

## SAR TEST REPORT

|                           |   |
|---------------------------|---|
| <b>Test report No:</b>    | <b>EMC-FCC-A0003</b>  |
| <b>Type of Equipment:</b> | <b>TabletPC</b>   |
| <b>Model Name:</b>        | <b>LZ-T700</b>  |
| <b>Applicant:</b>         | <b>OVIT CO., LTD</b>  |
| <b>FCCID:</b>             | <b>S4YLZT700</b>  |
| <b>IC Number</b>          | <b>10932A-LZT700</b>  |
| <b>Test standards:</b>    | <b>FCC OET Bulletin 6 supplement C</b><br><b>IEEE 1528 ,2003</b><br><b>IEC 62209 :2006/IEC62209-2 :2010</b><br><b>RSS-102</b> |
| <b>Max. SAR(1g)</b>       | <b>0.529 W/kg</b>   |

**Test result:** **Complied**

In the configuration tested, the EUT complied with the standards specified above.

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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Tested by:  
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Approved by:  
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## 1. Applicant information

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China

## 2. Laboratory information

### Address

#### **EMC compliance Ltd.**

480-5 Sin-dong, Yeongtong-gu, Suwon-city, Gyeonggi-do, 443-390, Korea

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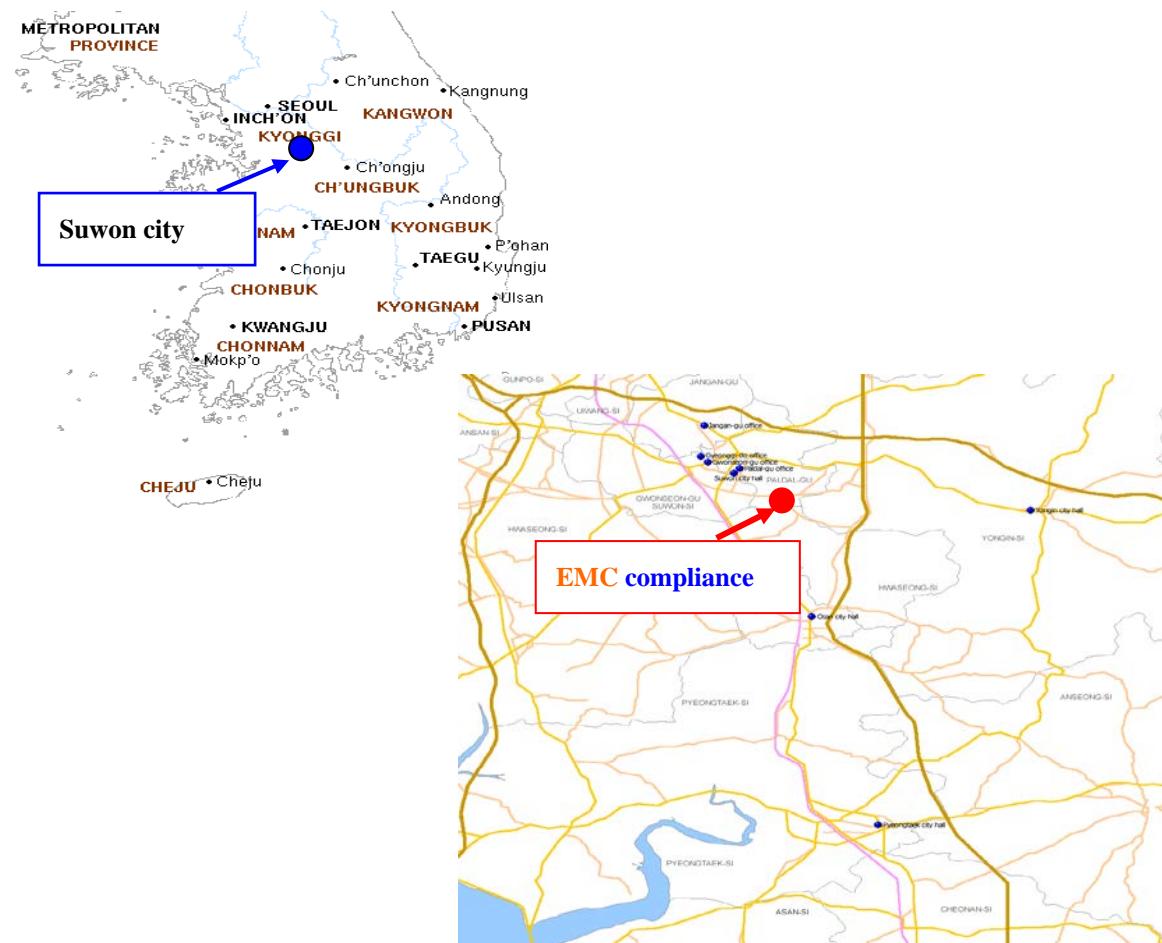
FCC CAB.: 508785

VCCI Registration No. : C-1713, R-1606, T-258

Industry Canada Registration No. : 8035A-2

KOLAS NO.: 231

### SITE MAP



### 3. Identification of Sample

|  |  |
|--|--|
| Mode of Operation                              | 802.11b/g/n, Bluetooth   |
| Model Number                                   | LZ-T700  |
| Serial Number                                  | N/A  |
| Sample Version                                 | N/A  |
| Tx Freq.Range                                  | 2 412 MHz ~ 2462 MHz / 2 402 MHz ~ 2 480 MHz   |
| Rx Freq.Range                                  | 2 412 MHz ~ 2462 MHz / 2 402 MHz ~ 2 480 MHz   |
| Traffic Channel                                | 1, 6, 11(802.11b/g/n) / 0, 39, 78(Bluetooth)   |
| Maximum<br>AVG Conducted Power<br>(Unit : dBm) | 802.11b – 17.13 dBm<br>802.11g – 10.78 dBm<br>802.11n20 – 8.56 dBm<br>Bluetooth – 0.83 dBm |
| Antenna Dimensions                             | 31 x 30 x 0.2(mm)  |
| Antenna Gain                                   | 2.48 dBi   |
| Normal Voltae                                  | DC 3.7 V   |

#### 3.1 Declaration by the manufacturer

- WLAN & BT do not transmit simultaneously.

## 4. Test Result Summary

### 4.1 Body-Worn Configuration

| Band & Mode | Tx Frequency    | AVG Power | SAR (W/k) |       |
|-------------|-----------------|-----------|-----------|-------|
|             |                 |           | 1g Body   | Limit |
| 802.11b     | 2412 ~ 2462 MHz | 17.13 dBm | 0.529     | 1.6   |

\* Contain the results of the worst test SAR including battery.

## 5. Report Overview

This report details the results of testing carried out on the samples listed in section 3, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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## 6. Test Lab Declaration or comments

