FCC SAR Test Report

Product	:	HANDHELD VITALSIGNS MONITORING SYSTEM
Trade mark	:	bewell connect
Model/Type reference	:	BW-X07HD
Serial Number	:	55e0ba2b
Report Number	:	EED32I00251309
FCC ID	:	2AF8T-BW-X07HD
Date of Issue:	:	Jun. 16, 2017
Test Standards	:	Refer to Section 1.5
Test result	:	PASS

Prepared for:

BEWELL CONNECT CORP
SUITE 410, 185 ALEWIFE BROOK PARKWAY
CAMBRIDGE, Massachusetts, United States

Prepared by:

Centre Testing International Group Co., Ltd.
Hongwei Industrial Zone, Bao'an 70 District,
Shenzhen, Guangdong, China
TEL: +86-755-3368 3668
FAX: +86-755-3368 3385

Tested By:	Huang xiaole (Test Project)	Compiled by:	Kevin lan (Project Engineer)
Reviewed by:	Kevin yang(Reviewer)	Approved by:	Sheek Luo (Lab supervisor)
Date:	Jun. 14, 2017		

CENTRE TESTING INTERNATIONAL GROUP CO.,LTD. CTI Report Seal

Check No.: 2392125448

Table of contents

Modified History

REV.	Modification Description	Issued Date	Remark
REV.1.0	Initial Test Report Relesse	Jun. 16, 2017	

1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in this test report.

Centre Testing International Group Co., Ltd. does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report is not to be reproduced or published in full without the prior written permission.

1.2 Application details

Date of receipt of test item:	2016-10-19
Start of test:	2017-04-02
End of test:	2017-04-26

1.3 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for BEWELL CONNECT CORP. Model Name: BW-X07HD Plus are as below:

Band	MAX Reported SAR (W/kg)	
	1-g Head	1-g Body (5mm)
UMTS Band II	N/A	1.029
LTE Band II	N/A	1.075
LTE Band IV	N/A	1.250
LTE Band VII	N/A	0.961
LTE Band XII*	N/A	0.492
WiFi 2.4G	N/A	0.334
The highest simultaneous SAR is 1.414W/kg per KDB 690783 D01		

Remark:

N/A: This device doesn't support voice mode, the head mode is not applicable.

*: Tested data comes from Report No.:4787997676.1

Note:

For body operation, this device has been tested and meets FCC/IC RF exposure guidelines when used with any accessory that contains no metal and that positions a minimum of 5mm from the body. Use of other accessories may not ensure compliance with FCC/IC RF exposure guidelines.

The device is in compliance with Specific Absorption Rate （SAR） for general population/uncontrolled exposure limits according to the FCC rule §2.1093, the ANSI/IEEE C95.1:1992, the NCRP Report Number 86 for uncontrolled environment, according to the Industry Canada Radio Standards Specification RSS-102 for General Population/Uncontrolled exposure, and had been tested in accordance with the measurement methods and procedures specified in IEEE Std 1528-2013

1.4 EUT Information

Device Information:			
Product Name:	HANDHELD VITALSIGNS MONITORING SYSTEM		
Model:	BW-X07HD		
FCC ID:	2AF8T-BW-X07HD		
SN:	55e0ba2b		
Device Type:	Portable device		
Exposure Category:	uncontrolled environment / general population		
Hardware version:	(manufacturer declare)H.VS.MSM8909.02		
Software version :	(manufacturer declare)Visiocheck_1.0.6		
Antenna Type :	internal antenna		
Device Operating Configurations:			
Supporting Mode(s) :	UMTS Band II,LTE Band II/IV/VII/XII, WIFI 802.11b/g/n(20M)/n(40M),BT4.0 Dual mode		
Modulation:	QPSK; QPSK/16QAM; DSSS/OFDM; GFSK, π/4DQPSK, 8DPSK		
Operating Frequency Range(s):	Band	TX(MHz)	RX(MHz)
	UMTS Band II	1850~1910	1930~1990
	LTE Band II	1850~1910	1930~1990
	LTE Band IV	1710~1755	2110~2170
	LTE Band VII	2500~2570	2620~2690
	LTE Band XII	699~716	729~746
	WIFI 2.4G	2412~2462	
	BT	2402~2480	
Test Channels (low-mid-high):	9262-9400-9538(UMTS Band II)		
	18700-18900-19100(LTE Band II)		
	20050-20175-20300(LTE Band IV)		
	20850-21100-21350(LTE Band VII)		
	23060-23095-23130(LTE Band XII)		
	1-3-6-9-11 (WiFi 2.4G)		
	0-39-78 (BT)		
Power Source:	2500mAh 3.7V (Rechargeable Li-ion Battery)		

Remark: The tested sample and the sample information are provided by the client.

1.5 Test standard/s

ANSI Std C95.1-1992	Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
IEEE Std 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
RSS-102	Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands (Issue 5 of March 2015)
KDB 248227 D01	SAR guidance for IEEE 802.11(Wi-Fi) transmitters v02r02
KDB 447498 D01	General RF Exposure Guidance v06
KDB 690783 D01	SAR Listings on Grants v01r03
KDB 865664 D01	SAR Measurement 100 MHz to 6 GHz v01r04
KDB 865664 D02	RF Exposure Reporting v01r02
KDB 941225 D01	3G SAR Procedures v03r01
KDB 941225 D05	SAR for LTE Devices v02r05
KDB 941225 D07	UMPC Mini Tablet v01r02

1.6 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain/Body/Arms/Legs)	**1.60 mW/g**	8.00 mW/g
Spatial Average SAR** (Whole Body)	0.08 mW/g	0.40 mW/g
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	4.00 mW/g	20.00 mW/g

The limit applied in this test report is shown in bold letters

Notes:

* The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

** The Spatial Average value of the SAR averaged over the whole body.

*** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation.

1.7 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dW) absorbed by(dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ).

$$SAR = \frac{d}{dt}\left(\frac{dW}{dm}\right) = \frac{d}{dt}\left(\frac{dW}{\rho dV}\right)$$

SAR is expressed in units of watts per kilogram (W/kg). SAR can be related to the electric field at a point by

$$SAR = \frac{\sigma |E|^2}{\rho}$$

where:

σ = conductivity of the tissue (S/m)
ρ = mass density of the tissue (kg/m^3)
E = rms electric field strength (V/m)

1.8 Testing laboratory

Test Site	Centre Testing International Group Co., Ltd.
Test Location	Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China
Telephone	+86 (0) 755 3368 3668
Fax	+86 (0) 755 3368 3385

1.9 Test Environment

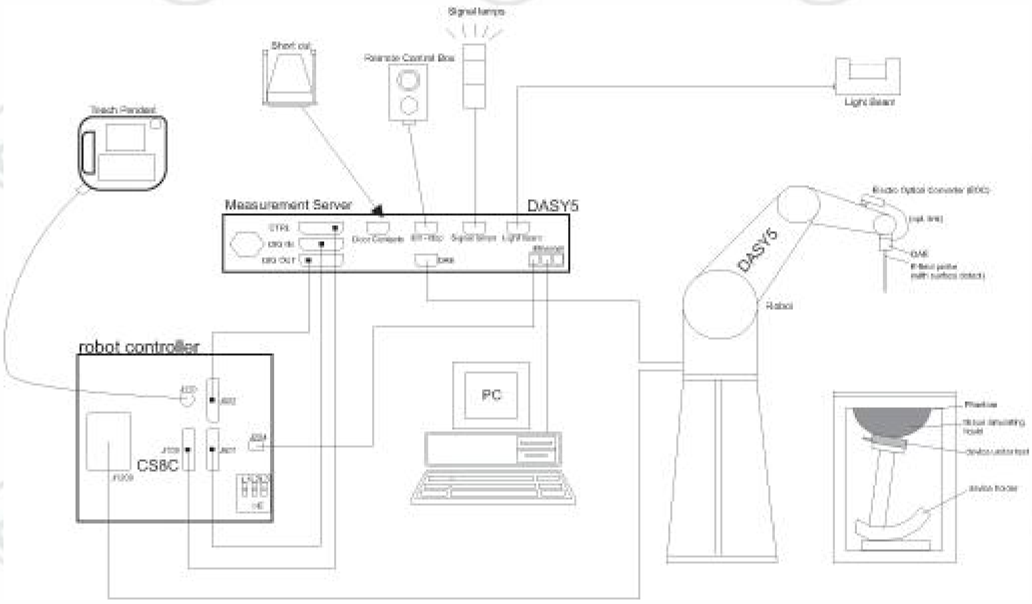
	Required	Actual
Ambient temperature:	18 – 25 °C	21.5 ± 2.0 °C
Tissue Simulating liquid:	18 – 25 °C	21.5 ± 2.0 °C
Relative humidity content:	30 – 70 %	30 – 70 %

1.10 Applicant and Manufacturer

Applicant/Client Name	BEWELL CONNECT CORP
Applicant Address	SUITE 410, 185 ALEWIFE BROOK PARKWAY CAMBRIDGE, Massachusetts, United States
Manufacturer Name	Visiomed Technology Co., Ltd
Manufacturer Address	2 Floor of No.1 Building, Jia An Technological Industrial Park, 67 District, Bao An, 518101 Shenzhen China
Factory	Visiomed Technology Co., Ltd
Address of Factory	2 Floor of No.1 Building, Jia An Technological Industrial Park, 67 District, Bao An, 518101 Shenzhen China

2 SAR Measurement System Description and Setup

2.1 The Measurement System Description



The DASY5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stäubli TX/RX family) 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.
- 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 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 Win7 profesional operating system 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.

2.2 Probe description

Dosimetric Probes: These probes are specially designed and calibrated for use in liquids with high permittivities. They should not be used in air, since the spherical isotropy in air is poor(±2 dB). The dosimetric probes have special calibrations in various liquids at different frequencies.

