SAR TEST REPORT

For

Fujian Newland Auto-ID Tech Co., Ltd.

Portable Data Collector

Model No.: NLS-MT90

Additional Model No.: /

Prepared for	:	Fujian Newland Auto-ID Tech Co., Ltd.
Address	:	Newland Science & Technology Park, No.1 Rujiang West Rd, Mawei, Fuzhou, P.R.China

Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	1/F., Xingyuan Industrial Park, Tongda Road, Bao’an Avenue, Bao’an District, Shenzhen, Guangdong, China
Tel	:	(86)755-82591330
Fax	:	(86)755-82591332
Web	:	www.LCS-cert.com
Mail	:	webmaster@LCS-cert.com

Date of receipt of test sample	:	July 09, 2018
Number of tested samples	:	1
Serial number	:	Prototype
Date of Test	:	July 09, 2018~August 16, 2018
Date of Report	:	September 06, 2018

SAR TEST REPORT

Report Reference No. .... :	**LCS180704037AEB**
Date Of Issue .... :	September 06, 2018
Testing Laboratory Name........ :	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address .... :	1/F., Xingyuan Industrial Park, Tongda Road, Bao'an Avenue, Bao'an District, Shenzhen, Guangdong, China
Testing Location/ Procedure....... :	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name...................... :	**Fujian Newland Auto-ID Tech Co., Ltd.**
Address .... :	Newland Science & Technology Park, No.1 Rujiang West Rd, Mawei, Fuzhou, P.R.China
Test Specification:	
Standard .... :	IEEE Std C95.1, 2005/IEEE Std 1528™-2013/ FCC Part 2.1093
Test Report Form No. .... :	LCSEMC-1.0
TRF Originator .... :	Shenzhen LCS Compliance Testing Laboratory Ltd.
Master TRF................................. :	Dated 2014-09

Test Item Description. .... :	**Portable Data Collector**
Trade Mark .... :	Newland
Model/Type Reference .... :	NLS-MT90
Operation Frequency .... :	LTEBand2, 5
Modulation Type .... :	LTE(QPSK,16QAM)
Ratings .... :	DC 3.8V by Rechargeable Li-ion Battery(4500mAh) Recharged by DC 5V/2A Adapter
Result .... :	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Vera Deng/ File administrators	Calvin Weng / Technique principal	Gavin Liang/ Manager

SAR -- TEST REPORT

Test Report No. :	**LCS180704037AEB**	September 06, 2018 Date of issue

Type / Model.........................	:	NLS-MT90
EUT.......................................	:	Portable Data Collector
Applicant..............................	**:**	**Fujian Newland Auto-ID Tech Co., Ltd.**
Address..................................	:	Newland Science & Technology Park, No.1 Rujiang West Rd, Mawei, Fuzhou, P.R.China
Manufacturer.......................	**:**	**Fujian Newland Auto-ID Tech Co., Ltd.**
Address..................................	:	Newland Science & Technology Park, No.1 Rujiang West Rd, Mawei, Fuzhou, P.R.China
Factory..................................	**:**	**Fujian Newland Auto-ID Tech Co., Ltd.**
Address..................................	:	Newland Science & Technology Park, No.1 Rujiang West Rd, Mawei, Fuzhou, P.R.China

Test Result	**Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Revison History

Revision	Issue Date	Revisions	Revised By
000	September 06, 2018	Initial Issue	Gavin Liang

TABLE OF CONTENTS

1.TEST STANDARDS AND TEST DESCRIPTION

1.1. Test Standards

IEEE Std C95.1, 2005:IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 KHz to 300 GHz.It specifies the maximum exposure limit of 1.6 W/kg as averaged over any 1 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.
IEEE Std 1528™-2013: IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.
FCC Part 2.1093 :Radiofrequency Radiation Exposure Evaluation:Portable Devices
KDB447498 D01 General RF Exposure Guidance : Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies
KDB648474 D04:Handset SAR v01r03: SAR Evaluation Considerations for Wireless Handsets
KDB865664 D01 SAR Measurement 100 MHz to 6 GHz :SAR Measurement Requirements for 100 MHz to 6 GHz
KDB865664 D02 RF Exposure Reporting: RF Exposure Compliance Reporting and Documentation Considerations
KDB 941225 D05 SAR for LTE Devices:SAR Evaluation Considerations for LTE Devices

1.2. Test Description

The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power .
And Test device is identical prototype.

1.3. General Remarks

Date of receipt of test sample	:	July 09, 2018
Testing commenced on	:	July 09, 2018
Testing concluded on	:	August 16, 2018

1.4. Product Description

The **Fujian Newland Auto-ID Tech Co., Ltd..'s** Model:**NLS-MT90** or the "EUT" as referred to in this report; more general information as follows,for more details, refer to the user's manual of the EUT.

General Description	
Product Name:	Portable Data Collector
Model/Type reference:	NLS-MT90
Additional Model No.:	/
Modulation Type:	QPSK, 16QAM for LTE
Device category:	Portable Device
Exposure category:	General population/uncontrolled environment
EUT Type:	Production Unit
Hardware Version	V2.00
Software Version:	MT90_0_V1.01.003
Power supply:	DC 3.8V by Rechargeable Li-ion Battery(4500mAh) Recharged by DC 5V/2A Adapter
Hotspot:	Not Supported
VoIP	Supported
The EUT is LTE, POS machine. the POS machine is intended for speech and Multimedia Message Service (MMS) transmission. It is equipped with LTE Band2,5 camera functions. For more information see the following datasheet	
Technical Characteristics	
LTE	
Support Band	LTE Band2,LTE Band5
FrequencyRange	LTE Band2:1850 ~1910MHz LTE Band5:824~848MHz
Power Class:	Class 3
Modulation Type:	QPSK/16QAM
LTE Release Version:	R9
VoLTE	Not Support
Antenna Gain	1.0dBi (max.) For all LTE Band

1.5. Statement of Compliance

The maximum of results of SAR found during testing for NLS-MT90 are follows:

<Highest Reported standalone SAR Summary>

Classment Class	Frequency Band	Head (Report SAR_{1-g} (W/Kg)	Body-worn (Report SAR_{1-g} (W/Kg)
PCE	LTE Band 2	0.150	**1.313**
	LTE Band 7	0.228	0.483

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-2005, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013.

2.TEST ENVIRONMENT

2.1. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

Site Description

EMC Lab. : FCC Registration Number. is 254912
Industry Canada Registration Number. is 9642A-1.
ESMD Registration Number. is ARCB0108.
UL Registration Number. is 100571-492.
TUV SUD Registration Number. is SCN1081.
TUV RH Registration Number. is UA 50296516-001
NVLAP Registration Code is 600167-0.

2.2. Environmental conditions

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

Temperature:	18-25 ° C
Humidity:	40-65 %
Atmospheric pressure:	950-1050mbar

2.3. SAR Limits

FCC Limit (1g Tissue)

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average(averaged over the whole body)	0.08	0.4
Spatial Peak(averaged over any 1 g of tissue)	1.6	8.0
Spatial Peak(hands/wrists/ feet/anklesaveraged over 10 g)	4.0	20.0

Population/Uncontrolled Environments are defined as locations where there is the exposure of individual 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).

2.4. Equipments Used during the Test

Test Equipment	Manufacturer	Type/Model	Serial Number	Calibration	
				Calibration Date	Calibration Due
PC	Lenovo	G5005	MY42081102	N/A	N/A
SAR Measurement system	SATIMO	4014_01	SAR_4014_01	N/A	N/A
Signal Generator	Angilent	E4438C	MY42081396	11/18/2017	11/18/2018
Multimeter	Keithley	MiltiMeter 2000	4059164	11/18/2017	11/18/2018
S-parameter Network Analyzer	Agilent	8753ES	US38432944	11/18/2017	11/18/2018
Wireless Communication Test Set	R & S	CMU200	105988	11/18/2017	11/18/2018
Wideband Radia Communication Tester	R&S	CMW500	1201.0002K50	11/18/2017	11/18/2018
Power Meter	R & S	KEITHLEY	4059164	11/18/2017	11/18/2018
E-Field PROBE	SATIMO	SSE2	SN 45/15 EPGO281	02/04/2018	02/03/2019
DIPOLE 835	SATIMO	SID 835	SN 07/14 DIP 0G835-303	10/01/2015	09/30/2018
DIPOLE 1900	SATIMO	SID 1900	SN 30/14 DIP 1G900-333	10/01/2015	09/30/2018
COMOSAR OPEN Coaxial Probe	SATIMO	OCPG 68	SN 40/14 OCPG68	11/18/2017	11/18/2018
SARLocator	SATIMO	VPS51	SN 40/14 VPS51	11/18/2017	11/18/2018
Communication Antenna	SATIMO	ANTA57	SN 39/14 ANTA57	11/18/2017	11/18/2018
Mobile Phone POSITIONING DEVICE	SATIMO	MSH98	SN 40/14 MSH98	N/A	N/A
DUMMY PROBE	SATIMO	DP60	SN 03/14 DP60	N/A	N/A
SAM PHANTOM	SATIMO	SAM117	SN 40/14 SAM117	N/A	N/A
Liquid measurement Kit	HP	85033D	3423A03482	11/18/2017	11/18/2018
Power meter	Agilent	E4419B	MY45104493	06/16/2018	06/15/2019
Power meter	Agilent	E4418B	GB4331256	06/16/2018	06/15/2019
Power sensor	Agilent	E9301H	MY41497725	06/16/2018	06/15/2019
Power sensor	Agilent	E9301H	MY41495234	06/16/2018	06/15/2019
Directional Coupler	MCLI/USA	4426-20	0D2L51502	06/16/2018	06/15/2019

Note:
1) Per KDB865664D01 requirements for dipole calibration, the test laboratory has adopted three year extended calibration interval. Each measured dipole is expected to evalute with following criteria at least on annual interval.
a) There is no physical damage on the dipole;
b) System check with specific dipole is within 10% of calibrated values;
c) The most recent return-loss results,measued at least annually,deviates by no more than 20% from the previous measurement;

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

2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

3.SAR MEASUREMENTS SYSTEM CONFIGURATION

3.1. SAR Measurement Set-up

The OPENSAR system for performing compliance tests consist of the following items:

A standard high precision 6-axis robot (KUKA) with controller and software.

KUKA Control Panel (KCP)

A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with a Video Positioning System(VPS).

The stress sensor is composed with mechanical and electronic when the electronic part detects a change on the electro-mechanical switch,It sends an “Emergency signal” to the robot controller that to stop robot’s moves

A computer operating Windows XP.

OPENSAR software

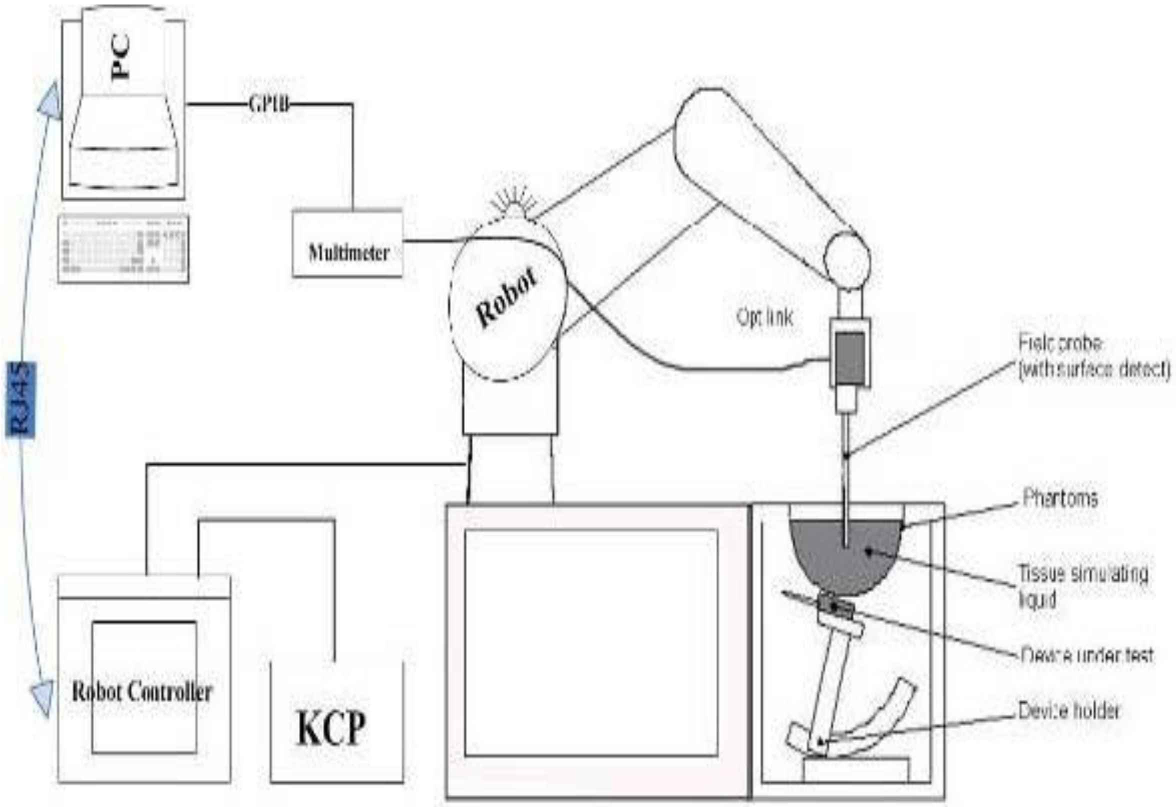
Remote control with teaches pendant and additional circuitry for robot safety such as warning lamps, etc.

