SAR TEST REPORT

For

Trackimo INC

NickWatch V1

Test Model: NICKW001-2

Prepared for	:	Trackimo INC
Address	:	680 Central Ave, Cedarhurst, New York 11516, USA
Prepared by	:	Shenzhen LCS Compliance Testing Laboratory Ltd.
Address	:	101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China
Date of receipt of test sample	:	Aug. 21, 2023
Number of tested samples	:	1
Sample No.	:	A231205060
Serial number	:	Prototype
Date of Test	:	Aug. 21, 2023 ~ Aug. 27, 2023
Date of Report	:	Aug. 29, 2023

SAR TEST REPORT	
Report Reference No. ..... :	**LCSA12053126E**
Date Of Issue ..... :	Aug. 29, 2023
Testing Laboratory Name..... :	**Shenzhen LCS Compliance Testing Laboratory Ltd.**
Address ..... :	101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China
Applicant's Name..... :	**Trackimo INC**
Address ..... :	680 Central Ave, Cedarhurst, New York 11516, USA
Test Specification:	
Standard ..... :	IEEE Std C95.1, 2019& 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 2011-03
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Test Item Description. ..... :	**NickWatch V1**
Trade Mark ..... :	NOBLEX
Model/Type Reference ..... :	NICKW001-2
Operation Frequency ..... :	GSM 850/PCS1900,WCDMA Band II/V; LTE Band 2/4/5/7/12/17/25/26/38/41; WLAN2.4 , Gand Bluetooth4.2.
Ratings ..... :	Rated Voltage:3.85V Charge Limit Voltage:4.35V Capacity: 460mAh
Result ..... :	**Positive**

Compiled by:	**Supervised by:**	**Approved by:**
Jay Zhan	Cary Luo	Gavin Liang
Jay Zhan / File administrators	Cary Luo / Technique principal	Gavin Liang/ Manager

SAR -- TEST REPORT

Test Report No. : LCSA12053126E	Aug. 29, 2023 Date of issue

Type / Model.....	: NICKW001-2
EUT.....	: NickWatch V1
Applicant.....	**: Trackimo INC**
Address.....	: 680 Central Ave, Cedarhurst, New York 11516, USA
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: TRACKIMO INC**
Address.....	: 680 Central Ave, Cedarhurst, New York 11516, USA
Telephone.....	: /
Fax.....	: /
Factory.....	**: / Huizhou TCL Mobile Communication Co,Ltd**
Address.....	: / No.86, Hechang 7th West Road, Zhong Kai Hi-tech Development District, Hui Zhou, Guang Dong
Telephone.....	: /
Fax.....	: /

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	Revision Content	Revised By
000	Aug. 29, 2023	Initial Issue	---

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1.TEST STANDARDS AND TEST DESCRIPTION

1.1. Test Standards

IEEE Std C95.1, 2019: IEEE Standard for Safety Levels with Respect to Human Exposure to Electric,Magnetic, and Electromagnetic Fields,0 Hz 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
KDB248227 D01 802.11 Wi-Fi SAR: SAR Guidance For Ieee 802.11 (Wi-Fi) Transmitters
KDB941225 D01 3G SAR Procedures: 3G SAR Meaurement Procedures
KDB 941225 D06 Hotspot Mode: SAR Evaluation Procedures For Portable Devices With Wireless Router Capabilities
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	:	Aug. 21, 2023
Testing commenced on	:	Aug. 21, 2023
Testing concluded on	:	Aug. 27, 2023

1.4. Product Description

The Trackimo INC. Model: NICKW001-2 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:	NickWatch V1
Test Model:	NICKW001-2
Series Model.:	NICKW001-5, NICKW001-6, NICKW001-7, NICKW001-8, NICKW001-9, NICKW001-10
Declaration of different:	The difference only in the model name and brand name.
Hardware Version:	UW02 AUO V0.3
Software Version:	0.2
Power supply:	Rated Voltage:3.85V Charge Limit Voltage:4.35V Capacity: 460mAh
The EUT is NickWatch V1. the NickWatch V1 is intended for speech and Multimedia Message Service (MMS) transmission. It is equipped with GPRS class 12 for GSM850,PCS1900,WCDMA Band II,Band V,LTE Band2,Band4,Band5,Band7,Band12, Band17, Band25,Band26,Band38 and Band41, Bluetooth,WiFi2.4G. functions. For more information see the following datasheet	

Technical Characteristics	
GSM	
Support Band:	☐GSM 900 (EU-Band) ☐DCS 1800 (EU-Band) ☒GSM 850 (U.S.-Band) ☒PCS 1900 (U.S.-Band)
Release Version:	R99
GPRS Class	Class 12
EGPRS Class	Class 12
Modulation Type:	GMSK for GSM/GPRS; GMSK/8PSK for EGPRS
Antenna Description:	Built-in LDS Antenna -4.5dBi (max.) For GSM 850 -4.5dBi (max.) For PCS 1900
UMTS	
Support Band:	☒WCDMA Band II (U.S.-Band) ☒WCDMA Band V (U.S.-Band) ☐WCDMA Band IV (U.S.-Band) ☐WCDMA Band I (EU-Band) ☐WCDMA Band VIII (EU-Band)
Release Version:	R8
Modulation Type:	QPSK,16QAM
Antenna Description:	Built-in LDS Antenna -3.4dBi (max.) For WCDMA Band II -3.4dBi (max.) For WCDMA Band V
LTE	
Support Band:	☒E-UTRA Band 2(U.S.-Band) ☒E-UTRA Band 4(U.S.-Band) ☒E-UTRA Band 5(U.S.-Band) ☒E-UTRA Band 7(U.S.-Band) ☒E-UTRA Band 12(U.S.-Band) ☒E-UTRA Band 17(U.S.-Band) ☒E-UTRA Band 25(U.S.-Band) ☒E-UTRA Band 26(U.S.-Band) ☒E-UTRA Band 38(U.S.-Band) ☒E-UTRA Band 41(U.S.-Band)
Power Class:	Class 3
LTE Release Version:	R9
Modulation Type:	QPSK/16QAM
Antenna Description:	Built-in LDS Antenna -3.1dBi (max.) For E-UTRA Band 2 -3.1dBi (max.) For E-UTRA Band 4 -3.1dBi (max.) For E-UTRA Band 5 -3.1dBi (max.) For E-UTRA Band 7 -3.1dBi (max.) For E-UTRA Band 12 -3.1dBi (max.) For E-UTRA Band 17 -3.1dBi (max.) For E-UTRA Band 25 -3.1dBi (max.) For E-UTRA Band 26 -3.1dBi (max.) For E-UTRA Band 38 -3.1dBi (max.) For E-UTRA Band 41
Bluetooth	
Frequency Range:	2402MHz-2480MHz
Bluetooth Version:	V4.2
Bluetooth Channel Number:	79 channels for Bluetooth V4.2 (DSS) 40 channels for Bluetooth V4.2 (DTS)
Bluetooth Channel Spacing:	1MHz for Bluetooth V4.2 (DSS) 2MHz for Bluetooth V4.2 (DTS)
Bluetooth Modulation Type:	GFSK, π/4-DQPSK, 8-DPSK for Bluetooth V4.2(DSS) GFSK for Bluetooth V4.2 (DTS)
Antenna Description:	Built-in LDS Antenna, -1.2dBi(Max.)

2.4G WLAN	
Frequency Range:	2412 – 2462 MHz
Channel Number:	11 Channels for 20MHz bandwidth (2412~2462MHz)
Modulation Type	IEEE 802.11b: DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Channel Spacing:	5MHz
Antenna Description:	Built-in LDS Antenna, -1.2dBi(Max.)
GPS function:	Support and only RX

1.5. Statement of Compliance

The maximum of results of SAR found during testing for NICKW001-2 are follows:

<Highest Reported standalone SAR Summary>

Classment Class	Frequency Band	Front of face (Report SAR_{1-g} (W/kg) (Separation Distance 10mm)	Wrist (Report SAR_{10-g} (W/kg) (Separation Distance 0mm)
PCE	GSM 850	0.051	0.559
	GSM1900	0.510	1.288
	WCDMA Band II	1.001	2.613
	WCDMA Band V	0.085	0.643
	LTE Band 2	0.641	1.912
	LTE Band 4	0.310	1.809
	LTE Band 5	0.155	0.756
	LTE Band 7	0.629	0.868
	LTE Band 12	0.034	0.217
	LTE Band 17	0.041	0.271
	LTE Band 25	0.766	1.579
	LTE Band 26	0.090	1.280
	LTE Band 38	0.290	0.717
	LTE Band 41	0.234	0.333
DTS	WIFI2.4G	0.234	0.201
	BLE	0.573	0.573

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 C95.1-2019, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013.

<Highest Reported simultaneous SAR Summary>

Exposure Position	Classment Class	Front of face (Report SAR_{1-g} (W/kg)	Highest Reported Simultaneous Transmission SAR_{1-g} (W/kg)
Front of face (Report SAR1-g Limit 1.6(W/kg)	PCE	1.001	**1.574**
	NII	0.573	
Exposure Position	Classment Class	Wrist (Report SAR_{10-g} (W/kg)	Highest Reported Simultaneous Transmission SAR_{10-g} (W/kg)
Wrist (Report SAR10-g Limit 4.0(W/kg)	PCE	2.613	**3.186**
	NII	0.573	

2.TEST ENVIRONMENT

2.1. Test Facility

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

Site Description

Sar Lab. : NVLAP Accreditation Code is 600167-0.
FCC Designation Number is CN5024.
CAB identifier is CN0071.
CNAS Registration Number is L4595.
Test Firm Registration Number: 254912.

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

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	PC	Lenovo	G5005	MY42081102	N/A	N/A
2	SAR Measurement system	SATIMO	4014_01	SAR_4014_01	N/A	N/A
3	Signal Generator	Agilent	E4438C	MY49072627	2023-06-09	2024-06-08
4	S-parameter Network Analyzer	Agilent	8753ES	US38432944	2023-06-09	2024-06-08
5	Wideband Radio Communication Tester	R&S	CMW500	103818-1	2023-10-25	2024-10-24
6	E-Field PROBE	MVG	SSE2	SN 25/22 EPGO376	2023-06-22	2024-06-21
7	DIPOLE 750	SATIMO	SID 750	SN 30/14 DIP 0G750-302	2021-09-29	2024-09-28
8	DIPOLE 835	SATIMO	SID 835	SN 07/14 DIP 0G835-303	2021-09-29	2024-09-28
9	DIPOLE 1800	SATIMO	SID 1800	SN 07/14 DIP 1G800-301	2021-09-29	2024-09-28
10	DIPOLE 1900	SATIMO	SID 1900	SN 38/18 DIP 1G900-466	2021-09-22	2024-09-21
11	DIPOLE 2450	SATIMO	SID 2450	SN 07/14 DIP 2G450-306	2021-09-29	2024-09-28
12	DIPOLE 2600	SATIMO	SID 2600	SN 38/18 DIP 2G600-468	2021-09-22	2024-09-21
14	COMOSAR OPENCoaxial Probe	SATIMO	OCPG 68	SN 40/14 OCPG68	2023-10-25	2024-10-24
16	Communication Antenna	SATIMO	ANTA57	SN 39/14 ANTA57	2023-10-25	2024-10-24
17	FEATURE PHONEPOSITIONING DEVICE	SATIMO	MSH98	SN 40/14 MSH98	N/A	N/A
18	DUMMY PROBE	SATIMO	DP60	SN 03/14 DP60	N/A	N/A
19	SAM PHANTOM	SATIMO	SAM117	SN 40/14 SAM117	N/A	N/A
20	Liquid measurement Kit	HP	85033D	3423A03482	N/A	N/A
21	Power meter	Agilent	E4419B	MY45104493	2023-10-25	2024-10-24
22	Power meter	Agilent	E4419B	MY45100308	2023-10-25	2024-10-24
23	Power sensor	Agilent	E9301H	MY41495616	2023-10-25	2024-10-24
24	Power sensor	Agilent	E9301H	MY41495234	2023-10-25	2024-10-24
25	Directional Coupler	MCLI/USA	4426-20	03746	2023-06-09	2024-06-08

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

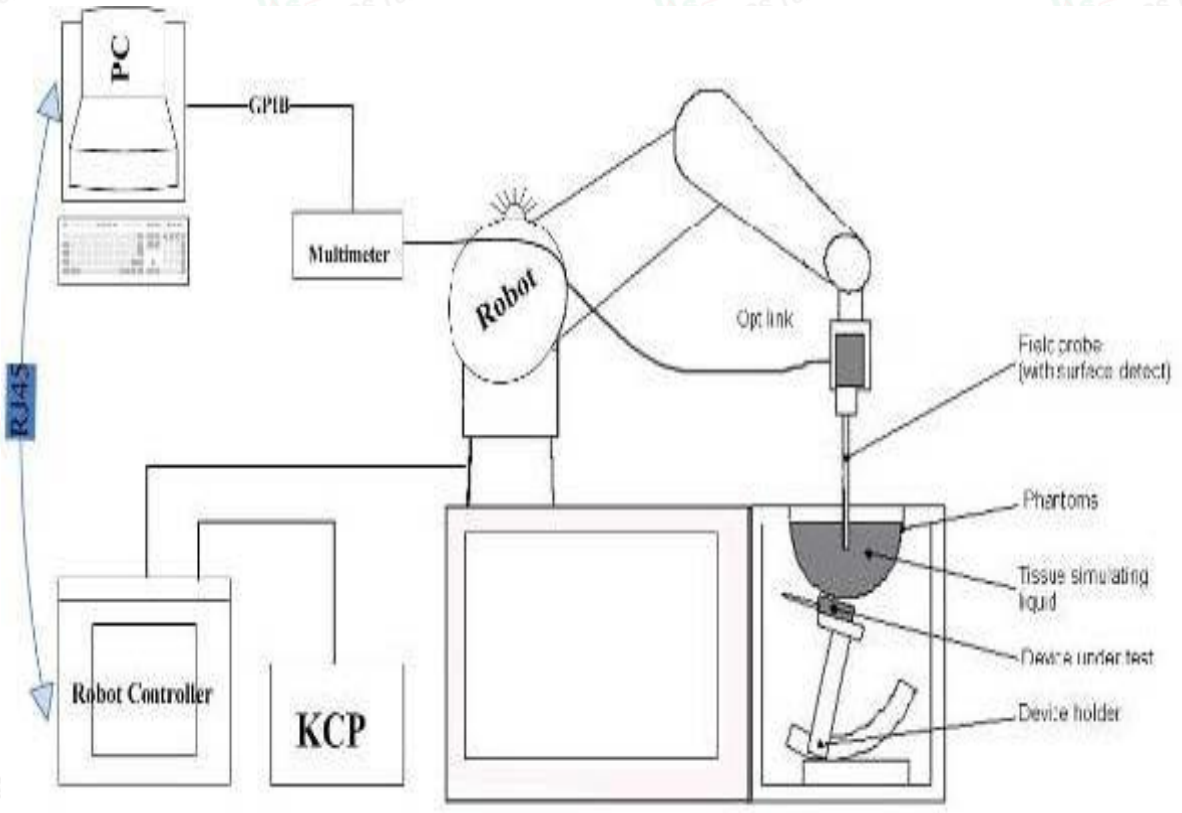
Remote control with teaches pendant and additional circuitry for robot safety such as warning lamps, etc.

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 EPGO376 (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)

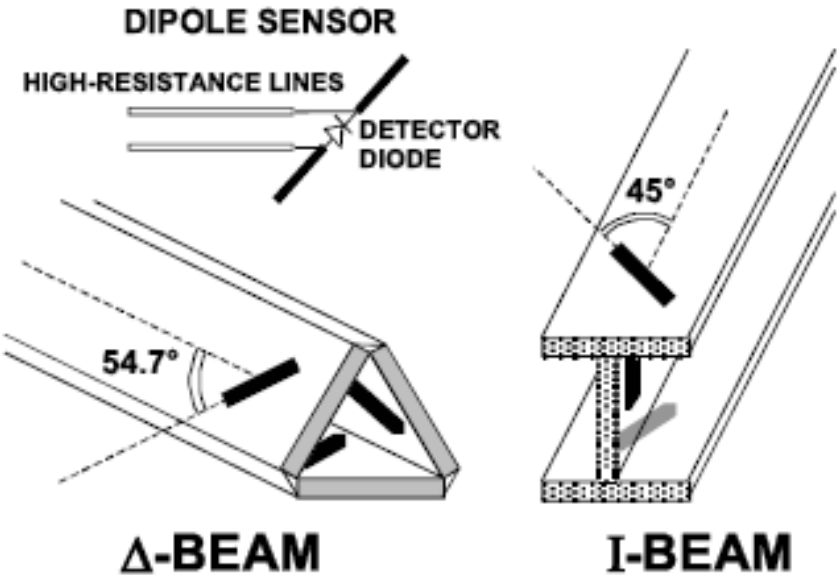
CalibrationISO/IEC 17025 calibration service available.

Frequency	450 MHz to 6 GHz; Linearity:0.25dB(450 MHz to 6 GHz)
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 NickWatch V1s

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.

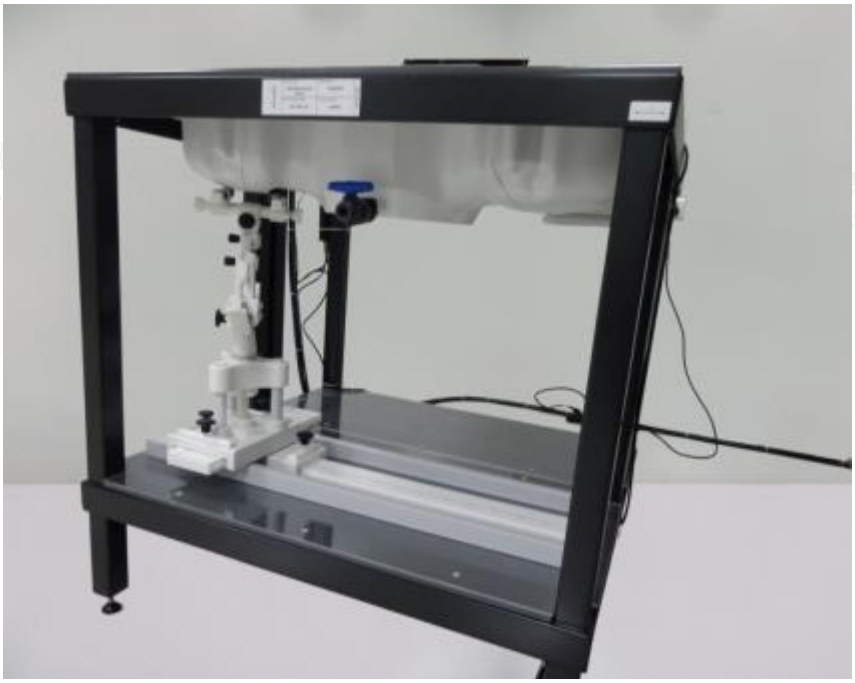
The E-Field probe utilizes a triangular sensor arrangement as detailed in the diagram below:



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 ENICKW001-2209-1 , ENICKW001-2209-2:2010.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

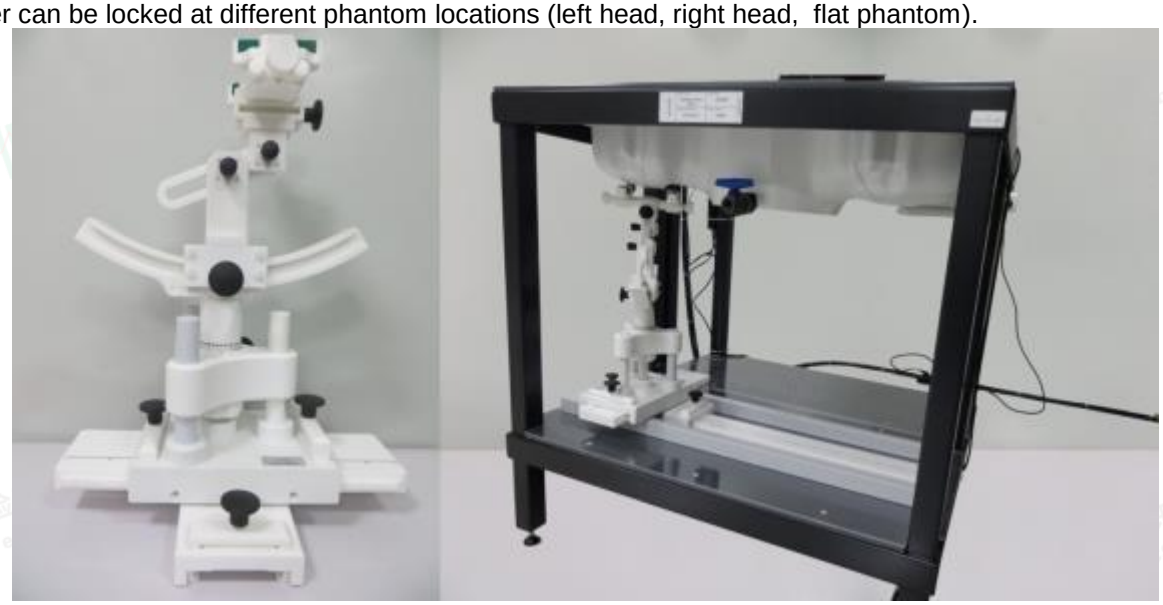
System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.



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.

Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$ mm	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

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 *reported* 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.

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:

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

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

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. 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	
	ε_r	$\sigma(S/m)$
450	43.5	0.87
750	41.9	0.89
835	41.5	0.90
900	41.5	0.97
1450	40.5	1.20
1640	40.2	1.31
1800	40.0	1.40
1900	40.0	1.40
2000	40.0	1.40
2450	39.2	1.80
2600	39.0	1.96
3000	38.5	2.40
5200	36.0	4.66
5800	35.3	5.27

3.8. Tissue equivalent liquid properties

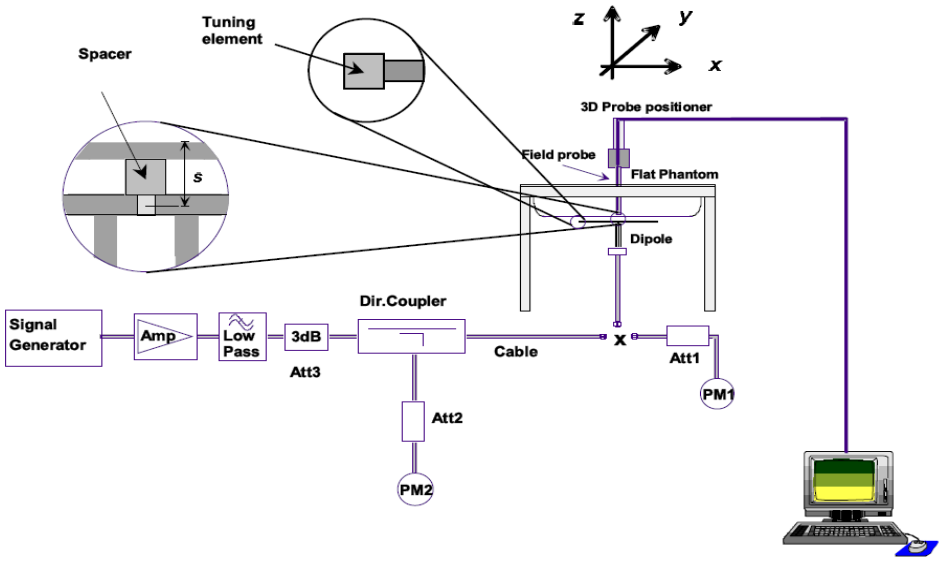
Dielectric Performance of Head Tissue Simulating Liquid

Test Engineer: bob.yang									
Tissue Type	Measured Frequency (MHz)	Target Tissue		Measured Tissue				Liquid Temp.	Test Data
		σ	ε_r	σ	Dev.	ε_r	Dev.		
750H	750	0.82	42	0.85	3.66%	43.78	4.24%	21.3	8/21/2023
835H	835	0.91	41.4	0.88	-3.30%	42.56	2.80%	20.1	8/21/2023
1800H	1800	1.42	41	1.42	1.43%	41.58	1.42%	22.2	8/26/2023
1900H	1900	1.42	39.8	1.45	2.11%	41.76	4.92%	21.3	8/26/2023
2450H	2450	1.81	39.3	1.82	0.55%	40.35	2.67%	22.2	8/27/2023
2600H	2600	1.97	39.2	1.93	-2.03%	40.1	2.30%	22.1	8/27/2023

3.9. 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.

SID750 SN 07/14 DIP 0G750-302 Extend Dipole Calibrations

Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (ohm)	Delta (ohm)
2021-09-29	-34.80		50.7		1.6	
2022-09-29	-34.35	-1.29	51.2	0.5	1.5	-0.1
2023-09-29	-34.42	-1.09	51.3	0.4	1.5	-0.1

SID835 SN 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)
2021-09-29	-24.49		54.9		2.8	
2022-09-29	-24.17	-1.31	54.5	-0.4	2.6	-0.2
2023-09-29	-24.20	-1.18	54.2	-0.7	2.5	-0.3

SID1800 SN 30/14 DIP 1G800-301 Extend Dipole Calibrations

Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (ohm)	Delta (ohm)
2021-09-29	-20.26		43.1		6.9	
2022-09-29	-20.13	-0.64	42.9	-0.2	6.7	-0.2
2023-09-29	-20.15	-0.54	42.8	-0.3	6.6	-0.3

SID1900 SN 38/18 DIP 1G900-466 Extend Dipole Calibrations

Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (ohm)	Delta (ohm)
2021-09-22	-26.43		50.5		4.7	
2022-09-22	-26.33	-0.38	50.2	-0.3	4.5	-0.2
2023-09-22	-26.40	-0.11	50.1	-0.4	4.6	-0.1

SID2450 SN 07/14 DIP 2G450-306 Extend Dipole Calibrations

Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (ohm)	Delta (ohm)
2021-09-29	-25.59		44.7		-1.1	
2022-09-29	-25.68	0.35	44.8	0.1	-1.0	0.1
2023-09-29	-25.70	0.43	44.5	-0.2	-1.1	0.0

SID2600 SN 38/18 DIP 2G600-468 Extend Dipole Calibrations

Date of Measurement	Return-Loss (dB)	Delta (%)	Real Impedance (ohm)	Delta (ohm)	Imaginary Impedance (ohm)	Delta (ohm)
2021-09-22	-29.14		49.2		3.4	
2022-09-22	-29.12	-0.07	49.1	-0.1	3.2	-0.2
2023-09-22	-29.10	-0.07	49.2	0.0	3.3	-0.1

Mixture Type	Frequency (MHz)	Power	SAR_{1g} (W/Kg)	SAR_{10g} (W/Kg)	Drift (%)	1W Target		Difference percentage		Liquid	Date
						SAR_{1g} (W/Kg)	SAR_{10g} (W/Kg)	1g	10g	Temp	
Head	750	100 mW	0.825	0.561	1.42	8.38	5.53	-1.55%	1.45%	21.5	8/21/2022
		Normalize to 1 Watt	8.25	5.61							
Head	835	100 mW	0.95	0.61	-0.55	9.6	6.2	-0.83%	-1.94%	20.6	8/21/2022
		Normalize to 1 Watt	9.52	6.08							
Head	1800	100 mW	3.855	2.052	1.62	38.13	20.2	1.10%	1.58%	22.3	8/26/2022
		Normalize to 1 Watt	38.55	20.52							
Head	1900	100 mW	4.01	2.048	-0.51	39.7	20.5	1.01%	-0.10%	21.4	8/26/2022
		Normalize to 1 Watt	40.1	20.48							
Head	2450	100 mW	5.49	2.524	-0.08	53.89	24.15	1.87%	4.51%	22.3	8/27/2022
		Normalize to 1 Watt	54.9	25.24							
Head	2600	100 mW	5.515	2.46	3.25	54.14	24.13	1.87%	1.95%	22.1	8/27/2022
		Normalize to 1 Watt	55.15	24.6							

3.10. 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 power in 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 GSM Test Configuration

SAR tests for GSM 850 and GSM 1900, a communication link is set up with a System Simulator (SS) by air link. Using CMU200 the power level is set to “5” for GSM 850, set to “0” for GSM 1900. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 4. the EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslots is 4.

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. GSM voice and GPRS data use GMSK, which is a constant amplitude modulation with minimal peak to average power difference within the time-slot burst. For EDGE, GMSK is used for MCS 1 – MCS 4 and 8-PSK is used for MCS 5 – MCS 9; where 8-PSK has an inherently higher peak-to-average power ratio. The GMSK and 8-PSK EDGE configurations are considered separately for SAR compliance. The GMSK EDGE configurations are grouped with GPRS and considered with respect to time-averaged maximum output power to determine compliance. The 3G SAR test reduction procedure is applied to 8-PSK EDGE with GMSK GPRS/EDGE as the primary mode.

3.11.3 UMTS Test Configuration

3G SAR Test Reduction Procedure
In the following procedures, the mode tested for SAR is referred to as the primary mode. The equivalent modes considered for SAR test reduction are denoted as secondary modes. Both primary and secondary modes must be in the same frequency band. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.3 This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as “otherwise” in the applicable procedures; SAR measurement is required for the secondary mode.

Output power Verification

Maximum output power is verified on the high, middle and low channels according to procedures described in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all “1’s” for WCDMA/HSDPA or by applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HSDPA, HSPA) are requied in the SAR report. All configurations that are not supported by the handset or cannot be measured due to technical or equipment limitations must be clearly identified.

Head SAR

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”. The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR in 3.4 kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure.

1) Body-Worn Accessory SAR

SAR for body-worn accessory configurations is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using an applicable RMC configuration with the corresponding spreaing code or DPDCHn, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When more than 2 DPDCHn are supported by the handset, it may be necessary to configure additional DPDCHn using FTM (Factory Test Mode) or other chipset based test approaches with parameters similar to those used in 384 kbps and 768 kbps RMC.

2) Handsets with Release 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body-worn accessory configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures in the "Release 5 HSDPA Data Devices" section of this document, for the highest reported SAR body-worn accessory exposure configuration in 12.2 kbps RMC. Handsets with both HSDPA and HSUPA are tested according to Release 6 HSPA test procedures.

HSDPA should be configured according to the UE category of a test device.The number of HSDSCH/ HS-PDSCHs, HARQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission conditions, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4 ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. DPCCH and DPDCH gain factors(βc, βd), and HS-DPCCH power offset parameters (ΔACK, ΔNACK, ΔCQI) should be set according to values indicated in the Table below. The CQI value is determined by the UE category, transport block size, number of HS-PDSCHs and modulation used in the H-set

Table 2: Subtests for UMTS Release 5 HSDPA

Sub-set	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (note 1, note 2)	CM(dB) (note 3)	MPR(dB)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (note 4)	15/15 (note 4)	64	12/15 (note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI}= 8 ⇔ $A_{hs} = \beta_{hs}/\beta_c$=30/15 ⇔ β_{hs}=30/15*β_c
Note2: CM=1 for β_c/β_d =12/15, β_{hs}/β_c=24/15.
Note3: For subtest 2 the $\beta_c\beta_d$ ratio of 12/15 for the TFC during the measurement period(TF1,TF0) is achieved by setting the signaled gain factors for the reference TFC (TFC1,TF1) to β_c=11/15 and β_d=15/15.