None

## 7. Applicant Declaration or Comments

None

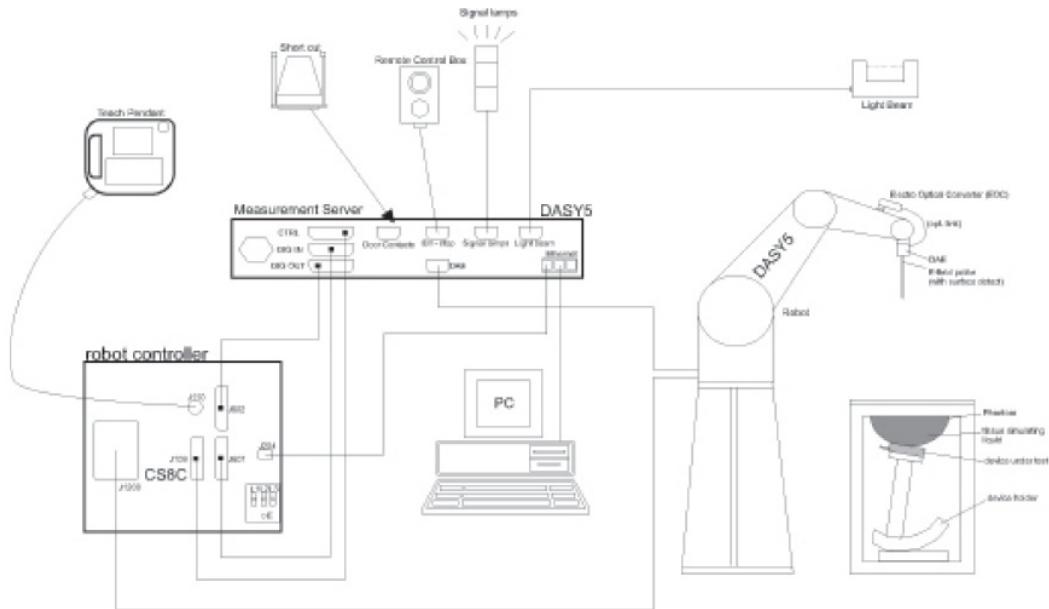
## 8. Measurement Uncertainty

Measurements and results are all in compliance with the standards listed in section 15 of this report. All measurements and results are recorded and maintained at the laboratory performing the tests and measurement uncertainties are taken into account when comparing measurements to pass / fail criteria.

### Uncertainty of SAR equipments for measurement

| a   | b          | c    | d      | e = f(d,k) | g     | i =<br>cxg/e | k        |
|---|------------|------|--------|------------|-------|--------------|----------|
| Uncertainty Component                                   | Section in | Tol  | Prob . | Div.       | Ci    | 1g           | Vi       |
|   | P1528      | (%)  | Dist.  |            | (10g) | ui (%)       | (VeFF)   |
| <b>Measurement System</b>                               |            |      |        |            |       |              |          |
| Probe calibration                                       | E.2.1      | 6.30 | N      | 1          | 1     | 6.30         | $\infty$ |
| Axial isotropy  | E.2.2      | 0.50 | R      | 1.73       | 0.71  | 0.20         | $\infty$ |
| hemispherical isotropy                                  | E.2.2      | 2.60 | R      | 1.73       | 0.71  | 1.06         | $\infty$ |
| Boundary effect   | E.2.3      | 0.80 | R      | 1.73       | 1     | 0.46         | $\infty$ |
| Linearity   | E.2.4      | 0.60 | R      | 1.73       | 1     | 0.35         | $\infty$ |
| System detection limit                                  | E.2.5      | 0.25 | R      | 1.73       | 1     | 0.14         | $\infty$ |
| Readout electronics                                     | E.2.6      | 0.30 | N      | 1          | 1     | 0.30         | $\infty$ |
| Response time   | E.2.7      | 0.00 | R      | 1.73       | 1     | 0.00         | $\infty$ |
| Integration time  | E.2.8      | 2.60 | R      | 1.73       | 1     | 1.50         | $\infty$ |
| RF ambient Condition -Noise                             | E.6.1      | 3.00 | R      | 1.73       | 1     | 1.73         | $\infty$ |
| RF ambient Condition - reflections                      | E.6.1      | 3.00 | R      | 1.73       | 1     | 1.73         | $\infty$ |
| Probe positioning- mechanical tolerance                 | E.6.2      | 0.40 | R      | 1.73       | 1     | 0.23         | $\infty$ |
| Probe positioning- with respect to phantom              | E.6.3      | 2.90 | R      | 1.73       | 1     | 1.67         | $\infty$ |
| Max. SAR evaluation                                     | E.5.2      | 2.00 | R      | 1.73       | 1     | 1.15         | $\infty$ |
| <b>Test Sample Related</b>                              |            |      |        |            |       |              |          |
| Test sample positioning                                 | E.4.2      | 4.75 | N      | 1          | 1     | 4.75         | 9        |
| Device holder uncertainty                               | E.4.1      | 3.60 | N      | 1          | 1     | 3.60         | $\infty$ |
| Output power variation -SAR drift measurement           | 6.62       | 5.00 | R      | 1.73       | 1     | 2.89         | $\infty$ |
| <b>Phantom and Setup</b>                                |            |      |        |            |       |              |          |
| Phantom uncertainty<br>(shape and thickness tolerances) | E.3.1      | 6.10 | R      | 1.73       | 1     | 3.52         | $\infty$ |
| Liquid conductivity<br>- deviation from target values   | E.3.2      | 5.00 | R      | 1.73       | 0.43  | 1.24         | $\infty$ |
| Liquid conductivity<br>- measurement uncertainty        | E.3.2      | 0.46 | N      | 1          | 0.43  | 0.20         | 5        |
| Liquid permittivity<br>- deviation from target values   | E.3.3      | 5.00 | R      | 1.73       | 0.49  | 1.41         | $\infty$ |
| Liquid permittivity<br>- measurement uncertainty        | E.3.3      | 0.75 | N      | 1          | 0.49  | 0.37         | 5        |
| Combined standard uncertainty                           |            |      |        | RSS        |       | 10.66        | 244      |
| Expanded uncertainty<br>(95% CONFIDENCE<br>INTERVAL)    |            |      |        | K=2        |       | 21.33        |          |

## 9. The SAR Measurement System



### <SAR System Configuration>

- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- 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 Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- 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.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.
-

## 9.1 Isotropic E-field Probe EX3DV4



**<EX3DV4 E-field Probe>**

|                      |   |  |
|----------------------|---|--|
| <b>Construction</b>  | : | Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g. DGBE).  |
| <b>Calibration</b>   | : | In air from 10 MHz to 6 GHz In brain simulating tissue (accuracy $\pm 6.3\%$ )   |
| <b>Frequency</b>     | : | 10 MHz to $>6$ GHz; Linearity: $\pm 0.2$ dB (30 MHz to 6 GHz)  |
| <b>Directivity</b>   | : | $\pm 0.2$ dB in brain tissue (rotation around probe axis)<br>$\pm 0.4$ dB in brain tissue (rotation normal to probe axis)  |
| <b>Dynamic Range</b> | : | 5 $\mu$ W/g to $>100$ mW/g; Linearity: $\pm 0.2$ dB  |
| <b>Srfce. Detect</b> | : | $\pm 0.2$ mm repeatability in air and clear liquids over diffuse reflecting surfaces   |
| <b>Dimensions</b>    | : | Overall length: 337 mm<br>Tip length: 9 mm<br>Body diameter: 10 mm<br>Tip diameter: 2.5 mm<br>Distance from probe tip to dipole centers: 2 mm  |
| <b>Application</b>   | : | High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing frequencies up to 6 GHz with precision of better 30%. |

## 9.2 SAM Twin Phantom



### <SAM Twin Phantom>

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has three measurement areas:

- Left head
- Right head
- Flat phantom

A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. Free space scans of devices on the cover are possible.

On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

Phantom specification:

**Description** The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-2003, IEC 62209-1 and IEC 62209-2. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.

**Shell Thickness** 2 + 0.2 mm, Center ear point: 6 + 0.2 mm

**Filling Volume** Approx.25 liters

**Dimensions** Length: 1000 mm, Width: 500 mm, Height: 850 mm

### 9.3 Device Holder for Transmitters



<Device Holder for Transmitters>

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source in 5mm distance, a positioning uncertainty of  $\pm 0.5$  mm would produce a SAR uncertainty of  $\pm 20\%$ . An accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions, in which the devices must be measured, are defined by the standards.

