



# SAR TEST REPORT

Report No.: STS2011042H01

Issued for

RTX HONG KONG LTD

8TH FL CORPORATION SQUARE, 8 LAM LOK ST.,  
KOWLOON BAY, HK.

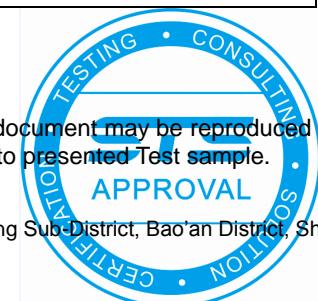
<b>Product Name:</b>	Cordless DECT Handset
<b>Brand Name:</b>	Alcatel-Lucent  Enterprise
<b>Model Name:</b>	8244 DECT Handset
<b>Series Model:</b>	N/A
<b>FCC ID:</b>	T7HCT8244
<b>Test Standard:</b>	ANSI/IEEE Std. C95.1 FCC 47 CFR Part 2 ( 2.1093) IEEE 1528: 2013
<b>Max. Report SAR (1g):</b>	Head: 0.209 W/kg Body: 0.104 W/kg

Any reproduction of this document must be done in full. No single part of this document may be reproduced without permission from STS, All Test Data Presented in this report is only applicable to presented Test sample.

ShenZhen STS Test Services Co.,Ltd.

A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China

TEL: +86-755 3688 6288 FAX: +86-755 3688 6277 E-mail:sts@stsapp.com





## Test Report Certification

**Applicant's name** ..... : RTX HONG KONG LTD  
Address ..... : 8TH FL CORPORATION SQUARE, 8 LAM LOK ST., KOWLOON BAY, HK.  
**Manufacturer's Name** ..... : RTX HONG KONG LTD  
Address ..... : 8TH FL CORPORATION SQUARE, 8 LAM LOK ST., KOWLOON BAY, HK.

### Product description

Product name ..... : Cordless DECT Handset

Brand name ..... : Alcatel-Lucent   
Enterprise

Model name ..... : 8244 DECT Handset

Series Model ..... : N/A

ANSI/IEEE Std. C95.1-1992

**Standards** ..... : FCC 47 CFR Part 2 ( 2.1093)  
IEEE 1528: 2013

The device was tested by Shenzhen STS Test Services Co., Ltd. in accordance with the measurement methods and procedures specified in KDB 865664. The test results in this report apply only to the tested sample of the stated device/equipment. Other similar device/equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

### Date of Test

Date (s) of performance of tests ..... : 16 Nov. 2020

Date of Issue ..... : 20 Nov. 2020

Test Result ..... : **Pass**

Testing Engineer : 

( Lemon Li)

Technical Manager : 

(Sean She)



Authorized Signatory :



(Vita Li)



## Table of Contents

<b>1. General Information</b>	<b>5</b>
1.1 EUT Description	5
1.2 Test Environment	6
1.3 Test Factory	6
<b>2. Test Standards and Limits</b>	<b>7</b>
<b>3. SAR Measurement System</b>	<b>8</b>
3.1 Definition of Specific Absorption Rate (SAR)	8
3.2 SAR System	8
<b>4. Tissue Simulating Liquids</b>	<b>11</b>
4.1 Simulating Liquids Parameter Check	11
<b>5. SAR System Validation</b>	<b>13</b>
5.1 Validation System	13
5.2 Validation Result	13
<b>6. SAR Evaluation Procedures</b>	<b>14</b>
<b>7. EUT Antenna Location Sketch</b>	<b>15</b>
7.1 SAR test exclusion consider table	16
<b>8. EUT Test Position</b>	<b>18</b>
8.1 Define Two Imaginary Lines On The Handset	18
8.2 Hotspot mode exposure position condition	19
<b>9. Uncertainty</b>	<b>20</b>
9.1 Measurement Uncertainty	20
9.2 System validation Uncertainty	21
<b>10. Conducted Power Measurement</b>	<b>22</b>
10.1 Test Result	22
<b>11. EUT And Test Setup Photo</b>	<b>23</b>
<b>12. SAR Result Summary</b>	<b>32</b>
12.1 Head SAR	32
12.2 Body SAR	32
<b>13. Equipment List</b>	<b>34</b>
<b>Appendix A. System Validation Plots</b>	<b>35</b>
<b>Appendix B. SAR Test Plots</b>	<b>37</b>
<b>Appendix C. Probe Calibration And Dipole Calibration Report</b>	<b>41</b>

**Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	20 Nov. 2020	STS2011042H01	ALL	Initial Issue

Note: **Format version** of the report - V01





## 1. General Information

Environmental evaluation measurements of specific absorption rate (SAR) distributions in emulated human head and body tissues exposed to radio frequency (RF) radiation from wireless portable devices for compliance with the rules and regulations of the U.S. Federal Communications Commission (FCC).

### 1.1 EUT Description

Product Name	Cordless DECT Handset										
Brand Name	Alcatel-Lucent  Enterprise										
Model Name	8244 DECT Handset										
Series Model	N/A										
Model difference	N/A										
Battery	Rated Voltage: 3.7V Capacity: 1100mAh										
Device Category	Portable										
Product stage	Production unit										
RF Exposure Environment	General Population / Uncontrolled										
Hardware Version	V04										
Software Version	V913										
Frequency Range	DECT: 1921.536 MHz ~ 1928.448 MHz BT: 2402 MHz ~ 2480MHz										
Max. Reported SAR(1g): (Limit:1.6W/kg)	Band	Mode	Ant	Head(W/kg)	Body(W/kg)						
	PUE	DECT-PP	0	0.002	0.003						
	DSS		1	0.024	0.008						
	1-g Sum SAR			0.233	0.112						
FCC Equipment Class	Part 15 Unlicensed PCS portable Tx held to ear (PUE)										
	Part 15 Spread Spectrum Transmitter (DSS)										
	Digital Transmission System (DTS)										
Operating Mode	DECT: GFSK Bluetooth: 4.2 + EDR (GFSK, π/4DQPSK, 8DPSK) BLE: GFSK										
	Antenna Specification										
Antenna Specification	DECT ANT 0: PCB Antenna DECT ANT 1: wire antenna BT: PCB Antenna										
	Hotspot Mode										
DTM Mode	Not Support										
	Not Support										
Note:											
1. Bluetooth SAR was estimated. 2. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power.											



## 1.2 Test Environment

Ambient conditions in the SAR laboratory:

Items	Required
Temperature (°C)	18-25
Humidity (%RH)	30-70

## 1.3 Test Factory

ShenZhen STS Test Services Co.,Ltd.

A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration No.: 625569

IC Registration No.: 12108A

A2LA Certificate No.: 4338.01





## 2. Test Standards and Limits

No.	Identity	Document Title
1	47 CFR Part 2	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	ANSI/IEEE Std. C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
3	IEEE Std. 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
4	FCC KDB 447498 D01 v06	Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
5	FCC KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
6	FCC KDB 865664 D02 v01r02	RF Exposure Reporting

(A). Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

(B). Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

NOTE: Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

**Population/Uncontrolled Environments:**

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

**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).

**NOTE**

**GENERAL POPULATION/UNCONTROLLED EXPOSURE**

**PARTIAL BODY LIMIT**

**1.6 W/kg**

### 3. SAR Measurement System

#### 3.1 Definition of Specific Absorption Rate (SAR)

SAR is related to the rate at which energy is absorbed per unit mass in an 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 general population/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 a given density (ρ). The equation description is as below:

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

SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

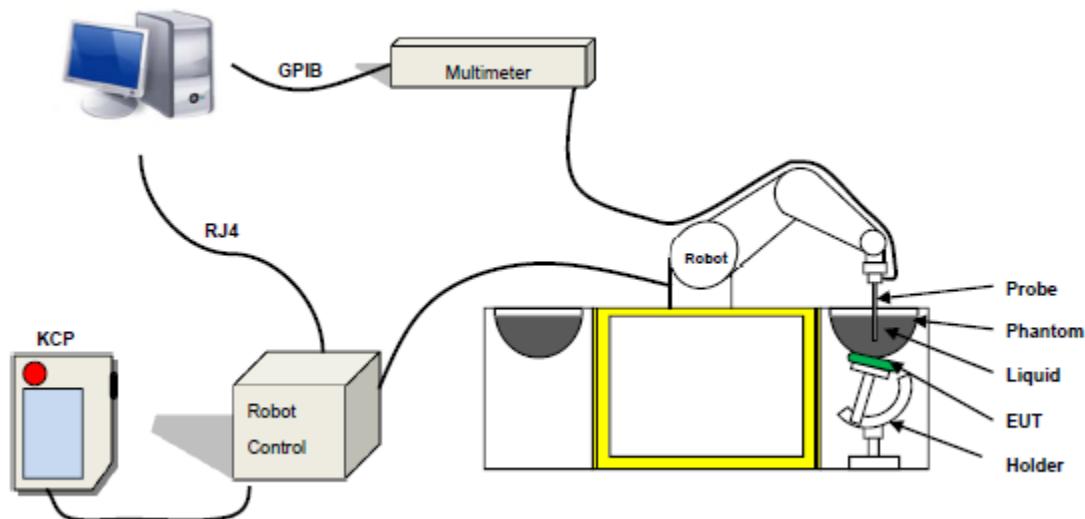
$$\text{SAR} = \frac{\sigma E^2}{\rho}$$

Where: σ is the conductivity of the tissue,

ρ is the mass density of the tissue and E is the RMS electrical field strength.

