SAR Test Report

Report No.: AGC11160210304FH01

FCC ID	:	2AOYX-NOYP3
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Arsenal 2 Pro
BRAND NAME	:	Arsenal
MODEL NAME	:	Robert
APPLICANT	:	North of You, LLC
DATE OF ISSUE	:	Apr. 08,2021
STANDARD(S)	:	IEEE Std. 1528:2013 FCC 47 CFR Part 2§2.1093:2013 IEEE Std C95.1 ™-2005 IEC 62209-1: 2016
REPORT VERSION	:	V1.0

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Apr. 08,2021	Valid	Initial Release

Test Report

Applicant Name	North of You, LLC
Applicant Address	90 West Madison Ave Suite E-237 Belgrade, MT 59714 United States of America
Manufacturer Name	North of You, LLC
Manufacturer Address	90 West Madison Ave Suite E-237 Belgrade, MT 59714 United States of America
Factory Name	Computime Limited
Factory Address	6/F, Building 20E, Phase 3, Hong Kong Science Park 20 Science Park East Avenue, Shatin, New Territories, Hong Kong
Product Designation	Arsenal 2 Pro
Brand Name	Arsenal
Model Name	Robert
EUT Voltage	DC3.7V by battery
Applicable Standard	IEEE Std. 1528:2013 FCC 47 CFR Part 2§2.1093:2013 IEEE Std C95.1 ™-2005 IEC 62209-1: 2016
Test Date	Apr. 02,2021 to Apr. 07,2021
Report Template	AGCRT- US -5G/SAR (2018-01-01)

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

Prepared By

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Reviewed By

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Approved By

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1. SUMMARY OF MAXIMUM SAR VALUE

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

Frequency Band	Highest Reported 1g-SAR(W/Kg)	SAR Test Limit (W/Kg)
	Body-worn(with 0mm separation)	
WIFI 2.4G	0.761	1.6
5.2GHz (U-NII-1)	0.758	
5.8GHz (U-NII-3)	1.148	
SAR Test Result	PASS	

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

- KDB 447498 D01 General RF Exposure Guidance v06
- KDB 865664 D01 SAR Measurement 100MHz to 6GHz v01r04
- KDB 248227 D01 802 11 Wi-Fi SAR v02r02

2. GENERAL INFORMATION

2.1. EUT Description

General Information	
Product Designation	Arsenal 2 Pro
Test Model	Robert
Hardware Version	Robert
Software Version	1.0.0
Device Category	Portable
RF Exposure Environment	Uncontrolled
Antenna Type	Internal
Bluetooth	
Operation Frequency	2402~2480MHz
Antenna Gain	1.7dBi
Bluetooth Version	V5.0
Type of modulation	**BLE:** GFSK
Peak Output Power	5.196dBm for 1M; 5.448dBm for 2M
2.4GHz WIFI	
WIFI Specification	☐802.11a ☒802.11b ☒802.11g ☒802.11n(20) ☒802.11n(40)
Operation Frequency	2412~2462MHz
Avg. Burst Power	11b: 15.00dBm,11g: 13.29dBm,11n(20): 12.75dBm,11n(40): 12.71dBm
Antenna Gain	1.7dBi
5 GHz WIFI	
WIFI Specification	☒802.11a ☒802.11n20 ☒802.11n40 ☒802.11ac20 ☒802.11ac40 ☒802.11ac80
Operation Frequency	U-NII-1: 5150MHz~5250MHz; U-NII-3: 5745MHz~5825MHz
Max. conducted Power	U-NII-1: 802.11a20:12.84dBm; 802.11n(20): 13.31dBm; 802.11n(40): 13.77dBm; 802.11ac(20): 12.42dBm; 802.11ac(40): 13.12dBm; 802.11ac(80): 12.90dBm U-NII-3: 802.11a20: 12.04dBm; 802.11n(20): 11.89dBm; 802.11n(40): 13.13dBm; 802.11ac(20): 12.58dBm; 802.11ac(40): **13.17**dBm; 802.11ac(80): 12.95dBm
Antenna Gain	2.7dBi
Battery Type (s) Tested:	DC3.7V, 1425mAh (by battery)

Note: 1.The sample used for testing is end product.
2.Duty-cycle = [on time/total time] x 100%
3. The test sample has no any deviation to the test method of standard mentioned in page 1.

Product	Type	
	☒ Production unit	☐ Identical Prototype

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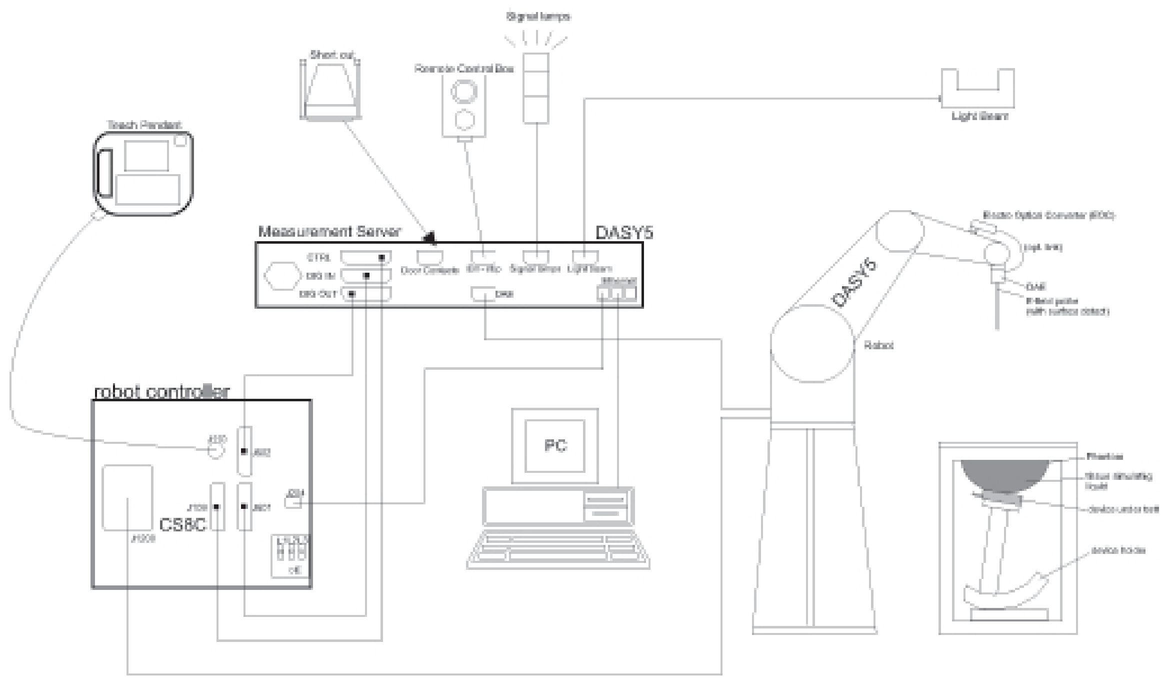
3. SAR MEASUREMENT SYSTEM

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



- A standard high precision 6-axis robot with controller, teach pendant and software.
- Data acquisition electronics (DAE) which attached to the robot arm extension. The DAE consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock
- A dosimetric probe equipped with an optical surface detector system.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital Communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- A Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- Phantoms, device holders and other accessories according to the targeted measurement.

3.2. DASY5 E-Field Probe

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

Isotropic E-Field Probe Specification

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

3.3. Data Acquisition Electronics description

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

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

DAE4

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

3.4. Robot

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

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

3.5. Light Beam Unit

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

3.6. Device Holder

The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (EPR).
Thus the device needs no repositioning when changing the angles.
The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

3.7. Measurement Server

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

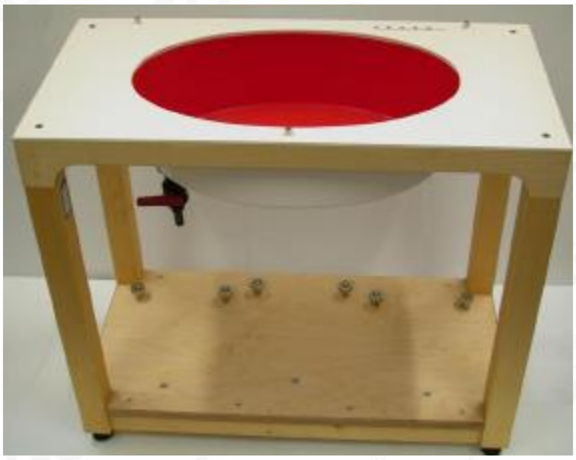
3.8. PHANTOM

SAM Twin Phantom

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

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

ELI4 Phantom

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

4. SAR MEASUREMENT PROCEDURE

4.1. Specific Absorption Rate (SAR)

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

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

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

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

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

$$SAR = c_h \left.\frac{dT}{dt}\right|_{t=0}$$

Where

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

4.2. SAR Measurement Procedure

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurement are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface is 2.7mm This distance cannot be smaller than the distance os sensor calibration points to probe tip as `defined in the probe properties,

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in db) is specified in the standards for compliance testing. For example, a 2db range is required in IEEE Standard 1528, whereby 3db is a requirement when compliance is assessed in accordance with the ARIB standard (Japan) If one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximum are detected, the number of Zoom Scan has to be increased accordingly.

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

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 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.	

Step 3: Zoom Scan

Zoom Scan are used to assess the peak spatial SAR value within a cubic average volume containing 1g abd 10g of simulated tissue. The Zoom Scan measures points(refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1g and 10g and displays these values next to the job's label.

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

<table>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
* When zoom scan is required and the <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

Step 4: Power Drift Measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the same settings. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

4.3. RF Exposure Conditions

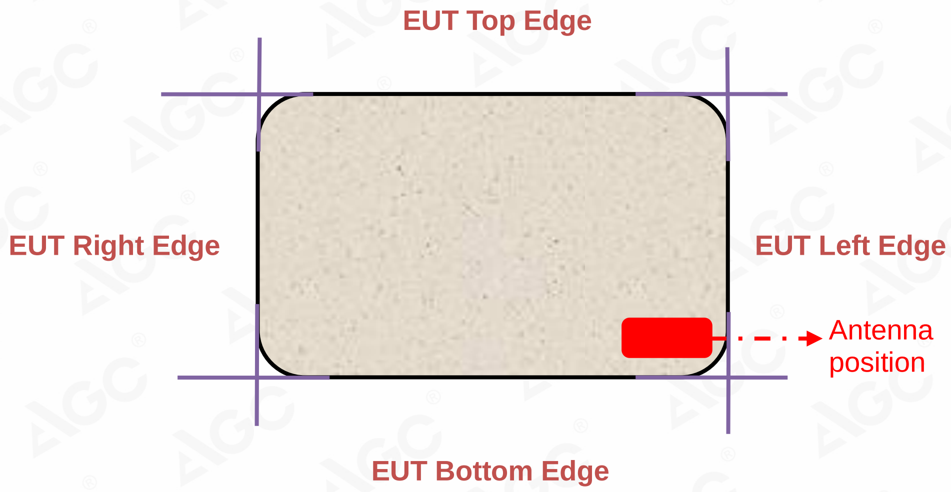
Test Configuration and setting:

The device supports Bluetooth and WIFI wireless technology.

WIFI and BT share the same antenna, and cannot transmit simultaneously.

For WLAN testing, the EUT is configured with the WLAN continuous TX tool through engineering command.

Antenna Location: (the back view)



5. TISSUE SIMULATING LIQUID

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15cm. For head SAR testing the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15cm For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15cm.The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 10% are listed in 6.2

5.1. The composition of the tissue simulating liquid

Ingredient (% Weight) / Frequency (MHz)	Water	Nacl	Polysorbate 20	DGBE	1,2-Propanediol	Triton X-100	Diethylen glycol monohexylether
2450 Head	71.88	0.16	0.0	7.99	0.0	19.97	0.0
5000 Head	65.52	0.0	0.0	0.0	0.0	17.24	17.24

5.2. Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEC 62209-1 have been incorporated in the following table. The body tissue dielectric parameters recommended by the IEC 62209-2 have been incorporated in the following table.