The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centers for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity = 3 and loss tangent = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

## 10. Measurement for Tissue Simulant Liquid

The dielectric properties for this Tissue Simulant Liquids were measured by using the Agilent Model 85070D Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjunction with Agilent E5070B Network Analyzer (9 kHz -3000 MHz). The Conductivity ( $\sigma$ ) and Permittivity ( $\rho$ ) are listed in Table 1. For the SAR measurement given in this report. The temperature variation of the Tissue Simulant Liquids was  $(22 \pm 2) ^\circ\text{C}$

| Frequency (MHz) | Tissue Type | Limit/Measured        | Permittivity ( $\rho$ )              | Conductivity ( $\sigma$ )          | Temp (°C)  |
|-----------------|-------------|-----------------------|--------------------------------------|------------------------------------|------------|
| 2450            | Body        | Recommended Limit     | $52.7 \pm 5\% (50.07\text{--}55.34)$ | $1.95 \pm 5\% (1.85\text{--}2.05)$ | $22 \pm 2$ |
|                 |             | Measured, 30-04, 2013 | 50.80                                | 2.01                               | 21.7       |

### <Measurement result of Tissue electric parameters>

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

| Ingredients (% by weight) | Frequency (MHz) |       |       |      |       |       |       |      |      |      |
|---------------------------|-----------------|-------|-------|------|-------|-------|-------|------|------|------|
|                           | 450             |       | 835   |      | 915   |       | 1900  |      | 2450 |      |
| Tissue Type               | Head            | Body  | Head  | Body | Head  | Body  | Head  | Body | Head | Body |
| Water                     | 38.56           | 51.16 | 41.45 | 52.4 | 41.05 | 56.0  | 54.9  | 40.4 | 62.7 | 73.2 |
| Salt (NaCl)               | 3.95            | 1.49  | 1.45  | 1.4  | 1.35  | 0.76  | 0.18  | 0.5  | 0.5  | 0.04 |
| Sugar                     | 56.32           | 46.78 | 56.0  | 45.0 | 56.5  | 41.76 | 0.0   | 58.0 | 0.0  | 0.0  |
| HEC                       | 0.98            | 0.52  | 1.0   | 1.0  | 1.0   | 1.21  | 0.0   | 1.0  | 0.0  | 0.0  |
| Bactericide               | 0.19            | 0.05  | 0.1   | 0.1  | 0.1   | 0.27  | 0.0   | 0.1  | 0.0  | 0.0  |
| Triton X-100              | 0.0             | 0.0   | 0.0   | 0.0  | 0.0   | 0.0   | 0.0   | 0.0  | 36.8 | 0.0  |
| DGBE                      | 0.0             | 0.0   | 0.0   | 0.0  | 0.0   | 0.0   | 44.92 | 0.0  | 0.0  | 26.7 |
| Dielectric Constant       | 43.5            | 56.7  | 41.5  | 55.2 | 42.0  | 56.8  | 40.0  | 53.3 | 39.2 | 52.7 |
| Conductivity (S/m)        | 0.87            | 0.94  | 0.90  | 0.97 | 1.0   | 1.07  | 1.40  | 1.52 | 1.80 | 1.95 |

Salt: 99+% Pure Sodium Chloride

Sugar: 98+% Pure Sucrose

Water: De-ionized, 16 MΩ+ resistivity

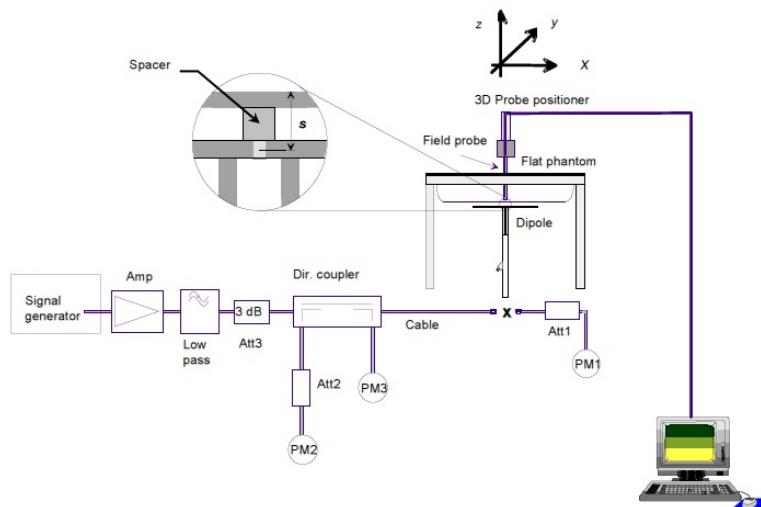
HEC: Hydroxyethyl Cellulose

DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]

Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1,3,3-tetramethylbutyl)phenyl]ether

## 11. SAR System Validation

The microwave circuit arrangement for system verification is sketched below picture. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within  $\pm 10\%$  from the target SAR values. These tests were done at 900/1800/1950/2450 MHz. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the table C-1 (A power level of 250 mW was input to the dipole antenna). During the tests, the ambient temperature of the laboratory was in the range 22 °C, the relative humidity was in the range 60 % and the liquid depth above the ear reference points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



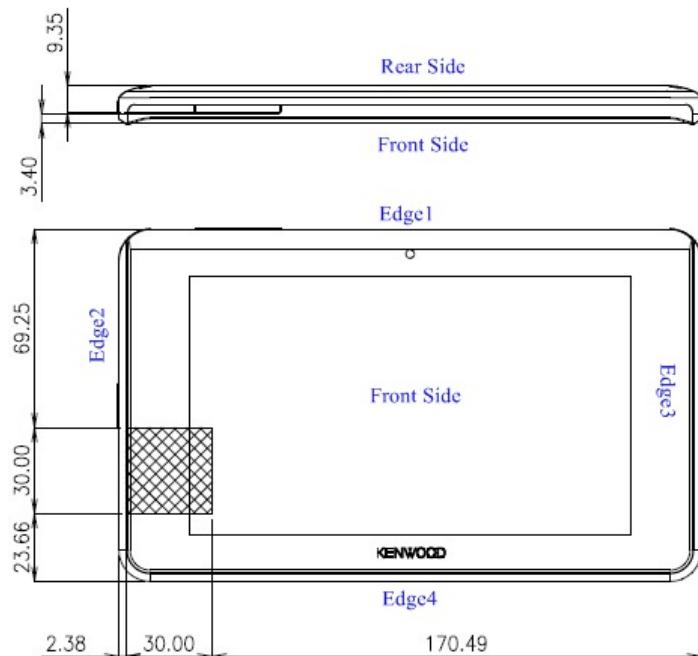
| Validation Kit | Frequency (MHz) | Tissue Type | Limit/Measurement (Normalized to 1 W) |                                    |                                    |
|----------------|-----------------|-------------|---------------------------------------|------------------------------------|------------------------------------|
|                |                 |             |                                       | 1 g                                | 10 g                               |
| D2450V2        | 2450            | Body        | Recommended Limit<br>(Normalized)     | $51.4 \pm 10\%$<br>(46.26 ~ 56.54) | $24.1 \pm 10\%$<br>(21.69 ~ 26.51) |
|                |                 |             | Measured, 30-04, 2013                 | 56.00(8.95 %)                      | 26.08(8.22 %)                      |
|                |                 |             | Recommended Limit<br>(Target)         | $52.4 \pm 10\%$<br>(47.16 ~ 57.64) | $24.4 \pm 10\%$<br>(21.96 ~ 26.84) |
|                |                 |             | Measured, 30-04, 2013                 | 56.00(6.87%)                       | 26.08(6.89 %)                      |

<SAR System Validation Result>

## 12. Operation Configurations

For the 802.11b/g/n SAR tests, a communication link is set up with the test mode software for WiFi mode test. The Absolute Radio Frequency Channel Number is allocated to 1,6 and 11 respectively in the case of 2450 MHz. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. Each channel should be tested at the max power data rate.

