SAR Test Report

Report No.: AGC06049180901FH01

FCC ID	:	ZS4FD-798W
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	3G network radio
BRAND NAME	:	FDX, ANYTALK
MODEL NAME	:	FD-798W, AT-588W
CLIENT	:	Quanzhou Feidaxin Electronics Co., Ltd.
DATE OF ISSUE	:	Nov.09,2018
STANDARD(S)	:	IEEE Std. 1528:2013 FCC 47CFR § 2.1093 IEEE/ANSI C95.1:2005
REPORT VERSION	:	V1.2

Attestation of Global Compliance(Shenzhen) Co., Ltd.

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Oct. 16,2018	Invalid	Initial Release
V1.1	1st	Oct.31,2018	Invalid	Updated the photos
V1.2	2nd	Nov.09,2018	Valid	Added the photo of test headset on page 42.

Test Report

Applicant Name	Quanzhou Feidaxin Electronics Co., Ltd.
Applicant Address	Feidaxin Building,Tandxi Industrial Zone, Luojiang District, Quanzhou , Fujian, China
Manufacturer Name	Quanzhou Feidaxin Electronics Co., Ltd.
Manufacturer Address	Feidaxin Building,Tandxi Industrial Zone, Luojiang District, Quanzhou , Fujian, China
Product Designation	3G network radio
Brand Name	FDX, ANYTALK
Model Name	FD-798W, AT-588W
Different Description	All the same, except for the model name and brand name. FDX corresponding to FD-798W; ANYTALK corresponding to AT-588W. The test model is FD-798W.
EUT Voltage	DC3.7V by battery
Applicable Standard	IEEE Std. 1528:2013 FCC 47CFR § 2.1093 IEEE/ANSI C95.1:2005
Test Date	Sep. 28,2018 to Sep. 29,2018
Report Template	AGCRT-US-3G3/SAR (2018-01-01)

Note: The results of testing in this report apply to the product/system which was tested only.

Owen Xiao

Tested By

Owen Xiao (Xiao Qi) Sep. 29,2018

Angela Li

Checked By

Angela Li(Li Jiao) Nov.09,2018

Forrest Lei

Authorized By

Forrest Lei(Lei Yonggang) Nov.09,2018
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1. SUMMARY OF MAXIMUM SAR VALUE

The maximum results of Specific Absorption Rate (SAR) found during testing for EUT are as follows:

Frequency Band	Highest Reported 1g-SAR(W/Kg)		SAR Test Limit (W/Kg)
	Head	Body-worn	
UMTS Band II	0.077	0.217	1.6
UMTS Band V	0.211	0.448	
SAR Test Result	PASS		

This device is compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6W/Kg) specified in IEEE Std. 1528:2013; FCC 47CFR § 2.1093; IEEE/ANSI C95.1:2005 and the following specific FCC Test Procedures:

- KDB 447498 D01 General RF Exposure Guidance v06
- KDB 648474 D04 Handset SAR v01r03
- KDB 865664 D01 SAR Measurement 100MHz to 6GHz v01r04
- KDB 941225 D01 3G SAR Procedures v03r01

2. GENERAL INFORMATION

2.1. EUT Description

General Information	
Product Designation	3G network radio
Test Model	FD-798W
Hardware Version	798W-F
Software Version	M021_FDX_3G_B2B5_V1_3_20180727
Device Category	Portable
RF Exposure Environment	Uncontrolled
Antenna Type	Internal
WCDMA	
Support Band	☒UMTS FDD Band II ☒UMTS FDD Band V ☐UMTS FDD Band I ☐UMTS FDD Band VIII
TX Frequency Range	WCDMA FDD Band II: 1850-1910MHz; WCDMA FDD Band V: 820-850MHz
RX Frequency Range	WCDMA FDD Band II: 1930-1990MHz; WCDMA FDD Band V: 869-894MHz
Release Version	Rel-6
Type of modulation	WCDMA:QPSK
Antenna Gain	WCDMA850: 1.14dBi; WCDMA1900:1.10dBi
Max. Average Power	Band II: 22.54dBm; Band V: 21.74dBm
Accessories	
Battery	Brand name: FDX Model No. : FDB-18 Voltage and Capacitance: 3.7 V & 5800mAh
Earphone	Brand name: N/A Model No. : N/A

Note: 1. CMU200 can measure the average power and Peak power at the same time
2. The sample used for testing is end product.

Product	Type	
	☒ Production unit	☐ Identical Prototype

Declaration on model difference
型号差异声明

We (Quanzhou Feidaxin Electronics Co., Ltd.) Officially notify Attestation of Global Compliance (Shenzhen) Co., Ltd. that the AT-588W_have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction, with FD-798W_The difference lies only in the different Only model name and brand name are different.

我司（福建省泉州市飞达信电子有限公司）本次申请检测的产品，AT-588W 与_FD-798W 具有相同的技术结构，包括电路图、PCB 布局、主要的元器件和元件布局、所有的电气结构和机械结构。不同之处在于_型号命名和商标。

Product Name 产品名称	3G network radio
Model No. 型号	FD-798W、AT-588W

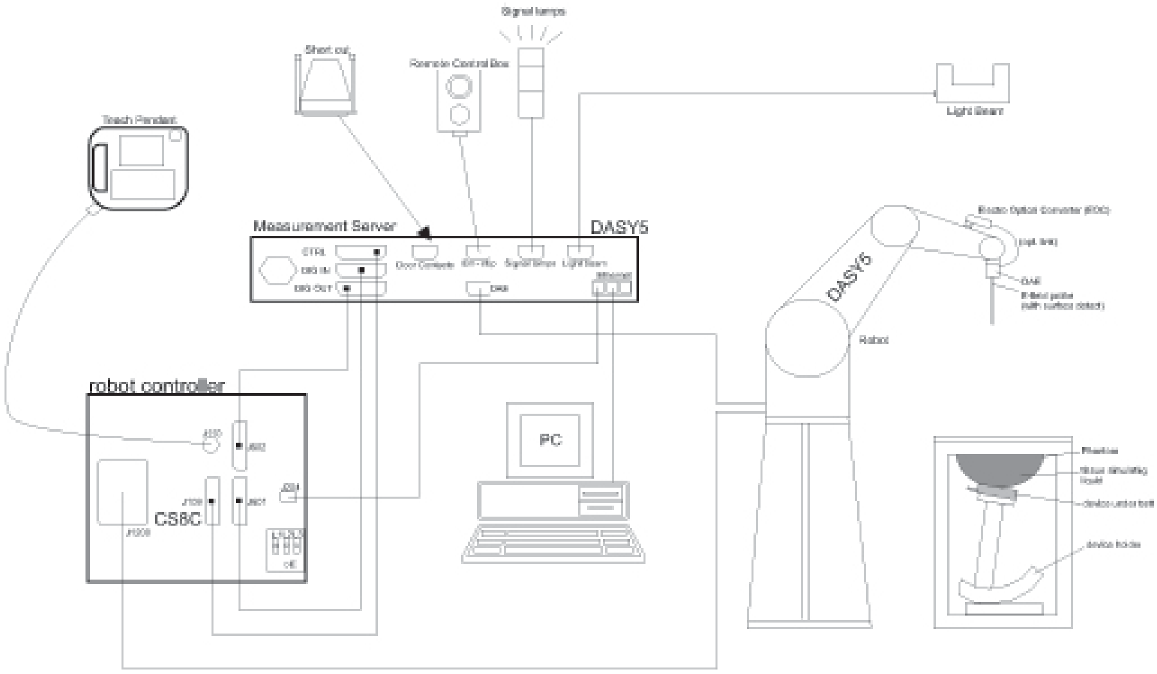
Manufacturer Information:

Company 公司名称	Quanzhou Feidaxin Electronics Co., Ltd.		
Address 地址	Feidaxin Building,Tandxi Industrial Zone, Luojiang District, Quanzhou , Fujian, China		
Name/Title	Minzhang Cai	E-mail	sales1@feidaxin.com
Tel. No.	86-595-22163929	Fax No.	86-595-22673929

Signature / stamp Date: 2018-09-1

3. SAR MEASUREMENT SYSTEM

3.1. The DASY5 system used for performing compliance tests consists of following items



- A standard high precision 6-axis robot with controller, teach pendant and software.
- Data acquisition electronics (DAE) which attached to the robot arm extension. The DAE 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
- A dosimetric probe equipped with an optical surface detector system.
- 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.
- A Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- Phantoms, device holders and other accessories according to the targeted measurement.

3.2. DASY5 E-Field Probe

The SAR measurement is conducted with the dosimetric probe manufactured by SPEAG. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. SPEAG conducts the probe calibration in compliance with international and national standards (e.g. IEEE-1528 and relevant KDB files etc.)Under ISO17025.The calibration data are in Appendix D.

Isotropic E-Field Probe Specification

Model	EX3DV4-SN:3953	
Manufacture	SPEAG	
frequency	0.7GHz-6GHz Linearity:±0.9%(k=2)	
Dynamic Range	0.01W/Kg-100W/Kg Linearity: ±0.9%(k=2)	
Dimensions	Overall length:337mm Tip diameter:2.5mm Typical distance from probe tip to dipole centers:1mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

3.3. Data Acquisition Electronics description

The data acquisition electronics (DAE) consist if a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converte and a command decoder with a control logic unit. Transmission to the measurement sever is accomplished through an optical downlink fir 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.

DAE4

Input Impedance	200MOhm	
The Inputs	Symmetrical and floating	
Common mode rejection	above 80 dB	

3.4. Robot

The DASY system uses the high precision robots (DASY5:TX60) type from Stäubli SA (France). For the 6-axis controller system, the robot controller version from is used.
The XL robot series have many features that are important for our application:

- High precision (repeatability 0.02 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)
- 6-axis controller

3.5. Light Beam Unit

The light beam switch allows automatic “tooling” of the probe. During the process, the actual position of the probe tip with respect to the robot arm is measured, as well as the probe length and the horizontal probe offset. The software then corrects all movements, such that the robot coordinates are valid for the probe tip.
The repeatability of this process is better than 0.1 mm. If a position has been taught with an aligned prob.1 mm, even if the other probe has different dimensions. During probe rotations, the probe tip will keep its actual position. e, the same position will be reached with another aligned probe within 0

3.6. Device Holder

The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (EPR).
Thus the device needs no repositioning when changing the angles.
The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity $\varepsilon=3$ and loss tangent $\delta = 0.02$. 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.