Target Frequency (MHz)	head		body	
	εr	σ (S/m)	εr	σ (S/m)
300	45.3	0.87	45.3	0.87
450	43.5	0.87	43.5	0.87
835	41.5	0.90	41.5	0.90
900	41.5	0.97	41.5	0.97
915	41.5	1.01	41.5	1.01
1450	40.5	1.20	40.5	1.20
1610	40.3	1.29	40.3	1.29
1800 – 2000	40.0	1.40	40.0	1.40
2450	**39.2**	**1.80**	**39.2**	**1.80**
3000	38.5	2.40	38.5	2.40
5200	**36.0**	**4.66**	**36.0**	**4.66**
5300	35.9	4.76	35.9	4.76
5600	35.5	5.07	35.5	5.07
5800	**35.3**	**5.27**	**35.3**	**5.27**

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

5.3. Tissue Calibration Result

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

Tissue Stimulant Measurement for 2450MHz					
Head	Fr. (MHz)	Dielectric Parameters (±10%)		Tissue Temp [°C]	Test time
		εr39.2(35.28-43.12)	δ[s/m]1.80(1.62-1.98)		
	2450	38.67	1.83	21.3	Apr. 07.2021
	2462	37.82	1.85		

Tissue Stimulant Measurement for 5200MHz					
Head	Fr. (MHz)	Dielectric Parameters (±10%)		Tissue Temp [°C]	Test time
		εr 36.0(32.4-39.6)	δ[s/m] 4.66(4.194 -5.126)		
	5200	36.74	4.51	21.2	Apr. 02.2021
	5190	35.69	4.53		

Tissue Stimulant Measurement for 5800MHz					
Head	Fr. (MHz)	Dielectric Parameters (±10%)		Tissue Temp [°C]	Test time
		εr 35.3 (31.77-38.83)	δ[s/m] 5.27 (4.743-5.797)		
	5755	37.22	5.20	22.6	Apr. 06.2021
	5795	36.52	5.23		
	5800	35.49	5.25		

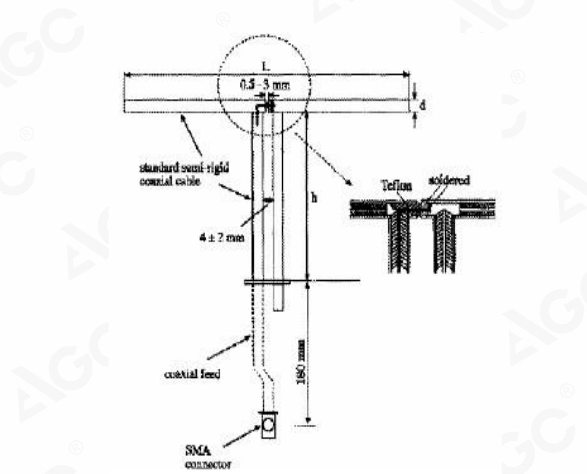
6. SAR SYSTEM CHECK PROCEDURE

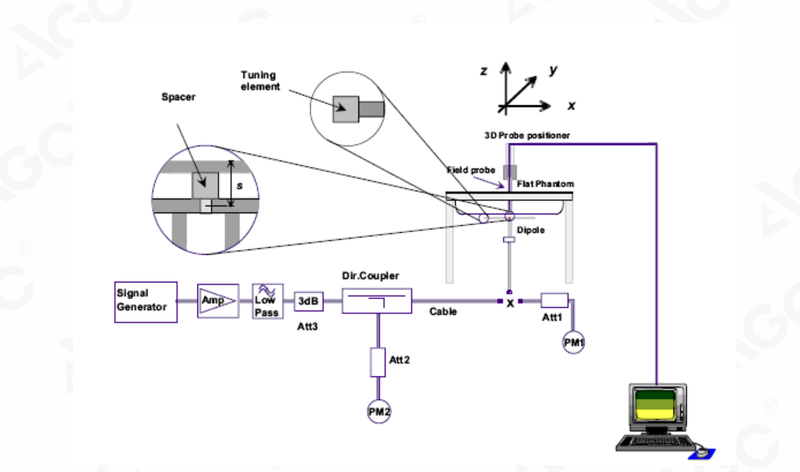
6.1. SAR System Check Procedures

SAR system check is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are remeasured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

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

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





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6.2. SAR System Check
6.2.1. Dipoles

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

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

Frequency	L (mm)	h (mm)	d (mm)
2450MHz	51.5	30.4	3.6

Frequency	L (mm)	W (mm)	L_f (mm)	W_f (mm)
5000MHz	40.39	20.19	81.03	61.98

6.2.2. System Check Result

System Performance Check at 2450MHz&5000-6000MHz for Head								
Validation Kit: D2450V2-SN:968& SN 15/15 WGA 36								
Frequency [MHz]	Target Value(W/Kg)		Reference Result (± 10%)		Tested Value(W/Kg)		Tissue Temp. [°C]	Test time
	1g	10g	1g	10g	1g	10g		
2450	53.6	25.0	48.24-58.96	22.50-27.50	48.66	24.25	21.3	Apr. 07.2021
5200	161.18	55.04	145.062-177.298	49.536-60.544	162.54	54.39	21.2	Apr. 02.2021
5800	181.69	60.11	163.521-199.859	54.099-66.121	178.98	59.13	22.6	Apr. 06.2021

Note:
(1) We use a CW signal of 18dBm(2450MHz) and 15dBm(5000-6000MHz) for system check, and then all SAR values are normalized to 1W forward power. The result must be within ±10% of target value.

7. EUT TEST POSITION

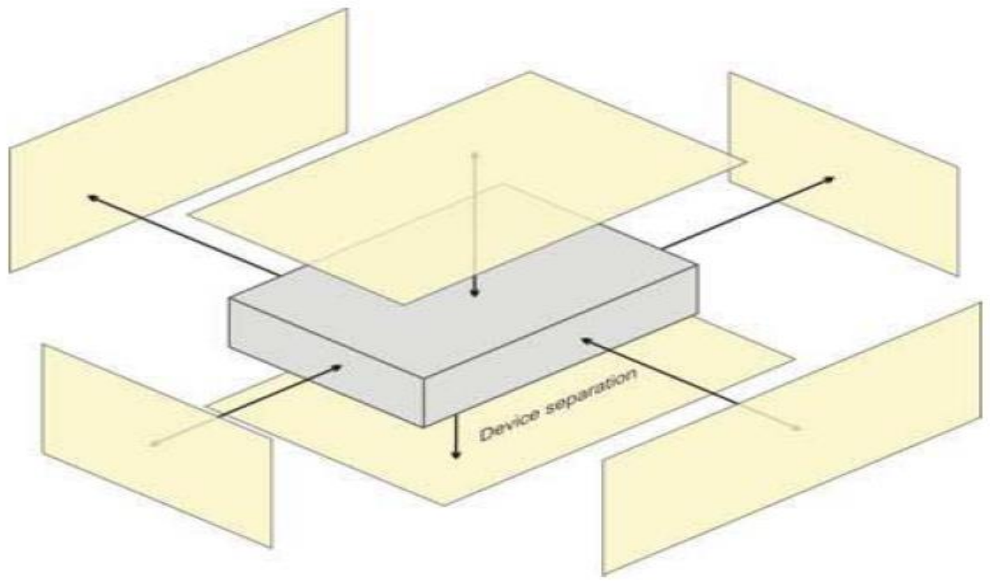
This EUT was tested in **Body back, Body front and 4Edges.**

7.1. Body Worn Position

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

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

(3) To adjust the distance between the EUT surface and the flat phantom to **0mm.**



8. SAR EXPOSURE LIMITS

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

Type Exposure	Uncontrolled Environment Limit (W/kg)
Spatial Peak SAR (1g cube tissue for brain or body)	1.60
Spatial Average SAR (Whole body)	0.08
Spatial Peak SAR (Limbs)	4.0

9. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

10. TEST EQUIPMENT LIST

Equipment description	Manufacturer/ Model	Identification No.	Current calibration date	Next calibration date
Stäubli Robot	Stäubli-TX60	F13/5Q2UD1/A/01	N/A	N/A
Robot Controller	Stäubli-CS8	139522	N/A	N/A
E-Field Probe	Speag- EX3DV4	SN:3953	Jul. 29,2020	Jul. 28,2021
SAM Twin Phantom	Speag-SAM	1790	N/A	N/A
Device Holder	Speag-SD 000 H01 KA	SD 000 H01 KA	N/A	N/A
DAE4	Speag-SD 000 D04 BM	1398	Apr. 23,2020	Apr. 22,2021
SAR Software	Speag-DASY5	DASY52.8	N/A	N/A
Liquid	SATIMO	-	N/A	N/A
Dipole	D2450V2	SN968	July 31,2018	July 30,2021
Wave guide	SWG5500	SN 15/15 WGA 36	Apr. 26,2019	Apr. 25,2022
Signal Generator	Agilent-E4438C	US41461365	Aug. 21,2020	Aug. 20,2021
Vector Analyzer	Agilent / E4440A	US41421290	Sep. 06,2020	Sep. 05,2021
Network Analyzer	Rhode & Schwarz ZVL6	SN101443	Oct. 16,2020	Oct. 15,2021
Attenuator	Warison /WATT-6SR1211	S/N:WRJ34AYM2F 1	June 10, 2020	June 09, 2021
Attenuator	Mini-circuits / VAT-10+	31405	June 10, 2020	June 09, 2021
Amplifier	AS0104-55_55	1004793	June 11,2020	June 10,2021
Directional Couple	Werlatone/ C5571-10	SN99463	June 11,2020	June 10,2021
Directional Couple	Werlatone/ C6026-10	SN99482	June 11,2020	June 10,2021
Power Sensor	NRP-Z21	1137.6000.02	Sep. 08,2020	Sep. 07,2021
Power Sensor	NRP-Z23	US38261498	Feb. 17,2021	Feb. 16,2022
Power Viewer	R&S	V2.3.1.0	N/A	N/A

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

11. MEASUREMENT UNCERTAINTY

DASY Uncertainty- EX3DV4 Measurement uncertainty for Dipole averaged over 1 gram / 10 gram.									
a	b	c	d	e f(d,k)	f	g	h c×f/e	i c×g/e	k
Uncertainty Component	Sec.	Tol (± %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (±%)	10g Ui (±%)	vi
Measurement System									
Probe calibration	E.2.1	6.65	N	1	1	1	6.65	6.65	∞
Axial Isotropy	E.2.2	0.6	R	√3	√0.5	√0.5	0.24	0.24	∞
Hemispherical Isotropy	E.2.2	1.6	R	√3	√0.5	√0.5	0.65	0.65	∞
Boundary effect	E.2.3	1	R	√3	1	1	0.58	0.58	∞
Linearity	E.2.4	0.45	R	√3	1	1	0.26	0.26	∞
System detection limits	E.2.4	1	R	√3	1	1	0.58	0.58	∞
Modulation response	E2.5	3.3	R	√3	1	1	1.91	1.91	∞
Readout Electronics	E.2.6	0.15	N	1	1	1	0.15	0.15	∞
Response Time	E.2.7	0	R	√3	1	1	0.00	0.00	∞
Integration Time	E.2.8	1.7	R	√3	1	1	0.98	0.98	∞
RF ambient conditions-Noise	E.6.1	3	R	√3	1	1	1.73	1.73	∞
RF ambient conditions-reflections	E.6.1	3	R	√3	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	E.6.2	0.4	R	√3	1	1	0.23	0.23	∞
Probe positioning with respect to phantom shell	E.6.3	6.7	R	√3	1	1	3.87	3.87	∞
Extrapolation, interpolation, and integrations algorithms for max. SAR evaluation	E.5	4	R	√3	1	1	2.31	2.31	∞
Test sample Related									
Test sample positioning	E.4.2	2.9	N	1	1	1	2.90	2.90	∞
Device holder uncertainty	E.4.1	3.6	N	1	1	1	3.60	3.60	∞
Output power variation—SAR drift measurement	E.2.9	5	R	√3	1	1	2.89	2.89	∞
SAR scaling	E.6.5	5	R	√3	1	1	2.89	2.89	∞
Phantom and tissue parameters									
Phantom shell uncertainty—shape, thickness, and permittivity	E.3.1	6.6	R	√3	1	1	3.81	3.81	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	E.3.2	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity measurement	E.3.3	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity measurement	E.3.3	5	N	1	0.23	0.26	1.15	1.30	M
Liquid conductivity—temperature uncertainty	E.3.4	2.5	R	√3	0.78	0.71	1.13	1.02	∞
Liquid permittivity—temperature uncertainty	E.3.4	2.5	R	√3	0.23	0.26	0.33	0.38	∞
Combined Standard Uncertainty			RSS				11.79	11.63	
Expanded Uncertainty (95% Confidence interval)			K=2				23.59	23.26	

