FCC SAR Test Report

Product	**:**	3G smart phone
Trade mark	**:**	N/A
Model/Type reference	**:**	SP4541
Serial Number	**:**	N/A
Report Number	**:**	EED32H000601-4
FCC ID	**:**	2AETNSP4541
Date of Issue:	**:**	Jun. 04, 2015
Test Standards	**:**	FCC 47 CFR Part 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE Std 1528-2003
Test result	**:**	PASS

Prepared for:

WOO GLOBAL MARKETS, S.L.

Camino de Vinateros, 10. Bajo (Oficinas) 28030 MADRID – SPAIN

Prepared by:

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CENTRE TESTING INTERNATIONAL CTI SZ06

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Modified History

REV.	Modification Description	Issued Date	Remark
REV.1.0	Initial Test Report Relesse	2015-06-04	

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 (Shenzhen) Corporation 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:	2015-05-25
Start of test:	2015-05-25
End of test:	2015-06-03

1.3 Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for WOO GLOBAL MARKETS, S.L. Model Name: SP4541 are as below:

Band	**MAX Reported SAR (W/kg)**		
	1-g Head	**1-g Body-worn Accessory(15mm)**	**1-g Hotspot (10mm)**
GSM850	0.138	0.189	0.277
GSM1900	0.195	0.204	0.539
UMTS Band V	0.199	0.241	0.303
UMTS Band II	**0.396**	**0.434**	**0.716**
WiFi 2.4G	0.137	0.064	0.064
The highest simultaneous SAR is 0.780W/kg per KDB 690783 D01			

Note:

For body worn 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 the handset a minimum of 15mm 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 1528-2003 & IEEE Std 1528a-2005.

1.4 EUT Information

<table>
<tr><td colspan="4">Device Information:</td></tr>
<tr><td>Product Type:</td><td colspan="3">3G smart phone</td></tr>
<tr><td>Model:</td><td colspan="3">SP4541</td></tr>
<tr><td>FCC ID:</td><td colspan="3">2AETNSP4541</td></tr>
<tr><td>SN:</td><td colspan="3">N/A</td></tr>
<tr><td>Device Type:</td><td colspan="3">Portable device</td></tr>
<tr><td>Exposure Category:</td><td colspan="3">uncontrolled environment / general population</td></tr>
<tr><td>Hardware version:</td><td colspan="3">S21_7731G_MB_1_V1.0</td></tr>
<tr><td>Software version :</td><td colspan="3">NA</td></tr>
<tr><td>Antenna Type :</td><td colspan="3">internal antenna</td></tr>
<tr><td>Others Accessories:</td><td colspan="3">N/A</td></tr>
<tr><td colspan="4">Device Operating Configurations:</td></tr>
<tr><td>Supporting Mode(s) :</td><td colspan="3">GSM850/1900, UMTS Band V/II,
WiFi 2.4G(tested),BT</td></tr>
<tr><td>Duty Cycle used for SAR testing</td><td colspan="3">100%</td></tr>
<tr><td>Modulation:</td><td colspan="3">GMSK,QPSK, DSSS,OFDM,
GFSK, π/4DQPSK, 8DPSK</td></tr>
<tr><td>Device Class :</td><td colspan="3">Class B, No DTM Mode</td></tr>
<tr><td rowspan="7">Operating Frequency Range(s)</td><td>Band</td><td>TX(MHz)</td><td>RX(MHz)</td></tr>
<tr><td>GSM850</td><td>824-849</td><td>869-894</td></tr>
<tr><td>GSM1900</td><td>1850-1910</td><td>1930-1990</td></tr>
<tr><td>UMTS Band V</td><td>824-849</td><td>869-894</td></tr>
<tr><td>UMTS Band II</td><td>1850-1910</td><td>1930-1990</td></tr>
<tr><td>WIFI 2.4G</td><td>2412~2462</td><td>2412~2462</td></tr>
<tr><td>BT</td><td colspan="2">2402~2480</td></tr>
<tr><td>GPRS class level:</td><td colspan="3">GPRS class 12</td></tr>
<tr><td rowspan="6">Test Channels (low-mid-high):</td><td colspan="3">128-190-251 (GSM850)</td></tr>
<tr><td colspan="3">512-661-810 (GSM1900)</td></tr>
<tr><td colspan="3">4132-4182-4233 (UMTS Band V)</td></tr>
<tr><td colspan="3">9262-9400-9538 (UMTS Band II)</td></tr>
<tr><td colspan="3">1-6-11 (WiFi 2.4G)</td></tr>
<tr><td colspan="3">0-39-78 (BT 2450)</td></tr>
<tr><td>Power Source:</td><td colspan="3">DC3.7V (Li-on Rechargeable Battery)</td></tr>
</table>

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 1528-2003	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
IEEE Std 1528a-2005	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques Amendment 1: CAD File for Human Head Model (SAM Phantom)
FCC 47 CFR Part 2 (§ 2.1093)	Radiofrequency radiation exposure evaluation: portable devices.
RSS-102	Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands (Issue 5 of March 2015)
KDB 941225 D01	3G SAR Procedures v03
KDB 941225 D06	Hot Spot SAR v02
KDB 447498 D01	General RF Exposure Guidance v05r02
KDB 648474 D04	Handset SAR v01r02
KDB 248227 D01	802.11 Wi-Fi SAR v02
KDB 865664 D01	SAR Measurement 100 MHz to 6 GHz v01r03
KDB 865664 D02	RF Exposure Reporting v01r01

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 (Shenzhen) Corporation
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