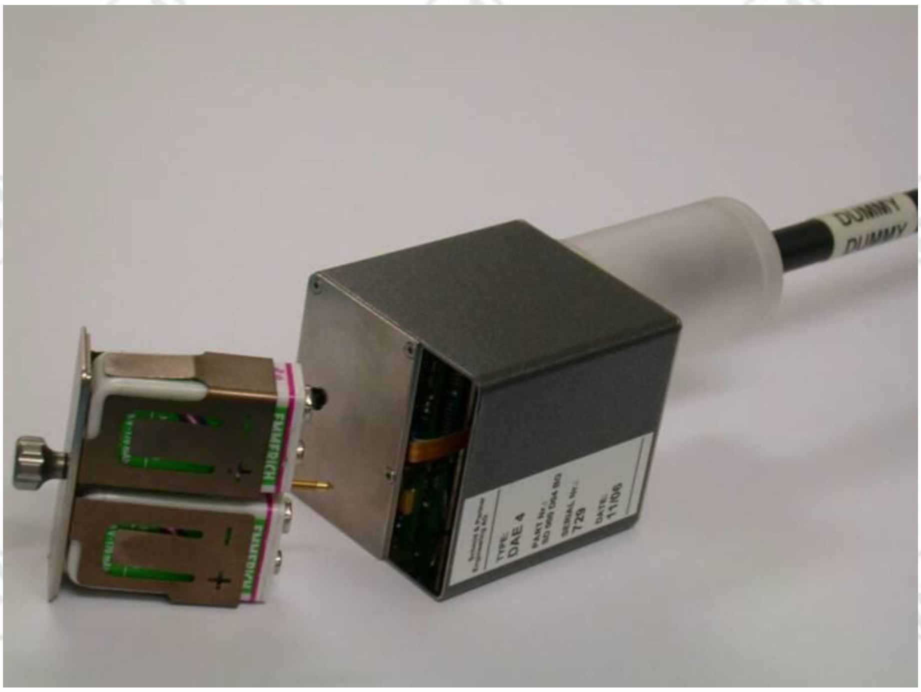
Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to 6 GHz; Linearity: ± 0.2 dB
Probe Overall Length	337mm
Probe Body Diameter	10mm
Tip Length	9mm
Tip Diameter	2.5mm
Dynamic range	5 μW/g to 100 mW/g; Linearity: ± 0.2 dB

2.3 Data Acquisition Electronics description

The data acquisition electronics (DAE4) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection. The input impedance of the DAE4 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

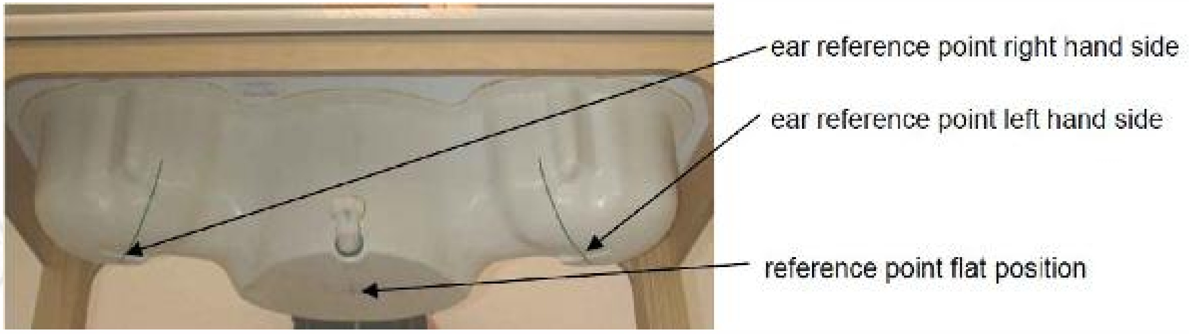
Batteries: The DAE works with either two standard 9V batteries or two 9V (actually 8.4V or 9.6 V) rechargeable batteries. Because the electronics automatically power-down unused components during braking or between measurements, the battery lifetime depends on system usage. Typical lifetimes are >20 hours for batteries and >10 hours for accus. Remove the batteries if you do not plan to use the DAE for a long period of time.



2.4 SAM Twin Phantom description

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

- ♦ Left hand
- ♦ Right hand
- ♦ Flat phantom



The phantom table for the DASY systems have the size of 100 x 50 x 85 cm (L xWx H). these tables are reinforced for mounting of the robot onto the table. For easy dislocation these tables have fork lift cut outs at the bottom.

The bottom plate contains three pairs of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections.

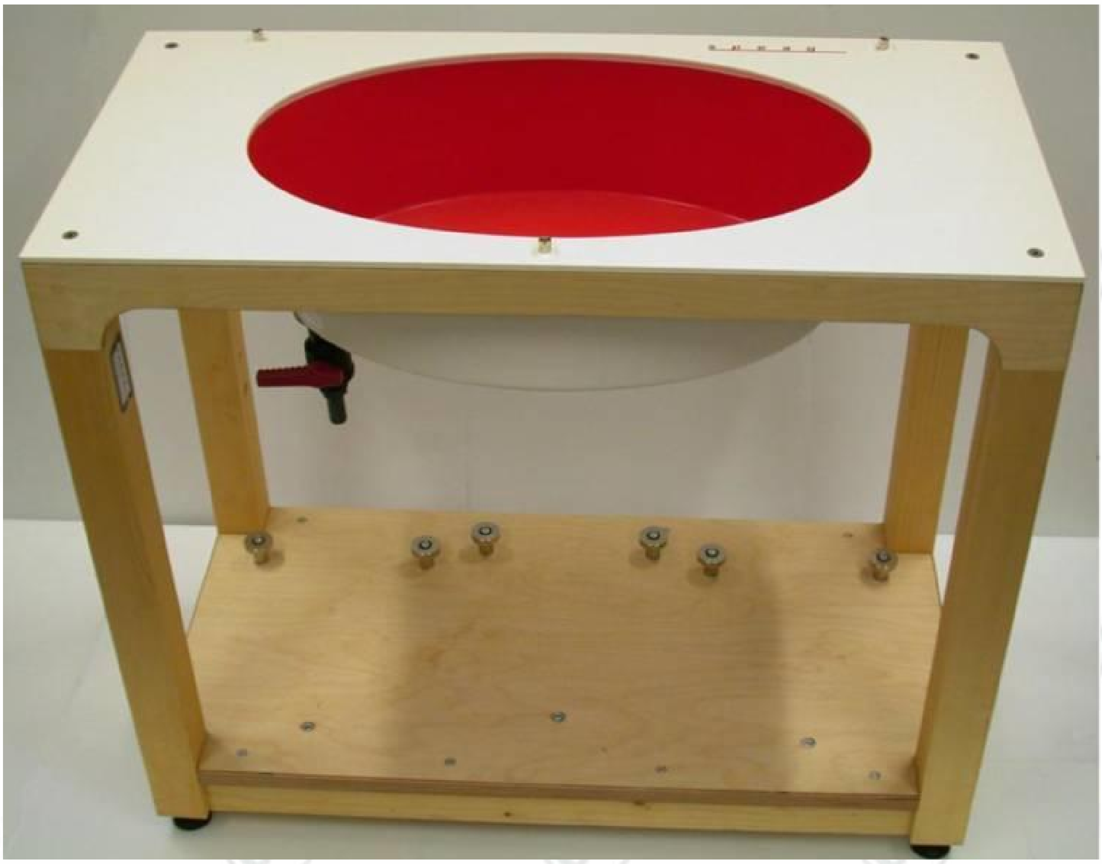
A white cover is provided to cover the phantom during off-periods to prevent water evaporation and changes in the liquid parameters.

Three reference marks are provided on the phantom counter. These reference marks are used to teach the absolute phantom position relative to the robot.

2.5 ELI4 Phantom description

The ELI4 phantom is intended for compliance testing of handheld and body mounted wireless devices in the frequency range of 30MHz to 6 GHz. ELI4 is fully compatible with the latest draft of the standard IEC 62209-2 and all known tissue simulating liquids.

ELI4 has been optimized regarding its performance and can be integrated into a SPEAG standard phantom table. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points



2.6 Device Holder description

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 at 5mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ±20%. 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 the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation centers for both scales is the ear reference point (ERP).Thus the device needs no repositioning when changing the angles.

The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity ε = 3 and loss tangent δ =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.

3 SAR Test Equipment List

To simplify the identification of the test equipment and/or ancillaries which were used, the reporting of the relevant test cases only refer to the test item number as specified in the table below.

	Manufacturer	Device Type	Type(Model)	Serial number	Date of last calibration	Valid period
☒	SPEAG	E-Field Probe	EX3DV4	7328	2017-02-29	One year
☒	SPEAG	1750 MHz Dipole	D1750V2	1134	2015-02-05	Three years
☒	SPEAG	1900 MHz Dipole	D1900V2	5d198	2015-02-06	Three years
☐	SPEAG	2000 MHz Dipole	D2000V2	1078	2015-02-05	Three years
☒	SPEAG	2450 MHz Dipole	D2450V2	959	2015-02-05	Three years
☒	SPEAG	2600 MHz Dipole	D2600V2	1101	2015-02-05	Three years
☐	SPEAG	5 GHz Dipole	D5GHzV2	1208	2015-02-03	Three years
☒	SPEAG	DAKS probe	DAKS-3.5	1052	2015-01-27	Three years
☒	SPEAG	Planar R140 Vector Reflectometer	DAKS-VNA R140	0200514	2015-01-27	Three years
☒	SPEAG	Data acquisition electronics	DAE4	1458	2017-02-22	One year
☒	SPEAG	Software	DASY 5	NA	NCR	NCR
☐	SPEAG	Twin Phantom	SAM V5.0	1875	NCR	NCR
☒	SPEAG	Flat Phantom	ELI V6.0	2024	NCR	NCR
☒	BALUN	Power Amplifier and directional coupler	SU319W	BLSZ1550140	NCR	NCR
☒	R & S	Universal Radio Communication Tester	CMU200	101553	2017-03-14	One year
☒	R & S	Universal Radio Communication Tester	CMW500	144383	2016-05-25	One year
☒	Agilent	Signal Generator	E4438C	MY45095744	2017-03-14	One year
☒	Agilent	Power Meter	E4418B	MY45104044	2016-12-16	One year
☒	Agilent	Power Meter Sensor	E9300A	MY41496140	2016-12-16	One year
☒	Agilent	Power Meter	PM2002	312901	2016-12-16	One year
☒	Agilent	Power Meter Sensor	51011A-EMC	36252	2016-12-16	One year

Note:1) Per KDB865664D01 requirements for dipole calibration, the test laboratory has adopted three-year extended calibration interval. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

a) There is no physical damage on the dipole;

b) System check with specific dipole is within 10% of calibrated value;

c) The most recent return-loss result, measured at least annually, deviates by no more than 20% from the previous measurement.

d) The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 5Ω from the previous measurement.