DASY Uncertainty- EX3DV4 System Check uncertainty for Dipole averaged over 1 gram / 10 gram.									
a	b	c	d	e f(d,k)	f	g	h c×f/e	i c×g/e	k
Uncertainty Component	Sec.	Tol (± %)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (±%)	10g Ui (±%)	vi
Measurement System									
Probe calibration drift	E.2.1	0.5	N	1	1	1	0.5	0.5	∞
Axial Isotropy	E.2.2	0.6	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Hemispherical Isotropy	E.2.2	1.6	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Boundary effect	E.2.3	1	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Linearity	E.2.4	0.45	R	$\sqrt{3}$	0	0	0.00	0.00	∞
System detection limits	E.2.4	1	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Modulation response	E2.5	3.3	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Readout Electronics	E.2.6	0.15	N	1	0	0	0.00	0.00	∞
Response Time	E.2.7	0	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Integration Time	E.2.8	1.7	R	$\sqrt{3}$	0	0	0.00	0.00	∞
RF ambient conditions-Noise	E.6.1	3	R	$\sqrt{3}$	0	0	0.00	0.00	∞
RF ambient conditions-reflections	E.6.1	3	R	$\sqrt{3}$	0	0	0.00	0.00	∞
Probe positioner mechanical tolerance	E.6.2	0.4	R	$\sqrt{3}$	1	1	0.37	0.37	∞
Probe positioning with respect to phantom shell	E.6.3	6.7	R	$\sqrt{3}$	1	1	3.87	3.87	∞
Extrapolation, interpolation, and integrations algorithms for max. SAR evaluation	E.5	4	R	$\sqrt{3}$	0	0	0.00	0.00	∞
System check source (dipole)									
Deviation of experimental dipoles	E.6.4	2.0	N	1	1	1	2.00	2.00	∞
Input power and SAR drift measurement	8,6.6.4	5.0	R	$\sqrt{3}$	1	1	2.89	2.89	∞
Dipole axis to liquid distance	8,E.6.6	2.0	R	$\sqrt{3}$	1	1	1.15	1.15	∞
Phantom and tissue parameters									
Phantom shell uncertainty—shape, thickness, and permittivity	E.3.1	6.6	R	$\sqrt{3}$	1	1	3.81	3.81	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	E.3.2	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity measurement	E.3.3	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity measurement	E.3.3	5	N	1	0.23	0.26	1.15	1.30	M
Liquid conductivity—temperature uncertainty	E.3.4	2.5	R	$\sqrt{3}$	0.78	0.71	1.13	1.02	∞
Liquid permittivity—temperature uncertainty	E.3.4	2.5	R	$\sqrt{3}$	0.23	0.26	0.33	0.38	∞
Combined Standard Uncertainty			RSS				7.34	7.07	
Expanded Uncertainty (95% Confidence interval)			K=2				14.67	14.14	

DASY Uncertainty- EX3DV4 System Validation uncertainty for Dipole averaged over 1 gram / 10 gram.									
a	b	c	d	e f(d,k)	f	g	h c×f/e	i c×g/e	k
Uncertainty Component	Sec.	Tol (±%)	Prob. Dist.	Div.	Ci (1g)	Ci (10g)	1g Ui (±%)	10g Ui (±%)	vi
Measurement System									
Probe calibration	E.2.1	6.65	N	1	1	1	6.65	6.65	∞
Axial Isotropy	E.2.2	0.6	R	√3	1	1	0.35	0.35	∞
Hemispherical Isotropy	E.2.2	1.6	R	√3	0	0	0.00	0.00	∞
Boundary effect	E.2.3	1	R	√3	1	1	0.58	0.58	∞
Linearity	E.2.4	0.45	R	√3	1	1	0.26	0.26	∞
System detection limits	E.2.4	1	R	√3	1	1	0.58	0.58	∞
Modulation response	E2.5	3.3	R	√3	0	0	0.00	0.00	∞
Readout Electronics	E.2.6	0.15	N	1	1	1	0.15	0.15	∞
Response Time	E.2.7	0	R	√3	0	0	0.00	0.00	∞
Integration Time	E.2.8	1.7	R	√3	0	0	0.00	0.00	∞
RF ambient conditions-Noise	E.6.1	3	R	√3	1	1	1.73	1.73	∞
RF ambient conditions-reflections	E.6.1	3	R	√3	1	1	1.73	1.73	∞
Probe positioner mechanical tolerance	E.6.2	0.4	R	√3	1	1	0.23	0.23	∞
Probe positioning with respect to phantom shell	E.6.3	6.7	R	√3	1	1	3.87	3.87	∞
Extrapolation, interpolation, and integrations algorithms for max. SAR evaluation	E.5	4	R	√3	1	1	2.31	2.31	∞
System check source (dipole)									
Deviation of experimental dipole from numerical dipole	E.6.4	5.0	N	1	1	1	5.00	5.00	∞
Input power and SAR drift measurement	8,6.6.4	5.0	R	√3	1	1	2.89	2.89	∞
Dipole axis to liquid distance	8,E.6.6	2.0	R	√3	1	1	1.15	1.15	∞
Phantom and tissue parameters									
Phantom shell uncertainty—shape, thickness, and permittivity	E.3.1	6.6	R	√3	1	1	3.81	3.81	∞
Uncertainty in SAR correction for deviations in permittivity and conductivity	E.3.2	1.9	N	1	1	0.84	1.90	1.60	∞
Liquid conductivity measurement	E.3.3	4	N	1	0.78	0.71	3.12	2.84	M
Liquid permittivity measurement	E.3.3	5	N	1	0.23	0.26	1.15	1.30	M
Liquid conductivity—temperature uncertainty	E.3.4	2.5	R	√3	0.78	0.71	1.13	1.02	∞
Liquid permittivity—temperature uncertainty	E.3.4	2.5	R	√3	0.23	0.26	0.33	0.38	∞
Combined Standard Uncertainty			RSS				11.45	11.28	
Expanded Uncertainty (95% Confidence interval)			K=2				22.89	22.55	

12. CONDUCTED POWER MEASUREMENT

2.4GHz WIFI

Mode	Data Rate (Mbps)	Channel	Frequency(MHz)	Avg. Burst Power(dBm)
802.11b	1	01	2412	13.32
		06	2437	14.76
		11	2462	**15.00**
802.11g	6	01	2412	12.11
		06	2437	12.70
		11	2462	13.29
802.11n(20)	6.5	01	2412	11.57
		06	2437	12.19
		11	2462	12.75
802.11n(40)	13.5	03	2422	12.71
		06	2437	12.09
		09	2452	12.36

Bluetooth_BLE

Modulation	Channel	Frequency(MHz)	Peak Power (dBm)
GFSK(1M)	0	2402	4.763
	19	2440	**5.196**
	39	2480	4.904
GFSK(2M)	0	2402	4.987
	19	2440	**5.448**
	39	2480	5.025

According to KDB 447498 D01, annex A, SAR is not required for Bluetooth.

Because:

BT(1M) Peak Power(dBm)= 5.196dBm= 3.308262789mW,

(3.308262789mW /5mm) .[√2.440GHz)]= 1.034<3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR.

BT(2M) Peak Power(dBm)= 5.448dBm=3.505903839mW,

(1.18mW /5mm) .[√2.440GHz)]= 1.095<3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR.

CONCLUSION: The BT SAR evaluation is not required.

5GHz WIFI

Mode	channel	Frequency	Average Power (dBm)							
			Data Rate(bps)							
			6M	9M	12M	18M	24M	36M	48M	54M
802.11a	36	5180	12.64	12.47	12.41	12.32	12.16	12.03	11.88	11.85
	40	5200	12.84	12.69	12.53	12.46	12.38	12.31	12.10	12.07
	48	5240	12.82	12.70	12.52	12.44	12.39	12.23	12.11	12.06
	149	5745	12.04	11.89	11.76	11.66	11.58	11.47	11.36	11.24
	157	5785	11.19	11.09	10.94	10.82	10.72	10.58	10.42	10.43
	165	5825	10.70	10.58	10.44	10.30	10.19	10.15	9.97	9.96
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11n (20)	36	5180	12.90	12.76	12.62	12.57	12.46	12.36	12.20	12.16
	40	5200	13.26	13.14	12.94	12.88	12.82	12.65	12.55	12.46
	48	5240	13.31	13.16	12.98	12.93	12.84	12.72	12.64	12.43
	149	5745	11.64	11.50	11.38	11.26	11.15	11.06	10.95	10.91
	157	5785	11.89	11.74	11.62	11.49	11.38	11.32	11.18	11.13
	165	5825	11.39	11.18	11.12	10.99	10.87	10.77	10.67	10.59
			MCS0	MCS0	MCS0	MCS0	MCS0	MCS0	MCS0	MCS0
802.11n (40)	38	5190	**13.77**	13.59	13.49	13.40	13.32	13.21	13.05	13.00
	46	5230	12.94	12.82	12.65	12.58	12.49	12.31	12.22	12.18
	151	5755	13.13	12.99	12.81	12.73	12.64	12.57	12.48	12.33
	159	5795	12.70	12.59	12.41	12.31	12.21	12.10	12.00	11.94
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11ac (20)	36	5180	12.19	12.01	11.91	11.82	11.74	11.63	11.47	11.41
	40	5200	12.40	12.28	12.11	12.06	11.95	11.77	11.68	11.64
	48	5240	12.42	12.28	12.10	12.02	11.93	11.86	11.77	11.60
	149	5745	12.58	12.47	12.29	12.19	12.09	11.98	11.88	11.80
	157	5785	11.87	11.74	11.64	11.46	11.36	11.32	11.12	11.12
	165	5825	11.38	11.21	11.12	11.04	10.88	10.77	10.69	10.60
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11ac (40)	38	5190	12.94	12.79	12.63	12.56	12.49	12.38	12.22	12.15
	46	5230	13.12	13.00	12.78	12.74	12.67	12.49	12.40	12.34
	151	5755	**13.17**	13.02	12.89	12.79	12.68	12.61	12.52	12.35
	159	5795	12.74	12.64	12.49	12.37	12.25	12.16	12.04	11.99
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
802.11ac (80)	42	5210	12.90	12.76	12.58	12.50	12.45	12.35	12.26	12.13
	155	5775	12.95	12.83	12.66	12.56	12.49	12.36	12.25	12.23

13. TEST RESULTS

13.1. SAR Test Results Summary

13.1.1. Test position and configuration

Body SAR was performed with the device 0mm from the phantom

13.1.2. Operation Mode

1. Per KDB 447498 D01 v06 ,for each exposure position, if the highest 1-g SAR is ≤ 0.8 W/kg, testing for low and high channel is optional.
2. Per KDB 865664 D01 v01r04,for each frequency band, if the measured SAR is ≥0.8W/Kg, testing for repeated SAR measurement is required , that the highest measured SAR is only to be tested. When the SAR results are near the limit, the following procedures are required for each device to verify these types of SAR measurement related variation concerns by repeating the highest measured SAR configuration in each frequency band.
   (1) When the original highest measured SAR is ≥0.8W/Kg, repeat that measurement once.
   (2) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is >1.20 or when the original or repeated measurement is ≥1.45 W/Kg.
   (3) Perform a third repeated measurement only if the original, first and second repeated measurement is ≥1.5 W/Kg and ratio of largest to smallest SAR for the original, first and second measurement is ≥ 1.20.
3. Maximum Scaling SAR in order to calculate the Maximum SAR values to test under the standard Peak Power, Calculation method is as follows:
   Maximum Scaling SAR =tested SAR (Max.) ×[maximum turn-up power (mw)/ maximum measurement output power(mw)]
4. Per KDB 248227 D01 v02r02 Chapter 5.2.2,when SAR measurement is required for 2.4GHz 802.11g/n OFDM configurations, the measurement and test reducing procedures for OFDM are applied. SAR is not required for the following 2.4 GHz OFDM conditions.
   (1) When KDB Publication 447498 D01 SAR test exclusion applies to the OFDM configuration.
   (2) 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,
5. Per KDB 248227 D01 v02r02 Chapter 5.3.4, 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 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.
   (1) When SAR test exclusion provisions of KDB Publication 447498 D01 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.
   (2) 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.