The SAM phantom enabling testing left-hand right-hand and body usage.

The Position device for handheld EUT

Tissue simulating liquid mixed according to the given recipes .

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



3.2. OPENSAR E-field Probe System

The SAR measurements were conducted with the dosimetric probe EPGO281(manufactured by SATIMO), designed in the classical triangular configuration and optimized for dosimetric evaluation.

Probe Specification

ConstructionSymmetrical design with triangular core
Interleaved sensors
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g., DGBE)

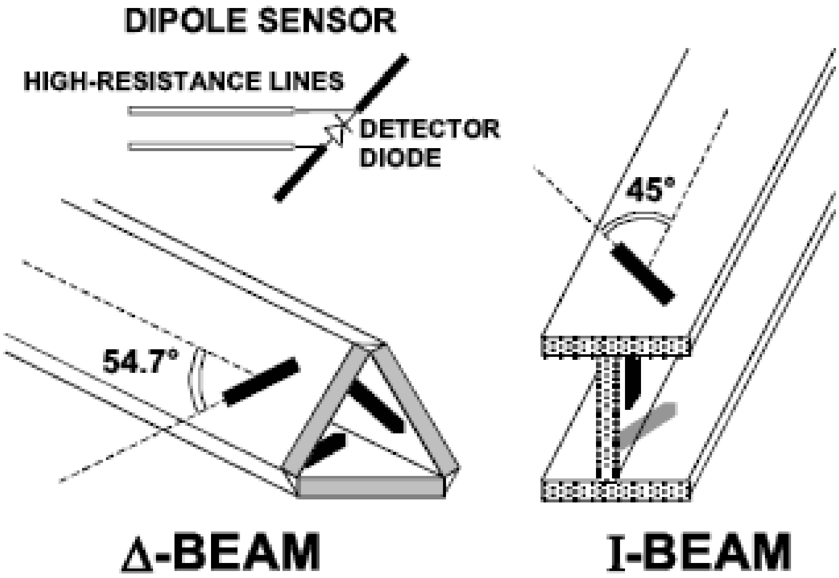
CalibrationISO/IEC 17025 calibration service available.

Frequency	450MHz to 6 GHz; Linearity:0.25dB(450 MHz to 6GHz)
Directivity	0.25 dB in HSL (rotation around probe axis) 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	0.01W/kg to > 100 W/kg; Linearity: 0.25 dB
Dimensions	Overall length: 330 mm (Tip: 16mm) Tip diameter: 5 mm (Body: 8 mm) Distance from probe tip to sensor centers: 2.5 mm
Application	General dosimetry up to 6 GHz Dosimetry in strong gradient fields Compliance tests of Mobile Phones

Isotropic E-Field Probe

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

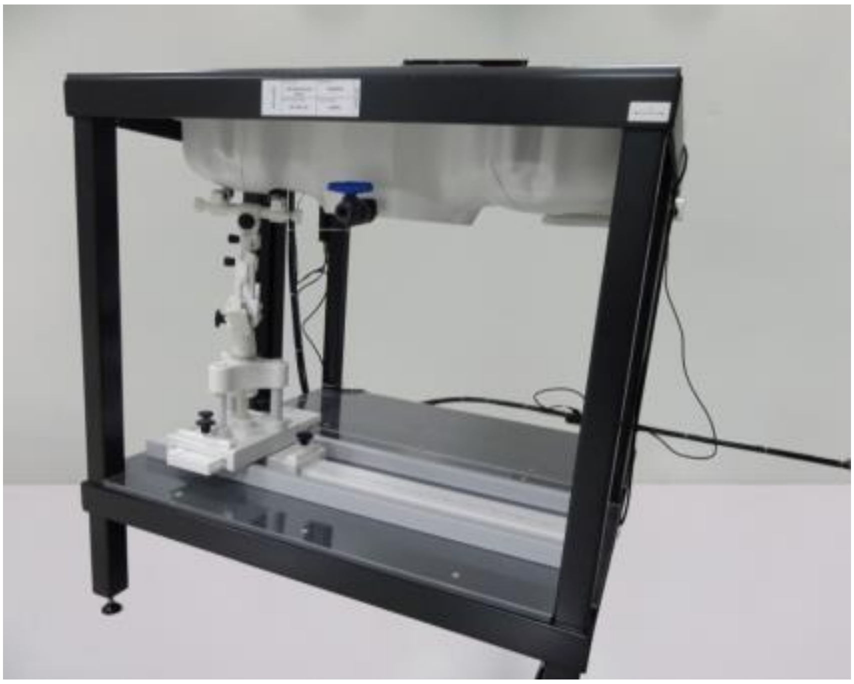
The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



3.3. Phantoms

The SAM Phantom SAM117 is constructed of a fiberglass shell ntegrated in a wooden table. The shape of the shell is in compliance with the specification set in IEEE P1528 and CENELEC EN62209-1 , EN62209-2:2010.The phantom enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents the evaporation of the liquid. Reference markings on the Phantom allow the complete setup of allpredefined phantom positions and measurement grids by manually teaching three points in the robo

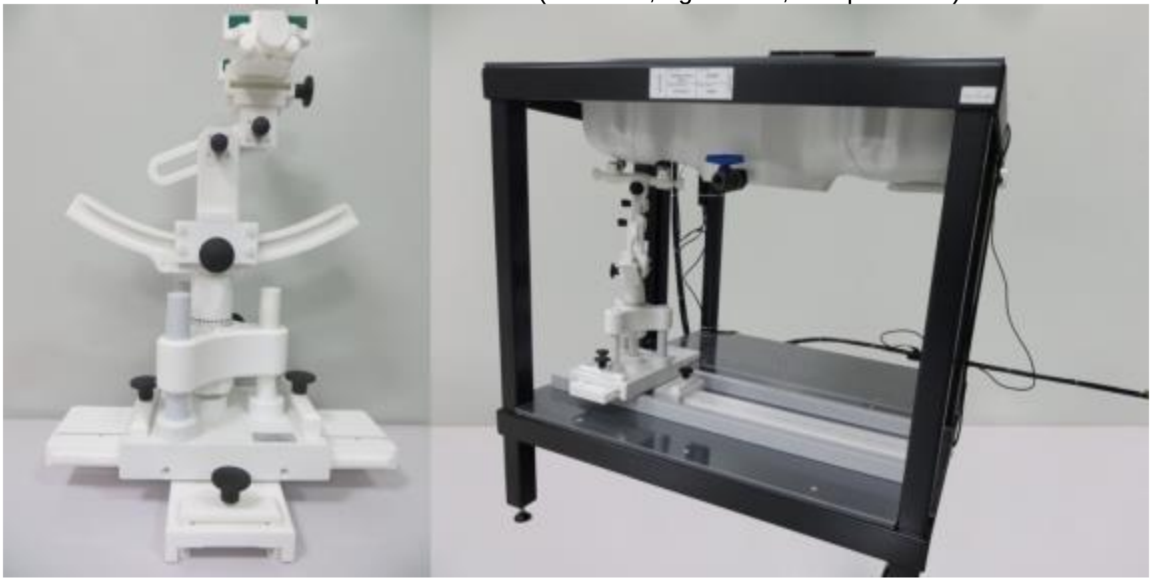
System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.



SAM Twin Phantom

3.4. Device Holder

In combination with the Generic Twin PhantomSAM117, the Mounting Device enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatedly positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).



Device holder supplied by SATIMO

3.5. Scanning Procedure

The procedure for assessing the peak spatial-average SAR value consists of the following steps

Power Reference Measurement

The reference and drift jobs are useful jobs for monitoring the power drift of the device under test in the batch process. Both jobs measure the field at a specified reference position, at a selectable distance from the phantom surface. The reference position can be either the selected section's grid reference point or a user point in this section. The reference job projects the selected point onto the phantom surface, orients the probe perpendicularly to the surface, and approaches the surface using the selected detection method.

Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values before running a detailed measurement around the hot spot.Before starting the area scan a grid spacing of 15 mm x 15 mm is set. During the scan the distance of the probe to the phantom remains unchanged. After finishing area scan, the field maxima within a range of 2 dB will be ascertained.

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

Zoom Scan

Zoom Scans are used to estimate the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The default Zoom Scan is done by 7x7x7 points within a cube whose base is centered around the maxima found in the preceding area scan.

<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">$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$ mm</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 IEEE Std 1528-2013 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 Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

Power Drift measurement

The drift job measures the field at the same location as the most recent reference job within the same procedure, and with the same settings. The drift measurement gives the field difference in dB from the reading conducted within the last reference measurement. Several drift measurements are possible for one reference measurement. This allows a user to monitor the power drift of the device under test within a batch process. In the properties of the Drift job, the user can specify a limit for the drift and have OPENSAR software stop the measurements if this limit is exceeded.

3.6. Data Storage and Evaluation

Data Storage

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

The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [mW/g], [mW/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

Data Evaluation

The OPENSAR software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

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

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

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

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

With Vi = compensated signal of channel i (i = x, y, z)
Ui = input signal of channel i (i = x, y, z)
cf = crest factor of exciting field
dcpi = diode compression point

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

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

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

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel i (i = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution
aij = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]
Ei = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

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

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

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

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

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

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

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

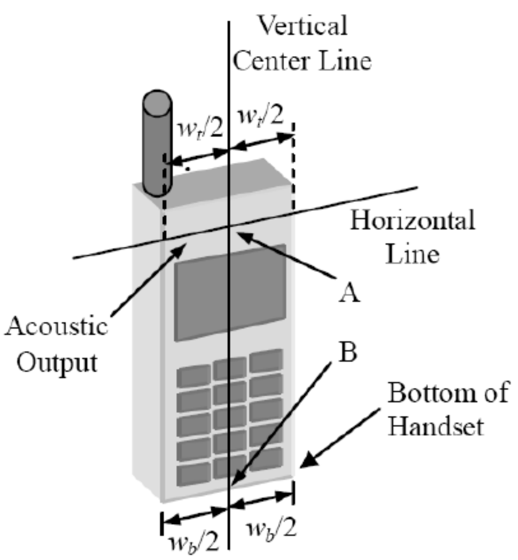
General considerations

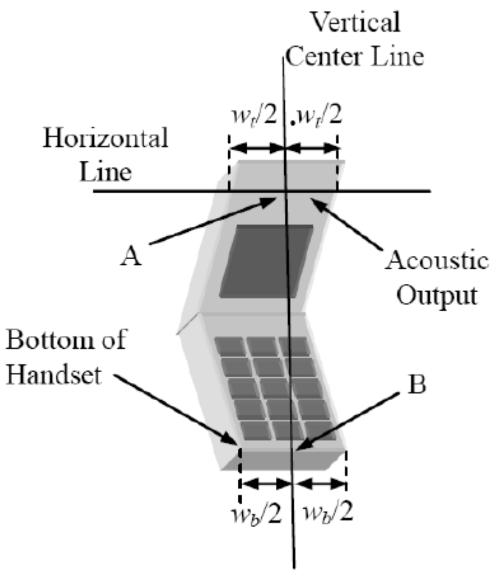
This standard specifies two handset test positions against the head phantom – the “cheek” position and the “tilt” position.

