FCC

SAR EVALUATION REPORT

For

FCC ID：2AB877612

Main Model : AWUS036ACM

Report Type：Original Report	**Product Name**：802.11ac High-Speed USB Adapter

Report Number：**RXZ211019002SA01**

Report Date：**2021-11-30**

Prepared By：**Bay Area Compliance Laboratories Corp. (New Taipei Laboratory)**
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Facilities：**The test site used by Bay Area Compliance Laboratories Corp. (New Taipei Laboratory) to collect test data is located on**
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Statement of Compliance

Applicant (Certification Holder)	Iconnect
	No.9, Aly. 58, Ln. 112, Ruiguand Rd., Neihu Dist., Taipei City, Taiwan, R.O.C.
Brand (Trade) Name	ALFA
Product (Equipment) Name	802.11ac High-Speed USB Adapter
Main Model Name	AWUS036ACM
Serial Mode Name	AWUS036ACX,AWSU036AC-X,AWUS036EACX,AWUS036EAC-X,AWUS036ACHX,AWUS036ACH-X,AWUS1900 X:Any alphanumeric character or blank
Serial number	RXZ211019002-01
Test Date	2021/11/17 ~ 2021/11/22

Note: *Serial Mode Name only for marketing segmentation.*

Measurement Procedures and Standards Used:

☒ IEEE1528:2013
☐ FCC 47 CFR part 2.1091
☒ FCC 47 CFR part 2.1093
☒ KDB 447498 D02 SAR Procedures for Dongle Xmtr v02
☒ KDB 447498 D01 General RF Exposure Guidance v06
☐ KDB 648474 D04 Handset SAR v01r03
☒ KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
☒ KDB 865664 D02 RF Exposure Reporting v01r02
☐ KDB 941225 D01 3G SAR Procedures v03r01
☐ KDB 941225 D05 SAR for LTE Devices v02r05
☒ KDB 248227 D01 802 11 Wi-Fi SAR v02r02

The measurement results in this report were performed at Bay Area Compliance Laboratories Corp. (New Taipei Laboratory)
Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.
Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.
The determination of the test results does not require consideration of the uncertainty of the measurement, unless the assessment is required by customer agreement, regulation or standard document specification.

Report Issued Date: 2021-11-30
Project Engineer: Anson Lu
Reviewed By: Gimmy Tsai

Revision History

Revision	No.	Report Number	Issue Date	Description	Author/ Revised by
0.0	RXZ211019002	RXZ211019002SA01	2021.11.30	Original Report	Anson Lu

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EUT RESULTS

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<tr><td>WLAN 5.2GHz</td><td>1g Body SAR</td><td>0.605</td></tr>
<tr><td>WLAN 5.8GHz</td><td>1g Body SAR</td><td>0.760</td></tr>
<tr><td colspan="4">Note: This wireless device has been shown to be capable of compliance for localized specific absorption rate (SAR) for General Population/Uncontrolled Exposure limits specified in FCC 47 CFR part 2.1093 and has been tested in accordance with the measurement procedures specified in IEEE 1528-2013 and RF exposure KDB procedures.
The results and statements contained in this report pertain only to the device(s) evaluated.</td></tr>
</table>

EUT DESCRIPTION

Technical Specification

Applicant	Iconnect
Exposure Category	Population / Uncontrolled
Antenna Type(s)	Dipole Antenna
Modulation Type	2.4G Wi-Fi: DSSS, OFDM; 5G Wi-Fi: OFDM
Frequency Band	2.4G Wi-Fi: 2412 ~ 2462 MHz(b/g/n20) ; 2422 ~ 2452 MHz(n40) 5G Wi-Fi UNII-1: 5150 ~ 5250 MHz, 5G Wi-Fi UNII-3: 5725 ~ 5850 MHz
Max. Output Power (Avg/Tune-up)	802.11b: 18.0 dBm 802.11g: 14.0 dBm 802.11n20: 13.5 dBm 802.11n40: 9.5 dBm 802.11a UNII-1: 16.0 dBm ; 802.11a UNII-3: 18.0 dBm 802.11n20 UNII-1: 16.0 dBm ; 802.11n20 UNII-3: 17.0 dBm 802.11ac20 UNII-1: 15.5 dBm ; 802.11ac20 UNII-3: 17.5 dBm 802.11n40 UNII-1: 8.5 dBm ; 802.11n40 UNII-3: 16.5 dBm 802.11ac40 UNII-1: 8.5 dBm ; 802.11ac40 UNII-3: 17.0 dBm 802.11ac80 UNII-1: 10.0 dBm ; 802.11ac80 UNII-3: 18.0 dBm
Power Source	USB DC 5V
Normal Operation:	Body Supported

All measurement and test data in this report was gathered from production sample serial number：RXZ211019002-01, (Assigned by BACL, (New Taipei Laboratory)).The EUT supplied by the applicant was received on 2021/09/22.

REFERENCE, STANDARDS, AND GUIDELINES

FCC：

The Report and Order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g as recommended by the ANSI/IEEE standard C95.1 [6] for an uncontrolled environment (Paragraph 65). According to the Supplement C of OET Bulletin 65 "Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at maximum output power (radiated from the antenna) under "worst-case" conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits. SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in North America is 1.6 mW/g average over 1 gram of tissue mass.

CE：

The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 2.0mW/g as recommended by EN62209-1 for an uncontrolled environment. According to the Standard, the device should be evaluated at maximum output power (radiated from the antenna) under "worst-case" conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits. SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in Europe is 2.0mW/g average over 10 gram of tissue mass.

The test configurations were laid out on a specially designed test fixture to ensure the reproducibility of measurements. Each configuration was scanned for SAR. Analysis of each scan was carried out to characterize the above effects in the device.

SAR Limits

FCC Limit

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)	**1.60**	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	**4.0**	20.0

CE Limit

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 10 g of tissue)	**2.0**	10
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

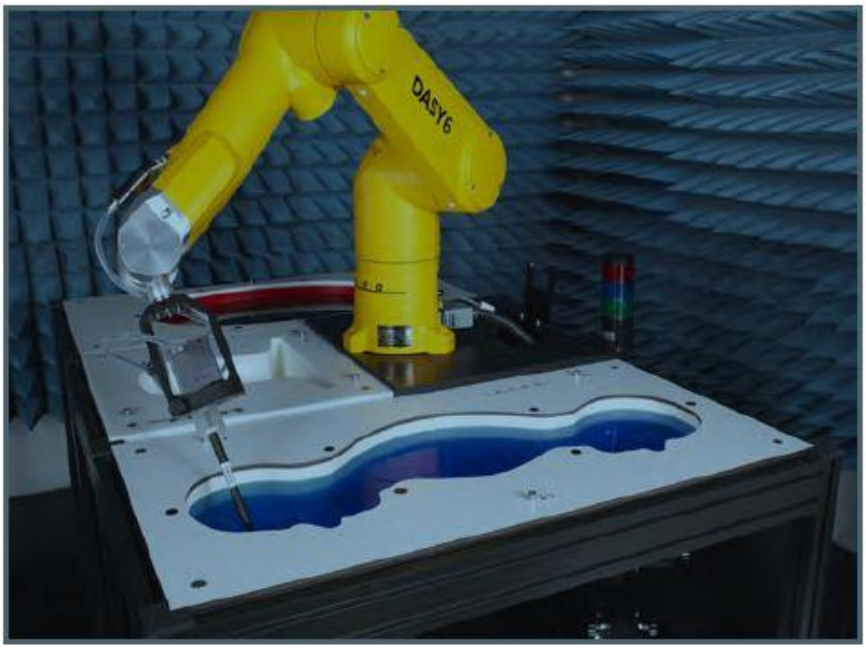
Population/Uncontrolled Environments are defined as locations where there is the exposure of individual who have no knowledge or control of their exposure.

Occupational/Controlled Environments are defined as locations where there is exposure that maybe incurred by people who are aware of the potential for exposure (i.e. as a result of employment or occupation).

General Population/Uncontrolled environments Spatial Peak limit 1.6W/kg (FCC) & 2.0 W/kg (CE) applied to the EUT.

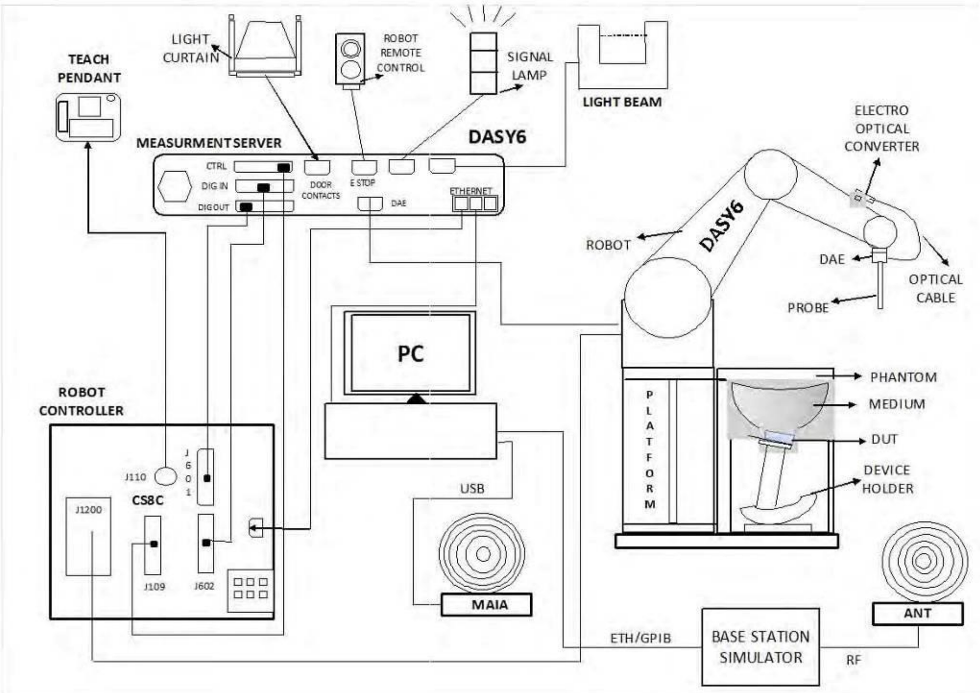
DESCRIPTION OF TEST SYSTEM

These measurements were performed with the automated near-field scanning system DASY6 from Schmid & Partner Engineering AG (SPEAG) which is the Fifth generation of the system shown in the figure hereinafter:



DASY6 System Description

The DASY6 system for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot (Staubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal application, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win7 professional operating system and the DASY52 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

DASY6 Measurement Server

The DASY6 measurement server is based on a PC/104 CPU board with a 400 MHz Intel ULV Celeron, 128 MB chip-disk and 128 MB RAM. The necessary circuits for communication with the DAE4 (or DAE3) electronics box, as well as the 16-bit AD converter system for optical detection and digital I/O interface are contained on the DASY6 I/O board, which is directly connected to the PC/104 bus of the CPU board.

