |                      | 777       | 848.31  | 0.840        | 0.579 |
| Face down<br>(with headset) | 1xRTT<br>(RC3, SO32) | 1013      | 824.70  |              |       |
|                             |                      | 384       | 836.52  | 0.776        | 0.516 |
|                             |                      | 777       | 848.31  |              |       |

### 11.2.2. PCS band with 15 mm separation distance

| Test position               | Mode                 | UL Ch No. | f (MHz) | SAR (mW/g)   |       |
|-----------------------------|----------------------|-----------|---------|--------------|-------|
|                             |                      |           |         | 1-g          | 10-g  |
| Face up                     | 1xRTT<br>(RC3, SO32) | 25        | 1851.25 |              |       |
|                             |                      | 600       | 1880.00 | 0.432        | 0.262 |
|                             |                      | 1175      | 1908.75 |              |       |
| Face down                   | 1xRTT<br>(RC3, SO32) | 25        | 1851.25 | 0.790        | 0.491 |
|                             |                      | 600       | 1880.00 | 0.849        | 0.510 |
|                             |                      | 1175      | 1908.75 | <b>0.871</b> | 0.501 |
| Face down<br>(with headset) | 1xRTT<br>(RC3, SO32) | 1175      | 1908.75 | 0.860        | 0.493 |

Based upon the power measurement in section 9.2, SAR for multiple code channel (FCH+SCH) is not required due to the output power is not ¼ dB higher than RC3/SO32.

Based upon the power measurement in section 9.1.2 and 9.1.3, SAR for 1xEVDO Rel.0 and Rev. A power measurement is not ¼ dB higher than RC3.

Thus, **RC3/SO32** is used for all body SAR measurement.

### 11.3. WIFI

**Note:** KDB 248227 - SAR is not required for 802.11g channels when the maximum average output power is less than 1/4 dBm (0.25 dBm) higher than that measured on the corresponding 802.11b channels.

#### 11.3.1. Left hand side (RHS)

| Mode    | Test position      | Ch No. | Freq. (MHz) | SAR (mW/g) |       |
|---------|--------------------|--------|-------------|------------|-------|
|         |                    |        |             | 1-g        | 10-g  |
| 802.11b | Touch (open)       | 1      | 2412        |            |       |
|         |                    | 6      | 2437        | 0.261      | 0.127 |
|         |                    | 11     | 2462        |            |       |
|         | Touch (close)      | 1      | 2412        |            |       |
|         |                    | 6      | 2437        | 0.231      | 0.101 |
|         |                    | 11     | 2462        |            |       |
|         | Tilt (15°) (open)  | 1      | 2412        |            |       |
|         |                    | 6      | 2437        | 0.209      | 0.099 |
|         |                    | 11     | 2462        |            |       |
|         | Tilt (15°) (close) | 1      | 2412        |            |       |
|         |                    | 6      | 2437        | 0.107      | 0.049 |
|         |                    | 11     | 2462        |            |       |

#### 11.3.2. Right Hand Side (RHS)

| Mode    | Test position      | Ch No. | Freq. (MHz) | SAR (mW/g) |       |
|---------|--------------------|--------|-------------|------------|-------|
|         |                    |        |             | 1-g        | 10-g  |
| 802.11b | Touch (open)       | 1      | 2412        |            |       |
|         |                    | 6      | 2437        | 0.163      | 0.086 |
|         |                    | 11     | 2462        |            |       |
|         | Touch (close)      | 1      | 2412        |            |       |
|         |                    | 6      | 2437        | 0.092      | 0.050 |
|         |                    | 11     | 2462        |            |       |
|         | Tilt (15°) (open)  | 1      | 2412        |            |       |
|         |                    | 6      | 2437        | 0.176      | 0.086 |
|         |                    | 11     | 2462        |            |       |
|         | Tilt (15°) (close) | 1      | 2412        |            |       |
|         |                    | 6      | 2437        | 0.090      | 0.046 |
|         |                    | 11     | 2462        |            |       |

## 11.4. BODY SAR

### 11.4.1. Body SAR with 1.5 cm separation distance

| Mode    | Test position | Ch No. | Freq. (MHz) | SAR (mW/g)   |         |
|---------|---------------|--------|-------------|--------------|---------|
|         |               |        |             | 1-g          | 10-g    |
| 802.11b | Face up       | 1      | 2412        |              |         |
|         |               | 6      | 2437        | <b>0.015</b> | 0.00887 |
|         |               | 11     | 2462        |              |         |
|         | w/ headset    | 6      | 2437        | 0.015        | 0.00877 |
|         | Face down     | 1      | 2412        |              |         |
|         |               | 6      | 2437        | 0.00697      | 0.00266 |
|         |               | 11     | 2462        |              |         |