802.11b/g/n operating modes are tested independently according to the service requirements in each frequency band. 802.11b/g/n modes are tested on channel 1,6,11; however, if output power reduction is necessary for channels 1 and/or 11 to meet restricted band requirements the highest output channel closest to each of these channels must be tested instead.



| Mode        | Front Side | Rear Side | Edge1 | Edge2 | Edge3 | Edge4 |
|-------------|------------|-----------|-------|-------|-------|-------|
| WiFi 2.4GHz | Yes        | Yes       | No    | Yes   | No    | Yes   |

Note : Per KDB616217 D04v01, SAR evaluation is required for back surface and edges of the tablet when the Diagonal dimension of the device is > 20 cm. When the antenna-to-edge distance is greater than 5 cm, the side does not need to be tested.

## 13. SAR Measurement Procedures

### Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties.

### Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01

|  | $\leq 3 \text{ GHz}$   | $> 3 \text{ GHz}$  |
|--|--|--|
| Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface | $5 \pm 1 \text{ mm}$   | $\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$                         |
| Maximum probe angle from probe axis to phantom surface normal at the measurement location              | $30^\circ \pm 1^\circ$   | $20^\circ \pm 1^\circ$   |
|  | $\leq 2 \text{ GHz}: \leq 15 \text{ mm}$<br>$2 - 3 \text{ GHz}: \leq 12 \text{ mm}$  | $3 - 4 \text{ GHz}: \leq 12 \text{ mm}$<br>$4 - 6 \text{ GHz}: \leq 10 \text{ mm}$ |
| Maximum area scan spatial resolution:<br>$\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$              | When either the x or y dimension of the test device in the measurement plane is smaller than the above, the measurement resolution must be $\leq$ the corresponding x and y dimensions of the test device, with at least one measurement point on the test device. |  |

### Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures  7x7x9 (above 4.5 GHz) 5x5x7 (below 3 GHz) points within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 10 MHz to 6 GHz v01

|   |  | $\leq 3 \text{ GHz}$  | $> 3 \text{ GHz}$  |
|---|--|---|--|
| <b>Maximum zoom scan spatial resolution:</b> $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$ |  | $\leq 2 \text{ GHz: } \leq 8 \text{ mm}$<br>$2 - 3 \text{ GHz: } \leq 5 \text{ mm}$           | $3 - 4 \text{ GHz: } \leq 5 \text{ mm}$<br>$4 - 6 \text{ GHz: } \leq 4 \text{ mm}$   |
|   | uniform grid:<br>$\Delta z_{\text{Zoom}}(n)$ | $\leq 5 \text{ mm}$   | $3 - 4 \text{ GHz: } \leq 4 \text{ mm}$<br>$4 - 5 \text{ GHz: } \leq 3 \text{ mm}$<br>$5 - 6 \text{ GHz: } \leq 2 \text{ mm}$                          |
| <b>Maximum zoom scan spatial resolution, normal to phantom surface</b>                        | graded grid                                  | $\Delta z_{\text{Zoom}}(1):$<br>between 1 <sup>st</sup> two points closest to phantom surface | $\leq 4 \text{ mm}$<br>$3 - 4 \text{ GHz: } \leq 3 \text{ mm}$<br>$4 - 5 \text{ GHz: } \leq 2.5 \text{ mm}$<br>$5 - 6 \text{ GHz: } \leq 2 \text{ mm}$ |
|   |  | $\Delta z_{\text{Zoom}}(n > 1):$<br>between subsequent points                                 | $\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$   |
| <b>Minimum zoom scan volume</b>   | x, y, z                                      | $\geq 30 \text{ mm}$  | $3 - 4 \text{ GHz: } \geq 28 \text{ mm}$<br>$4 - 5 \text{ GHz: } \geq 25 \text{ mm}$<br>$5 - 6 \text{ GHz: } \geq 22 \text{ mm}$                       |

### Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

### Step 5: Z-Scan

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a onedimensional grid. In order to get a reasonable extrapolation, the extrapolated distance should not be larger than the step size in Z-direction.

\* Z Scan Report on Liquid Measure the height Annex A.4 Liquid Depth photo to replace

## 14. Test Equipment Information

### SPEAG DASY5

| Test Platform               | SPEAG DASY5 System   |                 |                  |                         |
|-----------------------------|--|-----------------|------------------|-------------------------|
| Location                    | EMC Compliance Lab   |                 |                  |                         |
| Manufacture                 | SPEAG  |                 |                  |                         |
| Description                 | SAR Test System (Frequency range 300MHz-6GHz)<br>450, 835, 900, 1 800, 1 900, 1 950, 2 450, 5 000 frequency band |                 |                  |                         |
| Software Reference          | DASY5: V52.8<br>SEMCAD: V14.6.6  |                 |                  |                         |
| Hardware Reference          |  |                 |                  |                         |
| Equipment                   | Model  | Serial Number   | Calibration Date | Due date of calibration |
| Robot                       | TX90XL Speag   | F12/5L7FA1/A/01 | N/A              | N/A                     |
| Phantom                     | TwinSAM Phantom  | 1724            | N/A              | N/A                     |
| Phantom                     | TwinSAM Phantom  | 1728            | N/A              | N/A                     |
| Data Acquisition Unit (DAE) | DAE4   | 1342            | 2012-08-09       | 2013-08-08              |
| Probes                      | ES3DV3   | 3302            | 2012-08-06       | 2013-08-05              |
| Probes                      | EX3DV4   | 3865            | 2012-08-06       | 2013-08-05              |
| Dipole Validation Kits      | D300V3   | 1016            | 2012-07-24       | 2014-07-23              |
| Dipole Validation Kits      | D450V3   | 1080            | 2012-07-24       | 2014-07-23              |
| Dipole Validation Kits      | D850V2   | 1006            | 2012-08-07       | 2014-08-06              |
| Dipole Validation Kits      | D900V2   | 1d138           | 2012-08-07       | 2014-08-06              |
| Dipole Validation Kits      | D1750V2  | 1072            | 2012-07-19       | 2014-07-18              |
| Dipole Validation Kits      | D1900V2  | 5d160           | 2012-07-20       | 2014-07-19              |
| Dipole Validation Kits      | D2450V2  | 865             | 2012-07-24       | 2014-07-23              |
| Dipole Validation Kits      | D2600V2  | 1050            | 2012-07-24       | 2014-07-23              |
| Dipole Validation Kits      | D5GHzV2  | 1134            | 2012-07-27       | 2014-07-26              |
| Network Analyzer            | E5071B   | MY42403524      | 2012-07-20       | 2013-07-19              |
| Dual Directional Coupler    | 778D   | 16059           | 2012-09-21       | 2013-09-20              |
| Dual Directional Coupler    | 772D   | 2839A00719      | 2012-09-21       | 2013-09-20              |
| Signal Generator            | SMT06  | 847054/012      | 2012-06-27       | 2013-06-26              |

|                       |         |            |            |            |
|-----------------------|---------|------------|------------|------------|
| Power Amplifier       | GRF5039 | 1062       | 2012-07-20 | 2013-07-19 |
| Power Amplifier       | 5057FE  | 1009       | 2012-08-07 | 2013-08-06 |
| Power Amplifier       | 5190FE  | 1012       | 2012-09-21 | 2013-09-20 |
| Dual Power Meter      | E4419B  | GB43312301 | 2012-07-10 | 2013-07-09 |
| Power Sensor          | 8481H   | 3318A19674 | 2012-07-12 | 2013-07-11 |
| Power Sensor          | 8481H   | 3318A19376 | 2012-07-12 | 2013-07-11 |
| LP Filter             | LA-30N  | 40058      | 2012-10-05 | 2013-10-05 |
| WIDEBAND POWER SENSOR | NRP-Z81 | 100677     | 2012-05-04 | 2013-05-04 |

