FCC SAR TEST REPORT

Application No.:	SZCR2408003031AT
Applicant:	KEYENCE CORPORATION
Address of Applicant:	1-3-14, Higashinakajima, Higashiyodogawa-ku, Osaka, 533-8555 Japan
Manufacturer:	KEYENCE CORPORATION
Address of Manufacturer:	1-3-14, Higashinakajima, Higashiyodogawa-ku, Osaka, 533-8555 Japan
Factory:	KEYENCE CORPORATION
Address of Factory:	1-3-14, Higashinakajima, Higashiyodogawa-ku, Osaka, 533-8555 Japan
EUT Description:	Handheld Terminal
Model No.:	BT-A600
Trade Mark:	KEYENCE
FCC ID:	RF41761B
Standards:	FCC 47CFR §2.1093
Date of Receipt:	2024-08-16
Date of Test:	2024-08-16 to 2024-08-22
Date of Issue:	2024-09-11
Test Result :	**PASS ***

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

Keny Xu
EMC Laboratory Manager

Revision History			
Report Number	***Revision***	***Description***	***Issue Date***
SZCR240800303102	01	Original	2024-09-11

Prepared By	Vito Wang **Vito Wang**
Checked By	Roman Pan **Roman Pan**

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Test Summary

Frequency Band	Maximum Reported SAR(W/kg)			
	Head	Body-worn	Hotspot	Product specific 10g SAR
WI-FI (2.4GHz)	0.14	0.07	0.30	0.44
WI-FI (5GHz)	0.26	0.13	0.72	0.52
WI-FI (6GHz)	0.05	0.04	/	0.20
BT	0.08	0.04	0.18	0.26
SAR Limited(W/kg)	1.6			4.0
Maximum Simultaneous Transmission SAR (W/kg)				
Scenario	Head	Body-worn	Hotspot	Product specific 10g SAR
Sum SAR	0.48	0.26	0.96	0.96
SPLSR	/	/	/	/
SPLSR Limited	0.04			0.1

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1 General Information

1.1 Details of Client

Applicant:	KEYENCE CORPORATION
Address of Applicant:	1-13-14,Higashinakajima,Higashiyodogwa-ku, Osaka,533-8555 Japan
Manufacturer:	KEYENCE CORPORATION
Address of Manufacturer:	1-13-14,Higashinakajima,Higashiyodogwa-ku, Osaka,533-8555 Japan
Factory:	KEYENCE CORPORATION
Address of Factory:	1-13-14,Higashinakajima,Higashiyodogwa-ku, Osaka,533-8555 Japan

1.2 Test Location

Company:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Address:	No. 1 Workshop, M-10, Middle section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China
Post code:	518057
Test engineer:	Bert-Xu

1.3 Test Facility

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

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI (Member No. 1937)

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1336

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

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1.4 General Description of EUT

Product Name:	Handheld Terminal		
Model No.:	BT-A600		
Trade Mark:	KEYENCE		
Product Phase:	production unit		
Device Type:	portable device		
Exposure Category:	uncontrolled environment / general population		
Hardware Version:	V1.03		
Software Version:	T48		
Antenna Type:	FPC Antenna		
Device Operating Configurations:			
Modulation Mode:	**WIFI**:DSSS,OFDM,OFDMA; **BT**:GFSK, π/4DQPSK,8DPSK		
Frequency Bands:	Band	Tx(MHz)	Rx(MHz)
	WIFI 2.4G	2412~2462	2412~2462
	WIFI 5G	5150~5250	5150~5250
		5250~5350	5250~5350
		5470~5725	5470~5725
		5725~5850	5725~5850
	WIFI 6G	5925~6425	5925~6425
		6425~6525	6425~6525
		6525~6875	6525~6875
		6875~7125	6875~7125
	BT	2402~2480	2402~2480
RF Cable:	☒Provided by applicant ☐Provided by the laboratory		
Battery Information:	Model:	DX-BC6	
	Normal Voltage:	DC 3.6V	
	Rated capacity:	6270mAh	
	Manufacturer:	Manufactured by Getac Technology(Kunshan) Co.,Ltd	
Note: *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information , SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion. Remark:			