3.7. Measurement Server

The measurement server is based on a PC/104 CPU board with CPU (DASY5: 400 MHz, Intel Celeron), chip-disk (DASY5: 128MB), RAM (DASY5: 128MB). The necessary circuits for communication with the DAE electronic box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DAYS I/O board, which is directly connected to the PC/104 bus of the CPU board.
The measurement server performs all the real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operations.

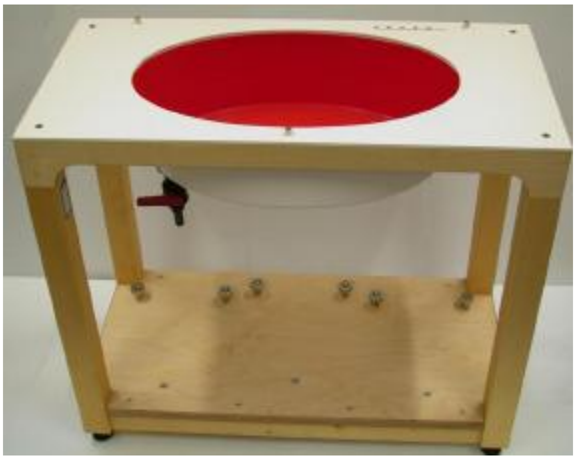
3.8. PHANTOM

SAM Twin Phantom

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

The bottom plate contains three pair 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 tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

ELI4 Phantom

Flat phantom a fiberglass shell flat phantom with 2mm+/- 0.2 mm shell thickness. It has only one measurement area for Flat phantom	

4. SAR MEASUREMENT PROCEDURE

4.1. Specific Absorption Rate (SAR)

SAR is related to the rate at which energy is absorbed per unit mass in object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and occupational/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element(dv) of given mass density (ρ). The equation description is as below:

$$\mathrm{SAR} = \frac{\mathrm{d}}{\mathrm{d}t}\left(\frac{\mathrm{d}W}{\mathrm{d}m}\right) = \frac{\mathrm{d}}{\mathrm{d}t}\left(\frac{\mathrm{d}W}{\rho \mathrm{d}V}\right)$$

SAR is expressed in units of Watts per kilogram (W/Kg)
SAR can be obtained using either of the following equations:

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

$$\mathrm{SAR} = c_h \left.\frac{\mathrm{d}T}{\mathrm{d}t}\right|_{t=0}$$

Where

SAR	is the specific absorption rate in watts per kilogram;
E	is the r.m.s. value of the electric field strength in the tissue in volts per meter;
σ	is the conductivity of the tissue in siemens per metre;
ρ	is the density of the tissue in kilograms per cubic metre;
c_h	is the heat capacity of the tissue in joules per kilogram and Kelvin;
$\frac{\mathrm{dT}}{\mathrm{dt}} \mid t = 0$	is the initial time derivative of temperature in the tissue in kelvins per second

4.2. SAR Measurement Procedure

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 is 2.7mm This distance cannot be smaller than the distance os 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 2db range is required in IEEE Standard 1528, whereby 3db is a requirement when compliance is assessed in accordance with the ARIB standard (Japan) If one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximum are detected, the number of Zoom Scan has to be increased accordingly.

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

<table>
<tr><th></th><th>≤ 3 GHz</th><th>> 3 GHz</th></tr>
<tr><td>Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td>Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">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.</td></tr>
</table>

Step 3: Zoom Scan

Zoom Scan are used to assess the peak spatial SAR value within a cubic average volume containing 1g abd 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 1g and 10g and displays these values next to the job’s label.

Zoom Scan Parameters extracted from KDB865664 d01 SAR Measurement 100MHz to 6GHz

<table>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
* When zoom scan is required and the <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB 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.</td></tr>
</table>

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 same settings. 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.

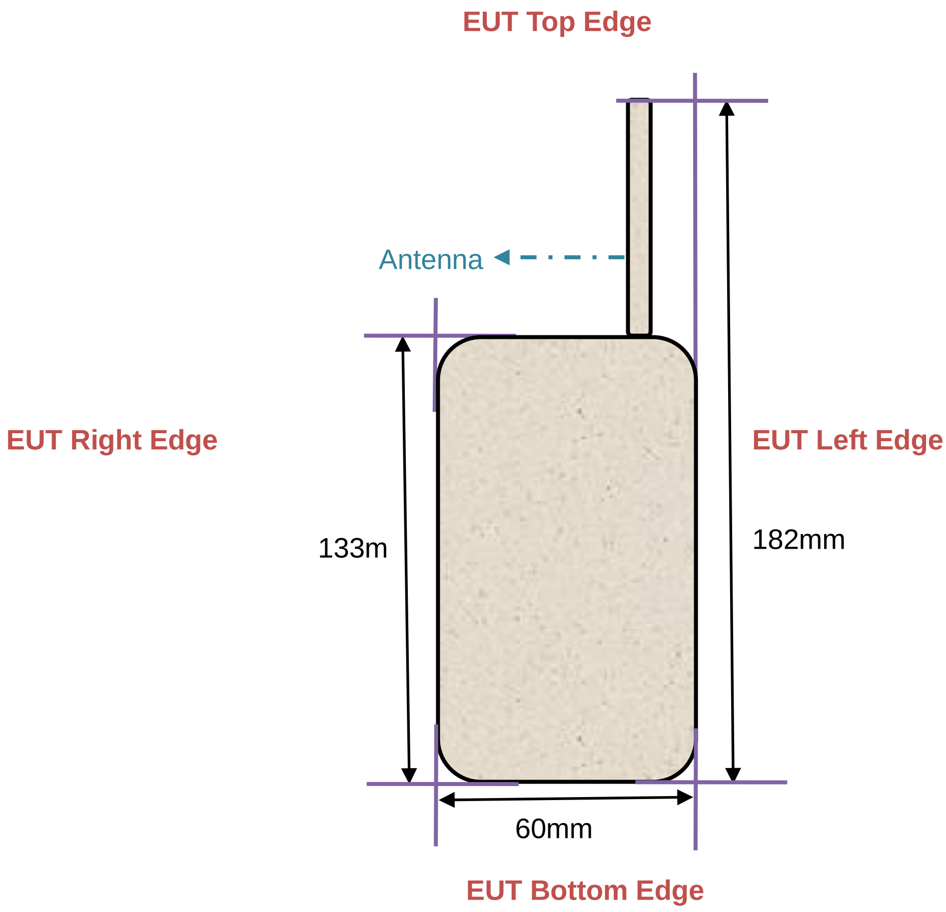
4.3. RF Exposure Conditions

Test Configuration and setting:

The EUT is a model of WCDMA Portable Mobile Station (MS). It supports WCDMA.

For WWAN SAR testing, the device was controlled by using a base station emulator. Communication between the device and the emulator were established by air link. The distance between the EUT and the antenna is larger than 50cm, and the output power radiated from the emulator antenna is at least 30db smaller than the output power of EUT.

Antenna Location: (back view)



5. TISSUE SIMULATING LIQUID

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15cm. For head SAR testing the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15cm For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15cm.The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in 5.2

5.1. The composition of the tissue simulating liquid

Ingredient (% Weight) / **Frequency** (MHz)	**Water**	**Nacl**	**Polysorbate 20**	**DGBE**	**1,2 Propanediol**	**Triton X-100**
835 Head	50.36	1.25	48.39	0.0	0.0	0.0
835 Body	54.00	1	0.0	15	0.0	30
1900 Head	54.9	0.18	0.0	44.92	0.0	0.0
1900 Body	70	1	0.0	9	0.0	20

5.2. Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE 1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in IEEE 1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in IEEE 1528.

Target Frequency (MHz)	**head**		**body**	
	εr	**σ (S/m)**	**εr**	**σ (S/m)**
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	**41.5**	**0.90**	**55.2**	**0.97**
900	41.5	0.97	55.0	1.05
915	41.5	1.01	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	**40.0**	**1.40**	**53.3**	**1.52**
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73

(εr = relative permittivity, σ = conductivity and ρ = 1000 kg/m3)

5.3. Tissue Calibration Result

The dielectric parameters of the liquids were verified prior to the SAR evaluation using DASY 5 Dielectric Probe Kit and R&S Network Analyzer ZVL6.

Tissue Stimulant Measurement for 835MHz					
Head	Fr. (MHz)	Dielectric Parameters (±5%)		Tissue Temp [°C]	Test time
		εr 41.5 (39.425-43.575)	δ[s/m] 0.90(0.855-0.945)		
	826.4	41.56	0.89	21.3	Sep. 28,2018
	835	41.07	0.90		
	836.6	40.74	0.91		
	846.6	40.26	0.92		
Body	Fr. (MHz)	Dielectric Parameters (±5%)		Tissue Temp [oC]	Test time
		εr 55.20(52.44-57-96)	δ[s/m]0.97(0.9215-1.0185)		
	826.4	54.69	0.94	21.5	Sep. 28,2018
	835	54.07	0.95		
	836.6	53.44	0.95		
	846.6	53.10	0.97		

Tissue Stimulant Measurement for 1900MHz					
Head	Fr. (MHz)	Dielectric Parameters (±5%)		Tissue Temp [°C]	Test time
		εr40.00(38.00-42.00)	δ[s/m]1.40(1.33-1.47)		
	1852.4	40.73	1.37	21.5	Sep. 29,2018
	1880	40.36	1.38		
	1900	39.78	1.40		
	1907.6	39.41	1.41		
Body	Fr. (MHz)	Dielectric Parameters (±5%)		Tissue Temp [oC]	Test time
		εr53.30(50.635-55.965)	δ[s/m]1.52(1.444-1.596)		
	1852.4	54.69	1.47	21.8	Sep. 29,2018
	1880	54.26	1.48		
	1900	53.71	1.50		
	1907.6	53.37	1.52		

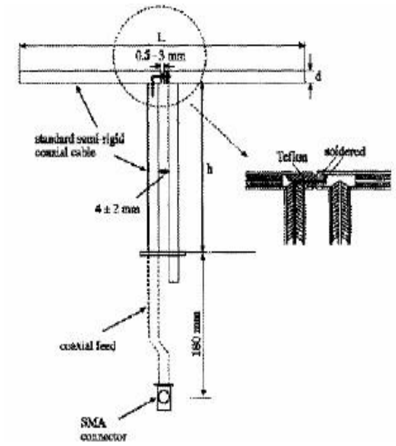
6. SAR SYSTEM CHECK PROCEDURE

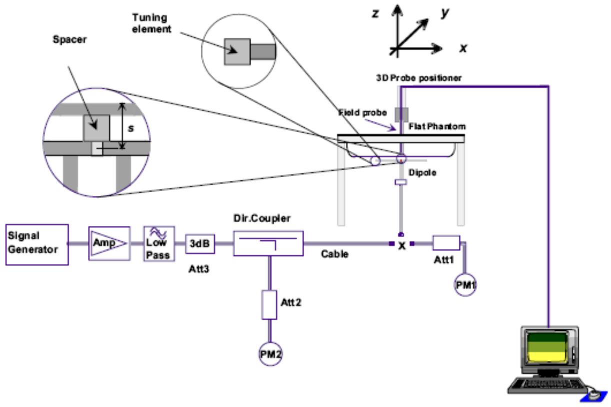
6.1. SAR System Check Procedures

SAR system check 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 remeasured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

Each DASY system is equipped with one or more system check kits. These units, together with the predefined measurement procedures within the DASY software, enable the user to conduct the system check and system validation. System kit includes a dipole, and dipole device holder.