## 15. SAR Test Results

### 15.1 Targeted Power Reduction Levels

(802.11b)

| CHANNEL | Channel frequency (MHz) | Rated  | Conducted Power Output(dBm) |       |
|---------|-------------------------|--------|-----------------------------|-------|
|         |                         | (Mbps) | Average                     | Peak  |
| 1       | 2412                    | 1      | <b>17.13</b>                | 20.01 |
|         |                         | 2      | 16.62                       | 19.54 |
|         |                         | 5.5    | 15.65                       | 19.56 |
|         |                         | 11     | 15.77                       | 19.91 |
| 6       | 2437                    | 1      | 16.98                       | 19.94 |
|         |                         | 2      | 16.94                       | 19.75 |
|         |                         | 5.5    | 16.78                       | 19.66 |
|         |                         | 11     | 16.14                       | 19.81 |
| 11      | 2462                    | 1      | 17.06                       | 20.31 |
|         |                         | 2      | 17.02                       | 20.29 |
|         |                         | 5.5    | 17.04                       | 20.17 |
|         |                         | 11     | 16.31                       | 20.15 |

(802.11g)

| CHANNEL | Channel frequency (MHz) | Rated  | Conducted Power Output(dBm) |       |
|---------|-------------------------|--------|-----------------------------|-------|
|         |                         | (Mbps) | Average                     | Peak  |
| 1       | 2412                    | 6      | 10.70                       | 21.25 |
|         |                         | 9      | 10.61                       | 21.59 |
|         |                         | 12     | 10.54                       | 20.63 |
|         |                         | 18     | 10.49                       | 21.03 |
|         |                         | 24     | 10.46                       | 21.00 |
|         |                         | 36     | 10.56                       | 20.65 |
|         |                         | 48     | 10.57                       | 20.63 |
|         |                         | 54     | 10.43                       | 20.69 |
|         |                         | 6      | 10.78                       | 21.41 |
| 6       | 2437                    | 9      | 10.73                       | 21.08 |
|         |                         | 12     | 10.68                       | 20.66 |
|         |                         | 18     | 10.68                       | 20.69 |
|         |                         | 24     | 10.74                       | 20.74 |
|         |                         | 36     | 10.55                       | 20.73 |
|         |                         | 48     | 10.48                       | 20.63 |
|         |                         | 54     | 10.70                       | 20.60 |
|         |                         | 6      | 10.71                       | 20.76 |
|         |                         | 9      | 10.68                       | 20.75 |
| 11      | 2462                    | 12     | 10.64                       | 20.73 |
|         |                         | 18     | 10.66                       | 20.70 |
|         |                         | 24     | 10.69                       | 20.75 |
|         |                         | 36     | 10.63                       | 20.72 |
|         |                         | 48     | 10.61                       | 20.75 |
|         |                         | 54     | 10.65                       | 20.73 |

(802.11n HT-20)

| CHANNEL | Channel frequency (MHz) | Rated  | Conducted Power Output(dBm) |       |
|---------|-------------------------|--------|-----------------------------|-------|
|         |                         | (Mbps) | Average                     | Peak  |
| 1       | 2412                    | 6      | 8.42                        | 20.75 |
|         |                         | 9      | 8.40                        | 20.66 |
|         |                         | 12     | 8.41                        | 20.71 |
|         |                         | 18     | 8.22                        | 20.65 |
|         |                         | 24     | 8.17                        | 20.48 |
|         |                         | 36     | 8.32                        | 20.30 |
|         |                         | 48     | 8.21                        | 20.33 |
|         |                         | 54     | 8.22                        | 20.41 |
|         |                         | 6      | 8.56                        | 20.64 |
| 6       | 2437                    | 9      | 8.47                        | 20.60 |
|         |                         | 12     | 8.40                        | 20.56 |
|         |                         | 18     | 8.33                        | 20.42 |
|         |                         | 24     | 8.15                        | 20.44 |
|         |                         | 36     | 8.31                        | 20.32 |
|         |                         | 48     | 8.24                        | 20.34 |
|         |                         | 54     | 8.19                        | 20.40 |
|         |                         | 6      | 8.54                        | 20.63 |
|         |                         | 9      | 8.43                        | 20.62 |
| 11      | 2462                    | 12     | 8.38                        | 20.70 |
|         |                         | 18     | 8.15                        | 20.65 |
|         |                         | 24     | 8.19                        | 20.45 |
|         |                         | 36     | 8.30                        | 20.30 |
|         |                         | 48     | 8.24                        | 20.48 |
|         |                         | 54     | 8.25                        | 20.36 |

<Note>

1. KDB 248227 - SAR is not required for 802.11g/HT20 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.

(Bluetooth)

| Mode      | Channel | Freq.(MHz) | Conducted Avg Power |      |
|-----------|---------|------------|---------------------|------|
|           |         |            | (dBm)               | (mW) |
| GFSK      | 0       | 2402       | -0.30               | 6.07 |
|           | 39      | 2441       | 0.02                | 6.40 |
|           | 78      | 2480       | 0.74                | 7.05 |
| PI/4DQPSK | 0       | 2402       | -2.64               | 3.95 |
|           | 39      | 2441       | -2.30               | 4.18 |
|           | 78      | 2480       | -1.66               | 4.74 |
| 8DPSK     | 0       | 2402       | -0.21               | 8.54 |
|           | 39      | 2441       | 0.12                | 8.96 |
|           | 78      | 2480       | <b>0.83</b>         | 9.67 |

## 15.2 Measurement of SAR average value

| WLAN 2.4 GHz Body SAR |         |            |                 | Ambient Temperature (°C) | 21.9             |              |
|-----------------------|---------|------------|-----------------|--------------------------|------------------|--------------|
|                       |         |            |                 | Liquid Temperature (°C)  | 21.6             |              |
|                       |         |            |                 | Date                     | 2013-04-30~ 05-1 |              |
| EUT Position          | Mode    | Dist. (mm) | AVG Power (dBm) | Traffic Channel          |                  | Note         |
|                       |         |            |                 | Frequency (MHz)          | Channel          |              |
|                       |         |            |                 | 17.13                    | 2412             | 1            |
| Front                 | 802.11b | 0          | 16.98           | 2437                     | 6                | 0.453        |
|                       |         |            |                 | 2462                     | 11               | <b>0.529</b> |
|                       |         |            |                 | 17.13                    | 2412             | 1            |
| Back                  | 802.11b | 0          | 16.98           | 2437                     | 6                | 0.180        |
|                       |         |            |                 | 2462                     | 11               | 1            |
|                       |         |            |                 | 17.13                    | 2412             | 1            |
| Edge2                 | 802.11b | 0          | 16.98           | 2437                     | 6                | 0.101        |
|                       |         |            |                 | 2462                     | 11               | 1            |
|                       |         |            |                 | 17.13                    | 2412             | 1            |
| Edge4                 | 802.11b | 0          | 16.98           | 2437                     | 6                | 0.018        |
|                       |         |            |                 | 2462                     | 11               | 1            |
|                       |         |            |                 | 17.06                    |                  |              |

<Note>

1. When the 1-g SAR for the mid-band channel, or the channel with the highest output power satisfy the following conditions, testing of the other channels in the band is not required. (Per KDB 447498)
  - =0.8 W/kg and transmission band =100 MHz
  - =0.6 W/kg and, 100 MHz < transmission bandwidth =200 MHz
  - =0.4 W/kg and transmission band > 200 MHz

## 16. Validation Test Results

### System Validation for 2 450 MHz- Body(30-04-2013)

**DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:895**

**Procedure Name: d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)**

Communication System: cw1; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2450$  MHz;  $\sigma = 2.007$  S/m;  $\epsilon_r = 50.801$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.47, 7.47, 7.47); Calibrated: 06.08.2012;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 09.08.2012
- Phantom: SAM twin SN1724; Type: QD000P40CD; Serial: TP:1724
- Measurement SW: DASY52, Version 52.8 (4); SEMCAD X Version 14.6.8 (7028)