(3) When the specified maximum output power is same for both UNII 1 and UNII 2A,begin SAR measurements in UNII 2A with the channel with the highest measured output power. If the report SAR for UNII 2A is <1.2W/Kg, SAR is nor required for UNII 1;otherwise treat the remaining bands separately and test them independently for SAR.

(4) When the specified maximum output power different between UNII 1 and UNII 2A,begin SAR with the band that has the higher specified maximum output. If the highest reported SAR for the band with the highest specified power is ≤1.2W/Kg, testing for the band with the lower specialized output power is not required; otherwise test is remaining separately for SAR;

6. WIFI and BT share the same antenna, and cannot transmit simultaneously.

13.1.3. Test Result

SAR MEASUREMENT									
Depth of Liquid (cm):>15					Relative Humidity (%): 54.3				
Product: Arsenal 2 Pro									
Test Mode: 802.11b									
Position	**Mode**	**Ch.**	**Fr. (MHz)**	**Power Drift (<±0.2dB)**	**SAR (1g) (W/kg)**	**Max. Tune-up Power (dBm)**	**Meas. output Power (dBm)**	**Scaled SAR (W/Kg)**	**Limit W/kg**
Body back	DTS	11	2462	0.18	**0.744**	15.10	15.00	**0.761**	1.6
Body front	DTS	11	2462	0.18	0.325	15.10	15.00	0.333	1.6
Edge 1 (Top)	DTS	11	2462	0.17	0.075	15.10	15.00	0.077	1.6
Edge 2 (Right)	DTS	11	2462	0.08	0.026	15.10	15.00	0.027	1.6
Edge 3 (Bottom)	DTS	11	2462	-0.12	0.449	15.10	15.00	0.459	1.6
Edge 4 (Left)	DTS	11	2462	0.14	0.455	15.10	15.00	0.466	1.6

Note:
- When the 1-g SAR is ≤ 0.8W/kg, testing for low and high channel is optional.
- The test separation of all above table is 0mm.
- According to KDB248227, SAR is not required for 802.11n HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a/b channels.

SAR MEASUREMENT								
Depth of Liquid (cm):>15				Relative Humidity (%): 54.5				
Product: Arsenal 2 Pro								
Test Mode: 5.2GHz-802.11n40								
Position	**Ch.**	**Fr. (MHz)**	**Power Drift (<±0.2dB)**	**SAR (1g) (W/kg)**	**Max. Tune-up Power (dBm)**	**Meas. output Power (dBm)**	**Scaled SAR (W/Kg)**	**Limit (W/kg)**
Body back	38	5190	0.10	**0.753**	13.80	13.77	**0.758**	1.6
Body front	38	5190	0.15	0.720	13.80	13.77	0.725	1.6
Edge 1 (Top)	38	5190	0.02	0.143	13.80	13.77	0.144	1.6
Edge 2 (Right)	38	5190	0.15	0.246	13.80	13.77	0.248	1.6
Edge 3 (Bottom)	38	5190	0.13	0.702	13.80	13.77	0.707	1.6
Edge 4 (Left)	38	5190	0.18	0.482	13.80	13.77	0.485	1.6

Note:
- When the 1-g SAR is ≤ 0.8W/kg, testing for low and high channel is optional.
- The test separation of all above table is 0mm.

SAR MEASUREMENT								
Depth of Liquid (cm):>15					Relative Humidity (%): 52.6			
Product: Arsenal 2 Pro								
Test Mode: 5.8GHz-802.11ac40								
Position	**Ch.**	**Fr. (MHz)**	**Power Drift (<±0.2dB)**	**SAR (1g) (W/kg)**	**Max. Tune-up Power (dBm)**	**Meas. output Power (dBm)**	**Scaled SAR (W/Kg)**	**Limit (W/kg)**
Body back	151	5755	0.01	1.04	13.20	13.17	1.047	1.6
Body back	159	5795	0.13	**1.14**	13.20	13.17	**1.148**	1.6
Body front	151	5755	0.17	0.693	13.20	13.17	0.698	1.6
Edge 1 (Top)	151	5755	0.01	0.066	13.20	13.17	0.066	1.6
Edge 2 (Right)	151	5755	-0.11	0.022	13.20	13.17	0.022	1.6
Edge 3 (Bottom)	151	5755	-0.17	1.04	13.20	13.17	1.047	1.6
Edge 3 (Bottom)	159	5795	0.02	1.00	13.20	13.17	1.007	1.6
Edge 4 (Left)	151	5755	0.11	0.510	13.20	13.17	0.514	1.6

Note:
- When the 1-g SAR is ≤ 0.8W/kg, testing for low and high channel is optional.
- The test separation of all above table is 0mm.

Repeated SAR									
Product: Arsenal 2 Pro									
Test Antenna: 5.8GHz-802.11ac40									
Position	**Ch.**	**Fr. (MHz)**	**Power Drift (<±0.2dB)**	**Once SAR (1g) (W/kg)**	**Power Drift (<±0.2dB)**	**Twice SAR (1g) (W/kg)**	**Power Drift (<±0.2)**	**Third SAR (1g) (W/kg)**	**Limit (W/kg)**
Body back	159	5795	0.10	1.10	--	--	--	--	1.6

APPENDIX A. SAR SYSTEM CHECK DATA

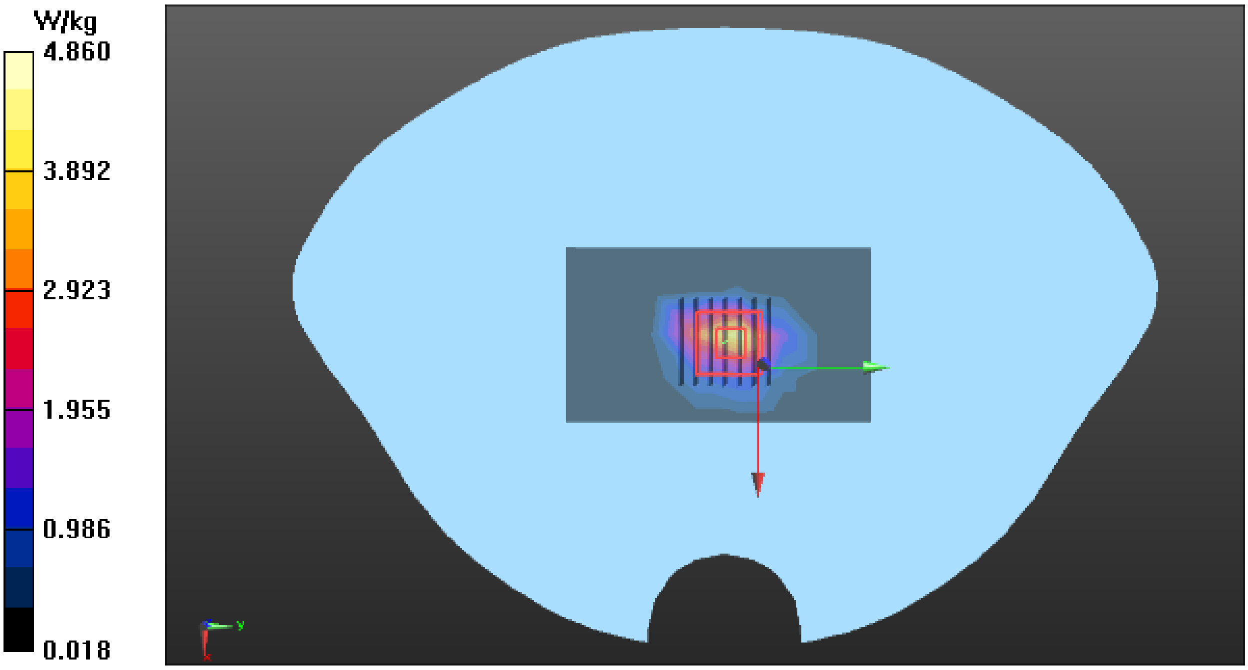
Test Laboratory: AGC Lab **Date: Apr. 07.2021**
System Check Head 2450 MHz
DUT: Dipole 2450 MHz Type: D2450V2

Communication System CW; Communication System Band: D2450 (2450.0 MHz); Duty Cycle: 1:1;
Frequency: 2450 MHz; Medium parameters used: f = 2450 MHz; σ=1.83 mho/m; εr =38.67; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=18dBm
Ambient temperature (℃): 21.5, Liquid temperature (℃): 21.3

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(7.66, 7.66, 7.66); Calibrated: Jul. 29,2020;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 SN1398; Calibrated: Apr. 23,2020
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check Head 2450Hz/Area Scan (5x8x1): Measurement grid:dx=15mm, dy=15mm
Maximum value of SAR (measured) = 4.77 W/kg

Configuration/System Check Head 2450Hz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.081 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 6.92 W/kg
SAR(1 g) = 3.07 W/kg; SAR(10 g) = 1.53 W/kg
Maximum value of SAR (measured) = 4.86 W/kg



