




TEST REPORT

For SAR

Report No. : **CHEW22080235** Report verification: 

Project No..... : **SHT2207088502EW**

FCC ID..... : **2ASWW-SMARTK**

Applicant's name..... : **XINCHUANGXIN INTERNATIONAL CO.,LTD**

Address..... : **ROOM 605 6/F, FA YUEN COMMERCIAL BUILDING, 75-77 FA YUEN STREET MONGKOK KL**

Test item description : **Feature phone**

Trade Mark : **CORN**

Model/Type reference..... : **Smart K**

Listed Model(s) : **-**

Standard : **FCC 47 CFR Part2.1093**
IEEE Std C95.1: 1999 Edition
IEEE Std 1528: 2013

Date of receipt of test sample..... : **Jul. 27, 2022**

Date of testing..... : **Jul. 28, 2022- Aug. 11, 2022**

Date of issue..... : **Aug. 12, 2022**

Result..... : **PASS**

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The test report merely correspond to the test sample.

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1. Statement of Compliance

Maximum Reported SAR (W/kg @1g)					
Type	Test setting	PCE	DTS	BT	Simultaneous TX
Head	Cheek	1.138	0.223	0.012	1.361
Body-worn	Dist.= 10mm	1.473	0.104	0.010	1.577
Hotspot	Dist.= 10mm	1.473	0.104	-	1.577

Note:

1. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg@1g) specified in FCC 47 CFR part 2 (2.1093) and IEEE Std C95.1,
2. This device had been tested in accordance with the measurement methods and procedures specified in IEEE 1528 and FCC KDB publications.

2. Test Standards and Report version

2.1. Test Standards

The tests were performed according to following standards:

[FCC 47 Part 2.1093](#): Radiofrequency radiation exposure evaluation: portable devices.

[IEEE Std C95.1, 1999 Edition](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz

[IEEE Std 1528™-2013](#): IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.

FCC published RF exposure KDB procedures:

[865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04](#): SAR Measurement Requirements for 100 MHz to 6 GHz

[865664 D02 RF Exposure Reporting v01r02](#): RF Exposure Compliance Reporting and Documentation Considerations

[447498 D04 Interim General RF Exposure Guidance v01](#): Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies

[248227 D01 802.11 Wi-Fi SAR v02r02](#): SAR Measurement Procedures for 802.11 a/b/g Transmitters

[648474 D04 Handset SAR v01r03](#): SAR Evaluation Considerations for Wireless Handsets

[941225 D01 3G SAR Procedures v03r01](#): SAR Measurement Procedures for 3G Devices

[941225 D05 SAR for LTE Devices v02r05](#): SAR Evaluation Considerations for LTE Devices

[941225 D06 Hotspot Mode v02r01](#): SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities

[TCB workshop](#) April, 2019; Page 19, Tissue Simulating Liquids (TSL)

2.2. Report version

Revision No.	Date of issue	Description
N/A	2022-08-12	Original

3. Summary

3.1. Client Information

Applicant:	XINCHUANGXIN INTERNATIONAL CO.,LTD
Address:	ROOM 605 6/F, FA YUEN COMMERCIAL BUILDING, 75-77 FA YUEN STREET MONGKOK KL
Manufacturer:	Shenzhen Chiteng Technology Co.,LTD
Address:	Second Floor,Area A, Building 4, Huiye Technology Workshop, Guanguang Road, Tangjia Community, Gongming Street, Guangming New District, Shenzhen, Guangdong

3.2. Product Description

Main unit	
Name of EUT:	Feature phone
Trade Mark:	CORN
Model No.:	Smart K
Listed Model(s):	-
Power supply:	DC 3.7V from Battery
Hardware version:	MM7202-MB-V1.1
Software version:	7202LAF_B1B2B5_FISE_A24303_20220817_1502
Device Dimension:	Length x Width x Thickness (mm): 130 x 50 x15
Device Category:	Portable
Product stage:	Production unit
RF Exposure Environment:	General Population/Uncontrolled
HTW test sample No.:	YPHT22070885004
Support SIM card quantity:#1	<input type="checkbox"/> Single card <input checked="" type="checkbox"/> Double card
Ancillary unit	
Battery information: #2	3.7Vdc, 1700mAh

Note:

#1: The Test EUT support two SIM card, so all the tests are performed at each SIM card mode, the datum recorded is the worst case for all the mode at SIM1 Card mode.

#2: The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power.

3.3. RF Specification Description

GSM			
Operation Band:	<input checked="" type="checkbox"/> GSM850	<input checked="" type="checkbox"/> PCS1900	
Support type:	<input checked="" type="checkbox"/> GSM	<input checked="" type="checkbox"/> GPRS	<input type="checkbox"/> EGPRS
Modulation type:	<input checked="" type="checkbox"/> GMSK	<input type="checkbox"/> 8PSK	
Power Class:	<input checked="" type="checkbox"/> GSM850: Class 4	<input checked="" type="checkbox"/> PCS1900: Class 1	
Device Class:	B		
GPRS Multi-Slot Class:	12		
EGPRS Multi-Slot Class:	12		
<i>Note:</i> <i>This device doesn't support DTM (Dual Transfer Mode).</i>			
WCDMA			
Operation Band:	<input checked="" type="checkbox"/> Band II	<input type="checkbox"/> Band IV	<input checked="" type="checkbox"/> Band V
Support type:	<input checked="" type="checkbox"/> UMTS Rel. 99 (Voice & Data)	<input checked="" type="checkbox"/> HSDPA	<input checked="" type="checkbox"/> HSUPA
Modulation type:	<input checked="" type="checkbox"/> QPSK		
Power Class:	Class 3		
Wi-Fi 2.4G			
Support type:	<input checked="" type="checkbox"/> 802.11b	<input checked="" type="checkbox"/> 802.11g	<input checked="" type="checkbox"/> 802.11n <input type="checkbox"/> 802.11ax
Support bandwidth:	<input checked="" type="checkbox"/> 20MHz	<input type="checkbox"/> 40MHz	
<i>Note:</i> <i>This device 2.4GHz Wi-Fi support hotspot operation</i>			
Bluetooth			
Support type:	<input checked="" type="checkbox"/> BR	<input checked="" type="checkbox"/> EDR	<input checked="" type="checkbox"/> BLE-1Mbps <input type="checkbox"/> BLE-2Mbps
<i>Note:</i> <i>This device support Bluetooth Tethering.</i>			

3.4. Testing Laboratory Information

Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.	
Laboratory Location	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China	
Connect information:	Tel: 86-755-26715499 E-mail: cs@szhtw.com.cn http://www.szhtw.com.cn	
Qualifications	Type	Accreditation Number
	FCC	762235

3.5. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Ambient temperature	18 °C to 25 °C
Ambient humidity	30%RH to 70%RH
Air Pressure	950-1050mbar

4. Equipments Used during the Test

Used	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YY-MM-DD)	Due date (YY-MM-DD)
●	Data Acquisition Electronics DAEx	SPEAG	DAE4	1549	2022/04/12	2023/04/11
●	E-field Probe	SPEAG	EX3DV4	7494	2022/05/16	2023/05/15
●	Universal Radio Communication Tester	R&S	CMW500	137681	2022/05/12	2023/05/11
● Tissue-equivalent liquids Validation						
●	Dielectric Assessment Kit	SPEAG	DAK-3.5	1267	N/A	N/A
○	Dielectric Assessment Kit	SPEAG	DAK-12	1130	N/A	N/A
●	Network analyzer	Keysight	E5071C	MY46733048	2021/09/17	2022/09/16
● System Validation						
○	System Validation Antenna	SPEAG	CLA-150	4024	2021/01/25	2024/01/24
○	System Validation Dipole	SPEAG	D450V3	1102	2021/01/20	2024/01/19
○	System Validation Dipole	SPEAG	D750V3	1180	2021/01/22	2024/01/21
●	System Validation Dipole	SPEAG	D835V2	4d238	2021/01/22	2024/01/21
○	System Validation Dipole	SPEAG	D1750V2	1164	2021/01/22	2024/01/21
●	System Validation Dipole	SPEAG	D1900V2	5d226	2021/01/22	2024/01/21
●	System Validation Dipole	SPEAG	D2450V2	1009	2021/01/25	2024/01/24
○	System Validation Dipole	SPEAG	D2600V2	1150	2021/01/25	2024/01/24
○	System Validation Dipole	SPEAG	D5GHzV2	1273	2021/01/26	2024/01/25
●	Signal Generator	R&S	SMB100A	114360	2021/08/05	2022/08/04
●	Power Viewer for Windows	R&S	N/A	N/A	N/A	N/A
●	Power sensor	R&S	NRP18A	101010	2021/08/05	2022/08/04
●	Power sensor	R&S	NRP18A	101386	2022/05/12	2023/05/12
●	Power Amplifier	BONN	BLWA 0160-2M	1811887	2021/11/11	2022/11/10
●	Dual Directional Coupler	Mini-Circuits	ZHDC-10-62-S+	F975001814	2021/11/11	2022/11/10
●	Attenuator	Mini-Circuits	VAT-3W2+	1819	2021/11/11	2022/11/10
●	Attenuator	Mini-Circuits	VAT-10W2+	1741	2021/11/11	2022/11/10

Note:

1. The Probe, Dipole and DAE calibration reference to the Appendix E and F.
2. Referring to KDB865664 D01, the dipole calibration interval can be extended to 3 years with justification. The dipole are also not physically damaged or repaired during the interval.

5. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be $\leq 30\%$, for a confidence interval of $k = 2$. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528 is not required in SAR reports submitted for equipment approval.

Therefore, the measurement uncertainty is not required.

6. SAR Measurement System Configuration

6.1. SAR Measurement Set-up

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

A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).

A dosimetric probe, i.e. an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

A data acquisition electronic (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.

A unit to operate the optical surface detector which is connected to the EOC.

The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.

The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows 2003.

DASY5 software and SEMCAD data evaluation software.

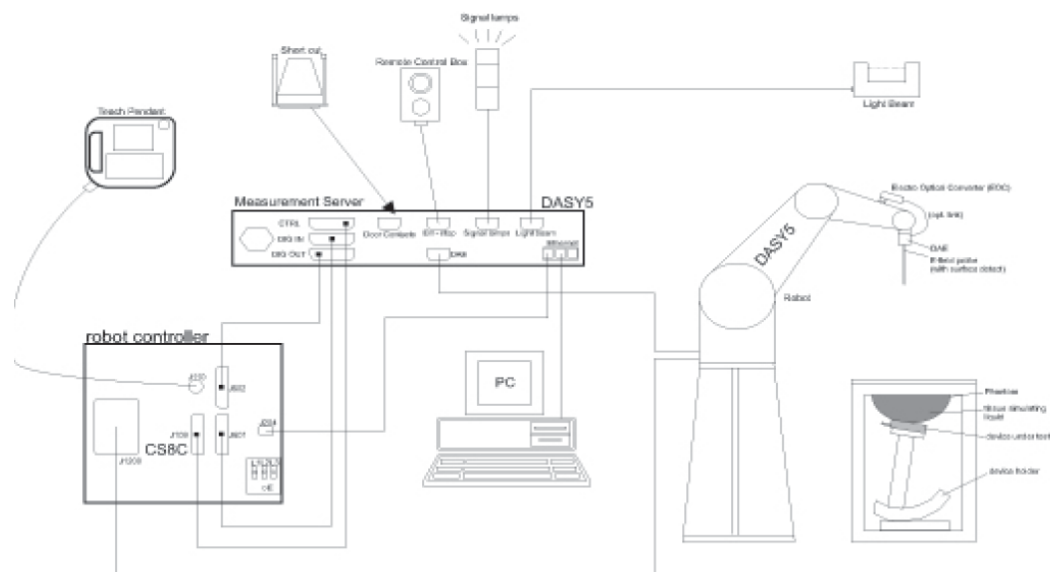
Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.