HSUPA Test Configuration

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body-worn accessory configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures in the "Release 6 HSPA Data Devices" section of this document, for the highest reported body-worn accessory exposure SAR configuration in 12.2 kbps RMC. When VOIP is applicable for next to the ear head exposure in HSPA, the 3G SAR test reduction procedure is applied to HSPA with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body-worn accessory measurements is tested for next to the ear head exposure.

Due to inner loop power control requirements in HSPA, a communication test set is required for output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSPA are configured according to the β values indicated in Table 2 and other applicable procedures described in the 'WCDMA Handset' and 'Release 5 HSDPA Data Devices' sections of this document

Table 3: Sub-Test 5 Setup for Release 6 HSUPA

Sub-set	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}(1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM (2) (dB)	MPR (dB)	AG(4) Index	E-TFCI
1	11/15(3)	15/15(3)	64	11/15(3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}:47/15 β_{ed2}:47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15(4)	15/15(4)	64	15/15(4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, ΔNACK and Δ_{CQI} = 8 ⇔ A_{hs} = β_{hs}/β_c = 30/15 ⇔ β_{hs}= 30/15 *β_c.
Note 2: CM = 1 for βc/βd =12/15, β_{hs}/β_c =24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the βc/βd ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 10/15 and βd = 15/15.
Note 4: For subtest 5 the βc/βd ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to βc = 14/15 and βd = 15/15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Figure 5.1g.
Note 6: βed can not be set directly; it is set by Absolute Grant Value.

3.11.4 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.

3.11.5 WIFI Test Configuration

The SAR measurement and test reduction procedures are structured according to either the DSSS or OFDM transmission mode configurations used in each standalone frequency band and aggregated band. For devices that operate in exposure configurations that require multiple test positions, additional SAR test reduction may be applied. The maximum output power specified for production units, including tune-up tolerance, are used to determine initial SAR test requirements for the 802.11 transmission modes in a frequency band. SAR is measured using the highest measured maximum output power channel for the initial test configuration. SAR measurement and test reduction for the remaining 802.11 modes and test channels are determined according to measured or specified maximum output power and reported SAR of the initial measurements. The general test reduction and SAR measurement approaches are summarized in the following:
1. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures.
2. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, an “initial test configuration” is first determined for each standalone and aggregated frequency band according to the maximum output power and tune-up tolerance specified for production units.

a. When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.
b. SAR is measured for OFDM configurations using the initial test configuration procedures. Additional frequency band specific SAR test reduction may be considered for individual frequency bands
c. Depending on the reported SAR of the highest maximum output power channel tested in the initial test configuration, SAR test reduction may apply to subsequent highest output channels in the initial test configuration to reduce the number of SAR measurements.
3. The Initial test configuration does not apply to DSSS. The 2.4 GHz band SAR test requirements and 802.11b DSSS procedures are used to establish the transmission configurations required for SAR measurement.
4. An “initial test position”is applied to further reduce the number of SAR tests for devices operating in next to the ear, UMPC mini-tablet or hotspot mode exposure configurations that require multiple test positions .
a. SAR is measured for 802.11b according to the 2.4 GHz DSSS procedure using the exposure condition established by the initial test position.
b. SAR is measured for 2.4 GHz and 5 GHz OFDM configurations using the initial test configuration.
802.11b/g/n operating modes are tested independently according to the service requirements in each frequency band. 802.11b/g/n modes are tested on the maximum average output channel.
5. The Initial test position does not apply to devices that require a fixed exposure test position. SAR is measured in a fixed exposure test position for these devices in 802.11b according to the 2.4 GHz DSSS procedure or in 2.4 GHz and 5 GHz OFDM configurations using the initial test configuration procedures .
6. The “subsequent test configuration”procedures are applied to determine if additional SAR measurements are required for the remaining OFDM transmission modes that have not been tested in the initial test configuration. SAR test exclusion is determined according to reported SAR in the initial test configuration and maximum output power specified or measured for these other OFDM configurations.

2.4 GHz and 5GHz SAR Procedures
Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions. When SAR measurement is required for an OFDM configuration, the initial test configuration, subsequent test configuration and initial test position procedures are applied. The SAR test exclusion requirements for 802.11g/n OFDM configurations are described in section 5.2.2.
1. 802.11b DSSS SAR Test Requirements
SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:
a. When the reported SAR of the highest measured maximum output power channel (section 3.1) for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
b. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.
1. 2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements
When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3). SAR is not required for the following 2.4 GHz OFDM conditions.
a. When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration
b. 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.
2. SAR Test Requirements for OFDM Configurations
When SAR measurement is required for 802.11 a/g/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 or §15.247 band are supported, the highest maximum output power transmission mode configuration and maximum output power channel across the bands must be used to determine SAR test reduction, according to the initial test configuration and subsequent test configuration requirements.20 In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.
3. OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements

The initial test configuration for 2.4 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures (section 4). When multiple configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined according to the following steps applied sequentially.

a. The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.
b. If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
c. If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.
d. When multiple transmission modes (802.11a/g/n) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11g is chosen over 802.11n.

After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.

a. Channels with measured maximum output power within ¼ dB of each other are considered to have the same maximum output.
b. 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.
c. 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.

Initial Test Configuration Procedures

An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required (see section 5.3.2). SAR test reduction of subsequent highest output test channels is based on the reported SAR of the initial test configuration. For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode.23 For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration. When the reported SAR of the initial test configuration is > 0.8 W/kg, SAR measurement is required for the subsequent next highest measured output power channel(s) in the initial test configuration until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

4. Subsequent Test Configuration Procedures

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. The initial test position procedure is applied to next to the ear, UMPC mini-tablet and hotspot mode configurations. When the same maximum output power is specified for multiple transmission modes, the procedures in section 5.3.2 are applied to determine the test configuration. Additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. The subsequent test configuration and SAR measurement procedures are described in the following.

a. When SAR test exclusion provisions of KDB Publication 447498 are applicable and SAR measurement is not required for the initial test configuration, SAR is also not required for the next highest maximum output power transmission mode subsequent test configuration(s) in that frequency band or aggregated band and exposure configuration.
b. When the highest reported SAR for the initial test configuration (when applicable, include subsequent highest output channels), according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.
c. The number of channels in the initial test configuration and subsequent test configuration can be different due to differences in channel bandwidth. When SAR measurement is required for a subsequent test configuration

and the channel bandwidth is smaller than that in the initial test configuration, all channels in the subsequent test configuration that overlap with the larger bandwidth channel tested in the initial test configuration should be used to determine the highest maximum output power channel. This step requires additional power measurement to identify the highest maximum output power channel in the subsequent test configuration to determine SAR test reduction.

1). SAR should first be measured for the channel with highest measured output power in the subsequent test configuration.

2). SAR for subsequent highest measured maximum output power channels in the subsequent test configuration is required only when the reported SAR of the preceding higher maximum output power channel(s) in the subsequent test configuration is > 1.2 W/kg or until all required channels are tested.

a) For channels with the same measured maximum output power, SAR should be measured using the channel closest to the center frequency of the larger channel bandwidth channel in the initial test configuration.

d. SAR measurements for the remaining highest specified maximum output power OFDM transmission mode configurations that have not been tested in the initial test configuration (highest maximum output) or subsequent test configuration(s) (subsequent next highest maximum output power) is determined by applying the subsequent test configuration procedures in this section to the remaining configurations according to the following:

1) replace “subsequent test configuration” with “next subsequent test configuration” (i.e., subsequent next highest specified maximum output power configuration)

2) replace “initial test configuration” with “all tested higher output power configurations.

3.11. Power Reduction

The product without any power reduction.

3.12. 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 447498 D01 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.”

<GSM Conducted Power>

General Note:

1. Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. According to October 2013TCB Workshop, for GSM / GPRS / EGPRS, the number of time slots to test for SAR should correspond to the highest frame-average maximum output power configuration, considering the possibility of e.g. 3rd party VoIP operation for head and body-worn SAR testing, the EUT was set in GPRS (4Tx slot) for GSM850/GSM1900 band due to their highest frame-average power.
3. For hotspot mode SAR testing, GPRS should be evaluated, therefore the EUT was set in GPRS (4 Tx slots) for GSM850/GSM1900 band due to its highest frame-average power.

Conducted power measurement results for GSM850/PCS1900

GSM 850		Tune-up	Burst Conducted power (dBm)			Division Factors	Tune-up	Average power (dBm)		
			Channel/Frequency(MHz)					Channel/Frequency(MHz)		
		Max	128/ 824.2	190/ 836.6	251/ 848.8		Max	128/ 824.2	190/ 836.6	251/8 48.8
GSM		33	32.82	32.78	32.89	-9.03dB	23.97	23.79	23.75	23.86
GPRS (GMSK)	1TX slot	33	32.72	32.67	32.80	-9.03dB	23.97	23.69	23.64	23.77
	2TX slot	31	30.83	30.65	30.80	**-6.02dB**	24.98	24.81	24.63	24.78
	3TX slot	29	28.77	28.61	28.73	-4.26dB	24.74	24.51	24.35	24.47
	4TX slot	27	26.58	26.43	26.55	-3.01dB	23.99	23.57	23.42	23.54
EGPRS (8PSK)	1TX slot	26	25.55	25.34	25.87	-9.03dB	16.97	16.52	16.31	16.84
	2TX slot	26	26.14	25.67	25.48	-6.02dB	19.98	20.12	19.65	19.46
	3TX slot	25.5	25.01	24.29	24.40	-4.26dB	21.24	20.75	20.03	20.14
	4TX slot	22.5	22.15	21.40	21.85	-3.01dB	19.49	19.14	18.39	18.84
GSM 1900		Tune-up	Burst Conducted power (dBm)			Division Factors	Tune-up	Average power (dBm)		
			Channel/Frequency(MHz)					Channel/Frequency(MHz)		
		Max	512/ 1850.2	661/ 1880	810/ 1909.8		Max.	512/ 1850.2	661/ 1880	810/ 1909.8
GSM		30	29.71	29.80	29.65	-9.03dB	20.97	20.68	20.77	20.62
GPRS (GMSK)	**1TX slot**	30	29.69	29.72	29.59	-9.03dB	20.97	20.66	20.69	20.56
	2TX slot	28	27.60	27.53	27.42	-6.02dB	21.98	21.58	21.51	21.40
	3TX slot	26	25.98	25.92	25.80	-4.26dB	21.74	21.72	21.66	21.54
	4TX slot	24	23.93	23.86	23.74	-3.01dB	20.99	20.92	20.85	20.73
EGPRS (8PSK)	1TX slot	24	21.54	23.11	23.73	-9.03dB	14.97	12.51	14.08	14.70
	2TX slot	23.5	21.80	22.70	23.07	-6.02dB	17.48	15.78	16.68	17.05
	3TX slot	23	20.26	21.72	22.69	-4.26dB	18.74	16.00	17.46	18.43
	4TX slot	29.5	17.56	19.05	19.16	-3.01dB	26.49	14.55	16.04	16.15

Notes:

1. Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.00dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.00dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.00dB
2. According to the conducted power as above, the GPRS measurements are performed with 4Txslot for GPRS850 and 2Txslot GPRS1900.

<UMTS Conducted Power>

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification. A summary of these settings are illustrated below:

HSDPA Setup Configuration:

a. The EUT was connected to Base Station CMW500 referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting:
   i. Set Gain Factors (β_c and β_d) and parameters were set according to each
   ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
   iii. Set RMC 12.2Kbps + HSDPA mode.
   iv. Set Cell Power = -86 dBm
   v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
   vi. Select HSDPA Uplink Parameters
   vii. Set Delta ACK, Delta NACK and Delta CQI = 8
   viii. Set Ack-Nack Repetition Factor to 3
   ix. Set CQI Feedback Cycle (k) to 4 ms
   x. Set CQI Repetition Factor to 2
   xi. Power Ctrl Mode = All Up bits
d. The transmitted maximum output power was recorded.

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

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

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSUPA Setup Configuration:

a. The EUT was connected to Base Station R&S CMW500 referred to the Setup Configuration.
b. The RF path losses were compensated into the measurements.
c. A call was established between EUT and Base Station with following setting * :
   i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
   ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
   iii. Set Cell Power = -86 dBm
   iv. Set Channel Type = 12.2k + HSPA
   v. Set UE Target Power
   vi. Power Ctrl Mode= Alternating bits
   vii. Set and observe the E-TFCI
   viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI

d. The transmitted maximum output power was recorded.

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.

Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.

Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

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

General Note

1. Per KDB 941225 D01, RMC 12.2kbps setting is used to evaluate SAR. If AMR 12.2kbps power is < 0.25dB higher than RMC 12.2kbps, SAR tests with AMR 12.2kbps can be excluded.
2. By design, AMR and HSDPA/HSUPA RF power will not be larger than RMC 12.2kbps, detailed information is included in Tune-up Procure exhibit.
3. It is expected by the manufacturer that MPR for some HSDPA/HSUPA subtests may differ from the specification of 3GPP, according to the chipset implementation in this model. The implementation and expected deviation are detailed in tune-up procedure exhibit.

Conducted Power Measurement Results(WCDMA Band II/V)

Item	band	WCDMA Band II result (dBm)			WCDMA Band V result (dBm)		
		Channel/Frequency(MHz)			Channel/Frequency(MHz)		
	sub-test	9262/ 1852.4	9400/ 1880	9538/ 1907.6	4132/ 826.4	4182/ 836.4	4233/ 846.6
RMC	12.2kbps	22.42	22.46	22.59	22.56	22.51	22.55
HSDPA	Sub –Test 1	21.93	21.66	21.16	22.02	21.40	21.17
	Sub –Test 2	21.43	22.40	22.20	20.89	21.88	21.30
	Sub –Test 3	21.92	21.82	22.56	21.17	21.33	21.86
	Sub –Test 4	22.46	22.09	21.89	21.49	21.42	21.19
HSUPA	Sub –Test 1	21.77	21.95	21.51	21.75	21.80	21.38
	Sub –Test 2	21.98	21.80	22.20	21.80	21.68	21.88
	Sub –Test 3	22.37	21.91	22.37	21.80	21.38	21.80
	Sub –Test 4	22.12	22.21	22.28	21.59	21.59	21.67
	Sub –Test 5	22.10	22.17	22.24	21.64	21.78	21.49

Note: When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤1/2dB higher than the primary mode (RMC12.2kbps) or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode.

LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
1.4	1	0	QPSK	23.00	23.19	23.11
1.4	1	2		23.03	23.22	23.10
1.4	1	5		23.00	23.36	23.10
1.4	3	0		22.92	23.03	23.23
1.4	3	1		22.95	23.11	23.34
1.4	3	2		23.02	23.12	23.28
1.4	6	0		22.06	22.19	22.27
1.4	1	0	16-QAM	22.31	22.41	22.78
1.4	1	2		22.35	22.40	22.82
1.4	1	5		22.27	22.46	22.69
1.4	3	0		22.39	22.15	22.35
1.4	3	1		22.34	22.14	22.38
1.4	3	2		22.30	22.22	22.30
1.4	6	0		21.36	21.43	21.11
3	1	0	QPSK	22.91	23.02	23.21
3	1	7		22.94	23.13	23.38
3	1	14		23.00	23.11	23.38
3	8	0		21.96	22.20	22.30
3	8	4		22.03	22.08	22.23
3	8	7		22.16	22.11	22.26
3	15	0		21.98	22.16	22.25
3	1	0	16-QAM	23.00	22.26	22.74
3	1	7		22.97	22.24	22.58
3	1	14		23.06	22.26	22.47
3	8	0		21.16	21.40	21.47
3	8	4		21.08	21.28	21.30
3	8	7		20.97	21.32	21.24
3	15	0		21.31	21.21	21.36

LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	22.92	23.20	23.28
5	1	12		23.04	23.14	23.14
5	1	24		23.04	23.16	23.22
5	12	0		22.11	22.19	22.40
5	12	6		22.12	22.02	22.33
5	12	11		22.19	22.20	22.33
5	25	0		22.11	22.17	22.41
5	1	0	16-QAM	22.26	21.80	22.27
5	1	12		22.33	21.75	22.39
5	1	24		22.40	21.86	22.26
5	12	0		21.20	21.10	21.46
5	12	6		21.00	21.03	21.52
5	12	11		21.03	21.06	21.29
5	25	0		21.19	21.22	21.39
10	1	0	QPSK	23.01	23.12	23.51
10	1	24		23.04	23.05	23.33
10	1	49		23.11	23.15	23.38
10	25	0		22.22	22.14	22.20
10	25	12		22.16	22.05	22.25
10	25	24		22.24	22.13	22.45
10	50	0		22.16	22.19	22.20
10	1	0	16-QAM	23.10	22.85	22.35
10	1	24		23.14	22.84	22.31
10	1	49		23.13	22.85	22.29
10	25	0		21.06	21.40	21.42
10	25	12		21.03	21.30	21.37
10	25	24		21.16	21.26	21.52
10	50	0		21.12	21.30	21.34

LTE Band 2 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
15	1	0	QPSK	22.99	23.08	23.40
15	1	37		23.09	23.05	23.41
15	1	74		23.16	23.11	23.34
15	36	0		22.16	22.17	22.34
15	36	18		22.22	22.10	22.36
15	36	39		22.22	22.15	22.43
15	75	0		22.09	22.06	22.30
15	1	0	16-QAM	23.09	22.30	23.13
15	1	38		23.08	22.25	22.95
15	1	75		23.17	22.35	23.06
15	36	0		21.11	21.39	21.49
15	36	18		21.20	21.27	21.35
15	36	39		21.28	21.34	21.43
15	75	0		21.20	21.15	21.52
20	1	0	QPSK	23.10	23.32	23.42
20	1	49		23.36	23.30	23.62
20	1	99		23.41	23.35	23.53
20	50	0		22.20	22.27	22.52
20	50	24		22.30	22.19	22.47
20	50	49		22.36	22.29	22.20
20	100	0		22.20	22.16	22.44
20	1	0	16-QAM	21.80	22.18	22.19
20	1	49		22.05	21.78	22.31
20	1	99		22.02	22.18	22.19
20	50	0		21.26	21.21	21.47
20	50	24		21.35	21.23	21.46
20	50	49		21.30	21.36	21.42
20	100	0		21.21	21.26	21.44

LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
1.4	1	0	QPSK	22.93	22.59	22.95
1.4	1	2		22.93	22.59	23.04
1.4	1	5		22.90	22.65	23.01
1.4	3	0		22.81	22.74	22.78
1.4	3	1		22.84	22.81	22.82
1.4	3	2		22.81	22.77	22.74
1.4	6	0		21.86	21.73	21.91
1.4	1	0	16-QAM	22.63	22.20	22.15
1.4	1	2		22.58	22.29	22.23
1.4	1	5		22.69	22.32	22.29
1.4	3	0		21.96	21.86	21.97
1.4	3	1		21.96	21.86	22.11
1.4	3	2		21.97	21.82	22.06
1.4	6	0		20.77	20.81	21.00
3	1	0	QPSK	22.62	22.62	23.04
3	1	7		22.66	22.65	23.03
3	1	14		22.67	22.63	23.04
3	8	0		21.77	21.69	21.77
3	8	4		21.73	21.77	21.78
3	8	7		21.81	21.79	21.92
3	15	0		21.68	21.75	21.85
3	1	0	16-QAM	22.61	22.20	22.18
3	1	7		22.72	22.33	22.21
3	1	14		22.69	22.30	22.25
3	8	0		20.62	20.92	20.88
3	8	4		20.65	21.15	20.81
3	8	7		20.68	21.07	20.95
3	15	0		20.85	21.00	20.84

LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	22.69	22.79	22.57
5	1	12		22.67	22.76	22.61
5	1	24		22.77	22.80	22.66
5	12	0		21.88	21.63	21.83
5	12	6		21.85	21.71	21.67
5	12	11		21.84	21.67	21.82
5	25	0		21.72	21.74	21.77
5	1	0	16-QAM	21.96	21.36	21.97
5	1	12		21.94	21.42	22.01
5	1	24		22.01	21.39	22.09
5	12	0		20.72	20.53	20.77
5	12	6		20.70	20.76	20.84
5	12	11		20.80	20.73	20.72
5	25	0		20.88	20.92	20.76
10	1	0	QPSK	22.65	22.65	22.88
10	1	24		22.74	22.68	23.01
10	1	49		22.76	22.72	23.05
10	25	0		21.75	21.72	21.72
10	25	12		21.88	21.73	21.71
10	25	24		21.93	21.73	21.67
10	50	0		21.80	21.86	21.69
10	1	0	16-QAM	22.75	21.78	21.92
10	1	24		22.75	21.81	21.86
10	1	49		22.80	21.77	21.97
10	25	0		20.80	20.68	20.71
10	25	12		20.74	20.94	20.81
10	25	24		20.79	20.70	20.79
10	50	0		20.81	20.94	20.81

LTE Band 4 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
15	1	0	QPSK	22.68	22.70	22.95
15	1	37		22.72	22.73	22.96
15	1	74		22.75	22.75	23.10
15	36	0		21.74	21.82	21.71
15	36	18		21.84	21.67	21.69
15	36	39		21.91	21.61	21.72
15	75	0		21.88	21.65	21.61
15	1	0	16-QAM	22.72	21.82	22.29
15	1	38		22.75	21.84	22.29
15	1	75		22.77	21.77	22.47
15	36	0		20.80	20.89	20.67
15	36	18		20.83	21.05	20.67
15	36	39		20.73	20.81	20.74
15	75	0		20.86	20.89	20.80
20	1	0	QPSK	22.91	22.79	22.90
20	1	49		22.99	22.79	22.94
20	1	99		22.93	22.84	23.11
20	50	0		21.79	21.83	21.71
20	50	24		21.89	21.79	21.86
20	50	49		21.75	21.62	21.79
20	100	0		21.87	21.70	21.74
20	1	0	16-QAM	21.51	22.05	21.69
20	1	49		21.62	22.02	21.89
20	1	99		21.50	21.95	21.82
20	50	0		20.87	20.79	20.67
20	50	24		20.89	20.94	20.70
20	50	49		20.91	20.72	20.87
20	100	0		20.78	20.88	20.70

LTE Band 5 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
1.4	1	0	QPSK	22.62	22.94	23.06
1.4	1	2		22.75	22.96	22.97
1.4	1	5		22.73	22.98	23.04
1.4	3	0		22.83	22.76	22.80
1.4	3	1		22.84	22.84	22.79
1.4	3	2		22.79	22.78	22.86
1.4	6	0		21.78	21.87	21.88
1.4	1	0	16-QAM	22.35	22.68	23.04
1.4	1	2		22.29	22.57	23.09
1.4	1	5		22.33	22.69	23.10
1.4	3	0		21.84	22.33	22.20
1.4	3	1		21.81	22.22	22.19
1.4	3	2		21.82	22.17	22.18
1.4	6	0		20.84	20.96	21.08
3	1	0	QPSK	22.69	22.76	22.94
3	1	7		22.76	22.69	22.96
3	1	14		22.86	22.68	22.98
3	8	0		21.75	21.77	21.87
3	8	4		21.81	21.84	21.77
3	8	7		21.88	21.84	21.79
3	15	0		21.75	21.99	21.96
3	1	0	16-QAM	22.55	22.37	22.76
3	1	7		22.54	22.35	22.74
3	1	14		22.54	22.35	22.78
3	8	0		20.84	20.94	20.79
3	8	4		20.90	20.94	20.81
3	8	7		20.74	20.85	20.90
3	15	0		21.03	20.72	20.78

LTE Band 5 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	22.65	22.80	22.77
5	1	12		22.67	22.79	22.67
5	1	24		22.69	22.78	22.84
5	12	0		21.71	21.74	21.78
5	12	6		21.88	21.96	21.83
5	12	11		21.93	21.87	21.80
5	25	0		21.72	21.82	21.80
5	1	0	16-QAM	21.90	21.58	21.82
5	1	12		21.95	21.52	21.74
5	1	24		21.94	21.48	21.79
5	12	0		20.89	20.71	20.84
5	12	6		20.74	20.57	20.75
5	12	11		20.79	20.51	20.73
5	25	0		20.82	20.75	20.67
10	1	0	QPSK	23.05	22.83	22.84
10	1	24		23.08	22.96	22.75
10	1	49		23.12	22.94	22.87
10	25	0		22.65	21.88	21.72
10	25	12		21.90	21.93	21.78
10	25	24		21.84	21.73	21.78
10	50	0		21.85	21.91	21.92
10	1	0	16-QAM	22.79	21.79	21.72
10	1	24		22.79	21.87	21.88
10	1	49		22.86	21.91	21.80
10	25	0		20.71	20.84	20.84
10	25	12		20.74	20.67	20.78
10	25	24		20.80	20.96	20.72
10	50	0		20.86	20.79	20.90

LTE Band 7 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	21.98	21.56	21.75
5	1	12		22.35	21.68	22.02
5	1	24		22.29	21.28	21.45
5	12	0		21.42	21.06	21.24
5	12	6		21.30	21.09	21.22
5	12	11		21.37	21.17	21.16
5	25	0		21.27	21.23	21.25
5	1	0	16-QAM	21.15	21.20	21.19
5	1	12		21.13	21.18	21.18
5	1	24		21.10	21.17	21.22
5	12	0		20.24	20.28	20.17
5	12	6		20.28	20.21	20.12
5	12	11		20.28	20.16	20.17
5	25	0		20.42	20.17	20.35
10	1	0	QPSK	21.78	21.66	21.74
10	1	24		22.12	21.55	22.09
10	1	49		22.15	21.52	21.90
10	25	0		21.43	21.14	21.21
10	25	12		21.37	21.09	21.25
10	25	24		21.26	21.09	21.29
10	50	0		21.38	21.11	21.22
10	1	0	16-QAM	21.71	21.19	21.37
10	1	24		22.18	21.19	21.34
10	1	49		22.24	21.17	21.38
10	25	0		20.33	20.28	20.29
10	25	12		20.32	20.24	20.29
10	25	24		20.29	20.26	20.36
10	50	0		20.38	20.29	20.24

LTE Band 7 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
15	1	0	QPSK	21.80	21.85	21.70
15	1	37		22.19	21.49	21.94
15	1	74		22.17	21.26	21.65
15	36	0		21.17	21.04	21.14
15	36	18		21.26	21.15	21.20
15	36	39		21.36	21.04	21.12
15	75	0		21.20	21.18	21.20
15	1	0	16-QAM	21.72	21.15	21.56
15	1	38		22.19	21.19	21.81
15	1	75		22.24	21.17	21.54
15	36	0		20.43	20.28	20.23
15	36	18		20.32	20.32	20.28
15	36	39		20.38	20.23	20.21
15	75	0		20.35	20.20	20.31
20	1	0	QPSK	21.84	22.11	21.43
20	1	49		22.37	21.57	21.85
20	1	99		22.24	21.75	21.98
20	50	0		21.36	21.22	21.23
20	50	24		21.20	21.12	21.20
20	50	49		21.11	21.14	21.21
20	100	0		21.32	21.19	21.34
20	1	0	16-QAM	21.26	21.48	21.13
20	1	49		21.05	21.42	21.21
20	1	99		21.05	21.53	21.27
20	50	0		20.41	20.23	20.27
20	50	24		20.37	20.31	20.36
20	50	49		20.44	20.13	20.26
20	100	0		20.34	20.25	20.30

LTE Band 12 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
1.4	1	0	QPSK	23.23	22.83	22.92
1.4	1	2		23.21	22.88	22.97
1.4	1	5		23.27	22.89	22.92
1.4	3	0		23.05	23.07	22.88
1.4	3	1		22.98	23.12	22.97
1.4	3	2		23.03	23.03	22.87
1.4	6	0		22.09	21.98	21.80
1.4	1	0	16-QAM	23.12	22.60	22.89
1.4	1	2		23.11	22.52	22.82
1.4	1	5		23.07	22.45	22.81
1.4	3	0		22.15	22.07	22.32
1.4	3	1		22.12	21.98	22.37
1.4	3	2		22.13	21.97	22.29
1.4	6	0		21.16	21.00	21.17
3	1	0	QPSK	23.00	22.86	22.99
3	1	7		23.10	22.91	22.92
3	1	14		23.08	22.89	22.97
3	8	0		22.18	22.00	21.99
3	8	4		22.11	22.01	21.81
3	8	7		22.12	21.99	21.80
3	15	0		22.08	22.00	21.92
3	1	0	16-QAM	22.98	22.57	22.99
3	1	7		22.91	22.44	22.90
3	1	14		22.95	22.50	22.84
3	8	0		20.94	21.09	20.73
3	8	4		20.95	21.27	20.69
3	8	7		21.04	21.22	20.95
3	15	0		21.13	21.17	20.69

LTE Band 12 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	22.86	23.02	22.95
5	1	12		23.07	22.94	22.79
5	1	24		23.01	22.98	22.77
5	12	0		22.09	22.07	21.92
5	12	6		21.93	21.95	22.02
5	12	11		22.07	21.99	21.94
5	25	0		21.98	22.00	22.03
5	1	0	16-QAM	22.16	21.68	21.90
5	1	12		22.21	21.67	21.89
5	1	24		22.27	21.68	21.86
5	12	0		20.94	20.82	20.92
5	12	6		20.99	20.95	20.81
5	12	11		21.06	20.91	20.71
5	25	0		21.12	21.12	20.71
10	1	0	QPSK	22.97	23.08	23.30
10	1	24		23.05	22.96	23.11
10	1	49		22.98	22.87	23.13
10	25	0		21.96	21.97	22.03
10	25	12		22.19	22.09	21.91
10	25	24		21.98	21.95	22.03
10	50	0		22.04	21.98	21.82
10	1	0	16-QAM	23.02	22.16	22.03
10	1	24		22.99	22.05	21.86
10	1	49		22.93	21.97	21.84
10	25	0		20.98	20.90	21.03
10	25	12		21.02	21.02	20.98
10	25	24		20.89	21.07	20.76
10	50	0		21.11	21.07	20.93

LTE Band 17 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	23.08	22.79	22.87
5	1	12		22.99	22.77	22.84
5	1	24		22.93	22.69	22.81
5	12	0		22.03	22.05	21.85
5	12	6		22.02	21.94	22.05
5	12	11		22.03	21.91	21.98
5	25	0		22.14	21.99	21.90
5	1	0	16-QAM	21.74	22.25	22.06
5	1	12		21.80	22.12	22.10
5	1	24		21.60	22.14	22.03
5	12	0		20.81	20.93	20.79
5	12	6		20.84	21.03	20.79
5	12	11		20.98	20.89	20.66
5	25	0		21.04	21.02	20.92
10	1	0	QPSK	23.03	22.97	23.16
10	1	24		22.88	22.99	23.12
10	1	49		22.95	22.86	23.07
10	25	0		22.07	21.96	22.05
10	25	12		21.98	21.94	21.87
10	25	24		22.02	21.83	22.03
10	50	0		22.04	21.90	21.84
10	1	0	16-QAM	23.01	22.14	22.05
10	1	24		22.93	21.96	21.80
10	1	49		23.07	21.92	21.84
10	25	0		20.77	21.10	21.01
10	25	12		20.88	21.03	20.98
10	25	24		20.89	20.88	20.83
10	50	0		20.92	21.06	20.95