### Validation/d=10mm, Pin=250 mW, dist=2.0mm (EX-Probe)/Zoom Scan

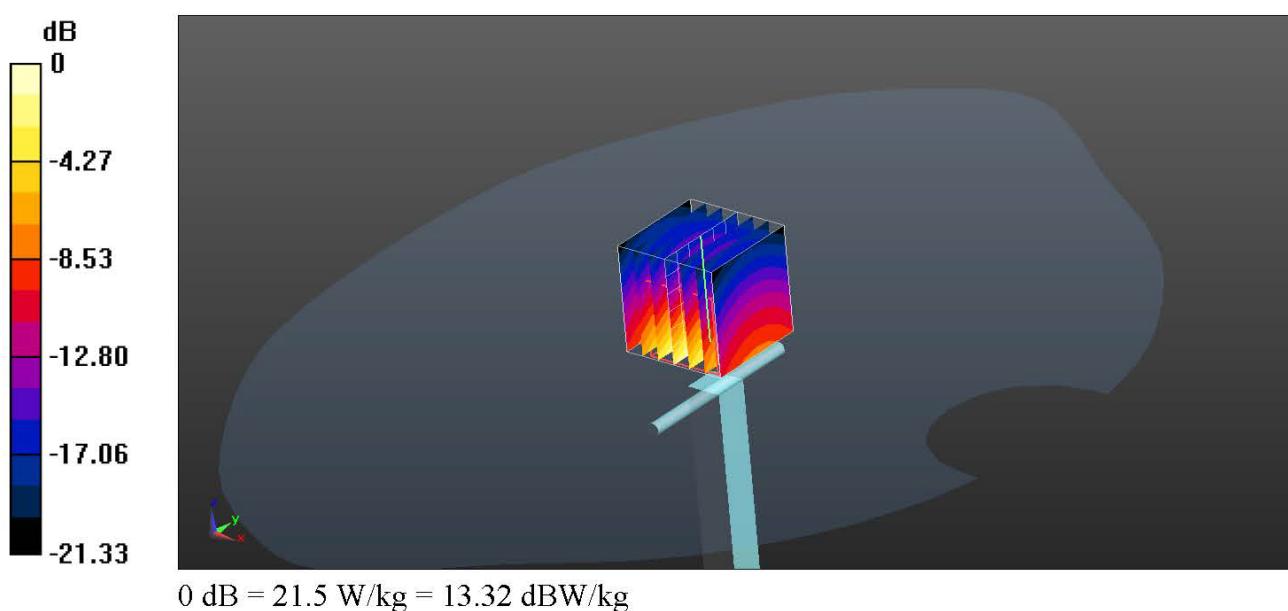
**(7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 102.9 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 28.8 W/kg

**SAR(1 g) = 14 W/kg; SAR(10 g) = 6.52 W/kg**

Maximum value of SAR (measured) = 21.5 W/kg



## 17. Test Results

### 17.1 WLAN 2.4 GHz

#### 2437\_Front\_gap 0 mm

**DUT: LZT700; Type: Tablet PC; Serial: N/A**  
**Procedure Name: 802.11b\_2437\_Front\_gap 0mm**

Communication System: 2.4G WLAN; Frequency: 2437 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.993$  S/m;  $\epsilon_r = 50.805$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section

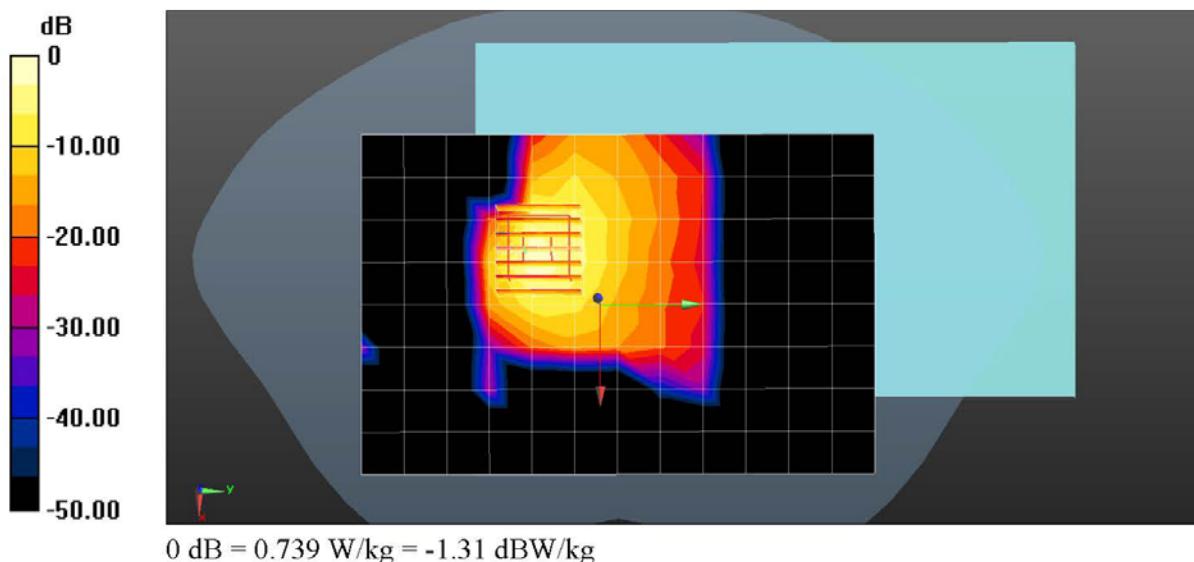
DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.47, 7.47, 7.47); Calibrated: 06.08.2012;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 09.08.2012
- Phantom: SAM twin SN1724; Type: QD000P40CD; Serial: TP:1724
- Measurement SW: DASY52, Version 52.8 (4); SEMCAD X Version 14.6.8 (7028)

**2.4GHz/802.11b\_2437\_Front\_gap 0mm/Area Scan (9x13x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (measured) = 0.719 W/kg

#### 2.4GHz/802.11b\_2437\_Front\_gap 0mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 3.796 V/m; Power Drift = 0.14 dB  
Peak SAR (extrapolated) = 1.16 W/kg  
**SAR(1 g) = 0.453 W/kg; SAR(10 g) = 0.190 W/kg**  
Maximum value of SAR (measured) = 0.739 W/kg



## 2437\_Back\_gap 0 mm

**DUT: Lzt700; Type: Tablet PC; Serial: N/A**  
**Procedure Name: 802.11b\_2437\_Back\_gap 0mm**

Communication System: 2.4G WLAN; Frequency: 2437 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.993$  S/m;  $\epsilon_r = 50.805$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section

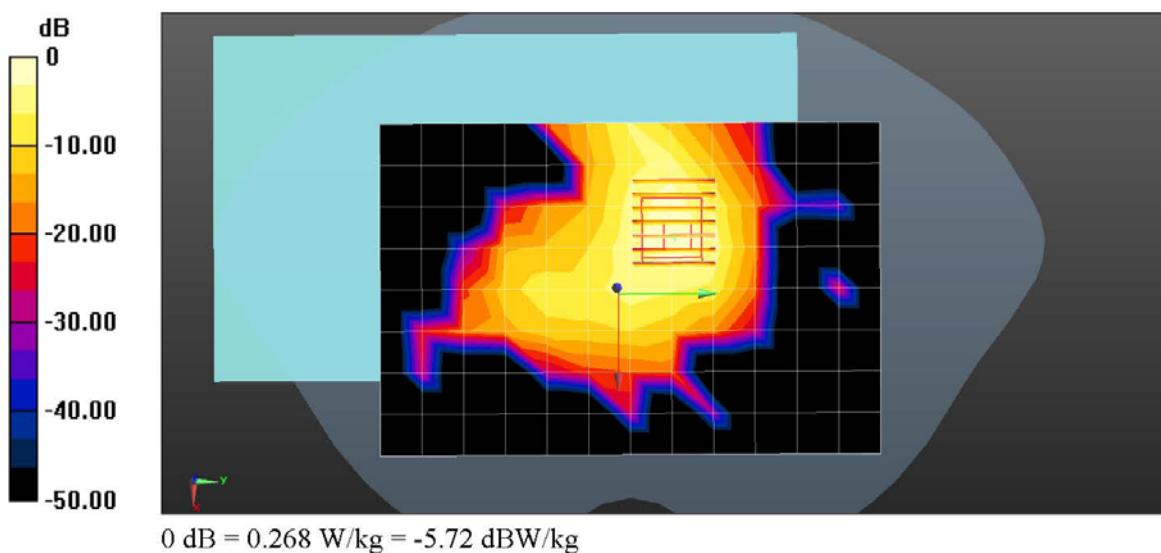
DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.47, 7.47, 7.47); Calibrated: 06.08.2012;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 09.08.2012
- Phantom: SAM twin SN1724; Type: QD000P40CD; Serial: TP:1724
- Measurement SW: DASY52, Version 52.8 (4); SEMCAD X Version 14.6.8 (7028)