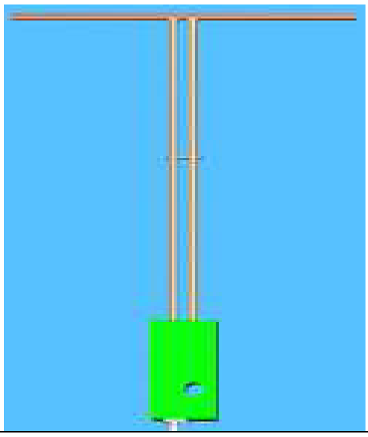
The system check verifies that the system operates within its specifications. It's performed daily or before every SAR measurement. The system check uses normal SAR measurement in the flat section of the phantom with a matched dipole at a specified distance. The system check setup is shown as below.





6.2. SAR System Check

6.2.1. Dipoles



The dipoles used are based on the IEEE-1528 standard, and is complied with mechanical and electrical specifications in line with the requirements of IEEE. the table below provides details for the mechanical and electrical specifications for the dipoles.

Frequency	L (mm)	h (mm)	d (mm)
835MHz	161.0	89.8	3.6
1900MHz	68	39.5	3.6

6.2.2. System Check Result

System Performance Check at 835MHz&1900MHz for Head								
Validation Kit: SN29/15 DIP 0G835-383&SN 29/15 DIP 1G900-389								
Frequency [MHz]	Target Value(W/Kg)		Reference Result (± 10%)		Tested Value(W/Kg)		Tissue Temp. [°C]	Test time
	1g	10g	1g	10g	1g	10g		
835	10.04	6.43	9.036-11.044	5.787 -7.073	10.22	6.53	21.3	Sep. 28,2018
1900	41.44	21.33	37.296-45.584	19.197-23.463	39.78	20.60	21.5	Sep. 29,2018
System Performance Check at 835 MHz &1900MHz for Body								
Frequency [MHz]	Target Value(W/Kg)		Reference Result (± 10%)		Tested Value(W/Kg)		Tissue Temp. [°C]	Test time
	1g	10g	1g	10g	1g	10g		
835	9.85	6.45	8.865-10.835	5.805-7.095	9.56	5.96	21.5	Sep. 28,2018
1900	39.38	20.86	35.442-43.318	18.774-22.946	36.29	19.34	21.8	Sep. 29,2018

Note:
(1) We use a CW signal of 18dBm for system check, and then all SAR values are normalized to 1W forward power. The result must be within ±10% of target value.

7. EUT TEST POSITION

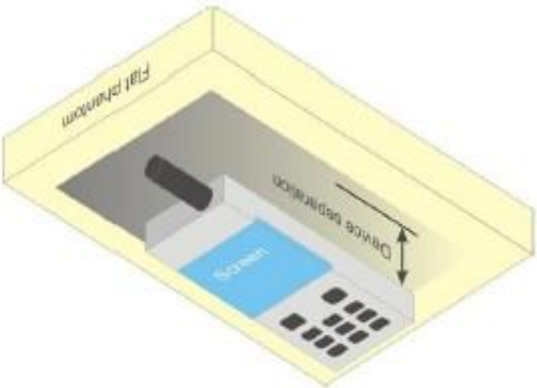
This EUT was tested in **Body back and Face Up.**

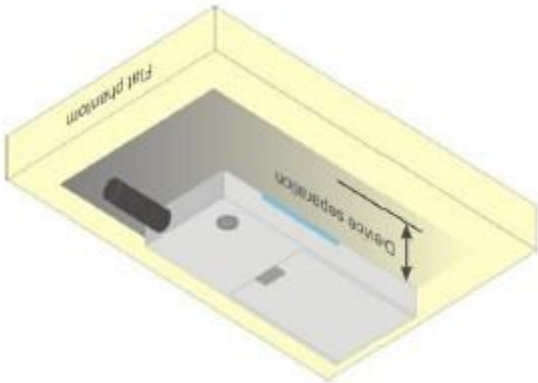
7.1. Body Worn Position

(1) To position the EUT parallel to the phantom surface.

(2) To adjust the EUT parallel to the flat phantom.

(3) To adjust the distance between the EUT surface and the flat phantom to **0mm for body back touch and face up with 25mm.**





8. SAR EXPOSURE LIMITS

SAR assessments have been made in line with the requirements of IEEE-1528, and comply with ANSI/IEEE C95.1-2005 “Uncontrolled Environments” limits. These limits apply to a location which is deemed as “Uncontrolled Environment” which can be described as a situation where the general public may be exposed to an RF source with no prior knowledge or control over their exposure.

Limits for General population/Uncontrolled exposure Environment

Type Exposure Limits	general population/uncontrolled exposure limits (W/Kg)
Spatial Average SAR (whole body)	1.6

9. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2F., Bldg.2, No.1-4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District B112-B113, Shenzhen 518012
NVLAP Lab Code	600153-0
Designation Number	CN5028
Test Firm Registration Number	682566
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by National Voluntary Laboratory Accreditation program, NVLAP Code 600153-0

10. TEST EQUIPMENT LIST

Equipment description	Manufacturer/ Model	Identification No.	Current calibration date	Next calibration date
Stäubli Robot	Stäubli-TX60	F13/5Q2UD1/A/01	N/A	N/A
Robot Controller	Stäubli-CS8	139522	N/A	N/A
E-Field Probe	Speag- EX3DV4	SN:3953	Aug. 10,2018	Aug. 09,2019
SAM Twin Phantom	Speag-SAM	1790	N/A	N/A
Device Holder	Speag-SD 000 H01 KA	SD 000 H01 KA	N/A	N/A
DAE4	Speag-SD 000 D04 BM	1398	Feb. 08,2018	Feb. 07,2019
SAR Software	Speag-DASY5	DASY52.8	N/A	N/A
Liquid	SATIMO	-	N/A	N/A
Radio Communication Tester	R&S-CMU200	069Y7-158-13-712	Mar. 01,2018	Feb. 28,2019
Dipole	SATIMO SID835	SN29/15 DIP 0G835-383	July 05,2016	July 04,2019
Dipole	SATIMO SID1900	SN 29/15 DIP 1G900-389	July 05,2016	July 04,2019
Comm Tester	Agilent-8960	GB46310822	Mar. 01,2018	Feb. 28,2019
Multimeter	Keithley 2000	1188656	Mar. 01,2018	Feb. 28,2019
Signal Generator	Agilent-E4438C	US41461365	Mar. 01,2018	Feb. 28,2019
Vector Analyzer	Agilent / E4440A	US41421290	Mar. 01,2018	Feb. 28,2019
Network Analyzer	Rhode & Schwarz ZVL6	SN100132	Mar. 01,2018	Feb. 28,2019
Attenuator	Warison /WATT-6SR1211	N/A	N/A	N/A
Attenuator	Mini-circuits / VAT-10+	N/A	N/A	N/A
Amplifier	EM30180	SN060552	Mar. 01,2018	Feb. 28,2019
Directional Couple	Werlatone/ C5571-10	SN99463	Jun. 12,2018	Jun. 11,2019
Directional Couple	Werlatone/ C6026-10	SN99482	Jun. 12,2018	Jun. 11,2019
Power Sensor	NRP-Z21	1137.6000.02	Oct. 12,2017	Oct. 11,2018
Power Sensor	NRP-Z23	US38261498	Mar. 01,2018	Feb. 28,2019
Power Viewer	R&S	V2.3.1.0	N/A	N/A

Note: Per KDB 865664 Dipole SAR Validation, AGC Lab has adopted 3 years calibration intervals. On annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:
1. There is no physical damage on the dipole;
2. System validation with specific dipole is within 10% of calibrated value;
3. Return-loss is within 20% of calibrated measurement;
4. Impedance is within 5Ω of calibrated measurement.

11. MEASUREMENT UNCERTAINTY

DASY Uncertainty- EX3DV4 Measurement uncertainty for Dipole averaged over 1 gram / 10 gram.									
a	b	c	d	e f(d,k)	f	g	h c×f/e	i c×g/e	k
Uncertainty Component	Sec.	Tol (± %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (±%)	10g Ui (±%)	vi
Measurement System									
Probe calibration	E.2.1	6.65	N	1	1	1	6.65	6.65	∞
Axial Isotropy	E.2.2	0.6	R	$\sqrt{3}$	√0.5	√0.5	0.24	0.24	∞
Hemispherical Isotropy	E.2.2	1.6	R	$\sqrt{3}$	√0.5	√0.5	0.65	0.65	∞
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	E.2.4	0.45	R	$\sqrt{3}$	1	1	0.26	0.26	∞
System detection limits	E.2.4	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation response	E2.5	3.3	R	$\sqrt{3}$	1	1	1.91	1.91	∞
Readout Electronics	E.2.6	0.15	N	1	1	1	0.15	0.15	∞
Response Time	E.2.7	0	R	$\sqrt{3}$	1	1	0	0	∞
Integration Time	E.2.8	1.7	R	$\sqrt{3}$	1	1	0.98	0.98	∞
RF ambient conditions-Noise	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF ambient conditions-reflections	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	E.6.2	0.4	R	$\sqrt{3}$	1	1	0.37	0.37	∞
Probe positioning with respect to phantom shell	E.6.3	6.7	R	$\sqrt{3}$	1	1	3.87	3.87	∞
Extrapolation, interpolation, and integrations algorithms for max. SAR evaluation	E.5	4	R	$\sqrt{3}$	1	1	2.31	2.31	∞
Test sample Related									
Test sample positioning	E.4.2	2.9	N	1	1	1	2.90	2.90	∞
Device holder uncertainty	E.4.1	3.6	N	1	1	1	3.60	3.60	∞
Output power variation—SAR drift measurement	E.2.9	5	R	$\sqrt{3}$	1	1	2.89	2.89	∞
SAR scaling	E.6.5	5	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Phantom and tissue parameters									
Phantom shell uncertainty—shape, thickness, and permittivity	E.3.1	6.6	R	$\sqrt{3}$	1	1	3.81	3.81	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	E.3.2	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity measurement	E.3.3	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity measurement	E.3.3	5	N	1	0.23	0.26	1.15	1.30	M
Liquid conductivity—temperature uncertainty	E.3.4	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	∞
Liquid permittivity—temperature uncertainty	E.3.4	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	∞
Combined Standard Uncertainty			RSS				11.80	11.635	
Expanded Uncertainty (95% Confidence interval)			K=2				23.60	23.27	