LTE Band 25 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
1.4	1	0	QPSK	23.21	23.02	21.83
1.4	1	2		23.24	23.02	21.72
1.4	1	5		23.22	22.97	21.19
1.4	3	0		23.11	23.09	21.64
1.4	3	1		23.16	23.18	21.56
1.4	3	2		23.13	23.18	21.31
1.4	6	0		22.12	22.10	20.91
1.4	1	0	16-QAM	23.10	22.19	20.88
1.4	1	2		23.09	22.22	20.87
1.4	1	5		23.09	22.15	20.38
1.4	3	0		22.28	22.14	21.20
1.4	3	1		22.36	22.23	21.11
1.4	3	2		22.33	22.14	20.84
1.4	6	0		21.26	21.14	20.16
3	1	0	QPSK	23.08	23.10	22.81
3	1	7		23.08	23.09	22.17
3	1	14		23.09	23.09	21.20
3	8	0		22.39	22.08	21.76
3	8	4		22.30	22.12	21.43
3	8	7		22.16	22.15	20.88
3	15	0		22.18	22.11	21.38
3	1	0	16-QAM	23.31	22.20	21.73
3	1	7		23.27	22.20	21.30
3	1	14		23.31	22.25	20.22
3	8	0		21.19	21.31	20.90
3	8	4		21.12	21.20	20.57
3	8	7		21.14	21.29	20.01
3	15	0		21.37	21.14	20.57

LTE Band 25 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	23.10	23.18	22.37
5	1	12		23.15	23.23	21.53
5	1	24		23.16	23.22	19.53
5	12	0		22.29	22.30	21.43
5	12	6		22.31	22.31	20.91
5	12	11		22.20	22.15	19.87
5	25	0		22.33	22.23	20.71
5	1	0	16-QAM	22.56	21.89	21.40
5	1	12		22.56	21.91	20.62
5	1	24		22.59	21.99	18.54
5	12	0		21.17	21.11	20.43
5	12	6		21.14	21.15	19.90
5	12	11		21.23	21.16	18.83
5	25	0		21.38	21.38	19.69
10	1	0	QPSK	23.25	23.23	22.82
10	1	24		23.27	23.16	22.57
10	1	49		23.29	23.20	19.96
10	25	0		22.40	22.27	21.67
10	25	12		22.39	22.34	21.53
10	25	24		22.50	22.31	20.69
10	50	0		22.43	22.36	21.61
10	1	0	16-QAM	23.38	22.35	21.91
10	1	24		23.40	22.36	21.59
10	1	49		23.36	22.40	19.04
10	25	0		21.21	21.34	20.83
10	25	12		21.36	21.39	20.53
10	25	24		21.31	21.34	19.77
10	50	0		21.35	21.43	20.55

LTE Band 25 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
15	1	0	QPSK	23.24	23.27	23.33
15	1	37		23.30	23.22	22.74
15	1	74		23.31	23.21	20.37
15	36	0		22.41	22.30	21.87
15	36	18		22.40	22.33	21.75
15	36	39		22.40	22.40	21.34
15	75	0		22.39	22.37	21.68
15	1	0	16-QAM	23.40	22.47	23.07
15	1	38		23.36	22.36	22.35
15	1	75		23.40	22.43	19.88
15	36	0		21.35	21.48	21.09
15	36	18		21.42	21.49	20.71
15	36	39		21.43	21.40	20.58
15	75	0		21.39	21.32	20.81
20	1	0	QPSK	23.35	23.41	23.49
20	1	49		23.51	23.24	23.03
20	1	99		23.60	23.41	22.15
20	50	0		22.33	22.18	22.40
20	50	24		22.43	22.31	21.97
20	50	49		22.57	22.29	21.54
20	100	0		22.47	22.19	21.92
20	1	0	16-QAM	22.07	22.18	22.20
20	1	49		22.24	21.83	21.81
20	1	99		22.19	22.23	21.12
20	50	0		21.54	21.27	21.42
20	50	24		21.56	21.25	21.01
20	50	49		21.51	21.25	20.58
20	100	0		21.48	21.27	21.04

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LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
1.4	1	0	QPSK	23.49	23.20	23.01
1.4	1	2		23.53	23.08	23.01
1.4	1	5		23.47	23.07	23.04
1.4	3	0		23.30	23.28	22.97
1.4	3	1		23.37	23.34	22.95
1.4	3	2		23.38	23.28	23.01
1.4	6	0		22.40	22.19	22.06
1.4	1	0	16-QAM	23.44	22.89	23.02
1.4	1	2		23.34	22.82	23.05
1.4	1	5		23.39	22.77	23.07
1.4	3	0		22.58	22.34	22.53
1.4	3	1		22.61	22.28	22.53
1.4	3	2		22.57	22.24	22.54
1.4	6	0		21.51	21.18	21.17
3	1	0	QPSK	23.25	23.11	23.06
3	1	7		23.30	23.12	23.04
3	1	14		23.20	23.10	23.14
3	8	0		22.38	22.34	21.90
3	8	4		22.46	22.32	21.86
3	8	7		22.38	22.17	21.88
3	15	0		22.47	22.25	21.91
3	1	0	16-QAM	23.20	22.93	22.91
3	1	7		23.26	22.83	22.95
3	1	14		23.24	22.74	23.01
3	8	0		21.25	21.45	20.87
3	8	4		21.21	21.45	20.88
3	8	7		21.20	21.40	20.98
3	15	0		21.52	21.25	20.86

LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	23.17	23.32	22.86
5	1	12		23.32	23.19	22.76
5	1	24		23.28	23.06	22.93
5	12	0		22.46	22.36	21.87
5	12	6		22.40	22.21	21.92
5	12	11		22.37	22.13	21.84
5	25	0		22.34	22.31	21.88
5	1	0	16-QAM	22.46	22.05	21.84
5	1	12		22.53	21.93	21.83
5	1	24		22.60	21.74	21.88
5	12	0		21.30	21.17	20.91
5	12	6		21.37	21.15	20.82
5	12	11		21.32	21.08	20.81
5	25	0		21.51	21.27	20.79
10	1	0	QPSK	23.29	23.39	23.06
10	1	24		23.39	23.28	23.01
10	1	49		23.48	23.15	22.93
10	25	0		22.50	22.26	21.91
10	25	12		22.51	22.17	21.98
10	25	24		22.45	22.04	21.84
10	50	0		22.43	22.27	21.97
10	1	0	16-QAM	23.34	22.32	22.07
10	1	24		23.52	22.25	21.89
10	1	49		23.42	22.02	21.92
10	25	0		21.31	21.39	21.01
10	25	12		21.39	21.26	20.94
10	25	24		21.39	21.17	20.92
10	50	0		21.35	21.24	20.94

LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
15	1	0	QPSK	23.58	23.43	23.37
15	1	37		23.38	23.42	23.01
15	1	74		23.17	23.07	23.02
15	36	0		22.44	22.38	22.18
15	36	18		22.45	22.25	22.04
15	36	39		22.37	22.01	21.95
15	75	0		22.38	22.17	21.98
15	1	0	16-QAM	23.35	22.48	22.90
15	1	38		23.56	22.26	22.56
15	1	75		23.48	21.90	22.51
15	36	0		21.35	21.43	21.13
15	36	18		21.39	21.37	21.09
15	36	39		21.32	21.18	20.92
15	75	0		21.45	21.21	21.12

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LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
1.4	1	0	QPSK	23.34	23.20	23.34
1.4	1	2		23.35	23.27	23.43
1.4	1	5		23.35	23.19	23.51
1.4	3	0		23.09	23.31	23.10
1.4	3	1		23.14	23.21	23.33
1.4	3	2		23.16	23.23	23.32
1.4	6	0		22.26	22.18	22.31
1.4	1	0	16-QAM	23.20	22.61	23.08
1.4	1	2		23.22	22.70	23.02
1.4	1	5		23.14	22.67	23.03
1.4	3	0		22.32	22.33	22.70
1.4	3	1		22.38	22.39	22.64
1.4	3	2		22.27	22.31	22.69
1.4	6	0		21.27	21.17	21.47
3	1	0	QPSK	23.17	23.19	23.47
3	1	7		23.20	23.20	23.48
3	1	14		23.18	23.25	23.47
3	8	0		22.22	22.22	22.22
3	8	4		22.21	22.09	22.27
3	8	7		22.13	22.20	22.26
3	15	0		22.17	22.14	22.33
3	1	0	16-QAM	23.20	22.73	23.09
3	1	7		23.08	22.69	23.09
3	1	14		23.07	22.71	23.12
3	8	0		21.13	21.39	21.28
3	8	4		21.03	21.47	21.23
3	8	7		21.08	21.40	21.35
3	15	0		21.26	21.23	21.33

LTE Band 26 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	23.18	23.14	23.19
5	1	12		23.12	23.12	23.11
5	1	24		23.20	23.25	23.26
5	12	0		22.13	22.15	22.25
5	12	6		22.26	22.22	22.26
5	12	11		22.29	22.25	22.36
5	25	0		22.21	22.18	22.23
5	1	0	16-QAM	22.48	21.85	22.15
5	1	12		22.55	21.89	22.16
5	1	24		22.53	21.92	22.33
5	12	0		21.01	21.05	21.20
5	12	6		21.04	21.06	21.22
5	12	11		21.08	21.10	21.26
5	25	0		21.24	21.28	21.16
10	1	0	QPSK	N/A	23.13	N/A
10	1	24		N/A	23.13	N/A
10	1	49		N/A	23.26	N/A
10	25	0		N/A	22.14	N/A
10	25	12		N/A	22.15	N/A
10	25	24		N/A	22.23	N/A
10	50	0		N/A	22.20	N/A
10	1	0	16-QAM	N/A	23.21	N/A
10	1	24		N/A	23.26	N/A
10	1	49		N/A	23.56	N/A
10	25	0		N/A	21.08	N/A
10	25	12		N/A	21.15	N/A
10	25	24		N/A	21.16	N/A
10	50	0		N/A	21.20	N/A

LTE Band 38 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	22.20	22.08	21.85
5	1	12		22.30	22.19	21.89
5	1	24		22.31	22.14	21.87
5	12	0		21.16	21.22	21.05
5	12	6		21.26	21.14	20.96
5	12	11		21.23	21.11	20.95
5	25	0		21.14	21.19	21.03
5	1	0	16-QAM	20.76	20.87	21.32
5	1	12		20.83	20.85	21.42
5	1	24		20.86	20.89	21.34
5	12	0		20.16	20.11	20.07
5	12	6		20.13	20.05	19.95
5	12	11		20.09	20.04	19.98
5	25	0		20.40	20.27	20.15
10	1	0	QPSK	22.32	22.16	21.93
10	1	24		22.28	22.23	21.94
10	1	49		22.23	22.22	21.95
10	25	0		21.03	21.14	20.98
10	25	12		21.07	21.18	21.02
10	25	24		21.06	21.22	21.04
10	50	0		21.04	21.19	21.02
10	1	0	16-QAM	21.94	20.49	21.30
10	1	24		21.93	20.50	21.23
10	1	49		21.87	20.55	21.35
10	25	0		20.17	20.15	20.15
10	25	12		20.10	20.21	20.19
10	25	24		20.11	20.11	20.20
10	50	0		20.17	20.23	20.05

LTE Band 38 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
15	1	0	QPSK	22.26	22.06	22.15
15	1	37		22.19	22.19	22.09
15	1	74		22.19	22.15	21.95
15	36	0		21.20	21.17	21.14
15	36	18		21.19	21.10	21.06
15	36	39		21.18	21.10	21.04
15	75	0		21.20	21.09	21.04
15	1	0	16-QAM	21.98	20.60	21.12
15	1	38		21.90	20.55	21.12
15	1	75		21.81	20.47	21.20
15	36	0		20.21	20.32	20.02
15	36	18		20.21	20.36	19.95
15	36	39		20.18	20.27	20.00
15	75	0		20.15	20.30	20.19
20	1	0	QPSK	22.18	22.35	22.10
20	1	49		22.09	22.14	22.06
20	1	99		22.13	22.20	22.10
20	50	0		21.17	21.21	21.09
20	50	24		21.12	21.12	21.12
20	50	49		21.15	21.12	21.09
20	100	0		21.12	21.10	21.10
20	1	0	16-QAM	21.24	20.90	20.89
20	1	49		21.28	20.82	20.82
20	1	99		21.24	20.80	20.34
20	50	0		20.33	20.19	20.15
20	50	24		20.27	20.16	20.11
20	50	49		20.35	20.07	20.12
20	100	0		20.21	20.18	20.10

LTE Band 41 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
5	1	0	QPSK	22.15	22.27	22.02
5	1	12		22.06	22.24	22.15
5	1	24		22.10	22.28	22.08
5	12	0		21.21	21.20	21.12
5	12	6		21.16	21.25	21.09
5	12	11		21.16	21.19	21.21
5	25	0		21.17	21.12	21.11
5	1	0	16-QAM	21.48	20.77	20.75
5	1	12		21.47	20.91	20.89
5	1	24		21.60	20.87	20.88
5	12	0		20.25	20.16	20.07
5	12	6		20.29	20.10	19.98
5	12	11		20.24	20.18	20.14
5	25	0		20.40	20.39	20.25
10	1	0	QPSK	22.40	22.19	22.11
10	1	24		22.30	22.25	22.18
10	1	49		22.39	22.28	22.13
10	25	0		21.24	21.23	21.16
10	25	12		21.22	21.29	21.05
10	25	24		21.31	21.25	21.08
10	50	0		21.29	21.23	21.05
10	1	0	16-QAM	21.73	20.60	21.78
10	1	24		21.86	20.54	21.77
10	1	49		21.75	20.47	21.59
10	25	0		20.25	20.27	20.12
10	25	12		20.28	20.27	20.17
10	25	24		20.33	20.28	20.20
10	50	0		20.39	20.29	20.15

LTE Band 41 Maximum Average Power [dBm]						
BW [MHz]	**RB Size**	**RB Offset**	**Mod**	**Lowest**	**Middle**	**Highest**
15	1	0	QPSK	22.34	22.18	21.96
15	1	37		22.36	22.27	21.98
15	1	74		22.37	22.33	21.98
15	36	0		21.24	21.26	21.08
15	36	18		21.26	21.19	21.06
15	36	39		21.29	21.09	21.00
15	75	0		21.16	21.21	21.12
15	1	0	16-QAM	21.66	20.62	21.29
15	1	38		21.82	20.56	21.13
15	1	75		21.84	20.49	21.26
15	36	0		20.37	20.46	20.01
15	36	18		20.34	20.47	20.01
15	36	39		20.41	20.37	20.05
15	75	0		20.27	20.40	20.23
20	1	0	QPSK	22.30	22.24	22.08
20	1	49		22.36	22.21	21.99
20	1	99		22.46	22.22	22.18
20	50	0		21.21	21.21	21.03
20	50	24		21.31	21.26	21.07
20	50	49		21.37	21.22	21.05
20	100	0		21.28	21.22	21.03
20	1	0	16-QAM	20.91	20.96	21.04
20	1	49		21.01	20.84	20.33
20	1	99		21.04	20.75	20.41
20	50	0		20.49	20.14	20.13
20	50	24		20.46	20.26	20.19
20	50	49		20.54	20.13	20.18
20	100	0		20.39	20.31	20.11

<WLAN 2.4GHz Conducted Power>

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)
IEEE 802.11b	1	2412	11.39
	6	2437	12.18
	11	2462	13
IEEE 802.11g	1	2412	12.45
	6	2437	13.58
	11	2462	14.07
IEEE 802.11n HT20	1	2412	11.82
	6	2437	12.81
	11	2462	13.54

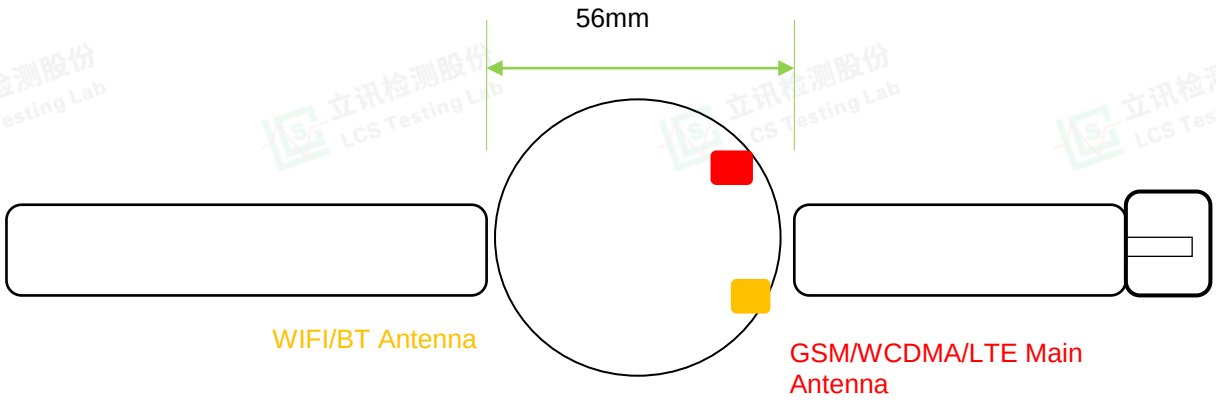
Note: SAR is not required for the following 2.4 GHz OFDM conditions as the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

<BT Conducted Power>

Mode	channel	Frequency (MHz)	Conducted AVG output power (dBm)
GFSK	0	2402	-1.01
	39	2441	-2.04
	78	2480	-2.96

4.2 Transmit Antennas and SAR Measurement Position

It is a NickWatch V1, support Bluetooth/GSM/WCDMA/LTE modes.



Rear view

4.3 SAR test exclusion consider table

Standalone SAR test exclusion applies 447498 D04 Interim General Radio Frequency Exposure Guidelines v01. The available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold Pth (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by:

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\ cm}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\ cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

d = the separation distance (cm);

Function	Fre. (GHz)	Separation distance (cm)	Max Turn up power (dBm)	Max Turn up power (mW)	Pth (mW)
BT	2.402	0.5	0	1	2.79

Note: The Maximum power is less than the Pth, complies with the exemption requirements.

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
GPRS850	1:2
GPRS1900	1:4
UMTS	1:1
LTE	1:1
WLAN2450	1:1

4.4.1 SAR Results

Next – to – Mouth <Flat / Front (10mm)>

Band	Model	Test Position	Freq.	SAR (1g) (W/kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas.No.
GSM850	GPRS (GMSK, 2-Slot)	Front Side	824.2	0.049	0.15	31.00	30.83	**0.051**	**1**
GSM1900	GPRS (GMSK, 3-Slot)	Front Side	1850.2	0.508	-0.61	26.00	25.98	**0.510**	**3**
WCDMA Band II	RMC	Front Side	1852.4	0.852	0.03	23.00	22.42	0.974	/
		Front Side	1880	0.881	3.96	23.00	22.46	0.998	/
		Front Side	1907.6	0.911	-0.94	23.00	22.59	**1.001**	**5**
WCDMA Band V	RMC	Front Side	826.4	0.077	-3.48	23.00	22.56	**0.085**	**7**
2.4GHz WLAN	802.11g	Front Side	2462	0.212	-3.24	14.50	14.07	**0.234**	**9**

Band	BW (MHz)	Mod.	RB Size	RB offset	Test Position	Freq.	Result 1g (W/Kg)	Power Drift(%)	Max. Turn-up Power(dBm)	Meas. Output Power(dBm)	Scaled SAR (W/Kg)	Meas.No.
LTE Band 2	20M	QPSK	1	0	Front Side	1900	0.587	-0.82	24	23.62	**0.641**	**11**
			50	0	Front Side	1900	0.265	-0.98	23	22.52	0.296	/
LTE Band 4	20M	QPSK	1	0	Front Side	1745	0.283	-3.27	23.5	23.11	**0.310**	**13**
			50	0	Front Side	1720	0.152	2.18	22	21.89	0.156	/
LTE Band 5	10M	QPSK	1	0	Front Side	829	0.142	1.17	23.5	23.12	**0.155**	**15**
			25	0	Front Side	829	0.099	-0.02	23	22.65	0.107	/
LTE Band 7	10M	QPSK	1	0	Front Side	2510	0.544	3.44	23	22.37	**0.629**	**17**
			50	0	Front Side	2510	0.265	-0.98	22	21.36	0.307	/
LTE Band 12	10M	QPSK	1	0	Front Side	711	0.029	1.51	24	23.30	**0.034**	**19**
			25	0	Front Side	704	0.020	2.16	22.5	22.19	0.021	/

LTE Band 17	10M	QPSK	1	0	Front Side	711	0.038	0.62	23.5	23.16	**0.041**	**21**
			25	0	Front Side	709	0.025	3.46	22.5	22.07	0.028	/
LTE Band 25	20M	QPSK	1	0	Front Side	1860	0.732	-3.17	23.8	23.60	**0.766**	**23**
			36	0	Front Side	1860	0.510	-0.12	23	22.57	0.563	/
LTE Band 26	15M	QPSK	1	0	Front Side	821.5	0.082	-3.13	24	23.58	**0.090**	**25**
			36	0	Front Side	821.5	0.060	-2.77	23	22.45	0.068	/
LTE Band 38	20M	QPSK	1	0	Front Side	2595	0.250	3.26	23	22.35	**0.290**	**27**
			50	0	Front Side	2595	0.123	0.77	22	21.21	0.148	/
LTE Band 41	20M	QPSK	1	0	Front Side	2310	0.207	-2.72	23	22.46	**0.234**	**29**
			50	0	Front Side	2310	0.104	-2.26	21.5	21.37	0.107	/

Extremity <Flat / Wrist (0mm)>

Band	Model	Test Position	Freq.	SAR (10g) (W/kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR (W/Kg)	Meas.No.
GSM850	GPRS (GMSK, 2-Slot)	Wrist	824.2	0.538	-1.36	31.00	30.83	**0.559**	**2**
GSM1900	GPRS (GMSK, 3-Slot)	Wrist	1850.2	1.282	1.64	26.00	25.98	**1.288**	**4**
WCDMA Band II	RMC	Wrist	1852.4	1.932	2.92	23.00	22.42	2.208	/
		Wrist	1880	1.893	1.54	23.00	22.46	2.144	/
		Wrist	1907.6	2.378	-3.37	23.00	22.59	**2.613**	**6**
WCDMA Band V	RMC	Wrist	826.4	0.581	3.20	23.00	22.56	**0.643**	**8**
2.4GHz WLAN	802.11g	Wrist	2462	0.182	-2.22	14.50	14.07	**0.201**	**10**

Band	BW (MHz)	Mod.	RB Size	RB offset	Test Position	Freq.	Result 10g (W/Kg)	Power Drift(%)	Max. Turn-up Power(dBm)	Meas. Output Power(dBm)	Scaled SAR (W/Kg)	Meas.No.
LTE Band 2	20M	QPSK	1	0	Wrist	1900	1.752	2.40	24	23.62	**1.912**	**12**
			50	0	Wrist	1900	1.420	-2.21	23	22.52	1.575	/
LTE Band 4	20M	QPSK	1	0	Wrist	1745	1.654	1.20	23.5	23.11	**1.809**	**14**
			50	0	Wrist	1720	1.326	0.04	22	21.89	1.360	/
LTE Band 5	10M	QPSK	1	0	Wrist	829	0.693	-2.13	23.5	23.12	**0.756**	**16**
			25	0	Wrist	829	0.416	3.41	23	22.65	0.451	/
LTE Band 7	10M	QPSK	1	0	Wrist	2510	0.751	1.39	23	22.37	**0.868**	**18**
			50	0	Wrist	2510	0.503	-3.85	22	21.36	0.583	/
LTE Band 12	10M	QPSK	1	0	Wrist	711	0.185	-0.90	24	23.30	**0.217**	**20**
			25	0	Wrist	704	0.110	0.99	22.5	22.19	0.118	/
LTE Band 17	10M	QPSK	1	0	Wrist	711	0.251	-0.21	23.5	23.16	**0.271**	**22**
			25	0	Wrist	709	0.132	3.41	22.5	22.07	0.146	/
LTE Band 25	20M	QPSK	1	0	Wrist	1860	1.508	3.59	23.8	23.60	**1.579**	**24**
			36	0	Wrist	1860	1.251	-0.61	23	22.57	1.381	/
LTE Band 26	15M	QPSK	1	0	Wrist	821.5	1.162	-1.45	24	23.58	**1.280**	**26**
			36	0	Wrist	821.5	0.958	-0.36	23	22.45	1.087	/
LTE Band 38	20M	QPSK	1	0	Wrist	2595	0.617	-0.23	23	22.35	**0.717**	**28**
			50	0	Wrist	2595	0.521	-1.42	22	21.21	0.625	/

Remark:
1. The value with black color is the maximum Reported 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 Standalone SAR Test Exclusion Considerations and Estimated SAR

Per KDB447498 requires when the standalone SAR test exclusion of section 4.3.1 is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to the following to determine simultaneous transmission SAR test exclusion;

● (max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [√ f(GHz)/x] W/kg for test separation distances ≤ 50 mm;

where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.

● 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm

Per FCC KD B447498 D01,simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the transmitting antenna in a specific a physical test configuration is ≤1.6 W/Kg.When the sum is greater than the SAR limit,SAR test exclusion is determined by the SAR to peak location separation ratio.

$$\text{Ratio}=\frac{(SAR_1+SAR_2)^{1.5}}{(\text{peak location separation,mm})}<0.04$$

Estimated stand alone SAR					
Communication system	Frequency (MHz)	Configuration	Maximum Power (dBm)	Separation Distance (mm)	Estimated SAR_{1-g} (W/kg)
Bluetooth*	2450	Front	0	10	0.573
Bluetooth*	2450	Back	0	10	0.083

Remark:

1. *Bluetooth*- Including Lower power Bluetooth*
2. *Maximum average power including tune-up tolerance;*
3. *When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion*
4. *Body as body use distance is 10mm from manufacturer declaration of user manual*

4.6 Introduction

Application Simultaneous Transmission information:

Combination No.	Mode
Front to face	WWAN+WIFI
	WWAN+BT
Wrist	WWAN+WIFI
	WWAN+BT

4.6.1 Evaluation of Simultaneous SAR

NOTE:

1. If the test separation distance is <5mm, 5mm is used for excluded SAR calculation.
2. The reported SAR summation is calculated based on the same configuration and test position.
3. KDB 447498 Appendix E, 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:

SARest =1.6 · Pant / Pth [W/kg].

Pant is maximum time-averaged power or effective radiated power (ERP), whichever is greater, and Pth is defined in Formula KDB 447498 (B.2).

Estimated SAR		Antenna to user(cm)	Pant	Pth	Stand Alone SAR(1g) [W/kg]
BLE	Body	≤0.5	1	2.79	0.573
Estimated SAR		Antenna to user(cm)	Pant	Pth	Stand Alone SAR(10g) [W/kg]
BLE	Wrist	≤0.5	1	2.79	0.573

Simultaneous Mode	Position	Mode	Max. SAR (W/kg)	Sum SAR (W/kg)
GSM + 2.4G WLAN	Body Stand Alone SAR(1g) [W/kg]	GSM	0.501	0.735
		2.4G WLAN	0.234	
	Wrist Stand Alone SAR(10g) [W/kg]	GSM	1.288	1.489
		2.4G WLAN	0.201	
WCDMA + 2.4G WLAN	Body Stand Alone SAR(1g) [W/kg]	WCDMA	1.001	1.235
		2.4G WLAN	0.234	
	Wrist Stand Alone SAR(10g) [W/kg]	WCDMA	2.613	2.814
		2.4G WLAN	0.201	
LTE + 2.4G WLAN	Body Stand Alone SAR(1g) [W/kg]	LTE	0.766	1.000
		2.4G WLAN	0.234	
	Wrist Stand Alone SAR(10g) [W/kg]	LTE	1.912	2.113
		2.4G WLAN	0.201	
GSM + BLE	Body Stand Alone SAR(1g) [W/kg]	GSM	0.501	1.074
		BLE	0.573	
	Wrist Stand Alone SAR(10g) [W/kg]	GSM	1.288	1.861
		BLE	0.573	
WCDMA + BLE	Body Stand Alone SAR(1g) [W/kg]	WCDMA	1.001	1.574
		BLE	0.573	
	Wrist Stand Alone SAR(10g) [W/kg]	WCDMA	2.613	3.186
		BLE	0.573	
LTE + BLE	Body Stand Alone SAR(1g) [W/kg]	LTE	0.766	1.339
		BLE	0.573	
	Wrist Stand Alone SAR(10g) [W/kg]	LTE	1.912	2.485
		BLE	0.573	

4.7 SAR Measurement Variability

Repeated SAR

Band	Mode	Test Position	Freq.	Result 1g (W/Kg)	Power Drift(%)	Max.Turn-up Power(dBm)	Meas.Output Power(dBm)	Scaled SAR(W/Kg)	Meas. No.
WCDMA Band II	RMC	Front Side	1852.4	0.832	1.06	23.00	22.42	0.951	-
		Front Side	1880	0.855	0.44	23.00	22.46	0.968	-
		Front Side	1907.6	0.879	-2.00	23.00	22.59	0.966	-
		Wrist	1852.4	1.890	-2.83	23.00	22.42	2.160	-
		Wrist	1880	1.861	0.88	23.00	22.46	2.107	-
		Wrist	1907.6	2.282	1.89	23.00	22.59	2.508	-

Repeated SAR measurement

Band	Mode	Test Position	Freq.	Original Measured SAR 1g(W/kg)	1 st Repeated SAR 1g	Ratio	Original Measured SAR 1g(W/kg)	2nd Repeated SAR 1g	Ratio
WCDMA Band II	RMC	Front Side	1852.4	0.852	0.832	1.024	-	-	-
		Front Side	1880	0.881	0.855	1.030	-	-	-
		Front Side	1907.6	0.911	0.879	1.036	-	-	-
		Wrist	1852.4	1.932	1.890	1.022	-	-	-
		Wrist	1880	1.893	1.861	1.017	-	-	-
		Wrist	1907.6	2.378	2.282	1.042	-	-	-

Note:

1. Per KDB 865664 D01,for each frequency band ,repeated SAR measurement is required only when the measured SAR is≥ 0.8W/Kg.
2. Per KDB 865664 D01,if the ratio of largest to smallest SAR for the original and first repeated measurement is≤1.2 and the measured SAR＜1.45W/Kg, only one repeated measurement is required.
3. Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is＞1.20 or when the original or repeated measurement is ≥1.45W/Kg.
4. The ratio is the difference in percentage between original and repeated measured SAR.