The measurement server performs all real-time data evaluations of field measurements and surface detection, controls robot movements, and handles safety operations. The PC operating system cannot interfere with these time-critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program- controlled robot movements. Furthermore, the measurement server is equipped with an expansion port, which is reserved for future applications. Please note that this expansion port does not have a standardized pinout, and therefore only devices provided by SPEAG can be connected. Connection of devices from any other supplier could seriously damage the measurement server.

Data Acquisition Electronics

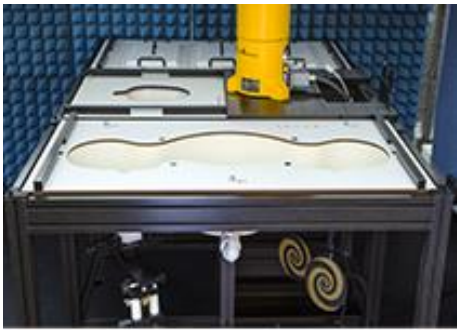
The data acquisition electronics (DAE4) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of both the DAE4 as well as of the DAE3 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

EX3DV4 E-Field Probes

Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 μW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μW/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI



SAM Twin Phantom
The SAM Twin Phantom (shown in front of DASY6) is a fiberglass shell phantom with shell thickness 2 mm, except in the ear region where the thickness is increased to 6 mm. The phantom has three measurement areas: 1) Left Head, 2) Right Head, and 3) Flat Section. For larger devices, the use of the ELI-Phantom (shown behind DASY6) is required. For devices such as glasses with a wireless link, the Face Down Phantom is the most suitable (between the SAM Twin and ELI phantoms).

When the phantom is mounted inside allocated slot of the DASY6 platform, phantom reference points can be taught directly in the DASY5 V5.2 software. When the DASY6 platform is used to mount the

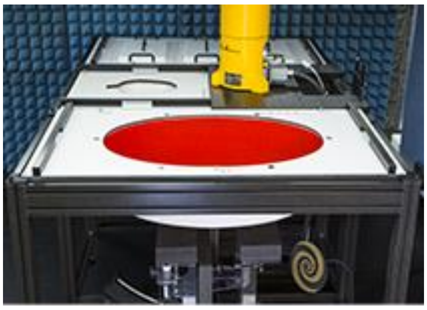
Phantom, some of the phantom teaching points cannot be reached by the robot in DASY5 V5.2. A special tool called P1a-P2aX-Former is provided to transform two of the three points, P1 and P2, to reachable locations. To use these new teaching points, a revised phantom configuration file is required.
In addition to our standard broadband liquids, the phantom can be used with the following tissue simulating liquids:

Sugar-water-based liquids can be left permanently in the phantom. Always cover the liquid when the system is not in use to prevent changes in liquid parameters due to water evaporation.
DGBE-based liquids should be used with care. As DGBE is a softener for most plastics, the liquid should be taken out of the phantom, and the phantom should be dried when the system is not in use (desirable at least once a week).

Do not use other organic solvents without previously testing the solvent resistivity of the phantom. Approximately 25 liters of liquid is required to fill the SAM Twin phantom.

ELI Phantom

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30MHz to 6 GHz. ELI is fully compatible with the latest draft of the standard IEC 62209-2 and the use of all known tissue simulating liquids. ELI has been optimized for performance and can be integrated into a SPEAG standard phantom table. A cover is provided to prevent evaporation of water and changes in liquid parameters. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points.



The phantom can be used with the following tissue simulating liquids:

- Sugar-water-based liquids can be left permanently in the phantom. Always cover the liquid when the system is not in use to prevent changes in liquid parameters due to water evaporation.

- DGBE-based liquids should be used with care. As DGBE is a softener for most plastics, the liquid should be taken out of the phantom, and the phantom should be dried when the system is not in use (desirable at least once a week).

- Do not use other organic solvents without previously testing the solvent resistivity of the phantom.

Approximately 25 liters of liquid is required to fill the ELI phantom

Robots

The DASY6 system uses the high-precision industrial robots TX60L, TX90XL, and RX160L from StaubliSA (France). The TX robot family - the successor of the well-known RX robot family - continues to offer the features important for DASY6 applications:

- High precision (repeatability 0.02mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements (brushless synchrony motors; no stepper motors)
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)

The robots are controlled by the Staubli CS8c robot controllers. All information regarding the use and maintenance of the robot arm and the robot controller is provided

Area Scans

Area scans are defined prior to the measurement process being executed with a user defined variable spacing between each measurement point (integral) allowing low uncertainty measurements to be conducted. Scans defined for FCC applications utilize a 15mm2 step integral, with 1.5mm interpolation used to locate the peak SAR area used for zoom scan assessments.

Where the system identifies multiple SAR peaks (which are within 25% of peak value) the system will provide the user with the option of assessing each peak location individually for zoom scan averaging.

Zoom Scan (Cube Scan Averaging)

The averaging zoom scan volume utilized in the DASY6 software is in the shape of a cube and the side dimension of a 1 g or 10 g mass is dependent on the density of the liquid representing the simulated tissue. A density of 1000 kg/m^3 is used to represent the head and body tissue density and not the phantom liquid density, in order to be consistent with the definition of the liquid dielectric properties, i.e. the side length of the 1g cube is 10mm, with the side length of the 10g cube is 21.5mm.

When the cube intersects with the surface of the phantom, it is oriented so that 3 vertices touch the surface of the shell or the center of a face is tangent to the surface. The face of the cube closest to the surface is modified in order to conform to the tangent surface.

The zoom scan integer steps can be user defined so as to reduce uncertainty, but normal practice for typical test applications (including FCC) utilize a physical step of 7 x7 x 7 (5mmx5mmx5mm) providing a volume of 30 mm in the X & Y & Z axis.

Recommended Tissue Dielectric Parameters for Head

Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEE 1528-2013

Recommended Tissue Dielectric Parameters for Head liquid

Table 3—Target dielectric properties of head tissue-equivalent material in the 300 MHz to 6000 MHz frequency range

Frequency (MHz)	Relative permittivity (ε'_r)	Conductivity (σ) (S/m)
300	45.3	0.87
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
1500	*40.4*	*1.23*
1640	*40.2*	*1.31*
1750	*40.1*	*1.37*
1800	40.0	1.40
1900	40.0	1.40
2000	40.0	1.40
2100	*39.8*	*1.49*
2300	*39.5*	*1.67*
2450	39.2	1.80
2600	*39.0*	*1.96*
3000	38.5	2.40
3500	*37.9*	*2.91*
4000	*37.4*	*3.43*
4500	*36.8*	*3.94*
5000	*36.2*	*4.45*
5200	*36.0*	*4.66*
5400	*35.8*	*4.86*
5600	*35.5*	*5.07*
5800	35.3	5.27
6000	*35.1*	*5.48*

NOTE—For convenience, permittivity and conductivity values at some frequencies that are not part of the original data from Drossos et al. [B60] or the extension to 5800 MHz are provided (i.e., the values shown in italics). These values were linearly interpolated between the values in this table that are immediately above and below these values, except the values at 6000 MHz that were linearly extrapolated from the values at 3000 MHz and 5800 MHz.

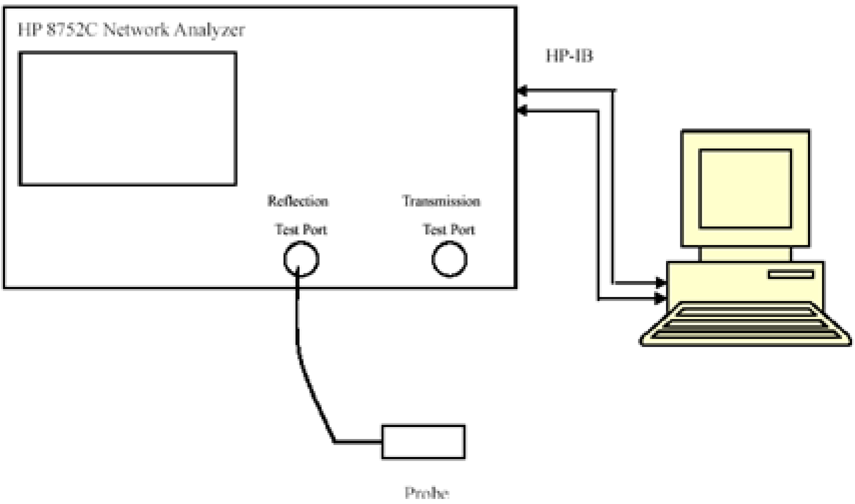
EQUIPMENT LIST AND CALIBRATION

Equipment's List & Calibration Information

Equipment	Model	S/N	Calibration Date	Calibration Due Date
Robot	TX90	5N26A1	N.C.R	N.C.R
DASY5 Test Software	DASY5.2	N/A	N.C.R	N.C.R
DASY6 Measurement Server	DASY 6.0	1588	N/A	N/A
Data Acquisition Electronics	DAE3	393	2021/04/09	2022/04/08
E-Field Probe	EX3DV4	3887	2021/10/22	2022/10/21
Dipole,2450 MHz	D2450V2	1068	2021/10/11	2024/10/10
Dipole,5GHz	D5GHzV2	1336	2021/10/12	2024/10/11
Twin SAM	Twin SAM V5.0	1368	N/A	N/A
Twin ELI	Twin ELI V8.0	2088	N/A	N/A
Simulated Tissue Head Liquid(0.6~6GHz)	TS-Head	/	Each Time	/
Mounting Device	N/A	SD 000 H01 KA	N/A	N/A
Network Analyzer	E5063A	MY54402093	2020/12/29	2021/12/28
Network Analyzer	E5063A	MY54402093	2021/12/15	2022/12/14
Dielectric probe kit	85070B	50207	/	/
Signal Generator	8648C	3537A01745	2020/12/30	2021/12/29
Signal Generator	MXG N5183A	MY50140407	2020/12/30	2021/12/29
Signal Generator	MXG N5183A	MY50140407	2021/12/15	2022/12/14
Power Meter	E4418B	GB43312279	2020/12/30	2021/12/29
Power Sensor	E9300A	US39210953	2021/05/05	2022/05/04
USB Wideband Power Sensor	U2021XA	MY58140006	2021/11/2	2022/11/1
Power Amplifier	ZVE-8G+	365701647	2021/1/8	2022/1/7
Power Amplifier	ZHL-42W+	329401642	2021/1/8	2022/1/7
Temperature and Humidity Recoder	HTC-1	005	2021/10/27	2022/10/26
Directional Coupler	488Z	810	N.C.R	N.C.R
Attenuator	20dB, 100W	1453	N.C.R	N.C.R