#### 3.2 SAR System

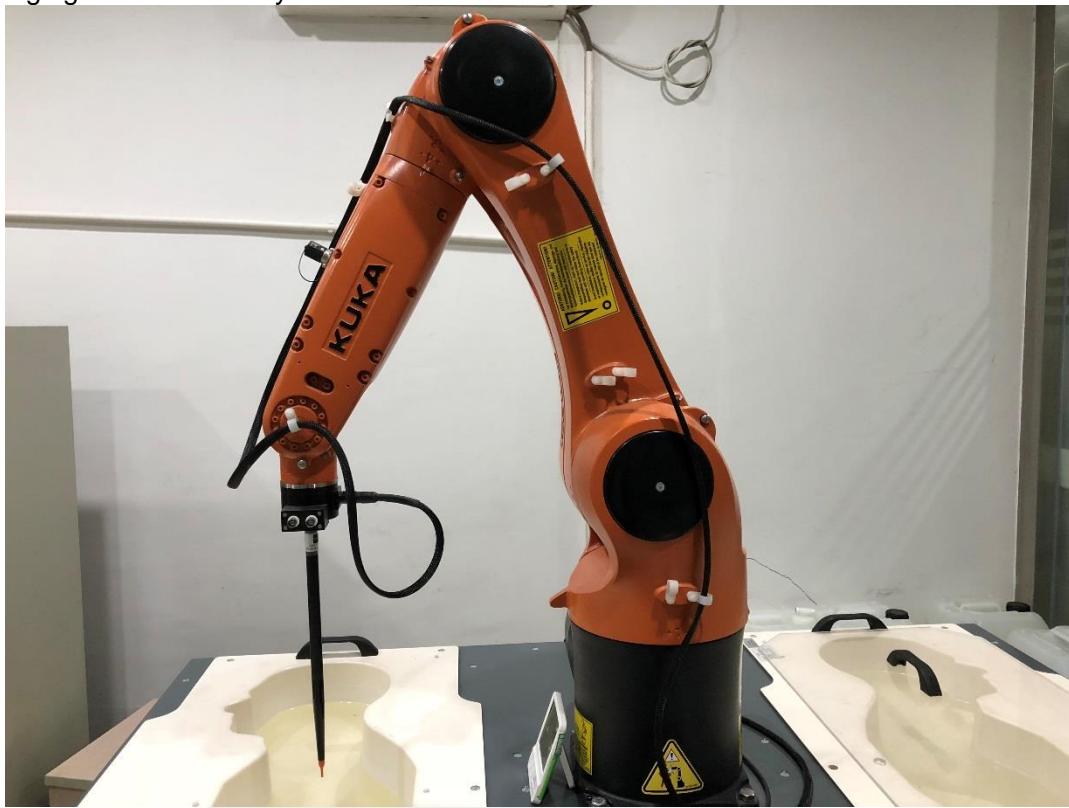
MVG SAR System Diagram:



COMOSAR is a system that is able to determine the SAR distribution inside a phantom of human being according to different standards. The COMOSAR system consists of the following items:

- Main computer to control all the system
- 6 axis robot
- Data acquisition system
- Miniature E-field probe
- Phone holder
- Head simulating tissue

The following figure shows the system.



The EUT under test operating at the maximum power level is placed in the phone holder, under the phantom, which is filled with head simulating liquid. The E-Field probe measures the electric field inside the phantom. The Open SAR software computes the results to give a SAR value in a 1g or 10g mass.

### 3.2.1 Probe

For the measurements the Specific Dosimetric E-Field Probe SN 41/18 EPGO334 with following specifications is used

- Probe Length: 330 mm
- Length of Individual Dipoles: 2 mm
- Maximum external diameter: 8 mm
- Probe Tip External Diameter: 2.5 mm
- Distance between dipole/probe extremity: 1 mm
- Dynamic range: 0.01-100 W/kg
- Probe linearity: 3%
- Axial Isotropy: < 0.10 dB
- Spherical Isotropy: < 0.10 dB
- Calibration range: 450 MHz to 6 GHz for head & body simulating liquid.
- Angle between probe axis (evaluation axis) and surface normal line: less than 30°



Figure 1-MVG COMOSAR Dosimetric E field Dipole

### 3.2.2 Phantom

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The phantom is a polyurethane shell integrated in a wooden table. The thickness of the phantom amounts to 2mm +/- 0.2mm. It enables the dosimetric evaluation of left and right phone usage and includes an additional flat phantom part for the simplified performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.

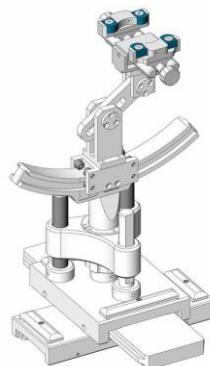


Figure-SN 32/14 SAM115



Figure-SN 32/14 SAM116

### 3.2.3 Device Holder



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



## 4. Tissue Simulating Liquids

### 4.1 Simulating Liquids Parameter Check

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 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 P1528 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 P1528.

#### Head Tissue

Frequency (MHz)	cellulose	DGBE	HEC	NaCl	Preventol	Sugar	X100	Water	Conductivity	Permittivity
	%	%	%	%	%	%	%	%	$\sigma$	$\epsilon_r$
750	0.2	/	/	1.4	0.2	57.0	/	41.1	0.89	41.9
835	0.2	/	/	1.4	0.2	57.9	/	40.3	0.90	41.5
900	0.2	/	/	1.4	0.2	57.9	/	40.3	0.97	41.5
1800	/	44.5	/	0.3	/	/	30.45	55.2	1.4	40.0
1900	/	44.5	/	0.3	/	/	30.45	55.2	1.4	40.0
2000	/	44.5	/	0.3	/	/	/	55.2	1.4	40.0
2450	/	44.9	/	0.1	/	/	/	55.0	1.80	39.2
2600	/	45.0	/	0.1	/	/	/	54.9	1.96	39.0

#### Body Tissue

Frequency (MHz)	cellulose	DGBE	HEC	NaCl	Preventol	Sugar	X100	Water	Conductivity	Permittivity
	%	%	%	%	%	%	%	%	$\sigma$	$\epsilon_r$
750	0.2	/	/	0.9	0.1	47.2	/	51.7	0.96	55.5
835	0.2	/	/	0.9	0.1	48.2	/	50.8	0.97	55.2
900	0.2	/	/	0.9	0.1	48.2	/	50.8	1.05	55.0
1800	/	29.4	/	0.4	/	/	30.45	70.2	1.52	53.3
1900	/	29.4	/	0.4	/	/	30.45	70.2	1.52	53.3
2000	/	29.4	/	0.4	/	/	/	70.2	1.52	53.3
2450	/	31.3	/	0.1	/	/	/	68.6	1.95	52.7
2600	/	31.7	/	0.1	/	/	/	68.2	2.16	52.3

Tissue dielectric parameters for head and body phantoms				
Frequency	$\epsilon_r$		$\sigma$ S/m	
	Head	Body	Head	Body
300	45.3	58.2	0.87	0.92
450	43.5	56.7	0.87	0.94
900	41.5	55.0	0.97	1.05
1450	40.5	54.0	1.20	1.30
1800	40.0	53.3	1.40	1.52
2450	39.2	52.7	1.80	1.95
3000	38.5	52.0	2.40	2.73
5800	35.3	48.2	5.27	6.00

**LIQUID MEASUREMENT RESULTS**

Date	Ambient condition		Head Simulating Liquid		Parameters	Target	Measured	Deviation [%]	Limited [%]
	Temp. [°C]	Humidity [%]	Frequency	Temp. [°C]					
2020-11-16	23.0	52	1900 MHz	22.8	Permittivity	40	40.44	1.10	±5
					Conductivity	1.4	1.42	1.43	±5

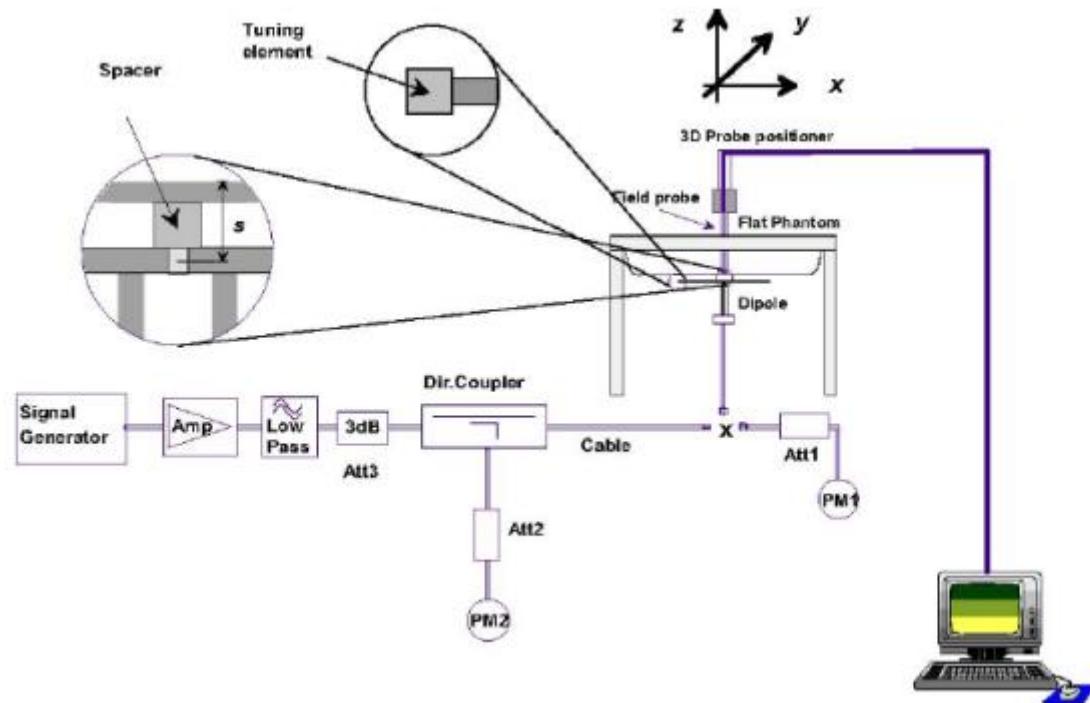


## 5. SAR System Validation

### 5.1 Validation System

Each MVG system is equipped with one or more system validation kits. These units, together with the predefined measurement procedures within the MVG software, enable the user to conduct the system performance 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 validation setup is shown as below.