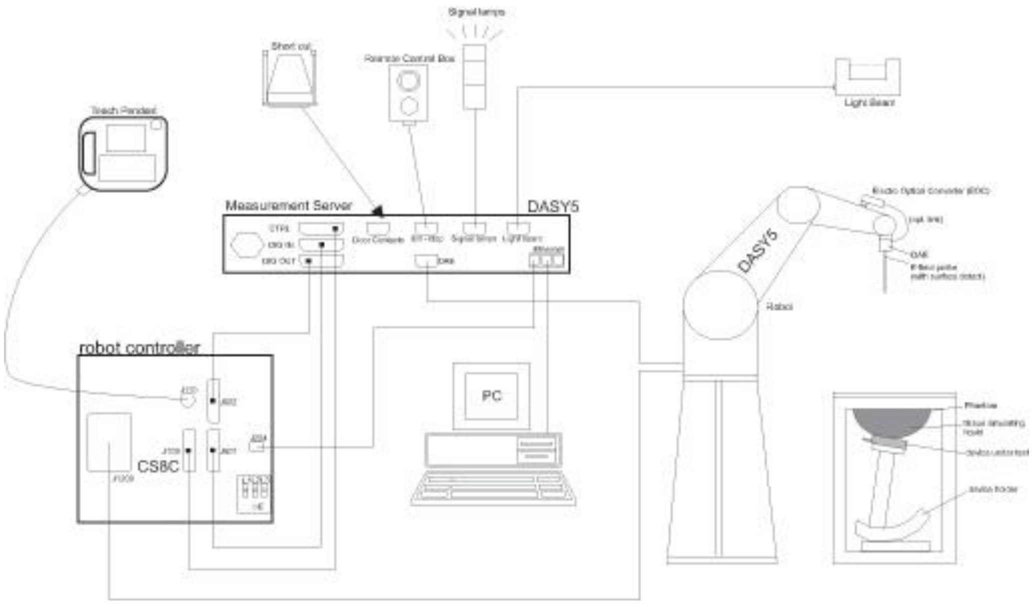
	Required	Actual
Ambient temperature:	18 – 25 °C	22 ± 2 °C
Tissue Simulating liquid:	22 ± 2 °C	22 ± 2 °C
Relative humidity content:	30 – 70 %	30 – 70 %

1.10 Applicant and Manufacturer

Applicant/Client Name	WOO GLOBAL MARKETS, S.L.
Applicant Address	Camino de Vinateros, 10. Bajo (Oficinas) 28030 MADRID - SPAIN
Manufacturer Name	WOO GLOBAL MARKETS, S.L.
Manufacturer Address	Camino de Vinateros, 10. Bajo (Oficinas) 28030 MADRID - SPAIN

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.

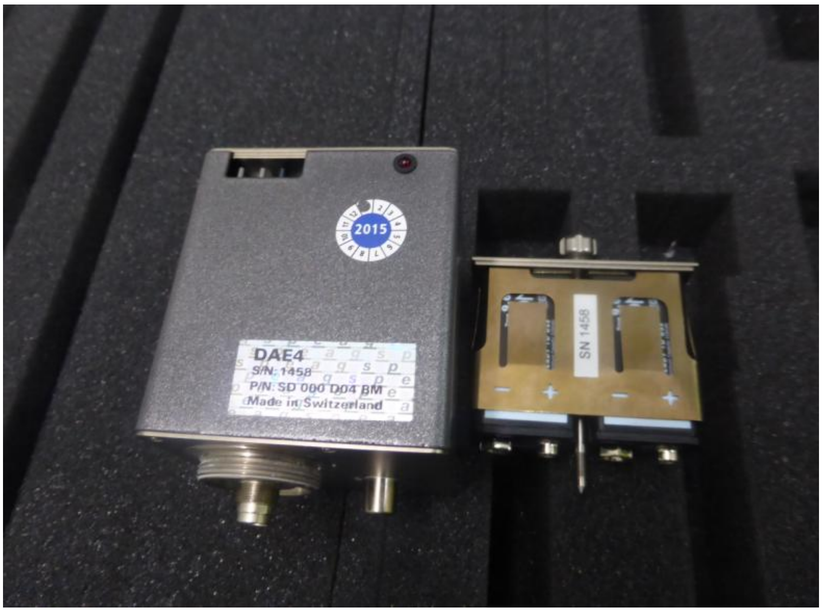
Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to 6 GHz; Linearity: ± 0.2 dB
Probe Overall 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.



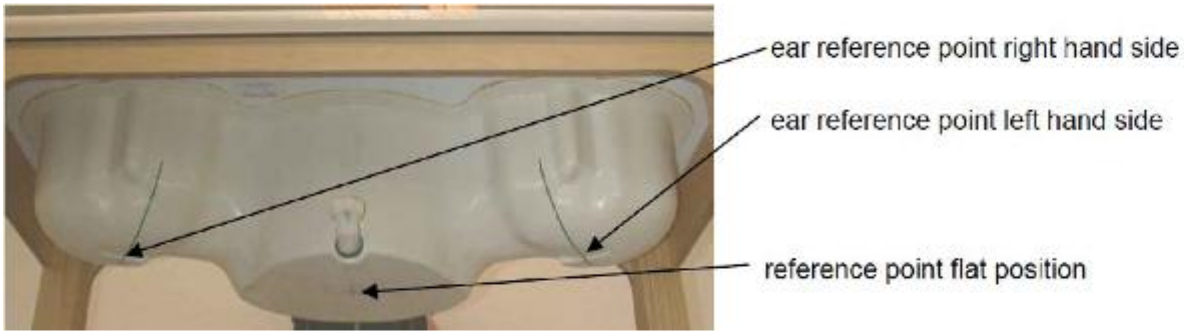
2.4 SAM Twin Phantom description

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.

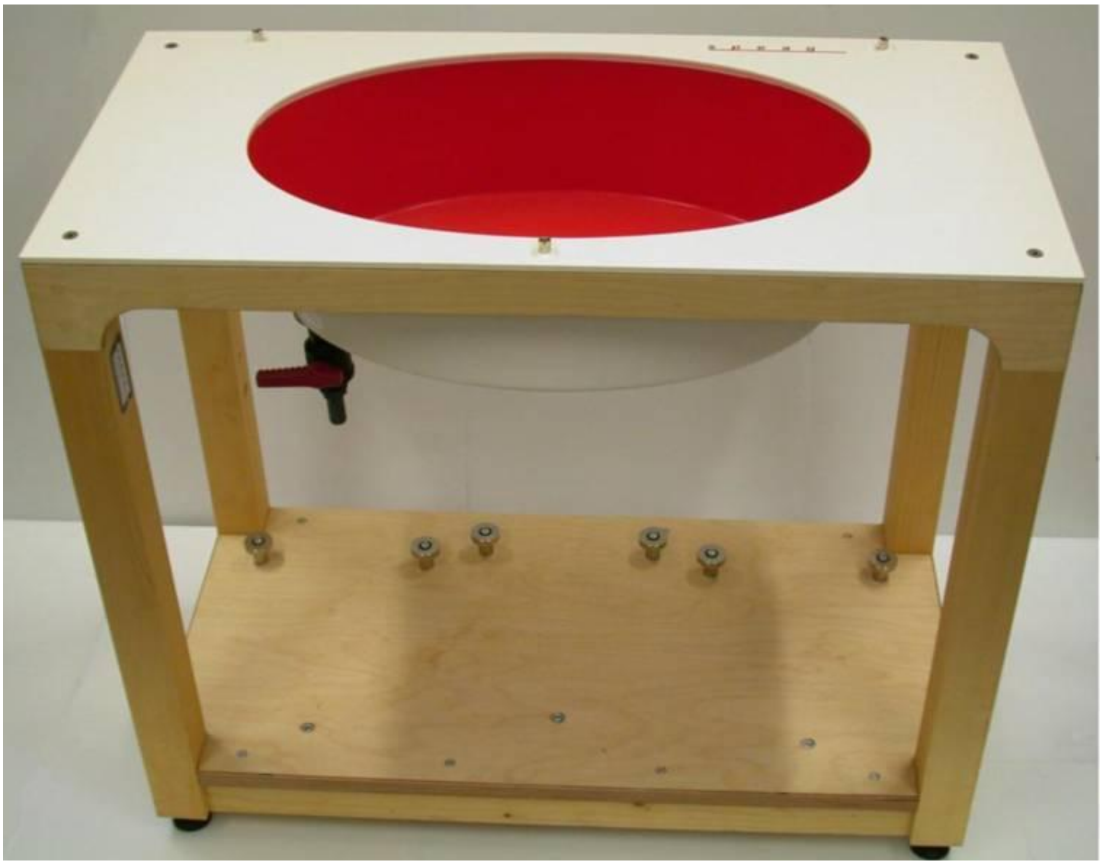
A white cover is provided to cover the phantom during off-periods to prevent water evaporation and changes in the liquid parameters.