SAR MEASUREMENT SYSTEM VERIFICATION

Liquid Verification



Liquid Verification Setup Block Diagram

Liquid Verification Results

Test Date	Frequency (MHz)	Liquid Type	Liquid parameter		Target Value		Delta (%)		Tolerance (%)
			Ơ (S/m)	εr	Ơ (S/m)	εr	Ơ (S/m)	εr	
2021/11/17	2450	HSL	1.841	41.077	1.8	39.2	2.28	4.79	±5
	2412	HSL	1.803	41.103	1.77	39.27	1.86	4.67	±5
	2437	HSL	1.832	41.065	1.79	39.22	2.35	4.70	±5
	2462	HSL	1.846	41.076	1.81	39.18	1.99	4.84	±5

Test Date	Frequency (MHz)	Liquid Type	Liquid parameter		Target Value		Delta (%)		Tolerance (%)
			Ơ (S/m)	εr	Ơ (S/m)	εr	Ơ (S/m)	εr	
2021/11/19	5250	HSL	4.734	35.245	4.71	35.95	0.51	-1.96	±5
	5200	HSL	4.609	35.535	4.66	36.0	-1.09	-1.29	±5
	5210	HSL	4.614	35.478	4.67	35.99	-1.20	-1.42	±5

Test Date	Frequency (MHz)	Liquid Type	Liquid parameter		Target Value		Delta (%)		Tolerance (%)
			Ơ (S/m)	εr	Ơ (S/m)	εr	Ơ (S/m)	εr	
2021/11/22	5800	HSL	5.341	34.245	5.27	35.30	1.35	-2.99	±5
	5825	HSL	5.403	34.012	5.3	35.28	1.94	-3.59	±5
	5775	HSL	5.354	34.349	5.25	35.33	1.98	-2.78	±5

System Accuracy Verification

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ±10%. The validation results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

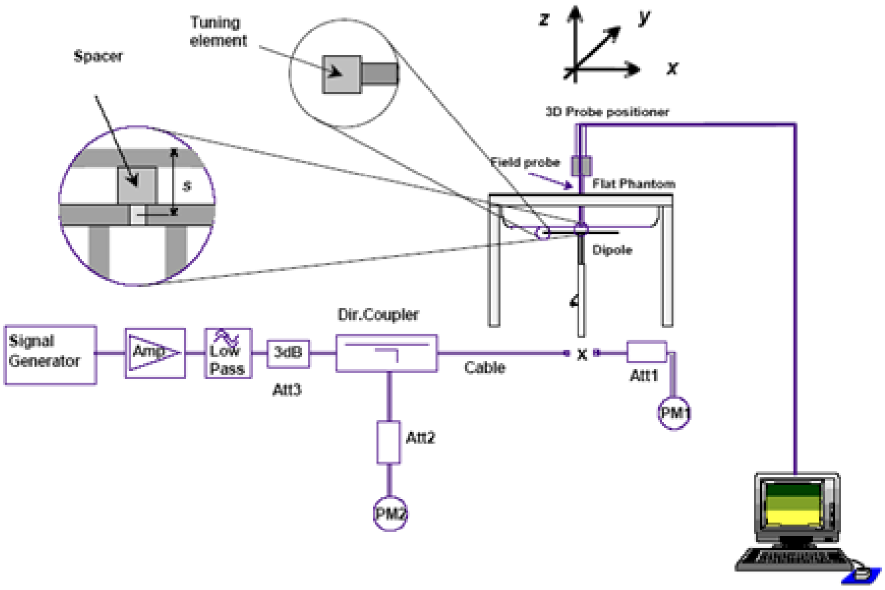
The spacing distances in the **System Verification Setup Block Diagram** is given by the following:

a) s = 15 mm ± 0,2 mm for 300 MHz ≤ f ≤ 1 000 MHz;

b) s = 10 mm ± 0,2 mm for 1 000 MHz < f ≤ 3 000 MHz;

c) s = 10 mm ± 0,2 mm for 3 000 MHz < f ≤ 6 000 MHz.

System Verification Setup Block Diagram



System Accuracy Check Results

Test Date	Frequency Band (MHz)	Liquid Type	Input Power (mW)	Measured SAR (W/kg)		Target Value (W/kg)		Normalized to 1W (W/kg)		Delta (%)	Tolerance (%)
2021/11/17	2450	HSL	250	1g	14.2	1g	54.2	1g	56.8	4.80	±10
				10g	---	10g	---	10g	---	---	±10
2021/11/19	5250	HSL	100	1g	8.72	1g	81.9	1g	87.2	6.47	±10
				10g	---	10g	---	10g	---	---	±10
2021/11/22	5800	HSL	100	1g	7.77	1g	83.3	1g	77.7	-6.72	±10
				10g	---	10g	---	10g	---	---	±10

Note:

1) *For Frequency < 5GHz, The power inputted to dipole is 0.25Watt; the SAR values are normalized to 1 Watt forward power by multiplying 4 times.*

2) *For Frequency > 5GHz, The power inputted to dipole is 0.10Watt; the SAR values are normalized to 1 Watt forward power by multiplying 10 times.*

SAR SYSTEM VALIDATION DATA

Test Laboratory:BACL.SAR TestingLab

System Check_Head_2450MHz

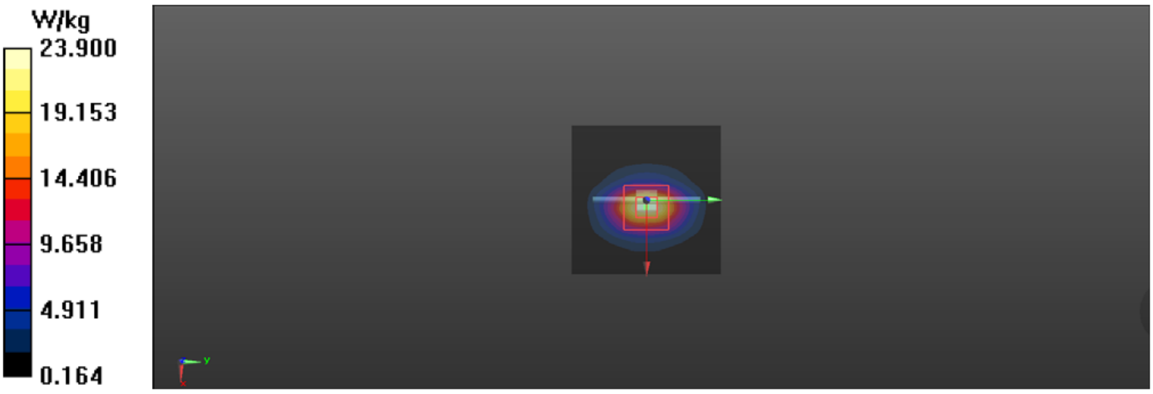
DUT: D2450V2-1068

Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: HSL2450 Medium parameters used: f = 2450 MHz; σ = 1.841 S/m; ε_r = 41.077; ρ = 1000 kg/m^3

DASY5 Configuration:
- Probe: EX3DV4 - SN3887; ConvF(7.48, 7.48, 7.48) @ 2450 MHz; Calibrated: 10/22/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/9/2021
- Phantom: ELI-Righr-ELI V8.0 (20deg probe tilt); Type: QD OVA 004 Ax; Serial: xxxx
- Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 23.5 W/kg

ConfiguPin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 109.4 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 29.9 W/kg
SAR(1 g) = 14.2 W/kg; SAR(10 g) = 6.61 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 47.8%
Maximum value of SAR (measured) = 23.9 W/kg



Test Laboratory:BACL.SAR TestingLab

System Check_Head_5250MHz

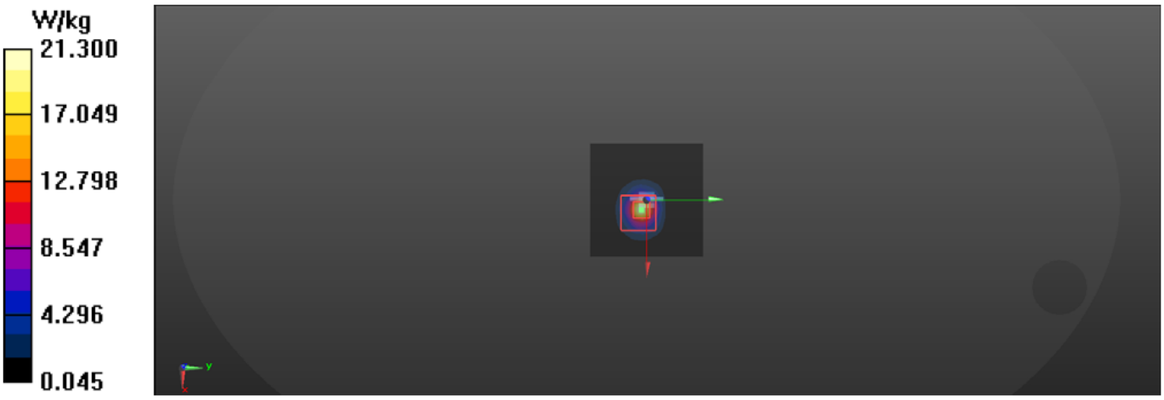
DUT: D5GHzV2-1336-5250

Communication System: UID 0, CW (0); Frequency: 5250 MHz;Duty Cycle: 1:1
Medium: HSL_5G Medium parameters used: f = 5250 MHz; σ = 4.734 S/m; ε_r = 35.245; ρ = 1000 kg/m^3

DASY5 Configuration:
- Probe: EX3DV4 - SN3887; ConvF(4.8, 4.8, 4.8) @ 5250 MHz; Calibrated: 10/22/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/9/2021
- Phantom: ELI-Righr-ELI V8.0 (20deg probe tilt); Type: QD OVA 004 Ax; Serial: xxxx
- Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 21.3 W/kg

Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 56.05 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 33.2 W/kg
SAR(1 g) = 8.72 W/kg; SAR(10 g) = 2.47 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 67%
Maximum value of SAR (measured) = 21.0 W/kg