### 5.2 Validation Result

Comparing to the original SAR value provided by MVG, the validation data should be within its specification of 10 %.

Freq.(MHz)	Power (mW)	Tested Value (W/Kg)	Normalized SAR (W/kg)	Target (W/Kg)	Tolerance (%)	Date
1900	100	3.891	38.91	39.7	-1.99	2020-11-16

Note:

1. The tolerance limit of System validation  $\pm 10\%$ .
2. The dipole input power (forward power) was 100 mW.
3. The results are normalized to 1 W input power.



## 6. SAR Evaluation Procedures

The procedure for assessing the average SAR value consists of the following steps:

The following steps are used for each test position

- Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- Measurement of the SAR distribution with a grid of 8 to 16mm \* 8 to16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.
- Around this point, a cube of 30 \* 30 \* 30 mm or 32 \* 32 \* 32 mm is assessed by measuring 5 or 8 \* 5 or 8\*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

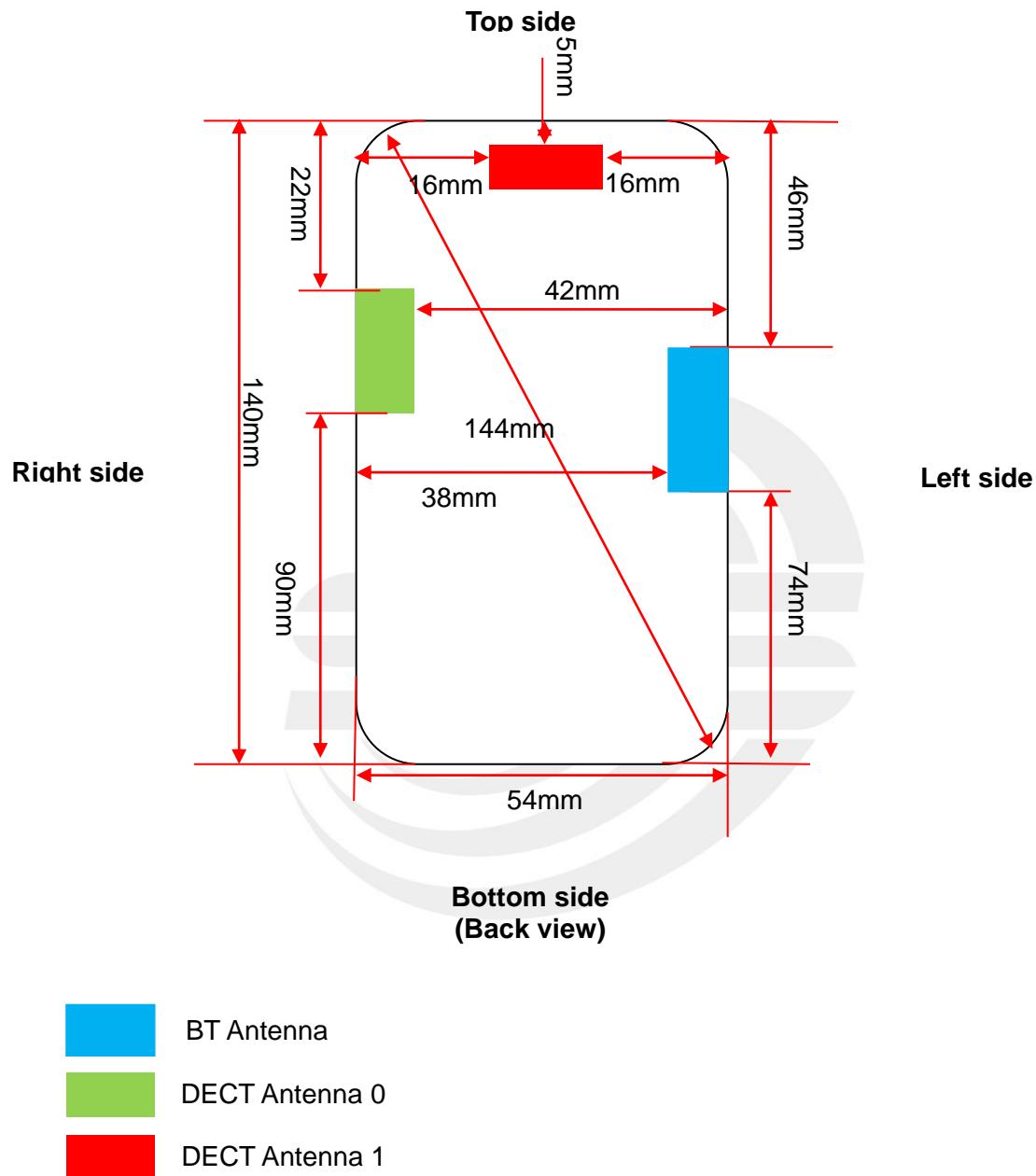
Area Scan& Zoom Scan:

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR -distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01v01r01 quoted below.

When the 1-g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.

## 7. EUT Antenna Location Sketch

It is a Cordless DECT Handset, support DECT/BT mode.



Note 1: The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report.



## 7.1 SAR test exclusion consider table

The DECT/BT SAR evaluation of Maximum power (dBm) summing tolerance.

	Wireless Interface	DECT Ant A	DECT Ant B	BT
Exposure Position	Calculated Frequency	1928.448	1924.992	2441
	Maximum power (dBm)	20.28	20.81	6.69
	Maximum rated power(mW)	106.660	120.504	4.667
	Separation distance (mm)	10	10	10
Back Side	exclusion threshold(mW)	22	22	22
	Testing required?	YES	YES	NO
	Separation distance (mm)	10	10	10
Front Side	exclusion threshold(mW)	22	22	22
	Testing required?	YES	YES	NO
	Separation distance (mm)	52	26	10
Left Edge	exclusion threshold(mW)	119	54	22
	Testing required?	NO	YES	NO
	Separation distance (mm)	10	26	48
Right Edge	exclusion threshold(mW)	22	54	76
	Testing required?	YES	YES	NO
	Separation distance (mm)	32	15	56
Top Edge	exclusion threshold(mW)	65	33	1279
	Testing required?	YES	YES	NO
	Separation distance (mm)	100	138	84
Bottom Edge	exclusion threshold(mW)	609	989	436
	Testing required?	NO	NO	NO

### Note:

1. maximum power is the source-based time-average power and represents the maximum RF output power among production units.
2. per KDB 447498 D01, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
3. per KDB 447498 D01, standalone SAR test exclusion threshold is applied; if the distance of the antenna to the user is <25mm, 25mm is user to determine SAR exclusion threshold
4. per KDB 447498 D01, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distance  $\leq 50$ mm are determined by:  
$$[(\text{max.power of channel, including tune-up tolerance, Mw}) / (\text{min. test separation distance, mm})]^* \checkmark$$



$f(\text{GHz}) \leq 3.0$  for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR,  $f(\text{GHz})$  is the RF channel transmit frequency in GHz. Power and distance are rounded to the nearest mW and mm before calculation. The result is rounded to one decimal place for comparison

For <50mm distance, we just calculate mW of the exclusion threshold value(3.0) to do compare

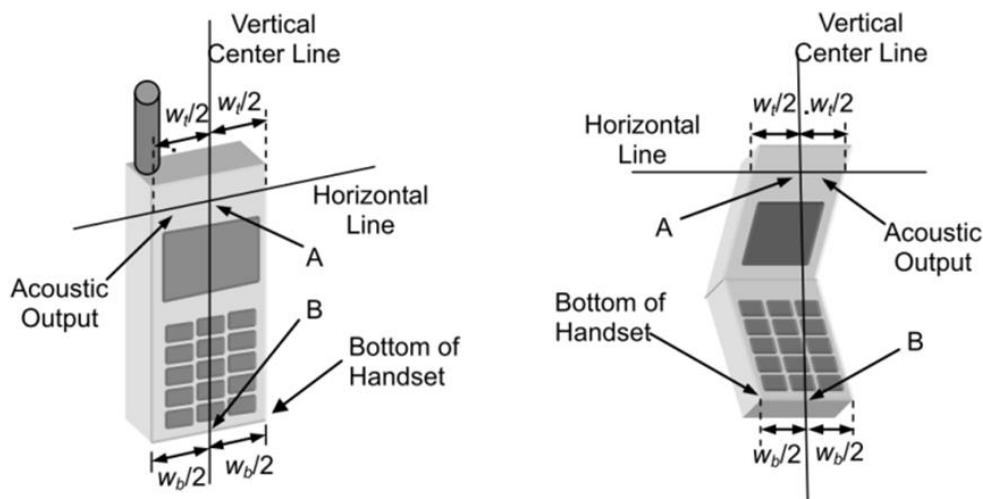
5. per KDB 447498 D01, at 100 MHz to 6GHz and for test separation distances >50mm, the SAR test exclusion threshold is determined according to the following
  - a)[threshold at 50mm in step 1]+(test separation distance -50mm)\*(f (MHz)/150)]mW, at 100 MHz to 1500 MHz
  - b) [threshold at 50mm in step1]+( test separation distance -50mm) \*10]mW at >1500MHz and  $\leq$  6GHz
6. Per KDB 248227 D01, choose the highest output power channel to test SAR and determine further SAR exclusion 8. for each frequency band ,testing at higher data rates and higher order modulations is not required when the maximum average output power for each of each of these configurations is less than 1/4db higher than those measured at the lower data rate than 11b mode ,thus the SAR can be excluded.
7. Per KDB 616217 D04, SAR evaluation for the front surface of tablet display screens are generally not necessary.