The generic twin phantom enabling the testing of left-hand and right-hand usage.

The device holder for handheld Mobile Phones.

Tissue simulating liquid mixed according to the given recipes.

System validation dipoles allowing to validate the proper functioning of the system.



6.2. DASY5 E-field Probe System

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

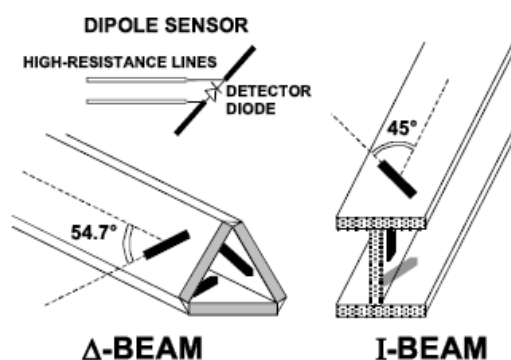
● Probe Specification

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	4 MHz to 10 GHz; Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 μ W/g to > 100 W/kg; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Distance from probe tip to dipole centers: 1.0 mm
Application	General dosimetry up to 6 GHz Dosimetry in strong gradient fields Compliance tests of Mobile Phones
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

◆ Isotropic E-Field Probe

The isotropic E-Field probe has been fully calibrated and assessed for isotropicity, and boundary effect within a controlled environment. Depending on the frequency for which the probe is calibrated the method utilized for calibration will change.

The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



6.3. Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SPEAG. The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6mm).

System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.



SAM-Twin Phantom

6.4. Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the DASY system.

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.



Device holder supplied by SPEAG

7. SAR Test Procedure

7.1. Scanning Procedure

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. Measure the local SAR at a test point within 8 mm of the phantom inner surface that is closest to the DUT. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scan

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

Area Scan Resolutions per FCC KDB Publication 865664 D01v04

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 mm ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2)$ mm ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area} , Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 3: Zoom Scan

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

Zoom Scan Resolutions per FCC KDB Publication 865664 D01v04

Maximum zoom scan spatial resolution: Δx_{Zoom} , Δy_{Zoom}		≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*	
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$	≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm	
	graded grid	$\Delta z_{Zoom}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$ mm	
Minimum zoom scan volume	x, y, z	≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm	
<p>Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.</p> <p>* When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</p>				

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1. The SAR drift shall be kept within $\pm 5\%$.

7.2. Data Storage and Evaluation

Data Storage

The DASY5 software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors),s together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension “.DA4”. The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated.

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [W/kg], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show 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 SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters:	Sensitivity:	Normi, ai0, ai1, ai2
	Conversion factor:	ConvFi
	Diode compression point:	Dcpi
Device parameters:	Frequency:	f
	Crest factor:	cf
Media parameters:	Conductivity:	σ
	Density:	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY5 components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

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

Vi:	compensated signal of channel (i = x, y, z)
Ui:	input signal of channel (i = x, y, z)
cf:	crest factor of exciting field (DASY parameter)
dcp _i :	diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

$$E - \text{fieldprobes} : \quad E_i = \sqrt{\frac{V_i}{\text{Norm}_i \cdot \text{ConvF}}}$$

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

Vi:	compensated signal of channel (i = x, y, z)
Norm _i :	sensor sensitivity of channel (i = x, y, z), [mV/(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 RSS 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.

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

SAR: local specific absorption rate in W/kg
Etot: total field strength in V/m
 σ : conductivity in [mho/m] or [Siemens/m]
 ρ : equivalent tissue density in g/cm³

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid.

8. Position of the wireless device in relation to the phantom

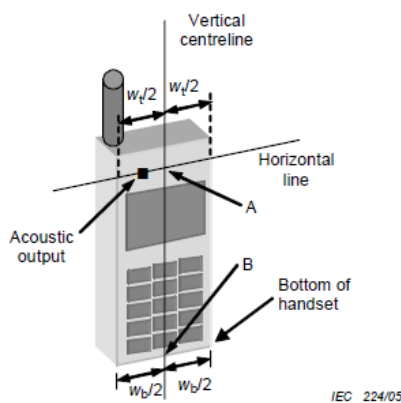
8.1. Head Position

The wireless device define two imaginary lines on the handset, the vertical centreline and the horizontal line, for the handset in vertical orientation as shown in Figures 5a and 5b.

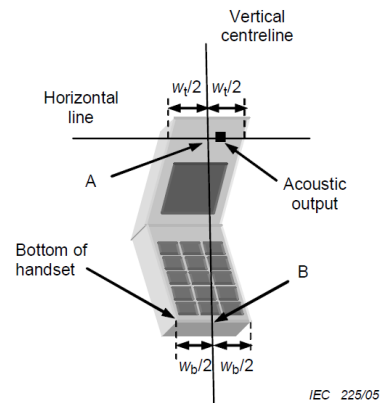
The vertical centreline passes through two points on the front side of the handset: the midpoint of the width W_t of the handset at the level of the acoustic output (point A in Figures 5a and 5b), and the midpoint of the width W_b of the bottom of the handset (point B).

The horizontal line is perpendicular to the vertical centreline and passes through the centre of the acoustic output (see Figures 5a and 5b). The two lines intersect at point A.

Note that for many handsets, point A coincides with the centre of the acoustic output. However, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centreline is not necessarily parallel to the front face of the handset (see Figure 5b), especially for clam-shell handsets, handsets with flip cover pieces, and other irregularly shaped handsets.



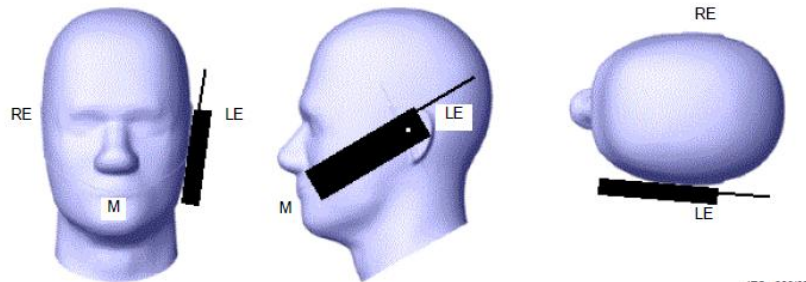
Figures 5a



Figures 5b

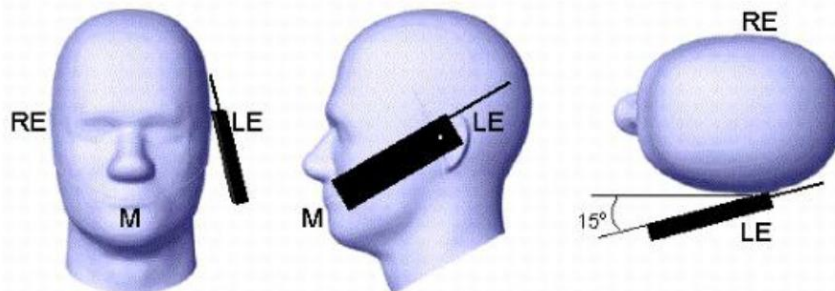
- W_t Width of the handset at the level of the acoustic
- W_b Width of the bottom of the handset
- A Midpoint of the width w_t of the handset at the level of the acoustic output
- B Midpoint of the width w_b of the bottom of the handset

Cheek position



Picture 2 Cheek position of the wireless device on the left side of SAM

Tilt position

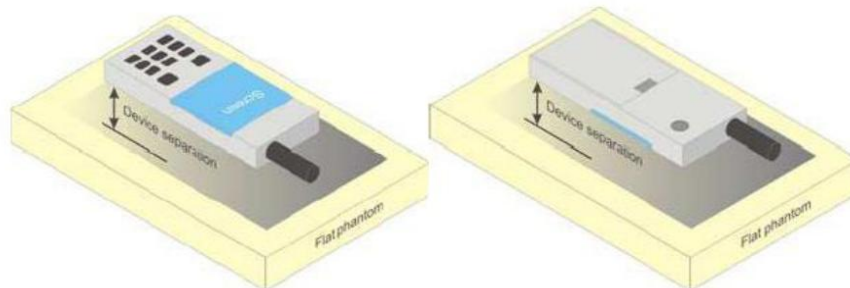


Picture 3 Tilt position of the wireless device on the left side of SAM

8.2. Body Position

Devices that support transmission while used with body-worn accessories must be tested for body-worn accessory SAR compliance, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics.

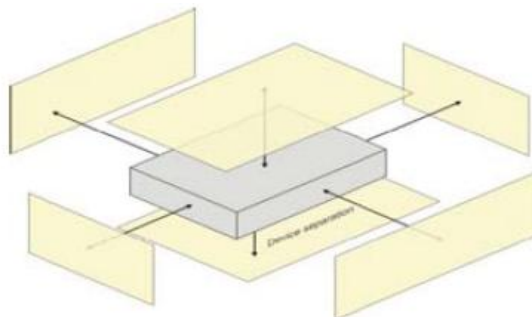
Devices that are designed to operate on the body of users using lanyards and straps or without requiring additional body-worn accessories must be tested for SAR compliance using a conservative minimum test separation distance $\leq 5\text{mm}$ to support compliance.



Picture 4 Test positions for body-worn devices

8.3. Hotspot Mode Exposure conditions

The hotspot mode and body-worn accessory SAR test configurations may overlap for handsets. When the same wireless mode transmission configurations for voice and data are required for SAR measurements, the more conservative configuration with a smaller separation distance should be tested for the overlapping SAR configurations. This typically applies to the back and front surfaces of a handset when SAR is required for both hotspot mode and body-worn accessory exposure conditions. Depending on the form factor and dimensions of a device, the test separation distance used for hotspot mode SAR measurement is either 10 mm or that used in the body-worn accessory configuration, whichever is less for devices with dimension $> 9\text{ cm} \times 5\text{ cm}$. For smaller devices with dimensions $\leq 9\text{ cm} \times 5\text{ cm}$ because of a greater potential for next to body use a test separation of $\leq 5\text{ mm}$ must be used.



Picture 5 Test positions for Hotspot Mode

9. Dielectric Property Measurements & System Check

9.1. Tissue Dielectric Parameters

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within $\pm 2^\circ\text{C}$ of the temperature when the tissue parameters are characterized.

The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3-4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.

The dielectric constant (ϵ_r) and conductivity (σ) of typical tissue-equivalent media recipes are expected to be within $\pm 5\%$ of the required target values; but for SAR measurement systems that have implemented the SAR error compensation algorithms documented in IEEE Std 1528, to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters, the tolerance for ϵ_r and σ may be relaxed to $\pm 10\%$. This is limited to frequencies ≤ 3 GHz.