DASY Uncertainty- EX3DV4 System Check uncertainty for Dipole averaged over 1 gram / 10 gram.									
a	b	c	d	e f(d,k)	f	g	h c×f/e	i c×g/e	k
Uncertainty Component	Sec.	Tol (± %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (±%)	10g Ui (±%)	vi
Measurement System									
Probe calibration drift	E.2.1	0.5	N	1	1	1	0.5	0.5	∞
Axial Isotropy	E.2.2	0.6	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Hemispherical Isotropy	E.2.2	1.6	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Linearity	E.2.4	0.45	R	$\sqrt{3}$	0	0	0.00	0.00	∞
System detection limits	E.2.4	1.0	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Modulation response	E2.5	3.3	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Readout Electronics	E.2.6	0.15	N	1	0	0	0.00	0.00	∞
Response Time	E.2.7	0	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Integration Time	E.2.8	1.7	R	$\sqrt{3}$	0	0	0.00	0.00	∞
RF ambient conditions-Noise	E.6.1	3.0	R	$\sqrt{3}$	0	0	0.00	0.00	∞
RF ambient conditions-reflections	E.6.1	3.0	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Probe positioner mechanical tolerance	E.6.2	0.4	R	$\sqrt{3}$	1	1	0.37	0.37	∞
Probe positioning with respect to phantom shell	E.6.3	6.7	R	$\sqrt{3}$	1	1	3.87	3.87	∞
Extrapolation, interpolation, and integrations algorithms for max. SAR evaluation	E.5	4	R	$\sqrt{3}$	0	0	0.00	0.00	∞
System check source (dipole)									
Deviation of experimental dipoles	E.6.4	2.0	N	1	1	1	2.00	2.00	∞
Input power and SAR drift measurement	8,6.6.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Dipole axis to liquid distance	8,E.6.6	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Phantom and tissue parameters									
Phantom shell uncertainty—shape, thickness, and permittivity	E.3.1	6.6	R	$\sqrt{3}$	1	1	3.81	3.81	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	E.3.2	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity measurement	E.3.3	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity measurement	E.3.3	5	N	1	0.23	0.26	1.15	1.30	M
Liquid conductivity—temperature uncertainty	E.3.4	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	∞
Liquid permittivity—temperature uncertainty	E.3.4	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	∞
Combined Standard Uncertainty			RSS				7.344	7.076	
Expanded Uncertainty (95% Confidence interval)			K=2				14.689	14.153	

DASY Uncertainty- EX3DV4 System Validation uncertainty for Dipole averaged over 1 gram / 10 gram.									
a	b	c	d	e f(d,k)	f	g	h c×f/e	i c×g/e	k
Uncertainty Component	Sec.	Tol (±%)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (±%)	10g Ui (±%)	vi
Measurement System									
Probe calibration	E.2.1	6.65	N	1	1	1	6.65	6.65	∞
Axial Isotropy	E.2.2	0.6	R	$\sqrt{3}$	1	1	0.35	0.35	∞
Hemispherical Isotropy	E.2.2	1.6	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Boundary effect	E.2.3	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Linearity	E.2.4	0.45	R	$\sqrt{3}$	1	1	0.26	0.26	∞
System detection limits	E.2.4	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	∞
Modulation response	E2.5	3.3	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Readout Electronics	E.2.6	0.15	N	1	1	1	0.15	0.15	∞
Response Time	E.2.7	0	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Integration Time	E.2.8	1.7	R	$\sqrt{3}$	0	0	0.00	0.00	∞
RF ambient conditions-Noise	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
RF ambient conditions-reflections	E.6.1	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	E.6.2	0.4	R	$\sqrt{3}$	1	1	0.37	0.37	∞
Probe positioning with respect to phantom shell	E.6.3	6.7	R	$\sqrt{3}$	1	1	3.87	3.87	∞
Extrapolation, interpolation, and integrations algorithms for max. SAR evaluation	E.5	4	R	$\sqrt{3}$	1	1	2.31	2.31	∞
System check source (dipole)									
Deviation of experimental dipole from numerical dipole	E.6.4	5.0	N	1	1	1	5.00	5.00	∞
Input power and SAR drift measurement	8,6.6.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Dipole axis to liquid distance	8,E.6.6	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Phantom and tissue parameters									
Phantom shell uncertainty—shape, thickness, and permittivity	E.3.1	6.6	R	$\sqrt{3}$	1	1	3.81	3.81	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	E.3.2	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity measurement	E.3.3	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity measurement	E.3.3	5	N	1	0.23	0.26	1.15	1.30	M
Liquid conductivity—temperature uncertainty	E.3.4	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	∞
Liquid permittivity—temperature uncertainty	E.3.4	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	∞
Combined Standard Uncertainty			RSS				11.451	11.281	
Expanded Uncertainty (95% Confidence interval)			K=2				22.901	22.561	

12. CONDUCTED POWER MEASUREMENT

UMTS BAND II

Mode	Frequency (MHz)	Avg. Burst Power (dBm)
WCDMA 1900 RMC	1852.4	**22.54**
	1880	22.47
	1907.6	22.38
WCDMA 1900 AMR	1852.4	22.42
	1880	22.28
	1907.6	22.34

UMTS BAND V

Mode	Frequency (MHz)	Avg. Burst Power (dBm)
WCDMA 850 RMC	826.4	**21.74**
	836.6	21.66
	846.6	21.72
WCDMA 850 AMR	826.4	21.42
	836.6	21.55
	846.6	21.48

13. TEST RESULTS

13.1. SAR Test Results Summary

13.1.1. Test position and configuration

Face up SAR was performed with the device 25mm to flat phantom and Body SAR was performed with the device configurated with all accessories close to the Flat Phantom.

13.1.2. Operation Mode

1. Per KDB 447498 D01 v06 ,for each exposure position, if the highest 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional.
2. Per KDB 865664 D01 v01r04,for each frequency band, if the measured SAR is ≥0.8W/Kg, testing for repeated SAR measurement is required , that the highest measured SAR is only to be tested. When the SAR results are near the limit, the following procedures are required for each device to verify these types of SAR measurement related variation concerns by repeating the highest measured SAR configuration in each frequency band.
   (1) When the original highest measured SAR is ≥0.8W/Kg, repeat that measurement once.
   (2) 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.
   (3) Perform a third repeated measurement only if the original, first and second repeated measurement is ≥1.5 W/Kg and ratio of largest to smallest SAR for the original, first and second measurement is ≥ 1.20.
3. Maximum Scaling SAR in order to calculate the Maximum SAR values to test under the standard Peak Power, Calculation method is as follows:
   Maximum Scaling SAR =tested SAR (Max.) ×[maximum turn-up power (mw)/ maximum measurement output power(mw)]

13.1.3. Test Result

SAR MEASUREMENT									
Depth of Liquid (cm):>15									
Product: 3G network radio									
Test Mode: WCDMA Band II& WCDMA Band V with QPSK modulation									
Position	**Mode**	**Ch.**	**Fr. (MHz)**	**Power Drift (<±0.2 dB)**	**SAR (1g) (W/kg)**	**Max. Tune-up Power (dBm)**	**Meas. output Power (dBm)**	**Scaled SAR (W/Kg)**	**Limit (W/kg)**
WCDMA Band II									
Body back	RMC 12.2kbps	9400	1880	0.09	**0.211**	22.60	22.47	**0.217**	1.6
Face up	RMC 12.2kbps	9400	1880	0.09	**0.075**	22.60	22.47	**0.077**	1.6
WCDMA Band V									
Body back	RMC 12.2kbps	4183	836.6	0.09	**0.434**	21.80	21.66	**0.448**	1.6
Face up	RMC 12.2kbps	4183	836.6	0.09	**0.204**	21.80	21.66	**0.211**	1.6

Note:
· When the 1-g Reported SAR is ≤ 0.8 W/kg, testing for low and high channel is optional. Refer to KDB 447498.
·The test distance of the face up is 25mm and the test distance of the body touch with belt clip is 0mm.

APPENDIX A. SAR SYSTEM CHECK DATA

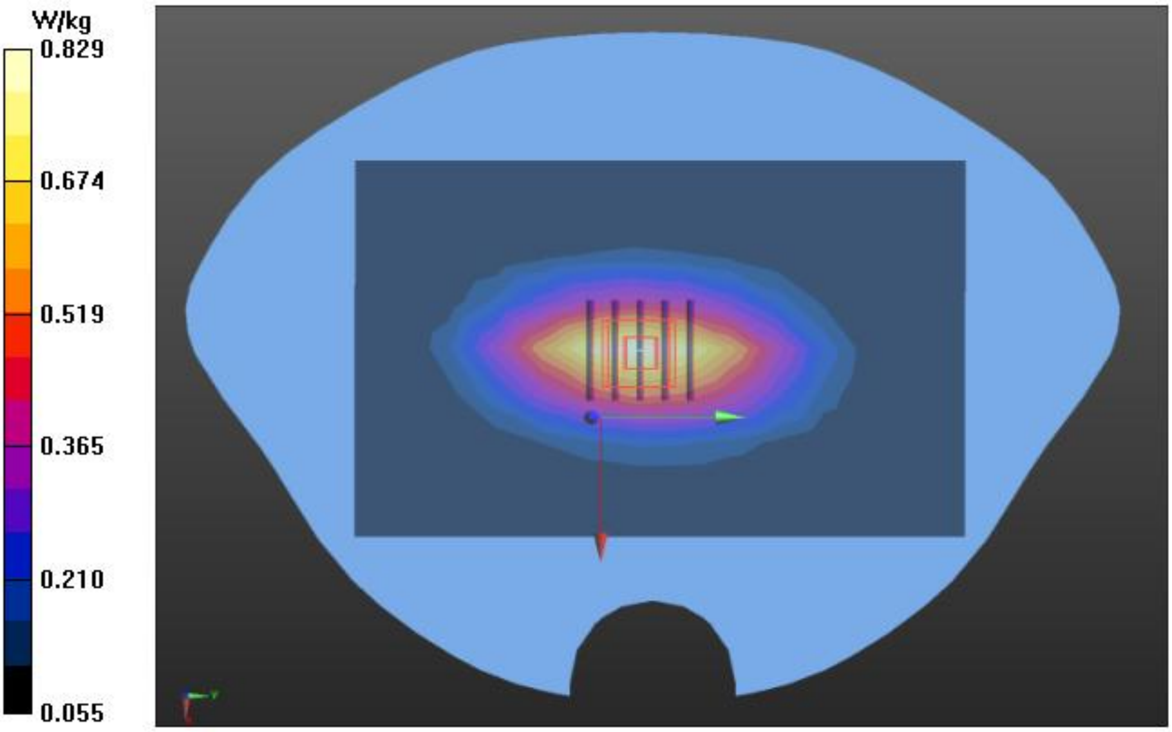
Test Laboratory: AGC Lab **Date: Sep. 28,2018**
System Check Head 835 MHz
DUT: Dipole 835 MHz Type: SID 835