## 12. WORST-CASE SAR TEST PLOTS

### Worst-case HEAD SAR Plot for Part 22

Date/Time: 6/30/2010 3:00:17 PM

Test Laboratory: Compliance Certification Services

#### CELL Band\_Left Hand Side\_open

DUT: Palm; Type: N/A; Serial: N/A

Communication System: CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 836.52$  MHz;  $\sigma = 0.896$  mho/m;  $\epsilon_r = 43$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(10.13, 10.13, 10.13); Calibrated: 2/23/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: SAM 2 (Twin); Type: SAM 2; Serial: 1050
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Touch\_M-ch/Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.978 mW/g

**Touch\_M-ch/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm

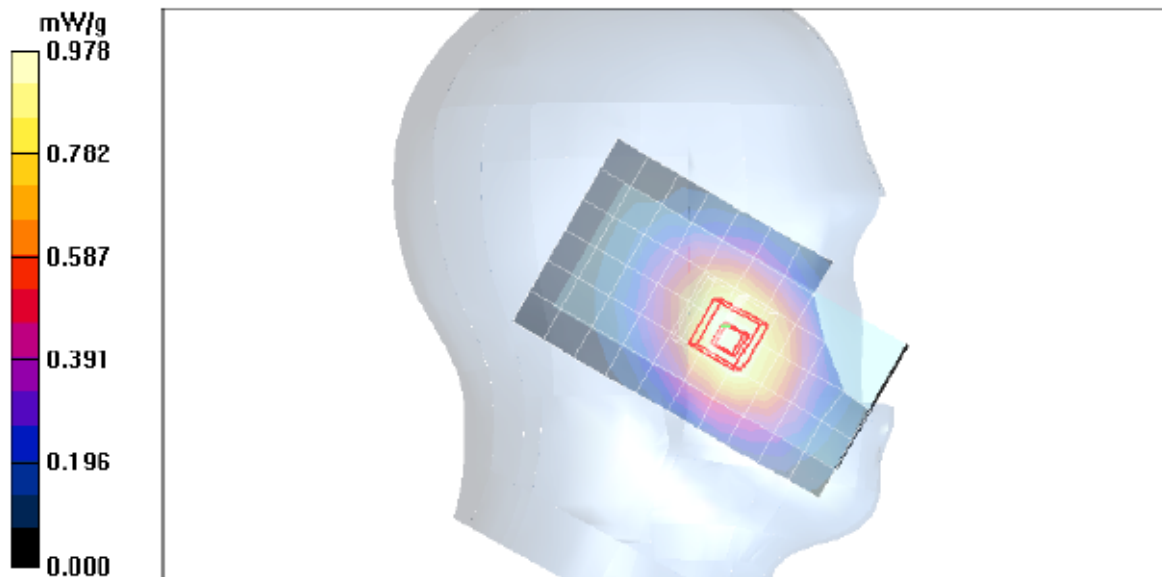
Reference Value = 32.6 V/m; Power Drift = -0.198 dB

Peak SAR (extrapolated) = 1.21 W/kg

**SAR(1 g) = 0.962 mW/g; SAR(10 g) = 0.714 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.05 mW/g





Worst-case HEAD SAR Plot for Part 24

Date/Time: 6/29/2010 9:40:55 PM

Test Laboratory: Compliance Certification Services

**PCS Band\_Right Hand Side\_close**

DUT: Palm; Type: N/A; Serial: N/A

Communication System: CDMA PCS band; Frequency: 1880 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.39$  mho/m;  $\epsilon_r = 41.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Right Section