4.8 General description of test procedures

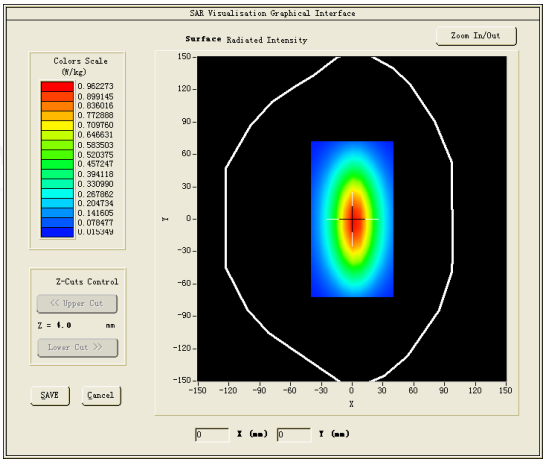
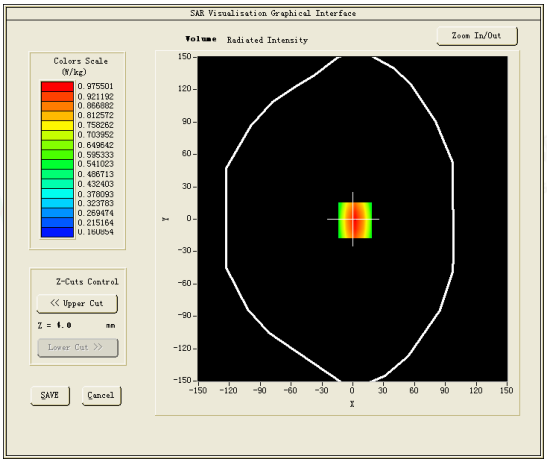
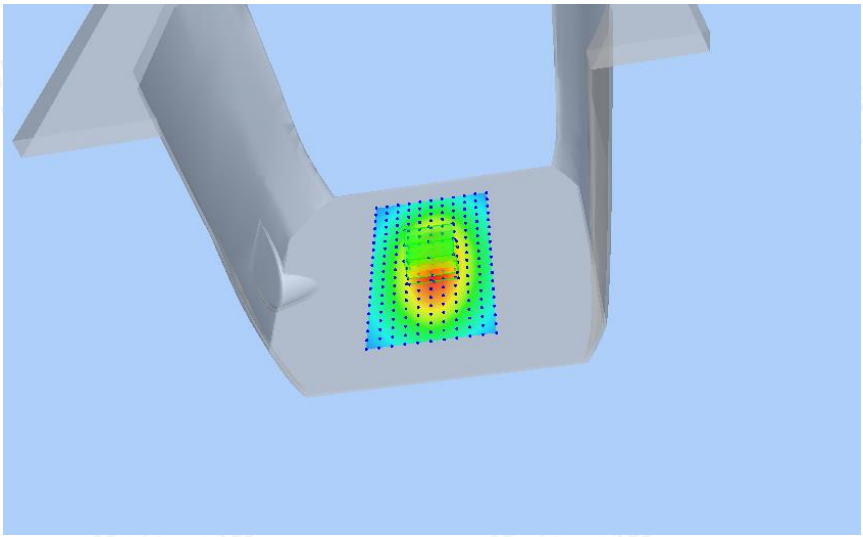
1. The DUT is tested using CMU 200 communications testers as controller unit to set test channels and maximum output power to the DUT, as well as for measuring the conducted peak power.
2. Test positions as described in the tables above are in accordance with the specified test standard.
3. Tests in 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 NickWatch V1s 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.

4.9 Measurement Uncertainty (450MHz-6GHz)

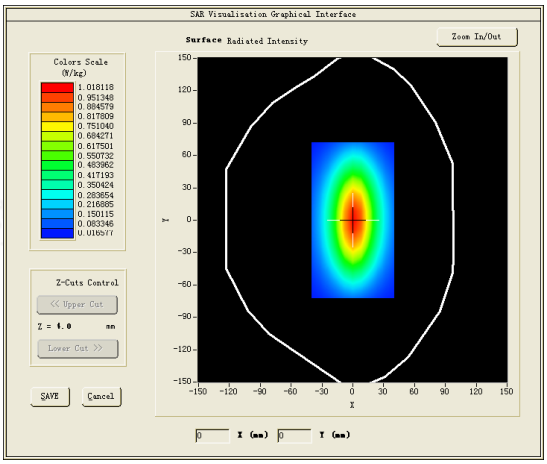
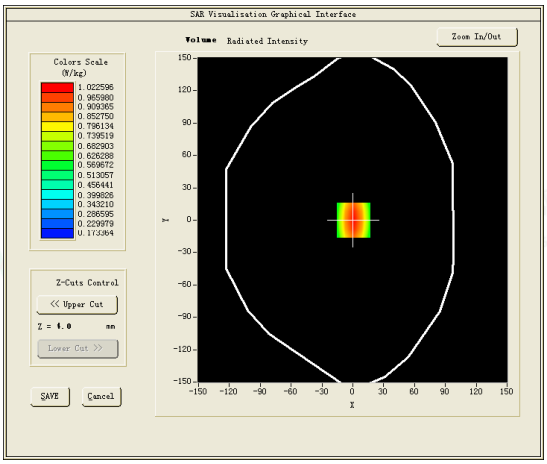
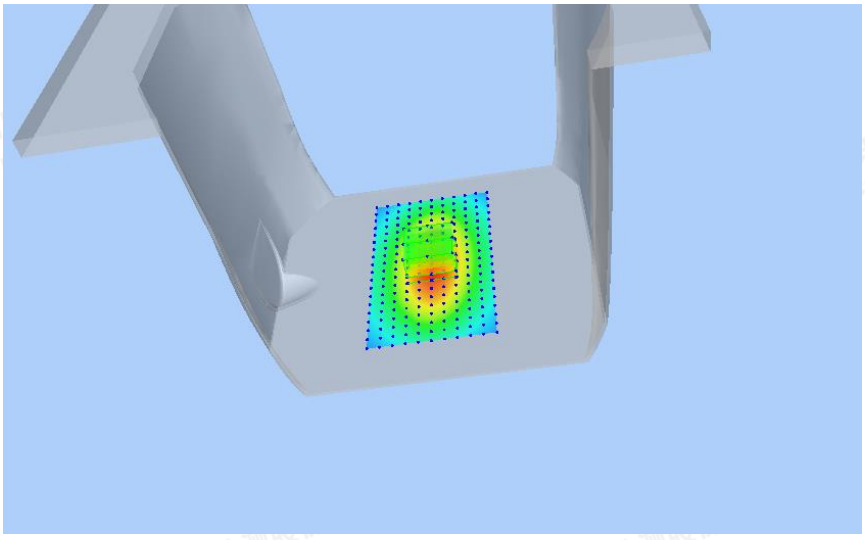
Not required as SAR measurement uncertainty analysis is required in SAR reports only when the highest measured SAR in a frequency band is ≥ 1.5 W/kg for 1-g SAR accoridng to KDB865664D01.

4.10 System Check Results

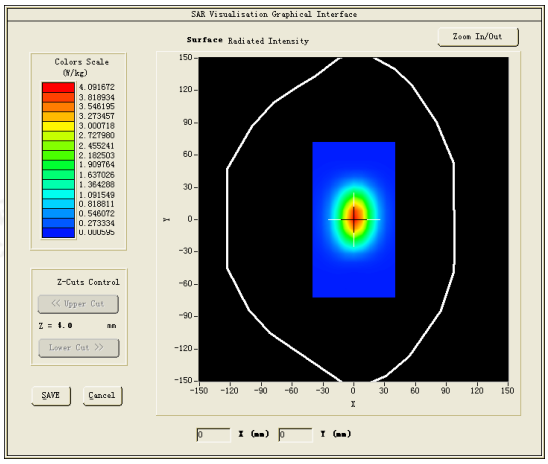
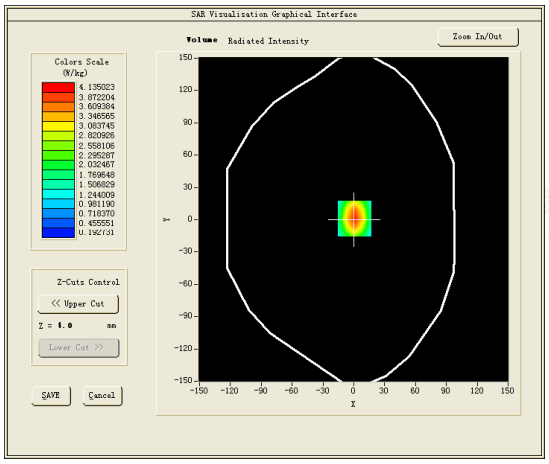
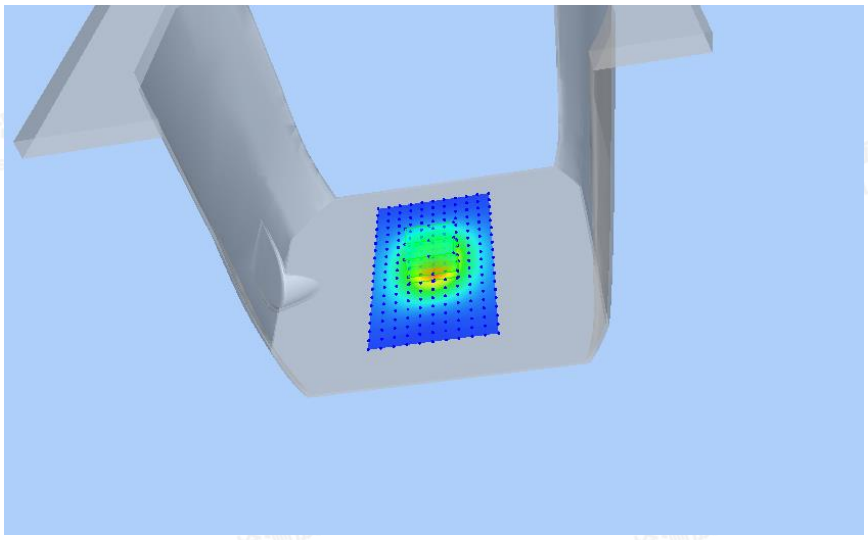
Test mode:750MHz(Head)
Product Description:Validation
Model:Dipole SID750
E-Field Probe: SSE2(SN 25/22 EPGO376)
Test Date: Aug. 21, 2023

Medium(liquid type)	HSL_750
Frequency (MHz)	750.0000
Relative permittivity (real part)	43.78
Conductivity (S/m)	0.85
Input power	100mW
Crest Factor	1.0
Conversion Factor	1.69
Variation (%)	1.020000
SAR 10g (W/Kg)	0.558028
SAR 1g (W/Kg)	0.828546
SURFACE SAR	**VOLUME SAR**
	
	

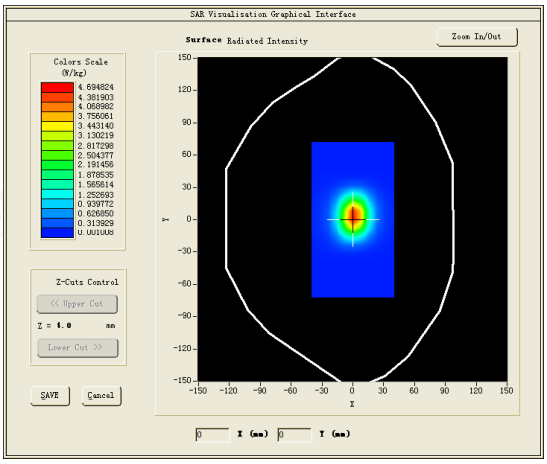
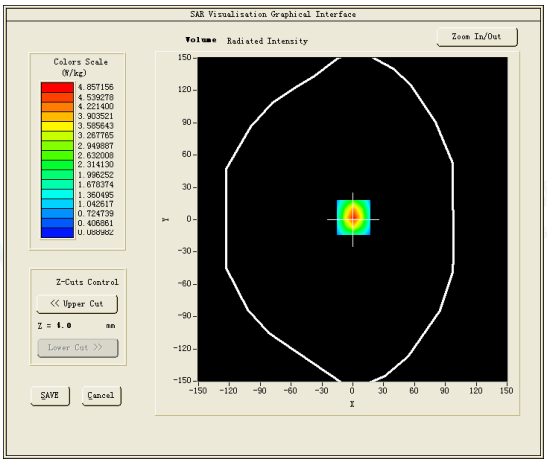
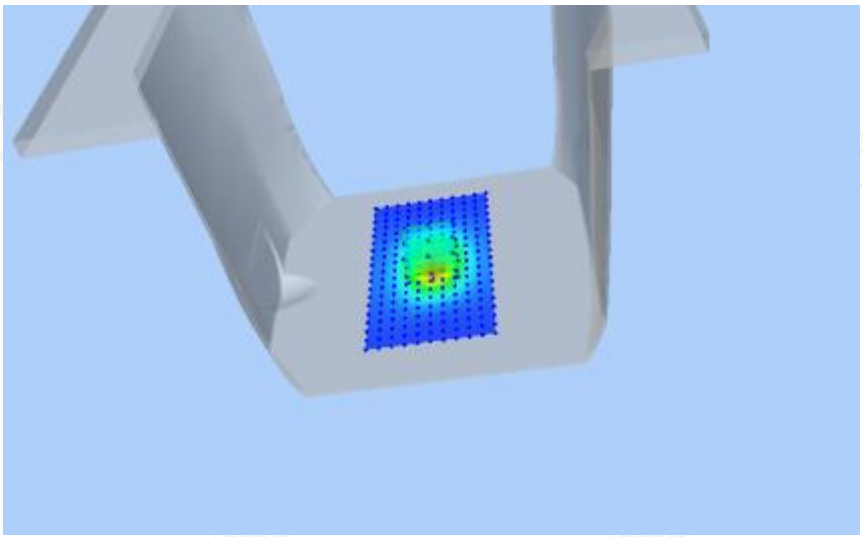
Test mode:835MHz(Head)
Product Description:Validation
Model:Dipole SID835
E-Field Probe:SSE2(SN 25/22 EPGO376)
Test Date: Aug. 21, 2023

Medium(liquid type)	HSL_850
Frequency (MHz)	835.0000
Relative permittivity (real part)	42.56
Conductivity (S/m)	0.88
Input power	100mW
Crest Factor	1.0
Conversion Factor	1.75
Variation (%)	2.780000
SAR 10g (W/Kg)	0.601456
SAR 1g (W/Kg)	0.945201
SURFACE SAR	**VOLUME SAR**
	
	

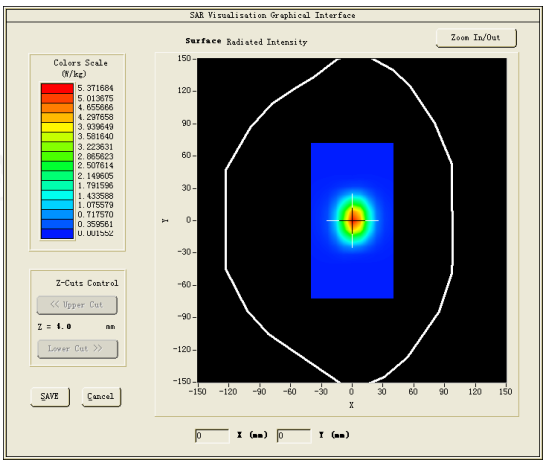
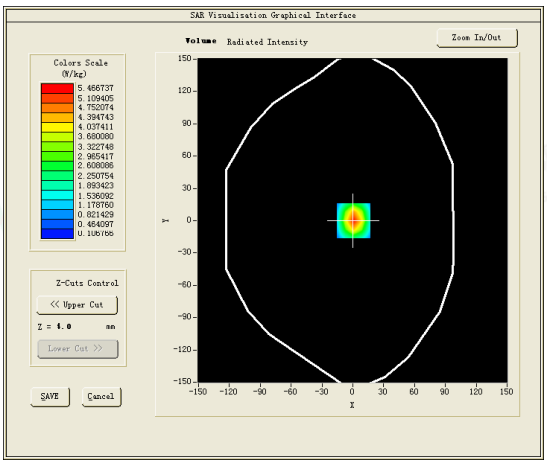
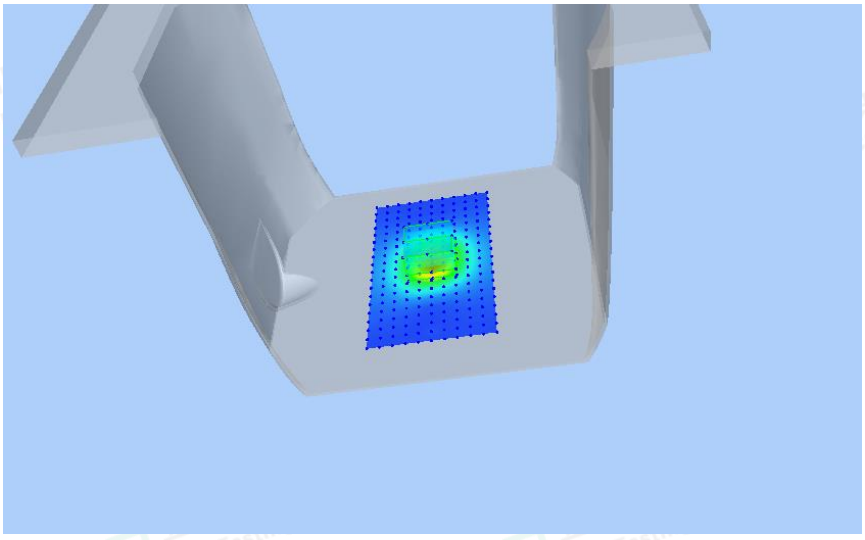
Test mode:1800MHz(Head)
Product Description:Validation
Model :Dipole SID1800
E-Field Probe:SSE2(SN 25/22 EPGO376)
Test Date: Aug. 26, 2023

Medium(liquid type)	HSL_1800
Frequency (MHz)	1800.0000
Relative permittivity (real part)	41.58
Conductivity (S/m)	1.42
Input power	100mW
Crest Factor	1.0
Conversion Factor	2.09
Variation (%)	1.740000
SAR 10g (W/Kg)	2.016007
SAR 1g (W/Kg)	3.931239
SURFACE SAR	**VOLUME SAR**
	
	

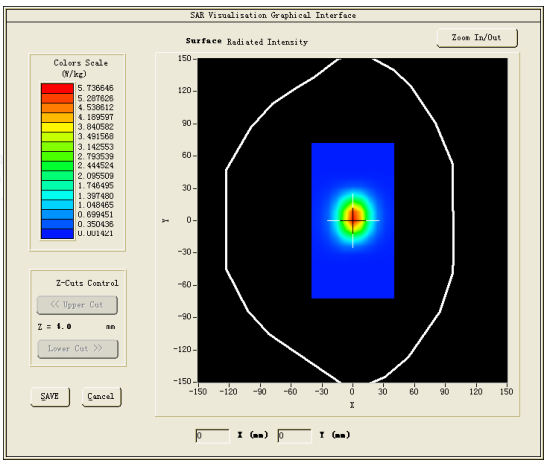
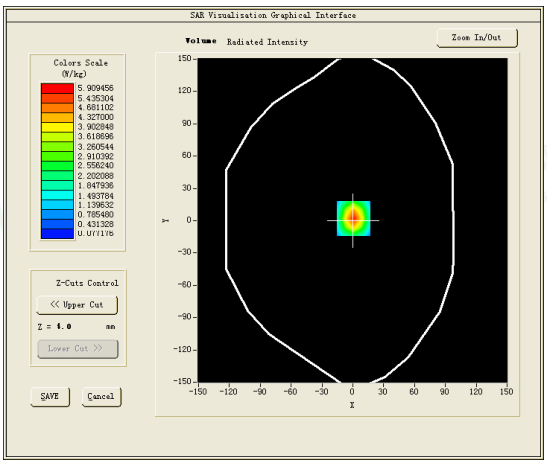
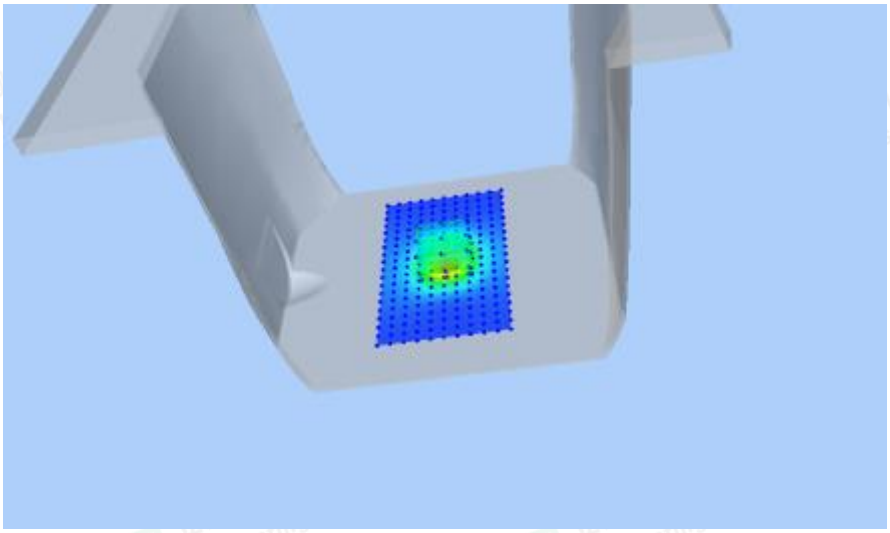
Test mode:1900MHz(Head)
Product Description:Validation
Model :Dipole SID1900
E-Field Probe: SSE2(SN 25/22 EPGO376)
Test Date: Aug. 27, 2023

Medium(liquid type)	HSL_1900
Frequency (MHz)	1900.0000
Relative permittivity (real part)	41.76
Conductivity (S/m)	1.45
Input power	100mW
Crest Factor	1.0
Conversion Factor	2.14
Variation (%)	-1.280000
SAR 10g (W/Kg)	2.041210
SAR 1g (W/Kg)	4.012414
SURFACE SAR	**VOLUME SAR**
	
	

Test mode:2450MHz(Head)
Product Description:Validation
Model:Dipole SID2450
E-Field Probe:SSE2(SN 25/22 EPGO376)
Test Date: Aug. 27, 2023

Medium(liquid type)	HSL_2450
Frequency (MHz)	2450.0000
Relative permittivity (real part)	40.35
Conductivity (S/m)	1.82
Input power	100mW
Crest Factor	1.0
Conversion Factor	2.60
Variation (%)	-0.850000
SAR 10g (W/Kg)	2.527433
SAR 1g (W/Kg)	5.488569
SURFACE SAR	**VOLUME SAR**
	
	

Test mode:2600MHz
Product Description:Validation
Model:Dipole SID2600
E-Field Probe: SSE2(SN 25/22 EPGO376)
Test Date: Aug. 27, 2023

Medium(liquid type)	HSL_2600
Frequency (MHz)	2600.0000
Relative permittivity (real part)	40.1
Conductivity (S/m)	1.93
Input power	100mW
Crest Factor	1.0
Conversion Factor	2.39
Variation (%)	3.120000
SAR 10g (W/Kg)	2.477494
SAR 1g (W/Kg)	5.686467
SURFACE SAR	**VOLUME SAR**
	
	

4.11 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

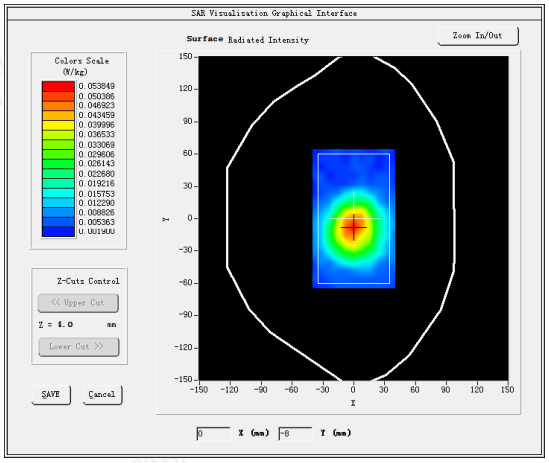
Test Mode:GSM 850MHz, (Front Side)

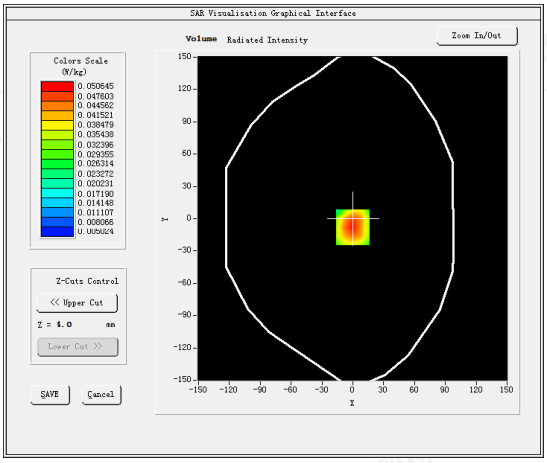
Product Description: NickWatch V1

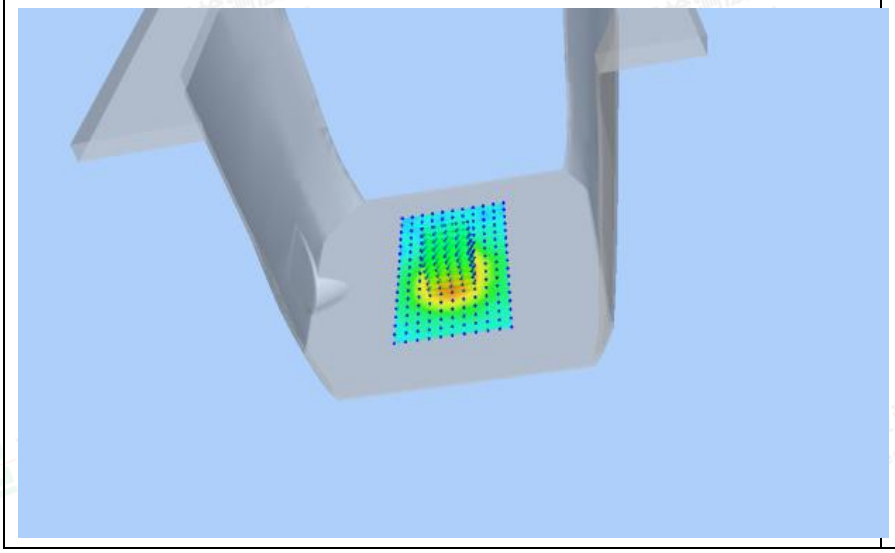
Model: NICKW001-2

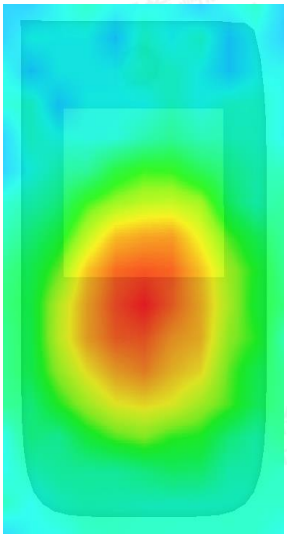
Test Date: Aug. 21, 2023

Medium(liquid type)	HSL_835
Frequency (MHz)	824.2000
Relative permittivity (real part)	42.56
Conductivity (S/m)	0.88
E-Field Probe	SN 25/22 EPGO376
Crest Factor	8.0
Conversion Factor	1.75
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	0.910000
SAR 10g (W/Kg)	0.031446
SAR 1g (W/Kg)	0.048561
SURFACE SAR	**VOLUME SAR**





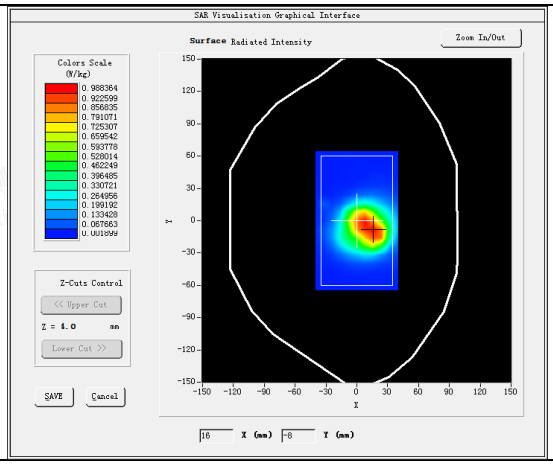


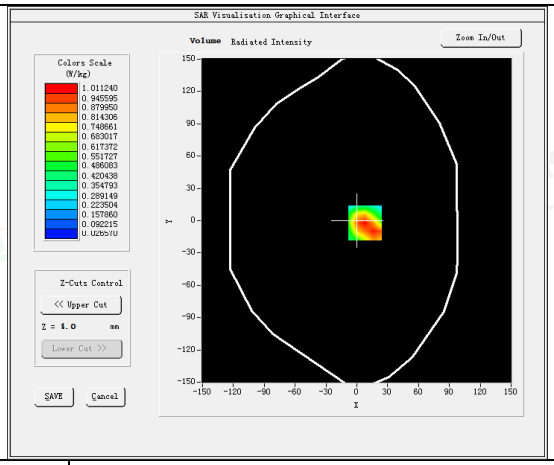


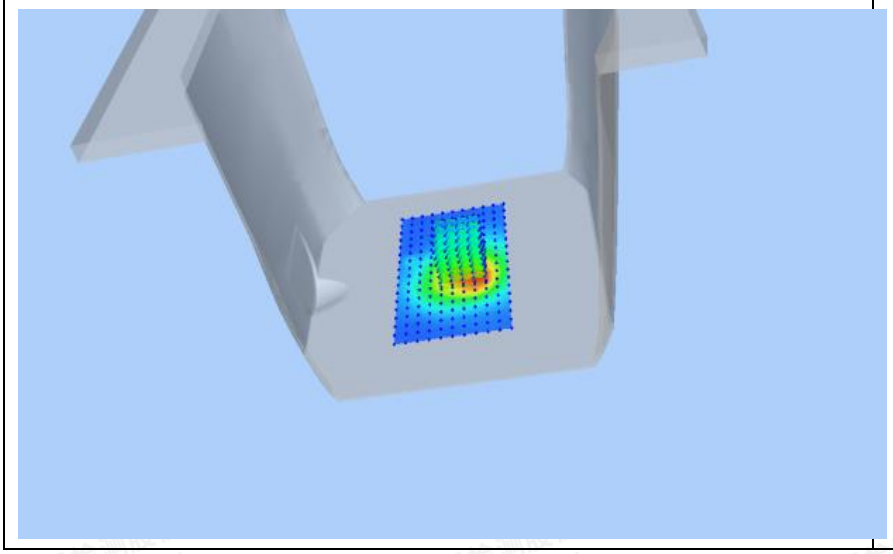
#2

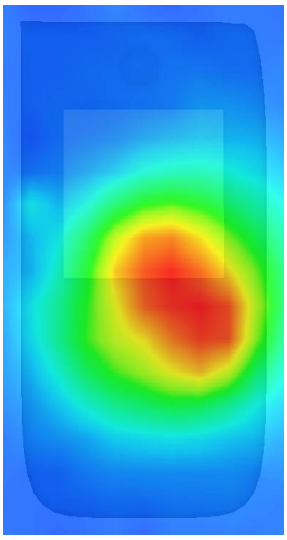
Test Mode: GSM850MHz, (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 21, 2023

Medium(liquid type)	HSL _835
Frequency (MHz)	824.2000
Relative permittivity (real part)	42.56
Conductivity (S/m)	0.88
E-Field Probe	SN 25/22 EPGO376
Crest Factor	2.0
Conversion Factor	1.75
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.180000
SAR 10g (W/Kg)	0.537568
SAR 1g (W/Kg)	0.961761
SURFACE SAR	VOLUME SAR