4 SAR Measurement Procedures

4.1 Spatial Peak SAR Evaluation

The DASY5 software includes all numerical procedures necessary to evaluate the spatial peak SAR values.The base for the evaluation is a "cube" measurement in a volume of 30mm^3 (7x7x7 points). The measured volume must include the 1 g and 10 g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan. If the 10g cube or both cubes are not entirely inside the measured volumes,the system issues a warning regarding the evaluated spatial peak values within the Postprocessing engine (SEMCAD X). This means that if the measured volume is shifted, higher values might be possible. To get the correct values you can use a finer measurement grid for the area scan. In complicated field distributions, a large grid spacing for the area scan might miss some details and give an incorrectly interpolated peak location. The entire evaluation of the spatial peak values is performed within the Postprocessing engine (SEMCAD X). The system always gives the maximum values for the 1 g and 10 g cubes.

The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. extraction of the measured data (grid and values) from the Zoom Scan
2. calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
3. generation of a high-resolution mesh within the measured volume
4. interpolation of all measured values from the measurement grid to the high-resolution grid
5. extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. calculation of the averaged SAR within masses of 1 g and 10 g

4.2 Data Storage and Evaluation

Data Storage

The DASY5 software stores the measured voltage acquired by the Data Acquisition Electronics (DAE) as raw data together with all the necessary software parameters for the data evaluation (probe calibration data, liquid parameters and communication system parameters) in measurement files with the extension .da5x. The postprocessing software evaluates the data every time the data is visualized or exported. This allows the verification and modification of the setup after completion of the measurement. For example, if a measurement has been performed with an incorrect crest factor, the parameter can be corrected afterwards and the data can be reevaluated.

To avoid unintentional parameter changes or data manipulations, the parameters in measured files are locked. In the administrator access mode of the software, the parameters can be unlocked. After changing the parameters, the measured scans can be reevaluated in the postprocessing engine.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type (e.g., E-field, H-field, SAR). Some of these units are not available in certain situations or give meaningless results, e.g., a SAR-output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

Data Evaluation

The fields and SAR are calculated from the measured voltage (probe voltage acquired by the DAE) and the following parameters:

Probe parameters:	- Sensitivity	$norm_i$, a_{i0}, a_{i1}, a_{i2}
	- Conversion Factor	$convF_i$
	- Diode Compression Point	dcp_i
	- Probe Modulation Response Factors	a_i, b_i, c_i, d
Device parameters:	- Frequency	f
	- Crest factor	cf
Media parameters:	- Conductivity	σ
	- Relative Permittivity	ρ

This parameters are stored in the DASY5 V52 measurement file.

These parameters must be correctly set in the DASY5 V52 software setup. They are available as configuration file and can be imported into the measurement file. The values displayed in the multimeter window are assessed using the parameters of the actual system setup. In the scan visualization and export modes, the parameters stored in the measurement file are used.

The measured voltage is not proportional to the exciting. It must be first linearized.

Approximated Probe Response Linearization using Crest Factor.

This linearization method is enabled when a custom defined communication system is measured. The compensation applied is a function of the measured voltage, the detector diode compression point and the crest factor of the measured signal.

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

with	V_i	=	linearized voltage of channel i (uV)	(i = x,y,z)
	U_i	=	measured voltage of channel i (uV)	(i = x,y,z)
	cf	=	crest factor of exciting field	(DASY parameter)

dcp_i = diode compression point of channel i (uV) (Probe parameter, i = x,y,z)

Field and SAR Calculation

The primary field data for each channel are calculated using the linearized voltage:

E - fieldprobes : $$E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

H - fieldprobes : $$H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

with V_i = linearized voltage of channel i (i = x,y,z)

$Norm_i$ = sensor sensitivity of channel i (i = x,y,z)

uV/(V/m)^2 for E-field Probes

ConvF = sensitivity enhancement in solution

a_{ij} = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

E_i = electric field strength of channel i in V/m

H_i = magnetic field strength of channel i in A/m

The RMS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

with SAR = local specific absorption rate in mW/g

E_{tot} = total field strength in V/m

σ = conductivity in [mho/m] or [Siemens/m]

ρ = equivalent tissue density in g/cm^3

Note that the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid.

Spatial Peak SAR for 1 g and 10 g

The DASY5 software includes all numerical procedures necessary to evaluate the spatial peak SAR values.The base for the evaluation is a "cube" measurement at the points of the fine cube grid consisting of 5 x 5 x 7 points(with 8mm horizontal resolution) or 7 x 7 x 7 points(with 5mm horizontal resolution) or 8 x 8 x 7 points(with 4mm horizontal resolution)..The entire evaluation of the spatial peak values is performed within the Postprocessing engine (SEMCAD X).The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. extraction of the measured data (grid and values) from the Zoom Scan.
2. calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters).
3. generation of a high-resolution mesh within the measured volume.
4. interpolation of all measured values from the measurement grid to the high-resolution grid
5. extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface.
6. calculation of the averaged SAR within masses of 1 g and 10 g.

4.3 Data Storage and Evaluation

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

Step 1: Power reference measurement

The Power Reference Measurement and Power Drift Measurement 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. By default, the Minimum distance of probe sensors to surface is 4 mm. This distance can be modified by the user, but cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties. The SAR measurement was taken at a selected spatial reference point to monitor power variations during testing. This fixed location point was measured and used as a reference value.

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 finer measurement around the hotspot. The sophisticated interpolation routines implemented in DASY5 software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maxima 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 1528-2003 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.

Step 3: Zoom Scan

The Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The default Zoom Scan is defined in the following table. DASY5 is also able to perform repeated zoom scans if more than 1 peak is found during area scan. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Area scan and Zoom scan resolutions per FCC KDB Publication 865664 D01:

Frequency	Maximun Area Scan resolution (Δx_{Area},Δy_{Area})	Maximun Zoom Scan spatial resolution (Δx_{Zoom},Δy_{Zoom})	Maximun Zoom Scan spatial resolution			Minimum zoom scan volume (x,y,z)
			Uniform Grid	Graded Grad		
			$\Delta z_{Zoom}(n)$	$\Delta z_{Zoom}(1)$*	$\Delta z_{Zoom}(n>1)$*	
≤ 2GHz	≤ 15mm	≤ 8mm	≤ 5mm	≤ 4mm	≤1.5*Δz_{Zoom}(n-1)	≥ 30mm
2-3GHz	≤ 12mm	≤ 5mm	≤ 5mm	≤ 4mm	≤1.5*Δz_{Zoom}(n-1)	≥ 30mm
3-4GHz	≤ 12mm	≤ 5mm	≤ 4mm	≤ 3mm	≤1.5*Δz_{Zoom}(n-1)	≥ 28mm
4-5GHz	≤ 10mm	≤ 4mm	≤ 3mm	≤ 2.5mm	≤1.5*Δz_{Zoom}(n-1)	≥ 25mm
5-6GHz	≤ 10mm	≤ 4mm	≤ 2mm	≤ 2mm	≤1.5*Δz_{Zoom}(n-1)	≥ 22mm

Step 4: Power Drift Monitoring

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement job 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. If the value changed by more than 5%, the evaluation should be retested.

5 SAR Verification Procedure

5.1 Tissue Verification

The following materials are used for producing the tissue-equivalent materials.
(Liquids used for tests are marked with☒):

Ingredients (% of weight)	Body Tissue					
frequency band	☐ 750	☐ 835	☒ 1750	☒ 1900	☒ 2450	☒ 2600
Water	50.3	52.5	69.91	69.91	73.20	64.50
Salt (NaCl)	1.60	1.40	0.13	0.13	0.04	0.02
Sugar	47.0	45.0	0.0	0.0	0.0	0.0
HEC	1.0	1.0	0.0	0.0	0.0	0.0
Bactericide	0.1	0.1	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0
DGBE	0.0	0.0	29.96	29.96	26.76	35.48

Salt: 99+% Pure Sodium Chloride
Sugar: 98+% Pure Sucrose
Water: De-ionized, 16MΩ+ 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
Tissue simulating liquids: parameters:

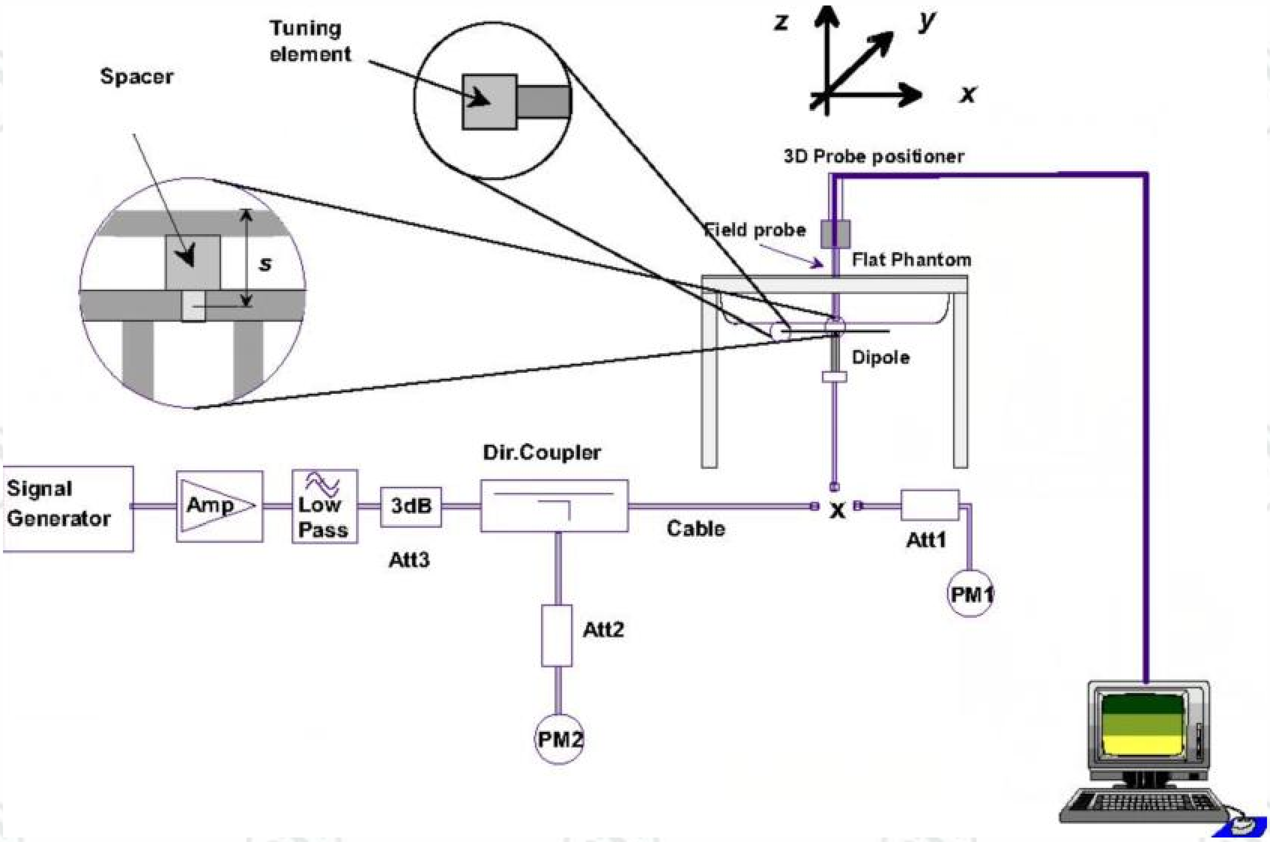
Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue		Liquid Temp.	Test Date
		ε_r (+/-5%)	σ (S/m) (+/-5%)	ε_r	σ (S/m)		
1750 Body	1710	53.50 (50.83~56.18)	1.46 (1.46~1.53)	53.38	1.480	21.68°C	2017/4/7
	1730	53.50 (50.83~56.18)	1.48 (1.41~1.55)	53.49	1.501		
	1750	53.40 (50.73~56.07)	1.49 (1.42~1.56)	53.38	1.521		
	1800	53.30 (50.64~55.97)	1.52 (1.44~1.60)	53.29	1.563		
1900 Body	1850	53.30 (50.64~55.97)	1.52 (1.44~1.60)	52.10	1.475	21.11°C	2017/4/5
	1880	53.30 (50.64~55.97)	1.52 (1.44~1.60)	51.90	1.510		
	1900	53.30 (50.64~55.97)	1.52 (1.44~1.60)	51.83	1.523		
	1910	53.30 (50.64~55.97)	1.52 (1.44~1.60)	51.84	1.542		
2450 Body	2410	52.80 (50.16~55.44)	1.91 (1.814~2.005)	51.58	1.857	21.20°C	2017/4/6
	2435	52.70 (50.07~55.34)	1.94 (1.843~2.037)	51.42	1.897		
	2450	52.70 (50.07~55.34)	1.95 (1.852~2.047)	51.45	1.909		

	2460	52.70 (50.07~55.34)	1.96 (1.862~2.058)	51.38	1.925		
2600 Body	2510	52.62 (49.99~55.25)	2.03 (1.93~2.13)	52.71	2.049	21.52°C	2017/4/2
	2535	52.59 (49.96~55.22)	2.07 (1.97~2.17)	52.63	2.072		
	2560	52.57 (49.94~55.20)	2.09 (1.99~2.19)	52.59	2.111		
	2600	52.50 (49.88~55.13)	2.16 (2.05~2.27)	52.35	2.151		
ε_r= Relative permittivity, σ= Conductivity							

5.2 System check procedure

The System check is performed by using a System check dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 100mW. To adjust this power a power meter is used. The power sensor is connected to the cable before the System check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the validation to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test (result on plot).

System check results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system.



5.3 System check results

The system Check is performed for verifying the accuracy of the complete measurement system and performance of the software. The following table shows System check results for all frequency bands and tissue liquids used during the tests (plot(s) see annex A).

System Check (MHz)	Target SAR (1W) (+/-10%)		Measured SAR (Normalized to 1W)		Liquid Temp.	Test Date
	1-g (mW/g)	10-g (mW/g)	1-g (mW/g)	10-g (mW/g)		
D1750V2 Body	37.70 (33.93~41.47)	20.20 (18.18~22.22)	36.50	19.40	21.68°C	2017/4/7
D1900V2 Body	41.00 (36.90~45.10)	21.70 (19.53~23.87)	42.30	22.40	21.11°C	2017/4/5
D2450V2 Body	51.20 (46.08~56.32)	23.70 (21.33~26.07)	51.20	24.10	21.20°C	2017/4/6
D2600V2 Body	55.50 (49.95~61.05)	24.80 (22.32~27.28)	54.80	24.70	21.52°C	2017/4/2
Note: All SAR values are normalized to 1W forward power.						

6 SAR Measurement variability and uncertainty

6.1 SAR measurement variability

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

6.2 SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04,when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

7 SAR Test Configuration

7.1 UMTS Test Configurations

1) RMC

As the SAR body tests for WCDMA Band II, we established the radio link through call processing. The maximum output power were verified on high, middle and low channels for each test band according to 3GPP TS 34.121 with the following configuration:

1) 12.2kbps RMC, 64,144,384 kbps RMC with TPC set to 'all 1'.
2) Test loop Mode 1.

For the output power, the configurations for the DPCCH and $DPDCH_1$ are as followed (EUT do not support the $DPDCH_{2-n}$)

	Channel Bit Rate (kbps)	Channel Symbol Rate (ksps)	Spreading Factor	Spreading Code Number	Bits/Slot
DPCCH	15	15	256	0	10
$DPDCH_1$	15	15	256	64	10
	30	30	128	32	20
	60	60	64	16	40
	120	120	32	8	80
	240	240	16	4	160
	480	480	8	2	320
	960	960	4	1	640
$DPDCH_n$	960	960	4	1, 2, 3	640

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits configured to all "1s". SAR for other spreading codes and multiple DPDCHn, when supported by the EUT, are not required when the maximum average outputs of each RF channel, for each spreading code and DPDCHn configuration, are less than ¼ dB higher than those measured in 12.2 kbps RMC.

2) HSDPA

SAR for body exposure configurations is measured according to the ''Body SAR Measurements'' procedures of 3G device. In addition, body SAR is also measured for HSDPA when the maximum average outputs of each RF channel with HSDPA active is at ¼ dB higher than that measured without HSDPA using 12.2kbps RMC or the maximum SAR 12.2kbps RMC is above 75% of the SAR limit. Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA.

HSDPA should be configured according to UE category of a test device. The number of HS-DSCH/ HS-PDSCHs, HAPRQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission condition, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. The β_c and β_d gain factors for DPCCH and DPDCH were set according to the values in the below table, β_{hs} for HS-DPCCH is set automatically to the correct value when ΔACK, ΔNACK, ΔCQI = 8. The variation of the β_c /β_d ratio causes a power reduction at sub-tests 2 - 4.

Sub-test	bβ_c	bβ_d	bβ_d (SF)	bβ_c /β_d	bβ_{hs} (1)	CM(dB)(2)	MPR (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0
2	12/15(3)	15/15(3)	64	12/15(3)	24/15	1.0	0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: ΔACK, ΔNACK and ΔCQI = 8Þ A_{hs} = β_{hs}/β_c = 30/15Þ β_{hs} = 30/15 * β_c

Note 2 : CM=1 for $\beta_c/\beta_{d=}$ 12/15, β_{hs}/β_c = 24/15. For all other combinations of DPDCH,DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 3 : For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to β_c = 11/15 and β_d = 15/15

The measurements were performed with a Fixed Reference Channel (FRC) and H-Set 1 QPSK.

Parameter	Value
Nominal average inf. bit rate	534 kbit/s
Inter-TTI Distance	3 TTI's
Number of HARQ Processes	2 Processes
Information Bit Payload	3202 Bits
MAC-d PDU size	336 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	4800 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	9600 SMLs
Coding Rate	0.67
Number of Physical Channel Codes	5

Note: settings of required H-Set 1 QPSK acc. to 3GPP 34.121

HS-DSCH Category	Maximum HS-DSCH Codes Received	Minimum Inter-TTI Interval	Maximum HS-DSCH Transport Block Bits/HS-DSCH TTI	Total Soft Channel Bits
1	5	3	7298	19200
2	5	3	7298	28800
3	5	2	7298	28800
4	5	2	7298	38400
5	5	1	7298	57600
6	5	1	7298	67200
7	10	1	14411	115200
8	10	1	14411	134400
9	15	1	25251	172800
10	15	1	27952	172800
11	5	2	3630	14400
12	5	1	3630	28800
13	15	1	34800	259200
14	15	1	42196	259200
15	15	1	23370	345600
16	15	1	27952	345600

3) HSUPA

Body SAR is also measured for HSDPA when the maximum average outputs of each RF channel with HSDPA active is at ¼ dB higher than that measured without HSDPA using 12.2kbps RMC or the maximum SAR 12.2kbps RMC is above 75% of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-set 1 and QPSK for FRC and 12.2kbps RMC configured in Test Loop Mode 1 with power control algorithm 2, according to the highest body SAR configuration in 12.2 kbps RMC without HSPA.

Due to inner loop power control requirements in HSDPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSDPA should be configured according to the b values indicated below as well as other applicable procedures described in the 'UMTS Handset' and 'Release 5 HSDPA Data Device' sections of 3G device.