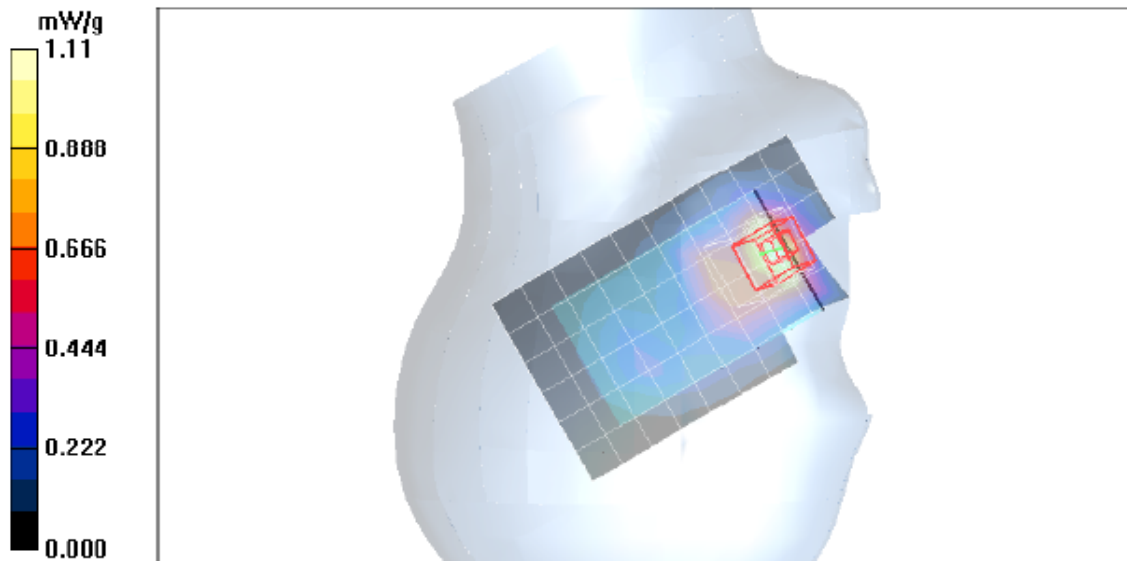
Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(8.64, 8.64, 8.64); Calibrated: 2/23/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: SAM 2 (Twin); Type: SAM 2; Serial: 1050
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Touch\_M-ch 2/Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (measured) = 1.11 mW/g

**Touch\_M-ch 2/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm  
Reference Value = 29.0 V/m; Power Drift = -0.087 dB  
Peak SAR (extrapolated) = 1.71 W/kg  
**SAR(1 g) = 0.960 mW/g; SAR(10 g) = 0.525 mW/g**  
Maximum value of SAR (measured) = 1.19 mW/g



Worst-case HEAD SAR Plot for Part 15 C

Date/Time: 7/6/2010 3:55:31 PM

Test Laboratory: Compliance Certification Services

**WiFi\_Left Hand Side\_open**

DUT: Palm; Type: N/A; Serial: N/A

Communication System: 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 2437$  MHz;  $\sigma = 1.85$  mho/m;  $\epsilon_r = 39$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(7.6, 7.6, 7.6); Calibrated: 2/23/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: SAM 2 (Twin); Type: SAM 2; Serial: 1050
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Touch\_M-ch/Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.335 mW/g

**Touch\_M-ch/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm

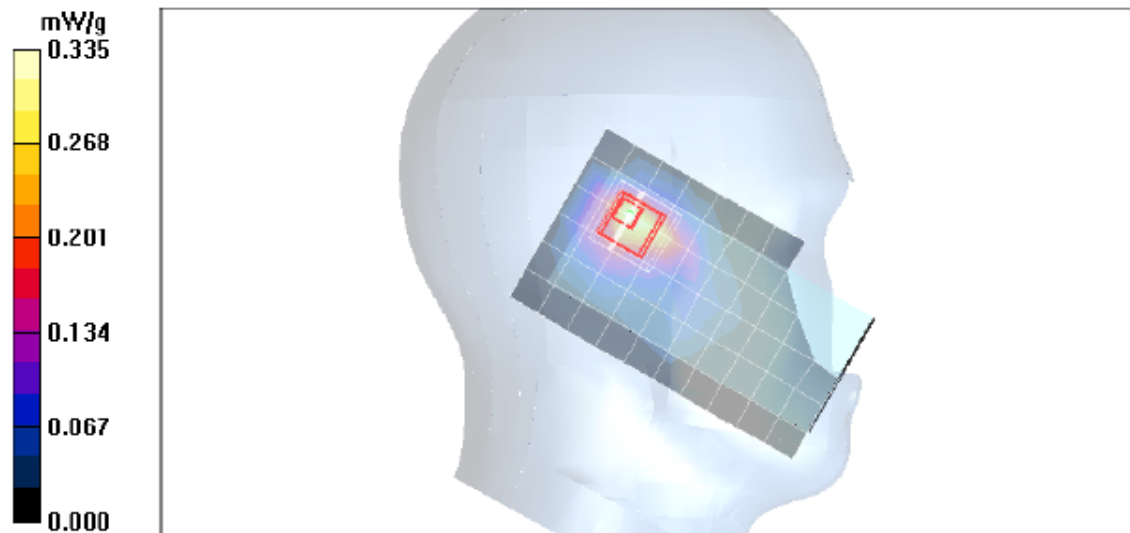
Reference Value = 13.6 V/m; Power Drift = 0.045 dB