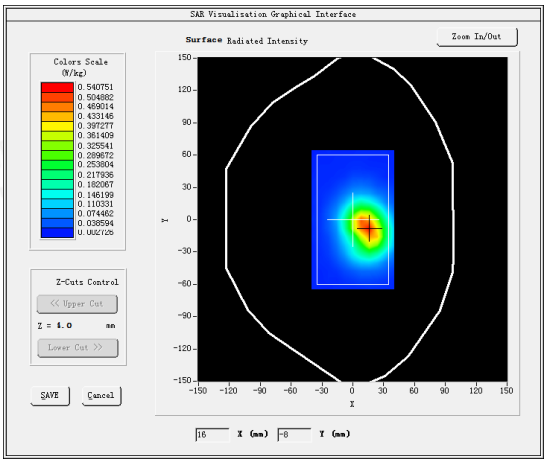
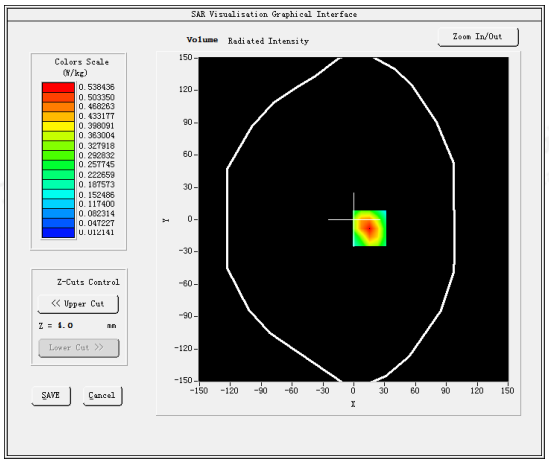
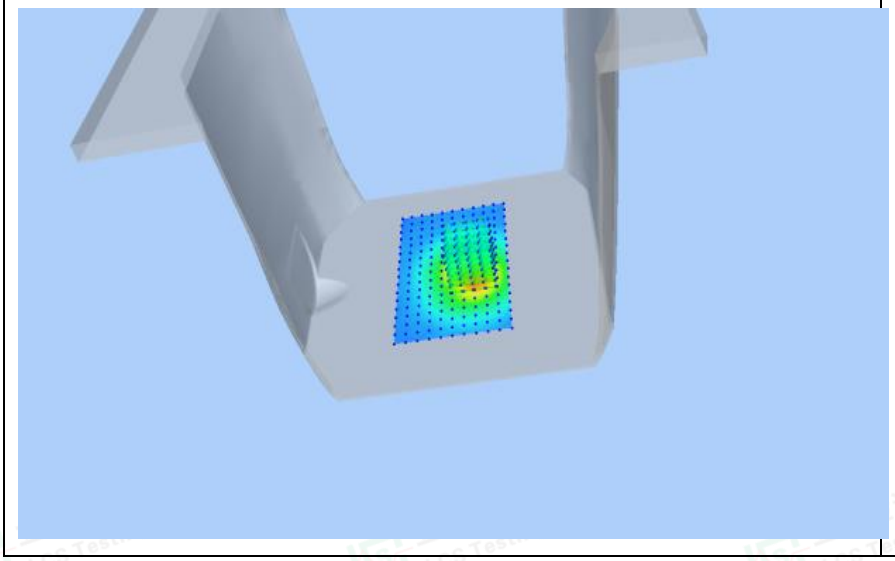
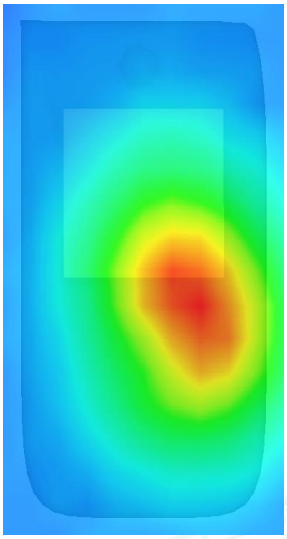






#3

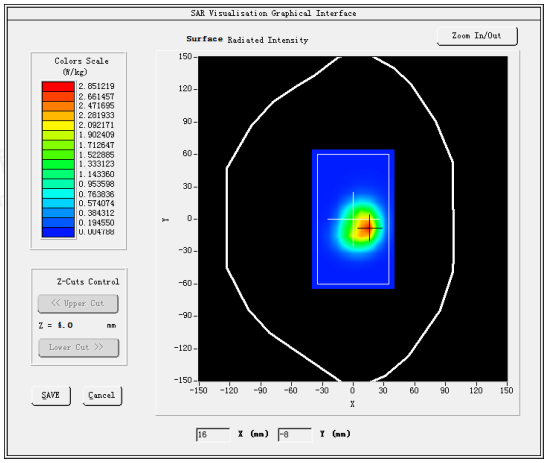
Test Mode:GSM 1900MHz, (Front Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 27, 2023

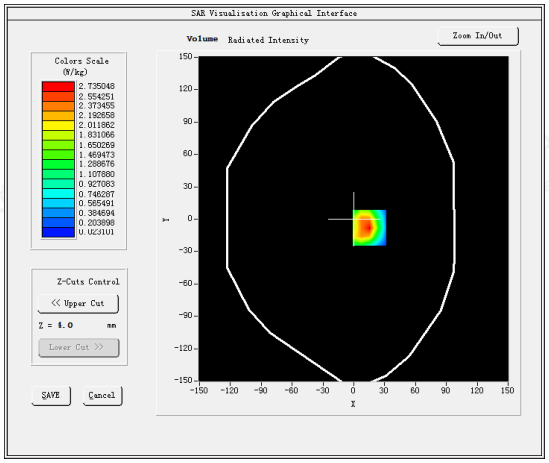
Medium(liquid type)	HSL_1900
Frequency (MHz)	1850.2000
Relative permittivity (real part)	41.76
Conductivity (S/m)	1.45
E-Field Probe	SN 25/22 EPGO376
Crest Factor	8.0
Conversion Factor	2.14
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.690000
SAR 10g (W/Kg)	0.278519
SAR 1g (W/Kg)	0.507781
SURFACE SAR	**VOLUME SAR**
	
	

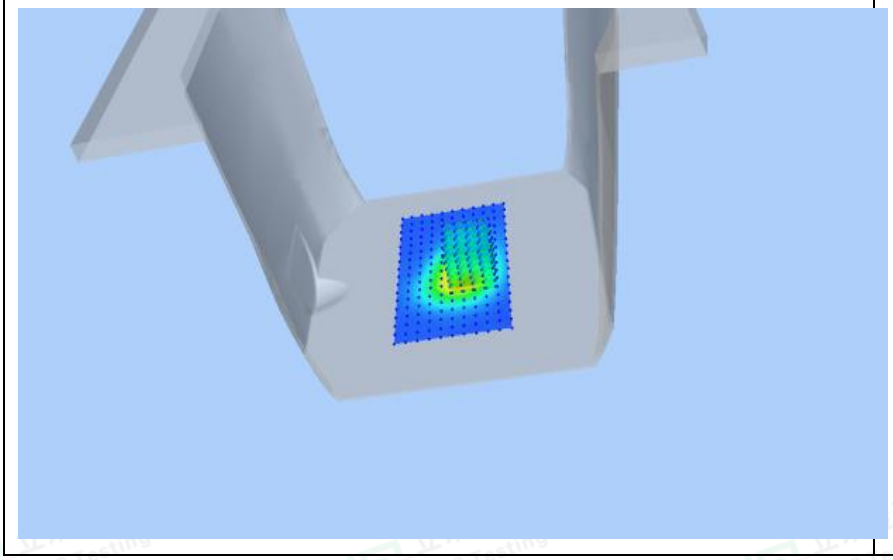
#4

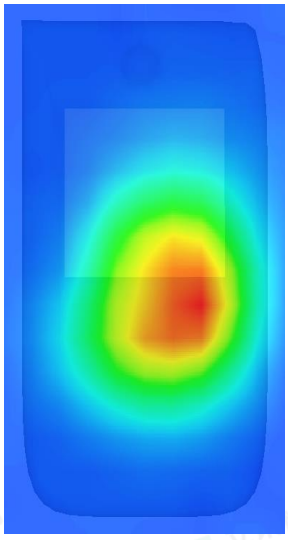
Test Mode: GPRS1900MHz, (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 27, 2023

Medium(liquid type)	HSL_1900
Frequency (MHz)	1850.2000
Relative permittivity (real part)	41.76
Conductivity (S/m)	1.45
E-Field Probe	SN 25/22 EPGO376
Crest Factor	2.0
Conversion Factor	2.14
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	2.250000
SAR 10g (W/Kg)	1.282389
SAR 1g (W/Kg)	2.583954
SURFACE SAR	**VOLUME SAR**



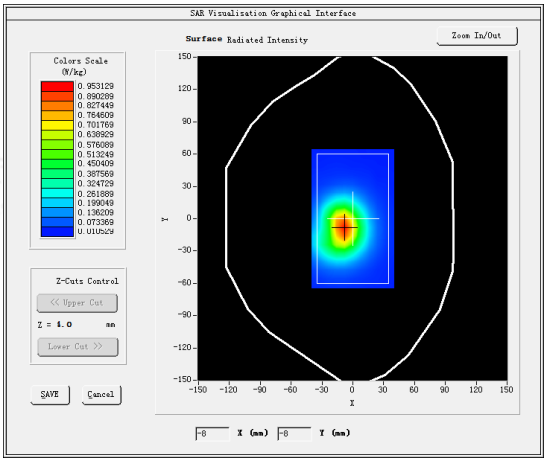
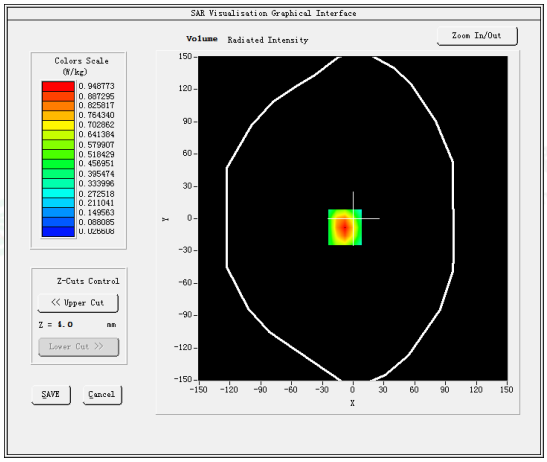
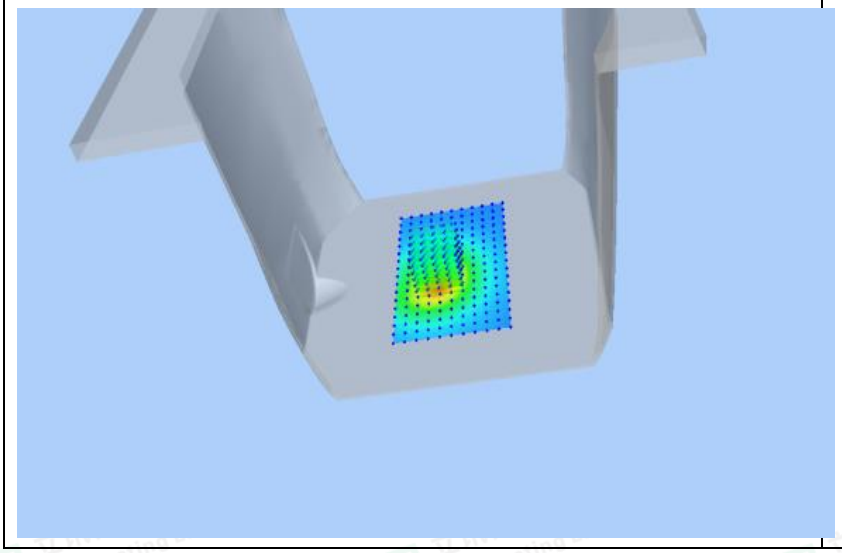
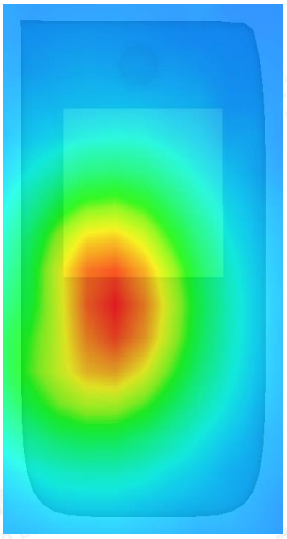






#5

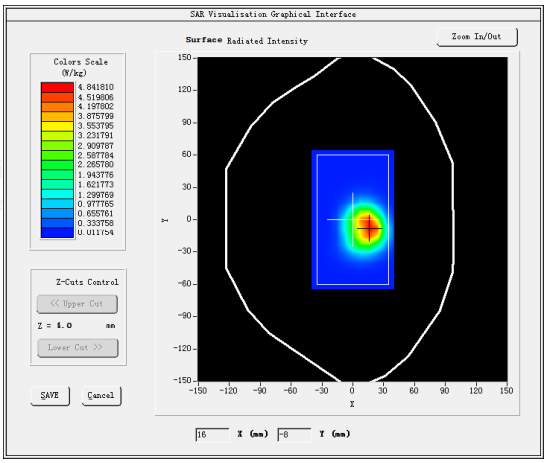
Test Mode:WCDMA Band II, (Front Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 26, 2023

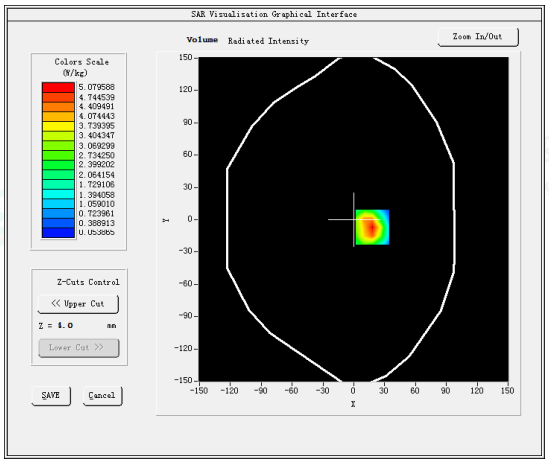
Medium(liquid type)	HSL_1900
Frequency (MHz)	1907.6000
Relative permittivity (real part)	41.76
Conductivity (S/m)	1.45
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	1.75
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.560000
SAR 10g (W/Kg)	0.504482
SAR 1g (W/Kg)	0.911223
SURFACE SAR	**VOLUME SAR**
	
	

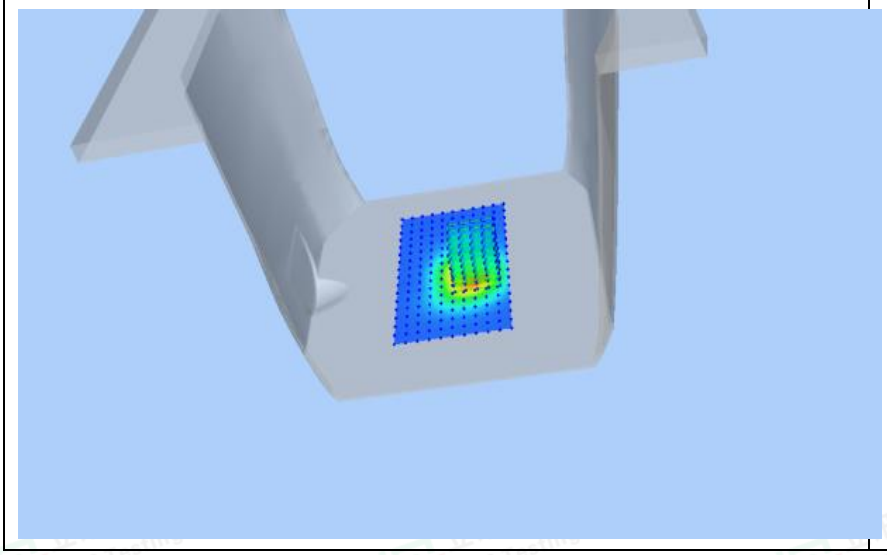
#6

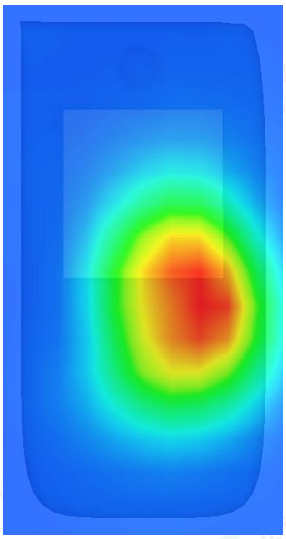
Test Mode: WCDMA Band II, (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 26, 2023

Medium(liquid type)	HSL_1900
Frequency (MHz)	1907.6000
Relative permittivity (real part)	41.76
Conductivity (S/m)	1.45
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	1.75
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.230000
SAR 10g (W/Kg)	2.378454
SAR 1g (W/Kg)	4.892896
SURFACE SAR	**VOLUME SAR**





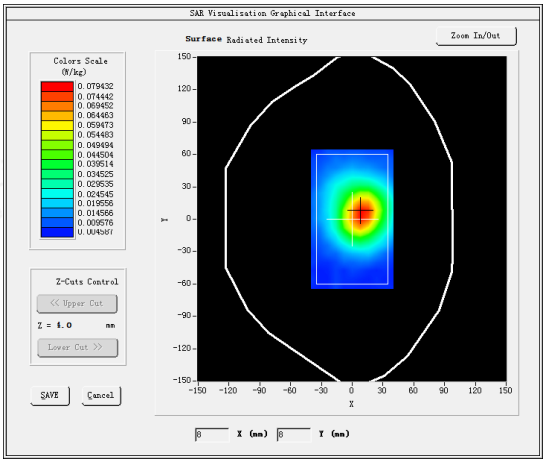


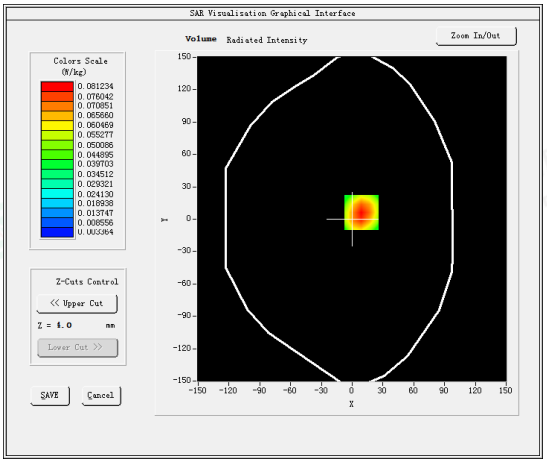


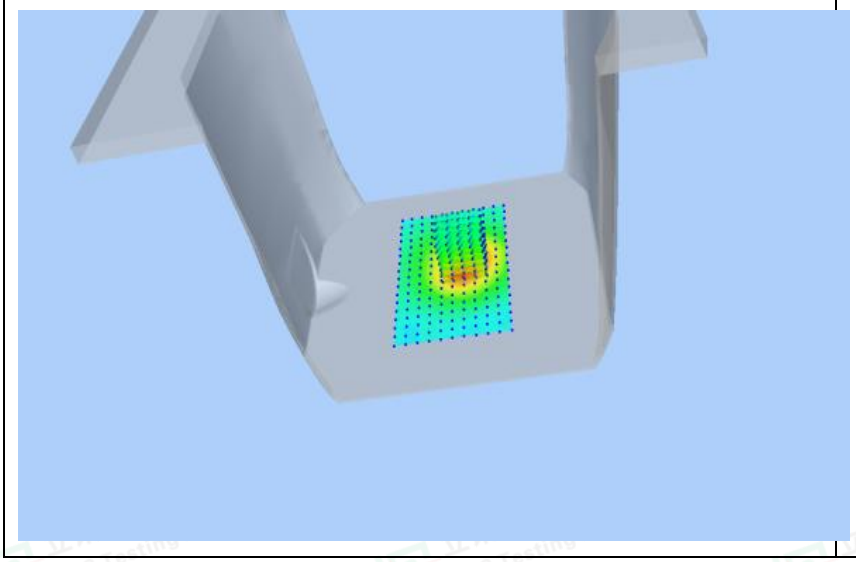
#7

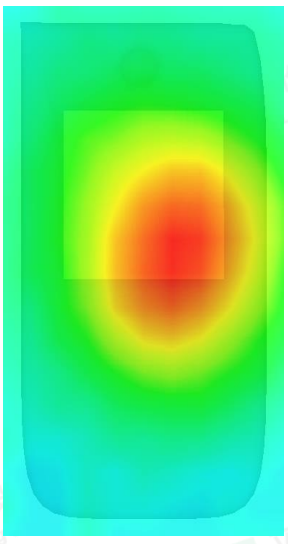
Test Mode:WCDMA Band V, (Front Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 21, 2023

Medium(liquid type)	HSL _835
Frequency (MHz)	826.4.0000
Relative permittivity (real part)	42.56
Conductivity (S/m)	0.88
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	2.14
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	3.600000
SAR 10g (W/Kg)	0.049694
SAR 1g (W/Kg)	0.076968
SURFACE SAR	**VOLUME SAR**





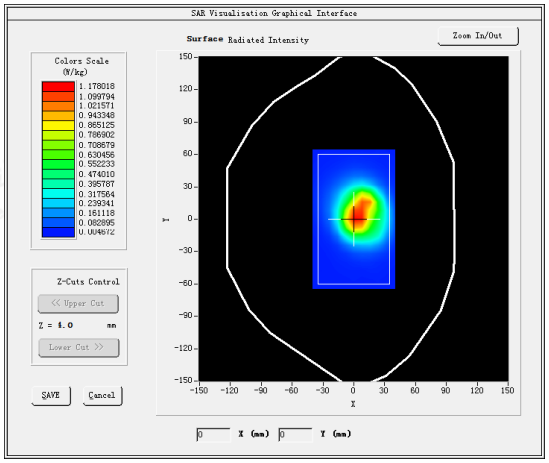


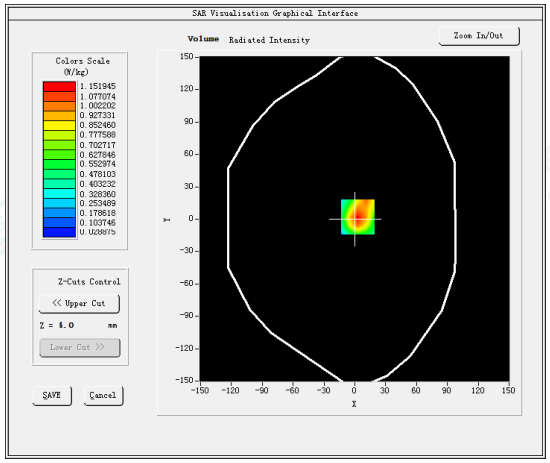


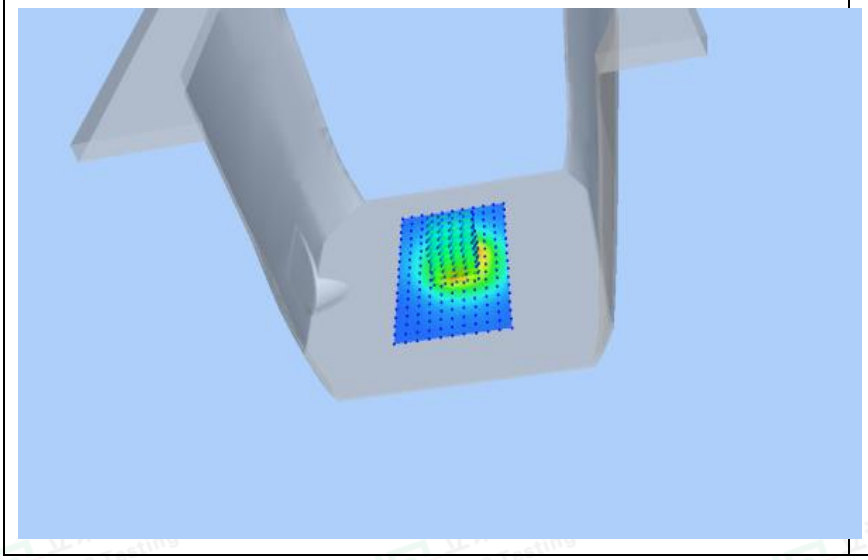
#8

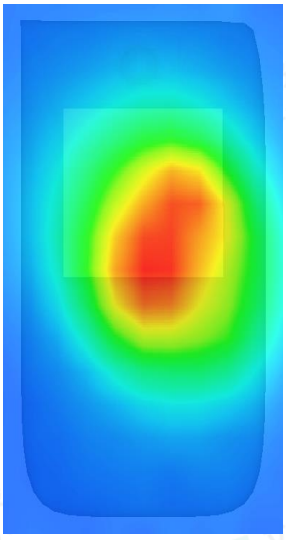
Test Mode: WCDMA Band V, (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 21, 2023

Medium(liquid type)	HSL _835
Frequency (MHz)	836.4.0000
Relative permittivity (real part)	42.56
Conductivity (S/m)	0.88
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	2.14
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.380000
SAR 10g (W/Kg)	0.580691
SAR 1g (W/Kg)	1.094297
SURFACE SAR	**VOLUME SAR**





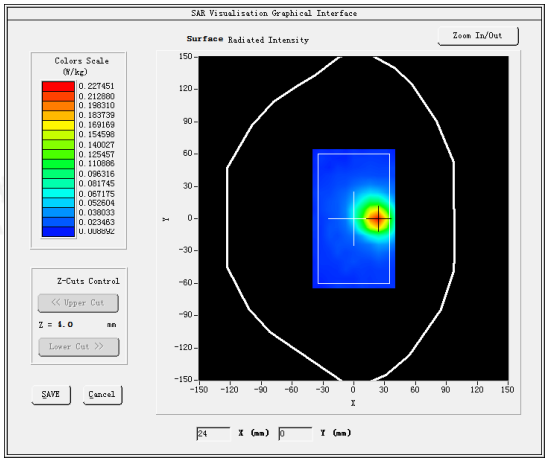


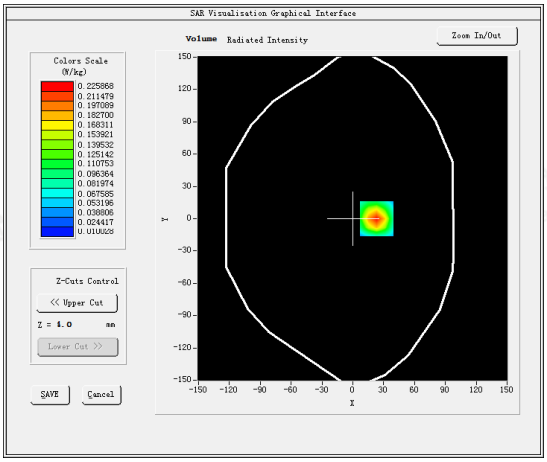


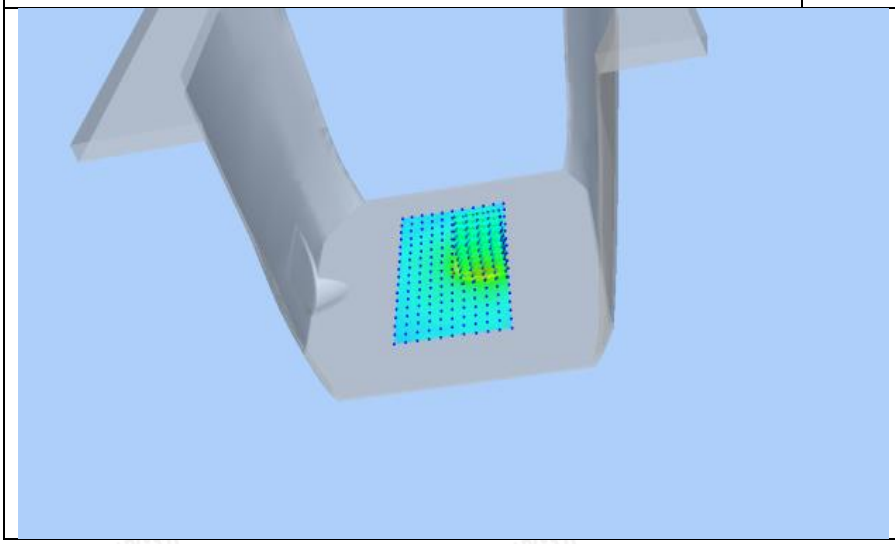
#9

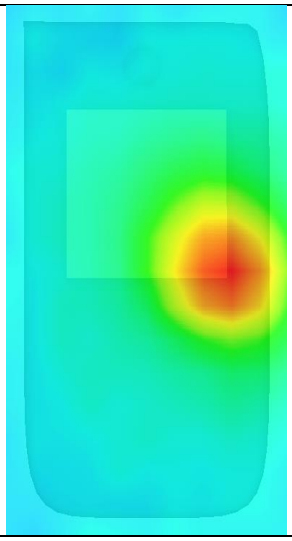
Test Mode: 802.11b (WiFi2.4G), (Head Right Cheek)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 27, 2023

Medium(liquid type)	HSL_2450
Frequency (MHz)	2462.0000
Relative permittivity (real part)	40.35
Conductivity (S/m)	1.82
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	2.60
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-1.130000
SAR 10g (W/Kg)	0.107924
SAR 1g (W/Kg)	0.211518
SURFACE SAR	**VOLUME SAR**





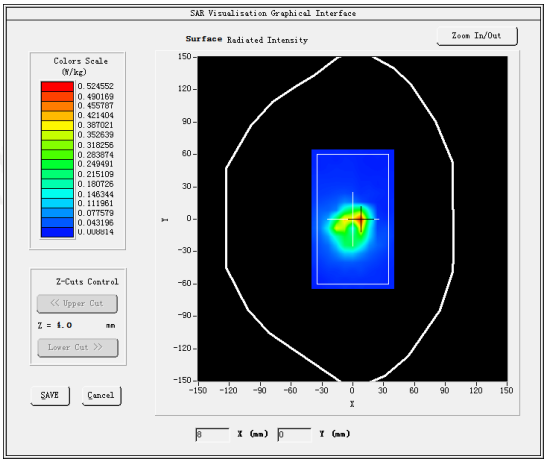


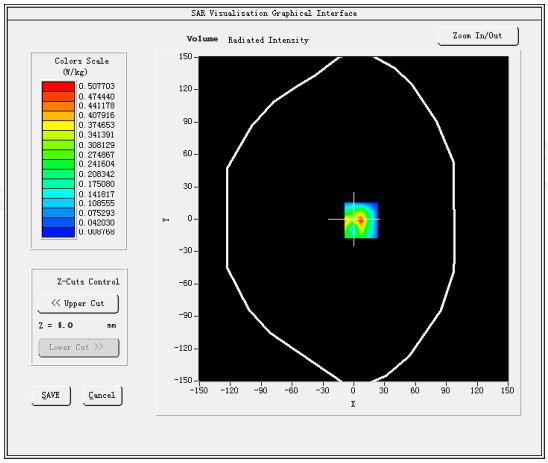


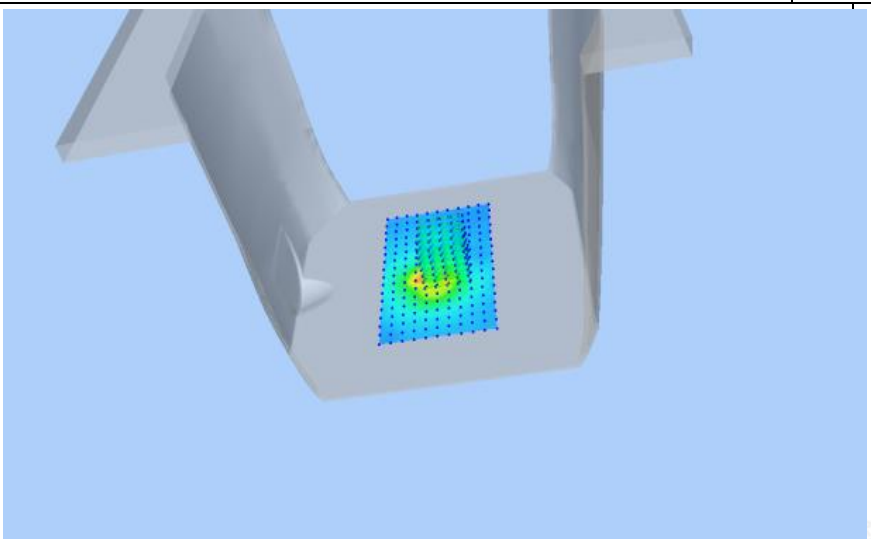
#10

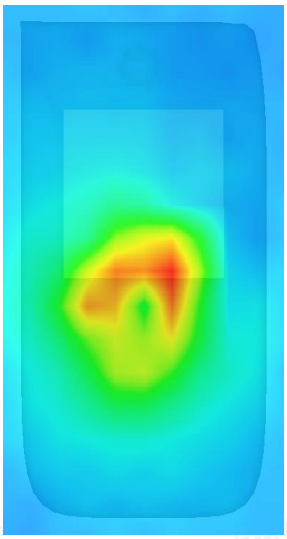
Test Mode: 802.11b (WiFi2.4G), (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 27, 2023