**2.4GHz/802.11b\_2437\_Back\_gap 0mm/Area Scan (9x13x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (measured) = 0.237 W/kg

**2.4GHz/802.11b\_2437\_Back\_gap 0mm/Zoom Scan (7x7x7)/Cube 0:**

Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 6.858 V/m; Power Drift = 0.12 dB  
Peak SAR (extrapolated) = 0.360 W/kg  
**SAR(1 g) = 0.180 W/kg; SAR(10 g) = 0.088 W/kg**  
Maximum value of SAR (measured) = 0.268 W/kg



## 2437\_Edge2\_gap 0 mm

**DUT: LZT700; Type: Tablet PC; Serial: N/A**  
**Procedure Name: 802.11b\_2437\_Edge2\_gap 0mm**

Communication System: 2.4G WLAN; Frequency: 2437 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.993$  S/m;  $\epsilon_r = 50.805$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section

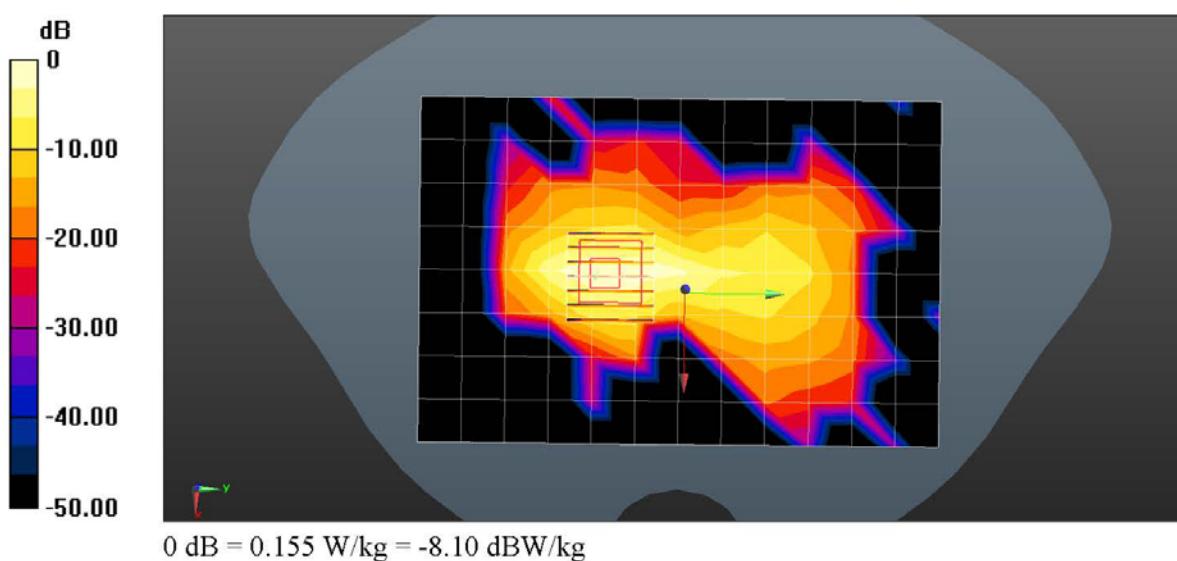
DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.47, 7.47, 7.47); Calibrated: 06.08.2012;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 09.08.2012
- Phantom: SAM twin SN1724; Type: QD000P40CD; Serial: TP:1724
- Measurement SW: DASY52, Version 52.8 (4); SEMCAD X Version 14.6.8 (7028)

**2.4GHz/802.11b\_2437\_Edge2\_gap 0mm/Area Scan (9x13x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (measured) = 0.158 W/kg

**2.4GHz/802.11b\_2437\_Edge2\_gap 0mm/Zoom Scan (7x7x7)/Cube 0:**

Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 6.638 V/m; Power Drift = 0.20 dB  
Peak SAR (extrapolated) = 0.222 W/kg  
**SAR(1 g) = 0.101 W/kg; SAR(10 g) = 0.044 W/kg**  
Maximum value of SAR (measured) = 0.155 W/kg



## 2437\_Edge4\_gap 0 mm

**DUT: LZT700; Type: Tablet PC; Serial: N/A**  
**Procedure Name: 802.11b\_2437\_Edge4\_gap 0mm**

Communication System: 2.4G WLAN; Frequency: 2437 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.993$  S/m;  $\epsilon_r = 50.805$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section

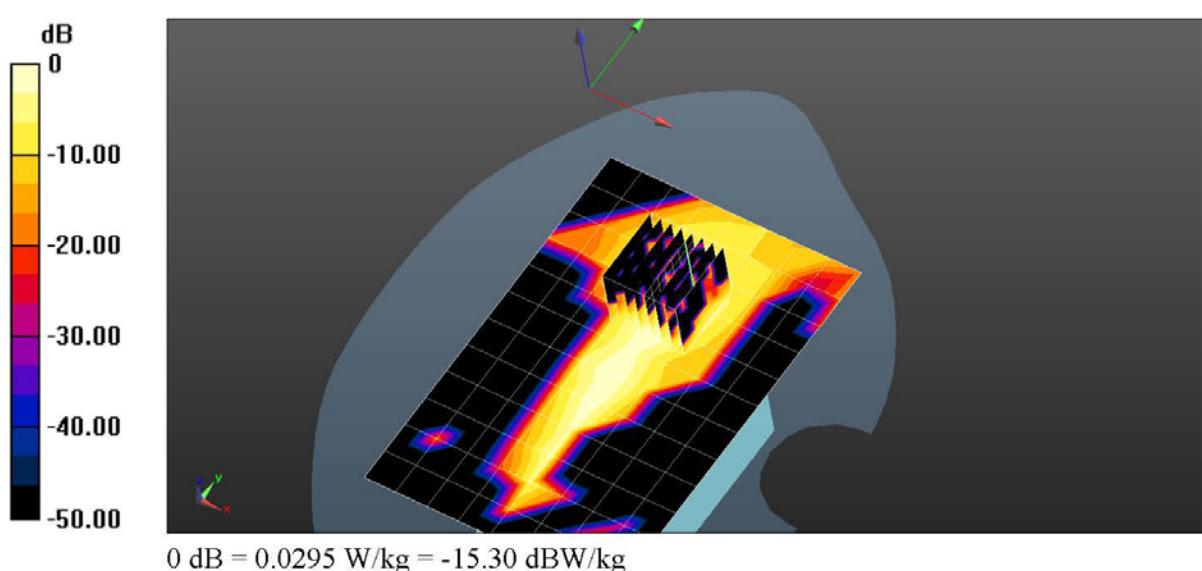
DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.47, 7.47, 7.47); Calibrated: 06.08.2012;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 09.08.2012
- Phantom: SAM twin SN1724; Type: QD000P40CD; Serial: TP:1724
- Measurement SW: DASY52, Version 52.8 (4); SEMCAD X Version 14.6.8 (7028)