Peak SAR (extrapolated) = 0.623 W/kg

**SAR(1 g) = 0.261 mW/g; SAR(10 g) = 0.127 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.344 mW/g



Worst-case BODY SAR plot for Part 22

Date/Time: 6/30/2010 4:56:07 PM

Test Laboratory: Compliance Certification Services

**CELL Band\_CDMA2000 1xRTT\_Body**

DUT: Palm; Type: NA; Serial: NA

Communication System: CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 836.52$  MHz;  $\sigma = 0.997$  mho/m;  $\epsilon_r = 55.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(10.18, 10.18, 10.18); Calibrated: 2/23/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Face down\_M-ch/Area Scan (8x12x1):** Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.16 mW/g

**Face down\_M-ch/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm

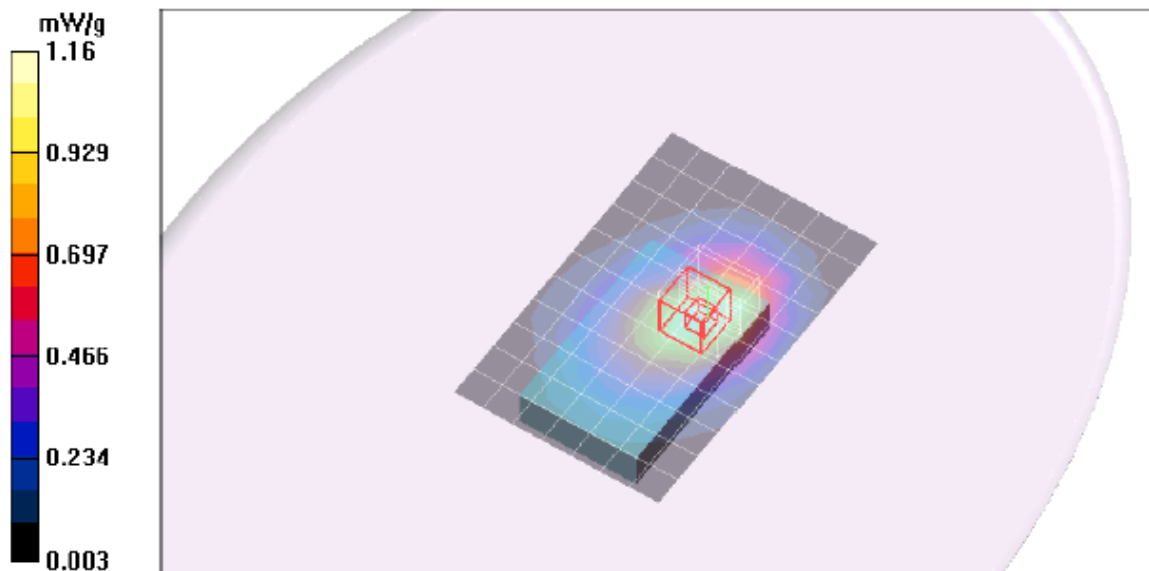
Reference Value = 34.6 V/m; Power Drift = -0.216 dB

Peak SAR (extrapolated) = 1.47 W/kg

**SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.721 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.19 mW/g



Worst-case BODY SAR plot for Part 24

Date/Time: 6/29/2010 3:40:09 PM

Test Laboratory: Compliance Certification Services

**PCS Band\_CDMA2000 1xRTT\_Body**

DUT: Palm; Type: NA; Serial: NA

Communication System: CDMA PCS band; Frequency: 1908.75 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 1908.75$  MHz;  $\sigma = 1.51$  mho/m;  $\epsilon_r = 52.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(8.04, 8.04, 8.04); Calibrated: 2/23/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Face down\_H-ch/Area Scan (8x12x1):** Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.03 mW/g