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

The table below gives a complete overview of the SAR measurement equipment. Devices used during the test are marked ☒

	Manufacturer	Device Type	Type(Model)	Serial number	Date of last calibration	Valid period
☒	SPEAG	E-Field Probe	EX3DV4	7328	2015-02-06	One year
☒	SPEAG	835 MHz Dipole	D835V2	4d193	2015-02-02	Three years
☐	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	Data acquisition electronics	DAE4	1458	2015-01-03	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
☒	SPEAG	DAKS probe	DAKS-3.5	1052	2015-01-27	One year
☒	SPEAG	Planar R140 Vector Reflectometer	DAKS-VNA R140	0200514	2014-10-16	One year
☒	Agilent	Universal Radio Communication Tester	E5515C	101553	2015-05-20	One year
☒	R & S	Universal Radio Communication Tester	CMU200	101553	2015-05-20	One year
☒	Agilent	Signal Generator	E4438C	MY45095744	2015-01-15	One year
☒	BONN	Power Amplifier	BLMA0842-3	128983	2014-11-21	One year
☒	Agilent	Power Meter	PM2002	312901	2015-01-13	One year
☒	Agilent	Power Meter Sensor	51011A-EMC	36252	2015-01-13	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*$\Delta z_{Zoom}(n-1)$	≥ 30mm
2-3GHz	≤ 12mm	≤ 5mm	≤ 5mm	≤ 4mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥ 30mm
3-4GHz	≤ 12mm	≤ 5mm	≤ 4mm	≤ 3mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥ 28mm
4-5GHz	≤ 10mm	≤ 4mm	≤ 3mm	≤ 2.5mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥ 25mm
5-6GHz	≤ 10mm	≤ 4mm	≤ 2mm	≤ 2mm	≤1.5*$\Delta z_{Zoom}(n-1)$	≥ 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)	Head Tissue						
frequency band	☒ 835	☐ 900	☐ 1800	☒ 1900	☐ 2300	☒ 2450	☐ 2600
Water	41.45	40.92	52.64	54.9	62.82	62.7	55.242
Salt (NaCl)	1.45	1.48	0.36	0.18	0.51	0.5	0.306
Sugar	56.0	56.5	0.0	0.0	0.0	0.0	0.0
HEC	1.0	1.0	0.0	0.0	0.0	0.0	0.0
Bactericide	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	47.0	44.92	36.67	0.0	44.452

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

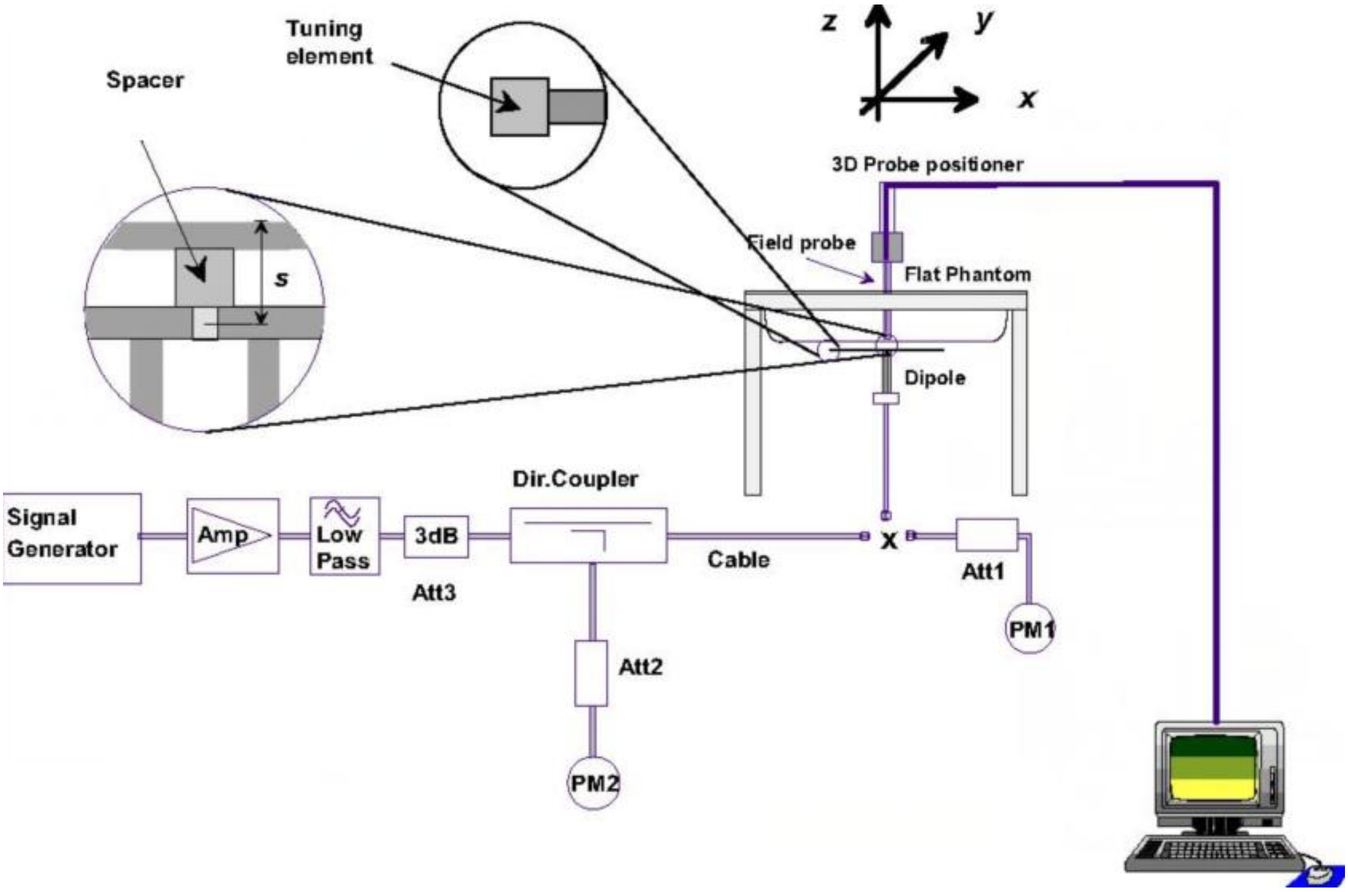
Tissue simulating liquids: parameters:

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)		
835H	825	41.60 (39.52~43.68)	0.90 (0.86~0.95)	41.52	0.879	21.0°C	2015/5/25

	835	41.50 (39.43~43.58)	0.90 (0.86~0.95)	41.41	0.881		
	850	41.50 (39.43~43.58)	0.92 (0.87~0.96)	41.31	0.893		
835B	825	55.20 (52.44~57.96)	0.97 (0.92~1.02)	54.44	0.964	21.0°C	2015/5/28
	835	55.20 (52.44~57.96)	0.97 (0.92~1.02)	54.40	0.967		
	850	55.20 (52.44~57.96)	0.99 (0.94~1.04)	54.33	0.971		
1900H	1850	40.00 (38.00~42.00)	1.40 (1.33~1.47)	38.82	1.346	21.0°C	2015/5/30
	1880	40.00 (38.00~42.00)	1.40 (1.33~1.47)	38.63	1.375		
	1900	40.00 (38.00~42.00)	1.40 (1.33~1.47)	38.65	1.394		
	1910	40.00 (38.00~42.00)	1.40 (1.33~1.47)	38.63	1.399		
1900B	1850	53.30 (50.64~55.97)	1.52 (1.44~1.60)	51.08	1.486	21.0°C	2015/5/27
	1880	53.30 (50.64~55.97)	1.52 (1.44~1.60)	50.93	1.515		
	1900	53.30 (50.64~55.97)	1.52 (1.44~1.60)	50.87	1.536		
	1910	53.30 (50.64~55.97)	1.52 (1.44~1.60)	50.82	1.544		
2450H	2410	39.30 (37.34~41.26)	1.76 (1.67~1.85)	38.32	1.753	21.0°C	2015/6/2
	2435	39.20 (37.24~41.16)	1.79 (1.70~1.88)	38.22	1.780		
	2450	39.20 (37.24~41.16)	1.80 (1.71~1.89)	38.21	1.802		
	2460	39.20 (37.24~41.16)	1.81 (1.72~1.90)	38.18	1.813		
2450B	2410	52.80 (50.16~55.44)	1.91 (1.81~2.00)	51.48	1.936	21.0°C	2015/6/3
	2435	52.70 (50.07~55.34)	1.94 (1.84~2.04)	51.30	1.968		
	2450	52.70 (50.07~55.34)	1.95 (1.85~2.05)	51.28	1.994		
	2460	52.70 (50.07~55.34)	1.96 (1.86~2.06)	51.27	2.007		
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 250mW. 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)		
835 Head	9.13 (8.22~10.04)	5.96 (5.36~6.56)	9.04	5.96	21.0°C	2015/05/25
1900 Head	40.60 (36.54~44.66)	21.40 (19.26~23.54)	43.20	22.56	21.0°C	2015/05/30
2450 Head	53.70 (48.33~59.07)	25.00 (22.50~27.50)	56.80	25.72	21.0°C	2015/06/02
835 Body	9.30 (8.37~10.23)	6.10 (5.49~6.71)	9.16	6.08	21.0°C	2015/05/28
1900 Body	41.00 (36.90~45.10)	21.70 (19.53~23.87)	44.40	23.36	21.0°C	2015/05/27
2450 Body	51.20 (46.08~56.32)	23.70 (21.33~26.07)	49.60	23.24	21.0°C	2015/06/03
Note: All SAR values are normalized to 1W forward power.						

6 SAR Measurement uncertainty evaluation

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03,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 1528-2003 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 GSM Test Configurations

SAR tests for GSM850 and GSM1900, a communication link is set up with a base station by air link. Using CMU200 the power lever is set to “5”and “0” in SAR of GSM850 and GSM1900. The tests in the band of GSM 850 and GSM 1900 are performed in the mode of GPRS function. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5.

7.2 UMTS Test Configurations

1) RMC

As the SAR body tests for WCDMA Band II/V, 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: Δ ACK, Δ NACK and Δ CQI = 8Þ A_{hs} = β_{hs}/β_c = 30/15Þ β_{hs} = 30/15 * β_c

Note 2 : CM=1 for β_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: Δ ACK, Δ NACK and Δ CQI = 8Þ $A_{hs} = \beta_{hs}/\beta_c$ = 30/15Þ β_{hs} = 30/15 * β_c

Note 2: CM = 1 for β_c/β_d = 12/15, β_{hs}/β_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 β_c = 10/15 and β_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 β_c = 14/15 and β_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)						

7.3 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 248227D01v02 are applied.

Per KDB 248227 D01 802.11 Wi-Fi SAR v02,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

1.For the measurements a Rohde & Schwarz Radio Communication Tester CMU200 was used.
2.Establish communication link between emulator and EUT and set EUT to operate at maximum output power all the time.
3.Source-based Time Averaged Burst Power Calculation:
For TDMA,the following duty cycle factor was used to calculate the Source-based Time Averaged power.