## 8. EUT Test Position

This EUT was tested in Right Cheek, Right Titled, Left Cheek, Left Titled, Front Face and Rear Face.

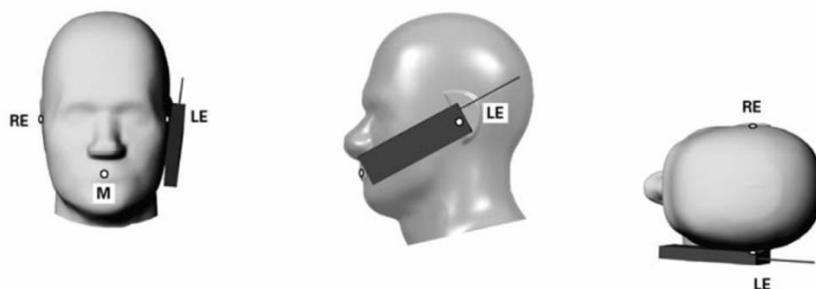
### 8.1 Define Two Imaginary Lines On The Handset

- (1) The vertical centerline 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, and the midpoint of the width  $w_b$  of the handset.
- (2) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.
- (3) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.



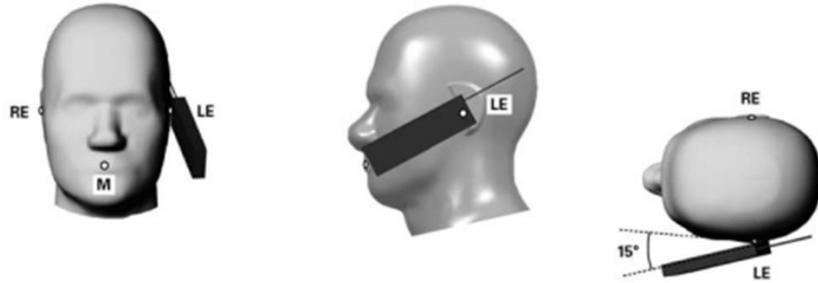
#### Cheek Position

- 1) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.
- 2) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost



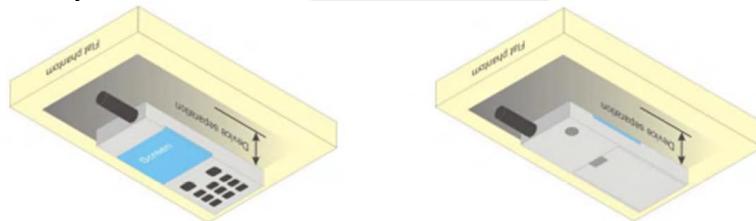
#### Title Position

- (1) To position the device in the "cheek" position described above.
- (2) While maintaining the device in the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until with the ear is lost.



#### Body-worn Position Conditions:

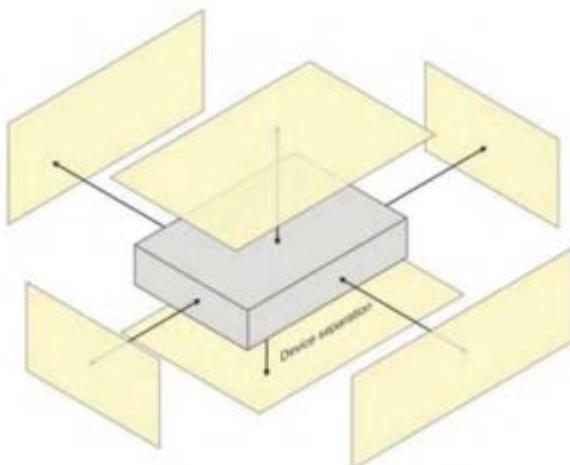
Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB Publication 447498 D01 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative *test separation distance* configuration may be used to support both SAR conditions. When the *reported* SAR for a body-worn accessory, measured without a headset connected to the handset, is  $> 1.2 \text{ W/kg}$ , the highest *reported* SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.



#### 8.2 Hotspot mode exposure position condition

For handsets that support hotspot mode operations, with wireless router capabilities and various web browsing function, the relevant hand and body exposure condition are tested according to the hotspot SAR procedures in KDB 941225. A test separation distance of 10 mm is required between the phantom and all surface and edges with a transmitting antenna located within 25 mm from that surface or edge.

When form factor of a handset is smaller than 9cm x 5cm, a test separation distance of 5mm (instead of 10mm) is required for testing hotspot mode. When the separate distance required for body-worn accessory testing is larger than or equal to that tested for hotspot mode, in the same wireless mode and for the same surface of the phone, the hotspot mode SAR data may be used to support body-worn accessory SAR compliance for that particular configuration(surface).





## 9. Uncertainty

### 9.1 Measurement Uncertainty

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in IEEE 1528: 2013. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Uncertainty Component	Tol (+- %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	vi
<b>Measurement System</b>								
Probe calibration	5.831	N	1	1	1	5.83	5.83	$\infty$
Axial Isotropy	0.695	R	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	0.28	0.28	$\infty$
Hemispherical Isotropy	1.045	R	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	0.43	0.43	$\infty$
Boundary effect	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	$\infty$
Linearity	0.685	R	$\sqrt{3}$	1	1	0.40	0.40	$\infty$
System detection limits	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	$\infty$
Modulation response	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	$\infty$
Readout Electronics	0.021	N	1	1	1	0.021	0.021	$\infty$
Response Time	0	R	$\sqrt{3}$	1	1	0	0	$\infty$
Integration Time	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	$\infty$
RF ambient conditions-Noise	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	$\infty$
RF ambient conditions-reflections	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	$\infty$
Probe positioner mechanical tolerance	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	$\infty$
Probe positioning with respect to phantom shell	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	$\infty$
Post-processing	2.3	R	$\sqrt{3}$	1	1	1.33	1.33	$\infty$
<b>Test sample Related</b>								
Test sample positioning	2.6	N	1	1	1	2.6	2.6	$\infty$
Device holder uncertainty	3	N	1	1	1	3	3	$\infty$
SAR drift measurement	5	R	$\sqrt{3}$	1	1	2.89	2.89	$\infty$
SAR scaling	5	R	$\sqrt{3}$	1	1	2.89	2.89	$\infty$
<b>Phantom and tissue parameters</b>								
Phantom uncertainty(shape and thickness uncertainty)	4	R	$\sqrt{3}$	1	1	2.31	2.31	$\infty$
Uncertainty in SAR correction for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.90	1.60	$\infty$
Liquid conductivity(temperature uncertainty)	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	$\infty$
Liquid conductivity(measured)	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity(temperature uncertainty)	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	$\infty$
Liquid permittivity(measured)	5	N	1	0.23	0.26	1.15	1.30	M
Combined Standard Uncertainty		RSS				9.79	9.59	
Expanded Uncertainty (95% Confidence interval)		K=2				19.58	19.18	



## 9.2 System validation Uncertainty

Uncertainty Component	Tol (+-%)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (+-%)	10g Ui (+-%)	vi
<b>Measurement System</b>								
Probe calibration	5.831	N	1	1	1	5.83	5.83	$\infty$
Axial Isotropy	0.695	R	$\sqrt{3}$	1	1	0.40	0.40	$\infty$
Hemispherical Isotropy	1.045	R	$\sqrt{3}$	0	0	0.00	0.00	$\infty$
Boundary effect	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	$\infty$
Linearity	0.685	R	$\sqrt{3}$	1	1	0.40	0.40	$\infty$
System detection limits	1.0	R	$\sqrt{3}$	1	1	0.58	0.58	$\infty$
Modulation response	3.0	R	$\sqrt{3}$	0	0	0.00	0.00	$\infty$
Readout Electronics	0.021	N	1	1	1	0.021	0.021	$\infty$
Response Time	0.0	R	$\sqrt{3}$	0	0	0.00	0.00	$\infty$
Integration Time	1.4	R	$\sqrt{3}$	0	0	0.00	0.00	$\infty$
RF ambient conditions-Noise	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	$\infty$
RF ambient conditions-reflections	3.0	R	$\sqrt{3}$	1	1	1.73	1.73	$\infty$
Probe positioner mechanical tolerance	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	$\infty$
Probe positioning with respect to phantom shell	1.4	R	$\sqrt{3}$	1	1	0.81	0.81	$\infty$
Post-Processing	2.3	R	$\sqrt{3}$	1	1	1.33	1.33	$\infty$
<b>System validation source</b>								
Deviation of experimental dipole from numerical dipole	5.0	N	1	1	1	5.00	5.00	$\infty$
Input power and SAR drift measurement	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	$\infty$
Other source contribution Uncertainty	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	$\infty$
<b>Phantom and set-up</b>								
Phantom uncertainty(shape and thickness uncertainty)	4.0	R	$\sqrt{3}$	1	1	2.31	2.31	$\infty$
Uncertainty in SAR correction for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.90	1.60	$\infty$
Liquid conductivity(temperature uncertainty)	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	$\infty$
Liquid conductivity(measured)	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity(temperature uncertainty)	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	$\infty$
Liquid permittivity(measured)	5	N	1	0.23	0.26	1.15	1.30	M
Combined Standard Uncertainty		RSS				9.718	9.517	
Expanded Uncertainty (95% Confidence interval)		K=2				19.44	19.04	