Test Laboratory:BACL.SAR TestingLab

System Check_Head_5800MHz

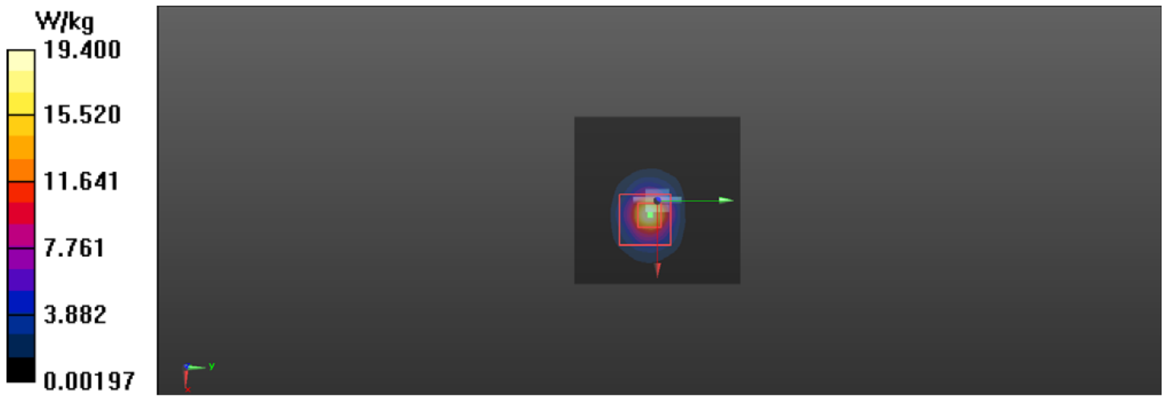
DUT: D5GHzV2-1336-5800

Communication System: UID 0, CW (0); Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: HSL_5G Medium parameters used: f = 5800 MHz; σ = 5.341 S/m; ε_r = 34.245; ρ = 1000 kg/m^3

DASY5 Configuration:
- Probe: EX3DV4 - SN3887; ConvF(4.39, 4.39, 4.39) @ 5800 MHz; Calibrated: 10/22/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn393; Calibrated: 4/9/2021
- Phantom: ELI-Righr-ELI V8.0 (20deg probe tilt); Type: QD OVA 004 Ax; Serial: xxxx
- Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 20.1 W/kg

Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 51.36 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 33.5 W/kg
SAR(1 g) = 7.77 W/kg; SAR(10 g) = 2.19 W/kg
Smallest distance from peaks to all points 3 dB below = 7.5 mm
Ratio of SAR at M2 to SAR at M1 = 62.8%
Maximum value of SAR (measured) = 19.4 W/kg

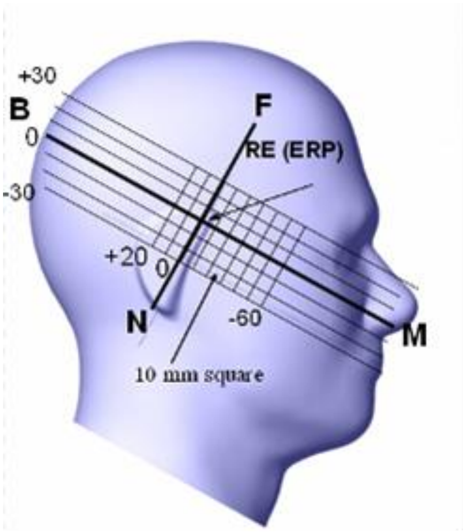


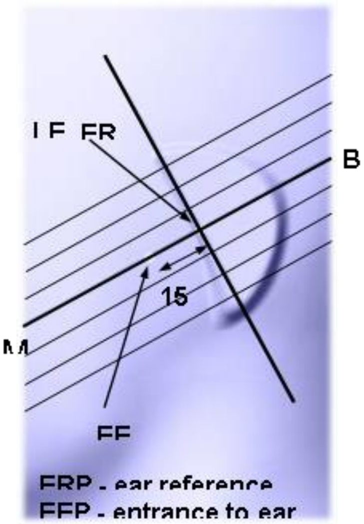
EUT TEST STRATEGY AND METHODOLOGY

Test Positions for Device Operating Next to a Person's Ear

This category includes most wireless handsets with fixed, retractable or internal antennas located toward the top half of the device, with or without a foldout, sliding or similar keypad cover. The handset should have its earpiece located within the upper ¼ of the device, either along the centerline or off-centered, as perceived by its users. This type of handset should be positioned in a normal operating position with the "test device reference point" located along the "vertical centerline" on the front of the device aligned to the "ear reference point". The "test device reference point" should be located at the same level as the center of the earpiece region. The "vertical centerline" should bisect the front surface of the handset at its top and bottom edges. A "ear reference point" is located on the outer surface of the head phantom on each ear spacer. It is located 1.5 cm above the center of the ear canal entrance in the "phantom reference plane" defined by the three lines joining the center of each "ear reference point" (left and right) and the tip of the mouth.

A handset should be initially positioned with the earpiece region pressed against the ear spacer of a head phantom. For the SCC-34/SC-2 head phantom, the device should be positioned parallel to the "N-F" line defined along the base of the ear spacer that contains the "ear reference point". For interim head phantoms, the device hould be positioned parallel to the cheek for maximum RF energy coupling. The "test device reference point" is aligned to the "ear reference point" on the head phantom and the "vertical centerline" is aligned to the "phantom reference plane". This is called the "initial ear position". While maintaining these three alignments, the body of the handset is gradually adjusted to each of the following positions for evaluating SAR:





Cheek/Touch Position

The device is brought toward the mouth of the head phantom by pivoting against the "ear reference point" or along the "N-F" line for the SCC-34/SC-2 head phantom.

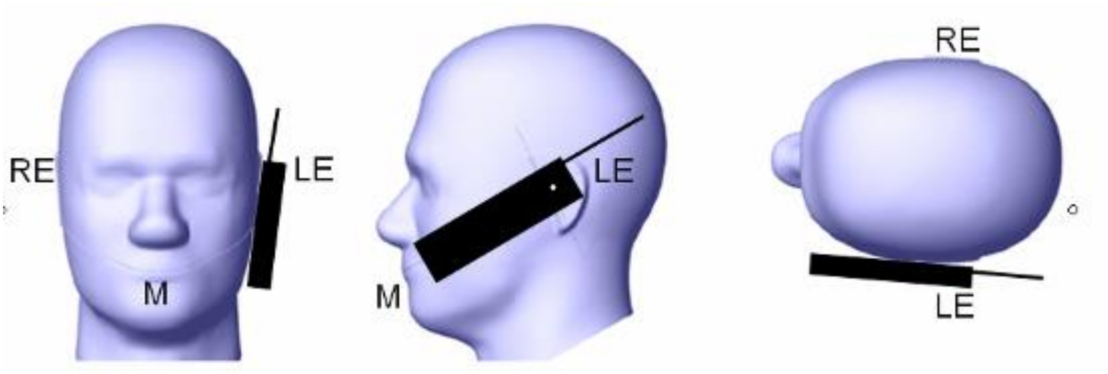
This test position is established:

When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.

(or) When any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.

For existing head phantoms – when the handset loses contact with the phantom at the pivoting point, rotation should continue until the device touches the cheek of the phantom or breaks its last contact from the ear spacer.

Cheek /Touch Position



Ear/Tilt Position

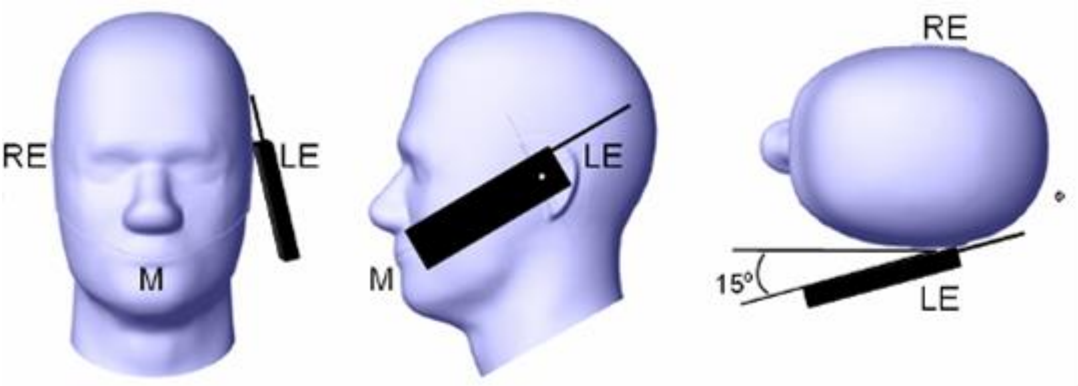
With the handset aligned in the "Cheek/Touch Position":

1) If the earpiece of the handset is not in full contact with the phantom's ear spacer (in the "Cheek/Touch position") and the peak SAR location for the "Cheek/Touch" position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the "initial ear position" by rotating it away from the mouth until the earpiece is in full contact with the ear spacer.

2) (otherwise) The handset should be moved (translated) away from the cheek perpendicular to the line passes through both "ear reference points" (note: one of these ear reference points may not physically exist on a split head model) for approximate 2-3 cm. While it is in this position, the device handset is tilted away from the mouth with respect to the "test device reference point" until the inside angle between the vertical centerline on the front surface of the phone and the horizontal line passing through the ear reference point is by 15 80°. After the tilt, it is then moved (translated) back toward the head perpendicular to the line passes through both "ear reference points" until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a tilt angle less than 15° so that the device and its antenna would touch the phantom simultaneously. This test position may require a device holder or positioner to achieve the translation and tilting with acceptable positioning repeatability.

If a device is also designed to transmit with its keypad cover closed for operating in the head position, such positions should also be considered in the SAR evaluation. The device should be tested on the left and right side of the head phantom in the "Cheek/Touch" and "Ear/Tilt" positions. When applicable, each configuration should be tested with the antenna in its fully extended and fully retracted positions. These test configurations should be tested at the high, middle and low frequency channels of each operating mode; for example, AMPS, CDMA, and TDMA. If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tilt/Ear, extended and retracted) is at least 2.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s). If the transmission band of the test device is less than 10 MHz, testing at the high and low frequency channels is optional.

Ear /Tilt 15o Position



Test positions for body-worn and other configurations

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations. Devices with a headset output should be tested with a headset connected to the device. When multiple accessories that do not contain metallic components are supplied with the device, the device may be tested with only the accessory that dictates the closest spacing to the body. When multiple accessories that contain metallic components are supplied with the device, the device must be tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (e.g., the same metallic belt-clip used with different holsters with no other metallic components), only the accessory that dictates the closest spacing to the body must be tested.

Body-worn accessories may not always be supplied or available as options for some devices that are intended to be authorized for body-worn use. A separation distance of 1.5 cm between the back of the device and a flat phantom is recommended for testing body-worn SAR compliance under such circumstances. Other separation distances may be used, but they should not exceed 2.5 cm. In these cases, the device may use body-worn accessories that provide a separation distance greater than that tested for the device provided however that the accessory contains no metallic components.

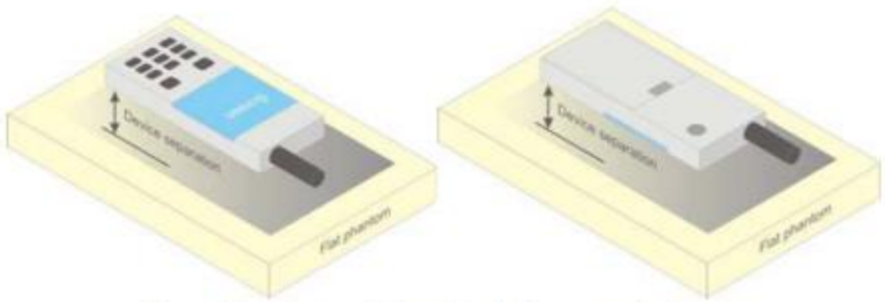


Figure 5 – Test positions for body-worn devices

Test Distance for SAR Evaluation

For this case the EUT(Equipment Under Test) is set 10mm away from the phantom, the test distance is 10mm.