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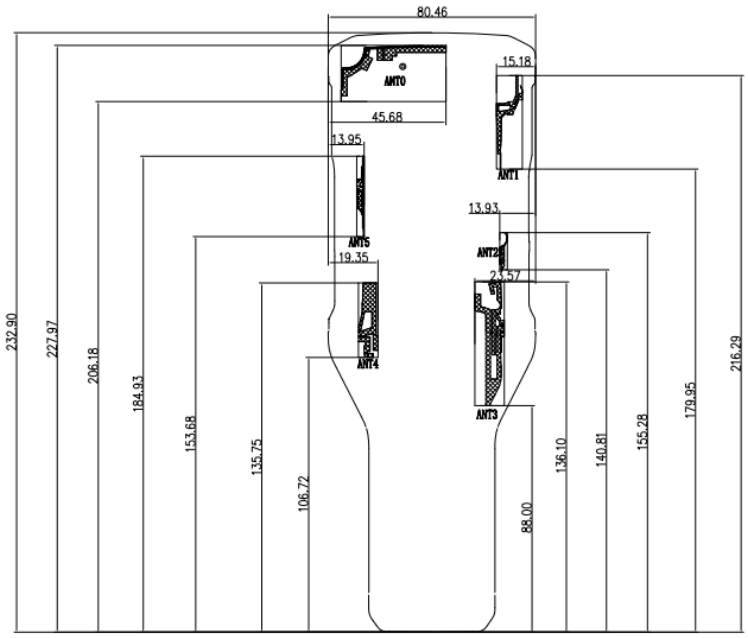
1.4.1 DUT Antenna Locations (Front View)



Note:

1) The test device is a smart phone. The overall diagonal dimension of this device is 230mm. Per KDB 648474 D04, because the diagonal distance of this device is ⩾160mm, so it is a phablet.

According to the distance between WIFI/BT antennas and the sides of the EUT we can draw the conclusion that:

Distance of the Antenna to the EUT surface/edge						
Mode	Front	Back	Left	Right	Top	Bottom
Ant1	≤25mm	≤25mm	>25mm	≤25mm	≤25mm	>25mm
Ant5	≤25mm	≤25mm	≤25mm	>25mm	≤25mm	>25mm

Table 1： Distance of the Antenna to the EUT surface/edge

Note:

1) When the antenna-to-edge distance is greater than 25mm, such position does not need to be tested.

1.5 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
ANSI/IEEE C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.
IEEE 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
IEC/IEEE 62209-1528:2020	Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices –Part 1528: Human models, instrumentation, and procedures(Frequency range of 4 MHz to 10 GHz)
IEC/IEEE 63195-1:2022	Assessment of power density of human exposure to radio frequency fields from wireless devices in close proximity to the head and body (frequency range of 6 GHz to 300 GHz) – Part 1: Measurement procedure
KDB 941225 D06	Hotspot Mode SAR v02r01
KDB 248227 D01	SAR Guidance for IEEE 802 11 Wi-Fi SAR v02r02
KDB 648474 D04	Handset SAR v01r03
KDB 447498 D04	Interim General RF Exposure Guidance v01
KDB 865664 D01	SAR Measurement 100 MHz to 6 GHz v01r04
KDB 865664 D02	RF Exposure Reporting v01r02
KDB 690783 D01	SAR Listings on Grants v01r03
KDB 616217 D04	SAR for laptop and tablets v01r02

1.6 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain*Trunk)	1.60 mW/g	8.00 mW/g
Spatial Average SAR** (Whole Body)	0.08 mW/g	0.40 mW/g
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	4.00 mW/g	20.00 mW/g

Notes:
* The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time
** The Spatial Average value of the SAR averaged over the whole body.
*** The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.
Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation.)