Tissue Dielectric Parameters

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

Tissue dielectric parameters for Head and Body				
Target Frequency (MHz)	Head		Body	
	ϵ_r	$\sigma(\text{S/m})$	ϵ_r	$\sigma(\text{S/m})$
750	41.9	0.89	55.5	0.96
835	41.5	0.90	55.2	0.97
1750	40.1	1.37	53.4	1.49
1800-2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
2600	39.0	1.96	52.5	2.16
5200	36.0	4.66	49.0	5.30
5300	35.9	4.76	48.9	5.42
5500	35.6	4.96	48.6	5.65
5600	35.5	5.07	48.5	5.77
5800	35.3	5.27	48.2	6.00

Measurement Results:

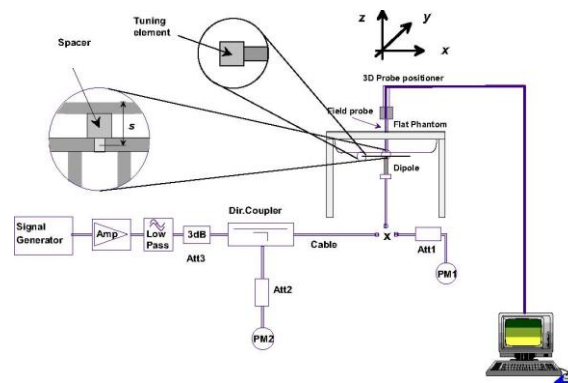
Dielectric performance of Head tissue simulating liquid									
Frequency (MHz)	ϵ_r		σ (S/m)		Delta (ϵ_r)	Delta (σ)	Limit	Temp (°C)	Date
	Target	Measured	Target	Measured					
835	41.50	42.58	0.900	0.939	2.60%	4.33%	±5%	22.4	2022/8/8
1900	40.00	40.54	1.400	1.467	1.35%	4.79%	±5%	22.4	2022/8/9
2450	39.20	39.69	1.800	1.830	1.25%	1.67%	±5%	22.4	2022/8/10

9.2. System Check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

System Performance Check Measurement Conditions:

- ◆ The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ± 0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- ◆ The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm for measurements > 3 GHz.
- ◆ The DASY system with an E-Field Probe was used for the measurements.
- ◆ The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- ◆ The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- ◆ Special 7x7x7 (below 3 GHz) and/or 8x8x7 (above 3 GHz) fine cube was chosen for the cube.
- ◆ The results are normalized to 1 W input power.



System Performance Check Setup

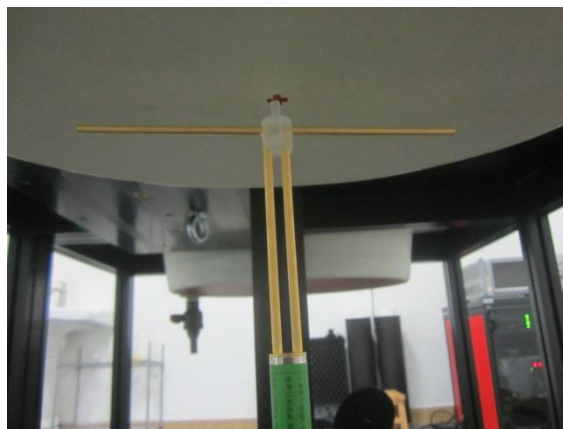


Photo of Dipole Setup

Measurement Results:

Head											
Frequency (MHz)	1g SAR			10g SAR			Delta (1g)	Delta (10g)	Limit	Temp (°C)	Date
	Target 1W	Normalize to 1W	Measured 250mW	Target 1W	Normalize to 1W	Measured 250mW					
835	9.39	9.40	2.35	6.14	6.12	1.53	0.11%	-0.33%	±10%	22.2	2022/8/8
1900	39.80	40.80	10.20	20.30	21.28	5.32	2.51%	4.83%	±10%	22.2	2022/8/9
2450	52.00	52.40	13.10	23.90	24.24	6.06	0.77%	1.42%	±10%	22.2	2022/8/10

Note:

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within ±10% of the manufacturer calibrated dipole SAR target.

Plots of System Performance Check**SystemPerformanceCheck-Head 835MHz**

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.939 \text{ S/m}$; $\epsilon_r = 42.58$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Ambient Temperature:22.4°C;Liquid Temperature:22.2°C;

DASY Configuration:

- Probe: EX3DV4 - SN7494; ConvF(10.3, 10.3, 10.3); Calibrated: 5/16/2022;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1549; Calibrated: 4/12/2022
- Phantom: Twin-SAM V8.0 ; Type: QD 000 P41 AA; Serial: 1974
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Head/d=15mm, Pin=250mW/Area Scan (41x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.73 W/kg

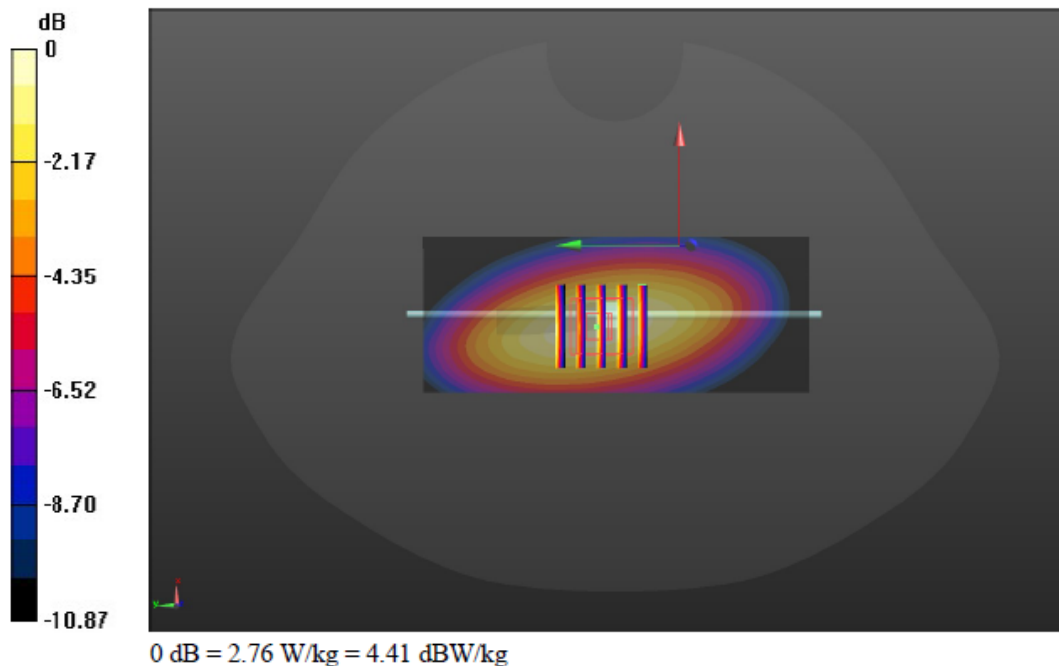
Head/d=15mm, Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 53.10 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.52 W/kg

SAR(1 g) = 2.35 W/kg; SAR(10 g) = 1.53 W/kg

Maximum value of SAR (measured) = 2.76 W/kg



SystemPerformanceCheck-Head 1900MHz

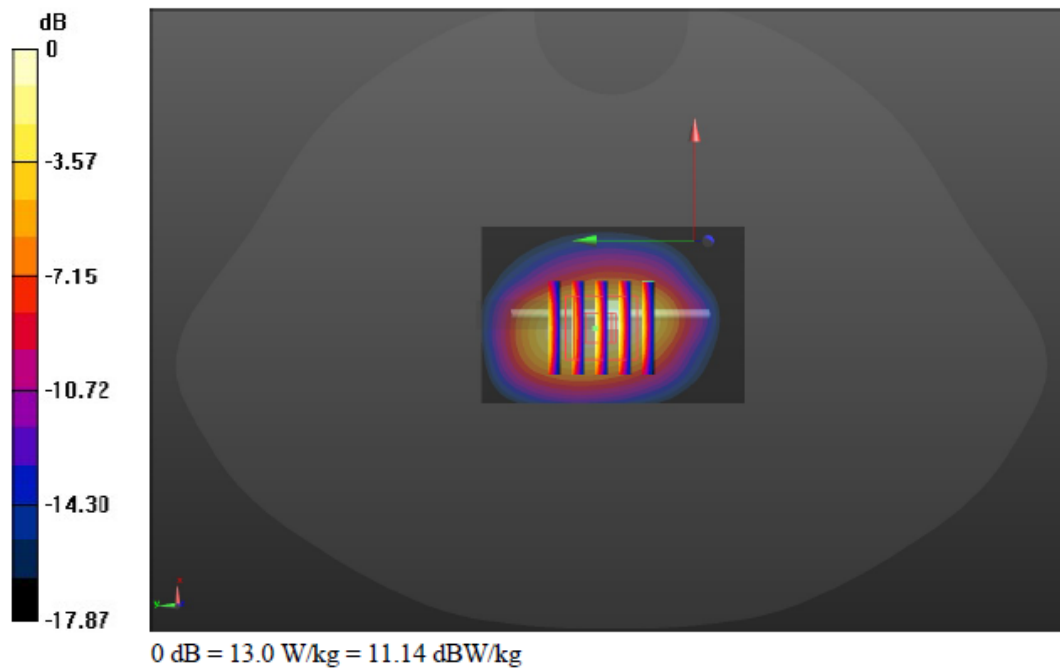
Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: $f = 1900$ MHz; $\sigma = 1.467$ S/m; $\epsilon_r = 40.54$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Ambient Temperature:22.4°C;Liquid Temperature:22.2°C;

DASY Configuration:

- Probe: EX3DV4 - SN7494; ConvF(8.45, 8.45, 8.45); Calibrated: 5/16/2022;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1549; Calibrated: 4/12/2022
- Phantom: Twin-SAM V8.0 ; Type: QD 000 P41 AA; Serial: 1974
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Head/d=10mm,Pin=250mW /Area Scan (41x61x1): Interpolated grid: dx=1.500 mm,
dy=1.500 mm
Maximum value of SAR (interpolated) = 13.9 W/kg

Head/d=10mm,Pin=250mW /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,
dy=8mm, dz=5mm
Reference Value = 88.41 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 18.7 W/kg
SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.32 W/kg
Maximum value of SAR (measured) = 13.0 W/kg



SystemPerformanceCheck-Head 2450MHz

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2450$ MHz; $\sigma = 1.83$ S/m; $\epsilon_r = 39.686$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient Temperature: 22.4°C; Liquid Temperature: 22.2°C;

DASY Configuration:

- Probe: EX3DV4 - SN7494; ConvF(7.9, 7.9, 7.9); Calibrated: 5/16/2022;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1549; Calibrated: 4/12/2022
- Phantom: Twin-SAM V8.0 ; Type: QD 000 P41 AA; Serial: 1974
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Head/d=10mm, Pin=250mW/Area Scan (41x61x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 18.6 W/kg