Sub-test	bβ_c	bβ_d	β_d (SF)	bβ_c/β_d	bβ_{hs}(1)	bβ_{ec}	bβ_{ed}	β_{ec} (SF)	β_{ed} (code)	CM(2) (dB)	MPR (dB)	AG(4) Index	E-TFCI
1	11/15(3)	15/15(3)	64	11/15(3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}:47/15 β_{ed2}:47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15(4)	15/15(4)	64	15/15(4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: ∆ACK, ∆NACK and ∆CQI = 8Þ $A_{hs} = \beta_{hs}/\beta_c = 30/15$Þ $\beta_{hs} = 30/15 * \beta_c$

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference

Note 3 : For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$

Note 4 : For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$

Note 5 : Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to

TS 25.306 Table 5.1g

Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

UE E-DCH Category	Maximum E-DCH Codes Transmitted	Number of HARQ Processes	E-DCH TTI(ms)	Minimum Speading Factor	Maximum E-DCH Transport Block Bits	Max Rate (Mbps)
1	1	4	10	4	7110	0.7296
2	2	8	2	4	2798	1.4592
	2	4	10	4	14484	
3	2	4	10	4	14484	1.4592
4	2	8	2	2	5772	2.9185
	2	4	10	2	20000	2.00
5	2	4	10	2	20000	2.00
6 (No DPDCH)	4	8	10	2SF2&2SF4	11484	5.76
	4	4	2		20000	2.00
7 (No DPDCH)	4	8	2	2SF2&2SF4	22996	?
	4	4	10		20000	?

NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4. UE categories 1 to 6 support QPSK only. UE category 7 supports QPSK and 16QAM. (TS25.306-7.3.0)

7.2 LTE Test Configuration

SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices. The CMW500 WideBand Radio Communication Tester was used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing.SAR test were performed with the same number of RB and RB offsets transmitting on all TTI frames(Maximum TTI)

1) Spectrum Plots for RB configurations

A properly configured base station simulator was used for LTE output power measurements and SAR testing.Therefore, spectrum plots for RB configurations were not required to be included in this report.

2) MPR

When MPR is implemented permanently within the UE, regardless of network requirements, only those RB configurations allowed by 3GPP for the channel bandwidth and modulation combinations may be tested with MPR active. Configurations with RB allocations less than the RB thresholds required by 3GPP must be tested without MPR.

The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

3) A-MPR

A-MPR(Additional MPR) has been disabled for all SAR tests by using Network Signaling Value of “NS_01”on the base station simulator.

4) LTE procedures for SAR testing

4.1) Largest channel bandwidth standalone SAR test requirements

4.1.1)QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

4.1.2)QPSK with 50% RB allocation

The procedures required for 1 RB allocation in 4.1.1) are applied to measure the SAR for QPSK with 50% RB allocation.

4.1.3)QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in 4.1.1) and 4.1.2) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

4.1.4)Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

4.2) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section 4.1) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

7.3 WIFI 2.4G Test Configurations

For WiFi SAR testing, a communication link is set up with the testing software for WiFi mode test. During the test,at the each test frequency channel, the EUT is operated at the RF continuous emission mode. The RF signal utilized in SAR measurement has 100% duty cycle and its crest factor is 1. The test procedures in KDB 248227D01 v02r02 are applied.

Per KDB 248227 D01 802.11 Wi-Fi SAR v02r02,SAR Test Reduction criteria are as follows:

SAR test reduction for 802.11 Wi-Fi transmission mode configurations are considered separately for DSSS and OFDM. An initial test position is determined to reduce the number of tests required for certain exposure configurations with multiple test positions. An initial test configuration is determined for each frequency band and aggregated band according to maximum output power, channel bandwidth, wireless mode configurations and other operating parameters to streamline the measurement requirements. For 2.4 GHz DSSS, either the initial test position or DSSS procedure is applied to reduce the number of SAR tests; these are mutually exclusive. For OFDM, an initial test position is only applicable to next to the ear, UMPC mini-tablet and hotspot mode configurations, which is tested using the initial test configuration to facilitate test reduction. For other exposure conditions with a fixed test position, SAR test reduction is determined using only the initial test configuration.

The multiple test positions require SAR measurements in head, hotspot mode or UMPC mini-tablet configurations may be reduced according to the highest reported SAR determined using the *initial test position(s)* by applying the DSSS or OFDM SAR measurement procedures in the required wireless mode test configuration(s). The relative SAR levels of multiple exposure test positions can be established by area scan measurements on the highest measured output power channel to determine the initial test position. The area scans must be measured using the same SAR measurement configurations, including test channel, maximum output power, probe tip to phantom distance, scan resolution etc.

When the *reported* SAR for the *initial test position* is:

1) ≤0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and wireless mode combination within the frequency band or aggregated band. DSSS and OFDM configurations are considered separately according to the required SAR procedures.

2) > 0.4 W/kg, SAR is repeated using the same wireless mode test configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions are tested.

3) For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, measure the SAR for these positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required test channels are considered.

SAR is not required for the following 2.4 GHz OFDM conditions.

1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.

2) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

8 SAR Test Results

8.1 Conducted Power Measurements

8.1.1 Conducted Power of UMTS Band II

UMTS Band VII		Conducted Power (dBm)		
		9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	23.64	23.65	23.44
	64kbps RMC	23.53	23.59	23.39
	144kbps RMC	23.55	23.47	23.32
	384kbps RMC	23.23	23.51	23.19
HSDPA	Subtest 1	22.36	22.62	22.50
	Subtest 2	21.47	22.02	21.62
	Subtest 3	21.40	21.87	21.55
	Subtest 4	21.55	21.86	21.65
HSUPA	Subtest 1	22.29	22.14	21.99
	Subtest 2	21.03	20.94	21.41
	Subtest 3	21.16	20.68	21.00
	Subtest 4	21.62	21.78	21.67
	Subtest 5	22.13	22.28	22.12

8.1.2 Conducted Power of LTE Band II

Bandwidth	Modulation	RB size	RB offset	Channel 18607	Channel 18900	Channel 19193
1.4MHz	QPSK	1	0	23.44	23.55	23.66
		1	3	23.60	23.62	23.82
		1	5	23.51	23.61	23.65
		3	0	22.59	22.77	22.57
		3	2	22.62	22.81	22.56
		3	3	22.65	22.75	22.59
		6	0	22.64	22.68	22.62
	16QAM	1	0	23.47	23.58	23.48
		1	3	23.61	23.73	23.57
		1	5	23.37	23.51	23.45
		3	0	22.50	22.63	22.98
		3	2	22.41	22.63	22.93
		3	3	22.37	22.59	22.76
		6	0	21.54	21.75	21.30
Bandwidth	Modulation	RB size	RB offset	Channel 18615	Channel 18900	Channel 19185
3MHz	QPSK	1	0	23.54	23.90	23.48
		1	7	23.54	23.70	23.49
		1	14	23.63	23.90	23.56
		7	0	22.80	22.85	22.78
		7	4	22.77	22.84	22.74
		7	7	22.76	22.86	22.78
		15	0	22.68	22.75	22.67
	16QAM	1	0	23.26	23.28	23.45
		1	7	22.95	23.13	23.18
		1	14	22.92	23.51	23.33
		7	0	21.96	22.01	21.88
		7	4	21.94	22.02	21.85
		7	7	21.91	22.01	21.81
		15	0	21.77	21.84	21.68
Bandwidth	Modulation	RB size	RB offset	Channel 18625	Channel 18900	Channel 19175
5MHz	QPSK	1	0	23.46	23.51	23.40
		1	13	23.56	23.57	23.49
		1	24	23.76	23.81	23.72

		12	0	22.68	22.80	22.65
		12	6	22.61	22.74	22.61
		12	13	22.78	22.84	22.67
		25	0	22.63	22.81	22.63
	16QAM	1	0	22.86	22.91	22.87
		1	13	22.59	22.71	22.55
		1	24	22.77	22.97	22.81
		12	0	21.73	21.81	21.52
		12	6	21.52	21.80	21.48
		12	13	21.64	21.64	21.58
		25	0	21.73	21.72	21.68
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel
				18650	18900	19150
10MHz	QPSK	1	0	23.57	23.70	23.59
		1	25	23.43	23.80	23.61
		1	49	23.76	23.86	23.61
		25	0	22.71	22.80	22.63
		25	13	22.61	22.80	22.73
		25	25	22.59	22.85	22.74
		50	0	22.63	22.78	22.63
	16QAM	1	0	23.24	23.20	23.26
		1	25	22.69	23.43	23.26
		1	49	23.40	23.54	23.49
		25	0	21.74	21.73	21.66
		25	13	21.65	21.70	21.66
		25	25	21.50	21.70	21.59
		50	0	21.73	21.79	21.48

Bandwidth	Modulation	RB size	RB offset	Channel 18675	Channel 18900	Channel 19125
15MHz	QPSK	1	0	23.82	23.78	23.70
		1	38	23.48	23.59	23.54
		1	74	23.78	23.91	23.85
		36	0	22.77	22.83	22.72
		36	18	22.53	22.79	22.68
		36	39	22.64	22.94	22.74
		75	0	22.58	22.82	22.61
	16QAM	1	0	23.18	23.15	23.13
		1	38	22.77	22.89	22.89
		1	74	23.57	23.57	23.65
		36	0	21.80	21.84	21.66
		36	18	21.46	21.82	21.43
		36	39	21.59	21.96	21.77
		75	0	21.61	21.87	21.64
Bandwidth	Modulation	RB size	RB offset	Channel 18700	Channel 18900	Channel 19100
20MHz	QPSK	1	0	23.83	**23.97**	**24.14**
		1	50	23.76	23.84	23.88
		1	99	**23.99**	23.74	24.01
		50	0	**22.81**	22.86	**22.88**
		50	25	22.69	**22.92**	22.77
		50	50	22.61	22.75	22.73
		100	0	22.62	**22.77**	22.76
	16QAM	1	0	22.72	22.59	22.79
		1	50	22.25	22.61	22.25
		1	99	22.49	22.60	22.96
		50	0	21.89	21.85	21.81
		50	25	21.76	21.92	21.70
		50	50	21.72	21.80	21.69
		100	0	21.64	21.79	21.70