2 Laboratory Environment

Temperature	Min. = 18℃, Max. = 25 ℃
Relative humidity	Min. = 30%, Max. = 70%
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

Table 2： The Ambient Conditions

3 SAR Measurements System Configuraion

3.1 The SAR Measurement System

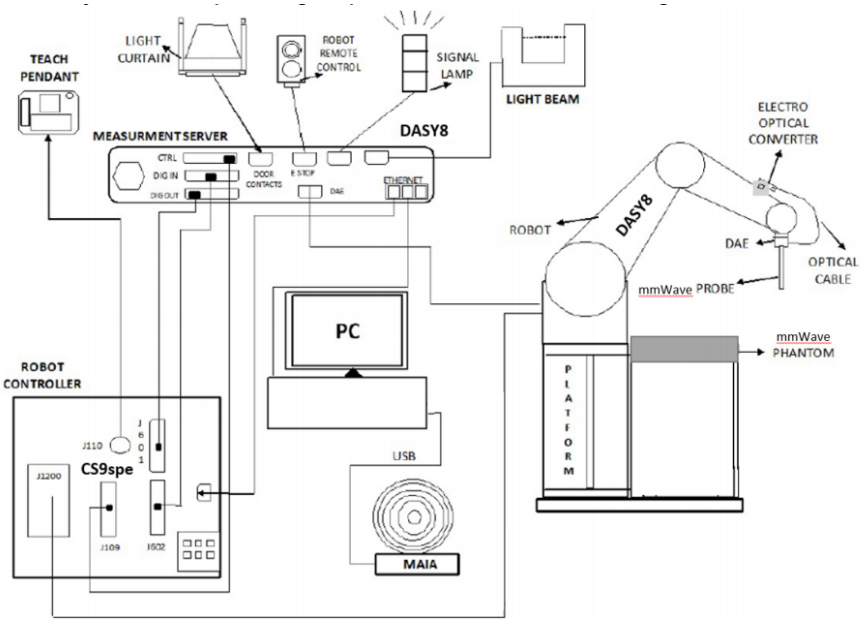
This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ (|Ei|2)/ ρ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

The DASY system for performing compliance tests consists of the following items:
A standard high precision 6-axis robot (Stabile RX family) with controller, teach pendant and software. An arm extension for accommodation the data acquisition electronics (DAE).

A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

A data acquisition electronics (DAE) which performs the signal amplification, 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 between optical and electrical of the signals for the digital communication to DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.



F-1. SAR Measurement System Configuration

- 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.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.

- A computer operating Windows 7.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand, right-hand and Body Worn usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validating the proper functioning of the system.

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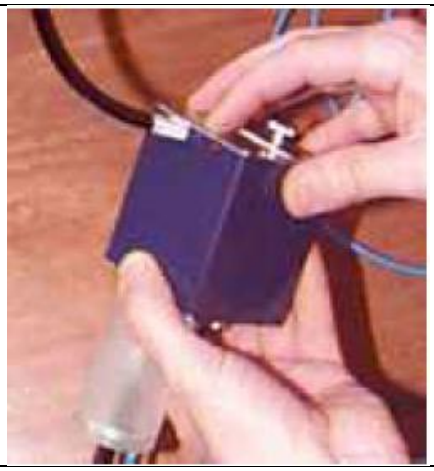
3.2 Isotropic E-field Proble EX3DV4

	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
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

3.3 Data Acquisition Electronics (DAE)

Model	DAE
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV,400mV)
Input Offset Voltage	< 5µV (with auto zero)
Input Bias Current	< 50 f A
Dimensions	60 x 60 x 68 mm



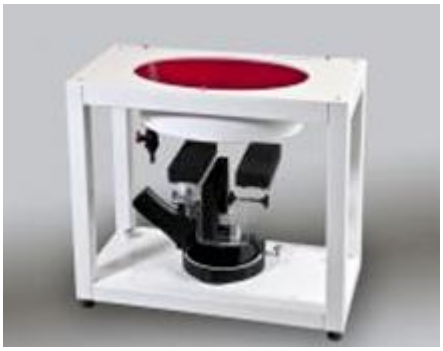
3.4 SAM Twin Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	pprox.. 25 liters
Wooden Support	SPEAG standard phantom table

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.
Twin SAM V5.0 has the same shell geometry and is manufactured from the same material as Twin SAM V4.0, but has reinforced top structure.

3.5 ELI Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2.0 ± 0.2 mm(bottom plate)
Dimensions	Major axis: 600 mm Minor axis: 400 mm
Filling Volume	pprox.. 30 liters
Wooden Support	SPEAG standard phantom table



Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. 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 is compatible with all SPEAG dosimetric probes and dipoles.
ELI V5.0 has the same shell geometry and is manufactured from the same material as ELI4 but has reinforced top structure.