## 10. Conducted Power Measurement

### 10.1 Test Result

DECT

ANT 0:

Carrier Channel	Frequency (MHz)	Measured Peak Output Power (dBm)
4	1921.536	20.01
2	1924.992	20.02
0	1928.448	20.05

ANT 1:

Carrier Channel	Frequency (MHz)	Measured Peak Output Power (dBm)
4	1921.536	19.54
2	1924.992	19.52
0	1928.448	19.47

Bluetooth

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
GFSK(1Mbps)	0	2402	2.44
	39	2441	6.69
	78	2480	5.30
$\pi/4$ -DQPSK(2Mbps)	0	2402	-2.36
	39	2441	2.88
	78	2480	1.67
8DPSK(3Mbps)	0	2402	-2.36
	39	2441	2.97
	78	2480	1.69

BLE

Mode	Channel Number	Frequency (MHz)	Average Power (dBm)
GFSK(1Mbps)	0	2402	-6.08
	19	2440	-0.51
	39	2480	-1.34



## 11. EUT And Test Setup Photo

### 11.1 EUT Photos

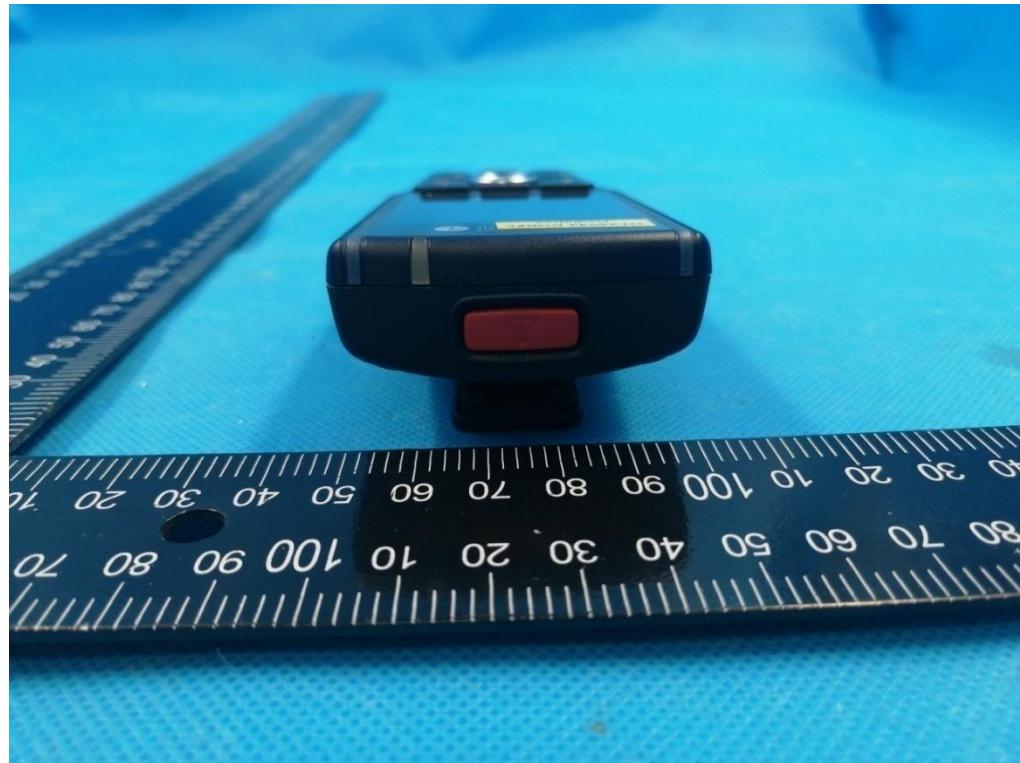
Front side



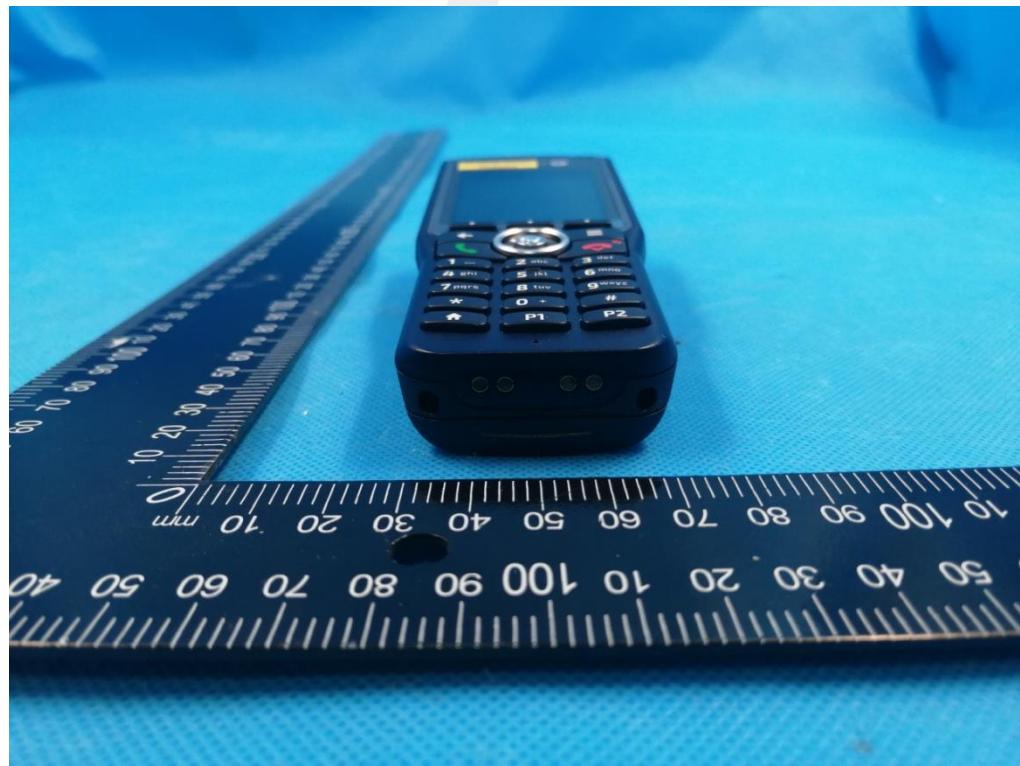
Back side



Top side



Bottom side





Left side



Right side





## 11.2 Setup Photos

Right Cheek



Right Tilt



Left Cheek



Left Tilt



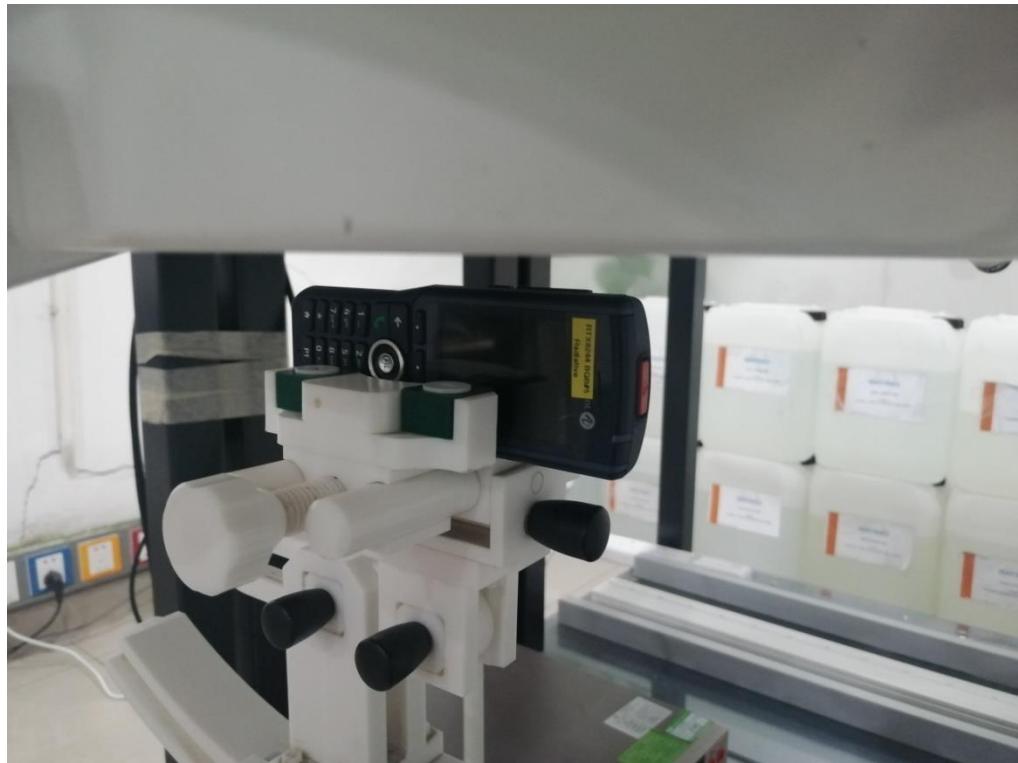
Front Side



Back Side



Left Edge



Right Edge



Top Edge



Bottom Edge





Liquid depth (15 cm)