The power flow density is calculated assuming the excitation field as a free space field

$$P_{(\mathrm{pwe})} = \frac{E_{tot}^2}{3770} \text{ or } P_{(\mathrm{pwe})} = H_{tot}^2 .37.7$$

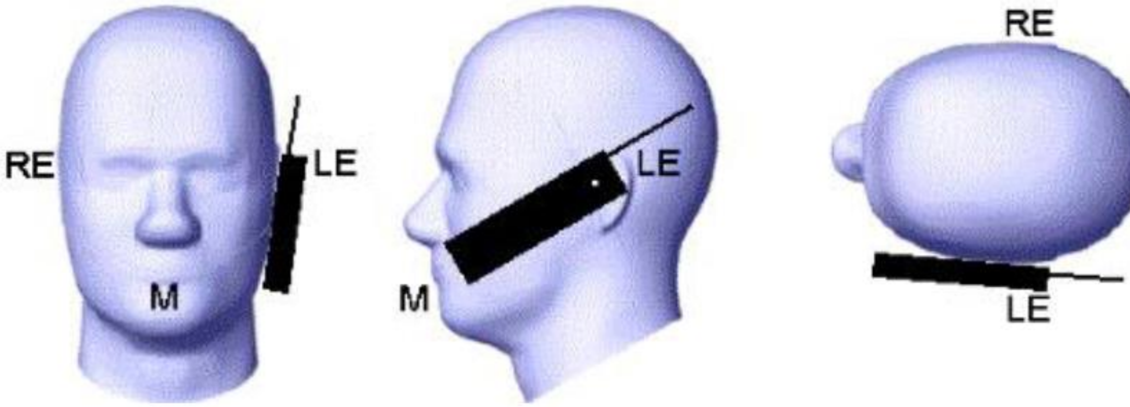
Where P_{pwe}=Equivalent power density of a plane wave in mW/cm2
E_{tot}=total electric field strength in V/m
H_{tot}=total magnetic field strength in A/m



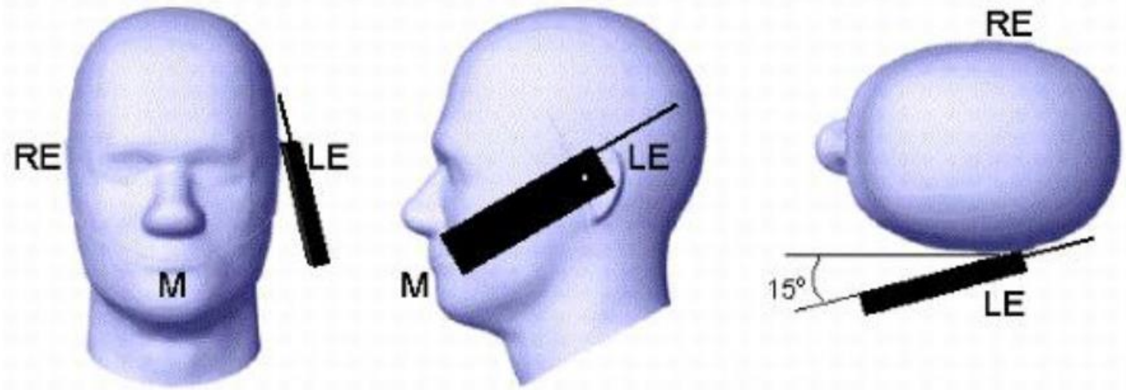


W_t Width of the handset at the level of the acoustic
W_b Width of the bottom of the handset
A Midpoint of the width w_t of the handset at the level of the acoustic output
B Midpoint of the width w_b of the bottom of the handset

Picture 1-a Typical “fixed” case handset Picture 1-b Typical “clam-shell” case handset



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



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

For body SAR test we applied to FCC KDB941225, KDB447498, KDB248227, KDB648654;

3.8. Tissue Dielectric Parameters for Head and Body Phantoms

The liquid is consisted of water,salt,Glycol,Sugar,Preventol and Cellulose.The liquid has previously been proven to be suited for worst-case.It's satisfying the latest tissue dielectric parameters requirements proposed by the KDB865664.

The composition of the tissue simulating liquid

Ingredient	750MHz		835MHz		1800 MHz		1900 MHz		2450MHz		2600MHz		5000MHz	
(% Weight)	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	39.28	51.3	41.45	52.5	54.5	40.2	54.9	40.4	62.7	73.2	60.3	71.4	65.5	78.6
Preventol	0.10	0.10	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HEC	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DGBE	0.00	0.00	0.00	0.00	45.33	59.31	44.92	59.10	36.80	26.70	39.10	28.40	0.00	0.00
Triton X-100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.2	10.7

Target Frequency (MHz)	Head		Body	
	ε_r 翁辉龙(Calvin)	σ(S/m)	ε_r	σ(S/m)
150	52.3	0.76	61.9	0.80
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	0.98	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
5800	35.3	5.27	48.2	6.00

3.9. Tissue equivalent liquid properties

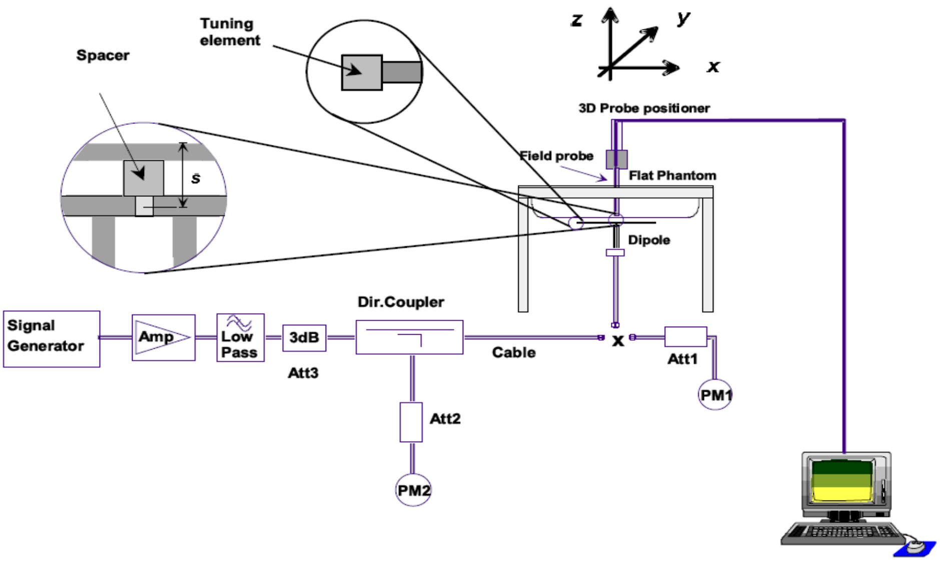
Dielectric Performance of Head and Body Tissue Simulating Liquid

Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue				Liquid Temp.	Test Data
		σ	ε_r	σ	Dev.	ε_r	Dev.		
835H	835	0.90	41.50	0.92	2.22%	40.84	-1.59%	20.5	07/09/2018
1900H	1900	1.40	40.00	1.39	-0.70%	40.61	1.53%	22.1	08/09/2018
835B	835	0.97	55.20	0.99	2.06%	55.01	-0.34%	21.3	07/10/2018
1900B	1900	1.52	53.30	1.50	-1.32%	54.35	1.97%	20.8	08/16/2018

3.10. System Check

The purpose of the system check is to verify that the system operates within its specifications at the decice test frequency.The system check is simple check of repeatability to make sure that the system works correctly at the time of the compliance test;

System check results have to be equal or near the values determined during dipole calibration with the relevant liquids and test system (±10 %).



The output power on dipole port must be calibrated to 20 dBm (100mW) before dipole is connected.

Photo of Dipole Setup

Justification for Extended SAR Dipole Calibrations

Referring to KDB 865664D01V01r04, if dipoles are verified in return loss (<-20dB, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.While calibration intervals not exceed 3 years.

SID835SN 07/14 DIP 0G835-303 Extend Dipole Calibrations

Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (ohm)	Delta (ohm)
2015-10-01	-24.46		55.4		2.4	
2016-09-30	-25.53	4.374	56.1	0.7	1.352	-1.048
2017-09-30	-25.16	2.862	55.8	0.4	1.832	-0.568

SID1900 SN 30/14 DIP 1G900-333 Extend Dipole Calibrations

Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (ohm)	Delta (ohm)
2015-10-01	-23.68		51.2		6.4	
2016-09-30	-23.40	-1.182	50.188	-1.012	3.562	-2.838
2017-09-30	-23.55	-0.549	50.395	-0.805	4.261	-2.139

Mixture Type	Frequency (MHz)	Power	SAR_{1g} (W/Kg)	SAR_{10g} (W/Kg)	Drift (%)	1W Target		Difference percentage		Liquid Temp	Date
						SAR_{1g} (W/Kg)	SAR_{10g} (W/Kg)	1g	10g		
Head	835	100 mW	0.986	0.634	1.57	9.60	6.20	2.71%	2.26%	20.5	07/09/2018
		Normalize to 1 Watt	9.86	6.34							
Body	835	100 mW	0.962	0.642	-0.18	9.90	6.39	-2.83%	0.47%	21.3	07/10/2018
		Normalize to 1 Watt	9.62	6.42							
Head	1900	100 mW	3.816	2.153	-1.46	39.84	20.20	-4.22%	6.58%	22.1	08/09/2018
		Normalize to 1 Watt	38.16	21.53							
Body	1900	100 mW	4.236	2.157	-0.35	43.33	21.59	-2.24%	-0.09%	20.8	08/16/2018
		Normalize to 1 Watt	42.36	21.57							

3.11. SAR measurement procedure

The measurement procedures are as follows:

3.11.1 Conducted power measurement

a. For WWAN power measurement, use base station simulator connection with RF cable, at maximum powerin each supported wireless interface and frequency band.
b. Read the WWAN RF power level from the base station simulator.
c. For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously Transmission, at maximum RF power in each supported wireless interface and frequency band.
d. Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power.

3.11.2 LTE Test Configuration

QPSK with 1 RB allocation
Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel.8 When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

QPSK with 50% RB allocation
The procedures required for 1 RB allocation in section 4.2.1 are applied to measure the SAR for QPSK with 50% RB allocation.9

QPSK with 100% RB allocation
For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in sections 4.2.1 and 4.2.2 are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

3.12. Power Reduction

The product without any power reduction.

3.13. Power Drift

To control the output power stability during the SAR test, SAR system calculates the power drift by measuring the E-field at the same location at the beginning and at the end of the measurement for each test position. This ensures that the power drift during one measurement is within 5%.

4.TEST CONDITIONS AND RESULTS

4.1. Conducted Power Results

According KDB 447498D01 General RF Exposure Guidance v06 Section 4.1 2) states that "Unless it is specified differently in the published RF exposure KDB procedures, these requirements also apply to test reduction and test exclusion considerations. Time-averaged maximum conducted output power applies to SAR and, as required by § 2.1091(c), time-averaged ERP applies to MPE. When an antenna port is not available on the device to support conducted power measurement, such as FRS and certain Part 15 transmitters with built-in integral antennas, the maximum output power allowed for production units should be used to determine RF exposure test exclusion and compliance."

LTE Band2

BW (MHz)	Frequency (MHz)	RB Configuration		Average Power [dBm]	
		Size	Offset	QPSK	16QAM
1.4	1850.7	1	0	23.50	22.50
		1	3	23.19	22.35
		1	5	23.13	22.30
		3	0	23.08	22.30
		3	2	22.99	22.20
		3	3	22.94	22.17
		6	0	22.28	21.41
	1880.0	1	0	23.39	22.80
		1	3	23.26	22.78
		1	5	23.36	22.81
		3	0	23.36	22.43
		3	2	23.30	22.43
		3	3	23.32	22.43
		6	0	22.51	21.55
	1909.3	1	0	21.48	20.90
		1	3	21.27	20.76
		1	5	21.25	20.73
		3	0	21.38	20.65
		3	2	21.28	20.57
		3	3	21.25	20.58
		6	0	20.66	20.04
3	1851.5	1	0	22.69	22.12
		1	7	22.38	21.85
		1	14	22.25	21.72
		8	0	22.03	21.26
		8	4	21.90	21.16
		8	7	21.85	21.09
		15	0	21.96	21.10
	1880.0	1	0	23.01	22.41
		1	7	22.95	22.37
		1	14	22.98	22.40
		8	0	22.29	21.52
		8	4	22.27	21.52
		8	7	22.29	21.52
		15	0	22.30	21.43
	1908.5	1	0	21.55	21.03
		1	7	21.26	20.81
		1	14	21.04	20.60
		8	0	20.77	20.00
		8	4	20.64	19.88
		8	7	20.55	19.84
		15	0	20.60	19.88
5	1852.5	1	0	22.60	22.03
		1	12	21.94	21.39
		1	24	22.04	21.48
		12	0	21.64	20.88

		12	6	21.43	20.67
		12	13	21.41	20.66
		25	0	21.48	20.66
	1880.0	1	0	22.94	22.38
		1	12	22.55	22.03
		1	24	22.84	22.31
		12	0	21.90	21.18
		12	6	21.79	21.08
		12	13	21.87	21.15
		25	0	21.85	21.03
	1907.5	1	0	21.65	20.74
		1	12	21.19	20.34
		1	24	21.08	20.27
		12	0	20.62	19.86
		12	6	20.44	19.75
		12	13	20.34	19.64
		25	0	20.47	19.70
10	1855.0	1	0	22.07	21.50
		1	24	21.70	21.17
		1	49	21.28	20.77
		25	0	21.42	20.60
		25	12	21.27	20.46
		25	25	21.11	20.31
		50	0	21.30	20.49
	1880.0	1	0	22.33	21.73
		1	24	22.48	21.90
		1	49	21.90	21.34
		25	0	21.74	20.90
		25	12	21.72	20.89
		25	25	21.54	20.72
		50	0	21.67	20.82
	1905.0	1	0	20.19	19.68
		1	24	21.15	20.62
		1	49	20.60	20.20
		25	0	20.22	19.46
		25	12	20.52	19.74
		25	25	20.44	19.69
		50	0	20.39	19.64
15	1857.5	1	0	22.20	21.62
		1	37	21.51	21.00
		1	74	21.55	21.02
		37	0	21.38	20.55
		37	18	21.15	20.33
		37	38	21.02	20.21
		75	0	21.21	20.40
	1880.0	1	0	22.41	21.78
		1	37	22.45	21.85
		1	74	21.70	21.13
		37	0	21.71	20.86
		37	18	21.66	20.80
		37	38	21.36	20.53
		75	0	21.53	20.70
	1902.5	1	0	20.36	19.82
		1	37	20.49	19.92
		1	74	20.83	20.31
		37	0	19.80	19.13
		37	18	20.00	19.28
		37	38	20.35	19.61
		75	0	20.09	19.34
20	1860.0	1	0	22.28	21.57
		1	49	21.59	20.98