SAR Evaluation Procedure

The evaluation was performed with the following procedure:

Step 1: Measurement of the SAR value at a fixed location above the ear point or central position was used as a reference value for assessing the power drop. The SAR at this point is measured at the start of the test and then again at the end of the testing.

Step 2: The SAR distribution at the exposed side of the head was measured at a distance of 4 mm from the inner surface of the shell. The area covered the entire dimension of the head or radiating structures of the EUT, the horizontal grid spacing was 15 mm x 15 mm, and the SAR distribution was determined by integrated grid of 1.5mm x 1.5mm. Based on these data, the area of the maximum absorption was determined by spline interpolation. The first Area Scan covers the entire dimension of the EUT to ensure that the hotspot was correctly identified.

Step 3: Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7x 7 x 7 points. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

1) The data at the surface were extrapolated, since the center of the dipoles is 1.2 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

2) The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one dimensional splines with the “Not a knot"-condition (in x, y and z-directions). The volume was integrated with the trapezoidal-algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the averages.

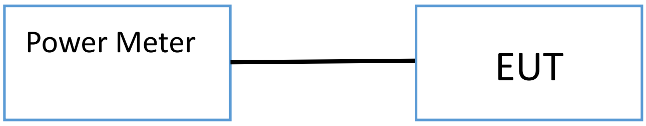
All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Re-measurement of the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation was repeated.

CONDUCTED OUTPUT POWER MEASUREMENT

Provision Applicable

EUT connect to Power Meter via a RF cable.



Test Results

WiFi 2.4G Peak Power:

Channel	Frequency (MHz)	Conducted Peak Output Power		Total Power (dBm)
		Chain 0	Chain 1	
802.11b Mode				
Low	2412	19.14	17.11	21.25
Middle	2437	18.52	16.81	20.76
High	2462	18.66	17.50	21.13
802.11g Mode				
Low	2412	20.41	19.58	23.03
Middle	2437	20.56	20.11	23.35
High	2462	20.55	20.05	23.32
802.11n HT20 Mode				
Low	2412	19.58	20.47	23.06
Middle	2437	18.81	18.82	21.83
High	2462	19.66	19.22	22.46
802.11n HT40 Mode				
Low	2422	14.11	15.83	18.06
Middle	2437	13.45	15.49	17.60
High	2452	14.06	15.59	17.90

WiFi 2.4G Avg Power:

Channel	Frequency (MHz)	Conducted Avg Output Power		Duty Factot (dB)	Total Power (dBm)
		Chain 0	Chain 1		
802.11b Mode					
Low	2412	15.80	13.81	0.00	17.93
Middle	2437	15.16	13.52	0.00	17.43
High	2462	15.32	14.4	0.00	17.89
802.11g Mode					
Low	2412	10.07	10.43	0.09	13.35
Middle	2437	10.00	9.83	0.09	13.02
High	2462	10.51	10.97	0.09	13.85
802.11n HT20 Mode					
Low	2412	9.52	10.99	0.09	13.42
Middle	2437	8.93	8.88	0.09	12.01
High	2462	8.63	8.59	0.09	11.71
802.11n HT40 Mode					
Low	2422	4.96	6.93	0.13	9.20
Middle	2437	4.91	6.60	0.13	8.98
High	2452	5.04	6.34	0.13	8.88

WiFi 2.4G Maximum Target Output Power:

Max Target Power(dBm)			
Mode / Band	Low Channel	Middle Channel	High Channel
WiFi 2.4GHz 802.11b	18	18	18
WiFi 2.4GHz 802.11g	14	14	14
WiFi 2.4GHz 802.11n20	13.5	13.5	13.5
WiFi 2.4GHz 802.11n40	9.5	9.5	9.5

WiFi 5GHz UNII-1 & UNIII_3 Power:

Channel	Frequency (MHz)	Conducted Avg Output Power		Duty Factot (dB)	Total Power (dBm)
		Chain 0	Chain 1		
802.11a Mode					
36	5180	12.74	11.68	0.09	15.34
40	5200	13.08	12.14	0.09	15.74
48	5240	12.01	11.01	0.09	14.64
149	5745	13.56	13.65	0.09	16.71
157	5785	14.71	14.65	0.09	17.78
165	5825	14.90	14.65	0.09	17.88
802.11ac20 Mode					
36	5180	12.24	11.44	0.09	14.96
40	5200	12.53	11.51	0.09	15.15
48	5240	11.90	10.91	0.09	14.53
149	5745	13.46	13.48	0.09	16.57
157	5785	13.65	13.55	0.09	16.70
165	5825	14.13	14.18	0.09	17.26
802.11ac40 Mode					
38	5190	5.86	4.54	0.13	8.39
46	5230	5.92	4.61	0.13	8.45
151	5755	13.64	13.79	0.13	16.86
159	5795	13.51	13.64	0.13	16.72
802.11ac80 Mode					
42	5210	4.44	4.41	0.32	7.76
155	5775	12.21	12.18	0.32	15.53

WiFi 5GHz UNII-1 & UNII-III Maximum Target Output Power:

Max Target Power(dBm)			
Mode / Band	**Low Channel**	**Middle Channel**	**High Channel**
802.11a UNII-1	16	16	16
802.11nHT20 UNII-1	15	15	15
802.11acHT20 UNII-1	15.5	15.5	15.5
Mode / Band	**Low Channel**		**High Channel**
802.11n40 UNII-1	8.5		8.5
802.11ac40 UNII-1	8.5		8.5
Mode / Band	**Low Channel**		
802.11ac80 UNII-1	10		

WiFi 5GHz UNII-3 Maximum Target Output Power:

Max Target Power(dBm)			
Mode / Band	**Low Channel**	**Middle Channel**	**High Channel**
802.11a UNII-3	18	18	18
802.11nHT20 UNII-3	17	17	17
802.11acHT20 UNII-3	17.5	17.5	17.5
Mode / Band	**Low Channel**		**High Channel**
802.11n40 UNII-3	16.5		16.5
802.11ac40 UNII-3	17		17
Mode / Band	**High Channel**		
802.11ac80 UNII-3	18		

Standalone SAR test mode

During SAR testing according KDB 447498 D02 SAR Procedures for Dongle Xmtr v02r01 and TCB workshop November 2019. In this case, For Dongles with a single external Swivel antenna the following guidance should be applied, if the dongle has multiple, independent swivel antennas, the guidance above should be applied to each antenna：

- Test the Horizontal Up and Horizontal Down positions of the dongle with the antenna connected in straight mode at a 5mm distance to the SAR phantom.
- The testing of the antenna tip is not necessary.
- If the two measured SAR levels are similar, then additionally test the Horizontal Up position with the antenna connected at 90 degrees, perpendicular to the phantom (antenna pointing down and away from the phantom).
- Dongle Tip position the antennas are connected at a 90 degree angle, parallel to the model (the antennas point Left and Right parallel to the model).
- A 5mm separation distance to the phantom would again apply. With these 3 test positions.
- When the 1-g SAR is ≤ 0.8W/Kg, testing for other channels are optional.
- SAR test mode(1 to 6) as：

  Mode 1：Horizontal Up(5mm)，please refer to page 39 “SAR Setup Photo” Mode1；
  Mode 2：Horizontal Down(5mm) ，please refer to page 39 “SAR Setup Photo” Mode2；
  Mode 3：Horizontal Up-90° (5mm) ，please refer to page 40 “SAR Setup Photo” Mode3；
  Mode 4：Horizontal Down-90° (5mm) ，please refer to page 40 “SAR Setup Photo” Mode4；
  Mode 5：Tip Right-90° (5mm) ，please refer to page 41 “SAR Setup Photo” Mode5；
  Mode 6：Tip Left-90° (5mm) ，please refer to page 41 “SAR Setup Photo” Mode6.

SAR MEASUREMENT RESULTS

This page summarizes the results of the performed diametric evaluation.

SAR Test Data

Environmental Conditions

Test Date	2021/11/17	2021/11/19	2021/11/22
Freq. Band(MHz)	2450	5250	5800
Temperature	23.6℃	24.1℃	24.1℃
Relative Humidity	59 %	67 %	60 %
Test Engineer	Nike Wu / Woods Chen	Nike Wu / Woods Chen	Nike Wu / Woods Chen

WiFi 2.4GHz：

EUT Position	Frequency (MHz)	Modulation Type	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg)				
					Scaled Factor	Meas. SAR	Scaled SAR	Limit	Plot
Mode1	2412	802.11b	17.93	18.00	1.016	1.030	1.046	1.6	17-3
	2412	802.11b	17.93	18.00	1.016	0.449	0.497	1.6	17-3-2
Mode1	2437	802.11b	17.43	18.00	1.140	0.937	1.068	1.6	17-4
Mode1	2462	802.11b	17.89	18.00	1.026	1.080	1.108	1.6	17-5
Mode1 Retest	2412	802.11b	17.93	18.00	1.016	0.976	0.992	1.6	17-6
	2412	802.11b	17.93	18.00	1.016	0.444	0.491	1.6	17-6-2
Mode2	2412	802.11b	17.93	18.00	1.016	0.761	0.773	1.6	18
Mode3	2412	802.11b	17.93	18.00	1.016	0.091	0.092	1.6	19
Mode4	2412	802.11b	17.93	18.00	1.016	0.097	0.099	1.6	20
Mode5	2412	802.11b	17.93	18.00	1.016	0.189	0.192	1.6	21
	2412	802.11b	17.93	18.00	1.016	0.090	0.091	1.6	21-2
Mode6	2412	802.11b	17.93	18.00	1.016	0.163	0.166	1.6	22
	2412	802.11b	17.93	18.00	1.016	0.132	0.134	1.6	22-2