3.6 Device Holder for Transmitters

F-2. Device Holder for Transmitters

- 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 centres for both scales are the ear reference point (ERP). 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 Procedure

3.7.1 Scanning procedure

Step 1: Power reference measurement

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure.

Step 2: Area scan

The SAR distribution at the exposed side of the head was measured at a distance of 4mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm*15mm or 12mm*12mm or 10mm*10mm.Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Zoom scan

Around this point, a volume of 32mm*32mm*30mm (f≤2GHz), 30mm*30mm*30mm (f for 2-3GHz) and 24mm*24mm*22mm (f for 5-6GHz) was assessed by measuring 5x5x7 points (f≤2GHz), 7x7x7 points (f for 2-3GHz) and 7x7x12 points (f for 5-6GHz). On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

The data at the surface was extrapolated, since the centre of the dipoles is 2.0mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification).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. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The volume was integrated with the trapezoidal algorithm. One thousand points were interpolated to calculate the average. All neighbouring volumes were evaluated until no neighboring volume with a higher average value was found.

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std. 1528-2013.

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

Step 4: Power reference measurement (drift)

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job within the same procedure, and with the same settings. The indicated drift is mainly the variation of the DUT's output power and should vary max. ± 5 %

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3.7.2 Data storage

The DASY software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension “DAE”. The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated. The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [m W/g], [m W/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

3.7.3 Data Evaluation by SEMCAD

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

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

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

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf / dcp_i$$

With Vi = compensated signal of channel I (I = x, y, z)
Ui = input signal of channel I (I = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcp I = diode compression point (DASY parameter)

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

$$E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$$

H-field probes:

$$H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f$$

With Vi = compensated signal of channel I (I = x, y, z)
Normi = sensor sensitivity of channel I (I = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution
aij = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strength of channel I in V/m
Hi = magnetic field strength of channel I in A/m

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

$$E_{tot} = (E_x^2 + E_Y^2 + E_z^2)^{1/2}$$

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

$$SAR = (Etot^2 \cdot \sigma) / (\varepsilon \cdot 1000)$$

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

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = Etot^2{}_2 / 3770 \text{ or } P_{pwe} = H_{tot}^2 \cdot 37.7$$

with Ppwe = equivalent power density of a plane wave in mW/cm2
Etot = total electric field strength in V/m
Htot = total magnetic field strength in A/m

4 SAR measurement variability and uncertainty

4.1 SAR measurement variability

Per KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04, SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.

3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

4.2 SAR measurement uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

5 Desciption of Test Position

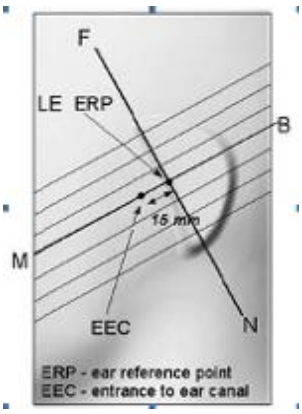
5.1 The Head Test Position

5.1.1 SAM Phantom Shape

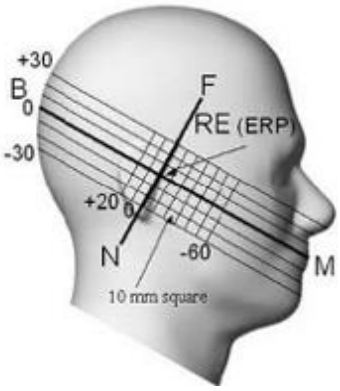
F-3. Front, back, and side views of SAM (model for the phantom shell). Full-head model is for illustration purposes only-procedures in this recommended practice are intended primarily for the phantom setup.

Note: The centre strip including the nose region has a different thickness tolerance.