		1	99	21.90	21.20
		50	0	21.33	20.50
		50	25	21.12	20.30
		50	50	21.09	20.26
		100	0	21.23	20.43
	1880.0	1	0	22.40	21.67
		1	49	22.55	21.83
		1	99	21.35	20.67
		50	0	21.66	20.80
		50	25	21.58	20.70
		50	50	21.15	20.33
		100	0	21.40	20.57
	1900.0	1	0	21.20	20.62
		1	49	20.06	19.55
		1	99	20.80	20.34
		50	0	20.04	19.36
		50	25	19.80	19.11
		50	50	20.16	19.42
		100	0	20.13	19.38

LTE Band5

BW (MHz)	Frequency (MHz)	RB Configuration		Average Power [dBm]	
		Size	Offset	QPSK	16QAM
1.4	824.7	1	0	23.73	22.95
		1	3	23.79	23.07
		1	5	23.72	22.94
		3	0	23.82	22.94
		3	2	23.79	22.89
		3	3	23.80	22.89
		6	0	22.79	21.75
	836.5	1	0	22.61	22.10
		1	3	22.64	22.12
		1	5	22.54	22.00
		3	0	22.92	21.96
		3	2	22.79	21.90
		3	3	22.84	21.93
		6	0	21.58	20.69
	848.3	1	0	23.34	22.62
		1	3	23.49	22.83
		1	5	23.48	22.73
		3	0	23.53	22.58
		3	2	23.52	22.58
		3	3	23.56	22.65
		6	0	22.45	21.66
3	825.5	1	0	23.65	22.95
		1	7	23.73	22.99
		1	14	23.60	22.84
		8	0	22.81	21.87
		8	4	22.80	21.84
		8	7	22.79	21.79
		15	0	22.79	21.74
	836.5	1	0	22.67	22.05
		1	7	22.51	21.95
		1	14	22.40	21.68
		8	0	21.77	20.94
		8	4	21.69	20.90
		8	7	21.61	20.82
		15	0	21.78	20.86
	847.5	1	0	23.06	22.49
		1	7	23.34	22.76

		1	14	23.45	22.80
		8	0	22.25	21.33
		8	4	22.36	21.42
		8	7	22.44	21.51
		15	0	22.37	21.41
5	826.5	1	0	23.76	23.13
		1	12	23.79	23.11
		1	24	23.55	22.91
		12	0	22.87	21.98
		12	6	22.83	21.93
		12	13	22.76	21.83
		25	0	22.76	21.74
	836.5	1	0	22.92	22.44
		1	12	22.62	22.18
		1	24	22.51	21.81
		12	0	21.97	21.23
		12	6	21.84	21.13
		12	13	21.74	21.00
		25	0	21.78	20.94
	846.5	1	0	22.98	22.00
		1	12	23.28	22.35
		1	24	23.51	22.49
		12	0	22.13	21.20
		12	6	22.26	21.36
		12	13	22.47	21.54
		25	0	22.25	21.32
10	829.0	1	0	23.80	23.09
		1	24	23.62	22.93
		1	49	23.00	22.40
		25	0	22.81	21.80
		25	12	22.72	21.72
		25	25	22.45	21.55
		50	0	22.74	21.70
	836.5	1	0	23.21	22.59
		1	24	22.61	21.99
		1	49	22.55	21.74
		25	0	22.11	21.20
		25	12	21.89	20.97
		25	25	21.71	20.73
		50	0	21.89	20.96
	844.0	1	0	22.60	21.86
		1	24	22.82	22.18
		1	49	23.38	22.81
		25	0	21.72	20.71
		25	12	21.89	20.88
		25	25	22.15	21.22
		50	0	21.93	20.94

4.2. Manufacturing tolerance

LTE Band 2

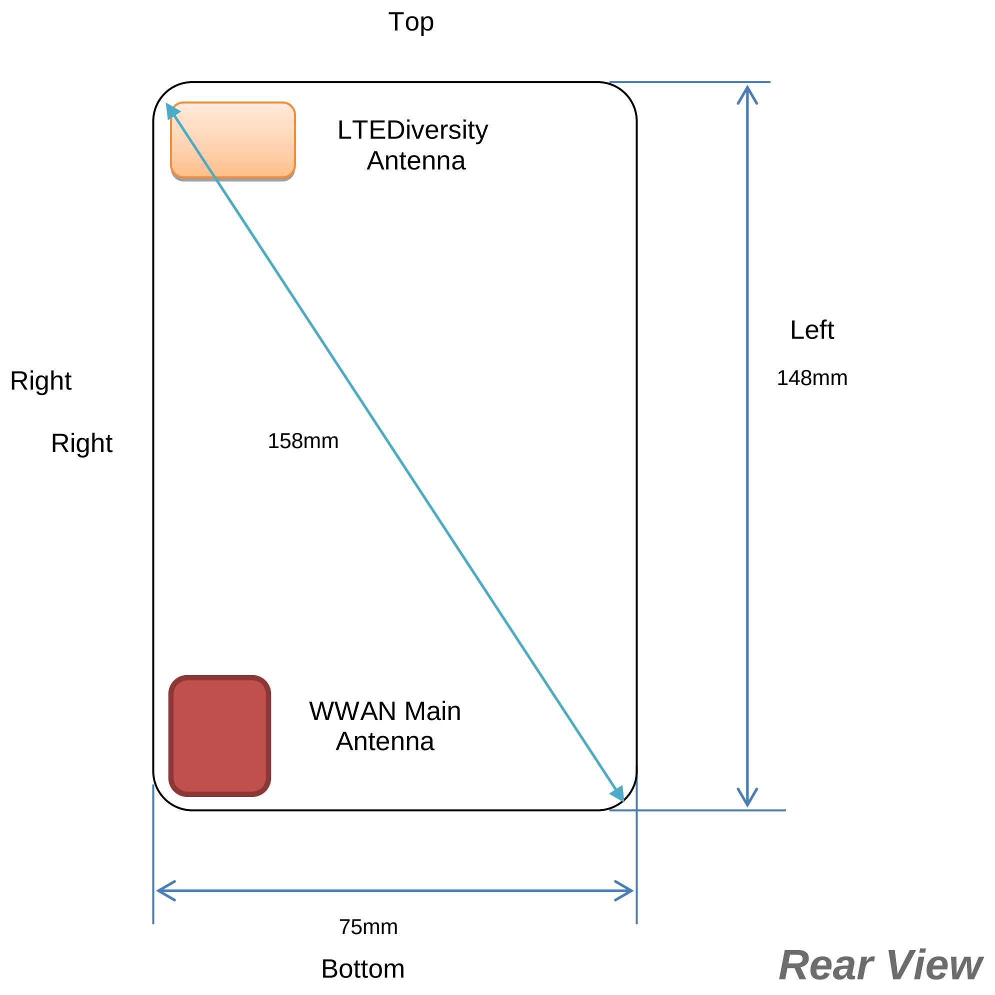
BW:1.4MHz [<RB=1>]						
Channel	Channel 18607		Channel 18900		Channel 19193	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	23.0	22.0	23.0	22.0	21.0	20.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:1.4MHz [<RB=3>, <RB=6>]						
Channel	Channel 18607		Channel 18900		Channel 19193	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	23.0	22.0	23.0	22.0	21.0	20.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:3MHz [<RB=1>]						
Channel	Channel 18615		Channel 18900		Channel 19185	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	22.0	22.0	23.0	22.0	21.0	21.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:3MHz [<RB=8>, <RB=15>]						
Channel	Channel 18615		Channel 18900		Channel 19185	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	22.0	21.0	22.0	21.0	20.0	20.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:5MHz [<RB=1>]						
Channel	Channel 18625		Channel 18900		Channel 19175	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	22.0	22.0	22.0	22.0	21.0	20.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:5MHz [<RB=12>, <RB=25>]						
Channel	Channel 18625		Channel 18900		Channel 19175	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	21.0	20.0	21.0	21.0	20.0	19.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:10MHz [<RB=1>]						
Channel	Channel 18650		Channel 18900		Channel 19150	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	22.0	21.0	22.0	21.0	21.0	20.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:10MHz [<RB=25>, <RB=50>]						
Channel	Channel 18650		Channel 18900		Channel 19150	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	21.0	20.0	21.0	20.0	20.0	19.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:15MHz [<RB=1>]						
Channel	Channel 18675		Channel 18900		Channel 19125	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	22.0	21.0	22.0	21.0	20.0	20.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:15MHz [<RB=37>, <RB=75>]						
Channel	Channel 18675		Channel 18900		Channel 19125	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	21.0	20.0	21.0	20.0	20.0	19.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:20MHz [<RB=1>]						
Channel	Channel 18700		Channel 18900		Channel 19100	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	22.0	21.0	22.0	21.0	21.0	20.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:20MHz [<RB=50>, <RB=100>]						
Channel	Channel 18700		Channel 18900		Channel 19100	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM

Target (dBm)	21.0	20.0	21.0	20.0	20.0	19.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0

LTE Band 5

BW:1.4MHz [<RB=1>]						
Channel	Channel 20407		Channel 20525		Channel 20643	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	23.0	23.0	22.0	22.0	23.0	22.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:1.4MHz [<RB=3>, <RB=6>]						
Channel	Channel 20407		Channel 20525		Channel 20643	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	23.0	22.0	22.0	21.0	23.0	22.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:3MHz [<RB=1>]						
Channel	Channel 20415		Channel 20525		Channel 20635	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	23.0	22.0	22.0	22.0	23.0	22.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:3MHz [<RB=8>, <RB=15>]						
Channel	Channel 20415		Channel 20525		Channel 20635	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	22.0	21.0	21.0	20.0	22.0	21.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:5MHz [<RB=1>]						
Channel	Channel 20425		Channel 20525		Channel 20625	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	23.0	23.0	22.0	22.0	23.0	22.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:5MHz [<RB=12>, <RB=25>]						
Channel	Channel 20425		Channel 20525		Channel 20625	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	22.0	21.0	21.0	21.0	22.0	21.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:10MHz [<RB=1>]						
Channel	Channel 20450		Channel 20525		Channel 20600	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	23.0	23.0	23.0	22.0	23.0	22.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0
BW:10MHz [<RB=25>, <RB=50>]						
Channel	Channel 20450		Channel 20525		Channel 20600	
	QPSK	16QAM	QPSK	16QAM	QPSK	16QAM
Target (dBm)	22.0	21.0	22.0	21.0	22.0	21.0
Tolerance ±(dB)	1.0	1.0	1.0	1.0	1.0	1.0

4.3. Transmit Antennas and SAR Measurement Position



Antenna information:

WWAN Main Antenna	LTE TX/RX
LTE Diversity antenna	Only RX

Note:

1). Per KDB648474 D04, because the overall diagonal distance of this devices is 158mm<160mm, it is considered as “Phablet“ device.

2). Per KDB648474 D04, 10-g extremity SAR is not required when Body-Worn mode 1-g reported SAR < 1.2 W/Kg.

4.4. SAR Measurement Results

The calculated SAR is obtained by the following formula:

Reported SAR=Measured SAR*10$^{(Ptarget-Pmeasured))/10}$

Scaling factor=10$^{(Ptarget-Pmeasured))/10}$

Reported SAR= Measured SAR* Scaling factor

Where

P_{target} is the power of manufacturing upper limit;

$P_{measured}$ is the measured power;

Measured SAR is measured SAR at measured power which including power drift)

Reported SAR which including Power Drift and Scaling factor

Duty Cycle

Test Mode	Duty Cycle
LTE	1:1

4.4.1 SAR Results

SAR Values [LTE Band 2]

Ch.	*Freq. (MHz)*	*Channel Type (20M)*	*Test Position*	*Conducted Power (dBm)*	*Maximum Allowed Power (dBm)*	*Power Drift (%)*	*Scaling Factor*	*SAR1-g results(W/kg)*		*Graph Results*
								Measured	*Reported*	
measured / reported SAR numbers - Head<SIM1>										
18700	1860.0	1RB	Left Cheek	23.50	24.00	-0.54	1.122	**0.134**	**0.150**	Plot 1
18700	1860.0	1RB	Left Tilt	23.50	24.00	1.54	1.122	0.089	0.100	
18700	1860.0	1RB	Right Cheek	23.50	24.00	-0.06	1.122	0.116	0.130	
18700	1860.0	1RB	Right Tilt	23.50	24.00	2.28	1.122	0.075	0.084	
18900	1880.0	50%RB	Left Cheek	21.67	22.00	-0.08	1.079	0.112	0.121	
18900	1880.0	50%RB	Left Tilt	21.67	22.00	-2.64	1.079	0.092	0.099	
18900	1880.0	50%RB	Right Cheek	21.67	22.00	2.00	1.079	0.104	0.112	
18900	1880.0	50%RB	Right Tilt	21.67	22.00	-0.84	1.079	0.068	0.073	
measured / reported SAR numbers - Body (hotspot open, distance 10mm)<SIM1>										
18700	1860.0	1RB	Front	23.50	24.00	-0.05	23.50	0.703	0.789	
18700	1860.0	1RB	Rear	23.50	24.00	-2.57	23.50	**1.170**	**1.313**	Plot 2
18900	1880.0	1RB	Rear	23.01	24.00	2.16	23.01	0.983	1.235	
19100	1900.0	1RB	Rear	21.65	22.00	0.87	21.65	1.055	1.144	
18900	1880.0	100%RB	Rear	21.40	22.00	1.54	21.40	0.712	0.817	
18900	1880.0	50%RB	Front	21.67	22.00	0.08	21.67	0.695	0.750	
18900	1880.0	50%RB	Rear	21.67	22.00	-1.01	21.67	0.566	0.611	