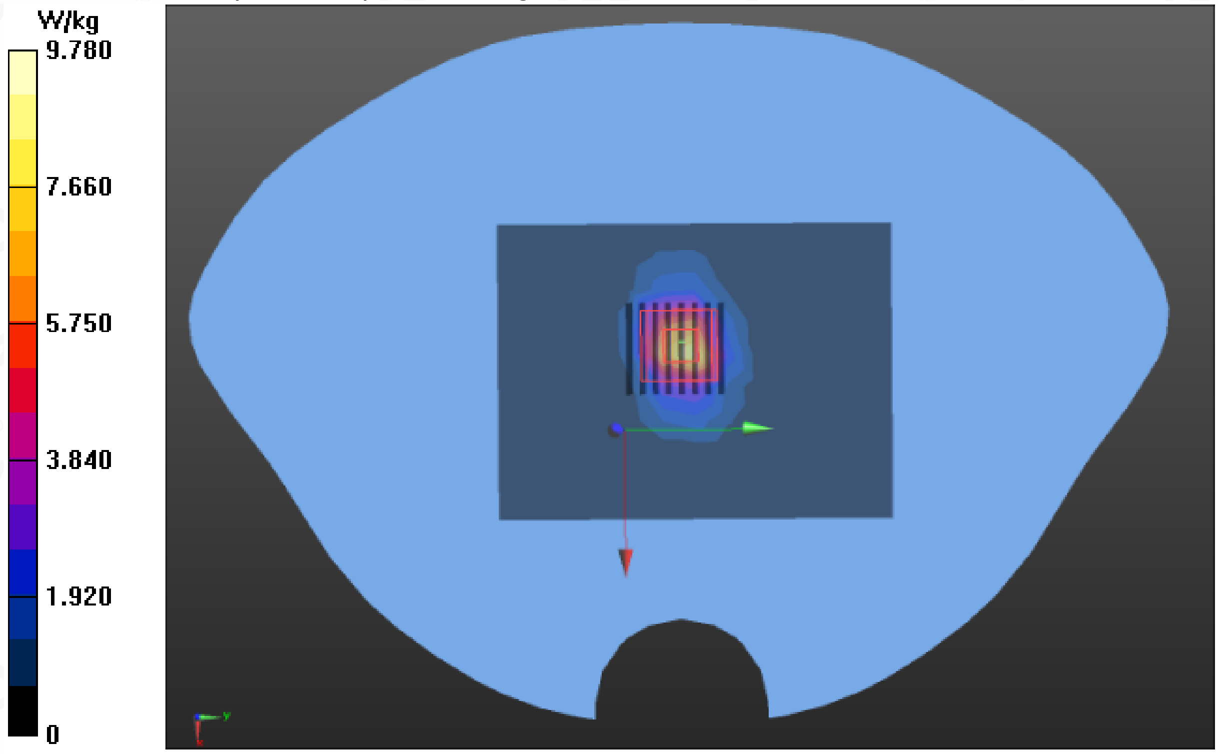
Test Laboratory: AGC Lab **Date: Apr. 02.2021**
System Check Head 5200 MHz
DUT: Dipole 5000MHz Type: SWG5500

Communication System: CW; Communication System Band: D5000 (5000.0 MHz); Duty Cycle: 1:1;
Frequency: 5200 MHz; Medium parameters used: f = 5250 MHz; σ =4.51mho/m; εr = 36.74; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=15dBm
Ambient temperature (℃): 21.4, Liquid temperature (℃): 21.2

DASY Configuration:
- Probe: EX3DV4 – SN3953; ConvF(5.53, 5.53, 5.53); Calibrated: Jul. 29,2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 SN1398; Calibrated: Apr. 23,2020
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 5200MHz Head/Area Scan (10x13x1): Measurement grid:dx=10mm, dy=10mm
Maximum value of SAR (measured) = 9.97 W/kg

Configuration/System Check 5200MHz Head/Zoom Scan (8x8x13)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 29.274 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 17.1 W/kg
SAR(1 g) = 5.14 W/kg; SAR(10 g) = 1.72 W/kg
Maximum value of SAR (measured) = 9.78 W/kg



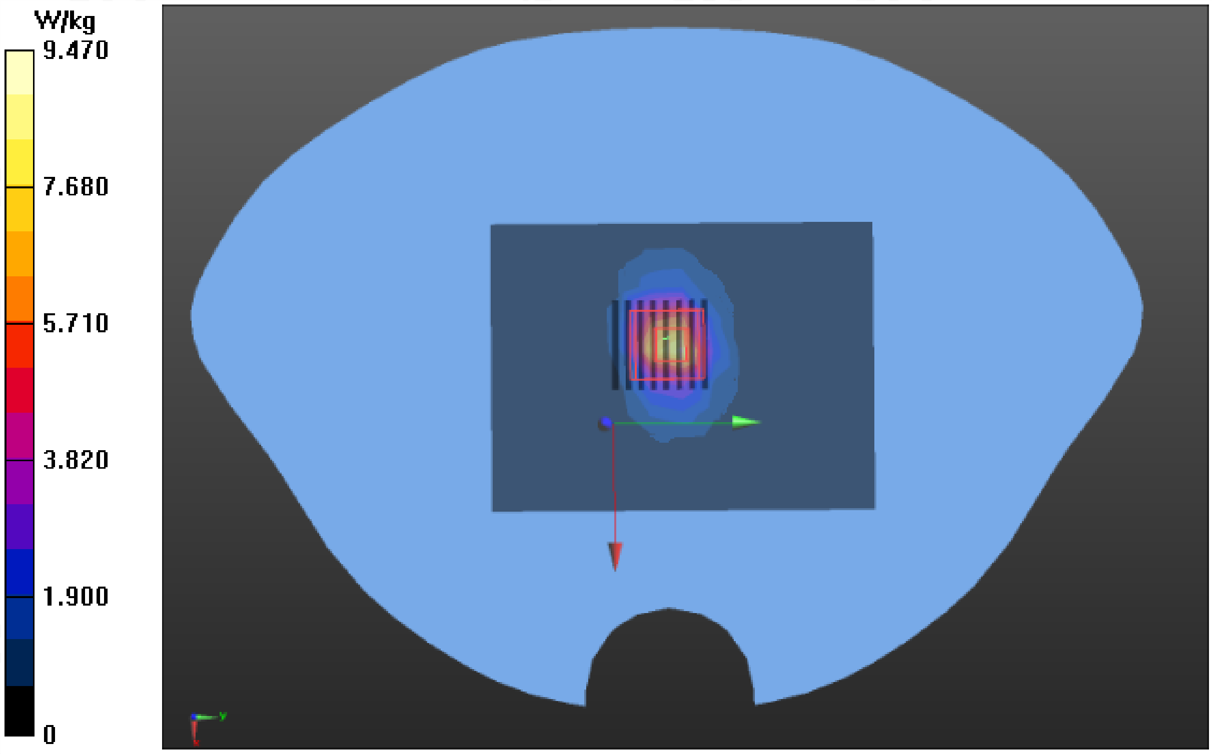
Test Laboratory: AGC Lab **Date: Apr. 06.2021**
System Check Head 5800 MHz
DUT: Dipole 5000MHz Type: SWG5500

Communication System: CW; Communication System Band: D5000 (5000.0 MHz); Duty Cycle: 1:1;
Frequency: 5800 MHz; Medium parameters used: f = 5750 MHz; σ =5.25 mho/m; εr =35.49; ρ= 1000 kg/m³ ;
Phantom section: Flat Section; Input Power=15dBm
Ambient temperature (℃): 22.9, Liquid temperature (℃): 22.6

DASY Configuration:
- Probe: EX3DV4 – SN3953; ConvF(4.99, 4.99, 4.99); Calibrated: Jul. 29,2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 SN1398; Calibrated: Apr. 23,2020
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Configuration/System Check 5800MHz Head/Area Scan (10x13x1): Measurement grid:dx=10mm, dy=10mm
Maximum value of SAR (measured) = 9.21 W/kg

Configuration/System Check 5800MHz Head/Zoom Scan (8x8x13)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 36.507 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 19.2 W/kg
SAR(1 g) = 5.66 W/kg; SAR(10 g) = 1.87 W/kg
Maximum value of SAR (measured) = 9.47 W/kg



APPENDIX B. SAR MEASUREMENT DATA

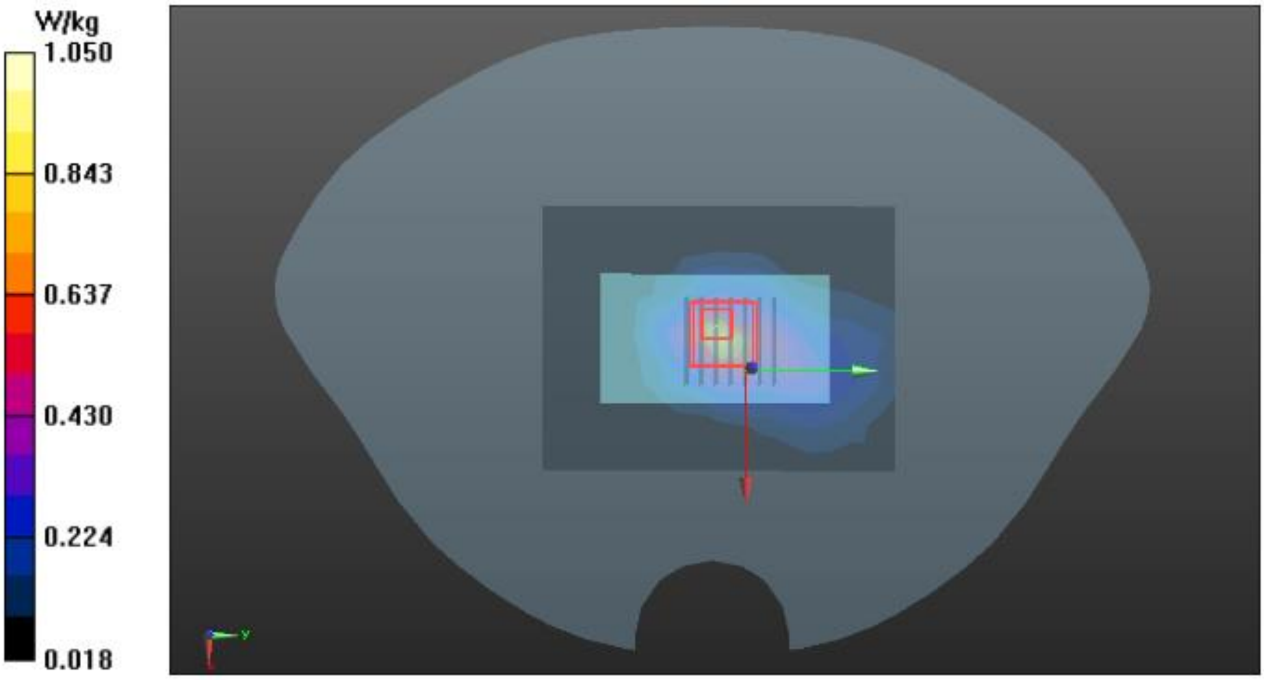
Test Laboratory: AGC Lab **Date: Apr. 07.2021**
802.11b High- Body- Back (DTS)
DUT: Arsenal 2 Pro; Type: Robert

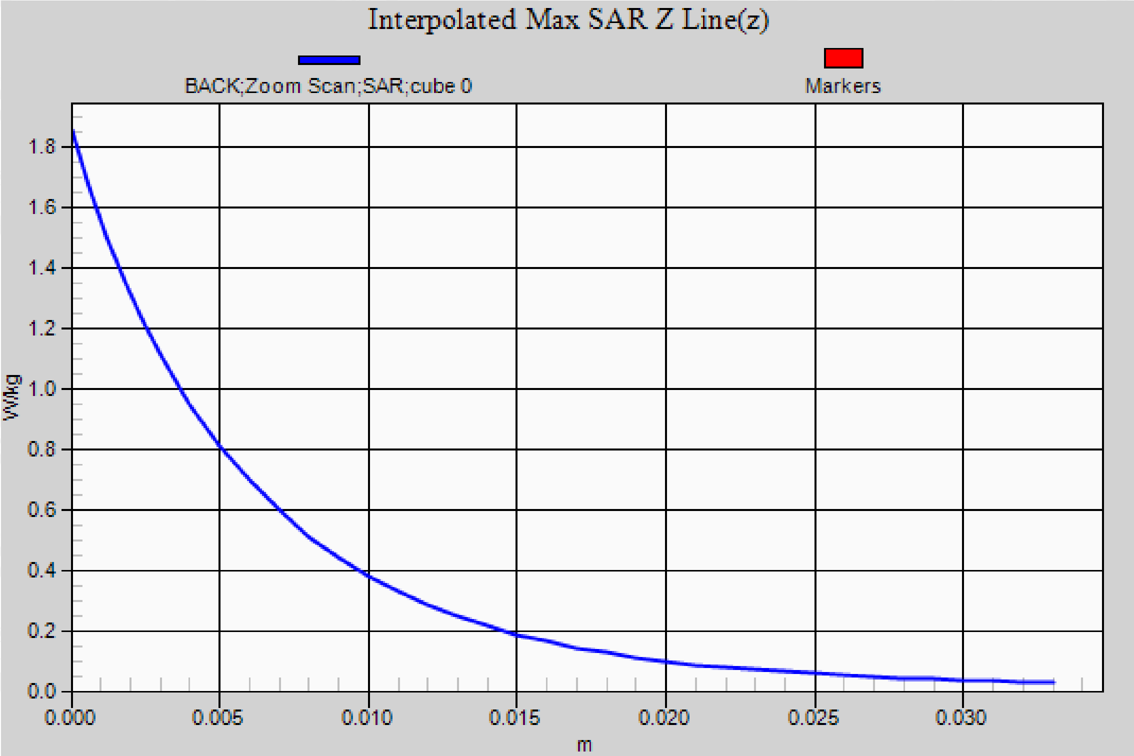
Communication System: Wi-Fi; Communication System Band: 802.11b; Duty Cycle: 1:1;
Frequency: 2462 MHz; Medium parameters used: f = 2450 MHz; σ=1.85 mho/m; εr =37.82; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃): 21.5, Liquid temperature (℃):21.3