## 12. SAR Result Summary

### 12.1 Head SAR

#### ANT 0

Band	Model	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
DECT-PP	GFSK	Right Cheek	0	0.002	-1.67	20.2	20.05	<b>0.002</b>	1
		Right Tilt	0	0.001	-2.24	20.2	20.05	0.001	-
		Left Cheek	0	0.002	3.21	20.2	20.05	0.002	-
		Left Tilt	0	0.001	2.41	20.2	20.05	0.001	-

#### ANT 1

Band	Model	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
DECT-PP	GFSK	Right Cheek	4	0.022	-1.65	20	19.54	<b>0.024</b>	3
		Right Tilt	4	0.004	-3.52	20	19.54	0.004	-
		Left Cheek	4	0.009	-0.80	20	19.54	0.010	-
		Left Tilt	4	0.002	-2.46	20	19.54	0.002	-

### 12.2 Body SAR

#### ANT 0

Band	Model	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
DECT-PP	GFSK	Front Side	0	0.003	1.57	20.2	20.05	<b>0.003</b>	2
		Back Side	0	0.001	-0.93	20.2	20.05	0.001	-
		Right Edge	0	0.001	0.84	20.2	20.05	0.001	-
		Top Edge	0	0.000	1.95	20.2	20.05	0.000	-

#### ANT 1

Band	Model	Test Position	Ch.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas. No.
DECT-PP	GFSK	Front Side	4	0.007	1.40	20	19.54	<b>0.008</b>	4
		Back Side	4	0.004	2.79	20	19.54	0.004	-
		Left Edge	4	0.002	0.47	20	19.54	0.002	-
		Right Edge	4	0.002	2.64	20	19.54	0.002	-
		Top Edge	4	0.001	1.30	20	19.54	0.001	-

Note:

1. The test separation of all above table is 10mm.
2. Per KDB 447498 D01, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
  - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
  - b. For DECT: Scaled SAR(W/kg)= Measured SAR(W/kg)\*Tune-up Scaling Factor

**Simultaneous Multi-band Transmission Evaluation:****NOTE:**

1. For simultaneous transmission at head and body exposure position, 2 transmitters simultaneous transmission was the worst state.
2. Based upon KDB 447498 D01, BT SAR is excluded as below table.
3. If the test separation distance is <5mm, 5mm is used for excluded SAR calculation.
4. For minimum test separation distance  $\leq$  50mm, Bluetooth standalone SAR is excluded according to  $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz}) / x}] \leq 3.0$  for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR
5. The reported SAR summation is calculated based on the same configuration and test position.
6. KDB 447498 / 4.3.2 (2) when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:
  - a)  $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz}) / x}] \text{ W/kg}$  for test separation distances  $\leq$  50 mm;  
Where  $x = 7.5$  for 1-g SAR, and  $x = 18.75$  for 10-g SAR.
  - b) 0.4W/Kg for 1-g SAR and 1.0W/Kg for 10-g SAR, when the separation distance is  $>50\text{mm}$ .

Estimated SAR		Maximum Power		Antenna to user(mm)	Frequency(GHz)	Stand Alone SAR(1g) [W/kg]
		dBm	mW			
BT	Head	7	5.012	5	2.441	0.209
	Body			10	2.441	0.104

Simultaneous Mode	Position	Mode	Max. 1-g SAR (W/kg)	1-g Sum SAR (W/kg)
DECT+BT	Head	DECT	0.024	0.233
		BT	0.209	
	Body	DECT	0.008	0.112
		BT	0.104	



## 13. Equipment List

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
1900MHz Dipole	MVG	SID1900	SN 30/14 DIP1G900-333	2020.07.14	2023.07.13
E-Field Probe	MVG	SSE5	SN 41/18 EPMG334	2020.07.14	2021.07.13
Dielectric Probe Kit	MVG	SCLMP	SN 32/14 OCPG67	2019.11.25	2020.11.24
Antenna	MVG	ANTA3	SN 07/13 ZNTA52	N/A	N/A
Phantom1	MVG	SAM	SN 32/14 SAM115	N/A	N/A
Phantom2	MVG	SAM	SN 32/14 SAM116	N/A	N/A
Phone holder	MVG	N/A	SN 32/14 MSH97	N/A	N/A
Laptop holder	MVG	N/A	SN 32/14 LSH29	N/A	N/A
Attenuator	Agilent	99899	DC-18GHz	N/A	N/A
Directional coupler	Narda	4226-20	3305	N/A	N/A
Network Analyzer	Agilent	8753ES	US38432810	2020.10.12	2021.10.11
Multi Meter	Keithley	Multi Meter 2000	4050073	2020.10.10	2021.10.09
Signal Generator	Agilent	N5182A	MY50140530	2020.10.10	2021.10.09
Test Platform for DECT	RTX	RTX2012 HS	1138-6122	2020.10.10	2021.10.09
Power Amplifier	DESAY	ZHL-42W	9638	2020.10.10	2021.10.09
Power Meter	R&S	NRP	100510	2020.10.12	2021.10.11
Power Meter	Agilent	E4418B	GB43312526	2020.10.10	2021.10.09
Power Sensor	R&S	NRP-Z11	101919	2020.10.10	2021.10.09
Power Sensor	Agilent	E9301A	MY41497725	2020.10.10	2021.10.09
Temperature hygrometer	SuWei	SW-108	N/A	2020.10.10	2021.10.09
Thermograph	Elitech	RC-4	S/N EF7176501537	2020.10.12	2021.10.11

Note:

Per KDB 865664 D01, Dipole SAR Validation Verification, STS 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

Return-loss is within 20% of calibrated measurement

## Appendix A. System Validation Plots

### System Performance Check Data (1900MHz)

Type: Phone measurement (Complete)

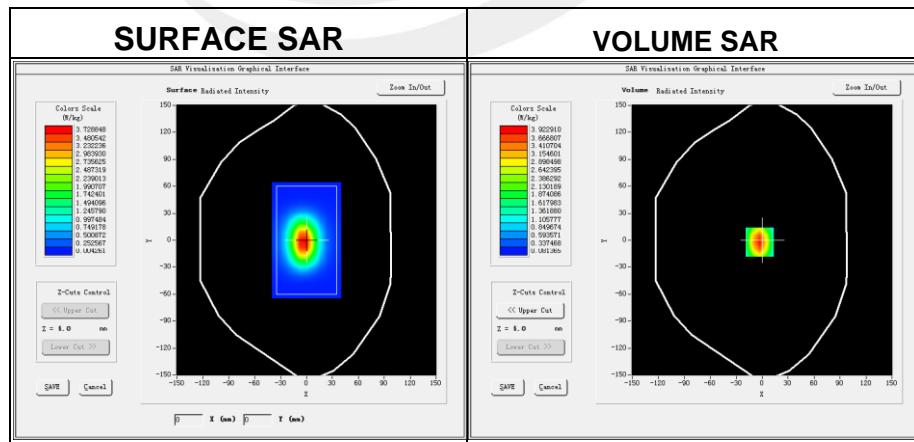
Area scan resolution:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$