Communication System CW; Communication System Band: D835 (835.0 MHz); Duty Cycle: 1:1;
Frequency: 835 MHz; Medium parameters used: f = 835 MHz; σ=0.90 mho/m; εr =41.07; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=18dBm
Ambient temperature (℃):22.0, Liquid temperature (℃): 21.3, Relative Humidity (%): 53.1

DASY Configuration:
- EX3DV4 – SN:3953; ConvF(10.11, 10.11, 10.11); Calibrated: Aug. 10,2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 SN1398; Calibrated: Feb. 08,2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 835MHz Head/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.829 W/kg

Configuration/System Check 835MHz Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.993 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.002 W/kg
SAR(1 g) = 0.645 W/kg; SAR(10 g) = 0.412 W/kg



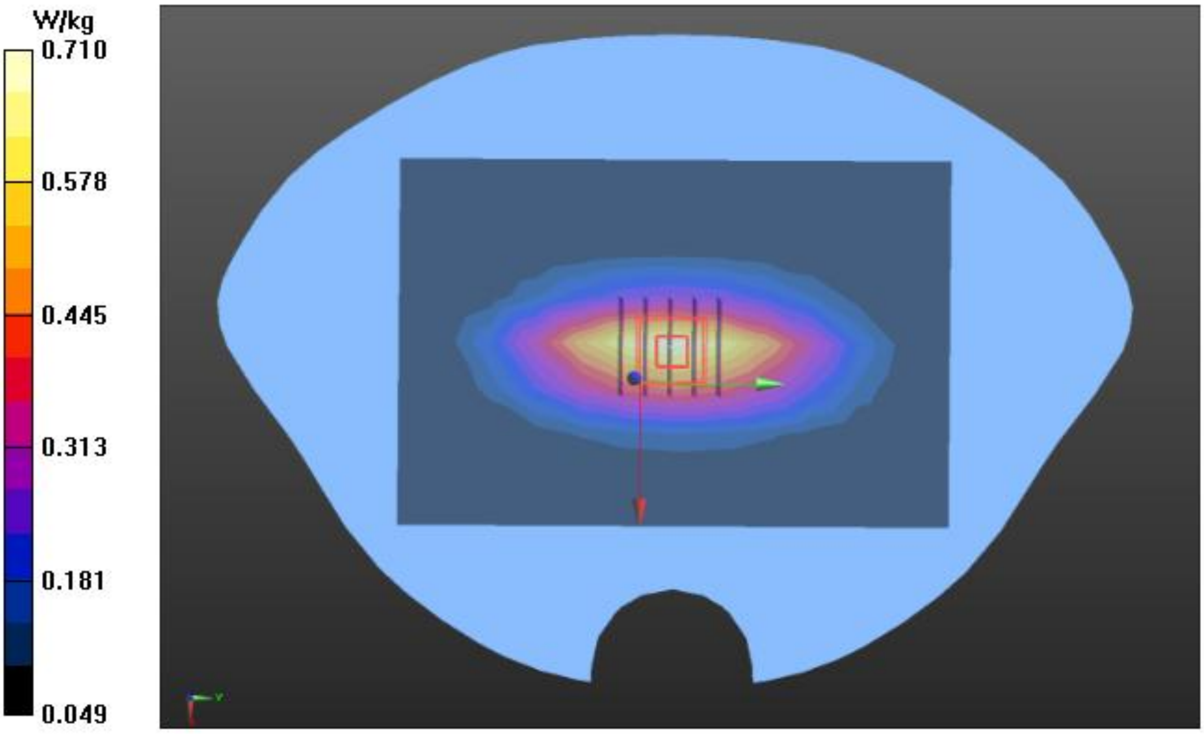
Test Laboratory: AGC Lab **Date: Sep. 28,2018**
System Check Body 835 MHz
DUT: Dipole 835 MHz Type: SID 835

Communication System CW; Communication System Band: D835 (835.0 MHz); Duty Cycle: 1:1;
Frequency: 835 MHz; Medium parameters used: f = 835 MHz; σ=0.95 mho/m; εr =54.07; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=18dBm
Ambient temperature (℃):22.0, Liquid temperature (℃): 21.5, Relative Humidity (%): 53.1

DASY Configuration:
- EX3DV4 – SN:3953; ConvF(10.18, 10.18, 10.18); Calibrated: Aug. 10,2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 SN1398; Calibrated: Feb. 08,2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 835MHz Body/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.699 W/kg

Configuration/System Check 835MHz Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.375 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.960 W/kg
SAR(1 g) = 0.603 W/kg; SAR(10 g) = 0.376 W/kg
Maximum value of SAR (measured) = 0.710 W/kg



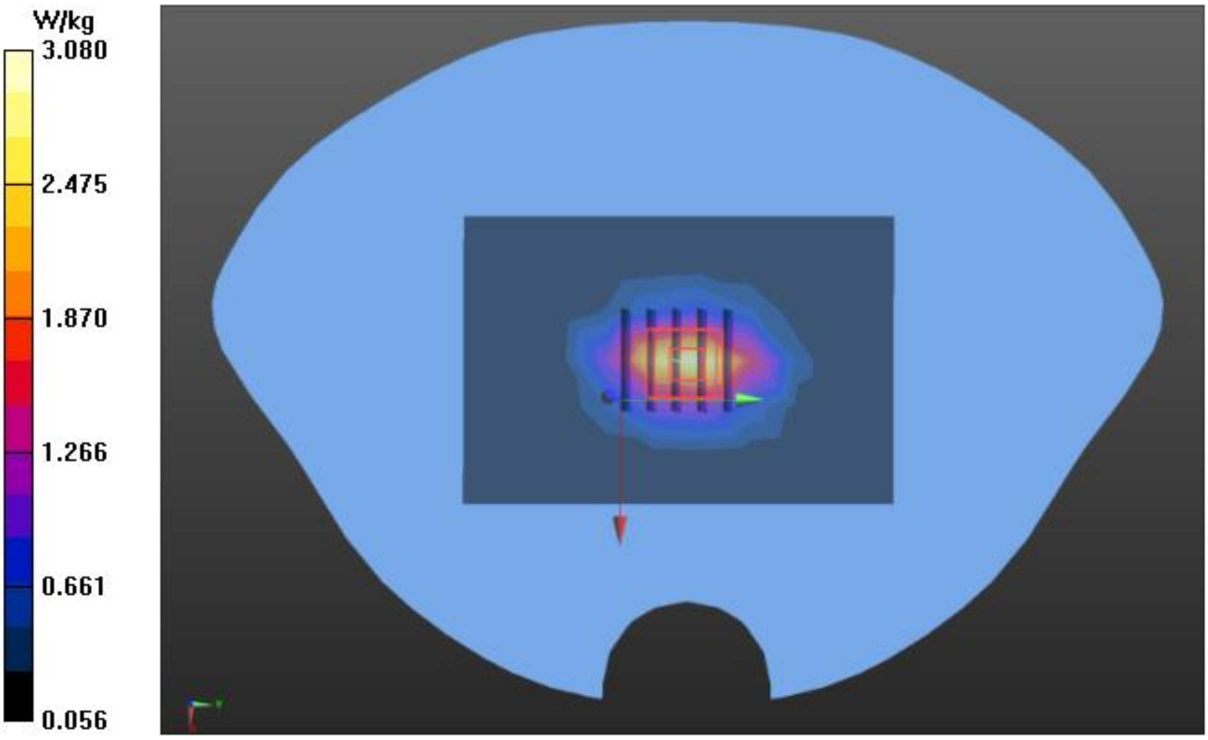
Test Laboratory: AGC Lab **Date: Sep. 29,2018**
System Check Head 1900MHz
DUT: Dipole 1900 MHz; Type: SID 1900

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Duty Cycle:1:1;
Frequency: 1900 MHz; Medium parameters used: f = 1900 MHz; σ=1.40 mho/m; εr =39.78; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=18dBm
Ambient temperature (℃):22.1, Liquid temperature (℃): 21.5, Relative Humidity (%): 52.4

DASY Configuration:
• EX3DV4 – SN:3953; ConvF(8.14, 8.14, 8.14); Calibrated: Aug. 10,2018;
• Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
• Electronics: DAE4 SN1398; Calibrated: Feb. 08,2018
• Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
• DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 1900MHz Head/Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.08 W/kg

Configuration/System Check 1900MHz Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.034 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 4.57 W/kg
SAR(1 g) = 2.51W/kg; SAR(10 g) = 1.30 W/kg