WiFi 5.2GHz：

EUT Position	Frequency (MHz)	Modulation Type	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg)				
					Scaled Factor	Meas. SAR	Scaled SAR	Limit	Plot
Mode1	5200	802.11a	15.74	16.00	1.062	0.570	0.605	1.6	1
Mode2	5200	802.11a	15.74	16.00	1.062	0.405	0.430	1.6	2
	5200	802.11a	15.74	16.00	1.062	0.215	0.229	1.6	2-2
Mode3	5200	802.11a	15.74	16.00	1.062	0.087	0.092	1.6	3
Mode4	5200	802.11a	15.74	16.00	1.062	0.147	0.156	1.6	4
Mode5	5200	802.11a	15.74	16.00	1.062	0.146	0.155	1.6	23
	5200	802.11a	15.74	16.00	1.062	0.071	0.075	1.6	23-2
Mode6	5200	802.11a	15.74	16.00	1.062	0.149	0.158	1.6	24
	5200	802.11a	15.74	16.00	1.062	0.101	0.107	1.6	24-2
Mode1	5210	802.11ac80	9.96	10.0	1.009	0.049	0.049	1.6	9
	5210	802.11ac80	9.96	10.0	1.009	0.043	0.044	1.6	9-2
Mode2	5210	802.11ac80	9.96	10.0	1.009	0.062	0.063	1.6	10
	5210	802.11ac80	9.96	10.0	1.009	0.059	0.060	1.6	10-2
Mode3	5210	802.11ac80	9.96	10.0	1.009	0.014	0.014	1.6	11
Mode4	5210	802.11ac80	9.96	10.0	1.009	0.012	0.012	1.6	12
Mode5	5210	802.11ac80	9.96	10.0	1.009	0.040	0.040	1.6	27
	5210	802.11ac80	9.96	10.0	1.009	0.039	0.039	1.6	27-2
Mode6	5210	802.11ac80	9.96	10.0	1.009	0.045	0.045	1.6	28
	5210	802.11ac80	9.96	10.0	1.009	0.021	0.021	1.6	28-2

WiFi 5.8GHz：

EUT Position	Frequency (MHz)	Modulation Type	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg)				
					Scaled Factor	Meas. SAR	Scaled SAR	Limit	Plot
Mode1	5825	802.11a	17.88	18.00	1.028	0.739	0.760	1.6	5
Mode2	5825	802.11a	17.88	18.00	1.028	0.630	0.648	1.6	6
	5825	802.11a	17.88	18.00	1.028	0.378	0.392	1.6	6-2
Mode3	5825	802.11a	17.88	18.00	1.028	0.525	0.540	1.6	7
Mode4	5825	802.11a	17.88	18.00	1.028	0.259	0.266	1.6	8
Mode5	5825	802.11a	17.88	18.00	1.028	0.283	0.291	1.6	25
	5825	802.11a	17.88	18.00	1.028	0.252	0.259	1.6	25-2
Mode6	5825	802.11a	17.88	18.00	1.028	0.274	0.282	1.6	26
	5825	802.11a	17.88	18.00	1.028	0.306	0.315	1.6	26-2
Mode1	5775	802.11ac80	17.73	18.00	1.064	0.029	0.031	1.6	13
Mode2	5775	802.11ac80	17.73	18.00	1.064	0.025	0.027	1.6	14
Mode3	5775	802.11ac80	17.73	18.00	1.064	0.014	0.015	1.6	15
Mode4	5775	802.11ac80	17.73	18.00	1.064	0.007	0.007	1.6	16
Mode5	5775	802.11ac80	17.73	18.00	1.064	0.199	0.212	1.6	29
	5775	802.11ac80	17.73	18.00	1.064	0.197	0.210	1.6	29-1
Mode6	5775	802.11ac80	17.73	18.00	1.064	0.280	0.298	1.6	30
	5775	802.11ac80	17.73	18.00	1.064	0.216	0.230	1.6	30-2

SAR SIMULTANEOUS TRANSMISSION DESCRIPTION

Simultaneous Transmission:

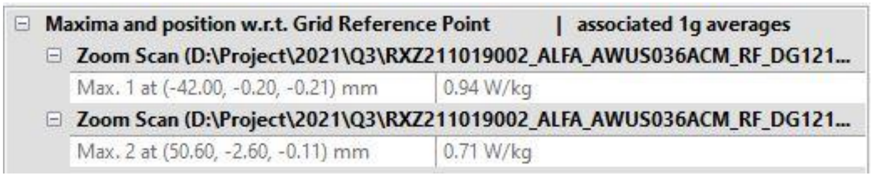
Description of Simultaneous Transmit Capabilities		
Transmitter Combination	**Simultaneous?**	**Hotspot**
WLAN 2.4G + WLAN 5.2G/5.8G	×	×

TOTAL SAR:

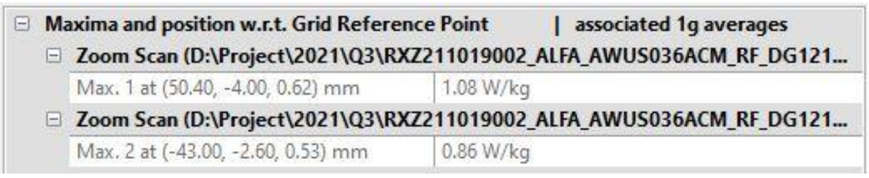
EUT Position	Band Channel Freq.	antenna	SAR (W/kg)	Total SAR	SPLSR	SPLSR calc. Result					
						X(mm)	Y(mm)	Z(mm)	SPLSR	Limit	Ref. pic
Mode1	802.11b 2437	Ant 0	0.708	1.645	need	50.6	-2.6	-0.11	0.023	0.04	a)
		Ant 1	0.937			-42	-0.2	-0.21			
Mode1	802.11b 2462	Ant 0	0.857	1.937	need	-43	-2.6	0.53	0.029	0.04	b)
		Ant 1	1.080			50.4	-4	0.62			

Note: *Ref. pic a) & b) are calculated by DASY 6 System.*

a)



b)



Note:

1) *During SAR testing, worst channel SAR to calculated Total SAR.*

2) *Total SAR is Ant. 0 SAR + Ant. 1 SAR. IF Total SAR > SAR limit need to calculate SAR SPLSR.*

3) *According KDB 447498 4.3.2 c), The ratio is determined by $(SAR1 + SAR2)^{1.5}/Ri$, rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion. Ri is the separation distance in mm between the peak SAR locations for the antenna pair.*

4) *According KDB 447498 4.3.2 d), The peak location separation distance is computed by the square root of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$, where (x_1, y_1, z_1) and (x_2, y_2, z_2) are the coordinates in the area scans or extrapolated peak SAR locations in the zoom scans, as appropriate.*

APPENDIX A MEASUREMENT UNCERTAINTY

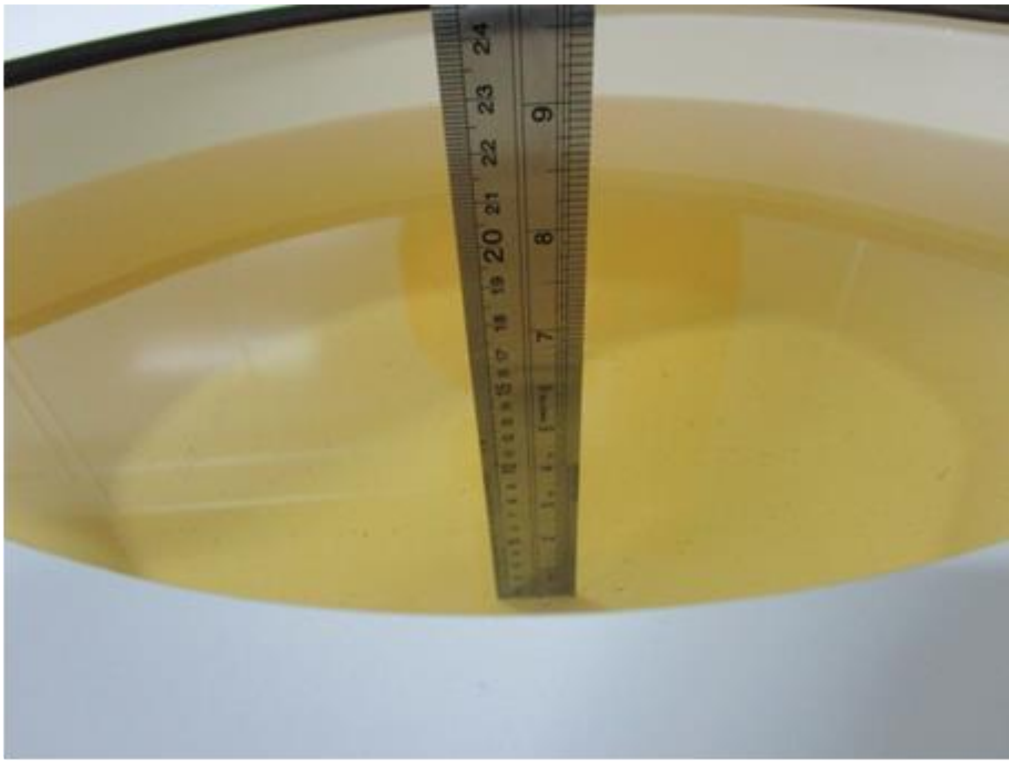
The uncertainty budget has been determined for the measurement system and is given in the following Table.