Zoom scan resolution:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$

Date of measurement: 2020-11-16

### Experimental conditions.

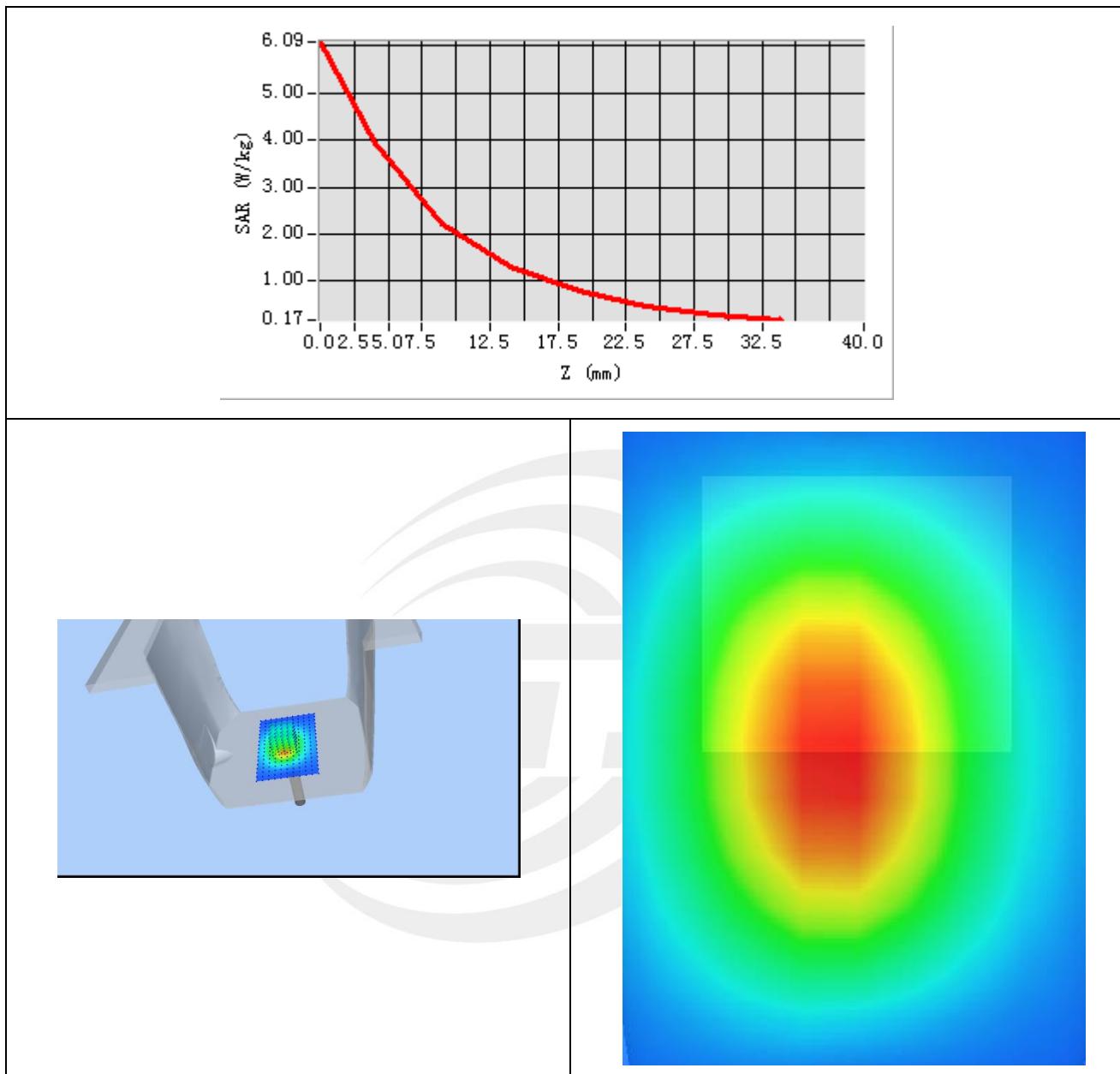
Phantom	Validation plane
Device Position	-
Band	1900MHz
Channels	-
Signal	CW
Frequency (MHz)	1900MHz
Relative permittivity	40.44
Conductivity (S/m)	1.42
Power drift (%)	1.28
Probe	SN 41/18 EPGO334
ConvF:	1.84
Crest factor:	1:1



Maximum location: X=2.00, Y=-2.00

SAR 10g (W/Kg)	2.075172
SAR 1g (W/Kg)	3.891412

## Z Axis Scan



## Appendix B. SAR Test Plots

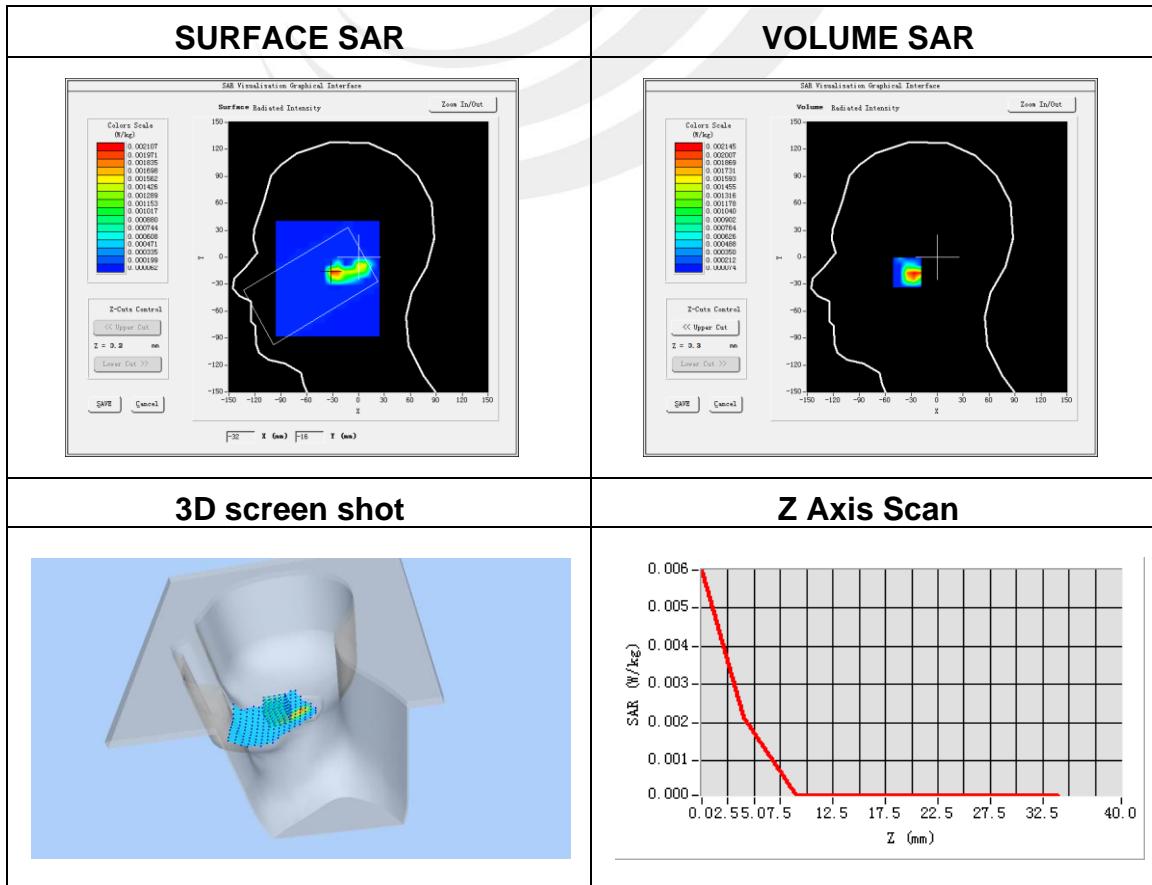
### Plot 1: DUT: Cordless DECT Handset; EUT Model: 8244 DECT Handset

Test Date	2020-11-16
Probe	SN 41/18 EPGO334
ConvF	1.84
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Right Cheek
Device Position	Cheek
Channels	0
ANT	0
Frequency (MHz)	1928.448
Relative permittivity (real part)	40.44
Conductivity (S/m)	1.42
Variation (%)	-2.10

Maximum location: X=-30.00, Y=-17.00

SAR Peak: 0.01W/kg

SAR 10g (W/Kg)	0.000702
SAR 1g (W/Kg)	0.002318



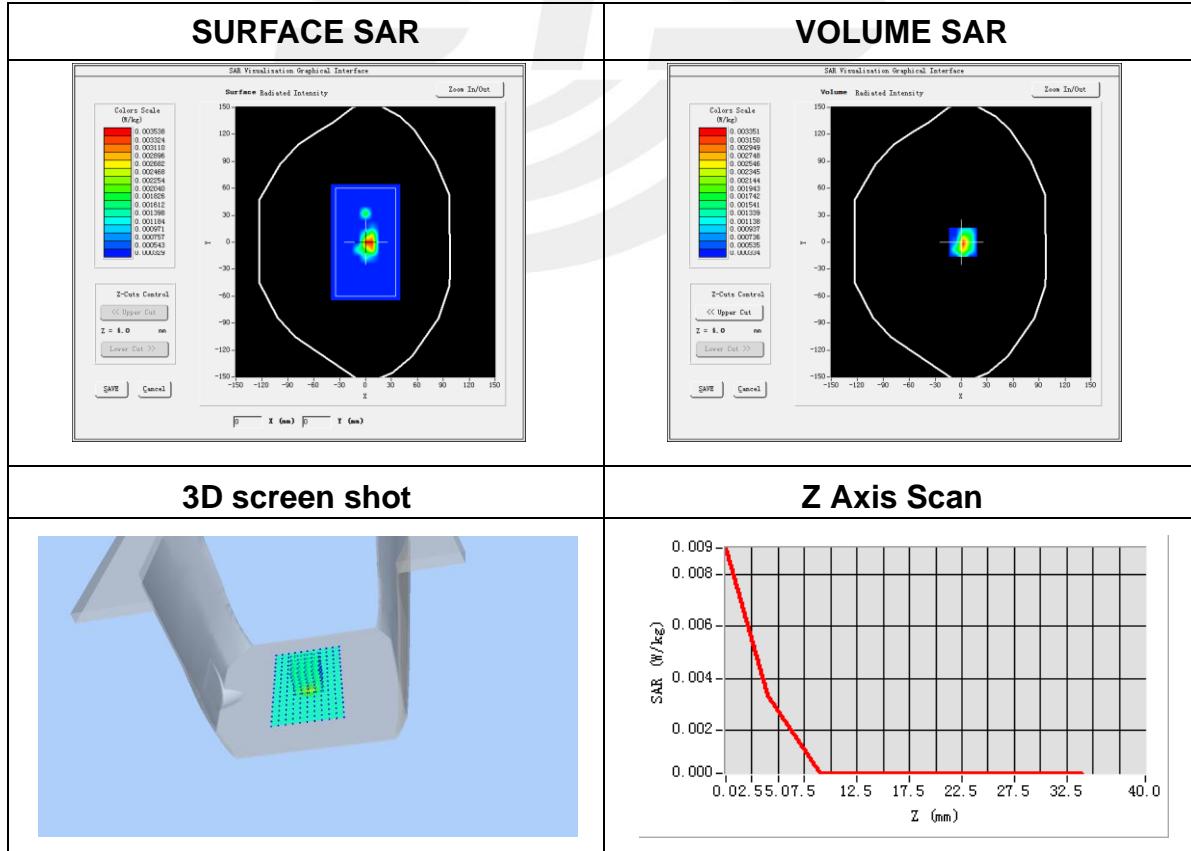
**Plot 2: DUT: Cordless DECT Handset; EUT Model: 8244 DECT Handset**