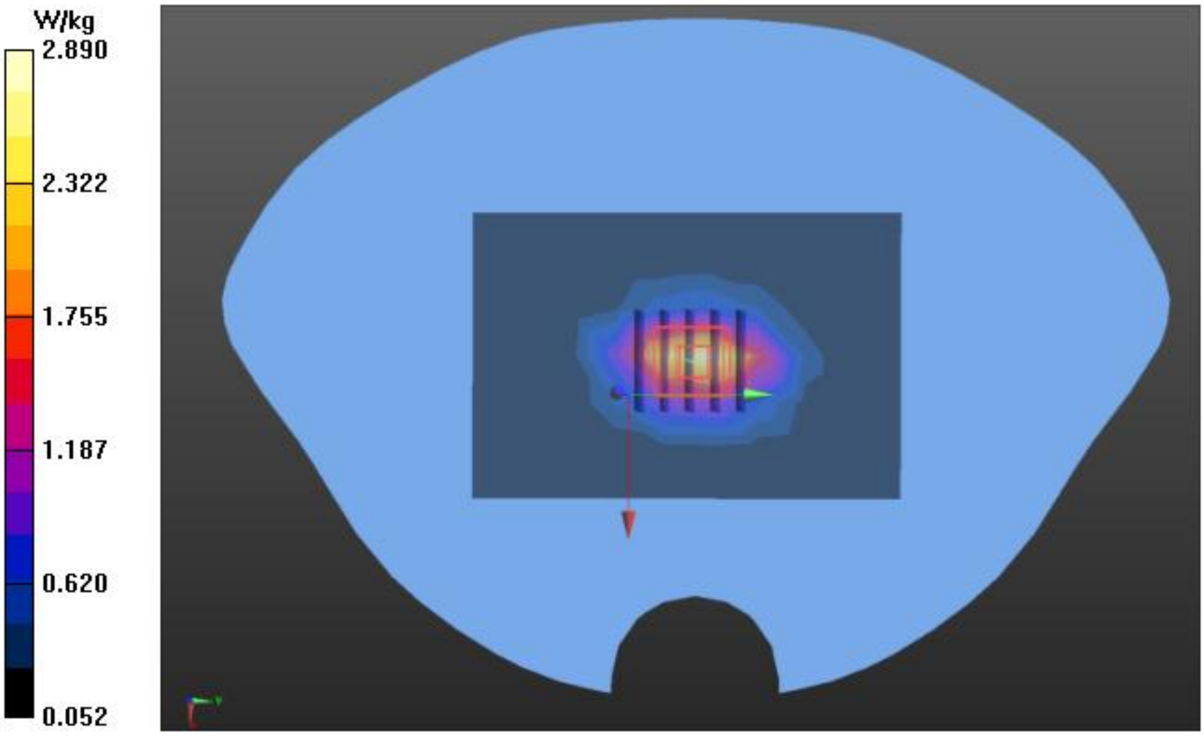
Test Laboratory: AGC Lab **Date: Sep. 29,2018**
System Check Body 1900MHz
DUT: Dipole 1900 MHz; Type: SID 1900

Communication System: CW; Communication System Band: D1900 (1900.0 MHz); Duty Cycle:1:1;
Frequency: 1900 MHz; Medium parameters used: f = 1900 MHz; σ=1.50 mho/m; εr =53.71; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=18dBm
Ambient temperature (℃):22.1, Liquid temperature (℃): 21.8, Relative Humidity (%): 52.4

DASY Configuration:
- EX3DV4 – SN:3953; ConvF(7.90, 7.90, 7.90); Calibrated: Aug. 10,2018;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 SN1398; Calibrated: Feb. 08,2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 1900MHz Body/Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.83 W/kg

Configuration/System Check 1900MHz Body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 47.671 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 4.19 W/kg
SAR(1 g) = 2.29 W/kg; SAR(10 g) = 1.22 W/kg
Maximum value of SAR (measured) = 2.89 W/kg



APPENDIX B. SAR MEASUREMENT DATA

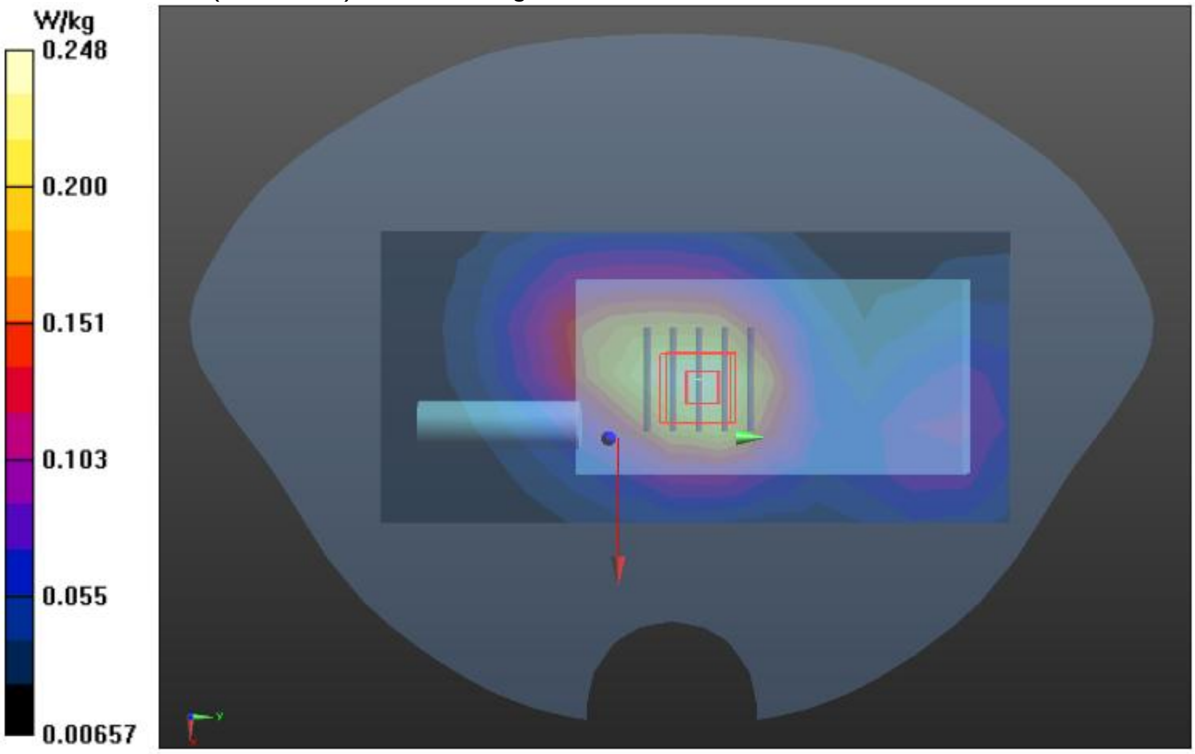
Test Laboratory: AGC Lab **Date: Sep. 29,2018**
WCDMA Band II Mid -Body-Towards Grounds
DUT: 3G network radio; Type: FD-798W

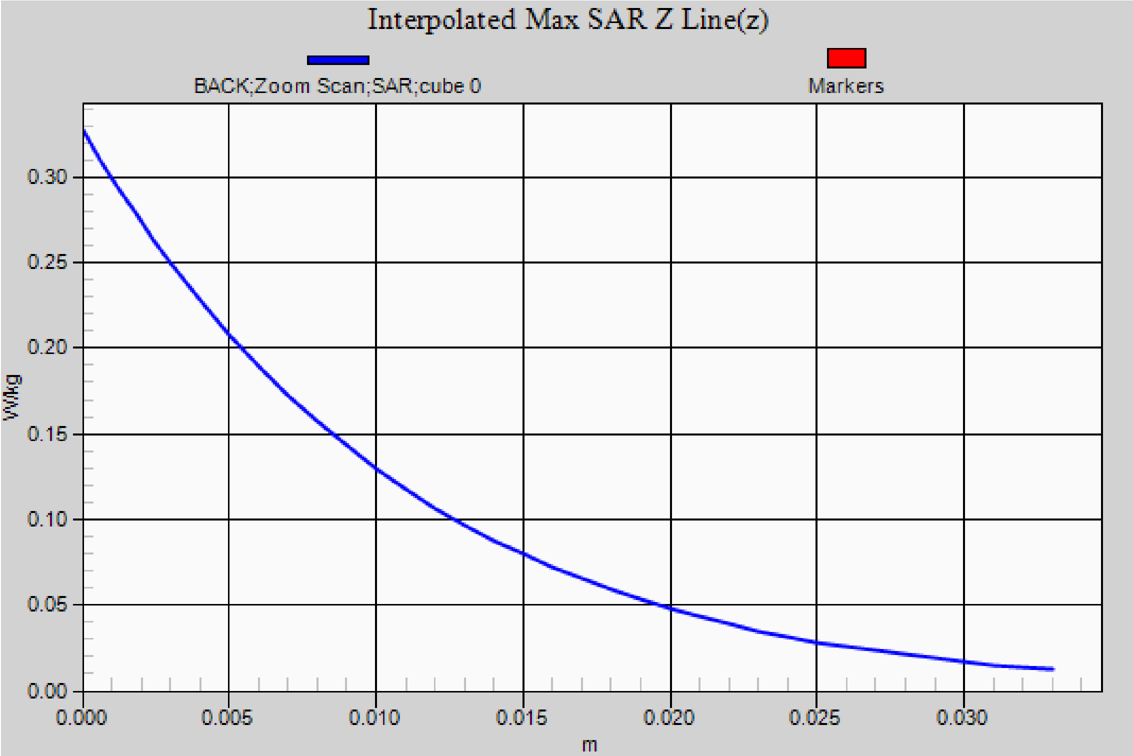
Communication System: UMTS; Communication System Band: Band II UTRA/FDD ;Duty Cycle:1:1;
Frequency: 1880 MHz; Medium parameters used: f = 1900 MHz; σ=1.48 mho/m; εr =54.26; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):22.1, Liquid temperature (℃): 21.8

DASY Configuration:
- EX3DV4 – SN:3953; ConvF(7.90, 7.90, 7.90); Calibrated: Aug. 10,2018;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 SN1398; Calibrated: Feb. 08,2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BACK/BACK/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.241 W/kg

BACK/BACK/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.923 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.327 W/kg
SAR(1 g) = 0.211 W/kg; SAR(10 g) = 0.130 W/kg
Maximum value of SAR (measured) = 0.248 W/kg




Interpolated Max SAR Z Line(z)
BACK;Zoom Scan;SAR;cube 0
Markers
W/kg
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