SAR Values [LTE Band 5]

Ch.	*Freq. (MHz)*	*Channel Type (20M)*	*Test Position*	*Conducted Power (dBm)*	*Maximum Allowed Power (dBm)*	*Power Drift (%)*	*Scaling Factor*	*SAR1-g results(W/kg)*		*Graph Results*
								Measured	*Reported*	
measured / reported SAR numbers - Head<SIM1>										
20407	824.7	1RB	Left Cheek	23.80	24.00	1.15	1.047	**0.172**	**0.228**	Plot 3
20407	824.7	1RB	Left Tilt	23.80	24.00	0.64	1.047	0.128	0.165	
20407	824.7	1RB	Right Cheek	23.80	24.00	-1.15	1.047	0.155	0.213	
20407	824.7	1RB	Right Tilt	23.80	24.00	2.57	1.047	0.103	0.136	
20407	824.7	50%RB	Left Cheek	22.74	23.00	-0.68	1.062	0.119	0.177	
20407	824.7	50%RB	Left Tilt	22.74	23.00	-0.09	1.062	0.093	0.142	
20407	824.7	50%RB	Right Cheek	22.74	23.00	2.22	1.062	0.101	0.188	
20407	824.7	50%RB	Right Tilt	22.74	23.00	0.08	1.062	0.075	0.091	
measured / reported SAR numbers - Body (hotspot open, distance 10mm)<SIM1>										
20407	824.7	1RB	Front	23.80	24.00	-0.08	1.047	0.328	0.343	
20407	824.7	1RB	Rear	23.80	24.00	0.87	1.047	**0.461**	**0.483**	Plot 4
20407	824.7	50%RB	Front	22.74	23.00	1.00	1.062	0.267	0.283	
20407	824.7	50%RB	Rear	22.74	23.00	-0.84	1.062	0.198	0.210	

Remark:
1. The value with block color is the maximum SAR Value of each test band.
2. Per FCC KDB Publication 447498 D01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is optional for such test configuration(s).

4.5. SAR Measurement Variability

According to KDB865664, Repeated measurements are required only when the measured SAR is ≥ 0.80 W/kg. If the measured SAR value of the initial repeated measurement is < 1.45 W/kg with ≤ 20% variation, only one repeated measurement is required to reaffirm that the results are not expected to have substantial variations, which may introduce significant compliance concerns. A second repeated measurement is required only if the measured result for the initial repeated measurement is within 10% of the SAR limit and vary by more than 20%, which are often related to device and measurement setup difficulties. The following procedures are applied to determine if repeated measurements are required. The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.19 The repeated measurement results must be clearly identified in the SAR report. All measured SAR, including the repeated results, must be considered to determine compliance and for reporting according to KDB 690783.Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

1) When the original highest measured SAR is ≥ 0.80 W/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 (~ 10% from the 1-g SAR limit).
3) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20

Frequency Band (MHz)	Air Interface	RF Exposure Configuration	Test Position	Repeated SAR (yes/no)	Highest Measured SAR_{1-g} (W/Kg)	First Repeated	
						Measued SAR_{1-g} (W/Kg)	Largest to Smallest SAR Ratio
850	LTE 5	Standalone	Body-Rear	no	0.461	n/a	n/a
1900	LTE 2	Standalone	Body-Rear	no	1.170	1.067	1.106

Remark:

1. *Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the orignal and first repeated measurement is not > 1.20 or 3 (1-g or 10-g respectively)*

4.6. General description of test procedures

1. The DUT is tested using CMU 200 communications testers as controller unit to set test channels and maximum output power to the DUT, as well as for measuring the conducted peak power.
2. Test positions as described in the tables above are in accordance with the specified test standard.
3. Tests in body position were performed in that configuration, which generates the highest time based averaged output power (see conducted power results).
4. Tests in head position with GSM were performed in voice mode with 1 timeslot unless GPRS/EGPRS/DTM function allows parallel voice and data traffic on 2 or more timeslots.
5. UMTS was tested in RMC mode with 12.2 kbit/s and TPC bits set to 'all 1'.
6. WiFi was tested in 802.11b/g/n mode with 1 Mbit/s and 6 Mbit/s. According to KDB 248227 the SAR testing for 802.11g/n is not required since When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
7. Required WiFi test channels were selected according to KDB 248227
8. According to FCC KDB pub 248227 D01,When there are multiple test channels with the same measured maximum output power, the channel closest to mid-band frequency is selected for SAR measurement and when there are multiple test channels with the same measured maximum output power and equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.
9. According to FCC KDB pub 941225 D06 this device has been tested with 10 mm distance to the phantom for operation in WiFi hot spot mode.
10. Per FCC KDB pub 941225 D06 the edges with antennas within 2.5 cm are required to be evaluated for SAR to cover WiFi hot spot function.
11. According to IEEE 1528 the SAR test shall be performed at middle channel. Testing of top and bottom channel is optional.
12. According to KDB 447498 D01 testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
    ●≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
    ●≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz

●≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

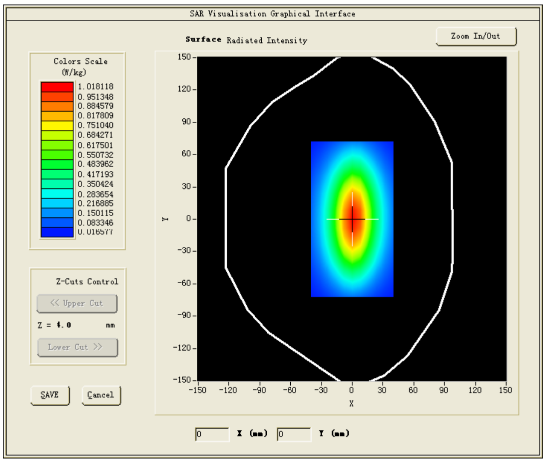
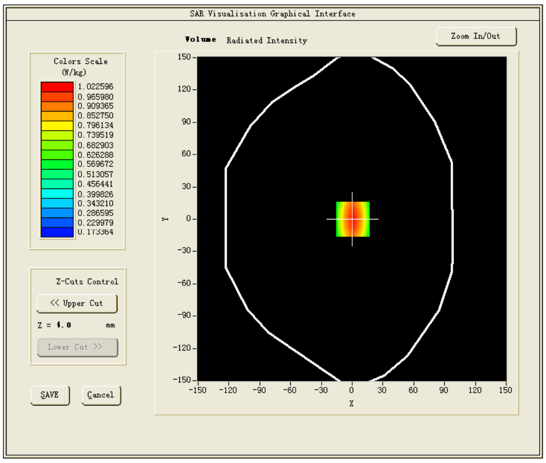
13. IEEE 1528-2003 require the middle channel to be tested first. This generally applies to wireless devices that are designed to operate in technologies with tight tolerances for maximum output power variations across channels in the band.
14. Per KDB648474 D04 require when the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is < 1.2 W/kg.
15. Per KDB648474 D04 require when the separation distance required for body-worn accessory testing is larger than or equal to that tested for hotspot mode, using the same wireless mode test configuration for voice and data, such as UMTS, LTE and Wi-Fi, 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)
16. 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g SAR > 1.2 W/kg.
17. Per KDB648474 D04 require for phablet SAR test considerations，For Portable Data Collectors with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.
18. 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g SAR > 1.2 W/kg.

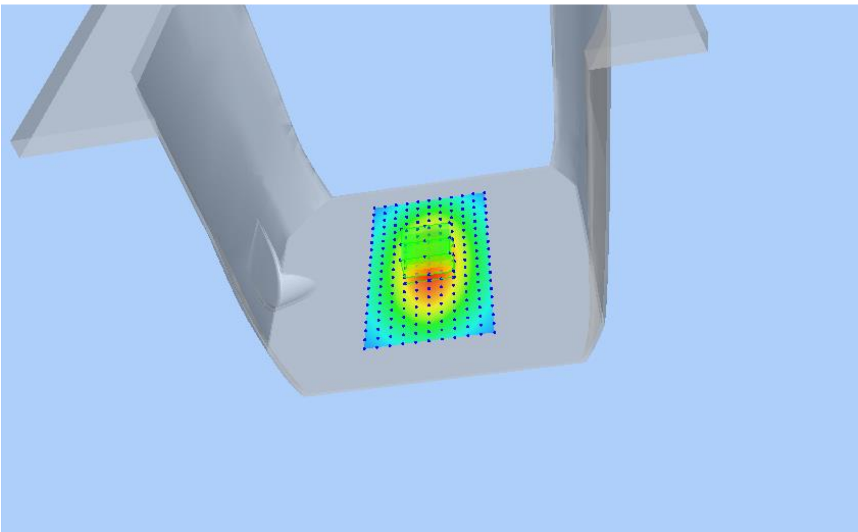
4.7. Measurement Uncertainty (450MHz-6GHz)

Not required as SAR measurement uncertainty analysis is required in SAR reports only when the highest measured SAR in a frequency band is ≥ 1.5 W/kg for 1-g SAR accoridng to KDB865664D01.

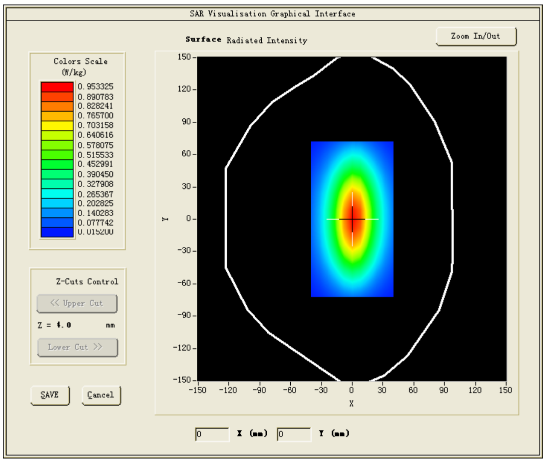
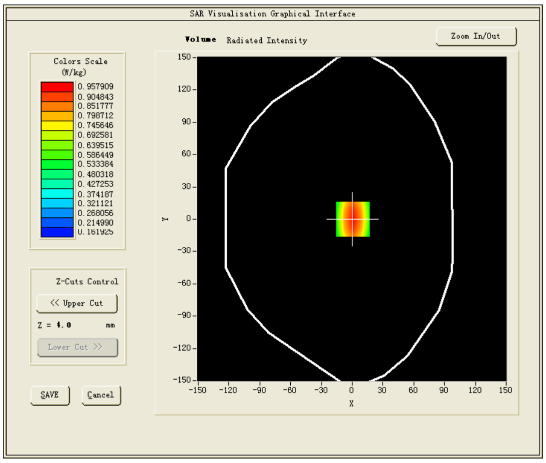
4.8. System Check Results

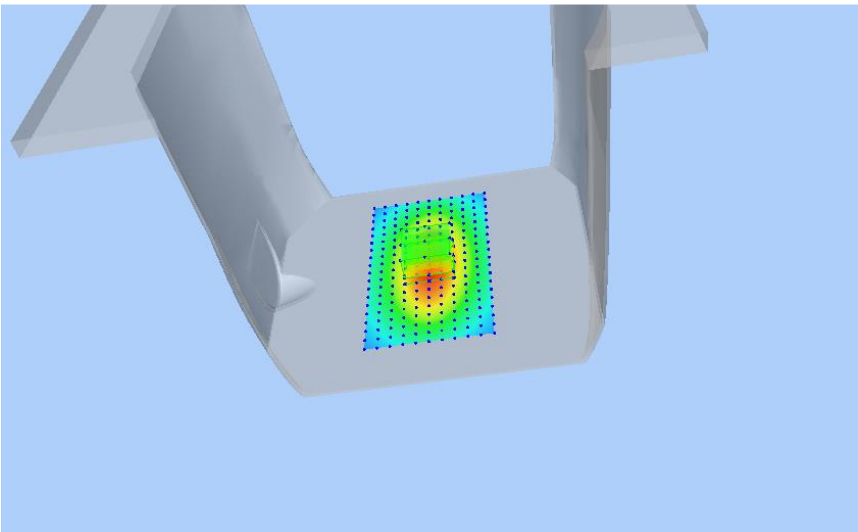
Test mode:835MHz(Head)
Product Description:Validation
Model:Dipole SID835
E-Field Probe:SSE2(SN 45/15 EPGO281)
Test Date:July 09, 2018