Number of Time slot	1	2	3	4
Duty cycle	1:8.3	1:4.1	1:2.77	1:2.08
Duty cycle factor	-9.19	-6.13	-4.42	-3.18

8.1.1 Conducted Power of GSM850

GSM850		Burst-Averaged output Power (dBm)			Division Factors	Source Based time Average Power(dBm)		
		128CH	190CH	251CH		128CH	190CH	251CH
GSM(CS)		31.95	31.95	31.82	-9.19	22.76	22.76	22.63
GPRS (GMSK)	1 Tx Slot	31.88	31.92	31.80	-9.19	22.69	22.73	22.61
	2 Tx Slots	30.16	30.36	29.99	-6.13	24.03	**24.23**	23.86
	3 Tx Slots	28.09	28.59	27.93	-4.42	23.67	24.17	23.51
	4 Tx Slots	26.55	26.63	26.00	-3.18	23.37	23.45	22.82

Note: 1) The conducted power of GSM850 is measured with RMS detector.
2) Source Based time Average Power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
3)The bolded GPRS 2Tx slots mode was selected for SAR testing according the highest Source Based time Average Power table.
4) channel /Frequency: 128/824.2,190/836.6,251/848.8

8.1.2 Conducted Power of GSM1900

GSM1900		Burst-Averaged output Power (dBm)			Division Factors	Source Based time Average Power(dBm)		
		512CH	661CH	810CH		512CH	661CH	810CH
GSM(CS)		29.87	29.40	29.48	-9.19	20.68	20.21	20.29
GPRS (GMSK)	1 Tx Slot	29.90	29.49	29.58	-9.19	20.71	20.30	20.39
	2 Tx Slots	27.65	27.77	27.76	-6.13	21.52	**21.64**	21.63
	3 Tx Slots	25.53	25.64	25.55	-4.42	21.11	21.22	21.13
	4 Tx Slots	23.84	24.23	24.37	-3.18	20.66	21.05	21.19

Note: 1) The conducted power of GSM1900 is measured with RMS detector.

2) Source Based time Average Power was calculated from the measured burst-averaged output power by converting the slot powers into linear units and calculating the energy over 8 timeslots.

3)The bolded GPRS 2Tx slots mode was selected for SAR testing according the highest Source Based time Average Power table.

4) channel /Frequency: 512/1850.2,661/1880,810/1909.8

8.1.3 Conducted Power of UMTS Band V

UMTS Band V		Conducted Power (dBm)		
		4132CH	4182CH	4233CH
WCDMA	12.2kbps RMC	22.81	22.94	22.99
	64kbps RMC	22.56	22.69	22.62
	144kbps RMC	22.60	22.71	22.61
	384kbps RMC	22.59	22.72	22.59
HSDPA	Subtest 1	22.65	22.76	22.59
	Subtest 2	22.68	22.77	22.58
	Subtest 3	22.70	22.75	22.64
	Subtest 4	22.65	22.71	22.59

Note: 1) channel /Frequency: 4132/826.4,4182/836.4,4233/846.6

8.1.4 Conducted Power of UMTS Band II

UMTS Band II		Conducted Power (dBm)		
		9262CH	9400CH	9538CH
WCDMA	12.2kbps RMC	23.02	22.80	22.66
	64kbps RMC	22.65	22.58	22.43
	144kbps RMC	22.55	22.49	22.36
	384kbps RMC	22.56	22.52	22.32
HSDPA	Subtest 1	22.23	22.25	22.32
	Subtest 2	22.33	22.35	22.36
	Subtest 3	22.46	22.48	22.45
	Subtest 4	22.44	22.44	22.39

Note: 1) channel /Frequency: 9612/1852.4,9400/1800,9538/1907.6

8.2 SAR test results

Notes:

1) Per KDB447498 D01v05 r02, the SAR test shall be performed at the high, middle and low frequency channels of each operating mode. If the scaled SAR measured at mid-band channel for each test configuration is at least 3.0 dB lower than the SAR limit (< 0.8 W/kg), testing at the high and low channels is optional.

2) Per KDB447498 D01v05r02, 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.

3) Per KDB447498 D01v05r02, All measurement SAR result is scaled-up to account for tune-up tolerance is compliant.

4) Per KDB648474 D04v01r02, SAR is evaluated without a headset connected to the device.When the standalone reported body-worn SAR is ≤1.2 W/kg, no additional SAR evaluations using a headset are required.

5) Per KDB648474 D04v01r02, body-worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.

6) Per KDB865664 D01v01r03,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.

7) Per KDB865664 D02v01r01, 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) Per KDB941225 D06v01r01, the DUT Dimension is bigger than 9 cm x 5 cm, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm,such position does not need to be tested.

9) Per KDB941225 D01v03, When the maximum output power and tune-up tolerance specified for production units in a Second mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

10) SIM1 and SIM2 is all the same, SAR is tested at SIM1 first and then tested at the worst position with SIM2.

8.2.1 Results overview of GSM850

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (%)	Conducted Power (dBm)	Tune-up power (dBm)	Scaled SAR_{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Left Hand Touched	190/836.6	GSM	0.096	0.087	-0.160	31.95	33.50	**0.138**	21.0°C
Left Hand Tilted 15°	190/836.6	GSM	0.066	0.052	0.020	31.95	33.50	0.095	21.0°C
Right Hand Touched	190/836.6	GSM	0.085	0.066	0.050	31.95	33.50	0.121	21.0°C
Right Hand Tilted 15°	190/836.6	GSM	0.068	0.052	0.180	31.95	33.50	0.097	21.0°C
Tested at the Worst position with SIM2									
Left Hand Touched	190/836.6	GSM	0.087	0.067	-0.160	31.95	33.50	0.124	21.0°C
Test Position of Body-worn With 15 mm	**Test channel /Frequency**	**Test Mode**	**SAR Value (W/kg)**		**Power Drift (%)**	**Conducted Power (dBm)**	**Tune-up power (dBm)**	**Scaled SAR_{1-g} (W/kg)**	**Liquid Temp.**
			1-g	**10-g**					
Front Side	190/836.6	GSM	0.116	0.088	0.080	31.95	33.50	0.166	21.0°C
Back Side	190/836.6	GSM	0.132	0.101	0.040	31.95	33.50	**0.189**	21.0°C
Tested at the Worst position with SIM2									
Back Side	190/836.6	GSM	0.130	0.099	-0.020	31.95	33.50	0.186	21.0°C
Test Position of Hotspot with 10mm	**Test channel /Frequency**	**Test Mode**	**SAR Value (W/kg)**		**Power Drift (%)**	**Conducted Power (dBm)**	**Tune-up power (dBm)**	**Scaled SAR_{1-g} (W/kg)**	**Liquid Temp.**
			1-g	**10-g**					
Front Side	190/836.6	GPRS 2TS	0.175	0.134	-0.060	30.36	31.50	0.228	21.0°C
Back Side	190/836.6	GPRS 2TS	0.213	0.164	0.040	30.36	31.50	**0.277**	21.0°C
Left Side	190/836.6	GPRS 2TS	0.055	0.038	-0.040	30.36	31.50	0.072	21.0°C
Right Side	190/836.6	GPRS 2TS	0.059	0.041	0.020	30.36	31.50	0.077	21.0°C
Bottom Side	190/836.6	GPRS 2TS	0.025	0.015	0.110	30.36	31.50	0.033	21.0°C
Tested at the Worst position with SIM2									
Back Side	190/836.6	GPRS 2TS	0.212	0.163	0.010	30.36	31.50	0.276	21.0°C