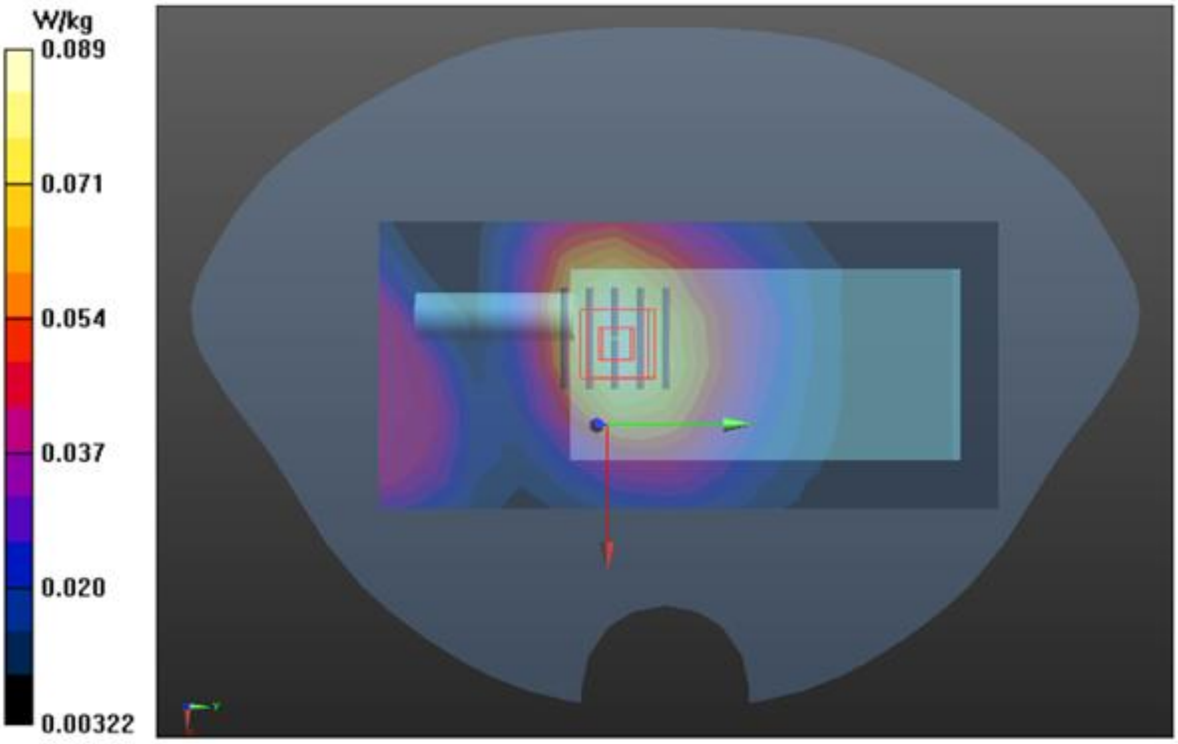
Test Laboratory: AGC Lab **Date: Sep. 29,2018**
WCDMA Band II Mid- Face up
DUT: 3G network radio; Type: FD-798W

Communication System: UMTS; Communication System Band: Band II UTRA/FDD ;Duty Cycle:1:1; Frequency: 1880 MHz; Medium parameters used: f = 1900 MHz; σ=1.38 mho/m; εr =40.36; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):22.1, Liquid temperature (℃): 21.8

DASY Configuration:
- EX3DV4 – SN:3953; ConvF(8.14, 8.14, 8.14); Calibrated: Aug. 10,2018;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 SN1398; Calibrated: Feb. 08,2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BODY/FACE UP/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.0889 W/kg

BODY/FACE UP/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.923 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.117 W/kg
SAR(1 g) = 0.075 W/kg; SAR(10 g) = 0.048 W/kg
Maximum value of SAR (measured) = 0.0885 W/kg



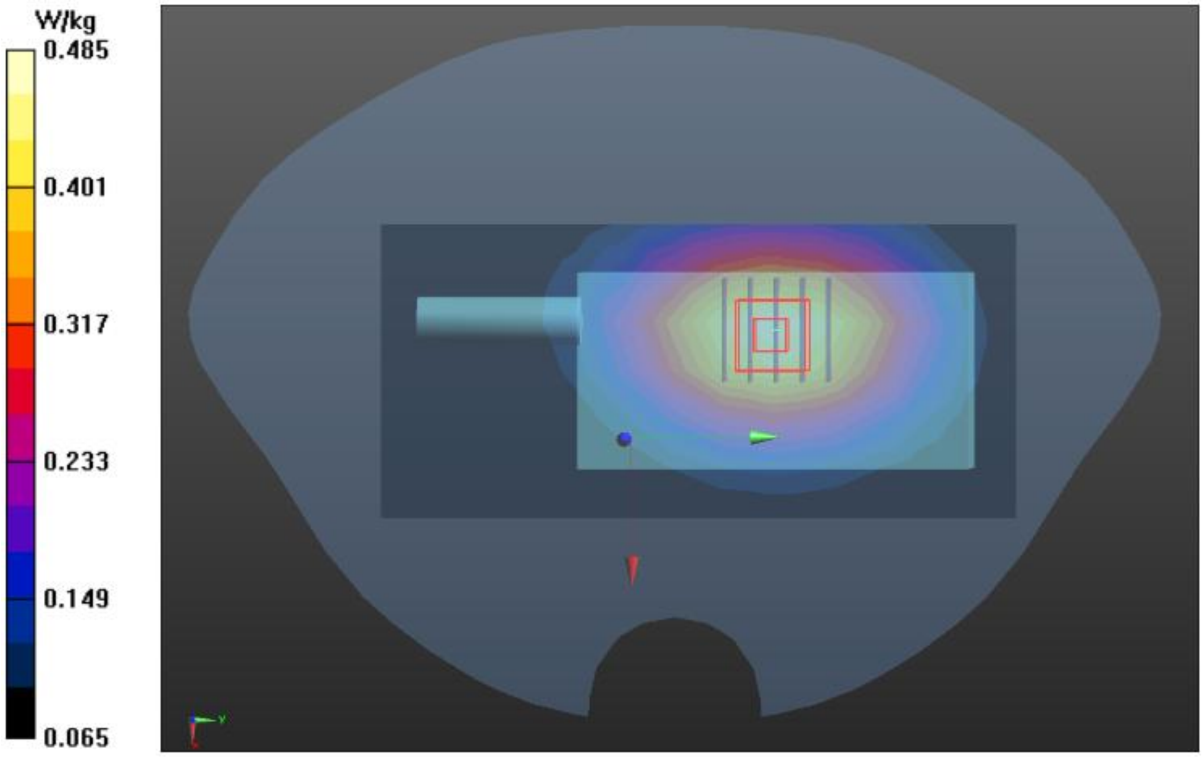
Test Laboratory: AGC Lab **Date: Sep. 28,2018**
WCDMA Band V Mid-Body-Towards Grounds
DUT: 3G network radio; Type: FD-798W

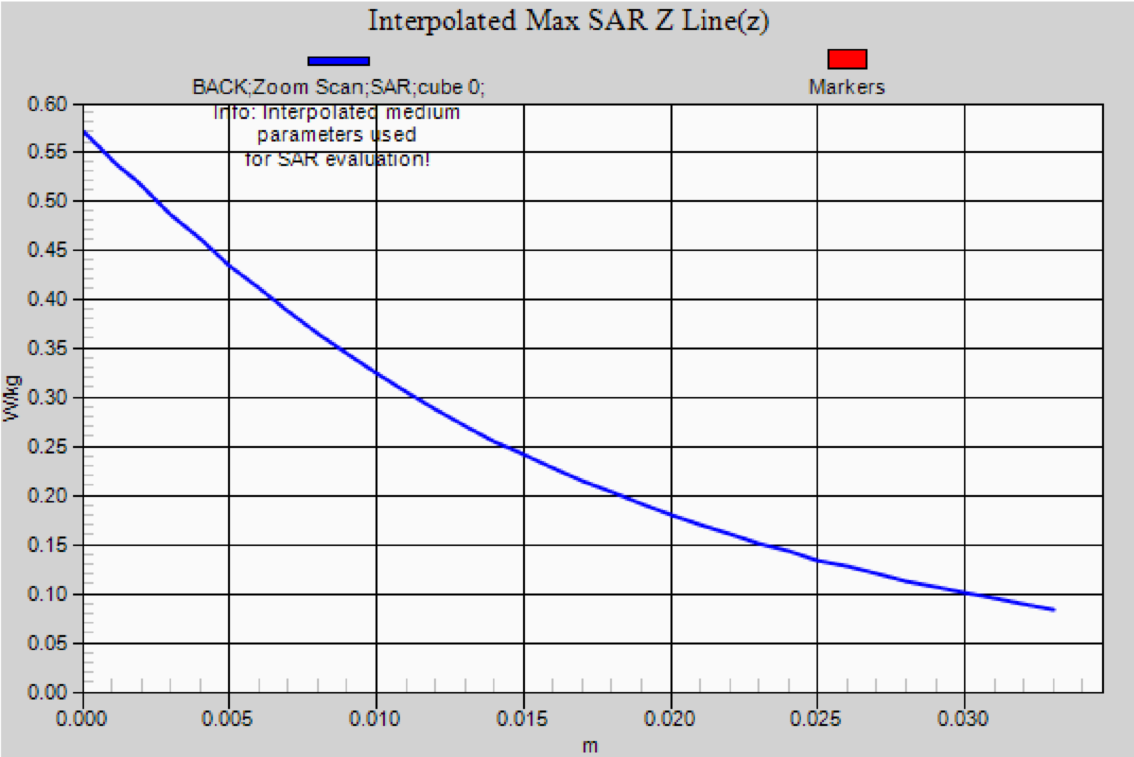
Communication System: UMTS; Communication System Band: BAND V UTRA/FDD;Duty Cycle:1:1;
Frequency: 836.6 MHz; Medium parameters used: f = 835 MHz;σ=0.95 mho/m; εr =53.44; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):22.0, Liquid temperature (℃): 21.5

DASY Configuration:
- EX3DV4 – SN:3953; ConvF(10.18, 10.18, 10.18); Calibrated: Aug. 10,2018;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 SN1398; Calibrated: Feb. 08,2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BODY/BACK/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.483 W/kg

BODY/BACK/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.095 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.570 W/kg
SAR(1 g) = 0.434 W/kg; SAR(10 g) = 0.314 W/kg
Maximum value of SAR (measured) = 0.485 W/kg




Interpolated Max SAR Z Line(z)
BACK;Zoom Scan;SAR;cube 0;
Info: Interpolated medium parameters used for SAR evaluation!
Markers
W/kg
m
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.000
0.005
0.010
0.015
0.020
0.025
0.030