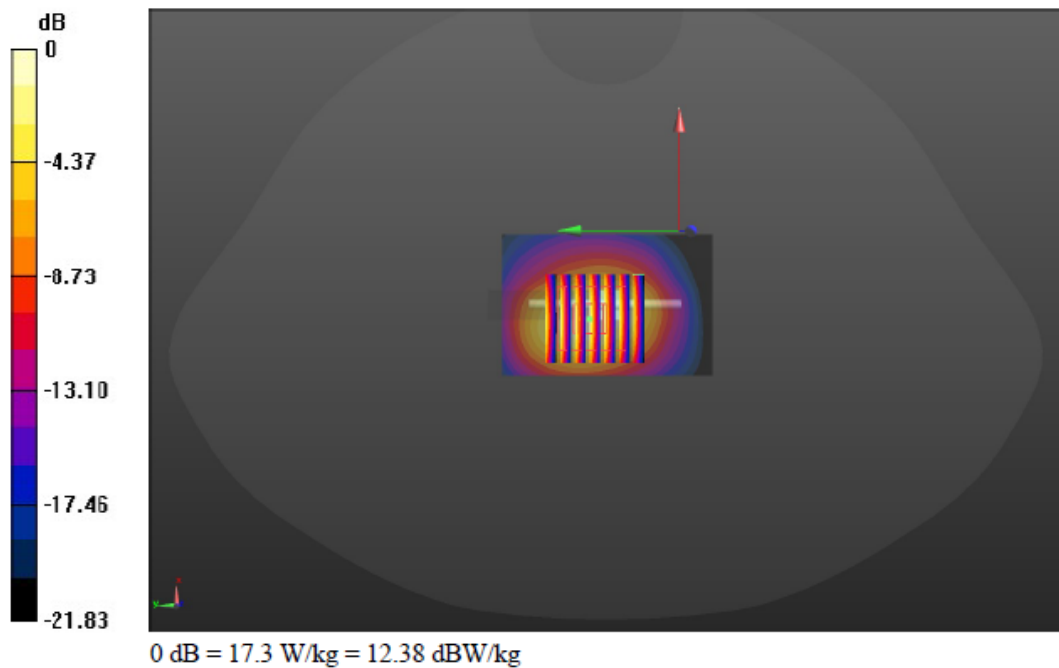
Head/d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 87.26 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 27.2 W/kg

SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.06 W/kg

Maximum value of SAR (measured) = 17.3 W/kg



10. SAR Exposure Limits

SAR assessments have been made in line with the requirements of FCC 47 CFR § 2.1093.

Type Exposure	Limit (W/kg)	
	General Population/ Uncontrolled Exposure Environment	Occupational/ Controlled Exposure Environment
Spatial Average SAR (whole body)	0.08	0.4
Spatial Peak SAR (1g cube tissue for head and trunk)	1.6	8.0
Spatial Peak SAR (10g for limb)	4.0	20.0

Note:

1. *Population/Uncontrolled Environments: are defined as locations where there is the exposure of individual who have no knowledge or control of their exposure.*
2. *Occupational/Controlled Environments: are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure (i.e. as a result of employment or occupation).*

11. Conducted Power Measurement Results and Tune-up

Please refer to appendix report

Note:

GSM

1. Per KDB 447498 D04, the maximum output power channel is used for SAR testing and further SAR test reduction.
2. Per KDB 941225 D01, considering the possibility of e.g. 3rd party VoIP operation for Head and Body-worn SAR test reduction for GSM and GPRS modes is determined by the source-base time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.
3. Per KDB941225 D01, for hotspot SAR test reduction for GPRS modes is determined by the source-based time-averaged output power including tune-up tolerance, For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

WCDMA

1. The following tests were conducted according to the test requirements outlines in 3GPP TS34.121 specification.
2. The procedures in KDB 941225 D01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode to determine SAR test exclusion

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

- a) The EUT was connected to base station RS CMU200 referred to the setup configuration
- b) The RF path losses were compensated into the measurements
- c) A call was established between EUT and base station with following setting:
 - i. Set Gain Factors (β_c and β_d) and parameters were set according to each specific sub-test in the following table, C10.1.4, Quoted from the TS 34.121
 - ii. Set RMC 12.2Kbps + HSDPA mode
 - iii. Set Cell Power=-86dBm
 - iv. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
 - v. Select HSDPA uplink parameters
 - vi. Set Delta ACK, Delta NACK and Delta CQI=8
 - vii. Set Ack-Nack repetition Factor to 3
 - viii. Set CQI Feedback Cycle (K) to 4ms
 - ix. Set CQI repetition factor to 2
 - x. Power ctrl mode= all up bits
- d) The transmitter maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	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 $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{HS} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. 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 4: 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 $\beta_c = 11/15$ and $\beta_d = 15/15$.

Setup Configuration

HSUPA Setup Configuration:

- a) The EUT was connected to base station RS CMU200 referred to the setup configuration
- b) The RF path losses were compensated into the measurements
- c) A call was established between EUT and base station with following setting:
 - i. Call configs = 5.2b, 5.9b, 5.10b, and 5.13.2B with QPSK
 - ii. Set Gain Factors (β_c and β_d) and parameters (AG index) were set according to each specific sub-test in the following table, C11.1.3, Quoted from the TS 34.121
 - iii. Set Cell Power=-86dBm
 - iv. Set channel type= 12.2Kbps + HSPA mode
 - v. Set UE Target power
 - vi. Set Ctrl mode=Alternating bits
 - vii. Set and observe the E-TFCI
 - viii. Confirm that E-TFCI is equal the target E-TFCI of 75 for Sub-test 1, and other subtest's E-TFCI
- d) The transmitter maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	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 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{isc} = 30/15 * \beta_c$.

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: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

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

LTE**General:**

1. CMW500 base station simulator was used to setup the connection with EUT; the frequency band, channel, bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r03, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r03, 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 RBoffsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r03, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.

LTE (TDD) Considerations

1. According to KDB 941225 D05 SAR for LTE Devices, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.
2. SAR was tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7.
3. LTE TDD Bands support 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplinkdownlink configurations and Table 4.2-1 for Special subframe configurations.

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$(1+X) \cdot 2192 \cdot T_s$	$(1+X) \cdot 2560 \cdot T_s$	$7680 \cdot T_s$	$(1+X) \cdot 2192 \cdot T_s$	$(1+X) \cdot 2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$		
5	$6592 \cdot T_s$	$(2+X) \cdot 2192 \cdot T_s$	$(2+X) \cdot 2560 \cdot T_s$	$20480 \cdot T_s$	$(2+X) \cdot 2192 \cdot T_s$	$(2+X) \cdot 2560 \cdot T_s$
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-		
9	$13168 \cdot T_s$			-		
10	$13168 \cdot T_s$	$13152 \cdot T_s$	$12800 \cdot T_s$	-	-	-

Table 4.2-2: Uplink-downlink configurations

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Calculated Duty Cycle = Extended cyclic prefix in uplink $\times (T_s) \times \#$ of S + $\#$ of U

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle = $5120 \times [1/(15000 \times 2048)] \times 2 + 6 \text{ ms} = 63.33\%$

where

$T_s = 1/(15000 \times 2048)$ seconds

This device supports uplink-downlink configurations 0-6. The configuration with highest duty cycle was used-configuration 0 at 63.3% duty cycle.

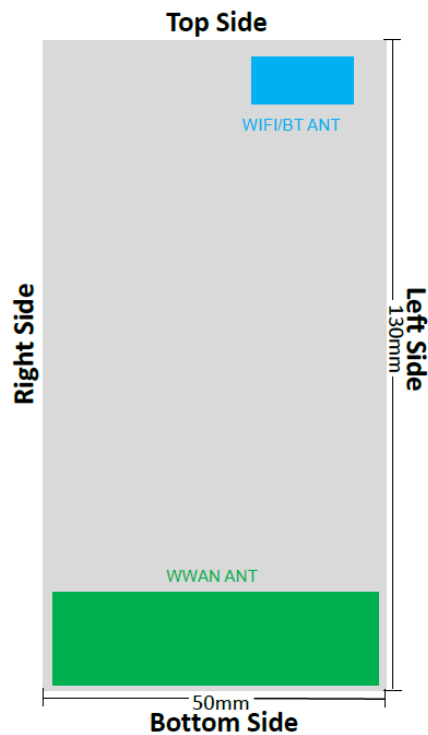
Wi-Fi

For 2.4GHz Wi-Fi SAR testing, highest average RF output power channel for the lowest data rate for 802.11b were for SAR evaluation.

The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures.

SAR testing is not required for OFDM mode(s) 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 $\leq 1.2 \text{ W/kg}$.

12. Antenna Location



Distance of the Antenna to the EUT surface/edge(mm)						
Antenna	Rear	Front	Top side	Bottom side	Right side	Left side
WWAN	5	5	105	5	5	5
WiFi/BT	5	5	5	120	30	7

Positions for SAR tests; Hotspot mode						
Antenna	Rear	Front	Top side	Bottom side	Right side	Left side
WWAN	Yes	Yes	No	Yes	Yes	Yes
WiFi/BT	Yes	Yes	Yes	No	No	Yes

Note:

Referring to KDB941225 D06, when the overall device length and width are >9cm*5cm, the test distance is 10mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge.

13. Measured and Reported SAR Results

Measurement Results:

Please refer to appendix report

Measurement data plots:

Please refer to appendix D

Note:

SAR Test Reduction criteria are as follows:

- Reported SAR(W/kg) for WWAN = Measured SAR * Tune-up Scaling Factor
- Reported SAR(W/kg) for Wi-Fi and Bluetooth = Measured SAR * Tune-up scaling factor * Duty Cycle scaling factor
- Duty Cycle scaling factor = 1 / Duty cycle (%)

KDB 447498 D04 Interim General RF Exposure Guidance v01:

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
- ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
- ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

KDB 648474 D04 Handset SAR:

With headset attached, when the reported SAR for body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset. Additional 1-g SAR testing at 5 mm is not required when hotspot mode 10-g extremity SAR is not required for the surfaces and edges; since all 1-g reported SAR < 1.2 W/kg.

KDB 941225 D01 SAR test for 3G SAR Test Reduction Procedure:

When the maximum output power and tune-up tolerance specified for production units in a secondary mode is $\leq 1/4$ 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 secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

GSM Guidance

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Please refer to section 9. for GSM power verification.

SAR is not required for EDGE (8PSK) mode because the maximum output power and tune-up limit is $\leq 1/4$ dB higher than GPRS/EDGE (GMSK) or the adjusted SAR of the highest reported SAR of GPRS/EDGE (GMSK) is ≤ 1.2 W/kg.

W-CDMA Guidance

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC (Head) and other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC (Body-Worn Accessory) as the primary mode.

Per KDB 941225 D01 RMC12.2Kbps setting is used to evaluate SAR. If the maximum output power and Tune-up tolerance specified for production units in HSDPA/HSUPA is $\leq 1/4$ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio fo specified maximum output power and tune-up tolerance of HSDPA / HSUPA to RMC 12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA.

KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

- Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among 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 for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
- Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are > 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
- Testing for 16-QAM and 64-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
- Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.

TDD LTE requirement:

For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9%) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix $63.3\%/62.9\% = 1.006$ is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg) * Tune-up Scaling Factor * scaling factor for extended cyclic prefix.