8.2.2 Results overview of GSM1900

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (%)	Conducted Power (dBm)	Tune-up power (dBm)	Scaled SAR_{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Left Hand Touched	661/1880	GSM	0.135	0.082	0.130	29.40	31.00	**0.195**	21.0°C
Left Hand Tilted 15°	661/1880	GSM	0.034	0.017	0.100	29.40	31.00	0.049	21.0°C
Right Hand Touched	661/1880	GSM	0.113	0.069	0.020	29.40	31.00	0.163	21.0°C
Right Hand Tilted 15°	661/1880	GSM	0.031	0.018	-0.016	29.40	31.00	0.045	21.0°C
Tested at the Worst position with SIM2									
Left Hand Touched	661/1880	GSM	0.121	0.074	0.110	29.40	31.00	0.175	21.0°C
Test Position of Body-worn With 15 mm	**Test channel /Frequency**	**Test Mode**	**SAR Value (W/kg)**		**Power Drift (%)**	**Conducted Power (dBm)**	**Tune-up power (dBm)**	**Scaled SAR_{1-g} (W/kg)**	**Liquid Temp.**
			1-g	**10-g**					
Front Side	661/1880	GSM	0.099	0.061	-0.060	29.40	31.00	0.143	21.0°C
Back Side	661/1880	GSM	0.139	0.086	0.040	29.40	31.00	0.201	21.0°C
Tested at the Worst position with SIM2									
Back Side	661/1880	GSM	0.141	0.086	-0.050	29.40	31.00	**0.204**	21.0°C
Test Position of Hotspot with 10mm	**Test channel /Frequency**	**Test Mode**	**SAR Value (W/kg)**		**Power Drift (%)**	**Conducted Power (dBm)**	**Tune-up power (dBm)**	**Scaled SAR_{1-g} (W/kg)**	**Liquid Temp.**
			1-g	**10-g**					
Front Side	661/1880	GPRS 2TS	0.215	0.132	0.140	27.77	29.00	0.285	21.0°C
Back Side	661/1880	GPRS 2TS	0.406	0.252	-0.170	27.77	29.00	**0.539**	21.0°C
Left Side	661/1880	GPRS 2TS	0.145	0.081	0.150	27.77	29.00	0.192	21.0°C
Right Side	661/1880	GPRS 2TS	0.036	0.022	0.090	27.77	29.00	0.048	21.0°C
Bottom Side	661/1880	GPRS 2TS	0.187	0.099	0.160	27.77	29.00	0.248	21.0°C
Tested at the Worst position with SIM2									
Back Side	661/1880	GPRS 2TS	0.390	0.234	-0.170	27.77	29.00	0.518	21.0°C

8.2.3 Results overview of UMTS Band V

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (%)	Conducted Power (dBm)	Tune-up power (dBm)	Scaled SAR_{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Left Hand Touched	4182/836.4	RMC	0.175	0.156	-0.180	22.94	23.50	**0.199**	21.0°C
Left Hand Tilted 15°	4182/836.4	RMC	0.123	0.107	0.100	22.94	23.50	0.140	21.0°C
Right Hand Touched	4182/836.4	RMC	0.160	0.110	-0.080	22.94	23.50	0.182	21.0°C
Right Hand Tilted 15°	4182/836.4	RMC	0.127	0.110	0.170	22.94	23.50	0.144	21.0°C
Tested at the Worst position with SIM2									
Left Hand Touched	4182/836.4	RMC	0.170	0.151	-0.160	22.94	23.50	0.193	21.0°C
Test Position of Body-worn With 15 mm	**Test channel /Frequency**	**Test Mode**	**SAR Value (W/kg)**		**Power Drift (%)**	**Conducted Power (dBm)**	**Tune-up power (dBm)**	**Scaled SAR_{1-g} (W/kg)**	**Liquid Temp.**
			1-g	**10-g**					
Front Side	4182/836.4	RMC	0.184	0.140	-0.100	22.94	23.50	0.209	21.0°C
Back Side	4182/836.4	RMC	0.212	0.162	0.100	22.94	23.50	**0.241**	21.0°C
Tested at the Worst position with SIM2									
Back Side	4182/836.4	RMC	0.185	0.136	0.180	22.94	23.50	0.210	21.0°C
Test Position of Hotspot with 10mm	**Test channel /Frequency**	**Test Mode**	**SAR Value (W/kg)**		**Power Drift (%)**	**Conducted Power (dBm)**	**Tune-up power (dBm)**	**Scaled SAR_{1-g} (W/kg)**	**Liquid Temp.**
			1-g	**10-g**					
Front Side	4182/836.4	RMC	0.218	0.168	0.040	22.94	23.50	0.248	21.0°C
Back Side	4182/836.4	RMC	0.266	0.205	0.160	22.94	23.50	**0.303**	21.0°C
Left Side	4182/836.4	RMC	0.060	0.042	-0.030	22.94	23.50	0.068	21.0°C
Right Side	4182/836.4	RMC	0.064	0.044	-0.130	22.94	23.50	0.073	21.0°C
Bottom Side	4182/836.4	RMC	0.022	0.013	0.140	22.94	23.50	0.024	21.0°C
Tested at the Worst position with SIM2									
Back Side	4182/836.4	RMC	0.254	0.184	0.030	22.94	23.50	0.289	21.0°C