Medium(liquid type)	HSL _2450
Frequency (MHz)	2462.0000
Relative permittivity (real part)	40.35
Conductivity (S/m)	1.82
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	2.60
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.590000
SAR 10g (W/Kg)	0.182425
SAR 1g (W/Kg)	0.428464
SURFACE SAR	**VOLUME SAR**





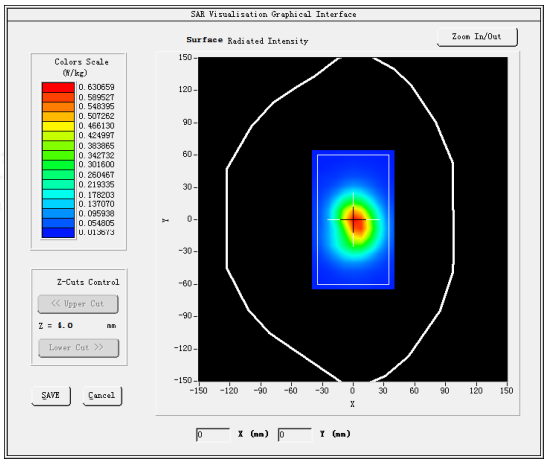


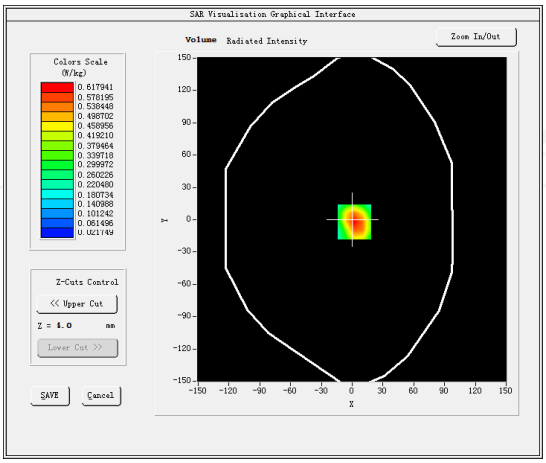


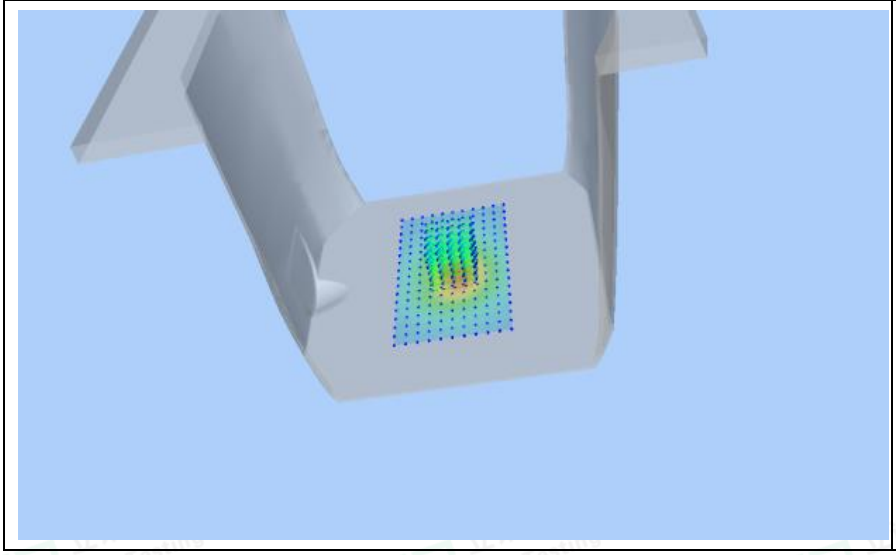
#11

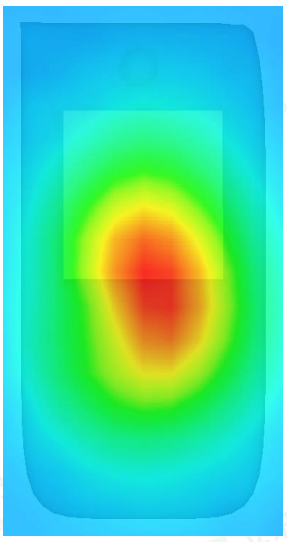
Test Mode: LTE Band 2, 1RB, (Front Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 26, 2023

Medium(liquid type)	HSL _1900
Frequency (MHz)	1880.0000
Relative permittivity (real part)	41.76
Conductivity (S/m)	1.45
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	2.14
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-3.460000
SAR 10g (W/Kg)	0.328355
SAR 1g (W/Kg)	0.586641
SURFACE SAR	**VOLUME SAR**



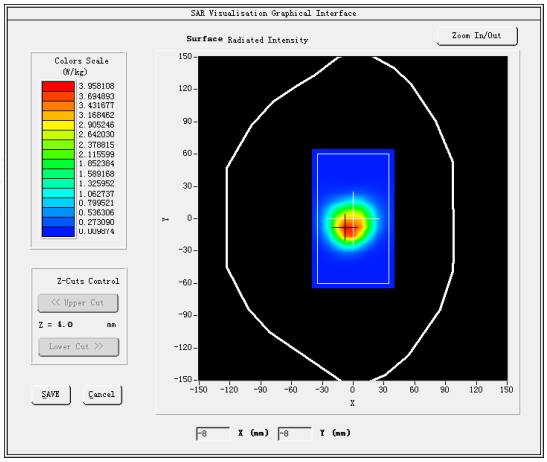
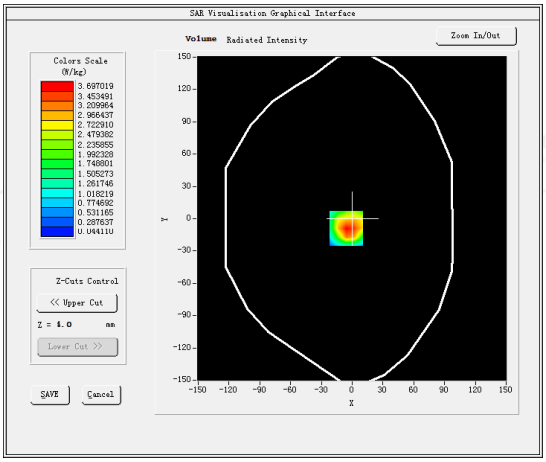
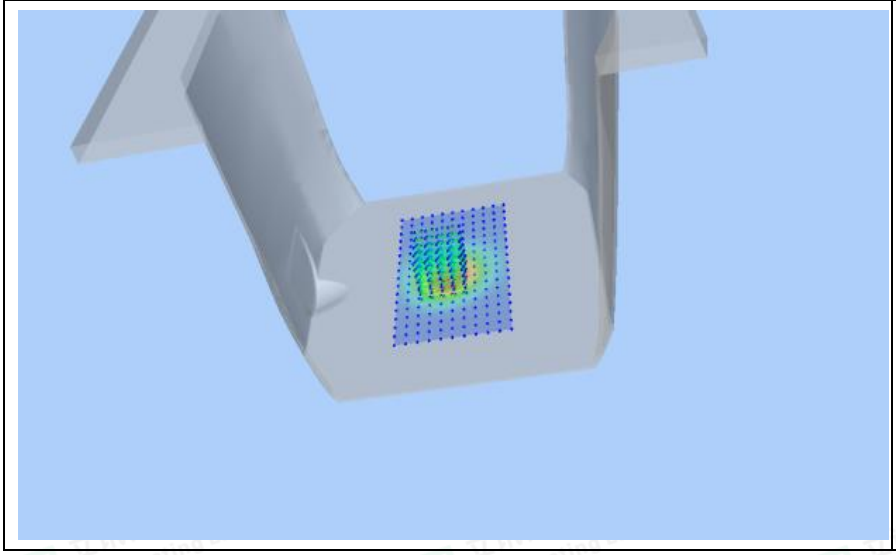
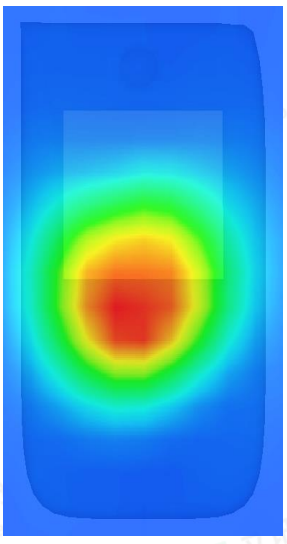






#12

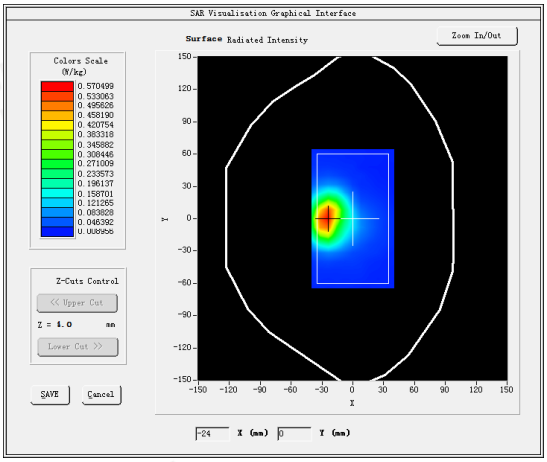
Test Mode: LTE Band 2, 1RB, (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 26, 2023

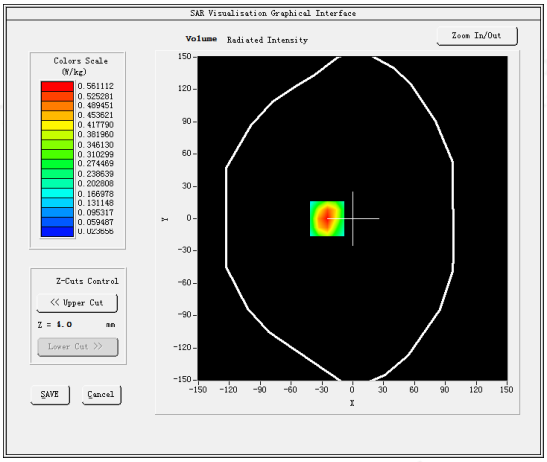
Medium(liquid type)	HSL _1900
Frequency (MHz)	1880.0000
Relative permittivity (real part)	41.76
Conductivity (S/m)	1.45
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	2.14
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.100000
SAR 10g (W/Kg)	1.752474
SAR 1g (W/Kg)	3.583295
SURFACE SAR	**VOLUME SAR**
	
	

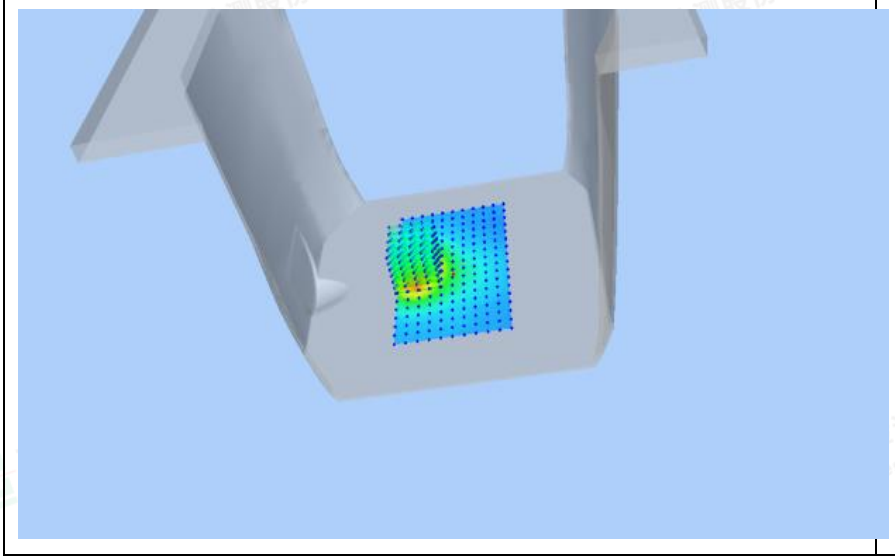
#13

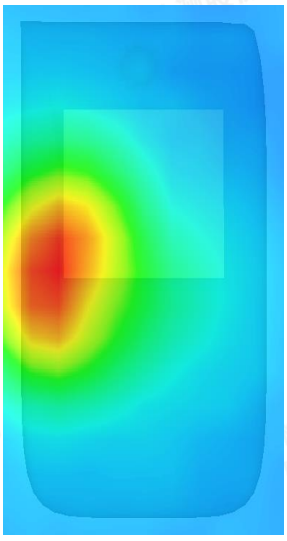
Test Mode: LTE Band 4, 1RB, (Front Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 26, 2023

Medium(liquid type)	HSL _1800
Frequency (MHz)	1745.0000
Relative permittivity (real part)	41.58
Conductivity (S/m)	1.42
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	2.09
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-4.020000
SAR 10g (W/Kg)	0.282748
SAR 1g (W/Kg)	0.533479
SURFACE SAR	**VOLUME SAR**





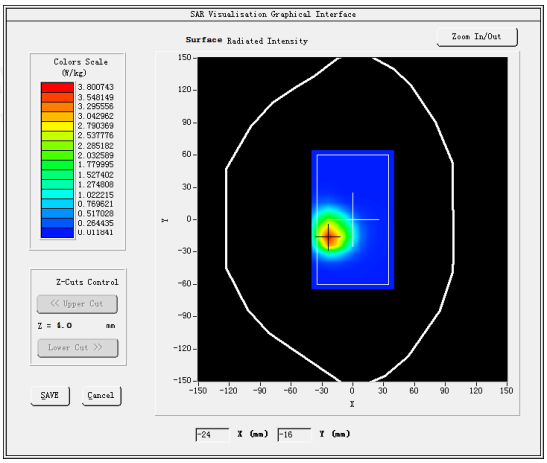


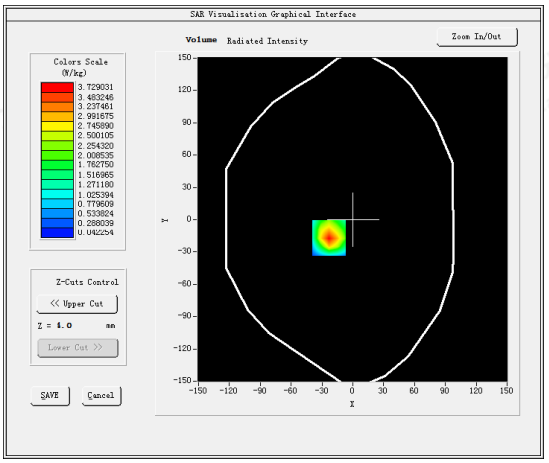


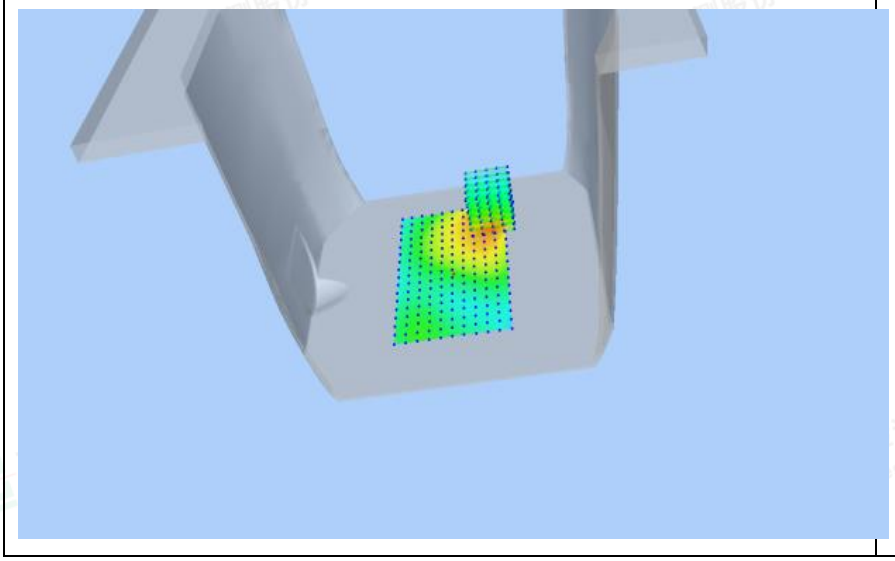
#14

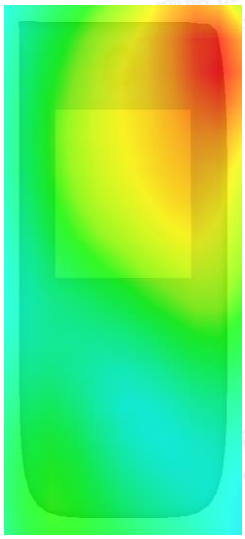
Test Mode: LTE Band 4, 1RB, (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 26, 2023

Medium(liquid type)	HSL _1800
Frequency (MHz)	1745.0000
Relative permittivity (real part)	41.58
Conductivity (S/m)	1.42
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	2.09
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	0.340000
SAR 10g (W/Kg)	1.653871
SAR 1g (W/Kg)	3.503798
SURFACE SAR	**VOLUME SAR**





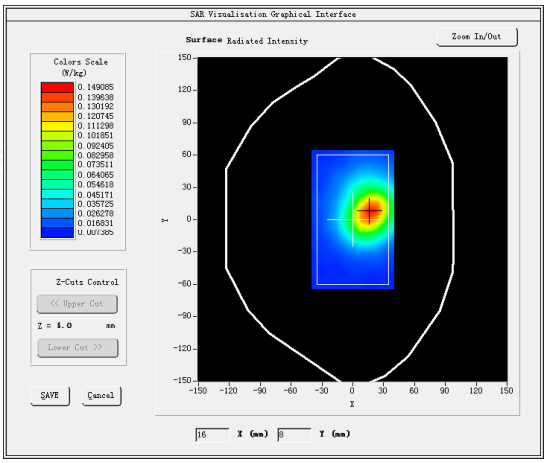


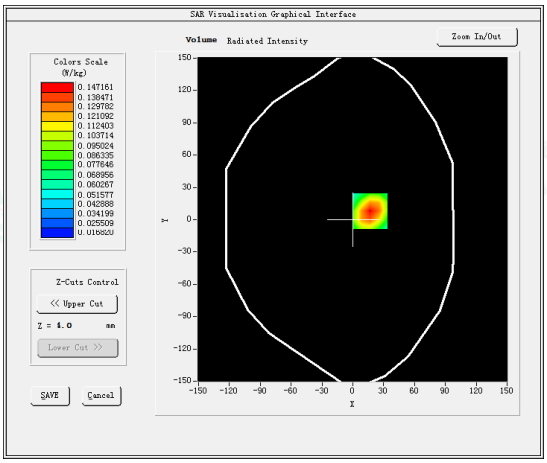


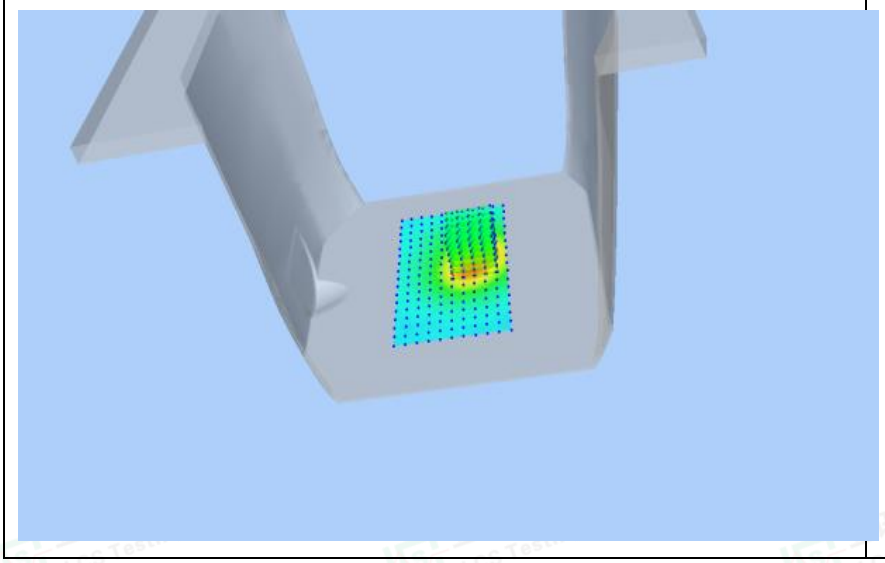
#15

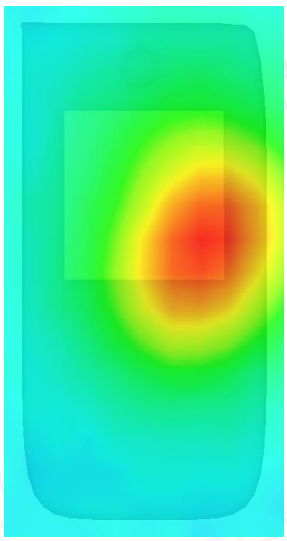
Test Mode: LTE Band 5, 1RB, (Front Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 21, 2023

Medium(liquid type)	HSL_835
Frequency (MHz)	829.0000
Relative permittivity (real part)	42.56
Conductivity (S/m)	0.88
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	1.75
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	0.300000
SAR 10g (W/Kg)	0.085675
SAR 1g (W/Kg)	0.141920
SURFACE SAR	**VOLUME SAR**





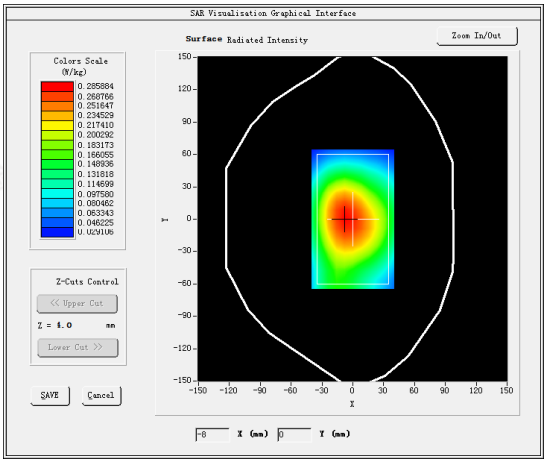


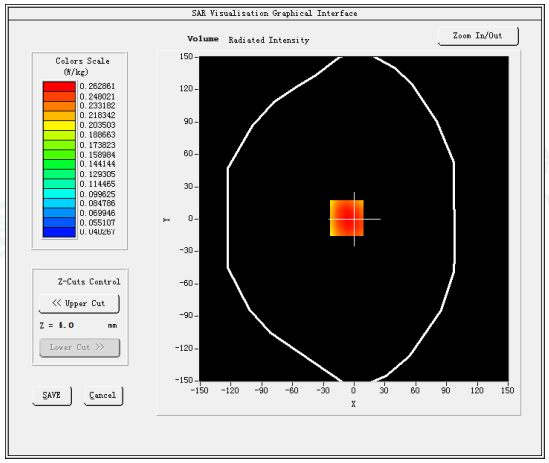


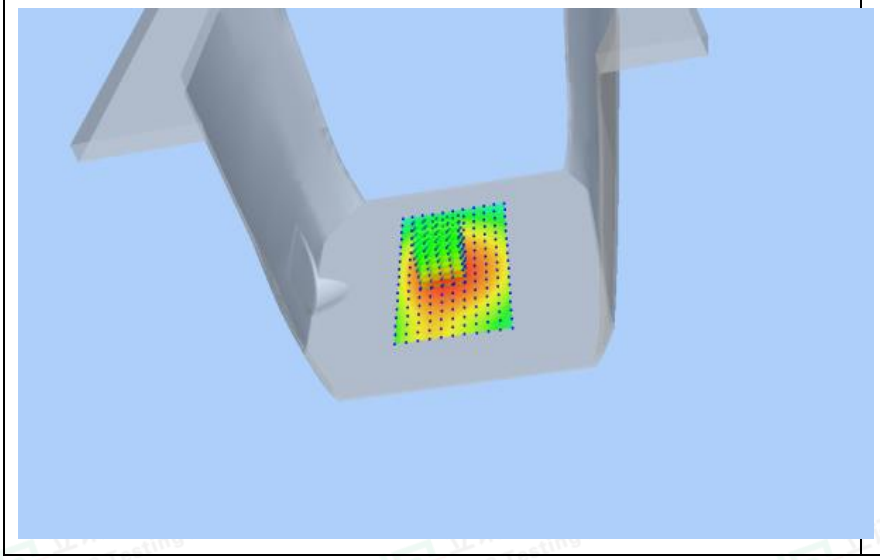
#16

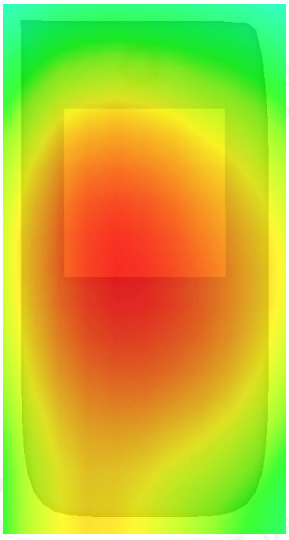
Test Mode: LTE Band 5, 1RB, (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 21, 2023

Medium(liquid type)	HSL _835
Frequency (MHz)	829.0000
Relative permittivity (real part)	42.56
Conductivity (S/m)	0.88
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	1.75
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.230000
SAR 10g (W/Kg)	0.191804
SAR 1g (W/Kg)	0.256471
SURFACE SAR	**VOLUME SAR**





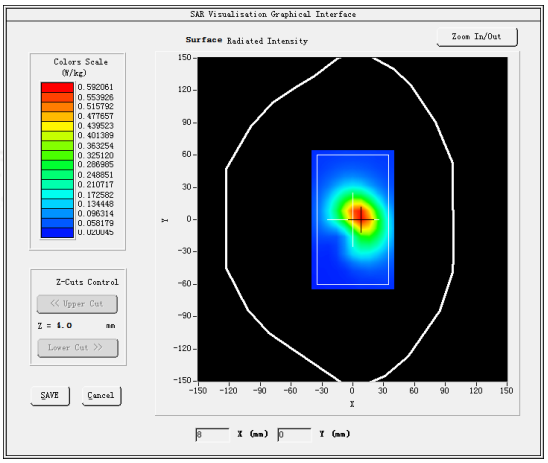


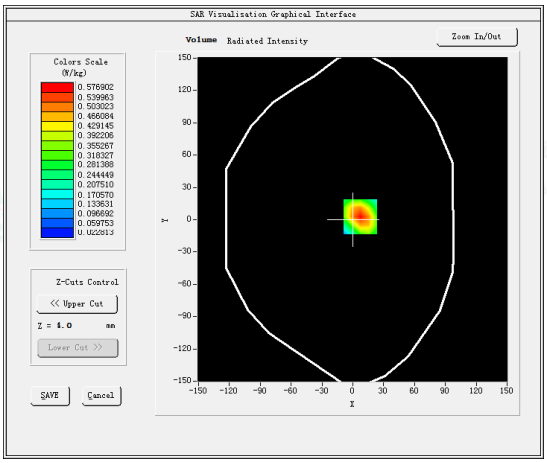


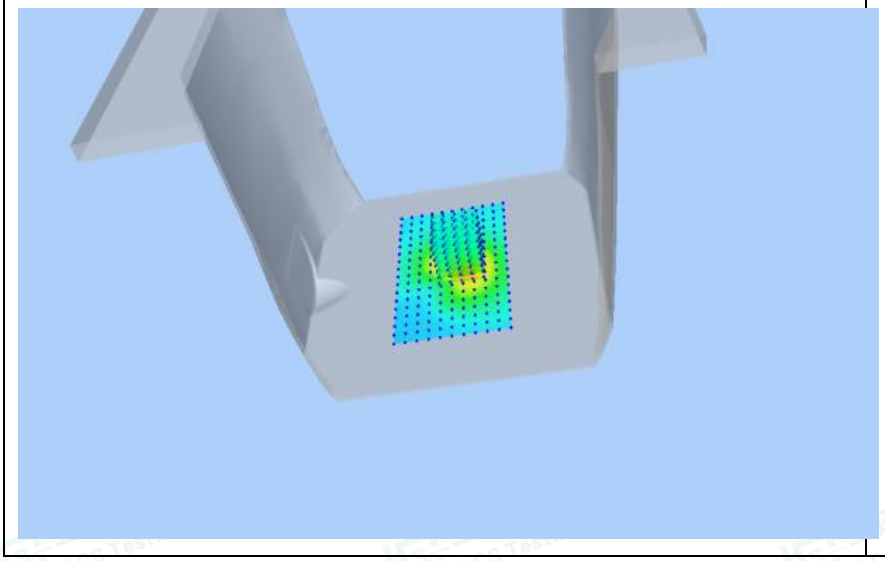
#17

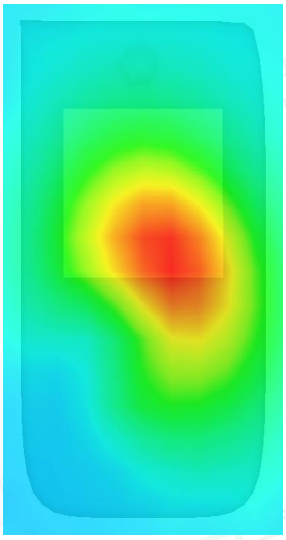
Test Mode: LTE Band 7, 1RB, (Front Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 27, 2023

Medium(liquid type)	HSL _2600
Frequency (MHz)	2510.0000
Relative permittivity (real part)	40.1
Conductivity (S/m)	1.93
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	1.75
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	0.300000
SAR 10g (W/Kg)	0.282161
SAR 1g (W/Kg)	0.544412
SURFACE SAR	**VOLUME SAR**