Measurement uncertainty evaluation for IEEE1528 SAR test

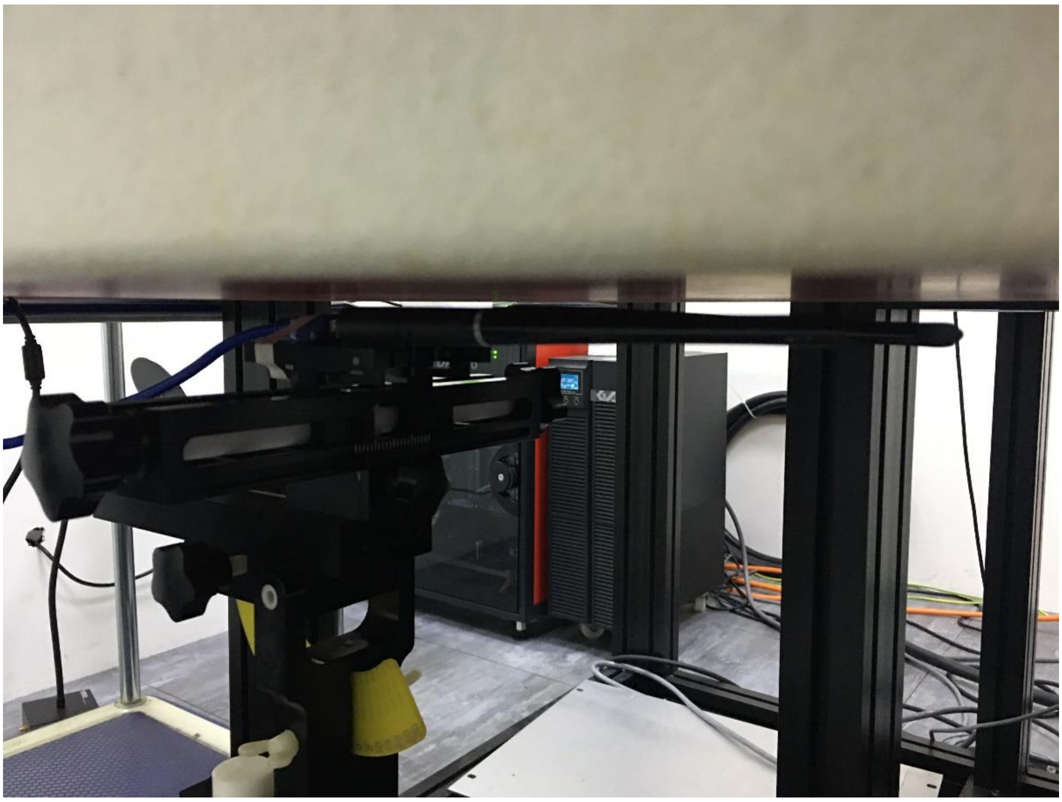
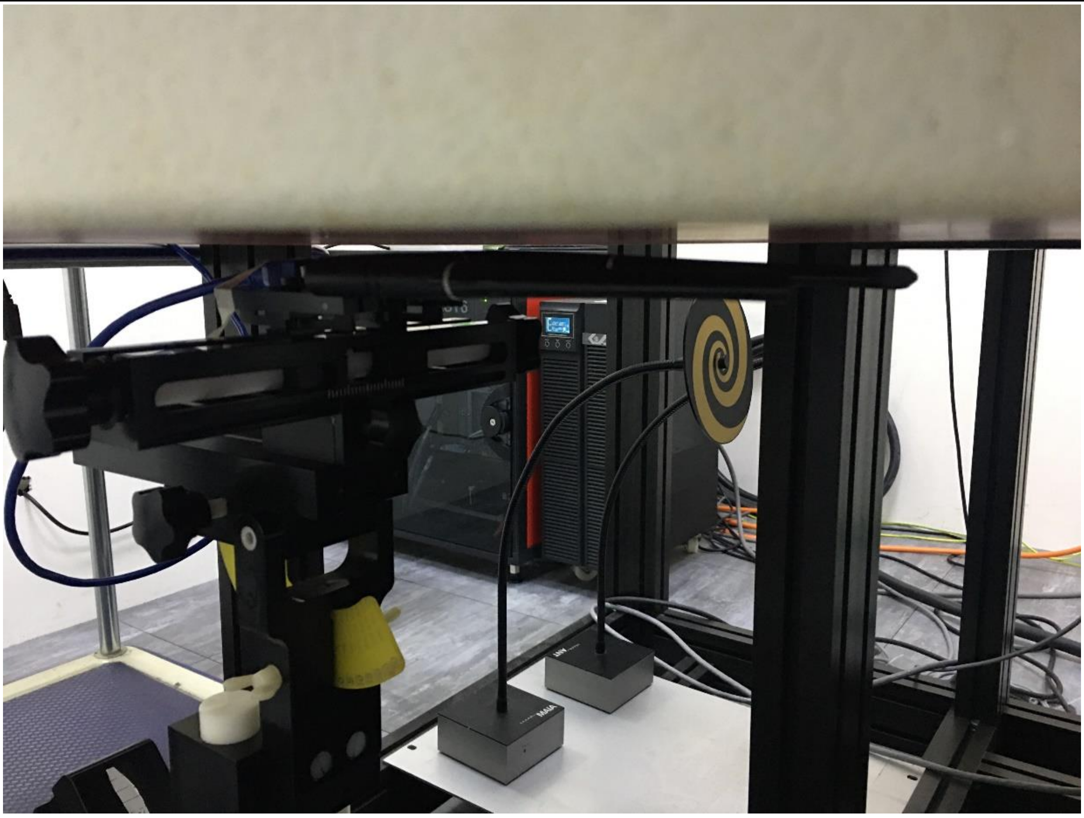
Source of uncertainty	Tolerance/ uncertainty ± %	Probability distribution	Divisor	ci (1 g)	ci (10 g)	Standard uncertainty ± %, (1 g)	Standard uncertainty ± %, (10 g)
Measurement system							
Probe calibration	6.55	N	1	1	1	6.6	6.6
Axial Isotropy	4.7	R	√3	1	1	2.7	2.7
Hemispherical Isotropy	9.6	R	√3	0	0	0.0	0.0
Boundary effect	1.0	R	√3	1	1	0.6	0.6
Linearity	4.7	R	√3	1	1	2.7	2.7
Detection limits	1.0	R	√3	1	1	0.6	0.6
Readout electronics	0.3	N	1	1	1	0.3	0.3
Response time	0.0	R	√3	1	1	0.0	0.0
Integration time	0.0	R	√3	1	1	0.0	0.0
RF ambientconditions – noise	1.0	R	√3	1	1	0.6	0.6
RF ambient conditions–reflections	1.0	R	√3	1	1	0.6	0.6
Probe positioner mech. Restrictions	0.8	R	√3	1	1	0.5	0.5
Probe positioning with respect to phantom shell	6.7	R	√3	1	1	3.9	3.9
Post-processing	2.0	R	√3	1	1	1.2	1.2
Test sample related							
Test sample positioning	2.8	N	1	1	1	2.8	2.8
Device holder uncertainty	6.3	N	1	1	1	6.3	6.3
Drift of output power	5.0	R	√3	1	1	2.9	2.9
Phantom and set-up							
Phantom uncertainty (shape and thickness tolerances)	4.0	R	√3	1	1	2.3	2.3
Liquid conductivity target)	5.0	R	√3	0.64	0.43	1.8	1.2
Liquid conductivity meas.)	2.5	N	1	0.64	0.43	1.6	1.1
Liquid permittivity target)	5.0	R	√3	0.6	0.49	1.7	1.4
Liquid permittivity meas.)	2.5	N	1	0.6	0.49	1.5	1.2
Combined standard uncertainty		RSS				12.2	12.0
Expanded uncertainty 95 % confidence interval)						24.3	23.9