8.1.3 Conducted Power of LTE Band IV

Bandwidth	Modulation	RB size	RB offset	Channel 19957	Channel 20175	Channel 20393
1.4MHz	QPSK	1	0	22.85	22.55	22.24
		1	3	23.03	22.57	22.34
		1	5	22.67	22.48	22.40
		3	0	22.72	22.71	22.37
		3	2	22.75	22.64	22.32
		3	3	22.71	22.57	22.37
		6	0	21.67	21.65	21.43
	16QAM	1	0	22.56	22.37	22.15
		1	3	22.71	22.44	22.32
		1	5	22.47	22.29	22.14
		3	0	21.98	21.97	21.74
		3	2	22.07	21.97	21.73
		3	3	22.03	21.53	21.56
		6	0	20.64	20.72	20.39
Bandwidth	Modulation	RB size	RB offset	Channel 19965	Channel 20175	Channel 20385
3MHz	QPSK	1	0	22.70	22.97	22.40
		1	7	22.66	22.65	22.47
		1	14	22.86	22.79	22.72
		7	0	21.78	21.85	21.57
		7	4	21.84	21.71	21.56
		7	7	21.93	21.64	21.60
		15	0	21.85	21.74	21.45
	16QAM	1	0	22.54	22.52	21.95
		1	7	22.60	22.06	21.97
		1	14	22.66	22.16	22.17
		7	0	20.93	21.00	20.73
		7	4	21.01	20.89	20.76
		7	7	20.97	20.79	20.74
		15	0	20.92	20.63	20.51
Bandwidth	Modulation	RB size	RB offset	Channel 19975	Channel 20175	Channel 20375
5MHz	QPSK	1	0	22.57	22.74	22.43
		1	13	22.71	22.40	22.34
		1	24	23.07	22.55	22.51
		12	0	21.77	21.84	21.40
		12	6	21.77	21.63	21.40

		12	13	21.97	21.56	21.44
		25	0	21.84	21.71	21.38
	16QAM	1	0	21.54	21.91	21.06
		1	13	21.41	21.29	21.11
		1	24	22.15	21.42	21.59
		12	0	20.78	20.88	20.34
		12	6	20.60	20.76	20.38
		12	13	20.89	20.81	20.46
		25	0	21.02	20.80	20.59
Bandwidth	Modulation	RB size	RB offset	Channel 20000	Channel 20175	Channel 20350
10MHz	QPSK	1	0	22.91	23.01	22.65
		1	25	22.91	22.67	22.52
		1	49	23.28	22.31	22.77
		25	0	21.91	21.92	21.45
		25	13	21.99	21.67	21.50
		25	25	22.20	21.50	21.51
		50	0	21.91	21.68	21.40
	16QAM	1	0	22.50	22.88	22.02
		1	25	22.64	22.24	22.06
		1	49	22.98	21.93	22.47
		25	0	20.89	20.89	20.37
		25	13	20.87	20.63	20.53
		25	25	21.11	20.48	20.28
		50	0	20.83	20.76	20.40

Bandwidth	Modulation	RB size	RB offset	Channel 20025	Channel 20175	Channel 20325
15MHz	QPSK	1	0	22.93	22.91	22.56
		1	38	23.04	22.53	22.45
		1	74	23.38	22.48	22.87
		36	0	21.90	21.91	21.38
		36	18	22.15	21.71	21.35
		36	39	22.19	21.37	21.52
		75	0	22.10	21.78	21.41
	16QAM	1	0	22.28	22.83	21.89
		1	38	22.40	21.86	21.73
		1	74	23.12	21.76	22.54
		36	0	20.97	20.99	20.27
		36	18	21.22	20.70	20.26
		36	39	21.26	20.44	20.44
		75	0	21.09	20.88	20.51
Bandwidth	Modulation	RB size	RB offset	Channel 20050	Channel 20175	Channel 20300
20MHz	QPSK	1	0	23.15	**23.14**	22.84
		1	50	**23.46**	22.72	22.60
		1	99	23.39	22.41	**23.03**
		50	0	21.95	**21.97**	21.41
		50	25	**22.23**	21.68	**21.43**
		50	50	22.10	21.38	21.41
		100	0	**22.04**	21.63	21.33
	16QAM	1	0	21.48	21.69	21.16
		1	50	22.36	21.24	20.91
		1	99	22.09	20.78	21.80
		50	0	20.90	20.93	20.46
		50	25	21.28	20.72	20.50
		50	50	21.18	20.36	20.47
		100	0	21.02	20.70	20.41

8.1.4 Conducted Power of LTE Band VII

Bandwidth	Modulation	RB size	RB offset	Channel 20775	Channel 21100	Channel 21425
5MHz	QPSK	1	0	22.18	22.11	22.36
		1	13	22.34	22.08	21.79
		1	24	22.62	22.34	21.58
		12	0	21.34	21.18	21.54
		12	6	21.36	21.09	21.27
		12	13	21.61	21.29	21.34
		25	0	21.48	21.15	21.35
	16QAM	1	0	21.51	21.36	21.66
		1	13	21.32	20.84	21.11
		1	24	21.69	21.42	21.04
		12	0	20.53	20.08	20.36
		12	6	20.27	19.97	20.14
		12	13	20.44	20.16	20.17
		25	0	20.72	20.33	20.56
Bandwidth	Modulation	RB size	RB offset	Channel 20800	Channel 21100	Channel 21400
10MHz	QPSK	1	0	22.38	22.15	22.37
		1	25	22.26	21.92	22.02
		1	49	22.76	21.68	20.96
		25	0	21.44	21.26	21.66
		25	13	21.43	21.04	21.29
		25	25	21.56	21.27	21.26
		50	0	21.35	21.09	21.49
	16QAM	1	0	21.85	21.94	22.06
		1	25	22.05	21.69	21.79
		1	49	22.36	21.26	20.62
		25	0	20.38	20.06	20.56
		25	13	20.36	19.96	20.24
		25	25	20.67	20.17	20.19
		50	0	20.49	20.29	20.57

Bandwidth	Modulation	RB size	RB offset	Channel 20825	Channel 21100	Channel 21375
15MHz	QPSK	1	0	22.66	22.38	22.76
		1	38	22.40	22.02	22.37
		1	74	22.87	22.67	22.35
		36	0	21.72	21.38	21.76
		36	18	21.73	21.25	21.45
		36	39	21.71	21.48	21.52
		75	0	21.56	21.46	21.50
	16QAM	1	0	22.32	22.38	22.86
		1	38	21.78	21.49	21.81
		1	74	22.62	22.35	21.74
		36	0	20.66	20.41	20.74
		36	18	20.54	20.12	20.33
		36	39	20.74	20.43	20.42
		75	0	20.72	20.54	20.72
Bandwidth	Modulation	RB size	RB offset	Channel 20850	Channel 21100	Channel 21350
20MHz	QPSK	1	0	22.71	22.27	**22.85**
		1	50	**22.75**	22.17	22.57
		1	99	22.62	**22.80**	22.30
		50	0	21.62	21.32	**21.90**
		50	25	21.58	21.24	21.52
		50	50	21.54	21.41	21.47
		100	0	21.55	21.38	**21.64**
	16QAM	1	0	21.35	21.76	22.14
		1	50	21.64	20.67	21.42
		1	99	21.73	21.38	20.82
		50	0	20.53	20.30	20.85
		50	25	20.60	20.18	20.38
		50	50	20.55	20.36	20.40
		100	0	20.51	20.49	20.57

8.1.5 Conducted Power of WiFi 2.4G

The output power of WiFi 2.4G is as following:

Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Tune-up	Average Power(dBm)	SAR Test (Yes/No)
802.11b	1	2412	1	15.0	14.08	Yes
	6	2437		15.0	14.65	Yes
	11	2462		15.0	14.33	Yes
802.11g	1	2412	6	14.0	Not Required	No
	6	2437		14.0	Not Required	No
	11	2462		14.0	Not Required	No
802.11n (HT20)	1	2412	6.5	14.0	Not Required	No
	6	2437		14.0	Not Required	No
	11	2462		14.0	Not Required	No
802.11n (HT40)	3	2422	13.5	14.0	Not Required	No
	6	2437		14.0	Not Required	No
	9	2452		14.0	Not Required	No

Note: 1) An entry of “Not Required” means power measurement is not required according to the default power measurement procedures in KDB248227D01.

8.1.6 Conducted Power of BT

The output power of BT antenna is as following:

For Other than BT 4.0:

Average Conducted Power(dBm)			
Channel	0CH	39CH	78CH
GFSK	-4.64	-4.38	-4.35
π/4DQPSK	-3.70	-3.43	-3.48
8DPSK	-3.58	-3.32	-3.36

Note: 1) channel /Frequency: 0/2402, 39/2441, 78/2480

For BT 4.0:

Average Conducted Power(dBm)			
Channel	0CH	19CH	39CH
BT	1.06	2.47	1.35

Note: 1) channel /Frequency: 0/2402, 19/2440, 39/2480.

8.2 SAR test results

Notes:

1) Per KDB447498 D01v06, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is: ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz. When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.

2) Per KDB447498 D01v06, All measurement SAR result is scaled-up to account for tune-up tolerance is compliant.

3) Per KDB865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/Kg; if the deviation among the repeated measurement is ≤ 20%, and the measured SAR <1.45W/Kg, only one repeated measurement is required.

4) Per KDB865664 D02v01r02, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is > 1.5 W/kg, or > 7.0 W/kg for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing (Refer to appendix B for details).