8.2.4 Results overview of UMTS Band II

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (%)	Conducted Power (dBm)	Tune-up power (dBm)	Scaled SAR_{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
Left Hand Touched	9400/1800	RMC	0.337	0.205	0.160	22.80	23.50	**0.396**	21.0°C
Left Hand Tilted 15°	9400/1800	RMC	0.113	0.071	-0.090	22.80	23.50	0.133	21.0°C
Right Hand Touched	9400/1800	RMC	0.309	0.187	0.110	22.80	23.50	0.363	21.0°C
Right Hand Tilted 15°	9400/1800	RMC	0.085	0.053	0.170	22.80	23.50	0.100	21.0°C
Tested at the Worst position with SIM2									
Left Hand Touched	9400/1800	RMC	0.309	0.194	-0.150	22.80	23.50	0.363	21.0°C
Test Position of Body-worn With 15 mm	**Test channel /Frequency**	**Test Mode**	**SAR Value (W/kg)**		**Power Drift (%)**	**Conducted Power (dBm)**	**Tune-up power (dBm)**	**Scaled SAR_{1-g} (W/kg)**	**Liquid Temp.**
			1-g	**10-g**					
Front Side	9400/1800	RMC	0.280	0.176	0.110	22.80	23.50	0.329	21.0°C
Back Side	9400/1800	RMC	0.369	0.229	-0.010	22.80	23.50	**0.434**	21.0°C
Tested at the Worst position with SIM2									
Back Side	9400/1800	RMC	0.288	0.171	0.170	22.80	23.50	0.338	21.0°C
Test Position of Hotspot with 10mm	**Test channel /Frequency**	**Test Mode**	**SAR Value (W/kg)**		**Power Drift (%)**	**Conducted Power (dBm)**	**Tune-up power (dBm)**	**Scaled SAR_{1-g} (W/kg)**	**Liquid Temp.**
			1-g	**10-g**					
Front Side	9400/1800	RMC	0.438	0.271	0.100	22.80	23.50	0.515	21.0°C
Back Side	9400/1800	RMC	0.609	0.370	0.150	22.80	23.50	**0.716**	21.0°C
Left Side	9400/1800	RMC	0.254	0.146	0.090	22.80	23.50	0.298	21.0°C
Right Side	9400/1800	RMC	0.074	0.046	0.070	22.80	23.50	0.087	21.0°C
Bottom Side	9400/1800	RMC	0.354	0.195	-0.130	22.80	23.50	0.416	21.0°C
Tested at the Worst position with SIM2									
Back Side	9400/1800	RMC	0.532	0.324	0.050	22.80	23.50	0.625	21.0°C

8.2.5 Results overview of WiFi 2.4G

Test Position of Head	Test channel /Freq.(MHz)	Test Mode	SAR Value (W/kg)		Power Drift (%)	Conducted Power (dBm)	Tune-up power (dBm)	Scaled SAR_{1-g} (W/kg)	Liquid Temp.
			1-g	10-g					
determine the initial test position by Area Scan measurements									
Left Hand Touched	1/2412	802.11b	0.047	0.024	-0.180				21.0°C
Left Hand Tilted 15°	1/2412	802.11b	0.051	0.024	-0.130				21.0°C
Right Hand Touched	1/2412	802.11b	0.144	0.064	0.060				21.0°C
Right Hand Tilted 15°	1/2412	802.11b	0.121	0.053	-0.110				21.0°C
Tested at the Worst position with Zoom Scan									
Right Hand Touched	1/2412	802.11b	0.127	0.048	-0.020	16.16	16.50	**0.137**	21.0°C
Test Position of Body-worn &Hotspot with 10mm	**Test channel /Frequency**	**Test Mode**	**SAR Value (W/kg)**		**Power Drift (%)**	**Conducted Power (dBm)**	**Tune-up power (dBm)**	**Scaled SAR_{1-g} (W/kg)**	**Liquid Temp.**
			1-g	**10-g**					
determine the initial test position by Area Scan measurements									
Front Side	1/2412	802.11b	0.042	0.018	0.030				21.0°C
Back Side	1/2412	802.11b	0.061	0.026	0.100				21.0°C
Left Side	1/2412	802.11b	0.012	0.004	0.130				21.0°C
Top Side	1/2412	802.11b	0.031	0.013	0.080				21.0°C
Tested at the Worst position with Zoom Scan									
Back Side	1/2412	802.11b	0.060	0.025	0.100	16.16	16.50	**0.064**	21.0°C

8.3 SAR measurement variability

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01. 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.

8.4 Multiple Transmitter Information

The output power of BT antenna is as following:

For BT 3.0:

Average Conducted Power(dBm)			
Channel	0CH	39CH	78CH
GFSK	2.11	2.94	3.21
π/4DQPSK	3.43	4.33	4.74
8DPSK	3.64	4.74	**5.06**

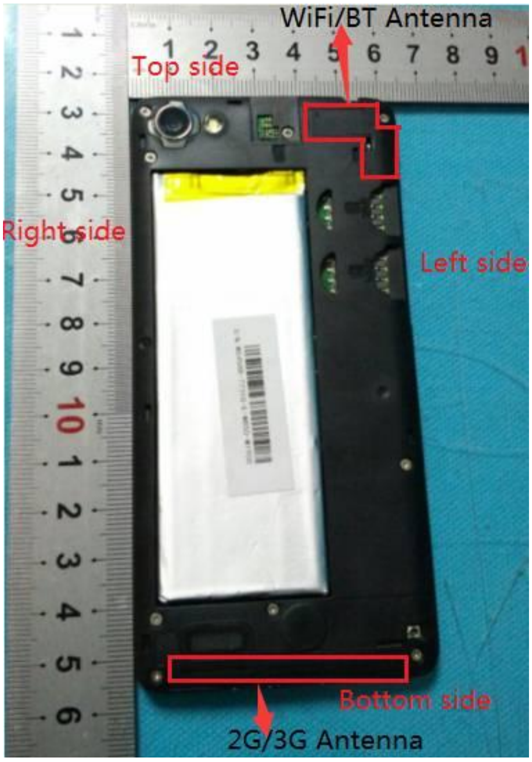
Note: 1) channel /Frequency:0/2402,39/2441,78/2480

The output power of WiFi 2.4G is as following:

Wi-Fi	Average Conducted Power(dBm)								
2450MHz	Channel	1	2	5.5	11	/	/	/	/
802.11b	1	**16.16**	16.13	16.11	16.08	/	/	/	/
	6	15.41	15.40	15.34	15.38	/	/	/	/
	11	15.78	15.70	15.65	15.66	/	/	/	/
802.11g	Channel	6	9	12	18	24	36	48	54
	1	12.36	12.33	12.30	12.35	12.28	12.29	12.25	12.26
	6	12.97	12.93	12.95	12.87	12.88	12.90	12.81	12.85
	11	**13.11**	13.10	13.04	13.09	13.03	13.05	13.01	13.06
802.11n (HT20)	Channel	6.5	13	19.5	26	39	52	58.5	65
	1	11.73	11.70	11.64	11.65	11.59	11.55	11.61	11.60
	6	12.39	12.33	12.35	12.30	12.24	12.29	12.31	12.36
	11	**12.62**	12.54	12.61	12.49	12.56	12.52	12.58	12.60

Note: 1) channel /Frequency: 1/2412,6/2437,11/2462.

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



The SAR measurement positions of each side are as below:

Mode	Front Side	Rear Side	Left Side	Right Side	Top Side	Bottom Side
2G Antenna	Yes	Yes	Yes	Yes	No	Yes
WiFi / BT	Yes	Yes	Yes	No	Yes	No

1) Per KDB941225 D06v01r01, the DUT Dimension is bigger than 9 cm x 5 cm, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.

8.5 Stand-alone SAR

1) SAR is not required for 802.11g/n HT20 channels 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.