**Face down\_H-ch/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm

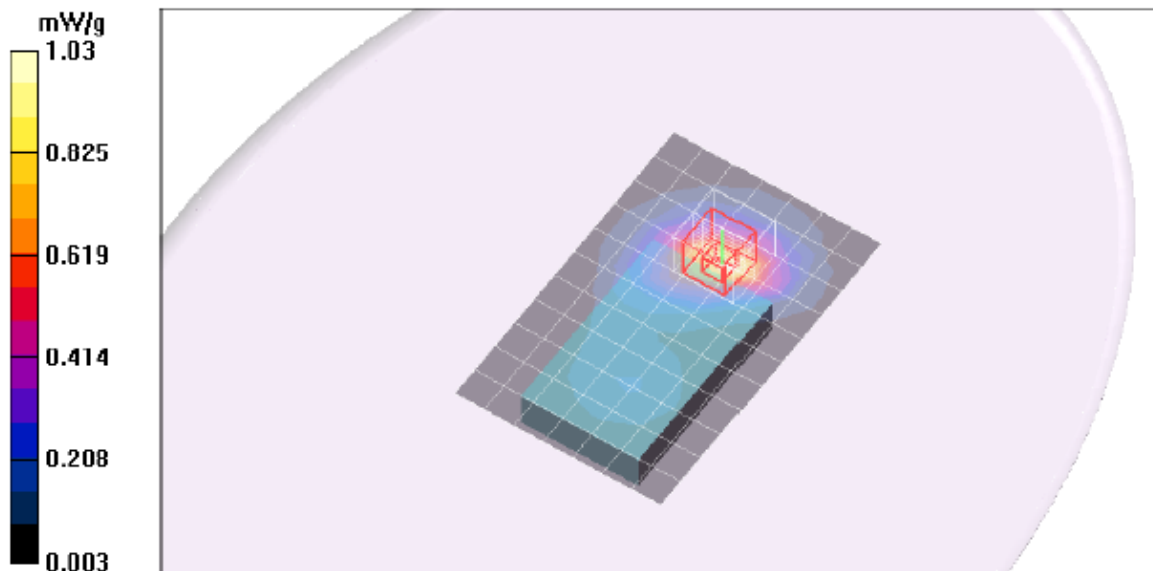
Reference Value = 26.0 V/m; Power Drift = 0.038 dB

Peak SAR (extrapolated) = 1.38 W/kg

**SAR(1 g) = 0.871 mW/g; SAR(10 g) = 0.501 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.04 mW/g



Worst-case BODY SAR plot for Part 15 C

Date/Time: 7/6/2010 5:36:14 PM

Test Laboratory: Compliance Certification Services

**WiFi\_Body**

DUT: Palm; Type: NA; Serial: NA

Communication System: 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated):  $f = 2437$  MHz;  $\sigma = 1.95$  mho/m;  $\epsilon_r = 52.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Room Ambient Temperature: 24.0 deg. C; Liquid Temperature: 23.0 deg. C

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Probe: EX3DV3 - SN3531; ConvF(7.58, 7.58, 7.58); Calibrated: 2/23/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn500; Calibrated: 9/15/2009
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN:1003
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Face up\_M-ch/Area Scan (8x12x1):** Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.018 mW/g

**Face up\_M-ch/Zoom Scan (7x7x9)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=3mm

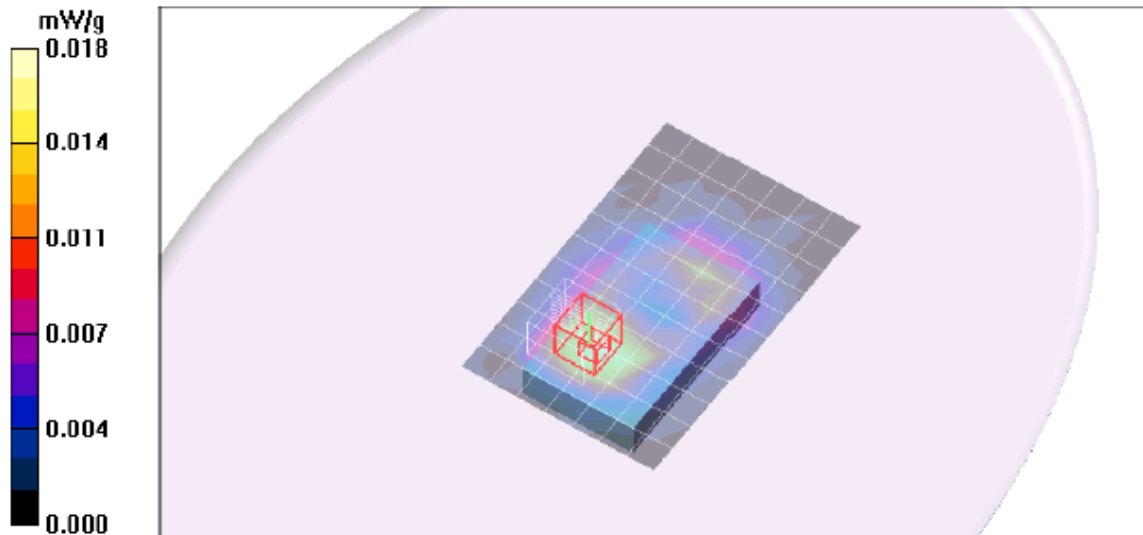
Reference Value = 3.13 V/m; Power Drift = -0.148 dB