KDB 248227 D01 SAR meas for 802.11:

When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

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 initial test position(s) is measured using the highest measured maximum output power channel in the required wireless mode test configuration(s). When the reported SAR for the initial test position is:

- ≤ 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.
- > 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.
 - For subsequent test positions with equivalent test separation distance or when exposure is dominated by coupling conditions, the position for maximum coupling condition should be tested.
 - When it is unclear, all equivalent conditions must be tested.
- 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.
 - The additional power measurements required for this step should be limited to those necessary for identifying subsequent highest output power channels to apply the test reduction.
- When the specified maximum output power is the same for both UNII 1 and UNII 2A, begin SAR

measurements in UNII 2A with the channel with the highest measured output power. If the reported SAR for UNII 2A is ≤ 1.2 W/kg, SAR is not required for UNII 1; otherwise treat the remaining bands separately and test them independently for SAR.

- *When the specified maximum output power is different between UNII 1 and UNII 2A, begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is ≤ 1.2 W/kg, testing for the band with the lower specified output power is not required; otherwise test the remaining bands independently for SAR.*

To determine the initial test position, Area Scans were performed to determine the position with the Maximum Value of SAR (measured). The position that produced the highest Maximum Value of SAR is considered the worst case position; thus used as the initial test position.

14. SAR Measurement Variability

In accordance with published RF Exposure KDB 865664 D01 SAR measurement 100 MHz to 6 GHz. 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 <0.8 or 2 W/kg (1-g or 10-g respectively); steps 2) through 4) do not apply.
- 2) When the original highest measured SAR is ≥ 0.8 or 2 W/kg (1-g or 10-g respectively), 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 or 3.6 W/kg ($\sim 10\%$ from the 1-g or 10-g respective SAR limit).
- 4) Perform a third repeated measurement only if the original, first, or second repeated measurement is ≥ 1.5 or 3.75 W/kg (1-g or 10-g respectively) and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

Band	Test Position	Frequency		Highest Measured SAR (W/kg)	First Repeated		Second Repeated	
		CH	MHz		Measured SAR(W/kg)	Largest to Smallest SAR Ratio	Measured SAR(W/kg)	Largest to Smallest SAR Ratio
GSM 850	Body	190	836.6	1.320	1.300	1.015	N/A	N/A
WCDMA Band II	Body	9400	1880.0	1.470	1.460	1.007	1.440	1.021
WCDMA Band V	Body	4183	836.6	1.240	1.220	1.016	N/A	N/A

15. Simultaneous Transmission analysis

No.	Simultaneous Transmission Configurations	Head	Body-worn	Hotspot	Note
1	GSM(voice) + Bluetooth (data)	Yes	Yes		
2	GSM(voice) + WLAN (data)	Yes	Yes		
3	WCDMA(voice) + Bluetooth (data)	Yes	Yes		
4	WCDMA(voice) + WLAN (data)	Yes	Yes		
5	GPRS (data) + Bluetooth (data)	Yes	Yes	NA	
6	GPRS (data) + WLAN (data)	Yes	Yes	Yes	
7	WCDMA (data) + Bluetooth (data)	Yes	Yes	NA	
8	WCDMA (data) + WLAN (data)	Yes	Yes	Yes	

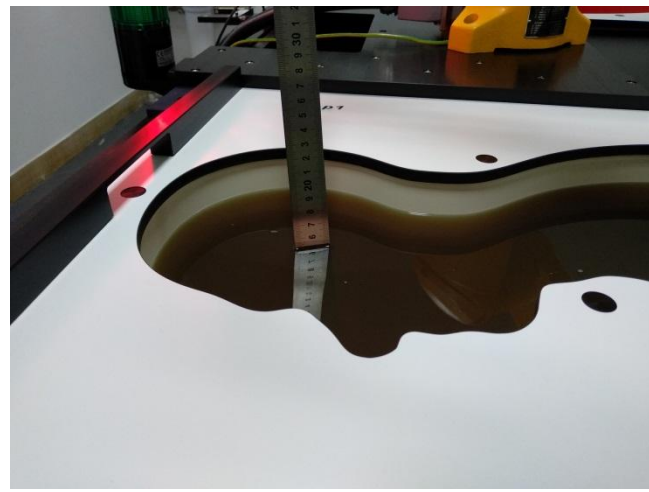
General note:

1. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
2. EUT will choose either GSM or WCDMA according to the network signal condition; therefore, they will not operate simultaneously at any moment.
3. The reported SAR summation is calculated based on the same configuration and test position

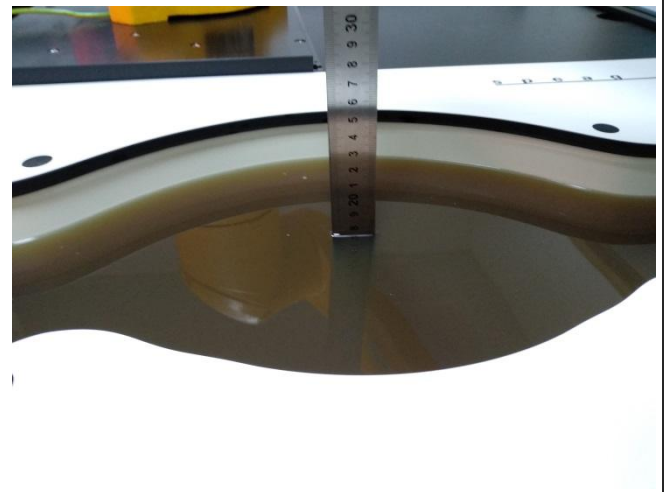
Simultaneous Transmission data:

Please refer to appendix report

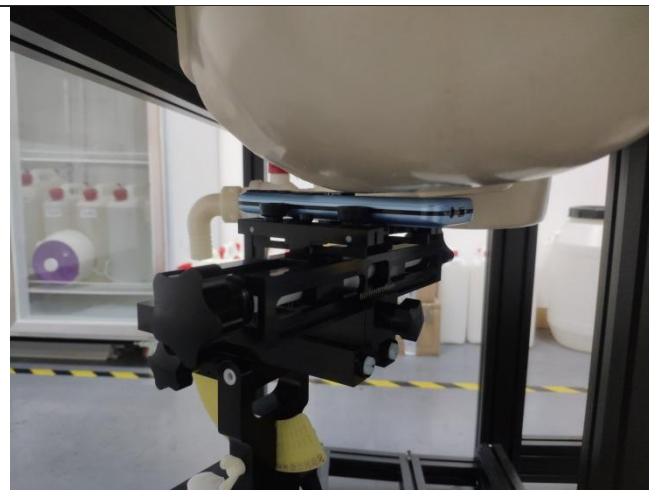
16. Test Setup Photos



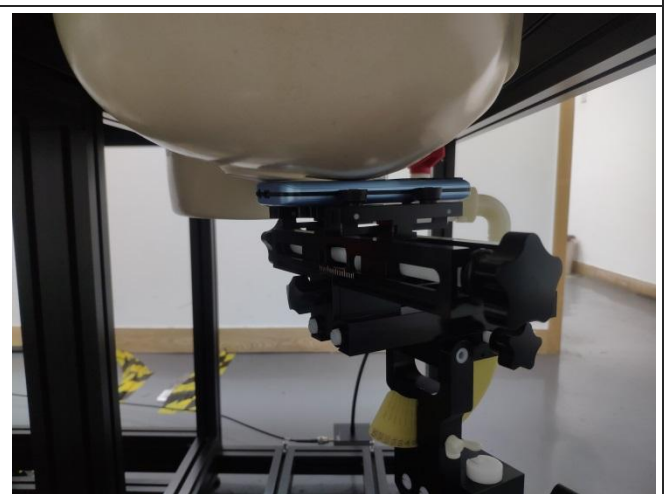
Liquid depth in the Head phantom



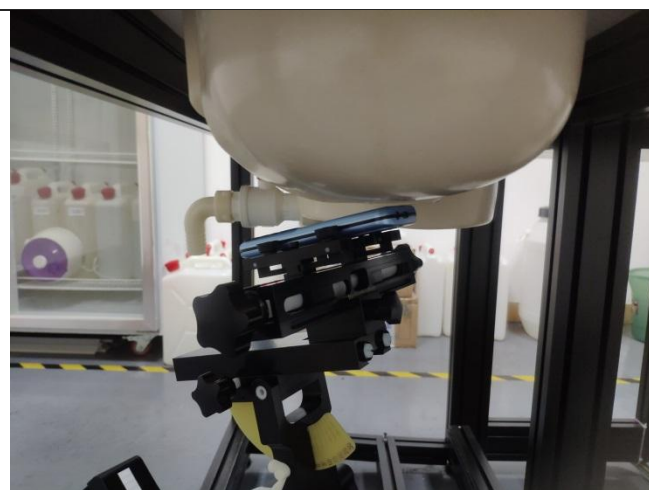
Liquid depth in the Body phantom



Left Head Touch



Right Head Touch



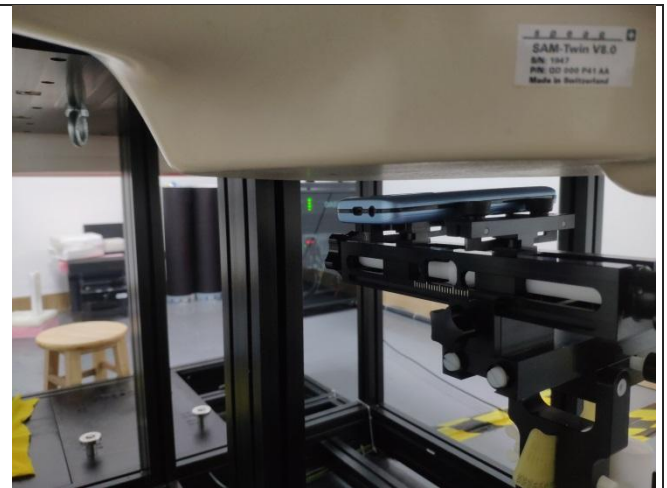
Left Head Tilt (15°)



Right Head Tilt (15°)



Front (10mm)



Rear (10mm)



Left Side (10mm)



Right Side (10mm)



Top Side (10mm)



Bottom Side (10mm)



Front with earphone (10mm)



Rear with earphone (10mm)



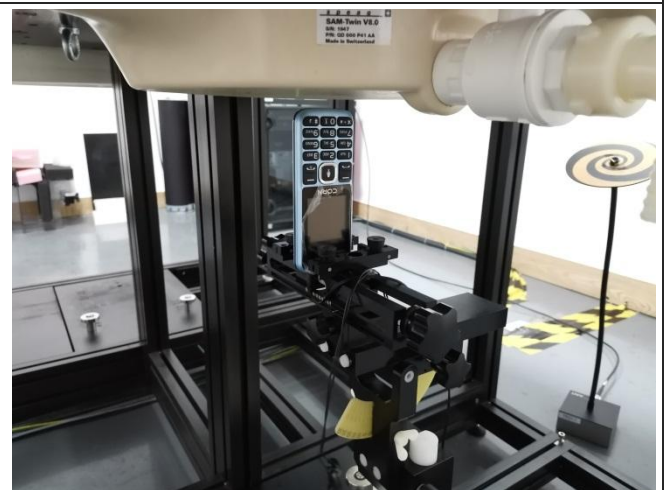
Left Side with earphone (10mm)