APPENDIX B EUT TEST POSITION PHOTOS

Liquid depth ≥ 15cm

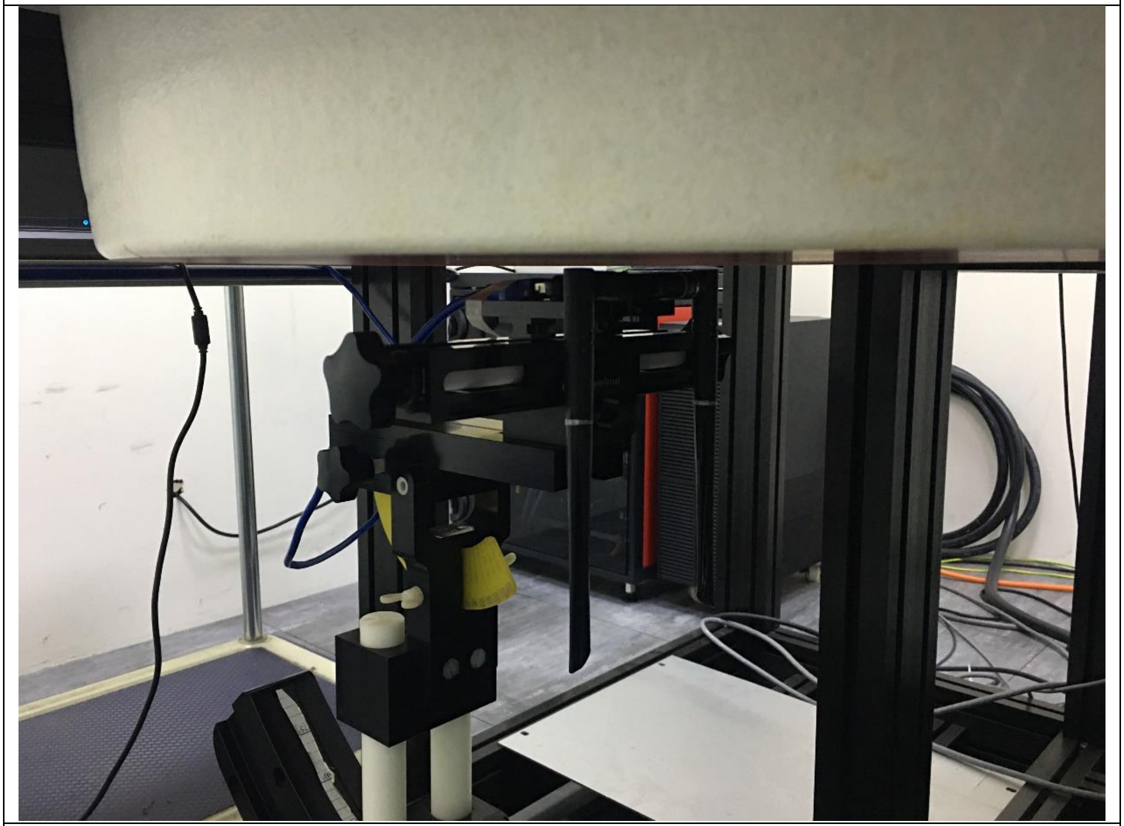


SAR Setup Photo

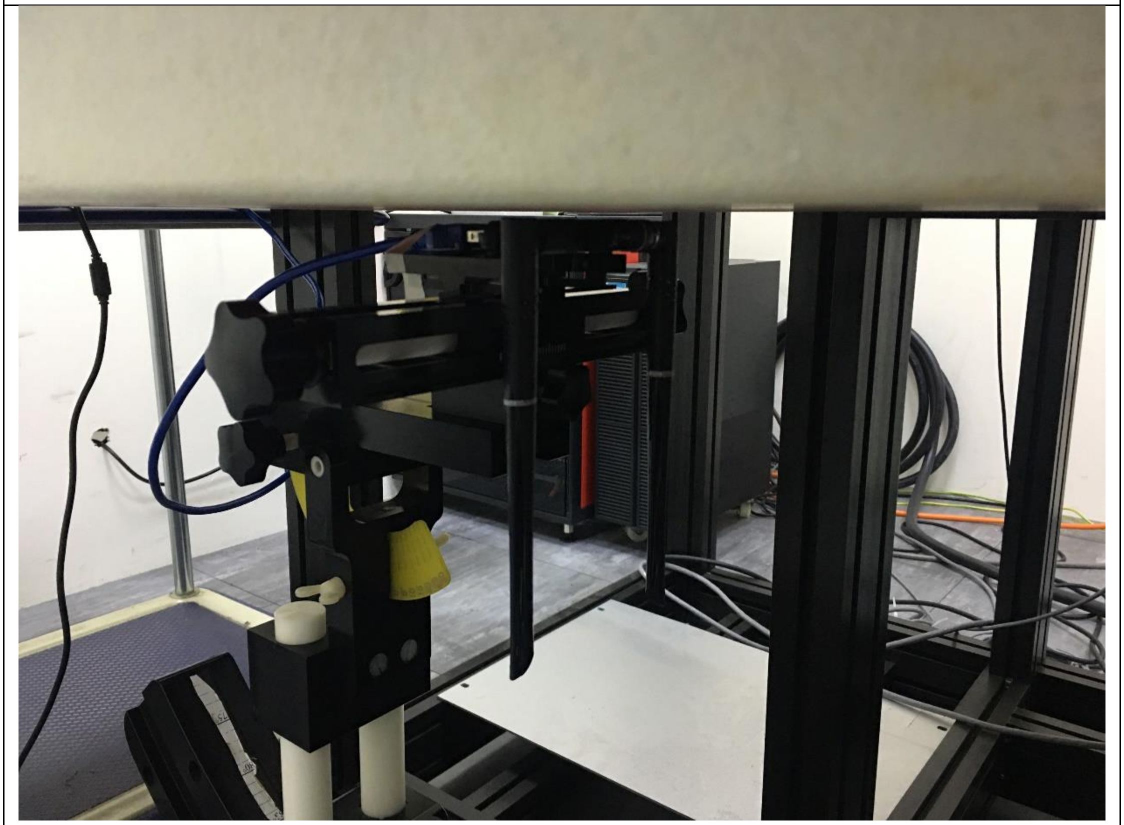
Body_Horizontal Up(5mm)_Mode 1

Body_Horizontal Down(5mm)_Mode 2


SAR Setup Photo

Body_Horizontal Up -90° (5mm)_Mode 3

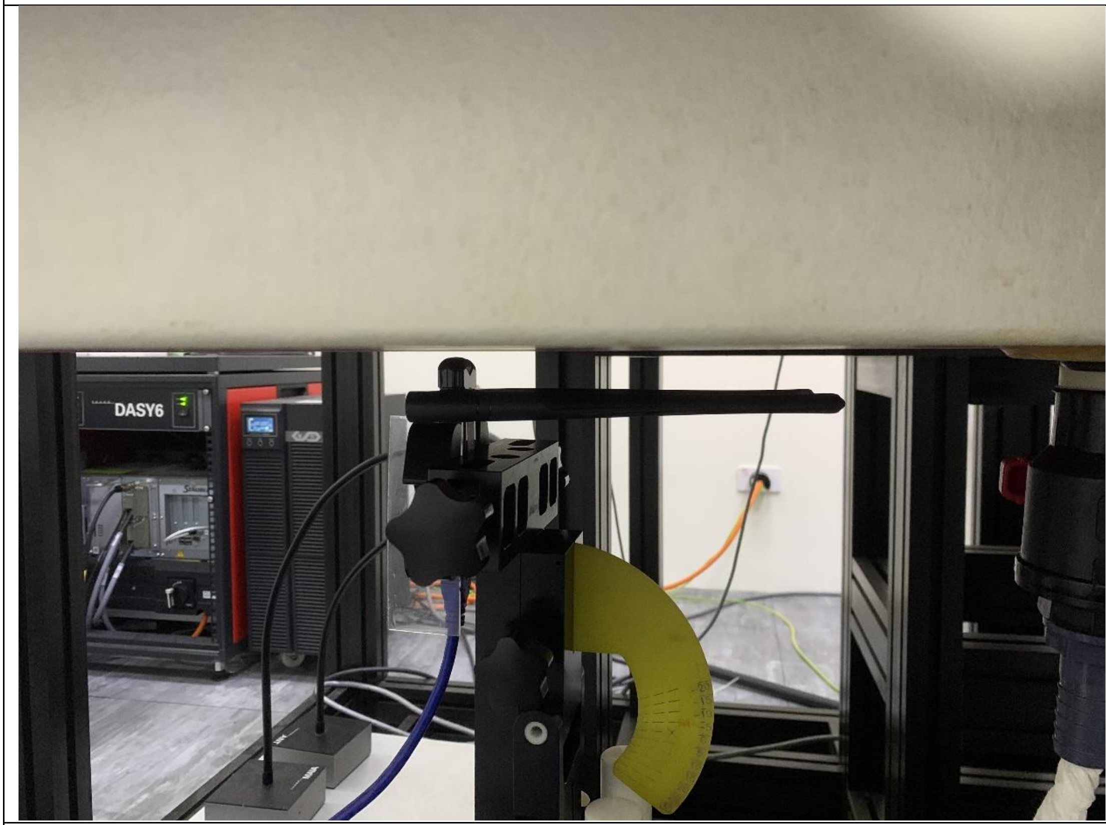


Body_Horizontal Down -90° (5mm)_Mode 4

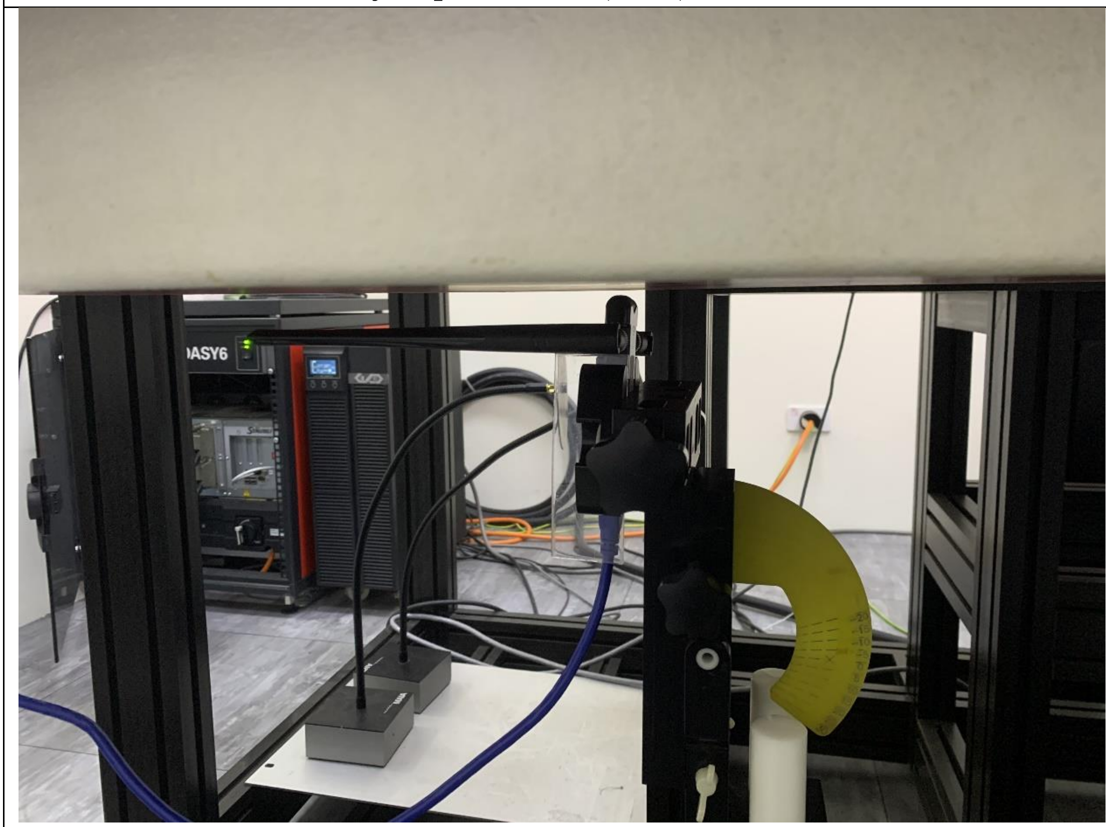


SAR Setup Photo

Body_Tip Right -90° (5mm)_Mode 5

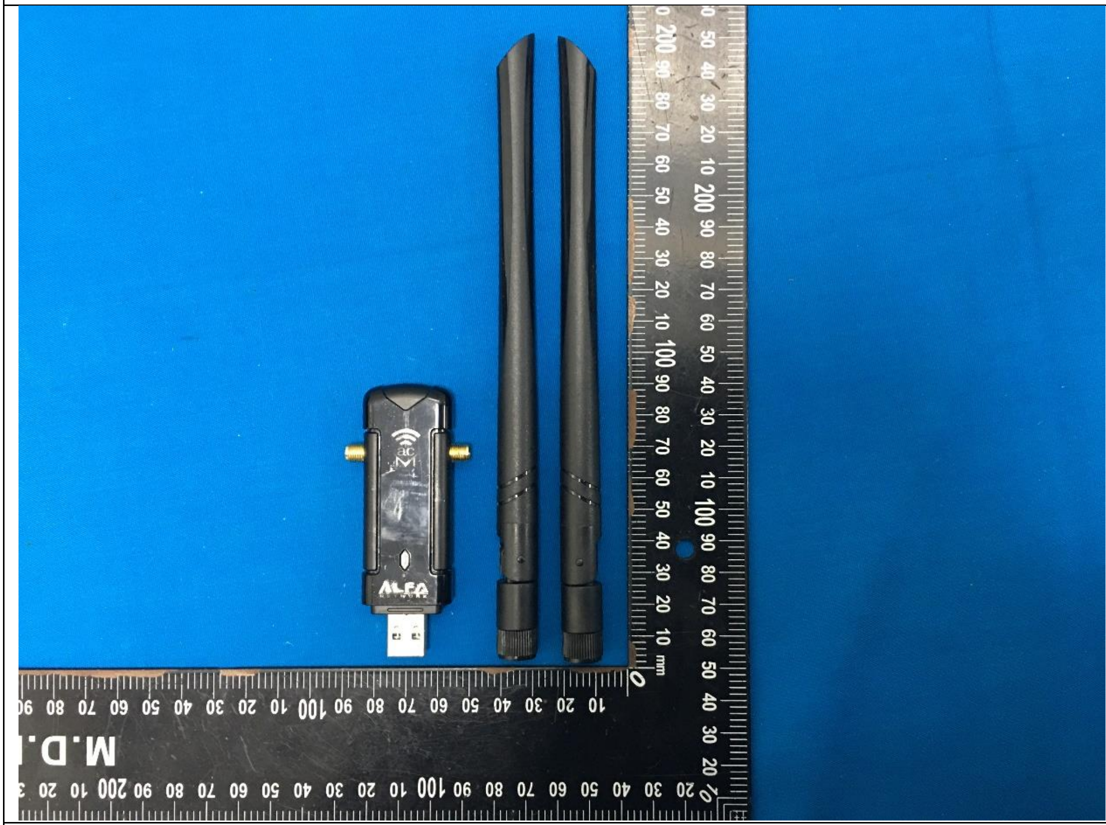


Body_Tip Left -90° (5mm)_Mode 6



SAR EUT Photo

EUT Front View



EUT Back View

APPENDIX C SAR PLOTS OF SAR MEASUREMENT

Please Refer to the Attachment APPENDIX C SAR PLOTS OF SAR MEASUREMENT

APPENDIX D PROBE & DAE CALIBRATION CERTIFICATES

Please refer to the file document PROBE & DAE CALIBRATION CERTIFICATES

APPENDIX E DIPOLE CALIBRATION CERTIFICATES

Please refer to the file document APPENDIX D DIPOLE CALIBRATION CERTIFICATES

******* END OF REPORT *******