8.2.1 Results overview of UMTS Band II

Test Position of Body With 5 mm	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up power (dBm)	Scaled SAR_{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Front Side	9400/1880	RMC	0.923	0.503	0.000	23.65	24.00	1.000	21.11°C
Back Side	9400/1880	RMC	0.254	0.158	0.020	23.65	24.00	0.275	21.11°C
Left Side	9400/1880	RMC	0.199	0.121	0.000	23.65	24.00	0.216	21.11°C
Right Side	9400/1880	RMC	0.145	0.089	0.190	23.65	24.00	0.157	21.11°C
Bottom Side	9400/1880	RMC	0.615	0.361	0.020	23.65	24.00	0.667	21.11°C
Front Side	9262/1852.4	RMC	0.921	0.502	0.160	23.64	24.00	1.001	21.11°C
Front Side	9538/1907.6	RMC	0.897	0.488	0.110	23.44	24.00	1.020	21.11°C
Front Side-Repeated	9400/1880	RMC	0.949	0.516	0.010	23.65	24.00	**1.029**	21.11°C

8.2.2 Results overview of LTE Band II

Test Position of Body With 5 mm	Test channel /Freq. (MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up power (dBm)	Scaled SAR_{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Front Side	19100/ 1900	20M QPSK 1RB#0	0.987	0.542	0.060	24.14	24.50	1.072	21.11°C
Back Side	19100/ 1900	20M QPSK 1RB#0	0.269	0.168	-0.050	24.14	24.50	0.292	21.11°C
Left Side	19100/ 1900	20M QPSK 1RB#0	0.206	0.124	0.030	24.14	24.50	0.224	21.11°C
Right Side	19100/ 1900	20M QPSK 1RB#0	0.146	0.090	0.060	24.14	24.50	0.159	21.11°C
Bottom Side	19100/ 1900	20M QPSK 1RB#0	0.697	0.418	-0.020	24.14	24.50	0.757	21.11°C
Front Side	18700/ 1860	20M QPSK 1RB#99	0.956	0.521	-0.060	23.99	24.50	**1.075**	21.11°C
Front Side-Repeated	18700/ 1860	20M QPSK 1RB#0	0.948	0.517	0.150	23.99	24.50	1.066	21.11°C
Front Side	18900/ 1880	20M QPSK 1RB#0	0.900	0.490	0.100	23.97	24.50	1.017	21.11°C
50%RB									
Front Side	18900/ 1880	20M QPSK 50%RB#25	0.751	0.406	-0.060	22.92	23.50	0.858	21.11°C
Back Side	18900/ 1880	20M QPSK 50%RB#25	0.265	0.165	-0.050	22.92	23.50	0.303	21.11°C
Left Side	18900/ 1880	20M QPSK 50%RB#25	0.203	0.122	0.000	22.92	23.50	0.232	21.11°C
Right Side	18900/ 1880	20M QPSK 50%RB#25	0.144	0.089	0.010	22.92	23.50	0.165	21.11°C
Bottom Side	18900/ 1880	20M QPSK 50%RB#25	0.507	0.299	0.110	22.92	23.50	0.579	21.11°C
Front Side	18700/ 1860	20M QPSK 50%RB#0	0.733	0.399	-0.140	22.81	23.50	0.859	21.11°C
Front Side	19100/ 1900	20M QPSK 50%RB#0	0.767	0.417	0.140	22.88	23.50	0.885	21.11°C
100%RB									
Front Side	18900/ 1880	20M QPSK 100%RB#0	0.756	0.410	0.070	22.77	23.50	0.894	21.11°C

8.2.3 Results overview of LTE Band IV

Test Position of Body With 5 mm	Test channel /Freq. (MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up power (dBm)	Scaled SAR_{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Front Side	20050/ 1720	20M QPSK 1RB#50	0.571	0.316	0.090	23.460	24.000	0.647	21.68°C
Back Side	20050/ 1720	20M QPSK 1RB#50	0.329	0.202	0.140	23.460	24.000	0.373	21.68°C
Left Side	20050/ 1720	20M QPSK 1RB#50	0.104	0.062	0.170	23.460	24.000	0.118	21.68°C
Right Side	20050/ 1720	20M QPSK 1RB#50	0.066	0.041	0.190	23.460	24.000	0.075	21.68°C
Bottom Side	20050/ 1720	20M QPSK 1RB#50	0.951	0.523	-0.010	23.460	24.000	1.077	21.68°C
Bottom Side	20175/ 1732.5	20M QPSK 1RB#0	0.926	0.519	0.130	23.140	24.000	1.129	21.68°C
Bottom Side	20300/ 1745	20M QPSK 1RB#99	1.000	0.550	0.110	23.030	24.000	**1.250**	21.68°C
Bottom Side -Repeated	20300/ 1745	20M QPSK 1RB#99	0.898	0.500	0.150	23.460	24.000	1.017	21.68°C
50%RB									
Front Side	20050/ 1720	20M QPSK 50%RB#25	0.475	0.262	0.130	22.230	23.000	0.567	21.68°C
Back Side	20050/ 1720	20M QPSK 50%RB#25	0.333	0.204	0.140	22.230	23.000	0.398	21.68°C
Left Side	20050/ 1720	20M QPSK 50%RB#25	0.103	0.062	0.160	22.230	23.000	0.123	21.68°C
Right Side	20050/ 1720	20M QPSK 50%RB#25	0.060	0.040	0.100	22.230	23.000	0.072	21.68°C
Bottom Side	20050/ 1720	20M QPSK 50%RB#25	0.761	0.420	0.030	22.230	23.000	0.909	21.68°C
Bottom Side	20300/ 1745	20M QPSK 50%RB#25	0.681	0.376	-0.080	21.430	23.000	0.978	21.68°C
Bottom Side	20175/ 1732.5	20M QPSK 50%RB#0	0.771	0.424	0.010	21.970	23.000	0.977	21.68°C
100%RB									
Bottom Side	20050/ 1720	20M QPSK 100%RB#0	0.765	0.422	-0.090	22.040	23.000	0.954	21.68°C

8.2.4 Results overview of LTE Band VII

Test Position of Body With 5 mm	Test channel /Freq. (MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up power (dBm)	Scaled SAR_{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Front Side	21350/ 2560	20M QPSK 1RB#0	0.827	0.373	0.160	22.85	23.50	**0.961**	21.52°C
Front Side -Repeated	21350/ 2560	20M QPSK 1RB#0	0.824	0.371	0.020	22.85	23.50	0.957	21.52°C
Back Side	21350/ 2560	20M QPSK 1RB#0	0.195	0.108	0.010	22.85	23.50	0.226	21.52°C
Left Side	21350/ 2560	20M QPSK 1RB#0	0.029	0.016	0.090	22.85	23.50	0.033	21.52°C
Right Side	21350/ 2560	20M QPSK 1RB#0	0.110	0.061	-0.110	22.85	23.50	0.128	21.52°C
Bottom Side	21350/ 2560	20M QPSK 1RB#0	0.827	0.392	-0.050	22.85	23.50	0.961	21.52°C
Front Side	20850/ 2510	20M QPSK 1RB#50	0.717	0.326	0.100	22.75	23.50	0.852	21.52°C
Front Side	21100/ 2535	20M QPSK 1RB#99	0.755	0.338	-0.050	22.80	23.50	0.887	21.52°C
Bottom Side	20850/ 2510	20M QPSK 1RB#50	0.762	0.389	-0.030	22.75	23.50	0.906	21.52°C
Bottom Side	21100/ 2535	20M QPSK 1RB#99	0.807	0.383	-0.070	22.80	23.50	0.948	21.52°C
50%RB									
Front Side	21350/ 2560	20M QPSK 50%RB#0	0.649	0.292	-0.100	21.90	22.50	0.745	21.52°C
Back Side	21350/ 2560	20M QPSK 50%RB#0	0.189	0.100	0.010	21.90	22.50	0.217	21.52°C
Left Side	21350/ 2560	20M QPSK 50%RB#0	0.003	0.001	-0.190	21.90	22.50	0.004	21.52°C
Right Side	21350/ 2560	20M QPSK 50%RB#0	0.110	0.060	0.010	21.90	22.50	0.126	21.52°C
Bottom Side	21350/ 2560	20M QPSK 50%RB#0	0.649	0.293	0.150	21.90	22.50	0.745	21.52°C
100%RB									
Bottom Side	21350/ 2560	20M QPSK 100%RB#0	0.651	0.295	0.110	21.64	22.50	0.794	21.52°C

8.2.5 Results overview of WiFi 2.4G

Test Position of Body With 5 mm	Test channel /Freq. (MHz)	Test Mode	SAR Value (W/kg)		Power Drift (dB)	Conducted Power (dBm)	Tune-up power (dBm)	Scaled SAR_{1-g} (W/kg)	Actual duty factor	Reported SAR 1-g (W/kg)
			1-g	10-g						
Front Side	6/2437	802.11b	0.230	0.099	0.080	14.65	15.00	0.249	98.50%	0.253
Back Side	6/2437	802.11b	0.035	0.020	0.080	14.65	15.00	0.038	98.50%	0.039
Right Side	6/2437	802.11b	0.207	0.097	0.080	14.65	15.00	0.224	98.50%	0.227
Bottom Side	6/2437	802.11b	0.007	0.003	0.120	14.65	15.00	0.008	98.50%	0.008
Front Side	1/2412	802.11b	0.270	0.118	0.130	14.08	15.00	**0.334**	98.50%	**0.339**
Front Side	11/2462	802.11b	0.269	0.116	0.050	14.33	15.00	0.314	98.50%	0.319

Note: Per KDB248227D01:

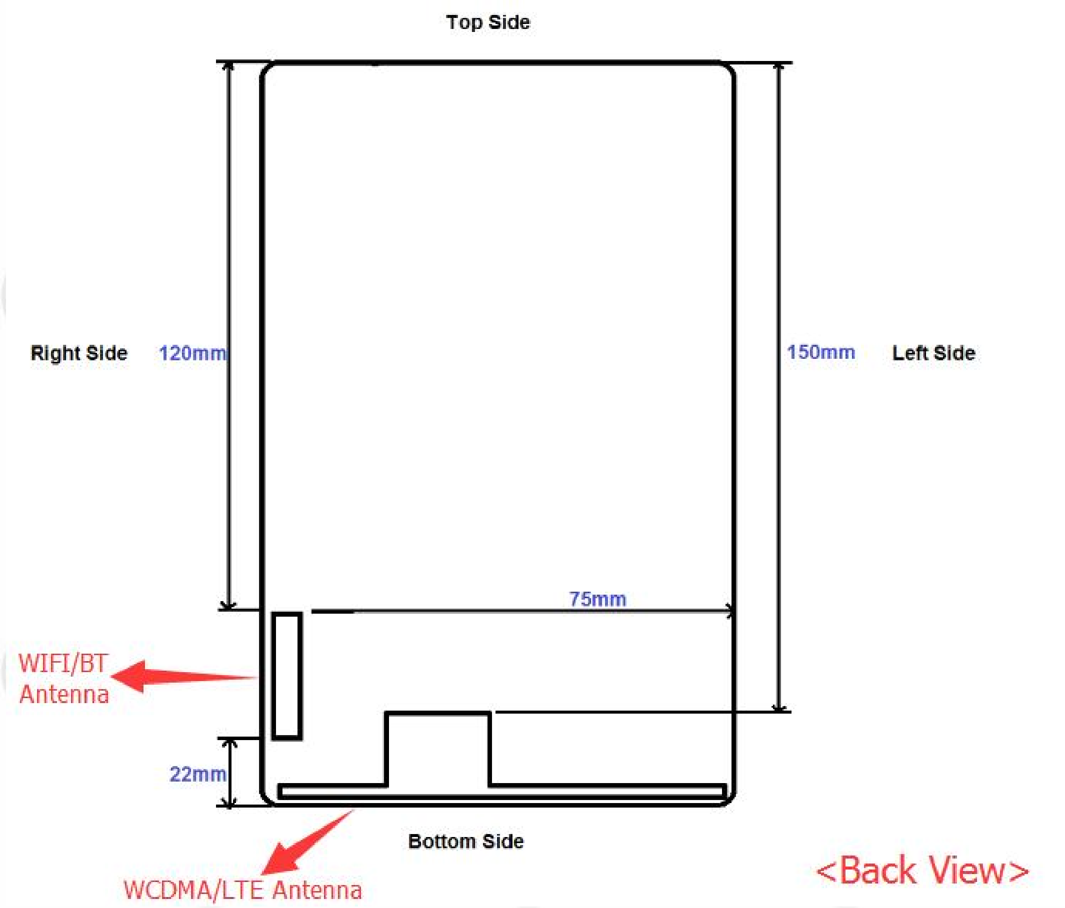
1) SAR is measured for 2.4 GHz 802.11b DSSS using initial test position procedure.