Medium(liquid type)	HSL_850
Frequency (MHz)	835.0000
Relative permittivity (real part)	40.84
Conductivity (S/m)	0.92
Input power	100mW
Crest Factor	1.0
Conversion Factor	2.04
Variation (%)	1.570000
SAR 10g (W/Kg)	0.634387
SAR 1g (W/Kg)	0.986256
SURFACE SAR	**VOLUME SAR**
	

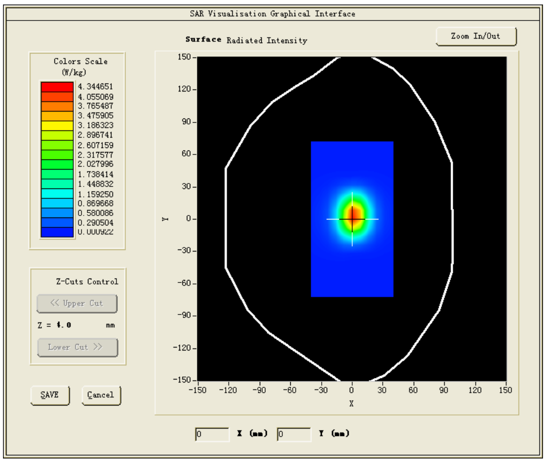
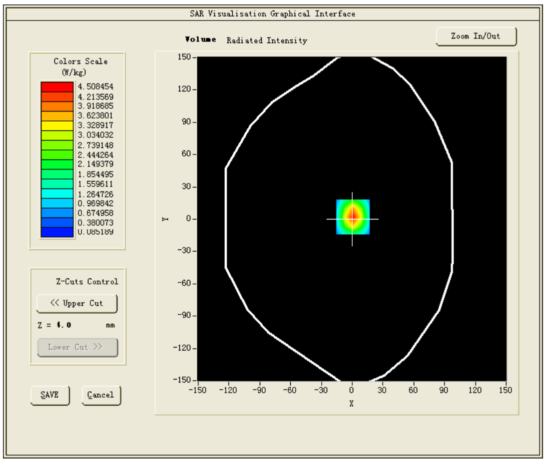


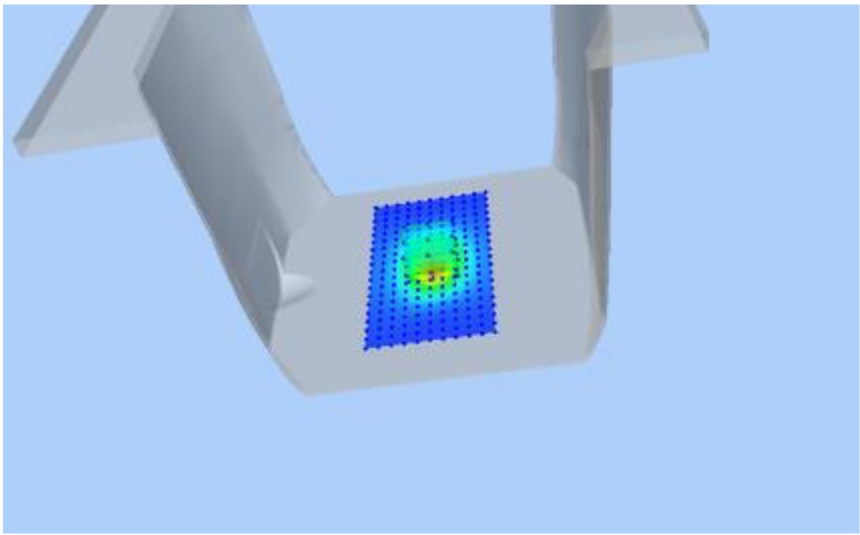
Test mode:835MHz(Body)
Product Description:Validation
Model:Dipole SID835
E-Field Probe:SSE2(SN 45/15 EPGO281)
Test Date: July 10, 2018

Medium(liquid type)	MSL_850
Frequency (MHz)	835.0000
Relative permittivity (real part)	55.01
Conductivity (S/m)	0.99
Input power	100mW
Crest Factor	1.0
Conversion Factor	1.85
Variation (%)	-0.1800000
SAR 10g (W/Kg)	0.641528
SAR 1g (W/Kg)	0.961712
SURFACE SAR	**VOLUME SAR**
	

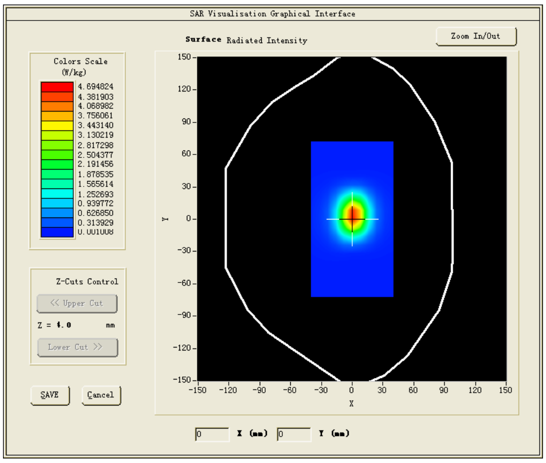
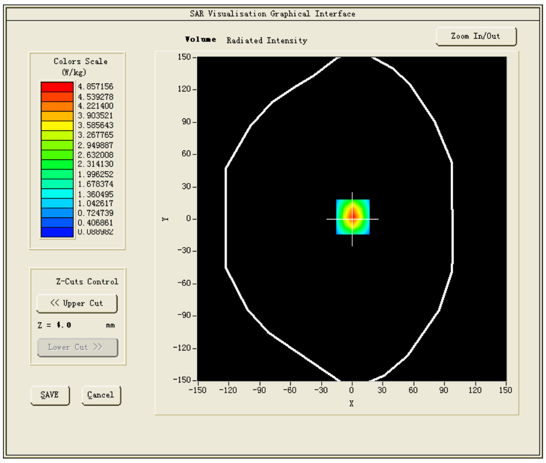


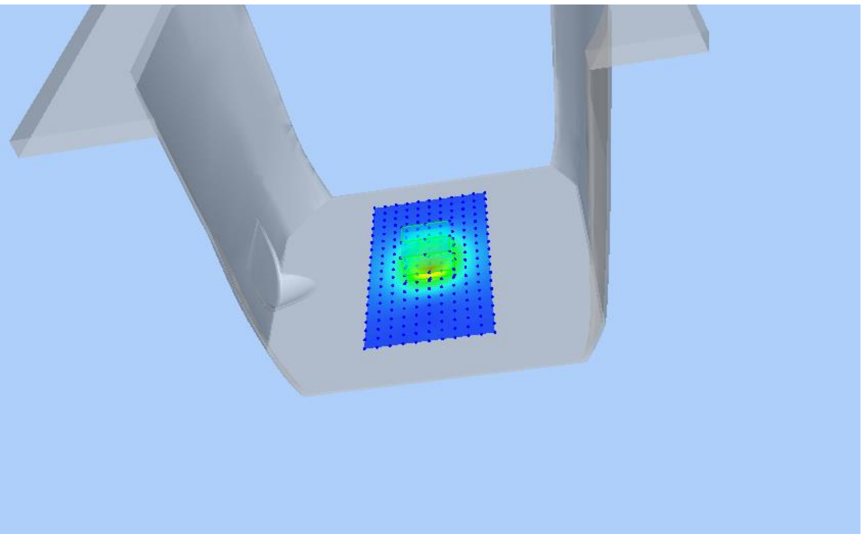
Test mode:1900MHz(Head)
Product Description:Validation
Model :Dipole SID1900
E-Field Probe:SSE2(SN 45/15 EPGO281)
Test Date:August 09, 2018

Medium(liquid type)	HSL_1900
Frequency (MHz)	1900.0000
Relative permittivity (real part)	40.61
Conductivity (S/m)	1.39
Input power	100mW
Crest Factor	1.0
Conversion Factor	2.10
Variation (%)	-1.460000
SAR 10g (W/Kg)	2.152864
SAR 1g (W/Kg)	3.816250
SURFACE SAR	**VOLUME SAR**
	



Test mode:1900MHz(Body)
Product Description:Validation
Model :Dipole SID1900
E-Field Probe:SSE2(SN 45/15 EPGO281)
Test Date: August 16, 2018

Medium(liquid type)	MSL_1900
Frequency (MHz)	1900.0000
Relative permittivity (real part)	54.35
Conductivity (S/m)	1.50
Input power	100mW
Crest Factor	1.0
Conversion Factor	2.16
Variation (%)	-0.690000
SAR 10g (W/Kg)	2.15684
SAR 1g (W/Kg)	4.235810
SURFACE SAR	**VOLUME SAR**
	



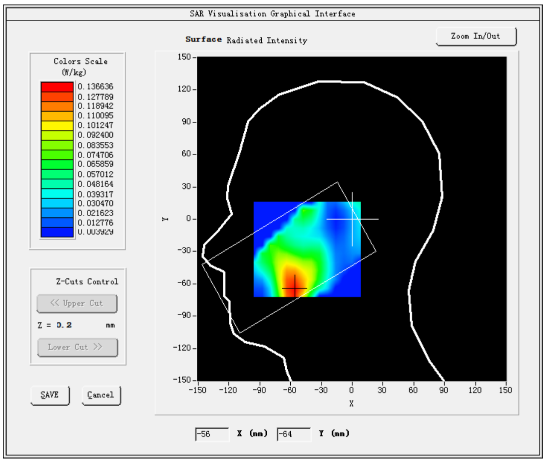
4.9. SAR Test Graph Results

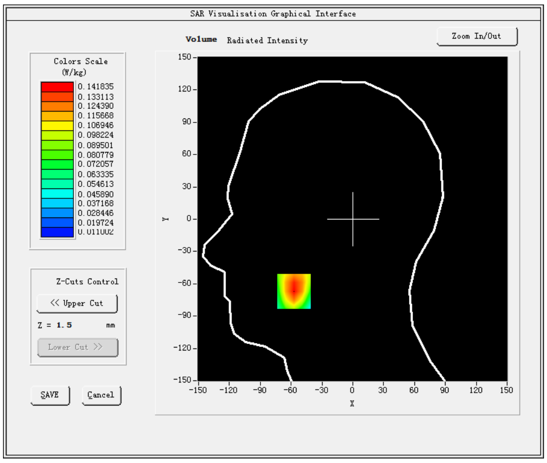
SAR plots for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination according to FCC KDB 865664 D02;

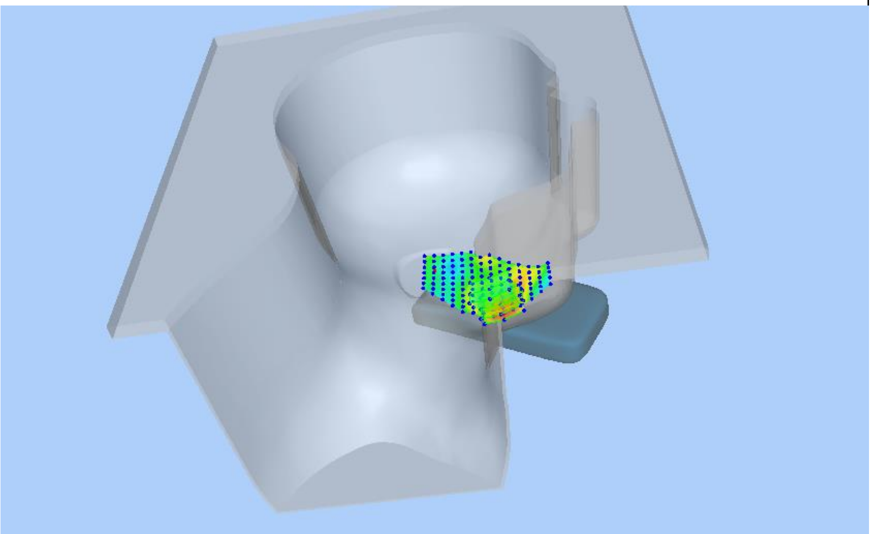
#1

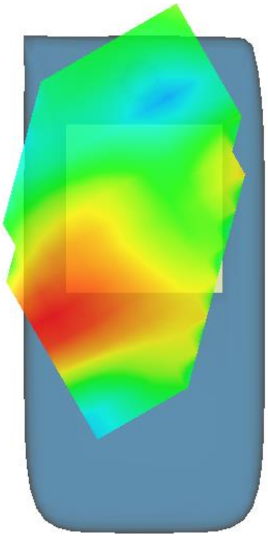
Test Mode: LTE Band 2, 1RB, Low channel(Head Left Cheek)
Product Description:Portable Data Collector
Model:NLS-MT90
Test Date: August 09, 2018

Medium(liquid type)	HSL_1900
Frequency (MHz)	1860.0000
Relative permittivity (real part)	40.61
Conductivity (S/m)	1.39
E-Field Probe	SN 45/15 EPGO281
Crest Factor	1.0
Conversion Factor	1.83
Sensor	4mm
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Variation (%)	-0.540000
SAR 10g (W/Kg)	0.080194
SAR 1g (W/Kg)	0.134430
SURFACE SAR	**VOLUME SAR**