Right Side with earphone (10mm)



Top Side with earphone (10mm)



Bottom Side with earphone (10mm)

17. External and Internal Photos of the EUT

Please reference to the report No.: CHTEW22080223

-----End of Report-----

Project No.	SHT2207088502EW		
Test sample No.	YPHT22070885004	Model No.	Smart K
Start test date	2022/8/5	Finish date	2022/8/10
Temperature	22.6°C	Humidity	39%
Test Engineer	Bo Wang	Auditor	<i>Weiyang.Xiang</i>

Appendix clause	Test Item	Result
A	Conducted Power Measurement Results	PASS
B	SAR Measurement Results	PASS
C	Simultaneous Transmission analysis	PASS

Appendix A:Conducted Power Measurement Results-GSM

GSM850		Burst Average Power (dBm)			Tune-up limit (dBm)	Division Factors	Frame-Average Power (dBm)			Tune-up limit (dBm)
		CH128	CH190	CH251			CH128	CH190	CH251	
		824.2MHz	836.6MHz	848.8MHz			824.2MHz	836.6MHz	848.8MHz	
GSM		32.48	32.47	32.47	32.50	-9.03	23.45	23.44	23.44	23.47
GPRS (GMSK)	1Tx slot	32.50	32.33	32.03	33.00	-9.03	23.47	23.30	23.00	23.97
	2Tx slots	32.01	31.98	31.66	32.50	-6.02	25.99	25.96	25.64	26.48
	3Tx slots	30.43	30.47	29.98	30.50	-4.26	26.17	26.21	25.72	26.24
	4Tx slots	29.16	29.14	28.78	29.50	-3.01	26.15	26.13	25.77	26.49

GSM1900		Burst Average Power (dBm)			Tune-up limit (dBm)	Division Factors	Frame-Average Power (dBm)			Tune-up limit (dBm)
		CH512	CH661	CH810			CH512	CH661	CH810	
		1850.2MHz	1880MHz	1909.8MHz			1850.2MHz	1880.0MHz	1909.8MHz	
GSM		29.13	29.41	29.45	29.50	-9.03	20.10	20.38	20.42	20.47
GPRS (GMSK)	1Tx slot	29.09	29.27	29.33	29.50	-9.03	20.06	20.24	20.30	20.47
	2Tx slots	28.26	28.68	28.83	29.00	-6.02	22.24	22.66	22.81	22.98
	3Tx slots	27.19	27.50	27.69	28.00	-4.26	22.93	23.24	23.43	23.74
	4Tx slots	24.80	25.27	25.51	26.00	-3.01	21.79	22.26	22.50	22.99

Appendix A:Conducted Power Measurement Results-WCDMA

WCDMA Band II		Conducted Power (dBm)			Tune-up limit (dBm)
		CH9262	CH9400	CH9538	
		1852.4MHz	1880MHz	1907.6MHz	
AMR 12.2K		22.79	22.96	22.82	23.00
RMC 12.2K		22.82	22.99	22.85	23.00
HSDPA	Subtest-1	21.79	21.40	21.03	22.00
	Subtest-2	21.33	20.91	20.58	21.50
	Subtest-3	21.37	20.92	20.60	21.50
	Subtest-4	21.33	20.91	20.60	21.50
HSUPA	Subtest-1	19.97	20.06	20.02	20.50
	Subtest-2	20.43	20.62	20.62	21.00
	Subtest-3	20.97	21.04	21.07	21.50
	Subtest-4	20.04	20.10	19.97	20.50
	Subtest-5	22.00	21.99	22.01	22.50

WCDMA Band V		Conducted Power (dBm)			Tune-up limit (dBm)
		CH4132	CH4183	CH4233	
		826.4MHz	836.6MHz	846.6MHz	
AMR 12.2K		23.33	23.35	22.96	23.50
RMC 12.2K		23.37	23.39	22.99	23.50
HSDPA	Subtest-1	22.06	22.17	21.72	22.50
	Subtest-2	21.71	21.70	21.30	22.00
	Subtest-3	21.67	21.69	21.34	22.00
	Subtest-4	21.68	21.73	21.33	22.00
HSUPA	Subtest-1	20.14	18.77	20.04	20.50
	Subtest-2	20.70	20.25	20.53	21.00
	Subtest-3	21.02	20.75	20.98	21.50
	Subtest-4	19.75	19.75	20.01	20.50
	Subtest-5	21.99	22.22	22.03	22.50

Appendix A:Conducted Power Measurement Results-WIFI/Bluetooth

WIFI 2.4G					
Mode	Channel	Frequency (MHz)	Peak Power (dBm)	Average Power (dBm)	Tune-up limit (dBm)
802.11b	1	2412	14.97	12.52	13.00
	6	2437	14.32	11.87	12.00
	11	2462	14.16	11.72	12.00
802.11g	1	2412	15.28	12.76	13.00
	6	2437	14.66	11.95	12.00
	11	2462	14.87	12.32	12.00
802.11n (HT20)	1	2412	14.78	12.56	13.00
	6	2437	14.66	11.83	12.00
	11	2462	14.49	11.65	12.00

Bluetooth						
Mode		Channel	Frequency (MHz)	Peak Power (dBm)	Average Power (dBm)	Tune-up limit (dBm)
EDR	GFSK	0	2402	4.22	4.21	4.50
		39	2441	3.11	3.10	3.50
		78	2480	3.64	3.63	4.00
	$\pi/4$ QPSK	0	2402	4.34	3.83	4.00
		39	2441	3.99	3.50	3.50
		78	2480	3.58	3.07	3.50
	8DPSK	0	2402	4.44	3.91	4.00
		39	2441	4.13	3.62	4.00
		78	2480	3.75	3.15	3.50
BLE	GFSK	0	2402	-3.58	-3.67	-3.50
		19	2440	-3.99	-4.08	-4.00
		39	2480	-5.02	-5.12	-5.00

Appendix B:SAR Measurement Results-Head

GSM850										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz					(W/kg)	(W/kg)	
GPRS 3Tx slots	Left-Cheek	128	824.2	30.43	30.50	1.016	0.13	1.060	1.077	-
		190	836.6	30.47	30.50	1.007	-0.14	1.130	1.138	1
		251	848.8	29.98	30.50	1.127	-0.08	0.974	1.098	-
	Left-Tilt	128	824.2	30.43	30.50	1.016	-	-	-	-
		190	836.6	30.47	30.50	1.007	0.15	0.726	0.731	-
		251	848.8	29.98	30.50	1.127	-	-	-	-
	Right-Cheek	128	824.2	30.43	30.50	1.016	0.09	0.969	0.985	-
		190	836.6	30.47	30.50	1.007	0.06	1.048	1.055	-
		251	848.8	29.98	30.50	1.127	-0.05	0.926	1.044	-
	Right-Tilt	128	824.2	30.43	30.50	1.016	-	-	-	-
		190	836.6	30.47	30.50	1.007	-0.08	0.699	0.704	-
		251	848.8	29.98	30.50	1.127	-	-	-	-

GSM1900										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz					(W/kg)	(W/kg)	
GPRS 3Tx slots	Left-Cheek	512	1850.2	27.19	28.00	1.205	-	-	-	-
		661	1880.0	27.50	28.00	1.122	-	-	-	-
		810	1909.8	27.69	28.00	1.074	-0.14	0.044	0.047	2
	Left-Tilt	512	1850.2	27.19	28.00	1.205	-	-	-	-
		661	1880.0	27.50	28.00	1.122	-	-	-	-
		810	1909.8	27.69	28.00	1.074	-0.10	0.013	0.014	-
	Right-Cheek	512	1850.2	27.19	28.00	1.205	-	-	-	-
		661	1880.0	27.50	28.00	1.122	-	-	-	-
		810	1909.8	27.69	28.00	1.074	0.07	0.042	0.045	-
	Right-Tilt	512	1850.2	27.19	28.00	1.205	-	-	-	-
		661	1880.0	27.50	28.00	1.122	-	-	-	-
		810	1909.8	27.69	28.00	1.074	0.09	0.009	0.010	-

WCDMA Band II										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz					(W/kg)	(W/kg)	
RMC 12.2Kbps	Left-Cheek	9262	1852.4	22.82	23.00	1.042	-	-	-	-
		9400	1880.0	22.99	23.00	1.002	-0.06	0.608	0.609	3
		9538	1907.6	22.85	23.00	1.035	-	-	-	-
	Left-Tilt	9262	1852.4	22.82	23.00	1.042	-	-	-	-
		9400	1880.0	22.99	23.00	1.002	-0.05	0.294	0.295	-
		9538	1907.6	22.85	23.00	1.035	-	-	-	-
	Right-Cheek	9262	1852.4	22.82	23.00	1.042	-	-	-	-
		9400	1880.0	22.99	23.00	1.002	-0.08	0.580	0.581	-
		9538	1907.6	22.85	23.00	1.035	-	-	-	-
	Right-Tilt	9262	1852.4	22.82	23.00	1.042	-	-	-	-
		9400	1880.0	22.99	23.00	1.002	0.03	0.262	0.263	-
		9538	1907.6	22.85	23.00	1.035	-	-	-	-

WCDMA Band V										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz					(W/kg)	(W/kg)	
RMC 12.2Kbps	Left-Cheek	4132	826.4	23.37	23.50	1.030	-0.01	0.911	0.939	-
		4183	836.6	23.39	23.50	1.026	0.11	0.953	0.977	4
		4233	846.6	22.99	23.50	1.125	0.13	0.862	0.969	-
	Left-Tilt	4132	826.4	23.37	23.50	1.030	-	-	-	-
		4183	836.6	23.39	23.50	1.026	-0.12	0.729	0.748	-
		4233	846.6	22.99	23.50	1.125	-	-	-	-
	Right-Cheek	4132	826.4	23.37	23.50	1.030	-0.08	0.824	0.849	-
		4183	836.6	23.39	23.50	1.026	-0.05	0.884	0.907	-
		4233	846.6	22.99	23.50	1.125	0.14	0.783	0.881	-
	Right-Tilt	4132	826.4	23.37	23.50	1.030	-	-	-	-
		4183	836.6	23.39	23.50	1.026	0.06	0.669	0.686	-
		4233	846.6	22.99	23.50	1.125	-	-	-	-

WIFI 2.4G												
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Duty Cycle	Duty Cycle Scaling Factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz							(W/kg)	(W/kg)	
802.11b 1Mbps	Left-Cheek	1	2412	12.52	13.00	1.117	99.50%	1.005	-0.11	0.199	0.223	5
		6	2437	11.87	12.00	1.030	99.50%	1.005	-	-	-	-
		11	2462	11.72	12.00	1.067	99.50%	1.005	-	-	-	-
	Left-Tilt	1	2412	12.52	13.00	1.117	99.50%	1.005	0.15	0.169	0.189	-
		6	2437	11.87	12.00	1.030	99.50%	1.005	-	-	-	-
		11	2462	11.72	12.00	1.067	99.50%	1.005	-	-	-	-
	Right-Cheek	1	2412	12.52	13.00	1.117	99.50%	1.005	0.06	0.191	0.215	-
		6	2437	11.87	12.00	1.030	99.50%	1.005	-	-	-	-
		11	2462	11.72	12.00	1.067	99.50%	1.005	-	-	-	-
	Right-Tilt	1	2412	12.52	13.00	1.117	99.50%	1.005	-0.08	0.161	0.180	-
		6	2437	11.87	12.00	1.030	99.50%	1.005	-	-	-	-
		11	2462	11.72	12.00	1.067	99.50%	1.005	-	-	-	-