DASY Configuration:
- Probe: EX3DV4 – SN:3953; ConvF(7.66, 7.66, 7.66); Calibrated: Jul. 29,2020;
- Sensor-Surface: 3mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 SN1398; Calibrated: Apr. 23,2020
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BODY/BACK/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.875 W/kg

BODY/BACK/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.834 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 1.86 W/kg
SAR(1 g) = 0.744 W/kg; SAR(10 g) = 0.363 W/kg
Maximum value of SAR (measured) = 1.05 W/kg




Interpolated Max SAR Z Line(z)
BACK;Zoom Scan;SAR;cube 0
Markers
W/kg
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

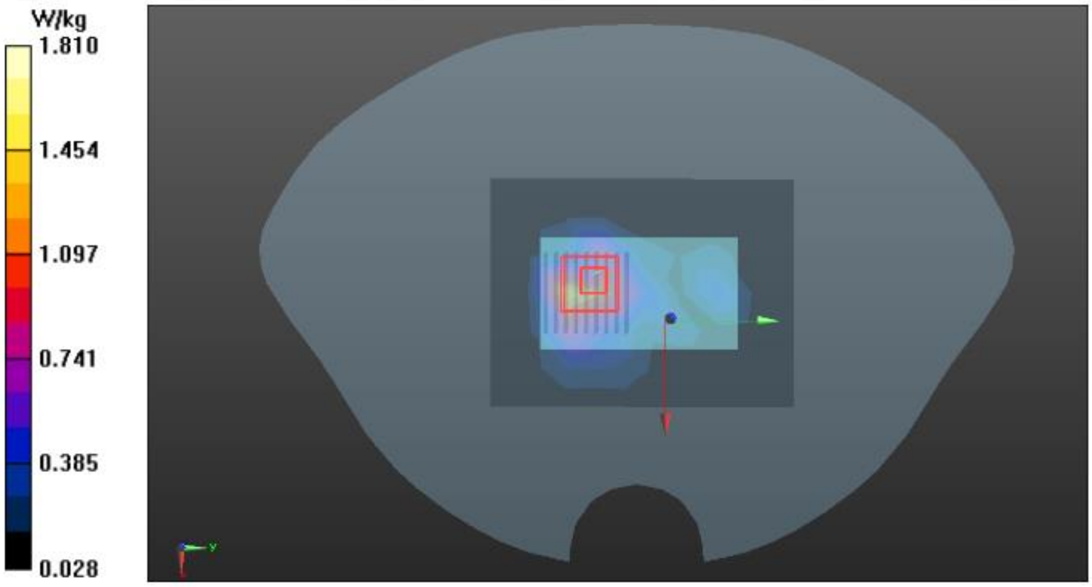
Test Laboratory: AGC Lab **Date: Apr. 02.2021**
5.2GHz -802.11n40 CH38- Body-Back
DUT: Arsenal 2 Pro; Type: Robert

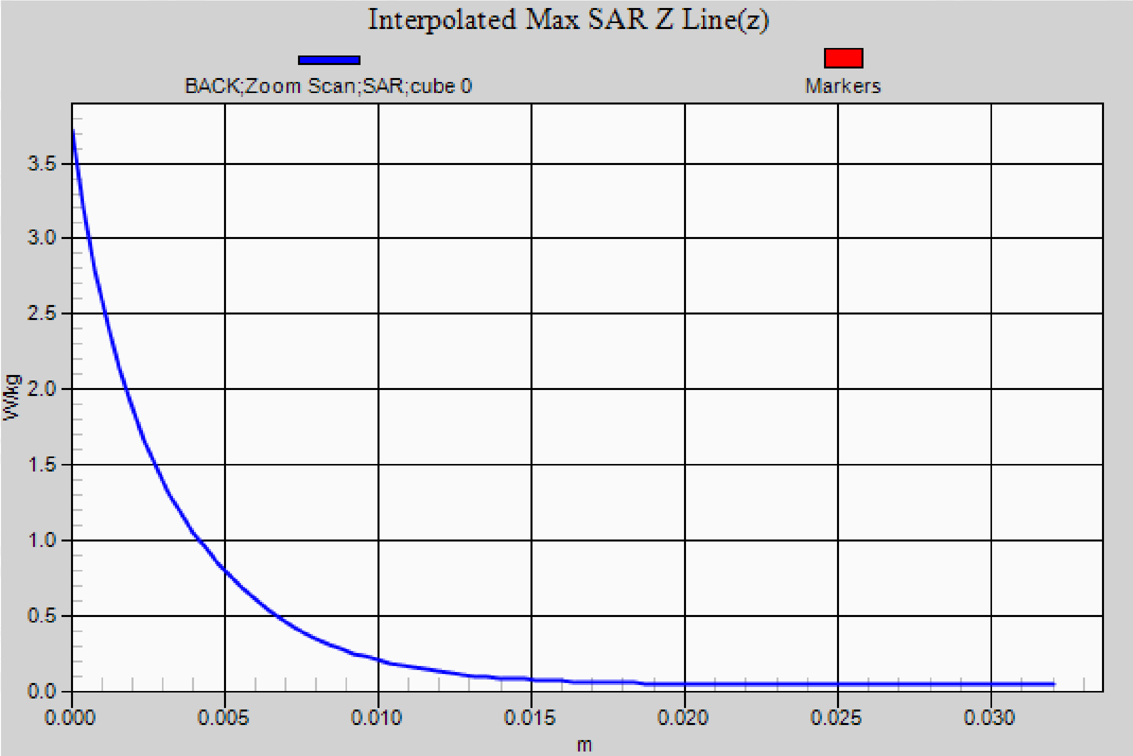
Communication System: Wi-Fi; Communication System Band: 802.11n40; Duty Cycle: 1:1
Frequency: 5190 MHz; Medium parameters used: f = 5250 MHz; σ=4.53 mho/m; εr =35.69; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃): 21.4, Liquid temperature (℃): 21.2

DASY Configuration:
- Probe: EX3DV4 – SN3953; ConvF(5.53, 5.53, 5.53); Calibrated: Jul. 29,2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 SN1398; Calibrated: Apr. 23,2020
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BODY/BACK/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.34 W/kg

BODY/BACK/Zoom Scan (9x9x16)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 9.417 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 3.72 W/kg
SAR(1 g) = 0.753 W/kg; SAR(10 g) = 0.363 W/kg
Maximum value of SAR (measured) = 1.81 W/kg




Interpolated Max SAR Z Line(z)
BACK;Zoom Scan;SAR;cube 0
Markers
W/kg
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
m

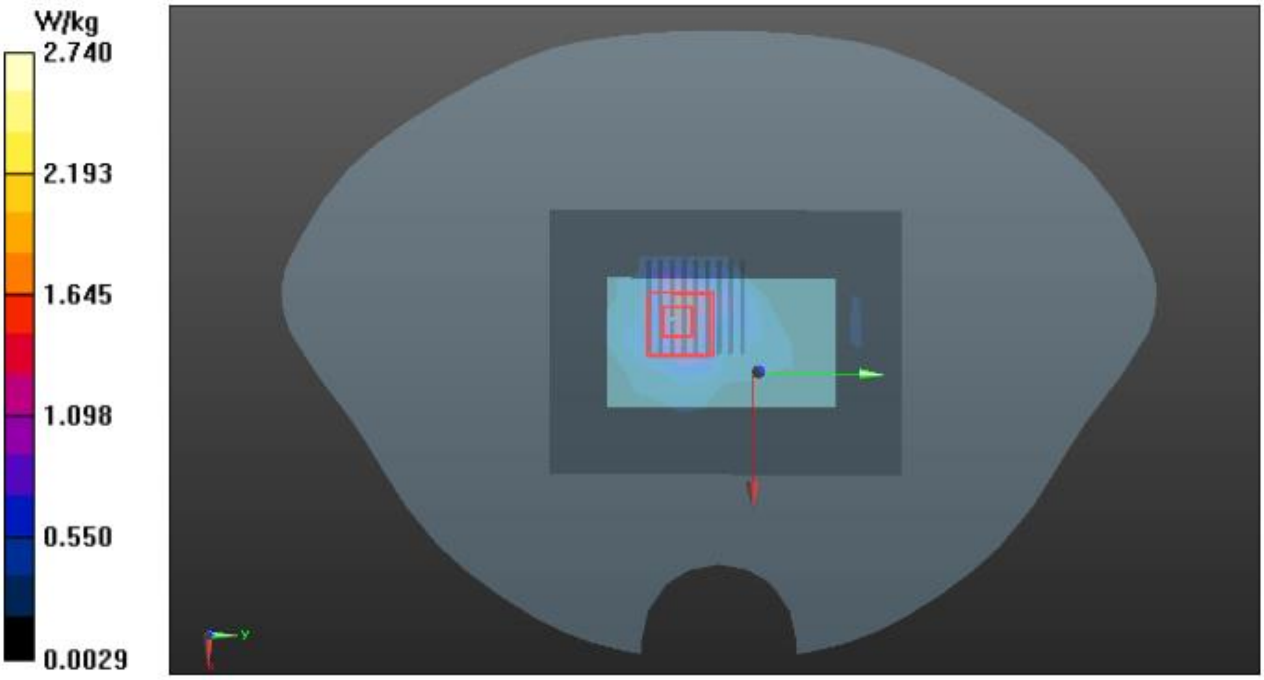
Test Laboratory: AGC Lab **Date: Apr. 06.2021**
5.8GHz -802.11ac40 CH159- Body-Back
DUT: Arsenal 2 Pro; Type: Robert

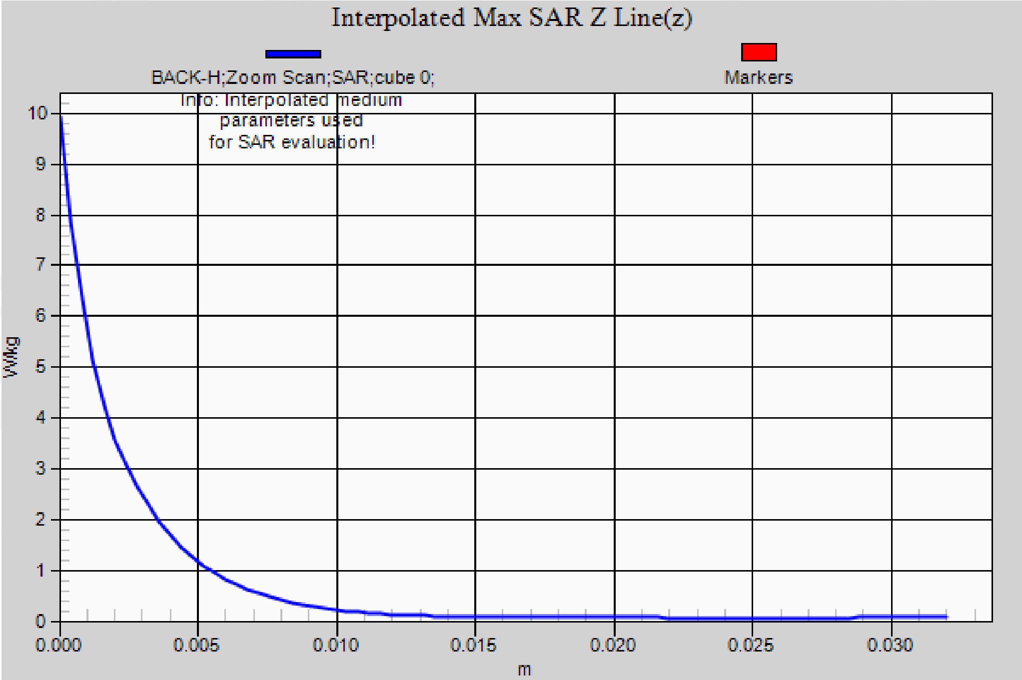
Communication System: Wi-Fi; Communication System Band: 802.11ac40; Duty Cycle: 1:1
Frequency: 5795 MHz; Medium parameters used: f = 5750 MHz; σ=5.23 mho/m; εr =36.52; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃): 22.9,, Liquid temperature (℃): 22.6