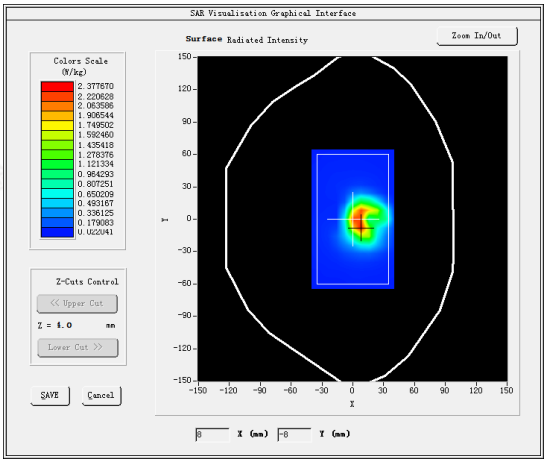


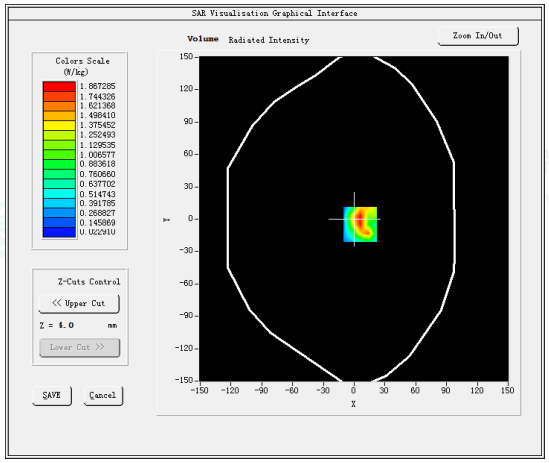


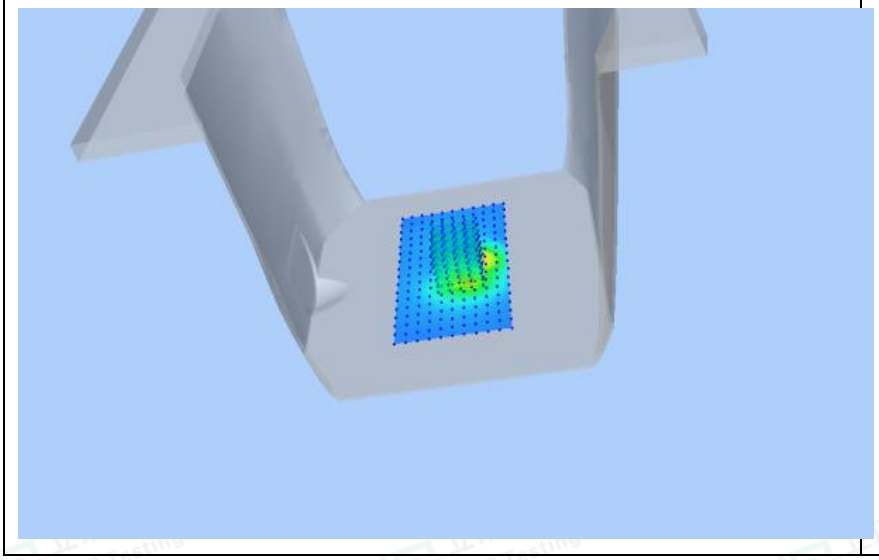
#18

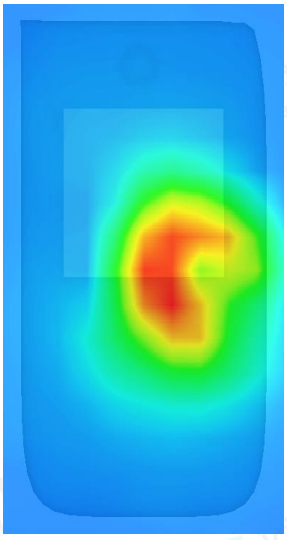
Test Mode: LTE Band 7, 1RB, (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 27, 2023

Medium(liquid type)	HSL _2600
Frequency (MHz)	2510.0000
Relative permittivity (real part)	40.1
Conductivity (S/m)	1.93
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	1.75
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.230000
SAR 10g (W/Kg)	0.750944
SAR 1g (W/Kg)	1.719251
SURFACE SAR	**VOLUME SAR**



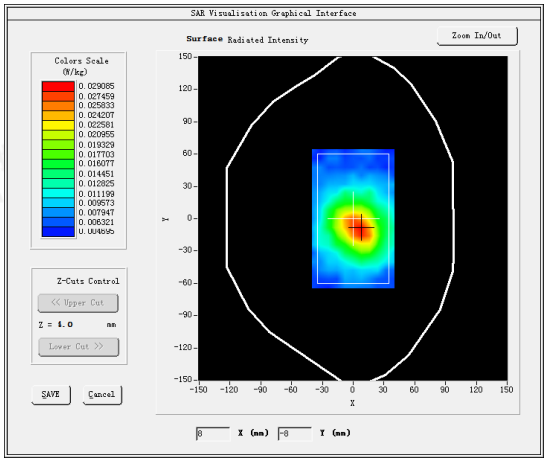
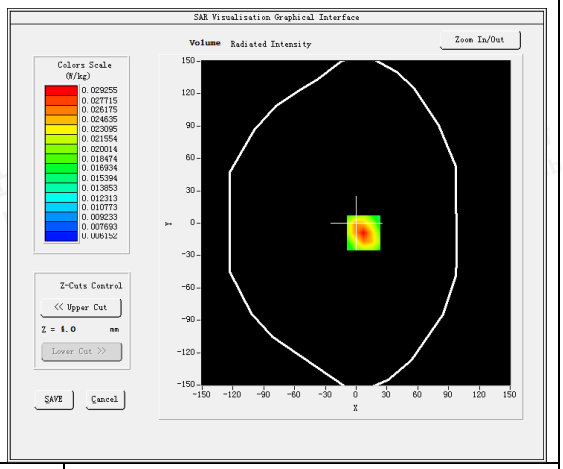
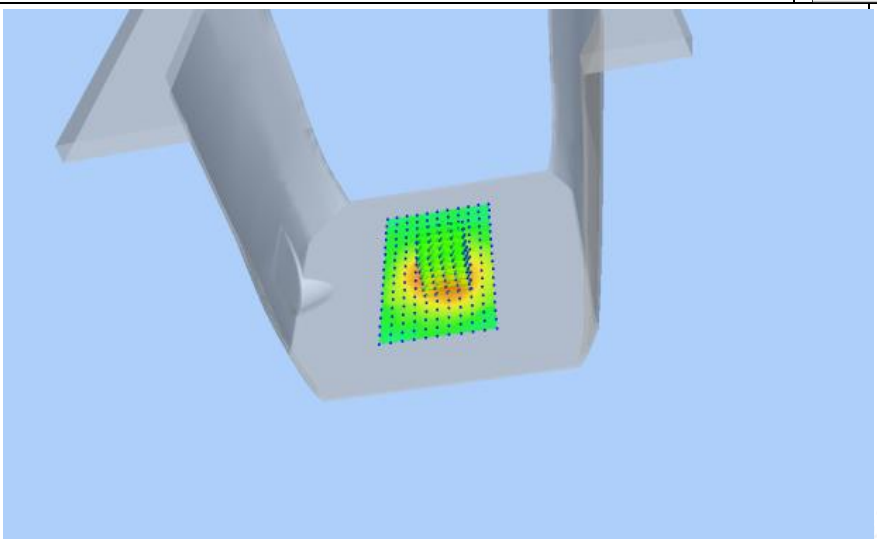
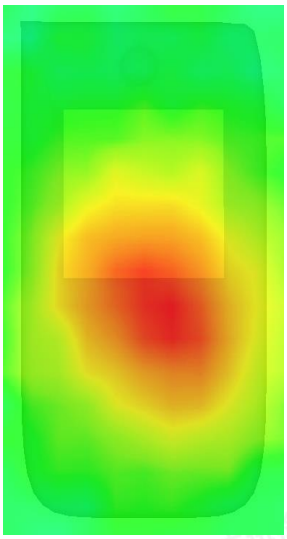






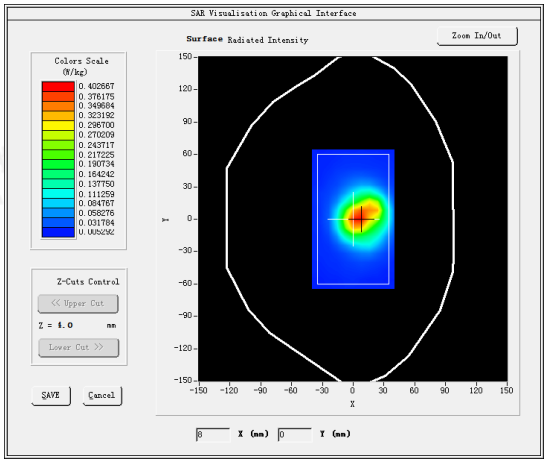
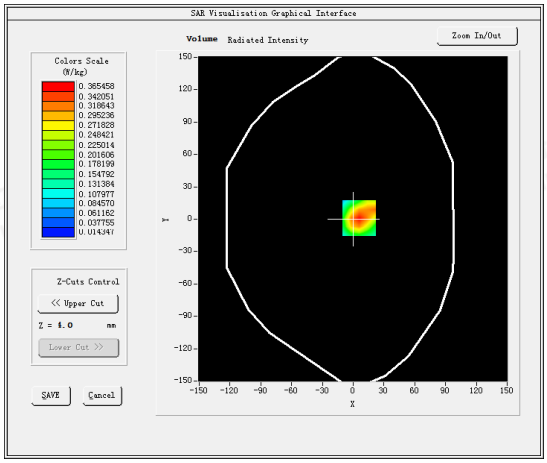
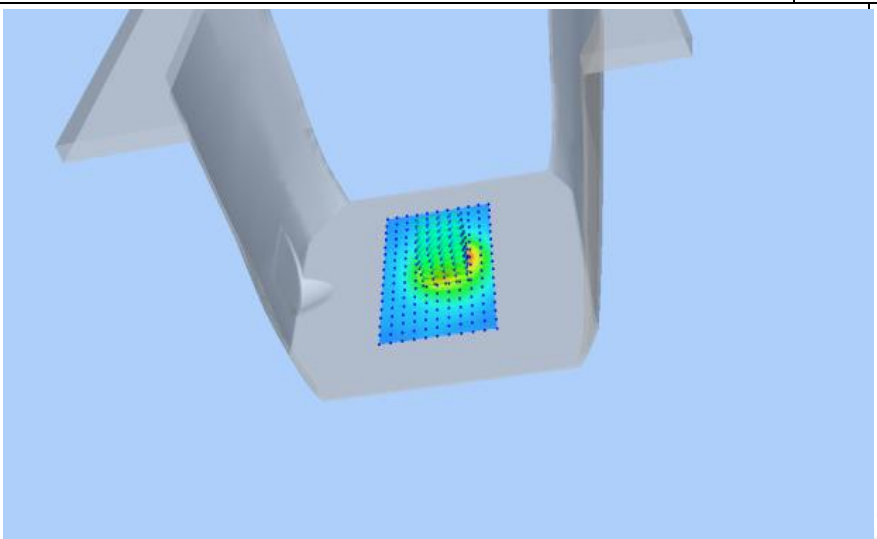
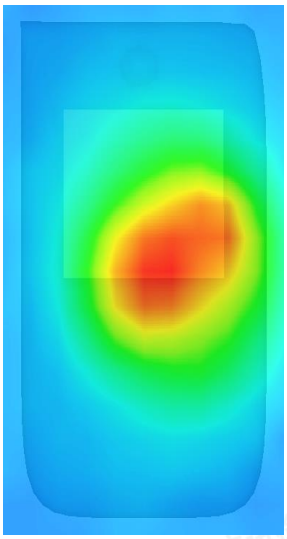
#19

Test Mode: LTE Band 12, 1RB, Low channel(Front Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 21, 2023

Medium(liquid type)	HSL _750
Frequency (MHz)	711.0000
Relative permittivity (real part)	43.78
Conductivity (S/m)	0.85
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	1.69
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.570000
SAR 10g (W/Kg)	0.019524
SAR 1g (W/Kg)	0.028972
SURFACE SAR	**VOLUME SAR**
	
	

#20

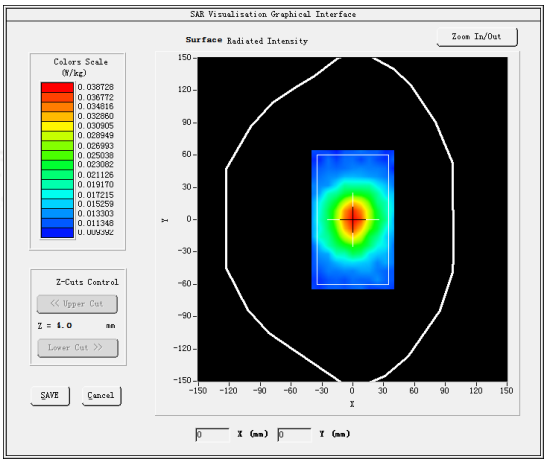
Test Mode: LTE Band 12, 1RB, Low channel (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 21, 2023

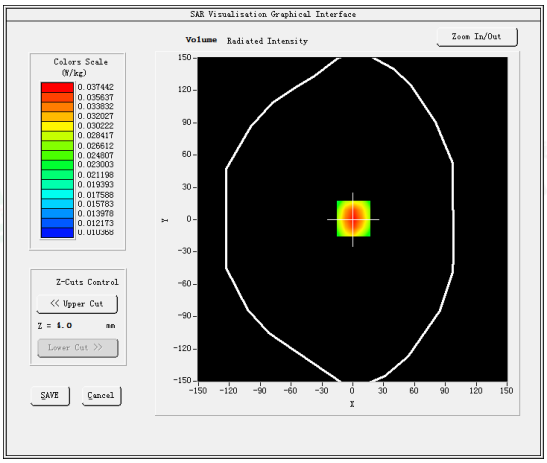
Medium(liquid type)	HSL _750
Frequency (MHz)	711.0000
Relative permittivity (real part)	43.78
Conductivity (S/m)	0.85
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	1.69
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.280000
SAR 10g (W/Kg)	0.184728
SAR 1g (W/Kg)	0.356623
SURFACE SAR	**VOLUME SAR**
	
	

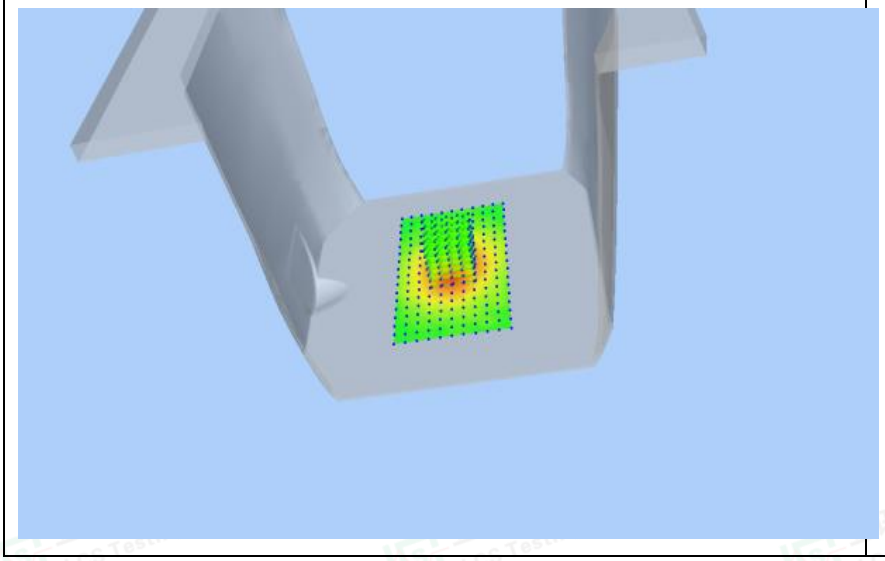
#21

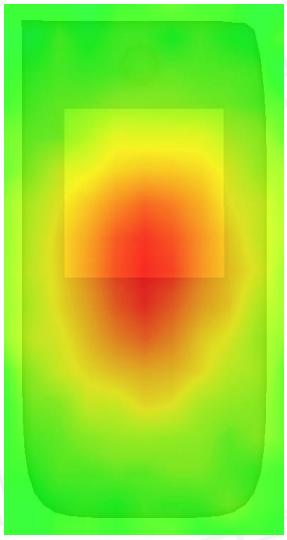
Test Mode: LTE Band 17, 1RB, (Front Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 21, 2023

Medium(liquid type)	HSL _750
Frequency (MHz)	711.0000
Relative permittivity (real part)	43.78
Conductivity (S/m)	0.85
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	1.69
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.350000
SAR 10g (W/Kg)	0.026474
SAR 1g (W/Kg)	0.038099
SURFACE SAR	**VOLUME SAR**





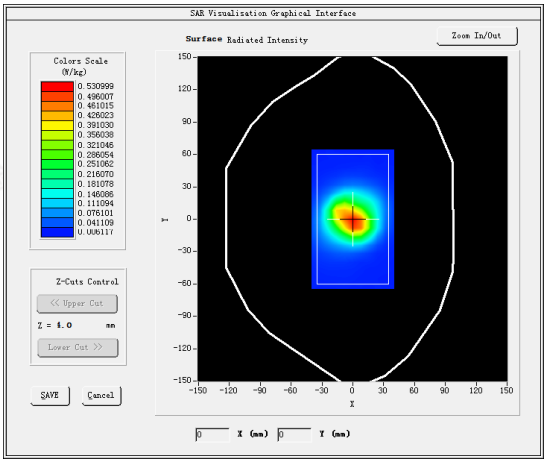


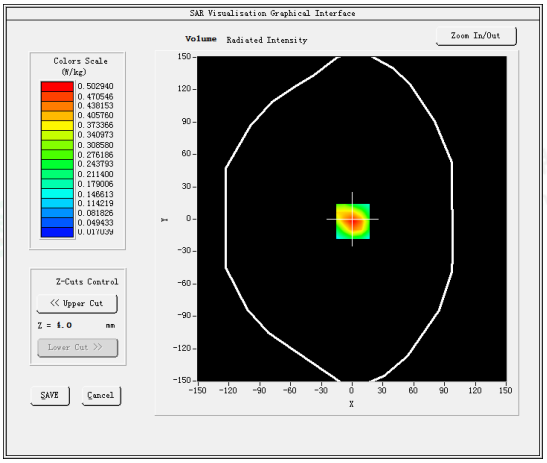


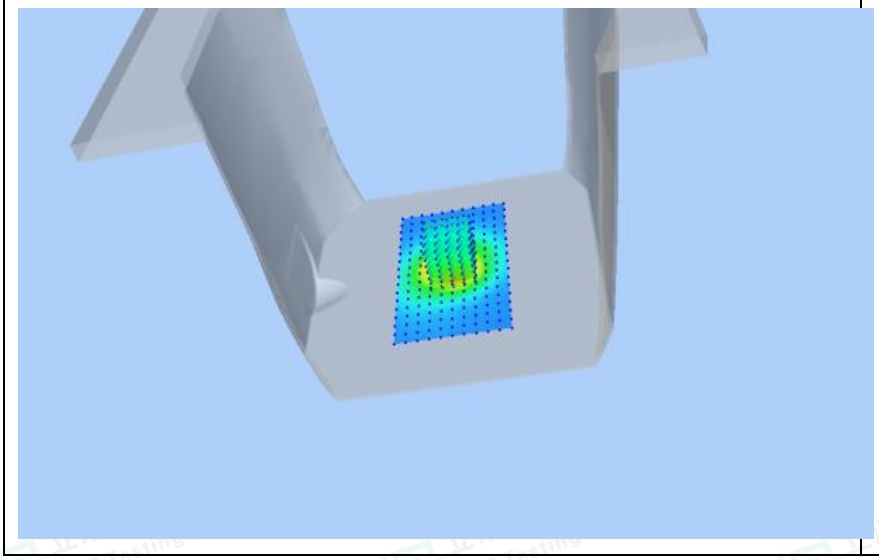
#22

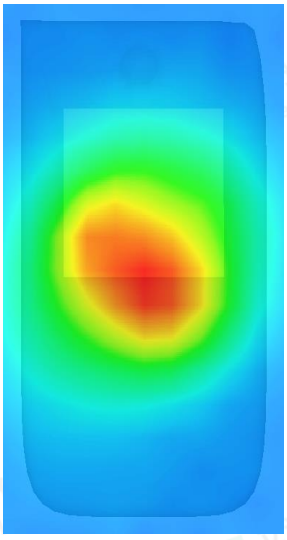
Test Mode: LTE Band 17, 1RB, (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 21, 2023

Medium(liquid type)	HSL _750
Frequency (MHz)	711.0000
Relative permittivity (real part)	43.78
Conductivity (S/m)	0.85
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	1.69
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	0.020000
SAR 10g (W/Kg)	0.250613
SAR 1g (W/Kg)	0.486583
SURFACE SAR	**VOLUME SAR**





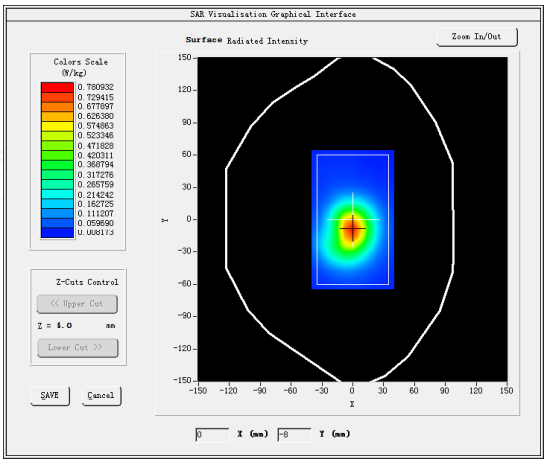


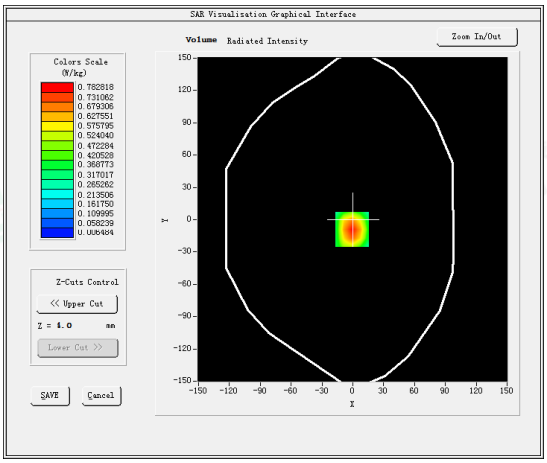


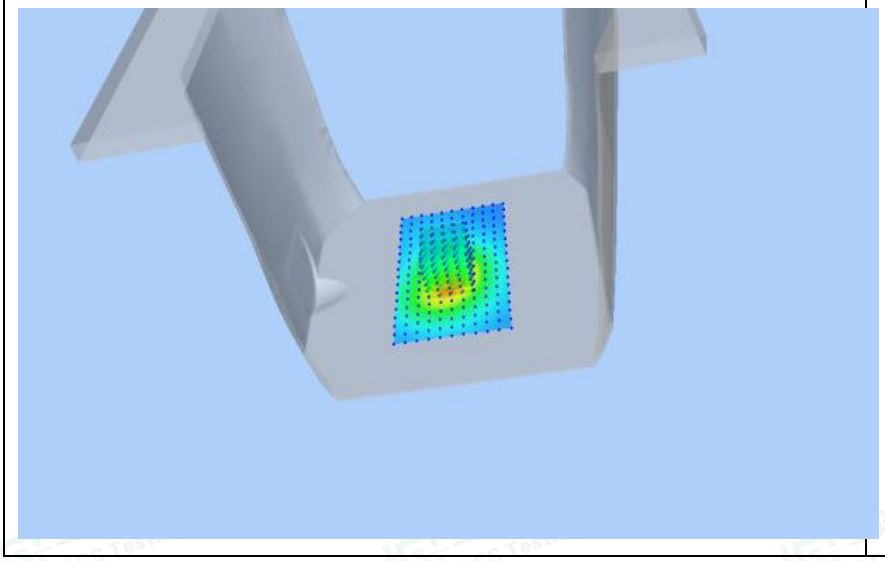
#23

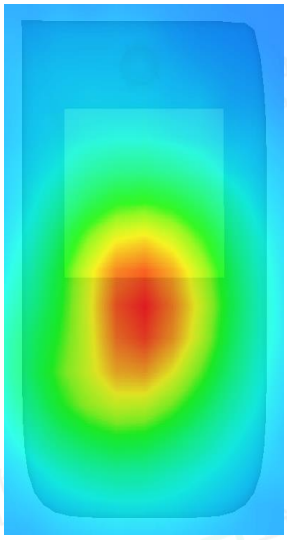
Test Mode: LTE Band 25, 1RB, (Front Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 26, 2023

Medium(liquid type)	HSL _1900
Frequency (MHz)	1860.0000
Relative permittivity (real part)	41.76
Conductivity (S/m)	1.45
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	1.69
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.350000
SAR 10g (W/Kg)	0.414447
SAR 1g (W/Kg)	0.731694
SURFACE SAR	**VOLUME SAR**





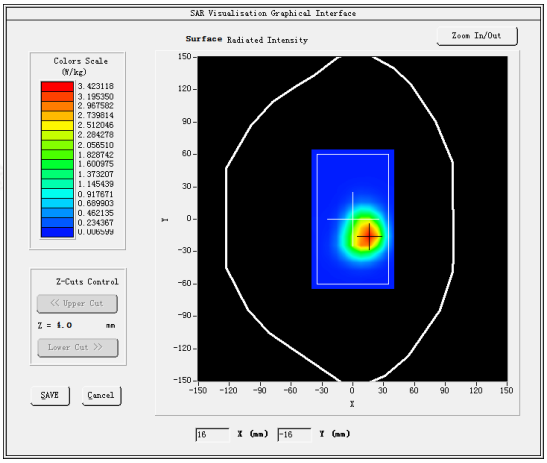


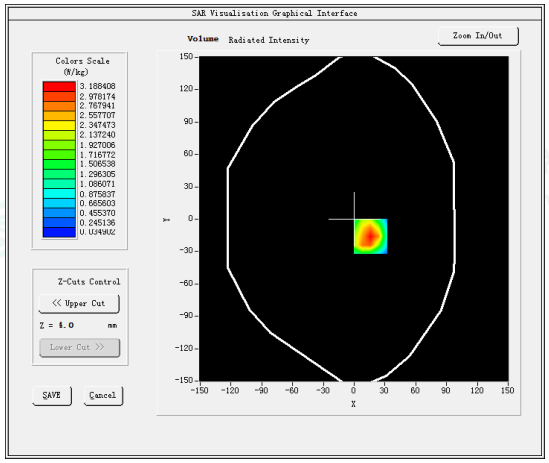


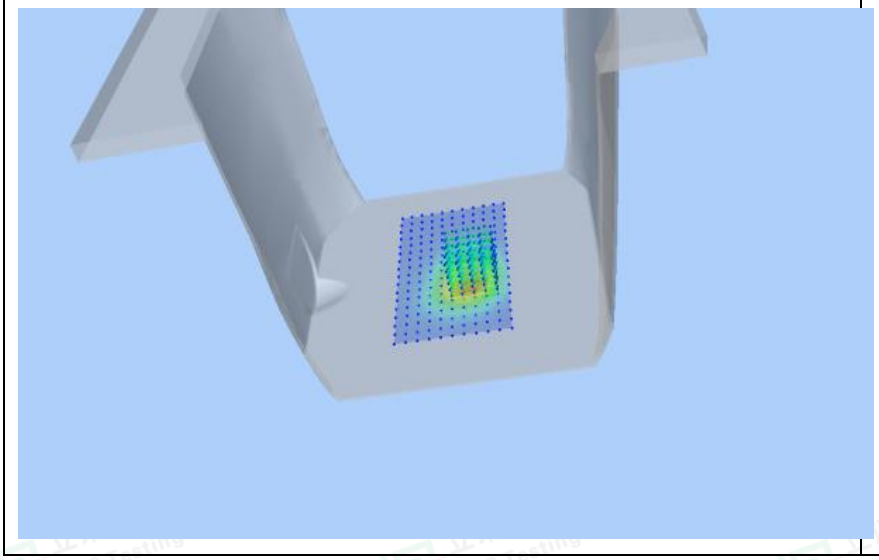
#24

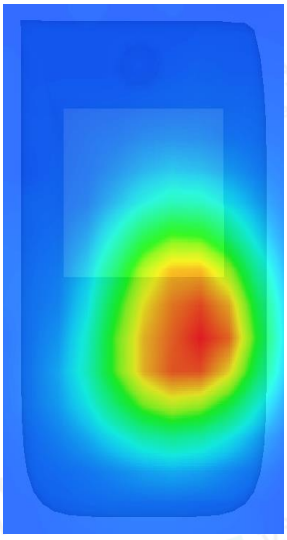
Test Mode: LTE Band 25, 1RB, (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 26, 2023

Medium(liquid type)	HSL _1900
Frequency (MHz)	1860.0000
Relative permittivity (real part)	41.76
Conductivity (S/m)	1.45
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	1.69
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	0.020000
SAR 10g (W/Kg)	1.508041
SAR 1g (W/Kg)	3.089301
SURFACE SAR	**VOLUME SAR**





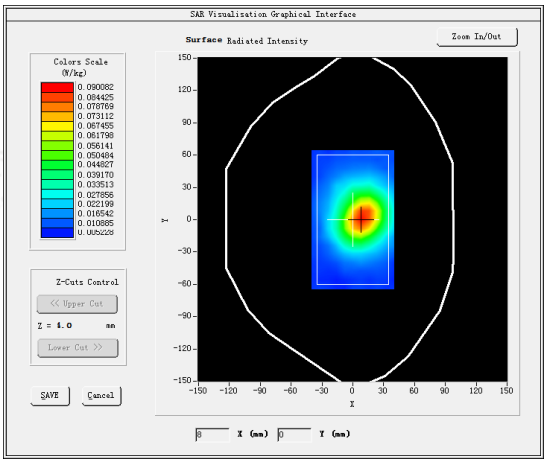


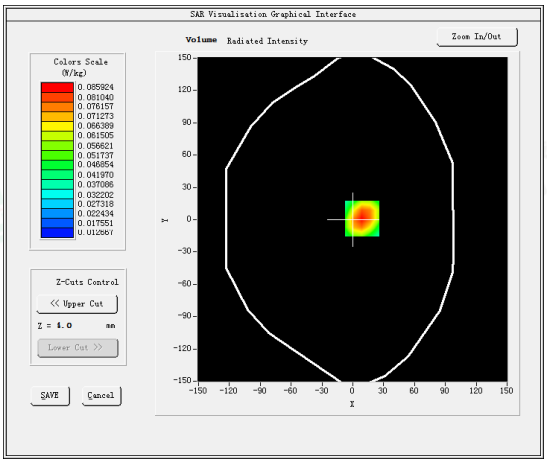


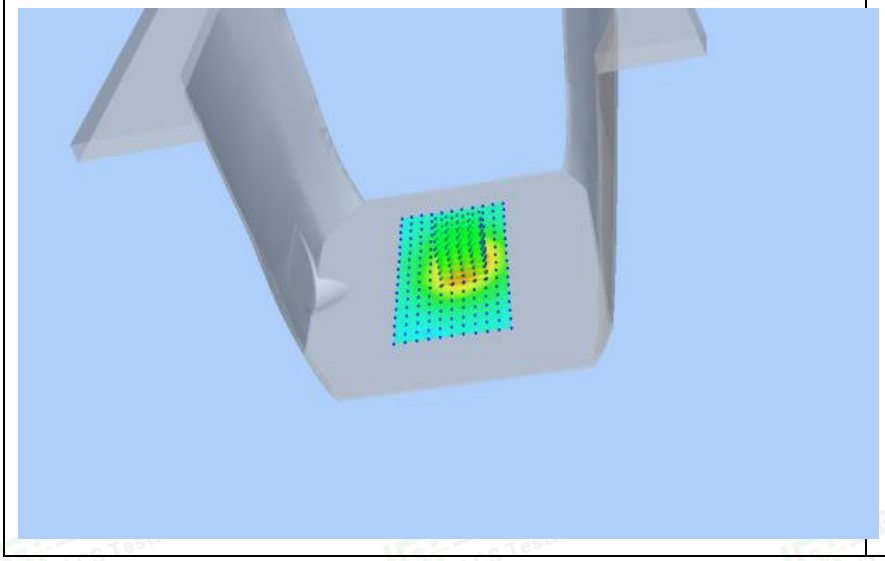
#25

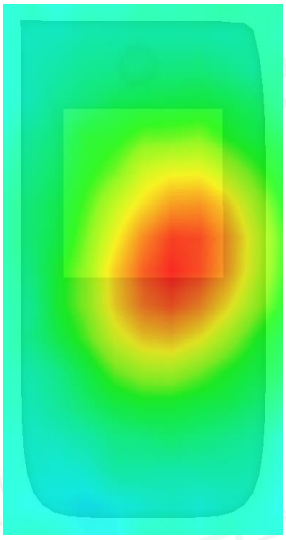
Test Mode: LTE Band 26, 1RB, (Front Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 21, 2023