**2.4GHz/802.11b\_2437\_Edge4\_gap 0mm/Area Scan (9x13x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (measured) = 0.0336 W/kg

**2.4GHz/802.11b\_2437\_Edge4\_gap 0mm/Zoom Scan (8x8x7)/Cube 0:**

Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 4.124 V/m; Power Drift = 0.18 dB  
Peak SAR (extrapolated) = 0.0410 W/kg  
**SAR(1 g) = 0.018 W/kg; SAR(10 g) = 0.00708 W/kg**  
Maximum value of SAR (measured) = 0.0295 W/kg



## 2412\_Front\_gap 0 mm

**DUT: LZT700; Type: Tablet PC; Serial: N/A**  
**Procedure Name: 802.11b\_2412\_Front\_gap 0mm**

Communication System: 2.4G WLAN; Frequency: 2412 MHz; Duty Cycle: 1:1  
 Medium parameters used:  $f = 2412 \text{ MHz}$ ;  $\sigma = 1.951 \text{ S/m}$ ;  $\epsilon_r = 50.855$ ;  $\rho = 1000 \text{ kg/m}^3$   
 Phantom section: Flat Section

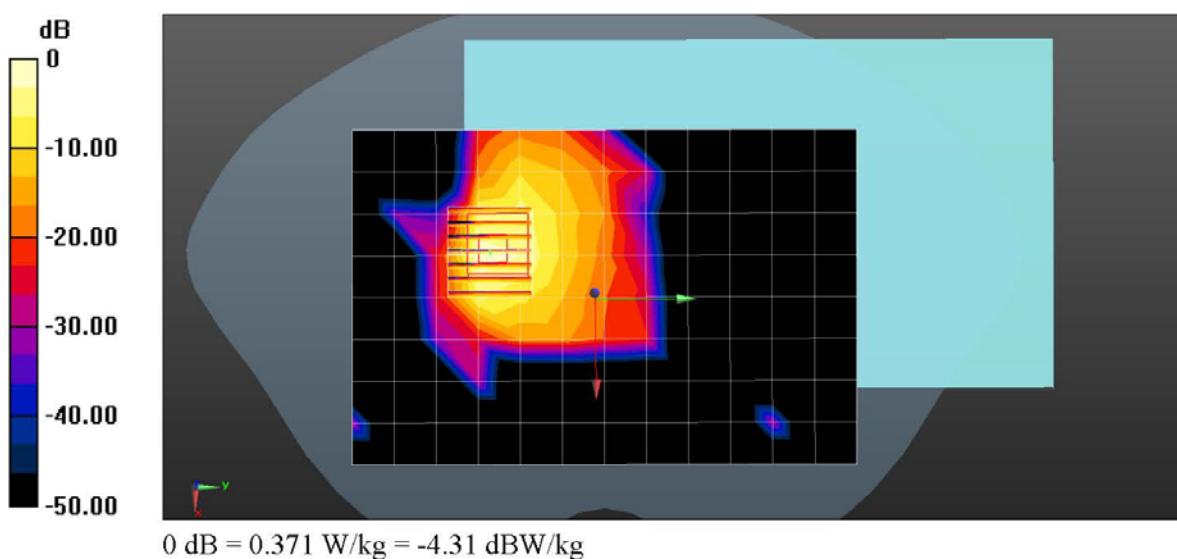
DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.47, 7.47, 7.47); Calibrated: 06.08.2012;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 09.08.2012
- Phantom: SAM twin SN1724; Type: QD000P40CD; Serial: TP:1724
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.8 (7028)

**2.4GHz/802.11b\_2412\_Front\_gap 0mm/Area Scan (9x13x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
 Maximum value of SAR (measured) = 0.305 W/kg

### 2.4GHz/802.11b\_2412\_Front\_gap 0mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$   
 Reference Value = 1.417 V/m; Power Drift = -0.13 dB  
 Peak SAR (extrapolated) = 0.552 W/kg  
**SAR(1 g) = 0.215 W/kg; SAR(10 g) = 0.089 W/kg**  
 Maximum value of SAR (measured) = 0.371 W/kg



## 2462\_Front\_gap 0 mm

**DUT: LZT700; Type: Tablet PC; Serial: N/A**  
**Procedure Name: 802.11b\_2462\_Front\_gap 0mm**

Communication System: 2.4G WLAN; Frequency: 2462 MHz; Duty Cycle: 1:1  
Medium parameters used:  $f = 2462$  MHz;  $\sigma = 2.012$  S/m;  $\epsilon_r = 50.795$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
Phantom section: Flat Section

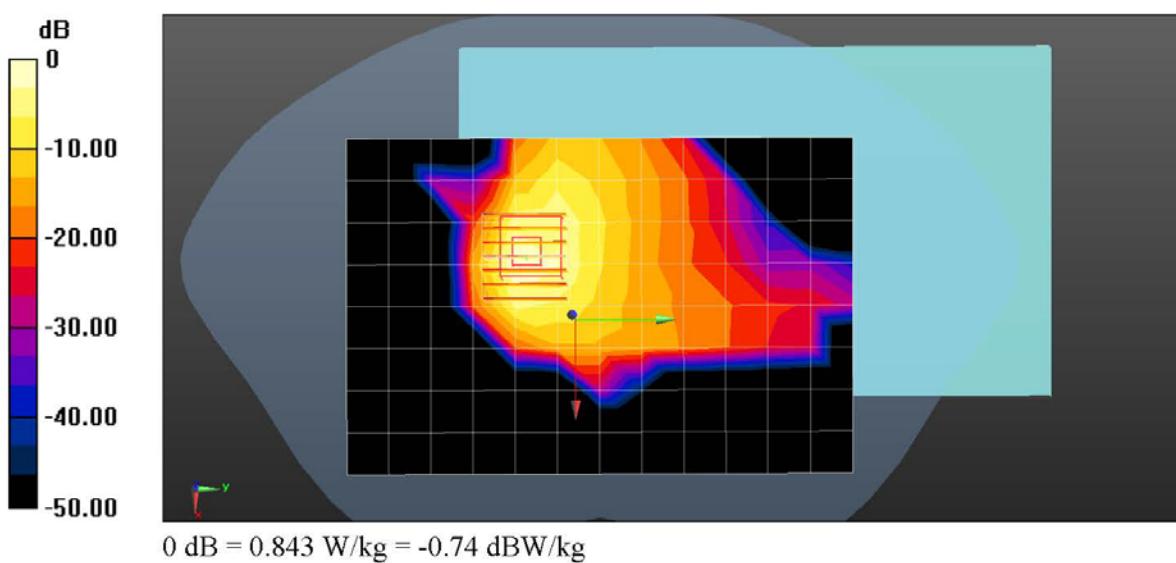
DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.47, 7.47, 7.47); Calibrated: 06.08.2012;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 09.08.2012
- Phantom: SAM twin SN1724; Type: QD000P40CD; Serial: TP:1724
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.8 (7028)

**2.4GHz/802.11b\_2462\_Front\_gap 0mm/Area Scan (9x13x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (measured) = 0.819 W/kg

**2.4GHz/802.11b\_2462\_Front\_gap 0mm/Zoom Scan (7x7x7)/Cube 0:**

Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 5.865 V/m; Power Drift = 0.20 dB  
Peak SAR (extrapolated) = 1.30 W/kg  
**SAR(1 g) = 0.529 W/kg; SAR(10 g) = 0.227 W/kg**  
Maximum value of SAR (measured) = 0.843 W/kg



## Annex A. Photographs

### Annex A.1 EUT



Front View



Back View



**Right side View**



**Left Side View**



**Top side View**



**Bottom Side View**