Bluetooth												
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Duty Cycle	Duty Cycle Scaling Factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz							(W/kg)	(W/kg)	
GFSK	Left-Cheek	0	2402	4.21	4.50	1.069	61.30%	1.631	-0.08	0.007	0.012	6
		39	2441	3.10	3.50	1.096	61.30%	1.631	-	-	-	-
		78	2480	3.63	4.00	1.089	61.30%	1.631	-	-	-	-
	Left-Tilt	0	2402	4.21	4.50	1.069	61.30%	1.631	0.11	0.005	0.009	-
		39	2441	3.10	3.50	1.096	61.30%	1.631	-	-	-	-
		78	2480	3.63	4.00	1.089	61.30%	1.631	-	-	-	-
	Right-Cheek	0	2402	4.21	4.50	1.069	61.30%	1.631	0.04	0.005	0.009	-
		39	2441	3.10	3.50	1.096	61.30%	1.631	-	-	-	-
		78	2480	3.63	4.00	1.089	61.30%	1.631	-	-	-	-
	Right-Tilt	0	2402	4.21	4.50	1.069	61.30%	1.631	-0.06	0.003	0.005	-
		39	2441	3.10	3.50	1.096	61.30%	1.631	-	-	-	-
		78	2480	3.63	4.00	1.089	61.30%	1.631	-	-	-	-

Appendix B:SAR Measurement Results-Body

GSM850										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz					(W/kg)	(W/kg)	
GPRS 3Tx slots	Front	128	824.2	30.43	30.50	1.016	0.05	0.933	0.948	-
		190	836.6	30.47	30.50	1.007	0.09	0.983	0.990	-
		251	848.8	29.98	30.50	1.127	-0.17	0.876	0.987	-
	Rear	128	824.2	30.43	30.50	1.016	0.11	1.290	1.311	-
		190	836.6	30.47	30.50	1.007	-0.01	1.320	1.329	7
		251	848.8	29.98	30.50	1.127	-0.03	1.160	1.308	-
GPRS 3Tx slots with earphone	Front	128	824.2	30.43	30.50	1.016	0.03	0.926	0.941	-
		190	836.6	30.47	30.50	1.007	-0.14	0.969	0.976	-
		251	848.8	29.98	30.50	1.127	0.05	0.850	0.958	-
	Rear	128	824.2	30.43	30.50	1.016	-0.08	1.270	1.291	-
		190	836.6	30.47	30.50	1.007	0.17	1.300	1.309	-
		251	848.8	29.98	30.50	1.127	0.06	1.130	1.274	-

GSM1900										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz					(W/kg)	(W/kg)	
GPRS 3Tx slots	Front	512	1850.2	27.19	28.00	1.205	-	-	-	-
		661	1880.0	27.50	28.00	1.122	-	-	-	-
		810	1909.8	27.69	28.00	1.074	0.05	0.112	0.120	-
	Rear	512	1850.2	27.19	28.00	1.205	-	-	-	-
		661	1880.0	27.50	28.00	1.122	-	-	-	-
		810	1909.8	27.69	28.00	1.074	-0.07	0.177	0.190	8

WCDMA Band II										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz					(W/kg)	(W/kg)	
RMC 12.2Kbps	Front	9262	1852.4	22.82	23.00	1.042	-0.09	0.969	1.010	-
		9400	1880.0	22.99	23.00	1.002	0.07	1.060	1.062	-
		9538	1907.6	22.85	23.00	1.035	0.08	0.992	1.027	-
	Rear	9262	1852.4	22.82	23.00	1.042	0.14	1.310	1.365	-
		9400	1880.0	22.99	23.00	1.002	-0.06	1.470	1.473	9
		9538	1907.6	22.85	23.00	1.035	-0.05	1.380	1.428	-
RMC 12.2Kbps with earphone	Front	9262	1852.4	22.82	23.00	1.042	-0.09	0.952	0.992	-
		9400	1880.0	22.99	23.00	1.002	0.13	1.040	1.042	-
		9538	1907.6	22.85	23.00	1.035	-0.07	0.979	1.013	-
	Rear	9262	1852.4	22.82	23.00	1.042	0.14	1.280	1.334	-
		9400	1880.0	22.99	23.00	1.002	0.11	1.450	1.453	-
		9538	1907.6	22.85	23.00	1.035	-0.02	1.360	1.408	-

WCDMA Band V										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz					(W/kg)	(W/kg)	
RMC 12.2Kbps	Front	4132	826.4	23.37	23.50	1.030	0.11	0.881	0.908	-
		4183	836.6	23.39	23.50	1.026	-0.02	0.924	0.948	-
		4233	846.6	22.99	23.50	1.125	-0.08	0.838	0.942	-
	Rear	4132	826.4	23.37	23.50	1.030	0.13	1.020	1.051	-
		4183	836.6	23.39	23.50	1.026	-0.01	1.240	1.272	10
		4233	846.6	22.99	23.50	1.125	-0.09	0.975	1.096	-
RMC 12.2Kbps with earphone	Front	4132	826.4	23.37	23.50	1.030	-0.09	0.862	0.888	-
		4183	836.6	23.39	23.50	1.026	0.01	0.911	0.934	-
		4233	846.6	22.99	23.50	1.125	0.13	0.816	0.918	-
	Rear	4132	826.4	23.37	23.50	1.030	-0.17	1.000	1.030	-
		4183	836.6	23.39	23.50	1.026	0.14	1.210	1.241	-
		4233	846.6	22.99	23.50	1.125	0.04	0.963	1.083	-

WIFI 2.4G												
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Duty Cycle	Duty Cycle Scaling Factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz							(W/kg)	(W/kg)	
802.11b 1Mbps	Front	1	2412	12.52	13.00	1.117	0.995	1.005	-0.05	0.074	0.083	-
		6	2437	11.87	12.00	1.030	0.995	1.005	-	-	-	-
		11	2462	11.72	12.00	1.067	0.995	1.005	-	-	-	-
	Rear	1	2412	12.52	13.00	1.117	0.995	1.005	-0.10	0.093	0.104	11
		6	2437	11.87	12.00	1.030	0.995	1.005	-	-	-	-
		11	2462	11.72	12.00	1.067	0.995	1.005	-	-	-	-

Bluetooth												
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Duty Cycle	Duty Cycle Scaling Factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz							(W/kg)	(W/kg)	
GFSK	Front	0	2402	4.21	4.50	1.069	0.613	1.631	-0.03	0.003	0.005	-
		39	2441	3.10	3.50	1.096	0.613	1.631	-	-	-	-
		78	2480	3.63	4.00	1.089	0.613	1.631	-	-	-	-
	Rear	0	2402	4.21	4.50	1.069	0.613	1.631	-0.09	0.006	0.010	12
		39	2441	3.10	3.50	1.096	0.613	1.631	-	-	-	-
		78	2480	3.63	4.00	1.089	0.613	1.631	-	-	-	-

Appendix B:SAR Measurement Results-Hotspot

GSM850										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz					(W/kg)	(W/kg)	
GPRS 3Tx slots	Front	128	824.2	30.43	30.50	1.016	0.05	0.933	0.948	-
		190	836.6	30.47	30.50	1.007	0.09	0.983	0.990	-
		251	848.8	29.98	30.50	1.127	-0.17	0.876	0.987	-
	Rear	128	824.2	30.43	30.50	1.016	0.11	1.290	1.311	-
		190	836.6	30.47	30.50	1.007	-0.01	1.320	1.329	7
		251	848.8	29.98	30.50	1.127	-0.03	1.160	1.308	-
	Left	128	824.2	30.43	30.50	1.016	0.05	0.759	0.771	-
		190	836.6	30.47	30.50	1.007	0.01	0.812	0.818	-
		251	848.8	29.98	30.50	1.127	-0.13	0.718	0.809	-
	Right	190	836.6	30.47	30.50	1.007	-0.06	0.776	0.781	-
	Top	190	836.6	30.47	30.50	1.007	-	-	-	-
	Bottom	190	836.6	30.47	30.50	1.007	-0.14	0.696	0.701	-
GPRS 3Tx slots with earphone	Front	128	824.2	30.43	30.50	1.016	0.03	0.926	0.941	-
		190	836.6	30.47	30.50	1.007	-0.14	0.969	0.976	-
		251	848.8	29.98	30.50	1.127	0.05	0.850	0.958	-
	Rear	128	824.2	30.43	30.50	1.016	-0.08	1.270	1.291	-
		190	836.6	30.47	30.50	1.007	0.17	1.300	1.309	-
		251	848.8	29.98	30.50	1.127	0.06	1.130	1.274	-
	Left	128	824.2	30.43	30.50	1.016	-0.08	0.755	0.767	-
		190	836.6	30.47	30.50	1.007	0.09	0.806	0.812	-
		251	848.8	29.98	30.50	1.127	-0.14	0.703	0.792	-
	Right	190	836.6	30.47	30.50	1.007	-0.05	0.768	0.773	-
	Top	190	836.6	30.47	30.50	1.007	-	-	-	-
	Bottom	190	836.6	30.47	30.50	1.007	0.07	0.683	0.688	-

GSM1900										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz					(W/kg)	(W/kg)	
GPRS 3Tx slots	Front	512	1850.2	27.19	28.00	1.205	-	-	-	-
		661	1880.0	27.50	28.00	1.122	-	-	-	-
		810	1909.8	27.69	28.00	1.074	0.05	0.112	0.120	-
	Rear	512	1850.2	27.19	28.00	1.205	-	-	-	-
		661	1880.0	27.50	28.00	1.122	-	-	-	-
		810	1909.8	27.69	28.00	1.074	-0.07	0.177	0.190	8
	Left	810	1909.8	27.69	28.00	1.074	0.04	0.109	0.117	-
	Right	810	1909.8	27.69	28.00	1.074	-0.03	0.104	0.112	-
	Top	810	1909.8	27.69	28.00	1.074	-	-	-	-
	Bottom	810	1909.8	27.69	28.00	1.074	0.01	0.166	0.178	-