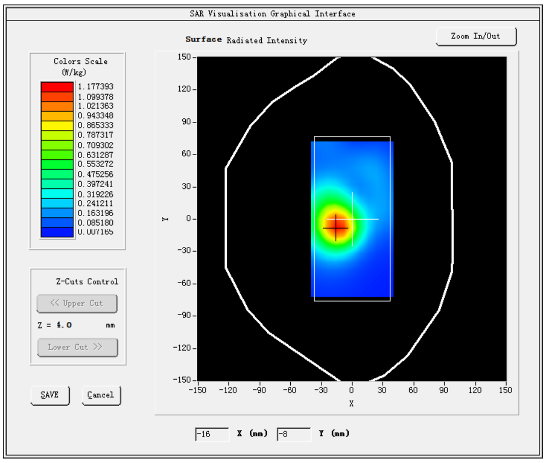


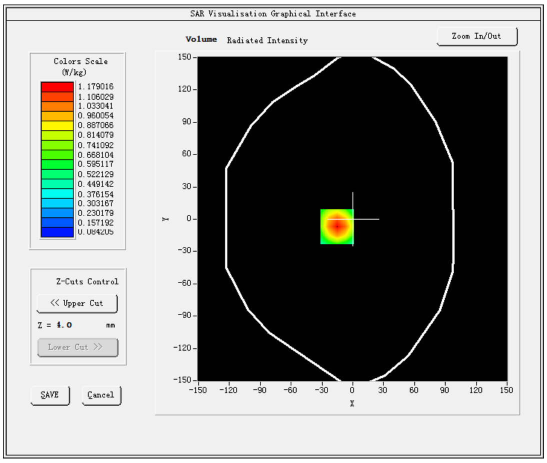


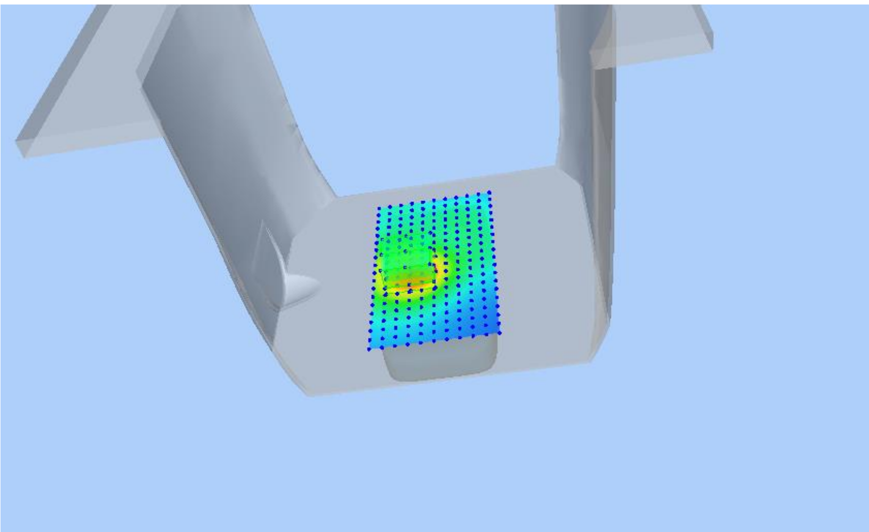
#2

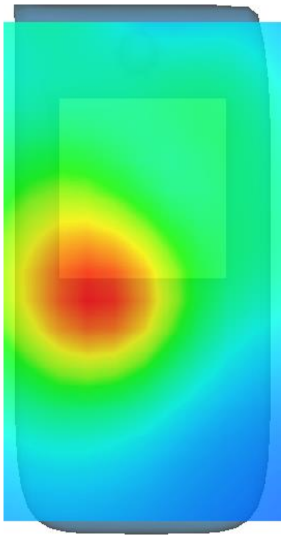
Test Mode: LTE Band 2, 1RB, Low channel(Body Front Side)
Product Description:Portable Data Collector
Model:NLS-MT90
Test Date: August 16, 2018

Medium(liquid type)	MSL_1900
Frequency (MHz)	1860.0000
Relative permittivity (real part)	54.35
Conductivity (S/m)	1.50
E-Field Probe	SN 45/15 EPGO281
Crest Factor	1.0
Conversion Factor	1.87
Sensor	4mm
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Variation (%)	-1.230000
SAR 10g (W/Kg)	0.696178
SAR 1g (W/Kg)	1.169802
SURFACE SAR	**VOLUME SAR**





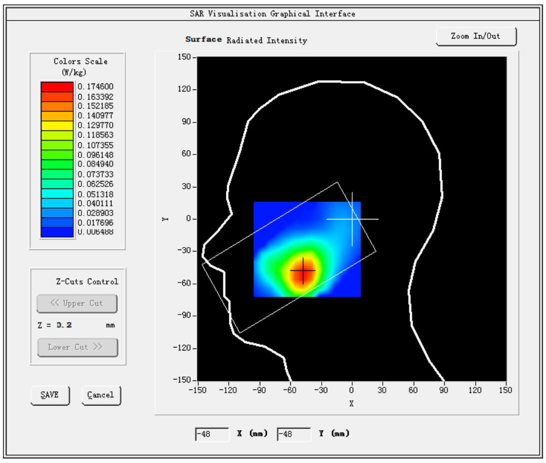


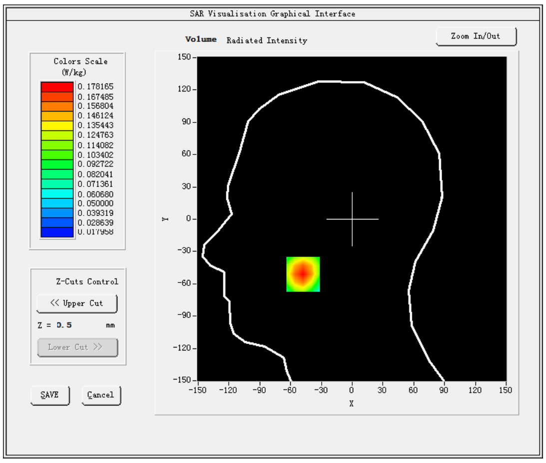


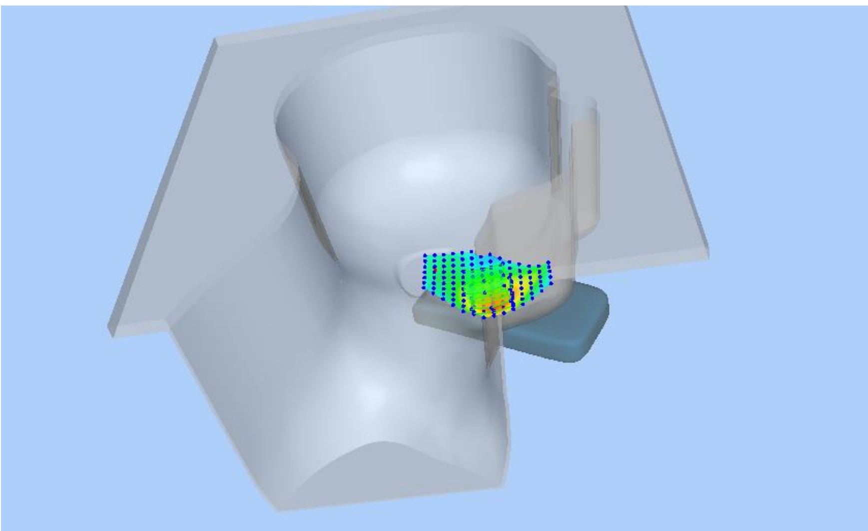
#3

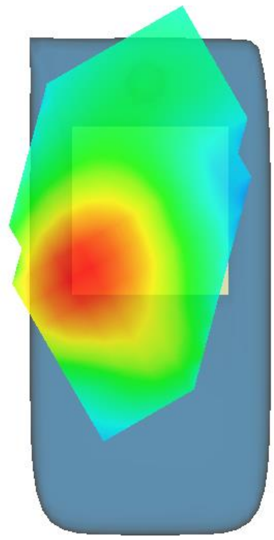
Test Mode: LTE Band 5,Low channel(Head Left Cheek)
Product Description:Portable Data Collector
Model:NLS-MT90
Test Date: July 09, 2018

Medium(liquid type)	HSL_850
Frequency (MHz)	824.7000
Relative permittivity (real part)	40.84
Conductivity (S/m)	0.92
E-Field Probe	SN 45/15 EPGO281
Crest Factor	1.0
Conversion Factor	4.86
Sensor	4mm
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Variation (%)	1.150000
SAR 10g (W/Kg)	0.107937
SAR 1g (W/Kg)	0.172092
SURFACE SAR	VOLUME SAR





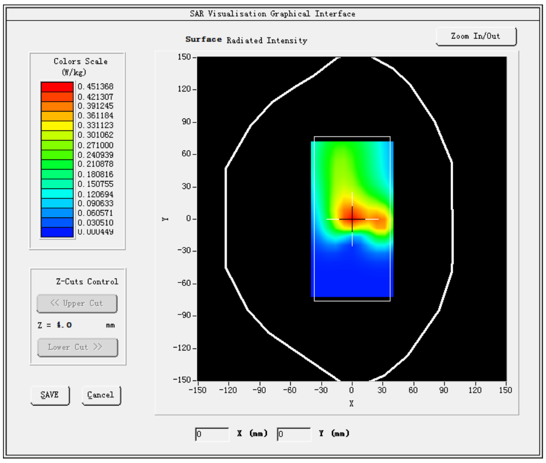


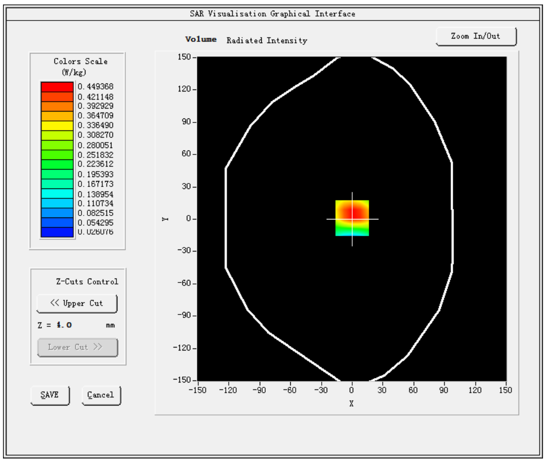


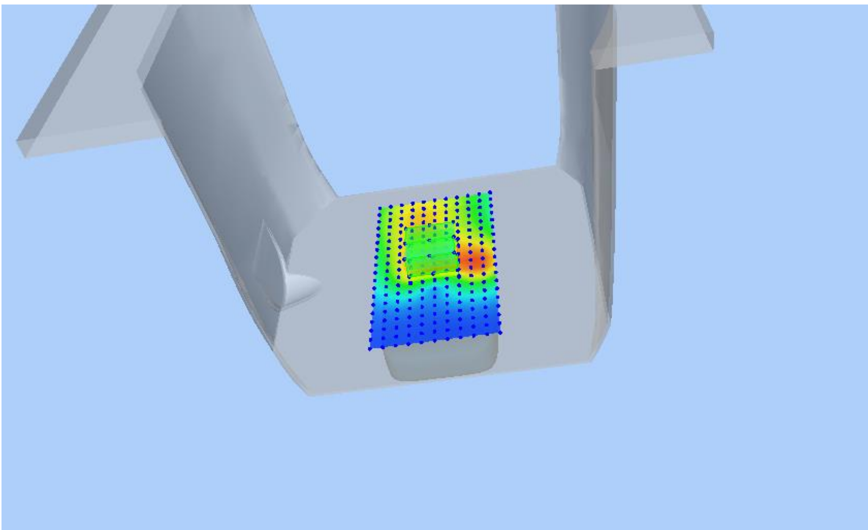
#4

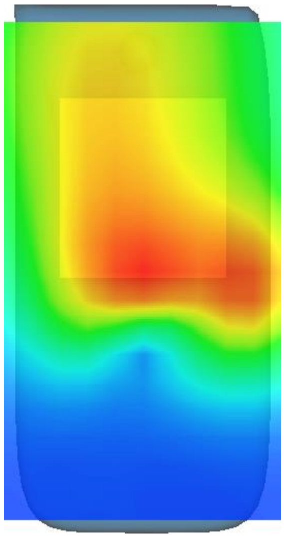
Test Mode:LTE Band 5,Low channel(Body Rear Side)
Product Description:Portable Data Collector
Model:NLS-MT90
Test Date: July 10, 2018

Medium(liquid type)	MSL_850
Frequency (MHz)	824.7000
Relative permittivity (real part)	55.01
Conductivity (S/m)	0.99
E-Field Probe	SN 45/15 EPGO281
Crest Factor	1.0
Conversion Factor	5.04
Sensor	4mm
Area Scan	dx=8mm dy=8mm
Zoom Scan	5x5x7,dx=8mm dy=8mm dz=5mm
Variation (%)	0.870000
SAR 10g (W/Kg)	0.287059
SAR 1g (W/Kg)	0.461456
SURFACE SAR	**VOLUME SAR**









5．CALIBRATION CERTIFICATES

5.1 Probe-EPGO281 Calibration Certificate

MVG
Microwave Vision Group

COMOSAR E-Field Probe Calibration Report

Ref : ACR.348.1.15.SATU.A

SHENZHEN STS TEST SERVICES CO., LTD.
1/F., BUILDING B, ZHUOKE SCIENCE PARK, No.190,
CHONGQING ROAD,FUYONG STREET
BAO'AN DISTRICT,SHENZHEN,GUANGDONG,CHINA
MVG COMOSAR DOSIMETRIC E-FIELD PROBE
SERIAL NO.: SN 45/15 EPGO281

Calibrated at MVG US
2105 Barrett Park Dr. - Kennesaw, GA 30144

ilac-MRA
ACCREDITED
Calibration CERT #2246-02

Calibration Date: 02/04/2018

Summary:

This document presents the method and results from an accredited COMOSAR Dosimetric E-Field Probe calibration performed in MVG USA using the CALISAR / CALIBAIR test bench, for use with a COMOSAR system only. All calibration results are traceable to national metrology institutions.

COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.348.1.15.SATU.A

	Name	Function	Date	Signature
Prepared by :	Jérôme LUC	Product Manager	02/08/2018	
Checked by :	Jérôme LUC	Product Manager	02/08/2018	
Approved by :	Kim RUTKOWSKI	Quality Manager	02/08/2018	Kim Rutkowski

	Customer Name
Distribution :	Shenzhen STS Test Services Co., Ltd.

Issue	Date	Modifications
A	02/08/2018	Initial release

TABLE OF CONTENTS

1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	SN 45/15 EPGO281
Product Condition (new / used)	New
Frequency Range of Probe	0.45 GHz-6GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.186 MΩ Dipole 2: R2=0.194 MΩ Dipole 3: R3=0.191 MΩ

A yearly calibration interval is recommended.

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

MVG's COMOSAR E field Probes are built in accordance to the IEEE 1528, OET 65 Bulletin C and CEI/IEC 62209 standards.

Figure 1 – *MVG COMOSAR Dosimetric E field Dipole*

Probe Length	330 mm
Length of Individual Dipoles	2 mm
Maximum external diameter	8 mm
Probe Tip External Diameter	2.5 mm
Distance between dipoles / probe extremity	1 mm

3 MEASUREMENT METHOD

The IEEE 1528, OET 65 Bulletin C, CENELEC EN50361 and CEI/IEC 62209 standards provide recommended practices for the probe calibrations, including the performance characteristics of interest and methods by which to assess their affect. All calibrations / measurements performed meet the fore mentioned standards.

3.1 LINEARITY

The evaluation of the linearity was done in free space using the waveguide, performing a power sweep to cover the SAR range 0.01W/kg to 100W/kg.

3.2 SENSITIVITY

The sensitivity factors of the three dipoles were determined using a two step calibration method (air and tissue simulating liquid) using waveguides as outlined in the standards.

3.3 LOWER DETECTION LIMIT

The lower detection limit was assessed using the same measurement set up as used for the linearity measurement. The required lower detection limit is 10 mW/kg.

3.4 ISOTROPY

The axial isotropy was evaluated by exposing the probe to a reference wave from a standard dipole with the dipole mounted under the flat phantom in the test configuration suggested for system validations and checks. The probe was rotated along its main axis from 0 - 360 degrees in 15 degree steps. The hemispherical isotropy is determined by inserting the probe in a thin plastic box filled with tissue-equivalent liquid, with the plastic box illuminated with the fields from a half wave dipole. The dipole is rotated about its axis (0°–180°) in 15° increments. At each step the probe is rotated about its axis (0°–360°).

3.5 BOUNDARY EFFECT

The boundary effect is defined as the deviation between the SAR measured data and the expected exponential decay in the liquid when the probe is oriented normal to the interface. To evaluate this effect, the liquid filled flat phantom is exposed to fields from either a reference dipole or waveguide. With the probe normal to the phantom surface, the peak spatial average SAR is measured and compared to the analytical value at the surface.

4 MEASUREMENT UNCERTAINTY

The guidelines outlined in the IEEE 1528, OET 65 Bulletin C, CENELEC EN50361 and CEI/IEC 62209 standards were followed to generate the measurement uncertainty associated with an E-field probe calibration using the waveguide technique. All uncertainties listed below represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2, traceable to the Internationally Accepted Guides to Measurement Uncertainty.

Uncertainty analysis of the probe calibration in waveguide					
ERROR SOURCES	**Uncertainty value (%)**	**Probability Distribution**	**Divisor**	**ci**	**Standard Uncertainty (%)**
Incident or forward power	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Reflected power	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Liquid conductivity	5.00%	Rectangular	$\sqrt{3}$	1	2.887%
Liquid permittivity	4.00%	Rectangular	$\sqrt{3}$	1	2.309%
Field homogeneity	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Field probe positioning	5.00%	Rectangular	$\sqrt{3}$	1	2.887%

Field probe linearity	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Combined standard uncertainty					5.831%
Expanded uncertainty 95 % confidence level k = 2					12.0%

5 CALIBRATION MEASUREMENT RESULTS

Calibration Parameters	
Liquid Temperature	21 °C
Lab Temperature	21 °C
Lab Humidity	45 %

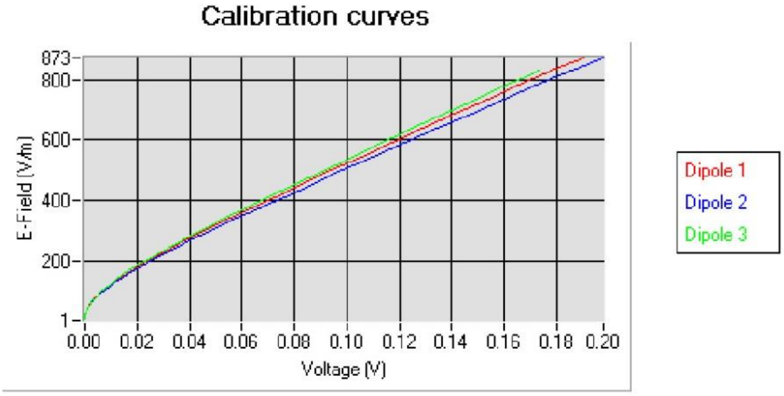
5.1 SENSITIVITY IN AIR

Normx dipole 1 ($\mu V/(V/m)^2$)	Normy dipole 2 ($\mu V/(V/m)^2$)	Normz dipole 3 ($\mu V/(V/m)^2$)
0.77	0.83	0.67

DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
91	90	95

Calibration curves ei=f(V) (i=1,2,3) allow to obtain H-field value using the formula:

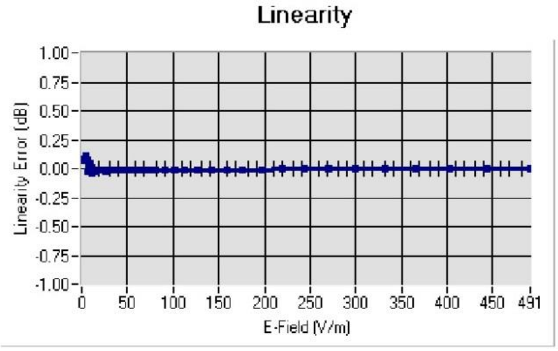
$$E = \sqrt{E_1^{\,2} + E_2^{\,2} + E_3^{\,2}}$$



COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.348.1.15.SATU.A

5.2 LINEARITY



Linearity: +/-2.60% (+/-0.11dB)

5.3 SENSITIVITY IN LIQUID

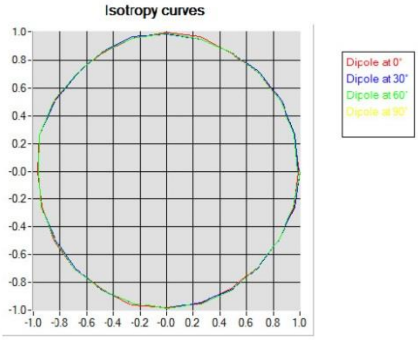
Liquid	Frequency (MHz +/- 100MHz)	Permittivity	Epsilon (S/m)	ConvF
HL450	450	44.12	0.88	1.76
BL450	450	58.92	1.00	1.81
HL750	750	42.24	0.90	1.53
BL750	750	56.85	0.99	1.59
HL850	835	43.02	0.90	1.78
BL850	835	53.72	0.98	1.85
HL900	900	42.47	0.99	1.62
BL900	900	56.97	1.09	1.67
HL1800	1800	42.24	1.40	1.83
BL1800	1800	53.53	1.53	1.87
HL1900	1900	40.79	1.42	2.10
BL1900	1900	54.47	1.57	2.16
HL2000	2000	40.52	1.44	2.01
BL2000	2000	54.18	1.56	2.09
HL2450	2450	38.73	1.81	2.21
BL2450	2450	53.23	1.96	2.28
HL2600	2600	38.54	1.95	2.32
BL2600	2600	52.07	2.23	2.38
HL5200	5200	36.80	4.84	2.46
BL5200	5200	51.21	5.16	2.52
HL5400	5400	36.35	4.96	2.70
BL5400	5400	50.51	5.70	2.79
HL5600	5600	35.57	5.23	2.74
BL5600	5600	49.83	5.91	2.83
HL5800	5800	35.30	5.47	2.53
BL5800	5800	49.03	6.28	2.60

LOWER DETECTION LIMIT: 9mW/kg

5.4 ISOTROPY

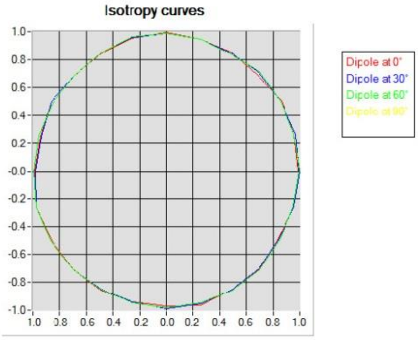
HL900 MHz

- Axial isotropy: 0.04 dB
- Hemispherical isotropy: 0.06 dB



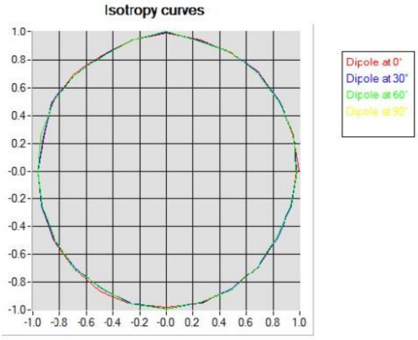
HL1800 MHz

- Axial isotropy: 0.04 dB
- Hemispherical isotropy: 0.08 dB



HL5600 MHz

- Axial isotropy: 0.06 dB
- Hemispherical isotropy: 0.08 dB



6 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	**Manufacturer / Model**	**Identification No.**	**Current Calibration Date**	**Next Calibration Date**
Flat Phantom	MVG	SN-20/09-SAM71	Validated. No cal required.	Validated. No cal required.
COMOSAR Test Bench	Version 3	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rhode & Schwarz ZVA	SN100132	02/2018	02/2021
Reference Probe	MVG	EP 94 SN 37/08	10/2017	10/2018
Multimeter	Keithley 2000	1188656	12/2015	12/2018
Signal Generator	Agilent E4438C	MY49070581	12/2015	12/2018
Amplifier	Aethercomm	SN 046	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Power Meter	HP E4418A	US38261498	12/2015	12/2018
Power Sensor	HP ECP-E26A	US37181460	12/2015	12/2018
Directional Coupler	Narda 4216-20	01386	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Waveguide	Mega Industries	069Y7-158-13-712	Validated. No cal required.	Validated. No cal required.
Waveguide Transition	Mega Industries	069Y7-158-13-701	Validated. No cal required.	Validated. No cal required.
Waveguide Termination	Mega Industries	069Y7-158-13-701	Validated. No cal required.	Validated. No cal required.
Temperature / Humidity Sensor	Control Company	150798832	10/2016	10/2018

5.2 SID835 Dipole Calibration Ceriticate

SAR Reference Dipole Calibration Report

Ref : ACR.287.4.14.SATU.A

SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD.
1F., XINGYUAN INDUSTRIAL PARK, TONGDA ROAD, BAO'AN BLVD
BAO'AN DISTRICT, SHENZHEN, GUANGDONG, CHINA
SATIMO COMOSAR REFERENCE DIPOLE
FREQUENCY: 835 MHZ
SERIAL NO.: SN 07/14 DIP 0G835-303

Calibrated at SATIMO US
2105 Barrett Park Dr. - Kennesaw, GA 30144

10/01/2015

Summary:

This document presents the method and results from an accredited SAR reference dipole calibration performed in SATIMO USA using the COMOSAR test bench. All calibration results are traceable to national metrology institutions.

SATIMO

SAR REFERENCE DIPOLE CALIBRATION REPORT

Ref: ACR.287.4.14.SATU.A

	Name	Function	Date	Signature
Prepared by :	Jérôme LUC	Product Manager	10/14/2015	
Checked by :	Jérôme LUC	Product Manager	10/14/2015	
Approved by :	Kim RUTKOWSKI	Quality Manager	10/14/2015	

	Customer Name
Distribution :	Shenzhen LCS Compliance Testing Laboratory Ltd.

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Page: 2/11

TABLE OF CONTENTS