F-4. Sagittally bisected phantom with extended perimeter (shown placed on its side as used for SAR measurements)

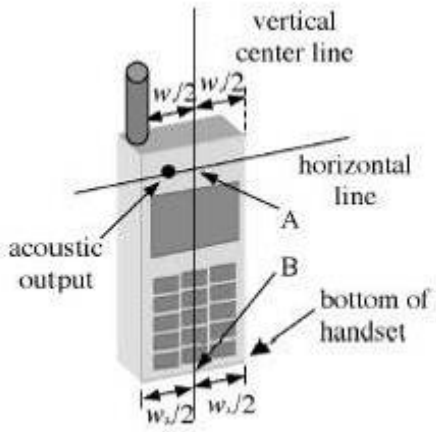


F-5. Close-up side view of phantom, showing the ear region, N-F and B-M lines, and seven cross-sectional plane locations

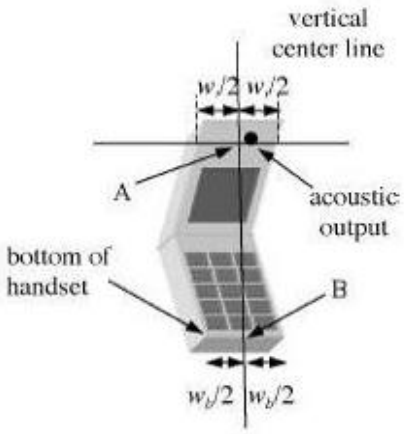


F-6.Side view of the phantom showing relevant markings and seven cross-sectional plane locations

5.1.2 EUT constructions



F-7. Handset vertical and horizontal reference lines- “fixed case”



F-8.Handset vertical and horizontal reference lines- “clam-shell case”

5.1.3 Definition of the “check” position

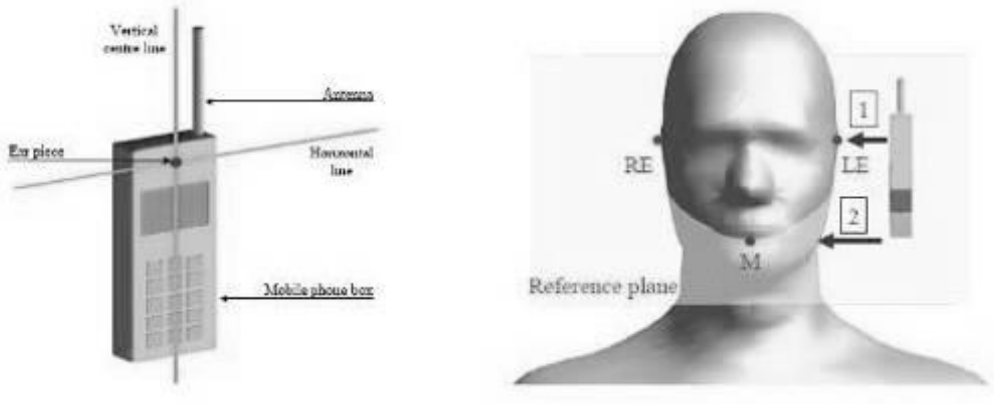
a) Position the device with the vertical centre line of the body of the device and the horizontal line crossing the centre of the ear piece in a plane parallel to the sagittal plane of the phantom (“initial position”). While maintaining the device in this plane, align the vertical centre line with the reference plane containing the three ear and mouth reference points (M, RE and LE) and align the centre of the ear piece with the line RE-LE.

b) Translate the mobile phone box towards the phantom with the ear piece aligned with the line LE-RE until telephone touches the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the box until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost.