WCDMA Band II										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz					(W/kg)	(W/kg)	
RMC 12.2Kbps	Front	9262	1852.4	22.82	23.00	1.042	-0.09	0.969	1.010	-
		9400	1880.0	22.99	23.00	1.002	0.07	1.060	1.062	-
		9538	1907.6	22.85	23.00	1.035	0.08	0.992	1.027	-
	Rear	9262	1852.4	22.82	23.00	1.042	0.14	1.310	1.365	-
		9400	1880.0	22.99	23.00	1.002	-0.06	1.470	1.473	9
		9538	1907.6	22.85	23.00	1.035	-0.05	1.380	1.428	-
	Left	9262	1852.4	22.82	23.00	1.042	-0.06	0.813	0.847	-
		9400	1880.0	22.99	23.00	1.002	0.03	0.905	0.907	-
		9538	1907.6	22.85	23.00	1.035	0.01	0.852	0.882	-
	Right	9262	1852.4	22.82	23.00	1.042	-0.08	0.794	0.828	-
		9400	1880.0	22.99	23.00	1.002	-0.02	0.864	0.866	-
		9538	1907.6	22.85	23.00	1.035	0.09	0.826	0.855	-
	Top	9400	1880.0	22.99	23.00	1.002	-	-	-	-
	Bottom	9262	1852.4	22.82	23.00	1.042	-0.17	0.983	1.025	-
		9400	1880.0	22.99	23.00	1.002	-0.02	1.150	1.153	-
9538		1907.6	22.85	23.00	1.035	0.12	1.060	1.097	-	
RMC 12.2Kbps with earphone	Front	9262	1852.4	22.82	23.00	1.042	-0.09	0.952	0.992	-
		9400	1880.0	22.99	23.00	1.002	0.13	1.040	1.042	-
		9538	1907.6	22.85	23.00	1.035	-0.07	0.979	1.013	-
	Rear	9262	1852.4	22.82	23.00	1.042	0.14	1.280	1.334	-
		9400	1880.0	22.99	23.00	1.002	0.11	1.450	1.453	-
		9538	1907.6	22.85	23.00	1.035	-0.02	0.000	1.408	-
	Left	9262	1852.4	22.82	23.00	1.042	-0.08	0.806	0.840	-
		9400	1880.0	22.99	23.00	1.002	0.15	0.896	0.898	-
		9538	1907.6	22.85	23.00	1.035	-0.10	0.838	0.867	-
	Right	9262	1852.4	22.82	23.00	1.042	-0.17	0.782	0.815	-
		9400	1880.0	22.99	23.00	1.002	-0.06	0.847	0.849	-
		9538	1907.6	22.85	23.00	1.035	0.03	0.815	0.844	-
	Top	9400	1880.0	22.99	23.00	1.002	-	-	-	-
	Bottom	9262	1852.4	22.82	23.00	1.042	0.19	0.968	1.009	-
		9400	1880.0	22.99	23.00	1.002	0.02	1.130	1.133	-
9538		1907.6	22.85	23.00	1.035	0.05	1.020	1.056	-	

WCDMA Band V										
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz					(W/kg)	(W/kg)	
RMC 12.2Kbps	Front	4132	826.4	23.37	23.50	1.030	0.11	0.881	0.908	-
		4183	836.6	23.39	23.50	1.026	-0.02	0.924	0.948	-
		4233	846.6	22.99	23.50	1.125	-0.08	0.838	0.942	-
	Rear	4132	826.4	23.37	23.50	1.030	0.13	1.020	1.051	-
		4183	836.6	23.39	23.50	1.026	-0.01	1.240	1.272	10
		4233	846.6	22.99	23.50	1.125	-0.09	0.975	1.096	-
	Left	4183	836.6	23.39	23.50	1.026	0.01	0.763	0.783	-
	Right	4183	836.6	23.39	23.50	1.026	0.00	0.729	0.748	-
	Top	4183	836.6	23.39	23.50	1.026	-	-	-	-
	Bottom	4183	836.6	23.39	23.50	1.026	-0.09	0.503	0.516	-
RMC 12.2Kbps with earphone	Front	4132	826.4	23.37	23.50	1.030	0.01	0.862	0.888	-
		4183	836.6	23.39	23.50	1.026	0.13	0.911	0.934	-
		4233	846.6	22.99	23.50	1.125	-0.17	0.816	0.918	-
	Rear	4132	826.4	23.37	23.50	1.030	0.14	1.000	1.030	-
		4183	836.6	23.39	23.50	1.026	0.04	1.210	1.241	-
		4233	846.6	22.99	23.50	1.125	0.00	0.963	1.083	-
	Left	4183	836.6	23.39	23.50	1.026	-0.06	0.757	0.776	-
	Right	4183	836.6	23.39	23.50	1.026	0.13	0.714	0.732	-
	Top	4183	836.6	23.39	23.50	1.026	-	-	-	-
	Bottom	4183	836.6	23.39	23.50	1.026	-0.08	0.486	0.498	-

WIFI 2.4G												
Mode	Test Position	Frequency		Conducted Power (dBm)	Tune-up limit (dBm)	Tune-up scaling factor	Duty Cycle	Duty Cycle Scaling Factor	Power Drift(dB)	Measured SAR(1g)	Report SAR(1g)	Plot No.
		CH	MHz							(W/kg)	(W/kg)	
802.11b	Front	1	2412	12.52	13.00	1.117	0.995	1.005	-0.05	0.074	0.083	-
		6	2437	11.87	12.00	1.030	0.995	1.005	-	-	-	-
		11	2462	11.72	12.00	1.067	0.995	1.005	-	-	-	-
	Rear	1	2412	12.52	13.00	1.117	0.995	1.005	-0.10	0.093	0.104	11
		6	2437	11.87	12.00	1.030	0.995	1.005	-	-	-	-
		11	2462	11.72	12.00	1.067	0.995	1.005	-	-	-	-
	Left	1	2412	12.52	13.00	1.117	0.995	1.005	0.06	0.057	0.064	-
	Right	1	2412	12.52	13.00	1.117	0.995	1.005	-	-	-	-
	Top	1	2412	12.52	13.00	1.117	0.995	1.005	-0.09	0.076	0.085	-
	Bottom	1	2412	12.52	13.00	1.117	0.995	1.005	-	-	-	-

Appendix C: Simultaneous Transmission analysis-Head

PCE + WLAN DTS					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR
			PCE	WLAN DTS	(W/kg)
GSM	GSM850	Left Cheek	1.138	0.223	1.361
		Left Tilted	0.731	0.189	0.920
		Right Cheek	1.055	0.215	1.270
		Right Tilted	0.704	0.180	0.884
	GSM1900	Left Cheek	0.047	0.223	0.270
		Left Tilted	0.014	0.189	0.203
		Right Cheek	0.045	0.215	0.260
		Right Tilted	0.010	0.180	0.190
WCDMA	Band II	Left Cheek	0.609	0.223	0.832
		Left Tilted	0.295	0.189	0.484
		Right Cheek	0.581	0.215	0.796
		Right Tilted	0.263	0.180	0.443
	Band V	Left Cheek	0.977	0.223	1.200
		Left Tilted	0.748	0.189	0.937
		Right Cheek	0.907	0.215	1.122
		Right Tilted	0.686	0.180	0.866

PCE + BT					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR
			PCE	BT	(W/kg)
GSM	GSM850	Left Cheek	1.138	0.012	1.150
		Left Tilted	0.731	0.009	0.740
		Right Cheek	1.055	0.009	1.064
		Right Tilted	0.704	0.005	0.709
	GSM1900	Left Cheek	0.047	0.012	0.059
		Left Tilted	0.014	0.009	0.023
		Right Cheek	0.045	0.009	0.054
		Right Tilted	0.010	0.005	0.015
WCDMA	Band II	Left Cheek	0.609	0.012	0.621
		Left Tilted	0.295	0.009	0.304
		Right Cheek	0.581	0.009	0.590
		Right Tilted	0.263	0.005	0.268
	Band V	Left Cheek	0.977	0.012	0.989
		Left Tilted	0.748	0.009	0.757
		Right Cheek	0.907	0.009	0.916
		Right Tilted	0.686	0.005	0.691

Appendix C: Simultaneous Transmission analysis-Body

PCE + WLAN DTS					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR
			PCE	WLAN DTS	(W/kg)
GSM	GSM850	Front	0.990	0.083	1.073
		Rear	1.329	0.104	1.433
	GSM850 with earphone	Front	0.976	0.083	1.059
		Rear	1.309	0.104	1.413
	GSM1900	Front	0.120	0.083	0.203
		Rear	0.190	0.104	0.294
WCDMA	Band II	Front	1.062	0.083	1.145
		Rear	1.473	0.104	1.577
	Band II with earphone	Front	1.042	0.083	1.125
		Rear	1.453	0.104	1.557
	Band V	Front	0.948	0.083	1.031
		Rear	1.272	0.104	1.376
	Band V with earphone	Front	0.934	0.083	1.017
		Rear	1.241	0.104	1.345

PCE + BT					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR
			PCE	BT	(W/kg)
GSM	GSM850	Front	0.990	0.005	0.995
		Rear	1.329	0.010	1.339
	GSM850 with earphone	Front	0.976	0.005	0.981
		Rear	1.309	0.010	1.319
	GSM1900	Front	0.120	0.005	0.125
		Rear	0.190	0.010	0.200
WCDMA	Band II	Front	1.062	0.005	1.067
		Rear	1.473	0.010	1.483
	Band II with earphone	Front	1.042	0.005	1.047
		Rear	1.453	0.010	1.463
	Band V	Front	0.948	0.005	0.953
		Rear	1.272	0.010	1.282
	Band V with earphone	Front	0.934	0.005	0.939
		Rear	1.241	0.010	1.251

Appendix C: Simultaneous Transmission analysis-Hotsopt

PCE + WLAN DTS					
WWAN Band		Exposure Position	Max SAR (W/kg)		Summed SAR
			PCE	WLAN DTS	(W/kg)
GSM	GSM850	Front	0.990	0.083	1.073
		Rear	1.329	0.104	1.433
		Left side	0.818	0.064	0.882
		Right side	0.781	-	0.781
		Top side	-	0.085	0.085
		Bottom side	0.701	-	0.701
	GSM850 with earphone	Front	0.976	0.083	1.059
		Rear	1.309	0.104	1.413
		Left side	0.812	0.064	0.876
		Right side	0.773	-	0.773
		Top side	-	0.085	0.085
		Bottom side	0.688	-	0.688
	GSM1900	Front	0.120	0.083	0.203
		Rear	0.190	0.104	0.294
		Left side	0.117	0.064	0.181
		Right side	0.112	-	0.112
		Top side	-	0.085	0.085
		Bottom side	0.178	-	0.178
WCDMA	Band II	Front	1.062	0.083	1.145
		Rear	1.473	0.104	1.577
		Left side	0.907	0.064	0.971
		Right side	0.866	-	0.866
		Top side	-	0.085	0.085
		Bottom side	1.153	-	1.150
	Band II with earphone	Front	1.042	0.083	1.125
		Rear	1.453	0.104	1.557
		Left side	0.898	0.064	0.962
		Right side	0.849	-	0.849
		Top side	-	0.085	0.085
		Bottom side	1.133	-	1.133
	Band V	Front	0.948	0.083	1.031
		Rear	1.272	0.104	1.376
		Left side	0.783	0.064	0.847
		Right side	0.748	-	0.748
		Top side	-	0.085	0.085
		Bottom side	0.516	-	0.516
	Band V with earphone	Front	0.934	0.083	1.017
		Rear	1.241	0.104	1.345
		Left side	0.776	0.064	0.840
		Right side	0.732	-	0.732
		Top side	-	0.085	0.085
		Bottom side	0.498	-	0.498