Peak SAR (extrapolated) = 0.027 W/kg

**SAR(1 g) = 0.015 mW/g; SAR(10 g) = 0.00887 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.019 mW/g



### 13. KDB 648474 SIMULTANEOUS TRANSMISSION CONSIDERATION

#### SUMMARY OF SAR EVALUATION FOR A CELL PHONE WITH MULTIPLE TRANSMITTERS

| <u>Transmitter</u> | <u>Stand-alone SAR</u>                                           |
|--------------------|------------------------------------------------------------------|
| WWAN               | Yes                                                              |
| WiFi               | Yes                                                              |
| Bluetooth          | Not required due to average output is < P <sub>Ref</sub> (12 mW) |

#### SIMULTANEOUS TRANSMISSION

- WWAN can transmit simultaneously with WiFi
- WWAN can transmit simultaneously with Bluetooth
- WiFi can transmit simultaneously with Bluetooth

#### ANTENNA-TO-ANTENNA SEPARATION DISTANCES:

7.5 cm - WWAN antenna-to-WiFi/BT main antenna when slide closed

11.0 cm - WWAN antenna-to-WiFi/BT main antenna when slide open

0 cm - WiFi antenna-to-BT antenna. (WiFi and BT transmitters sharing a common antenna)

#### Highest SAR value and the sum of the 1-g SAR for WWAN & WiFi

| Tes position            | Highest 1-g SAR (W/kg) |       |         | $\Sigma$ 1-g SAR (W/kg) |
|-------------------------|------------------------|-------|---------|-------------------------|
|                         | WWAN                   |       | WiFi    |                         |
| Head (LHS Touch open)   | Cellular               | 0.962 | 0.261   | 1.223                   |
| Head (RHS Touch closed) | PCS                    | 0.960 | 0.163   | 1.221                   |
| Body (Face down)        | Cellular               | 1.04  | 0.00697 | 1.047                   |
|                         | PCS                    | 0.871 | 0.00697 | 0.878                   |

#### Highest SAR value and the sum of the 1-g SAR for WiFi & WWAN

| Tes position          | Highest 1-g SAR (W/kg) |       |       | $\Sigma$ 1-g SAR (W/kg) |
|-----------------------|------------------------|-------|-------|-------------------------|
|                       | WWAN                   |       | WiFi  |                         |
| Head (LHS touch open) | Cellular               | 0.962 | 0.261 | 1.223                   |
|                       | PCS                    | 0.590 |       | 0.851                   |
| Body (Face up)        | Cellular               | 0.66  | 0.015 | 0.675                   |
|                       | PCS                    | 0.432 |       | 0.432                   |

#### CONCLUSION:

**WWAN & WFi** - Simultaneous transmission SAR not required for WWAN & WiFi because the antenna is > 5 cm from each others and the sum of the 1-g SA is < 1.6 W/kg.

**WWAN & Bluetooth** - Simultaneous transmission SAR not required for WWAN & Bluetooth because stand-alone SAR not required due to Bluetooth's output < 2. P<sub>Ref</sub> (24 mW) and antenna is > 5 cm from other antenna.

**WiFi & Bluetooth** - Simultaneous transmission SAR not required for WiFi & Bluetooth because stand-alone SAR not required due to Bluetooth's output < P<sub>Ref</sub> (12 mW)



## 14. ATTACHMENTS

| <u>No.</u> | <u>Contents</u>                                            | <u>No. of page (s)</u> |
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