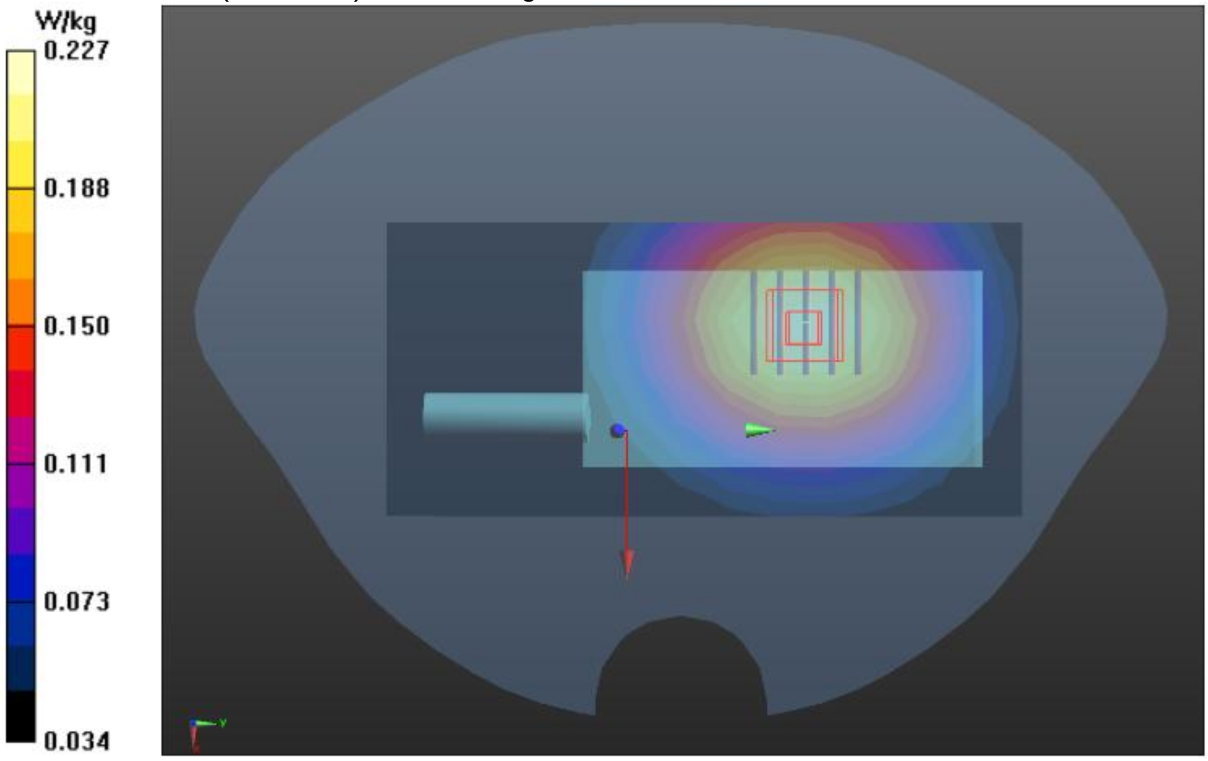
Test Laboratory: AGC Lab **Date: Sep. 28,2018**
WCDMA Band V Mid- Face up
DUT: 3G network radio; Type: FD-798W

Communication System: UMTS; Communication System Band: BAND V UTRA/FDD;Duty Cycle:1:1;
Frequency: 836.6 MHz; Medium parameters used: f = 835 MHz; σ=0.91 mho/m; εr =40.74;ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃):22.0, Liquid temperature (℃): 21.5

DASY Configuration:
- EX3DV4 – SN:3953; ConvF(10.11, 10.11, 10.11); Calibrated: Aug. 10,2018;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 SN1398; Calibrated: Feb. 08,2018
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BODY/FACE UP/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.225 W/kg

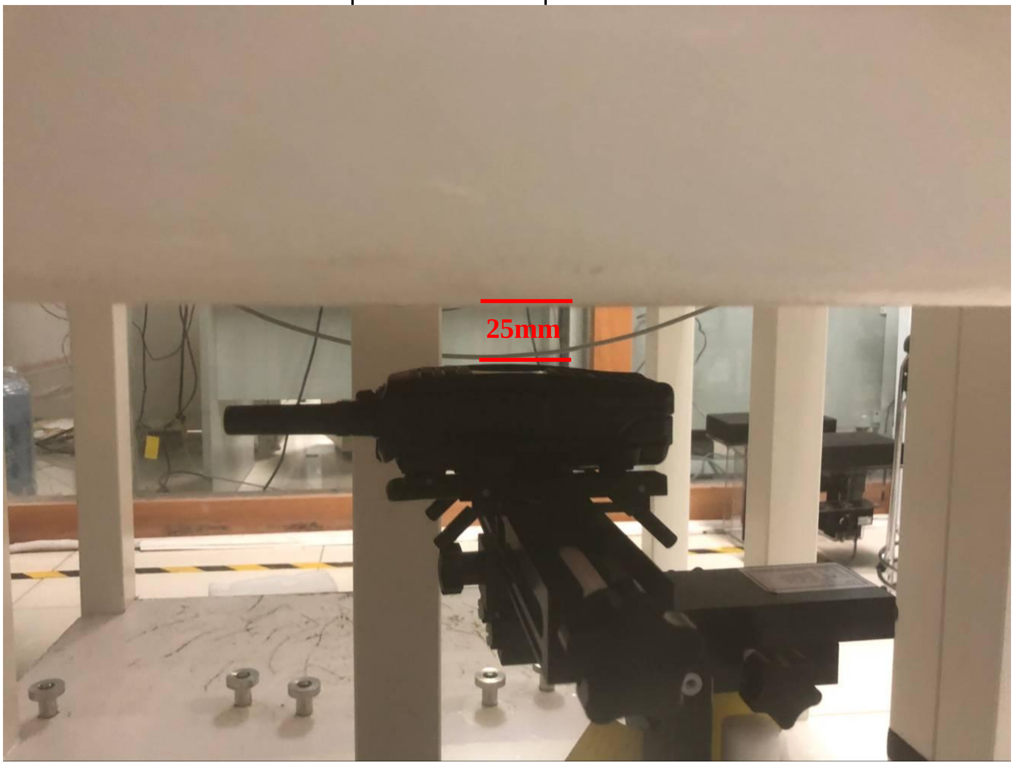
BODY/FACE UP/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.095 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.266 W/kg
SAR(1 g) = 0.204 W/kg; SAR(10 g) = 0.151 W/kg
Maximum value of SAR (measured) = 0.227 W/kg



APPENDIX C. TEST SETUP PHOTOGRAPHS

Body Back Touch with all accessories

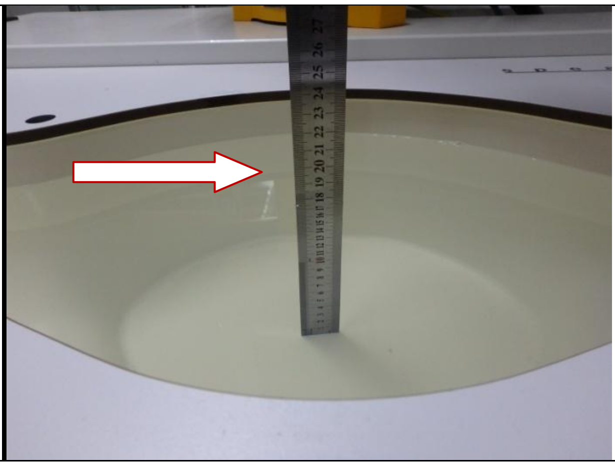
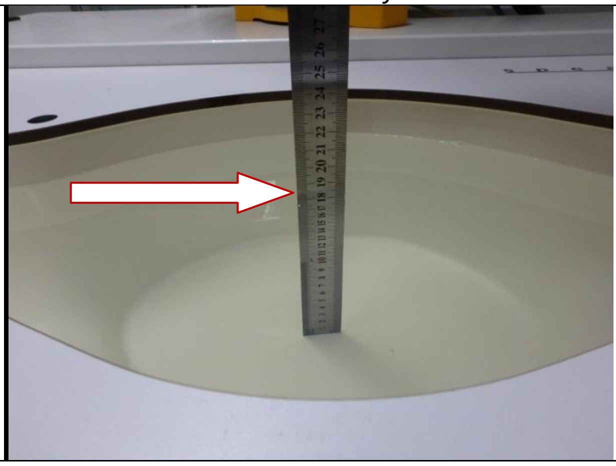
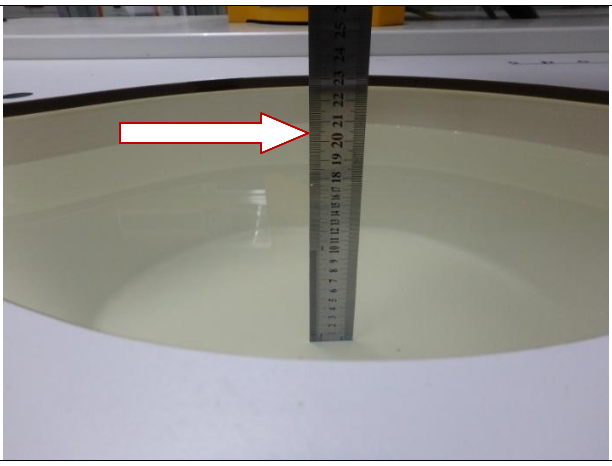
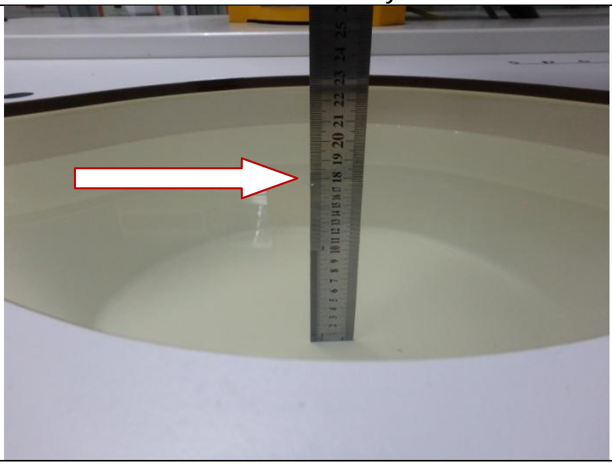
Face Up with 2.5 cm Separation Distance



Note : The headset is just for testing. This tested and electrically similar headsets may be used.

DEPTH OF THE LIQUID IN THE PHANTOM—ZOOM IN

Note：The position used in the measurement were according to IEEE 1528-2013

835MHz head	835MHz body
	
1900MHz head	1900MHz body
	

APPENDIX D. CALIBRATION DATA

Refer to Attached files.