Medium(liquid type)	HSL _835
Frequency (MHz)	821.5000
Relative permittivity (real part)	42.56
Conductivity (S/m)	0.88
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	1.69
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.350000
SAR 10g (W/Kg)	0.052075
SAR 1g (W/Kg)	0.082024
SURFACE SAR	**VOLUME SAR**





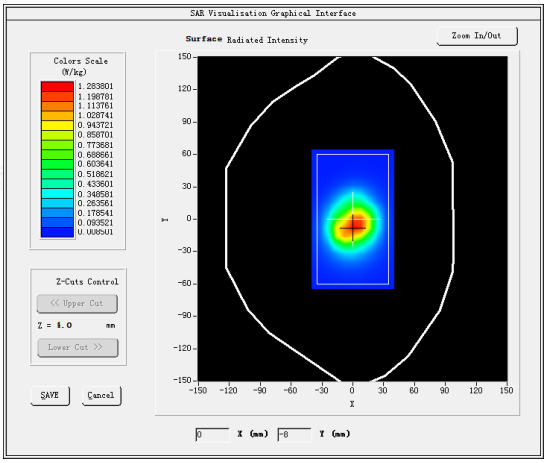


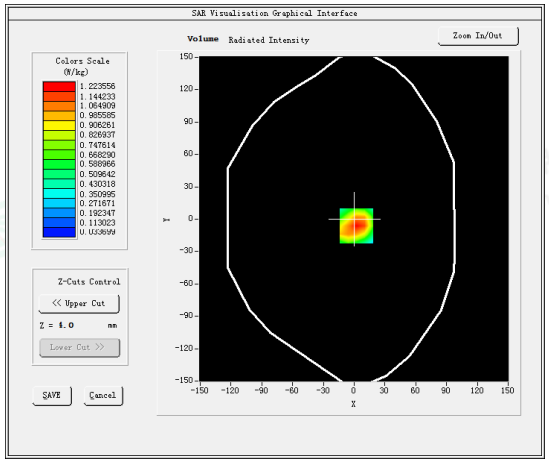


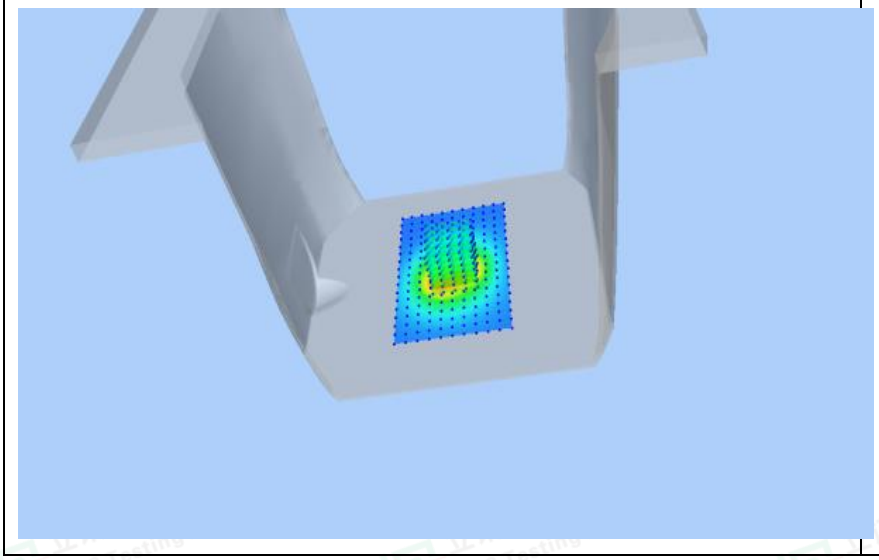
#26

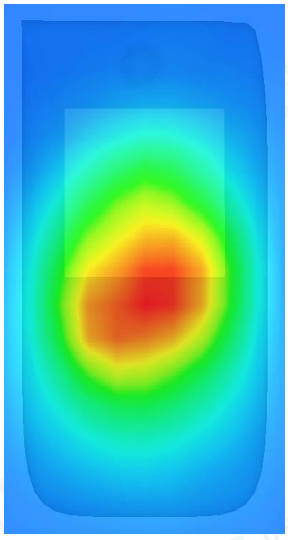
Test Mode: LTE Band 26, 1RB, (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 21, 2023

Medium(liquid type)	HSL _835
Frequency (MHz)	821.5000
Relative permittivity (real part)	42.56
Conductivity (S/m)	0.88
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	1.69
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	0.020000
SAR 10g (W/Kg)	0.614547
SAR 1g (W/Kg)	1.161755
SURFACE SAR	**VOLUME SAR**





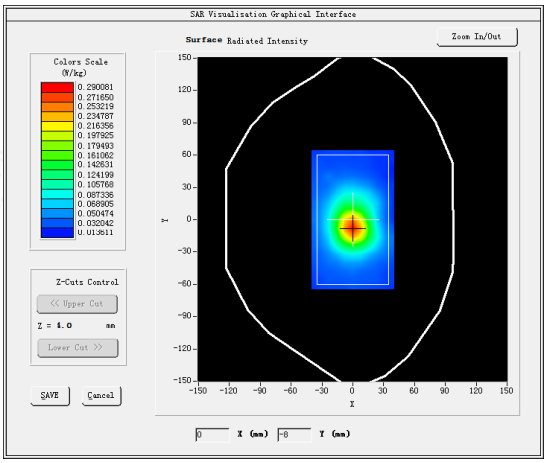


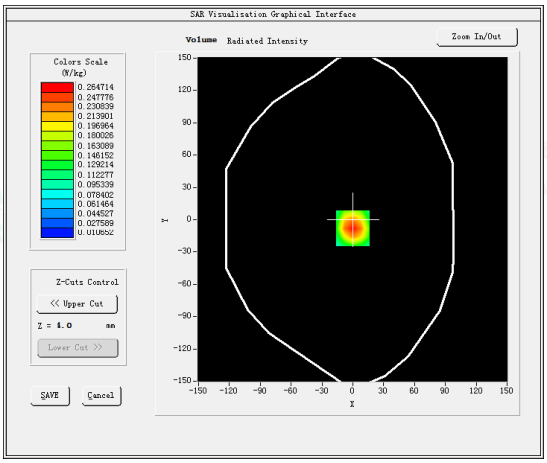


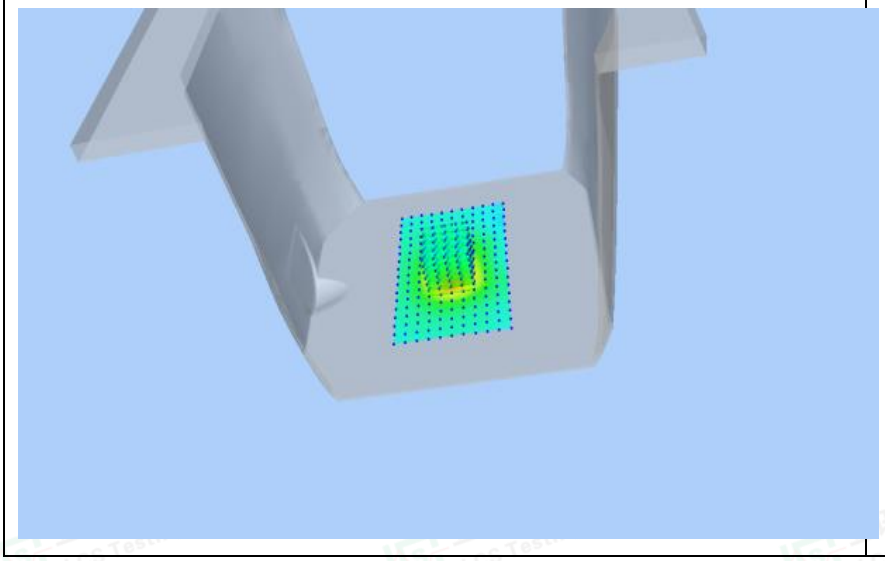
#27

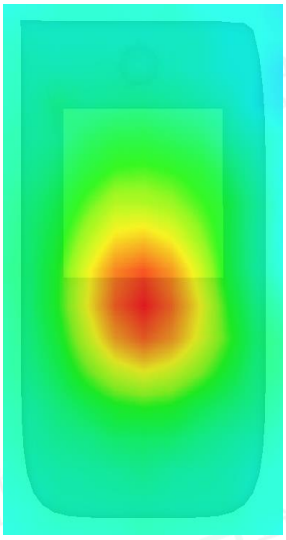
Test Mode: LTE Band 38, 1RB, (Front Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 27, 2023

Medium(liquid type)	HSL_2600
Frequency (MHz)	2595.0000
Relative permittivity (real part)	40.1
Conductivity (S/m)	1.93
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	2.39
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.010000
SAR 10g (W/Kg)	0.137640
SAR 1g (W/Kg)	0.249804
SURFACE SAR	**VOLUME SAR**





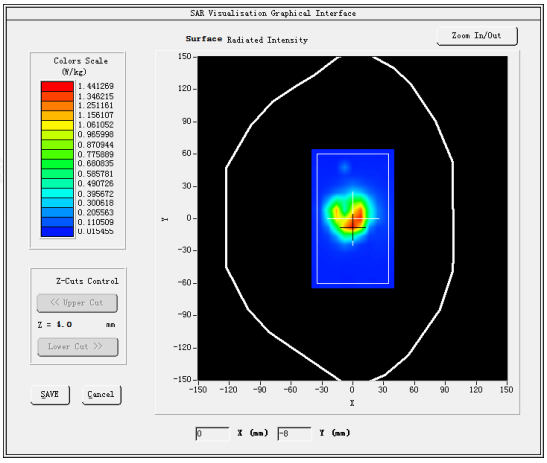


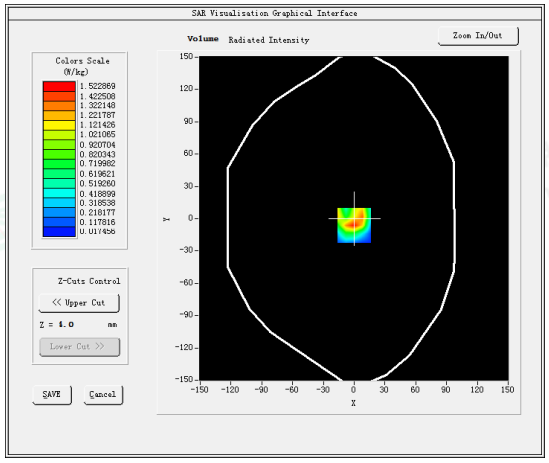


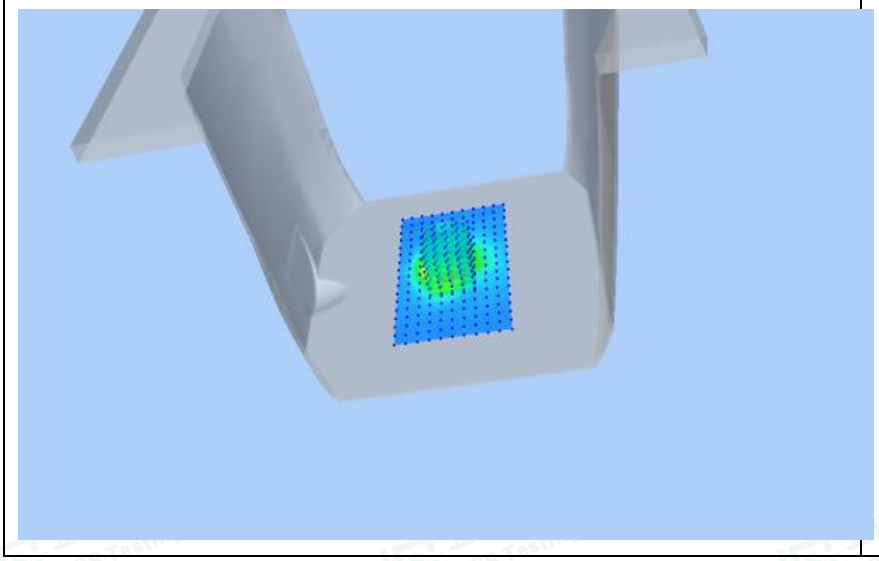
#28

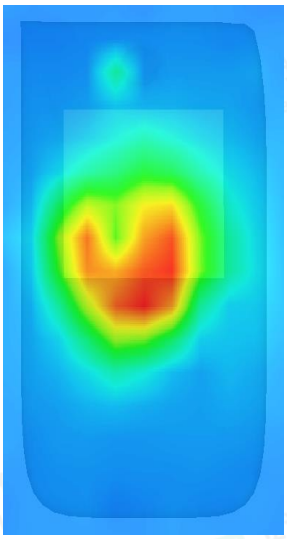
Test Mode: LTE Band 38, 1RB, (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 27, 2023

Medium(liquid type)	HSL_2600
Frequency (MHz)	2595.0000
Relative permittivity (real part)	40.1
Conductivity (S/m)	1.93
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	2.39
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.010000
SAR 10g (W/Kg)	0.617378
SAR 1g (W/Kg)	1.353065
SURFACE SAR	**VOLUME SAR**





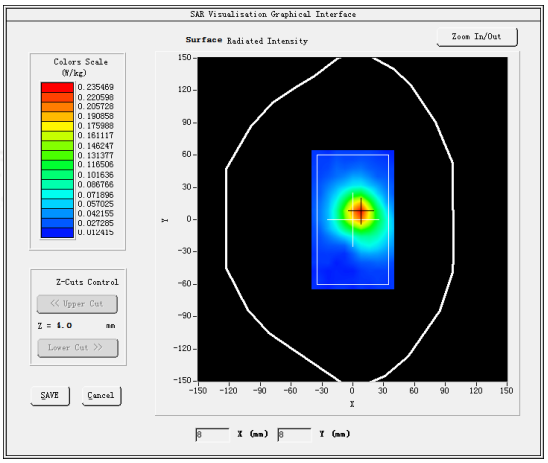


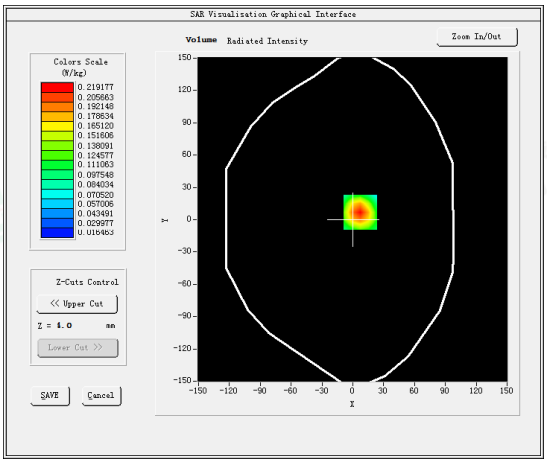


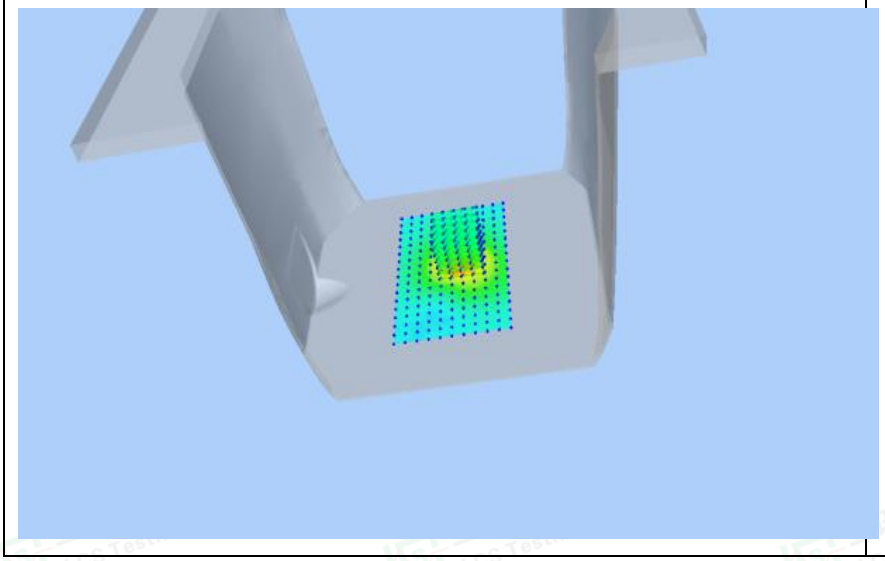
#29

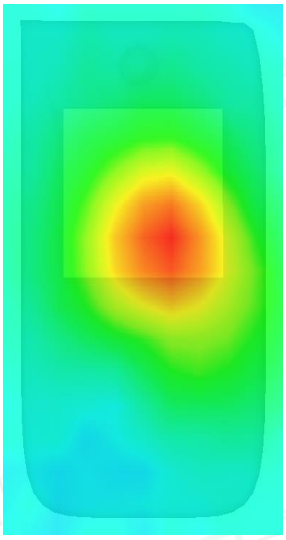
Test Mode: LTE Band 41, 1RB, (Front Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 27, 2023

Medium(liquid type)	HSL_2600
Frequency (MHz)	2565.0000
Relative permittivity (real part)	40.1
Conductivity (S/m)	1.93
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	2.39
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.010000
SAR 10g (W/Kg)	0.116940
SAR 1g (W/Kg)	0.207095
SURFACE SAR	**VOLUME SAR**





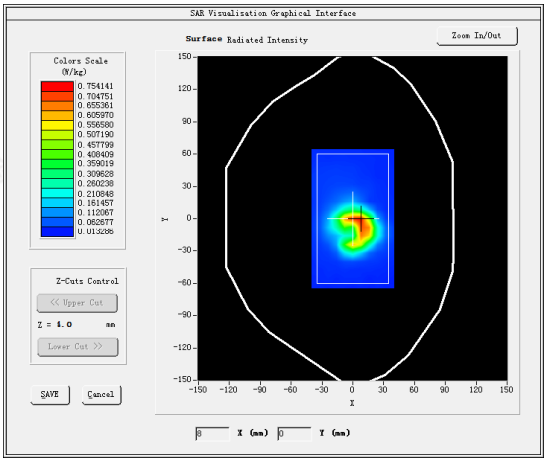


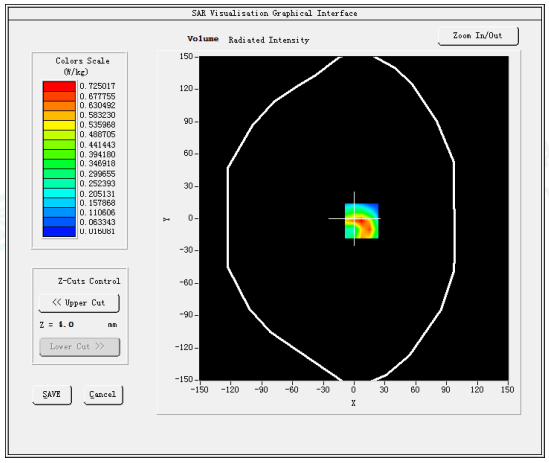


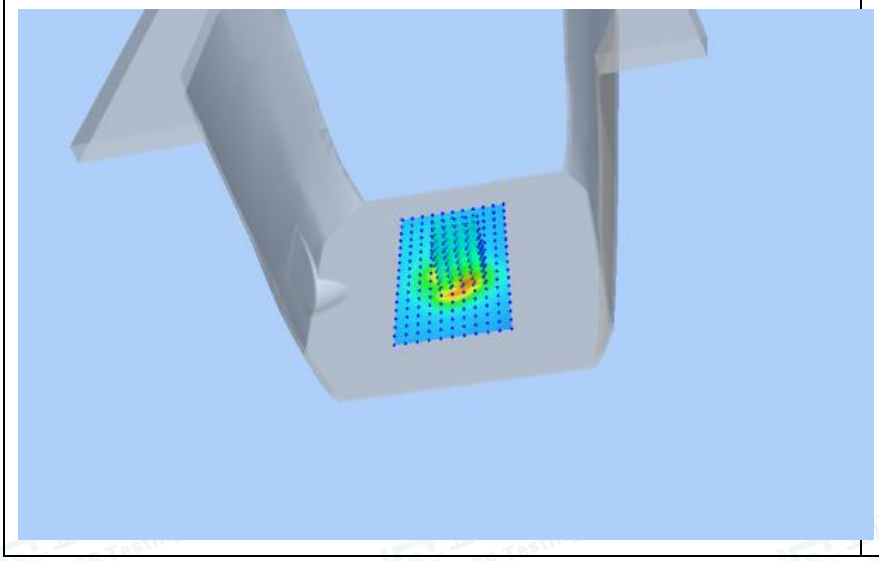
#30

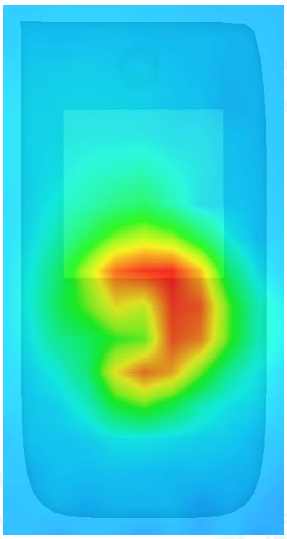
Test Mode: LTE Band 41, 1RB, (Back Side)
Product Description: NickWatch V1
Model: NICKW001-2
Test Date: Aug. 27, 2023

Medium(liquid type)	HSL_2600
Frequency (MHz)	2565.0000
Relative permittivity (real part)	40.1
Conductivity (S/m)	1.93
E-Field Probe	SN 25/22 EPGO376
Crest Factor	1.0
Conversion Factor	2.39
Sensor	4mm
Area Scan	dx=12mm dy=12mm
Zoom Scan	7x7x7,dx=5mm dy=5mm dz=5mm
Variation (%)	-0.010000
SAR 10g (W/Kg)	0.293583
SAR 1g (W/Kg)	0.648592
SURFACE SAR	**VOLUME SAR**









5. CALIBRATION CERTIFICATES

5.1 Probe-EPGO376 Calibration Certificate

COMOSAR E-Field Probe Calibration Report

Ref : ACR.180.4.42.BES.A

SHENZHEN LCS COMPLIANCE TESTING LABORATORY LTD.

1F., XINGYUAN INDUSTRIAL PARK, TONGDA ROAD, BAO'AN BLVD

BAO'AN DISTRICT, SHENZHEN, GUANGDONG, CHINA

MVG COMOSAR DOSIMETRIC E-FIELD PROBE

SERIAL NO.: SN 25/22 EPGO376

Calibrated at MVG

Z.I. de la pointe du diable

Technopôle Brest Iroise – 295 avenue Alexis de Rochon

29280 PLOUZANE - FRANCE

Calibration date: 06/22/2023

Accreditations #2-6792
Scope available on www.cofrac.fr

The use of the Cofrac brand and the accreditation references is prohibited from any reproduction.

Summary:

This document presents the method and results from an accredited COMOSAR Dosimetric E-Field Probe calibration performed at MVG, using the CALIPROBE test bench, for use with a MVG COMOSAR system only. The test results covered by accreditation are traceable to the International System of Units (SI).

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	Name	Function	Date	Signature
Prepared by :	Jérôme Le Gall	Measurement Responsible	6/23/2023	
Checked & approved by:	Jérôme Luc	Technical Manager	6/23/2023	
Authorized by:	Yann Toutain	Laboratory Director	6/23/2023	

2023.06.23
13:37:50 +02'03'

	Customer Name
Distribution :	Shenzhen LCS Compliance Testing Laboratory Ltd.

Issue	Name	Date	Modifications
A	Jérôme Le Gall	6/23/2023	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 25/22 EPGO376
Product Condition (new / used)	New
Frequency Range of Probe	0.15 GHz-6GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.193 MΩ Dipole 2: R2=0.188 MΩ Dipole 3: R3=0.198 MΩ

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

MVG's COMOSAR E field Probes are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards.

Figure 1 – *MVG COMOSAR Dosimetric E field Probe*

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 IEC/IEEE 62209-1528 and FCC KDB865664 D01 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 to 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°).

3.1 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.

The boundary effect uncertainty can be estimated according to the following uncertainty approximation formula based on linear and exponential extrapolations between the surface and d_{be} + d_{step} along lines that are approximately normal to the surface:

$$\mathrm{SAR}_{\mathrm{uncertainty}}[\%] = \delta\mathrm{SAR}_{be}\,\frac{(d_{be}+d_{step})^2}{2d_{step}}\,\frac{\left(e^{-d_{be}/(\delta/2)}\right)}{\delta/2} \quad \text{for } (d_{be}+d_{step}) < 10\ \mathrm{mm}$$

where

$\mathrm{SAR}_{\mathrm{uncertainty}}$	is the uncertainty in percent of the probe boundary effect
d_{be}	is the distance between the surface and the closest *zoom-scan* measurement point, in millimetre
Δ_{step}	is the separation distance between the first and second measurement points that are closest to the phantom surface, in millimetre, assuming the boundary effect at the second location is negligible
δ	is the minimum penetration depth in millimetres of the head tissue-equivalent liquids defined in this standard, i.e., $\delta \approx 14$ mm at 3 GHz;
$\Delta\mathrm{SAR}_{be}$	in percent of SAR is the deviation between the measured SAR value, at the distance d_{be} from the boundary, and the analytical SAR value.

The measured worst case boundary effect SAR uncertainty[%] for scanning distances larger than 4mm is 1.0% Limit ,2%).

4 MEASUREMENT UNCERTAINTY

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 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 (%)**
Expanded uncertainty 95 % confidence level k = 2					14 %

5 CALIBRATION MEASUREMENT RESULTS

Calibration Parameters	
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

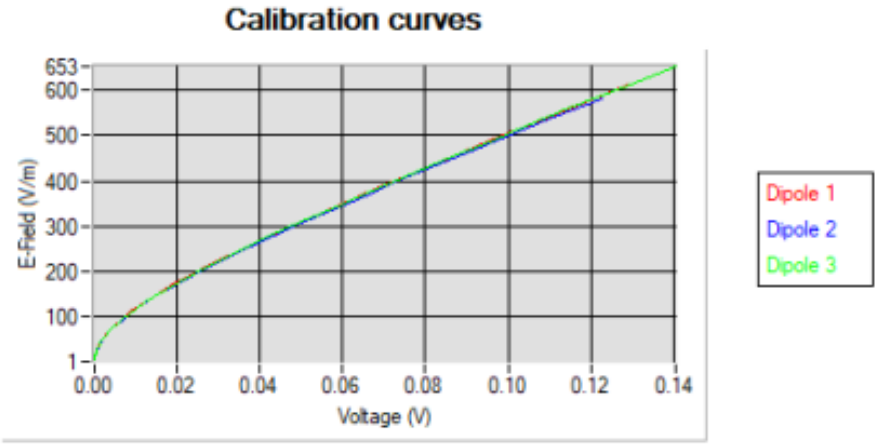
5.1 SENSITIVITY IN AIR

Normx dipole 1 (μV/(V/m)²)	Normy dipole 2 (μV/(V/m)²)	Normz dipole 3 (μV/(V/m)²)
0.76	0.78	0.76

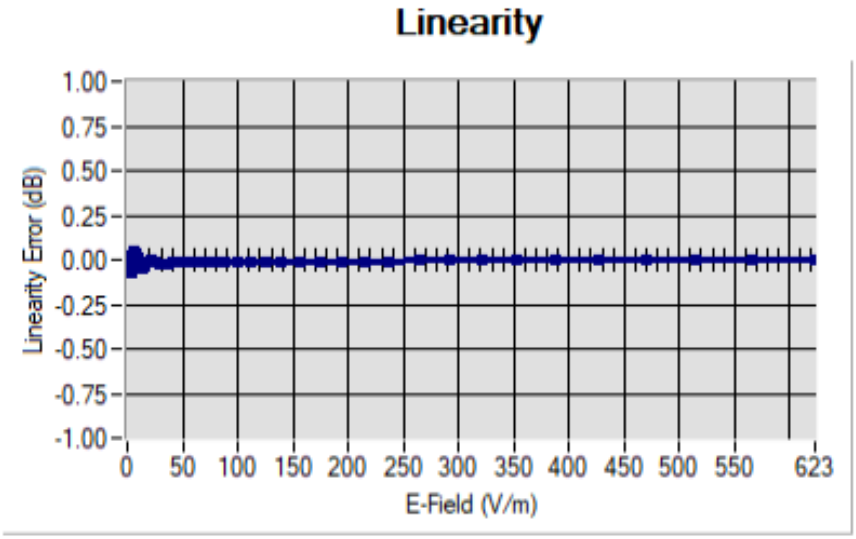
DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
106	107	108

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

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



5.2 LINEARITY



Linearity:+/-1.81% (+/-0.08dB)

5.3 SENSITIVITY IN LIQUID

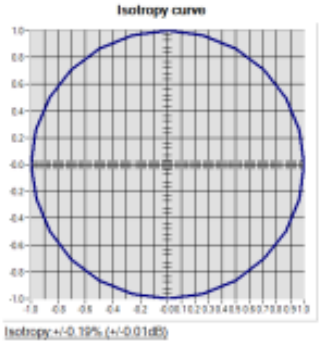
Liquid	Frequency (MHz +/- 100MHz)	ConvF
HL450*	450*	1.74*
BL450*	450*	1.67*
HL750	750	1.69
BL750	750	1.73
HL850	835	1.75
BL850	835	1.80
HL900	900	1.87
BL900	900	1.85
HL1800	1800	2.09
BL1800	1800	2.15
HL1900	1900	2.14
BL1900	1900	2.27
HL2000	2000	2.31
BL2000	2000	2.34
HL2300	2300	2.46
BL2300	2300	2.51
HL2450	2450	2.60
BL2450	2450	2.70
HL2600	2600	2.39
BL2600	2600	2.50
HL5200	5200	1.85
BL5200	5200	1.81
HL5400	5400	2.07
BL5400	5400	2.00
HL5600	5600	2.19
BL5600	5600	2.11
HL5800	5800	2.01
BL5800	5800	1.97

* Frequency not cover by COFRAC scope, calibration not accredited

LOWER DETECTION LIMIT: 7mW/kg

5.4 ISOTROPY

HL1800 MHz



6 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	**Manufacturer / Model**	**Identification No.**	**Current Calibration Date**	**Next Calibration Date**
CALIPROBE Test Bench	Version 2	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2024
Network Analyzer	Agilent 8753ES	MY40003210	10/2022	10/2025
Network Analyzer – Calibration kit	HP 85033D	3423A08186	06/2021	06/2027
Multimeter	Keithley 2000	1160271	02/2023	02/2026
Signal Generator	Rohde & Schwarz SMB	106589	03/2022	03/2025
Amplifier	MVG	MODU-023-C-0002	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Power Meter	NI-USB 5680	170100013	06/2021	06/2024
Power Meter	Rohde & Schwarz NRVD	832839-056	11/2022	11/2025
Directional Coupler	Krytar 158020	131467	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Waveguide	MVG	SN 32/16 WG4_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_0G900_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG6_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G500_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG8_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G800B_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G800H_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG10_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_3G500_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG12_1	Validated. No cal required.	Validated. No cal required.