DASY Configuration:
- Probe: EX3DV4 – SN3953; ConvF(4.99, 4.99, 4.99); Calibrated: Jul. 29,2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 SN1398; Calibrated: Apr. 23,2020
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

BODY/BACK-H/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.59 W/kg

BODY/BACK-H/Zoom Scan (9x9x16)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 8.705 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 9.92 W/kg
SAR(1 g) = 1.14 W/kg; SAR(10 g) = 0.281 W/kg
Maximum value of SAR (measured) = 2.74 W/kg




Interpolated Max SAR Z Line(z)
BACK-H;Zoom Scan;SAR;cube 0;
Info: Interpolated medium parameters used for SAR evaluation!
Markers
W/kg
m
0.000
0.005
0.010
0.015
0.020
0.025
0.030

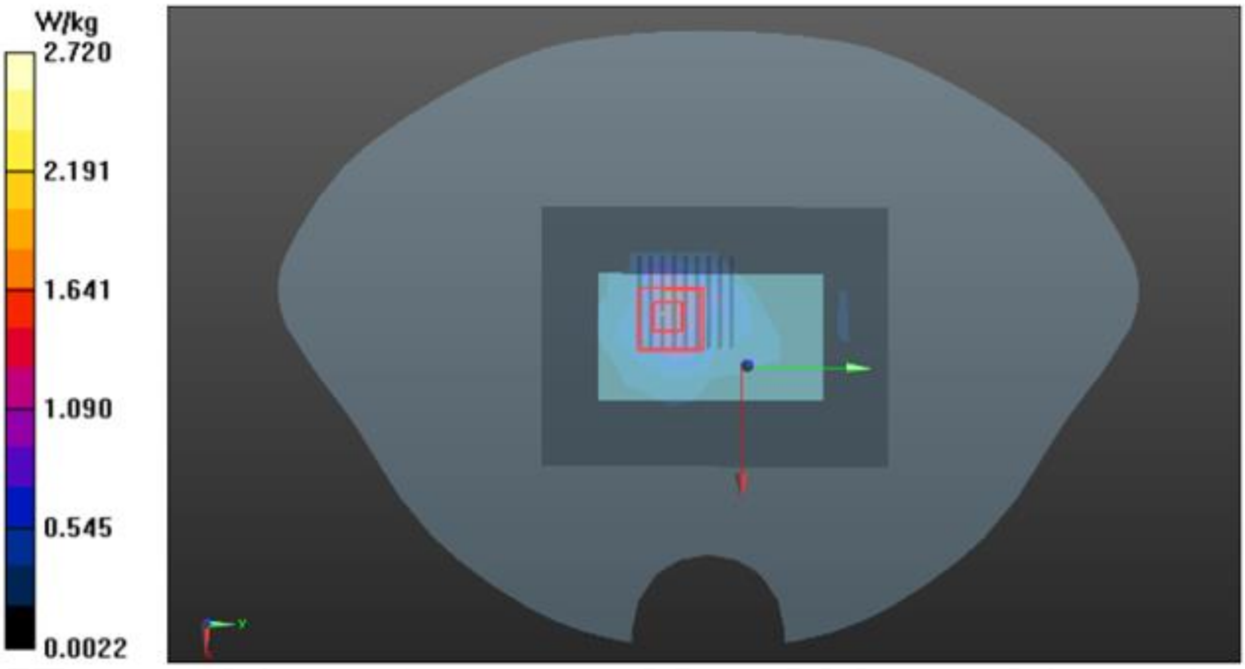
Repeated SAR
Test Laboratory: AGC Lab **Date: Apr. 06.2021**
5.8GHz -802.11ac40 CH159- Body-Back
DUT: Arsenal 2 Pro; Type: Robert

Communication System: Wi-Fi; Communication System Band: 802.11ac40; Duty Cycle: 1:1
Frequency: 5795 MHz; Medium parameters used: f = 5750 MHz; σ=5.23 mho/m; εr =36.52; ρ= 1000 kg/m³ ;
Phantom section: Flat Section
Ambient temperature (℃): 22.9,, Liquid temperature (℃): 22.6

DASY Configuration:
- Probe: EX3DV4 – SN3953; ConvF(4.99, 4.99, 4.99); Calibrated: Jul. 29,2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 SN1398; Calibrated: Apr. 23,2020
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

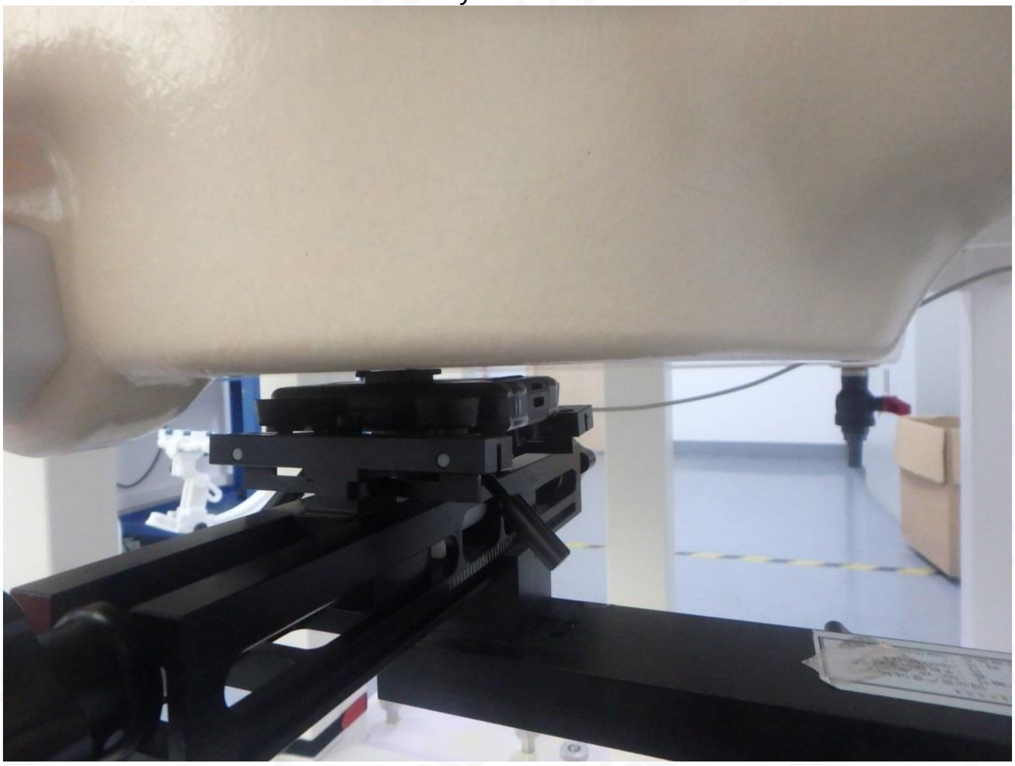
BODY/BACK-H-REPEATED/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.56 W/kg

BODY/BACK-H-REPEATED/Zoom Scan (9x9x16)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 8.688 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 9.87 W/kg
SAR(1 g) = 1.10 W/kg; SAR(10 g) = 0.275 W/kg
Maximum value of SAR (measured) = 2.72 W/kg