   For 802.11g: 0.137*(22.39/44.67)=0.069 ≤ 1.2 W/kg,SAR is not required for 802.11g.

   For 802.11 n HT20: 0.137*(22.39/44.67)=0.069 ≤ 1.2 W/kg,SAR is not required for 802.11 n HT20.

2) 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.

Body-Worn position

Mode	Pmax(dBm)	Pmax(mW)	Distance(mm)	f(GHz)	Calculation Result	exclusion Threshold	SAR test exclusion
BT	6.00	3.98	15.00	2.450	0.42	3.00	Yes

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-worn	6	3.98	15.00	2.45	7.50	0.055

8.6 Simultaneous Transmission Possibilities

The Simultaneous Transmission Possibilities are as below:

Simultaneous Transmission Possibilities				
Simultaneous Tx Combination	Configuration	Head	Body-worn	Hotspot
1	GSM/GPRS+WiFi 2.4G	YES	YES	YES
2	WCDMA+WiFi 2.4G	YES	YES	YES
3	GSM/GPRS+BT	N/A	YES	N/A
4	WCDMA+BT	N/A	YES	N/A

Note:

1) Wi-Fi 2.4G and Bluetooth share the same Tx antenna and can’t transmit simultaneously.

2) GSM&WCDMA share the same Tx antenna and can’t transmit simultaneously.

8.7 SAR Summation Scenario

Test Position		Scaled SAR_{Max} GSM850	Scaled SAR_{Max} WIFI	$\sum_{1\text{-}g}$ SAR	SPLSP
Head	Left Hand Touched	0.138	0.051	0.189	NA
	Left Hand Tilted 15°	0.095	0.055	0.150	NA
	Right Hand Touched	0.121	0.137	0.258	NA
	Right Hand Tilted 15°	0.097	0.131	0.228	NA
Body-worn	Front side	0.166	0.045	0.211	NA
	Back side	0.189	0.064	0.253	NA
Body	Front side	0.228	0.045	0.273	NA
	Back side	0.277	0.064	0.341	NA
	Left side	0.072	0.013	0.085	NA
	Right side	0.077	0	0.077	NA
	Top side	0	0.033	0.033	NA
	Bottom side	0.033	0	0.033	NA

Note: Simultaneous Tx Combination of GSM850 and WIFI

Test Position		Scaled SAR_{Max} GSM1900	Scaled SAR_{Max} WIFI	$\sum_{1\text{-}g}$ SAR	SPLSP
Head	Left Hand Touched	0.195	0.051	0.246	NA
	Left Hand Tilted 15°	0.049	0.055	0.104	NA
	Right Hand Touched	0.163	0.137	0.300	NA
	Right Hand Tilted 15°	0.045	0.131	0.176	NA
Body-worn	Front side	0.143	0.045	0.188	NA
	Back side	0.204	0.064	0.268	NA
Body	Front side	0.285	0.045	0.330	NA
	Back side	0.539	0.064	0.603	NA
	Left side	0.192	0.013	0.205	NA
	Right side	0.048	0	0.048	NA
	Top side	0	0.033	0.033	NA
	Bottom side	0.248	0	0.248	NA

Note: Simultaneous Tx Combination of GSM1900 and WIFI

Test Position		Scaled SAR_{Max}		$\sum_{1\text{-}g}$ SAR	SPLSP
		WCDMA 850	**WIFI**		
Head	Left Hand Touched	0.199	0.051	0.250	NA
	Left Hand Tilted 15°	0.14	0.055	0.195	NA
	Right Hand Touched	0.182	0.137	0.319	NA
	Right Hand Tilted 15°	0.144	0.131	0.275	NA
Body-worn	Front side	0.209	0.045	0.254	NA
	Back side	0.241	0.064	0.305	NA
Body	Front side	0.248	0.045	0.293	NA
	Back side	0.303	0.064	0.367	NA
	Left side	0.068	0.013	0.081	NA
	Right side	0.073	0	0.073	NA
	Top side	0	0.033	0.033	NA
	Bottom side	0.024	0	0.024	NA

Note: Simultaneous Tx Combination of WCDMA850 and WIFI

Test Position		Scaled SAR_{Max}		$\sum_{1\text{-}g}$ SAR	SPLSP
		WCDMA 1900	**WIFI**		
Head	Left Hand Touched	0.396	0.051	0.447	NA
	Left Hand Tilted 15°	0.133	0.055	0.188	NA
	Right Hand Touched	0.363	0.137	0.500	NA
	Right Hand Tilted 15°	0.1	0.131	0.231	NA
Body-worn	Front side	0.329	0.045	0.374	NA
	Back side	0.434	0.064	0.498	NA
Body	Front side	0.515	0.045	0.560	NA
	Back side	0.716	0.064	**0.780**	NA
	Left side	0.298	0.013	0.311	NA
	Right side	0.087	0	0.087	NA
	Top side	0	0.033	0.033	NA
	Bottom side	0.416	0	0.416	NA

Note: Simultaneous Tx Combination of WCDMA1900 and WIFI

Test Position		Scaled SAR_{Max}		$\sum_{1\text{-}g}$ SAR	SPLSP
		GSM850	BT		
Body-Worn	Front Side	0.166	0.055	0.221	NA
	Back Side	0.189	0.055	0.244	NA

Note: Simultaneous Tx Combination of GSM850 and BT

Test Position		Scaled SAR_{Max}		$\sum_{1\text{-}g}$ SAR	SPLSP
		GSM1900	BT		
Body-Worn	Front Side	0.143	0.055	0.198	NA
	Back Side	0.204	0.055	0.259	NA

Note: Simultaneous Tx Combination of GSM1900 and BT

Test Position		Scaled SAR_{Max}		$\sum_{1\text{-}g}$ SAR	SPLSP
		WCDMA 850	BT		
Body-Worn	Front Side	0.209	0.055	0.264	NA
	Back Side	0.241	0.055	0.296	NA

Note: Simultaneous Tx Combination of WCDMA850 and BT

Test Position		Scaled SAR_{Max}		$\sum_{1\text{-}g}$ SAR	SPLSP
		WCDMA 1900	BT		
Body-Worn	Front Side	0.329	0.055	0.384	NA
	Back Side	0.434	0.055	0.489	NA

Note: Simultaneous Tx Combination of WCDMA1900 and BT

8.8 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 D01v05r02

Appendix A: SAR System performance Check Plots

(Please See Appendix A)

Appendix B: SAR Measurement results Plots

(Please See Appendix B)

Appendix C: Calibration reports

(Please See Appendix C)

Appendix D: Photo documentation

(Please See Appendix D)

——END OF REPORT——