2) As the highest reported SAR for DSSS is adjusted by the ratio of OFDM 802.11g to DSSS specified maximum output power and the adjusted SAR is < 1.2 W/kg, so SAR for OFDM 802.11g is not required.

3) As the highest reported SAR for DSSS is adjusted by the ratio of OFDM 802.11n(20MHz)& 802.11n(40MHz) to DSSS specified maximum output power and the adjusted SAR is < 1.2 W/kg, so SAR for OFDM 802.11n(20MHz)& 802.11n(40MHz) are not required.

8.3 Multiple Transmitter Information

The location of the antennas inside BW-X07HD is shown as below picture:



Note:

Per KDB 941225 D07 , because the diagonal Length is＜200mm, it is considered a “ UMPC Mini-Tablet” device and need to test 5mm 1g Body SAR.

8.4 Stand-alone SAR

Per FCC KDB 447498D01:

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

2) At 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following:

a) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·(f(MHz)/150)]} mW, at 100 MHz to 1500 MHz

b) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·10]} mW at > 1500 MHz and ≤ 6 GHz

(Antennas <50mm to adjacent sides)

Band	Exposure Condition	f(GHz)	Pmax	Pmax	Seperation Distance(mm)						Calculated Valve						SAR Test (Yes or No)					
			dBm	mW	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side	Front Side	Back Side	Left Side	Right Side	Top Side	Bo S
UIMTS Band II	Body 0mm	1.900	24.00	251.19	5.0	5.0	5.0	5.0	150.0	5.0	69.25	69.25	69.25	69.25	>50mm	69.25	Yes	Yes	Yes	Yes	>50mm	Y
LTE Band II	Body 0mm	1.900	24.50	281.84	5.0	5.0	5.0	5.0	150.0	5.0	77.70	77.70	77.70	77.70	>50mm	77.70	Yes	Yes	Yes	Yes	>50mm	Y
LTE Band IV	Body 0mm	1.750	24.00	251.19	5.0	5.0	5.0	5.0	150.0	5.0	66.46	66.46	66.46	66.46	>50mm	66.46	Yes	Yes	Yes	Yes	>50mm	Y
LTE Band VII	Body 0mm	2.600	23.50	223.87	5.0	5.0	5.0	5.0	150.0	5.0	72.20	72.20	72.20	72.20	>50mm	72.20	Yes	Yes	Yes	Yes	>50mm	Y
WiFi 2.4G	Body 0mm	2.450	16.00	39.81	5.0	5.0	75.0	5.0	120.0	22.0	12.46	12.46	>50mm	12.46	>50mm	2.83	Yes	Yes	>50mm	Yes	>50mm	N
BT	Body 0mm	2.450	4.00	2.51	5.0	5.0	75.0	5.0	120.0	22.0	0.79	0.79	>50mm	0.79	>50mm	0.18	NO	NO	>50mm	NO	>50mm	N

(Antennas >50mm to adjacent sides)

Band	Exposure Condition	f(GHz)	Pmax	Pmax	Seperation Distance(mm)						Calculated Valve						SAR Test (Yes or No)					
			dBm	mW	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side	Front Side	Back Side	Left Side	Right Side	Top Side	Bo S
UIMTS Band II	Body 0mm	1.900	24.00	251.19	5.0	5.0	5.0	5.0	150.0	5.0	<50mm	<50mm	<50mm	<50mm	1109.00	<50mm	<50mm	<50mm	<50mm	<50mm	NO	<5
LTE Band II	Body 0mm	1.900	24.50	281.84	5.0	5.0	5.0	5.0	150.0	5.0	<50mm	<50mm	<50mm	<50mm	1109.00	<50mm	<50mm	<50mm	<50mm	<50mm	NO	<5
LTE Band IV	Body 0mm	1.750	24.00	251.19	5.0	5.0	5.0	5.0	150.0	5.0	<50mm	<50mm	<50mm	<50mm	1115.00	<50mm	<50mm	<50mm	<50mm	<50mm	NO	<5
LTE Band VII	Body 0mm	2.600	23.50	223.87	5.0	5.0	5.0	5.0	150.0	5.0	<50mm	<50mm	<50mm	<50mm	1093.00	<50mm	<50mm	<50mm	<50mm	<50mm	NO	<5
WiFi 2.4G	Body 0mm	2.450	16.00	39.81	5.0	5.0	75.0	5.0	120.0	22.0	<50mm	<50mm	346.00	<50mm	796.00	<50mm	<50mm	<50mm	NO	<50mm	NO	N
BT	Body 0mm	2.450	4.00	2.51	5.0	5.0	75.0	5.0	120.0	22.0	<50mm	<50mm	346.00	<50mm	796.00	<50mm	<50mm	<50mm	NO	<50mm	NO	N

3) When the standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to the following to determine simultaneous transmission SAR test exclusion:

(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)]·[√f(GHz)/x] W/kg for test separation distances ≤ 50 mm, where x = 7.5 for 1-g SAR.

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Mode	**Position**	**Pmax(dBm)**	**Pmax(mW)**	**Distance(mm)**	**f(GHz)**	**X**	**Estimated SAR(W/Kg)**
BT	Body 0mm	4	2.51	5.00	2.45	7.50	0.105

Note: 1) maximum possible output power (including tune-up tolerance) declared by manufacturer

4) When the minimum test separation distance is > 50 mm, the estimated SAR value is 0.4 W/kg.

For conditions where the estimated SAR is overly conservative for certain conditions, the test lab may choose to perform standalone SAR measurements and use the measured SAR to determine simultaneous transmission SAR test exclusion.

Band	Exposure Condition	f(GHz)	Pmax	Pmax	Seperation Distance(mm)						Estimated 1-g SARvalue (W/kg)					
			dBm	mW	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side	Front Side	Back Side	Left Side	Right Side	Top Side	Bottom Side
UIMTS Band II	Body 0mm	1.900	24.00	251.19	5.0	5.0	5.0	5.0	150.0	5.0	Measure	Measure	Measure	Measure	0.400	Measure
LTE Band II	Body 0mm	1.900	24.50	281.84	5.0	5.0	5.0	5.0	150.0	5.0	Measure	Measure	Measure	Measure	0.400	Measure
LTE Band IV	Body 0mm	1.750	24.00	251.19	5.0	5.0	5.0	5.0	150.0	5.0	Measure	Measure	Measure	Measure	0.400	Measure
LTE Band VII	Body 0mm	2.600	23.50	223.87	5.0	5.0	5.0	5.0	150.0	5.0	Measure	Measure	Measure	Measure	0.400	Measure
WiFi 2.4G	Body 0mm	2.450	16.00	39.81	5.0	5.0	75.0	5.0	120.0	22.0	Measure	Measure	0.400	Measure	0.400	Measure
BT	Body 0mm	2.450	4.00	2.51	5.0	5.0	75.0	5.0	120.0	22.0	0.105	0.105	0.400	0.105	0.400	0.105

Note: maximum possible output power (including tune-up tolerance) declared by manufacturer

8.5 Simultaneous Transmission Possibilities

The Simultaneous Transmission Possibilities of this device are as below:

Simultaneous Tx Combination	Configuration	Head	Body
1	UMTS/LTE + WiFi 2.4G	N/A	YES
2	UMTS/LTE + BT	N/A	YES

Note: 1)The device does not support simultaneous BT and WiFi 2.4G, because the BT and WiFi 2.4G share the same antenna and can't transmit simultaneously.

2) N/A: This device doesn't support voice mode, the head mode is not applicable.

8.6 SAR Summation Scenario

Test Position		3G/4G Antenna SARmax					WIFI/BT Antenna SARmax		∑1-g SAR	SPLSR
		UMTS Band II	LTE Band II	LTE Band IV	LTE Band VII	LTE Band XII*	WIFI 2.4G	BT		
Body 5mm	Front Side	1.029	1.075	0.647	0.961	0.492	0.339	0.105	1.414	NO
	Back Side	0.275	0.303	0.398	0.226	0.094	0.039	0.105	0.503	NO
	Left Side	0.216	0.232	0.123	0.033	0.104	0.400	0.400	0.632	NO
	Right Side	0.157	0.165	0.072	0.128	0.075	0.227	0.105	0.384	NO
	Top Side	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.800	NO
	Bottom Side	0.667	0.757	1.250	0.961	0.071	0.008	0.105	1.355	NO

Note: Simultaneous Tx Combination of UMTS&LTE antenna and 2.4G WiFi/BT.

*Tested data comes from Report No.:4787997676.1

8.7 Simultaneous Transmission Conlcusion

The above numeral summed SAR results is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore simultaneous transmission SAR with Volume Scans is not required per KDB 447498 D01v06

Annex A: Appendix A: SAR System performance Check Plots

(Please See Appendix A)

Annex B: Appendix B: SAR Measurement results Plots

(Please See Appendix B)

Annex C: Appendix C: Calibration reports

(Please See Appendix C)

Annex D: Appendix D: Photo documentation

(Please See Appendix D)

——END OF REPORT——

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.