Test Date	2020-11-16
Probe	SN 41/18 EPGO334
ConvF	1.88
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Front side
Channels	0
ANT	0
Frequency (MHz)	1928.448
Relative permittivity (real part)	40.44
Conductivity (S/m)	1.42
Variation (%)	2.14

Maximum location: X=2.00, Y=0.00

SAR Peak: 0.01 W/kg

SAR 10g (W/Kg)	0.001103
SAR 1g (W/Kg)	0.003295



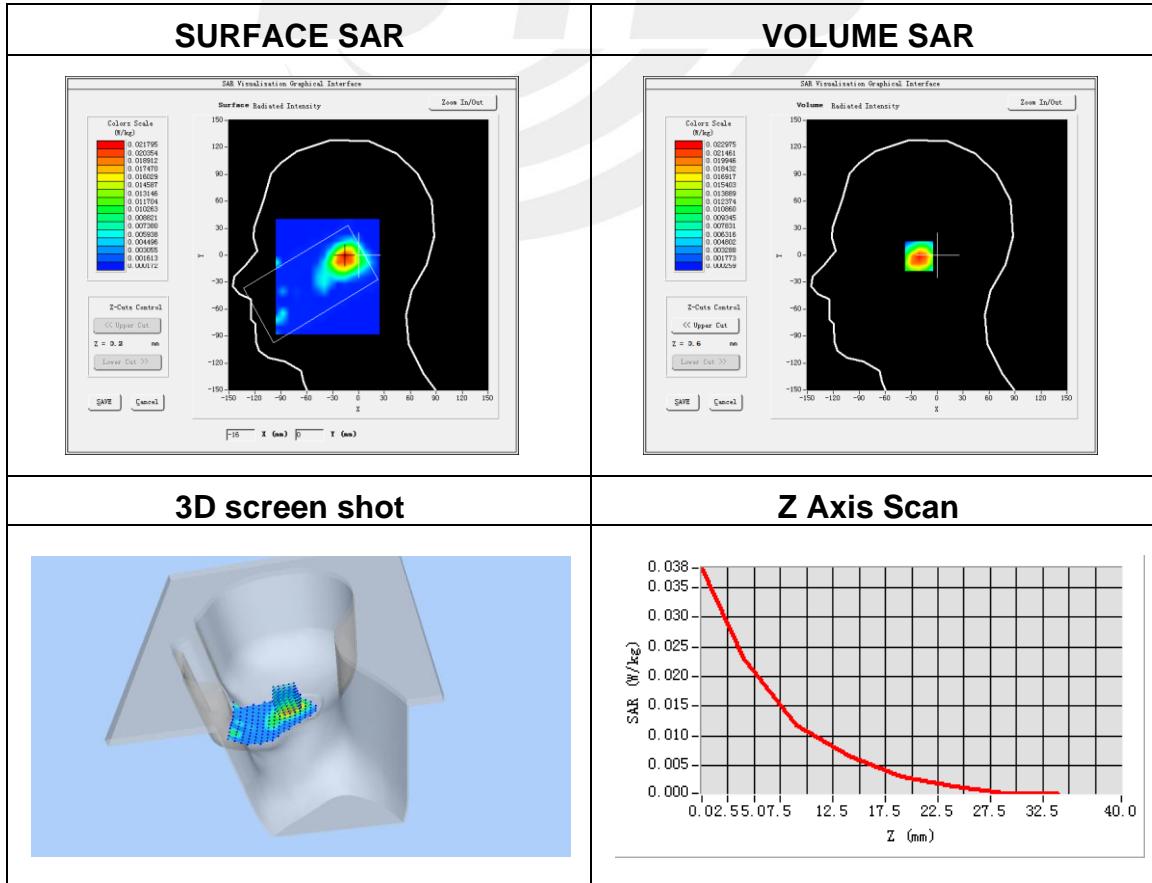
**Plot 3: DUT: Cordless DECT Handset; EUT Model: 8244 DECT Handset**

Test Date	2020-11-16
Probe	SN 41/18 EPGO334
ConvF	1.84
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Right cheek
Device Position	Cheek
Channels	4
ANT	1
Frequency (MHz)	1924.992
Relative permittivity (real part)	40.44
Conductivity (S/m)	1.42
Variation (%)	-1.58

Maximum location: X=-16.00, Y=-1.00

SAR Peak: 0.04W/kg

SAR 10g (W/Kg)	0.011115
SAR 1g (W/Kg)	0.022381



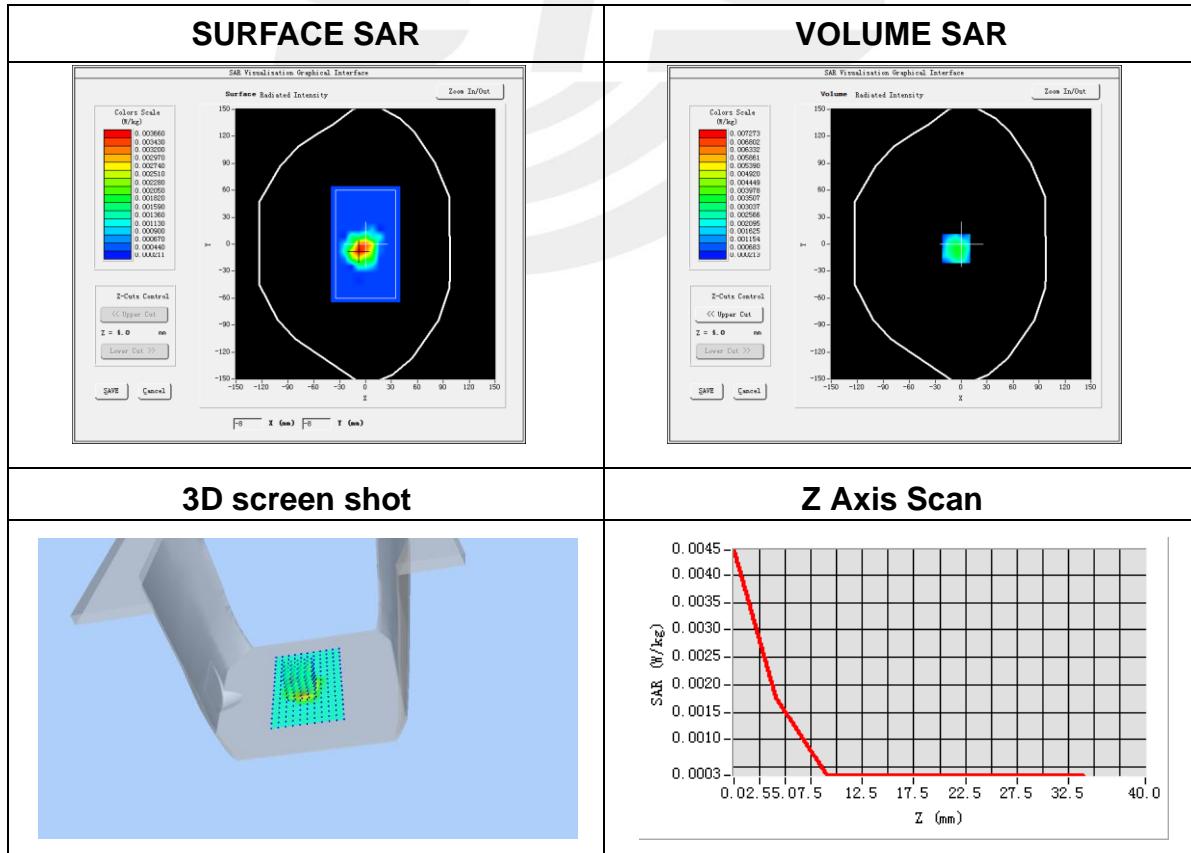
**Plot 4: DUT: Cordless DECT Handset; EUT Model: 8244 DECT Handset**

Test Date	2020-11-16
Probe	SN 41/18 EPGO334
ConvF	1.88
Area Scan	dx=8mm, dy=8mm, h= 5.00 mm
Zoom Scan	5x5x7, dx=8mm, dy=8mm, dz=5mm, Complete/ndx=8mm, dy=8mm, h= 5.00 mm
Phantom	Validation plane
Device Position	Front side
Channels	4
ANT	1
Frequency (MHz)	1924.992
Relative permittivity (real part)	40.44
Conductivity (S/m)	1.42
Variation (%)	0.58

Maximum location: X=-6.00, Y=-5.00

SAR Peak: 0.01 W/kg

SAR 10g (W/Kg)	0.003988
SAR 1g (W/Kg)	0.006805





## Appendix C. Probe Calibration And Dipole Calibration Report

Refer the appendix Calibration Report.

※※※※※END OF THE REPORT※※※※※