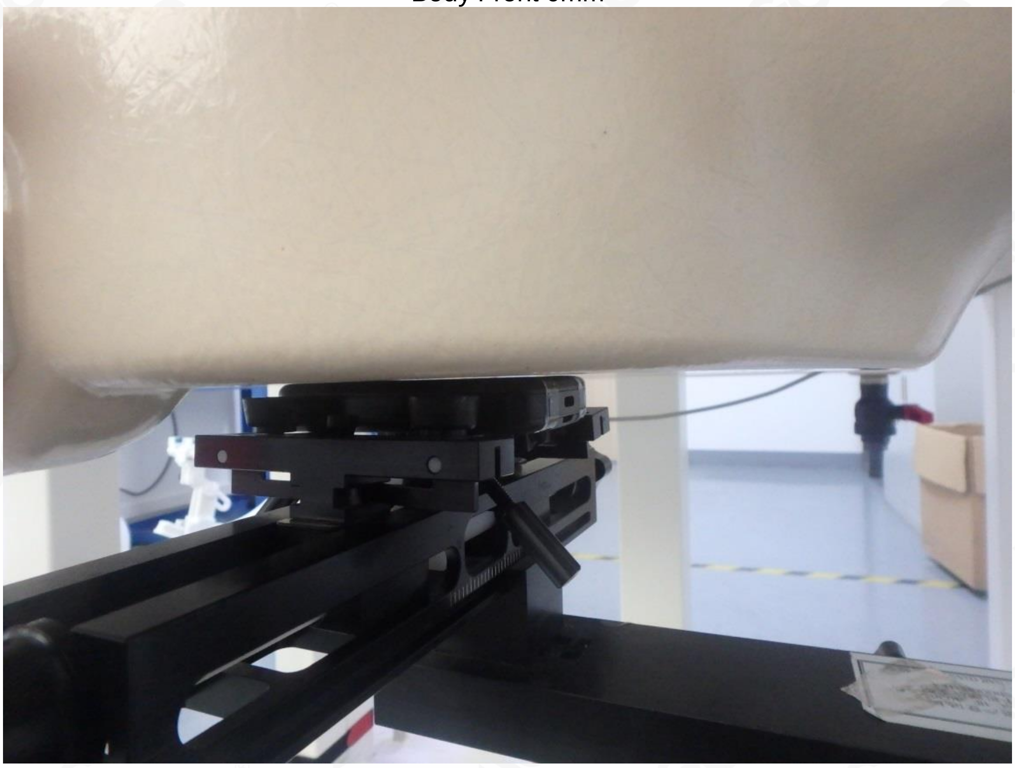


APPENDIX C. TEST SETUP PHOTOGRAPHS

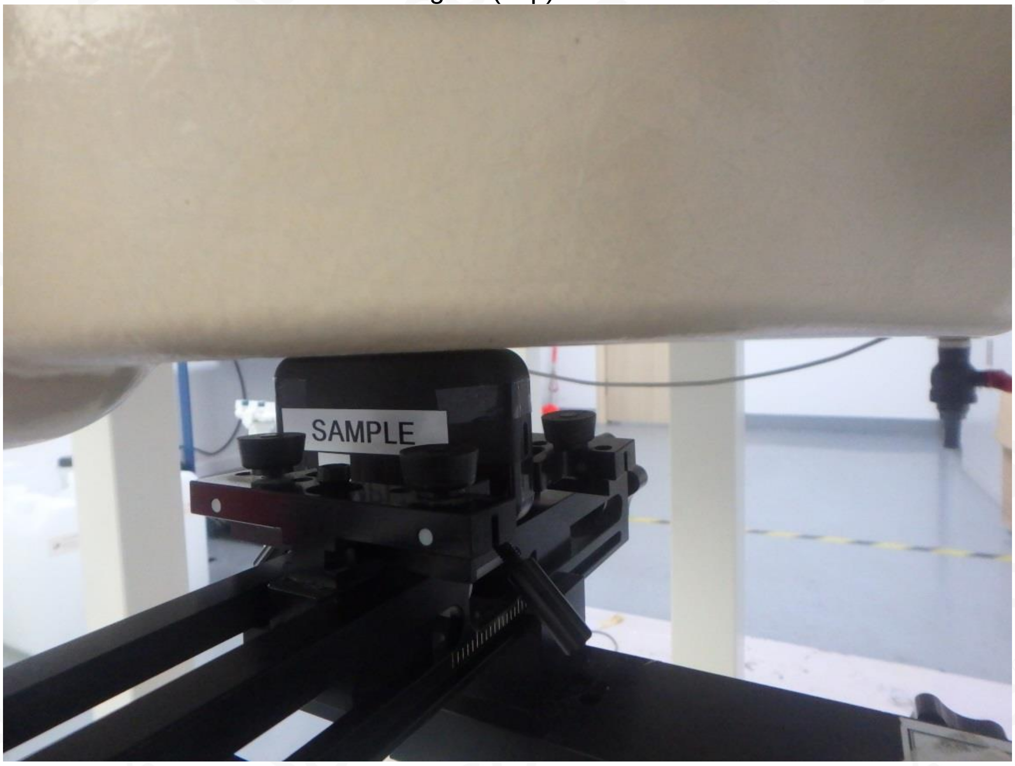
Body Back 0mm



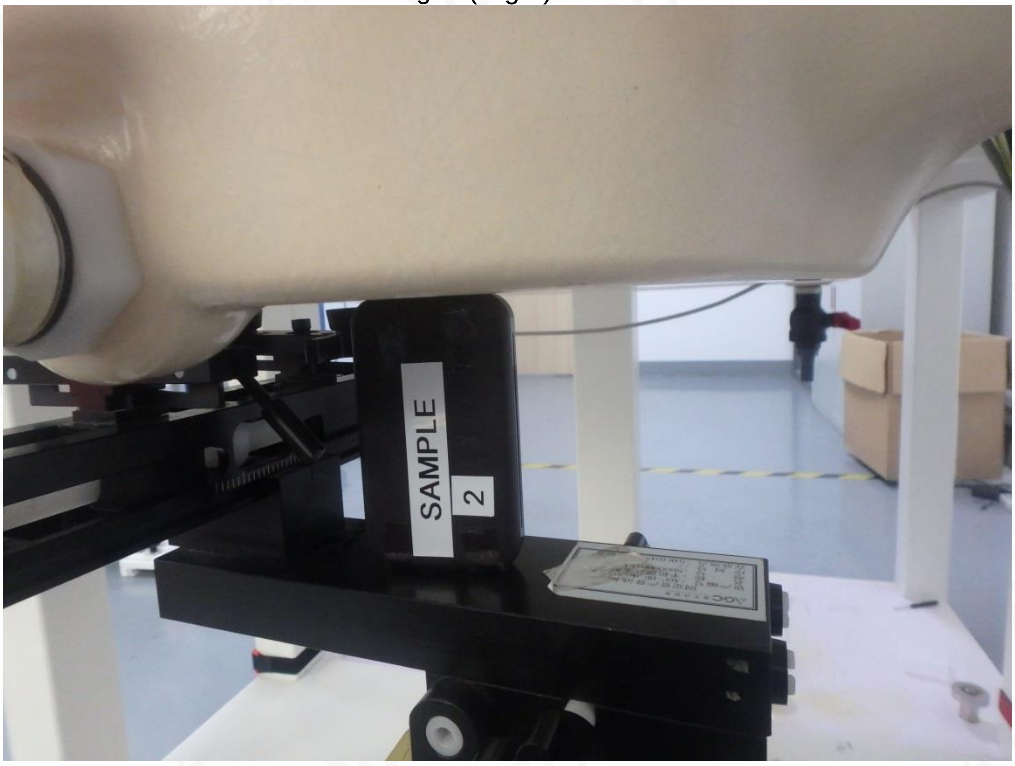
Body Front 0mm



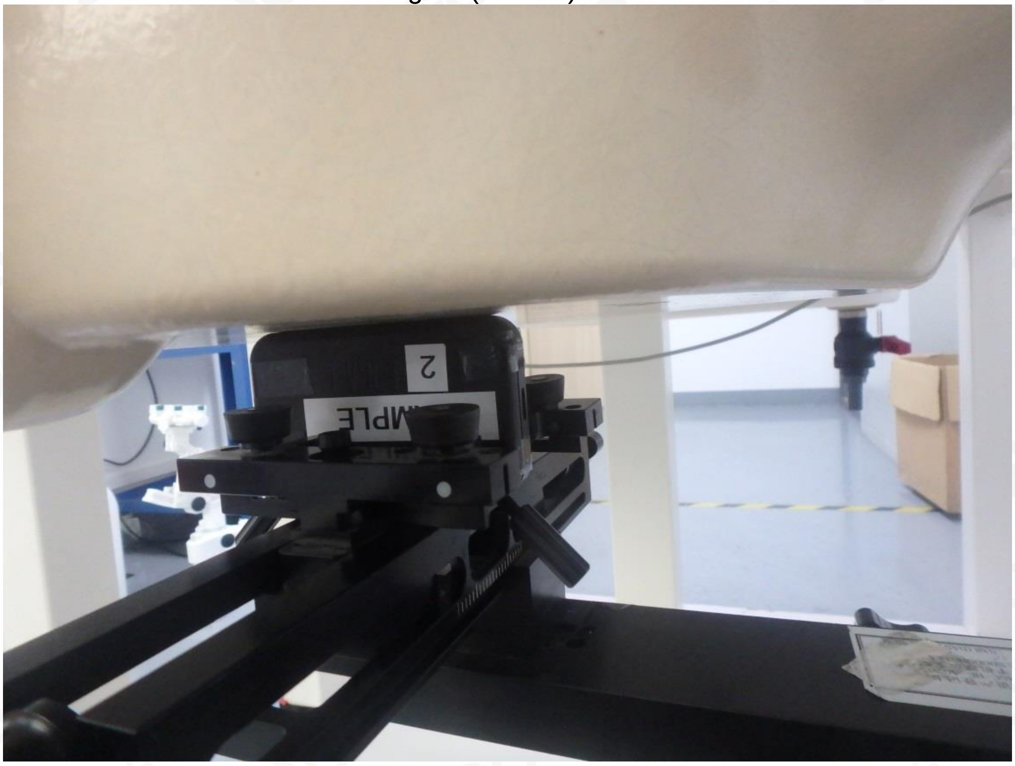
Edge 1 (Top) 0mm



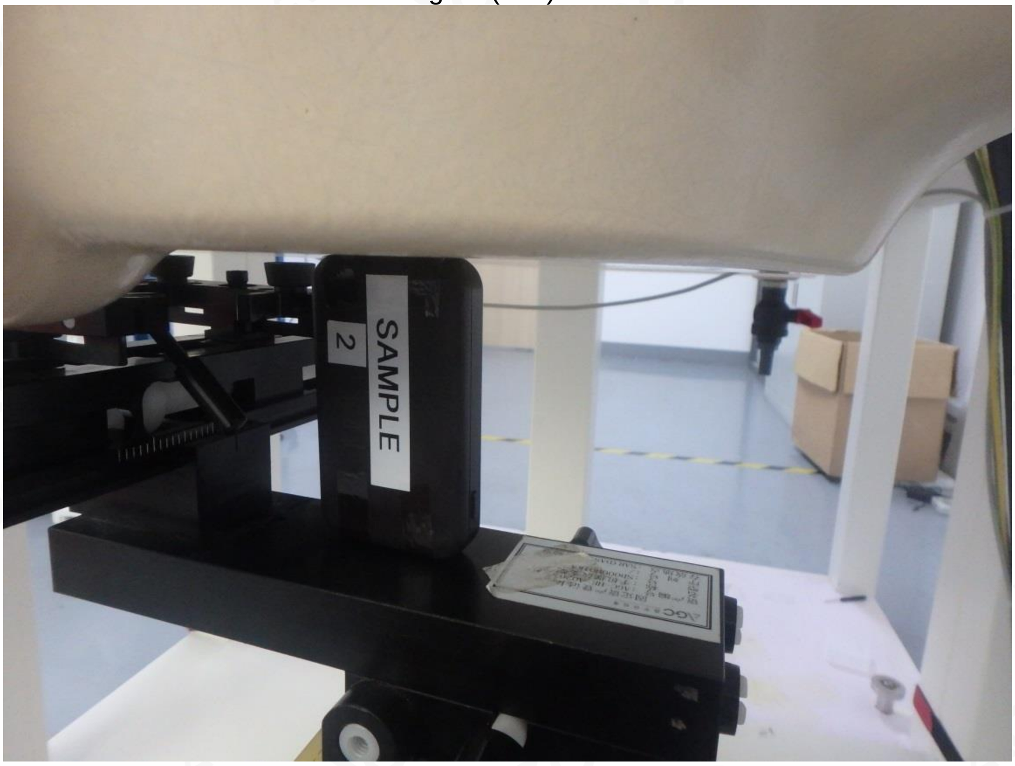
Edge2 (Right) 0mm



Edge 3 (Bottom) 0mm

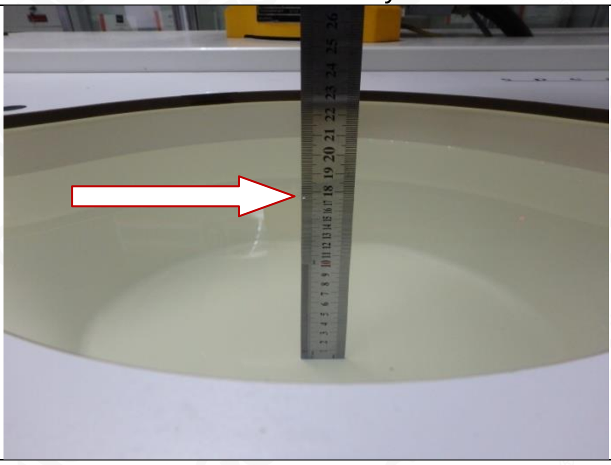
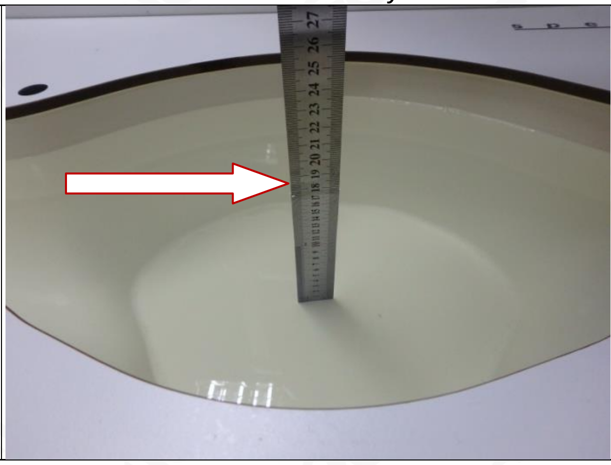


Edge 4 (Left) 0mm



DEPTH OF THE LIQUID IN THE PHANTOM—ZOOM IN

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

2450MHz body	5000MHz body
	

APPENDIX D. CALIBRATION DATA

Refer to Attached files.

Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").

2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3.The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

4. The non-CMA report issued by AGC is only permitted to be used by the client as internal reference use and shall not be used for public demonstration purpose.

5. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

6. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

7. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

8.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

9. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.

10. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.