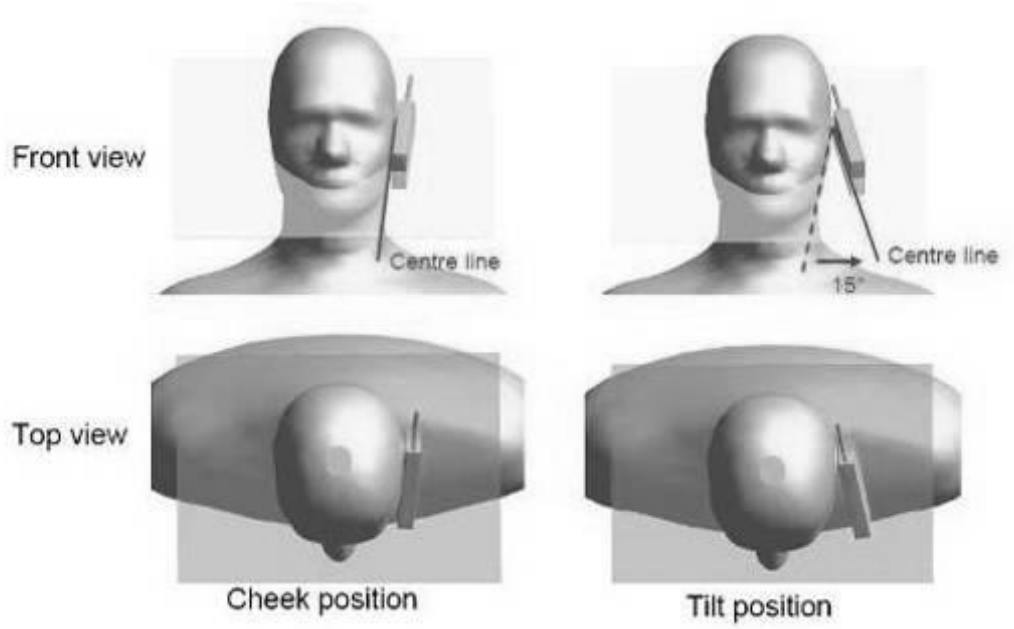
5.1.4 Definition of the “tilted” position

a) Position the device in the “cheek” position described above.

b) While maintaining the device in the reference plane described above and pivoting against the ear, move it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost.



F-9.Definition of the reference lines and points, on the phone and on the phantom and initial position



F-10. “Cheek” and “tilt” positions of the mobile phone on the left side

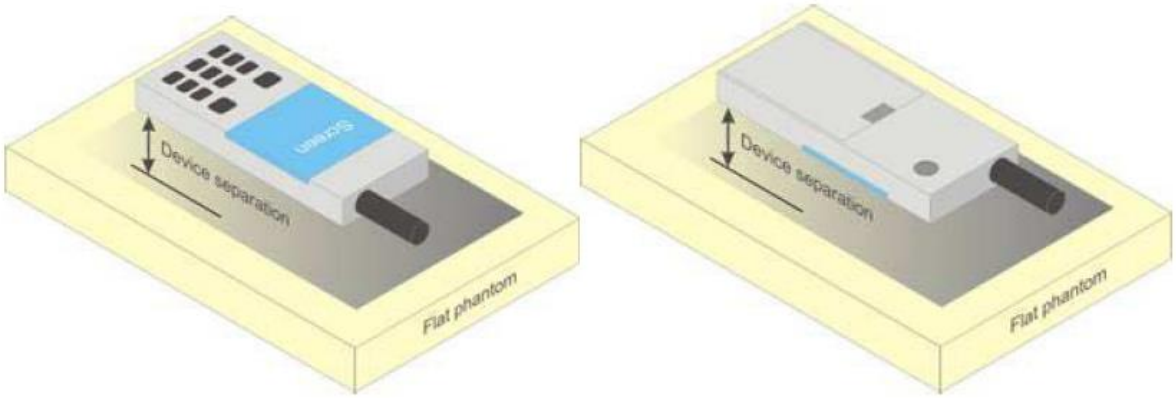
5.2 The Body Test Position

5.2.1 Body-worn accessory exposure conditions

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.
Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. Per FCC KDB Publication 648474 D04, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D04 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. 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 is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented. Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration. This device has a handheld scenario, with an evaluation test distance of 0mm and a limit of 10g and 4.0W/kg.



F-11.Test positions for body-worn devices

5.2.2 Wireless Router exposure conditions

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed-use conditions for this type of devices. For devices with form factors smaller than 9 cm x 5 cm, a test separation distance of 5 mm is required.

5.3 Extremity exposure conditions

Per FCC KDB 648474D04, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the device is marketed as “Phablet”.
The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for Product Specific 10-g SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, Product Specific 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg; however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.

Due to the SAR result, only the following frequency bands need to test with 0mm for the Product Specific 10-g SAR, the others are not required.

6 SAR System Verificaion Procedure

6.1 Tissue Simulate Liquid

6.1.1 Recipes for Tissue Simulate Liquid

The bellowing tables give the recipes for tissue simulating liquids to be used in different frequency bands:

Ingredients (% by weight)	Frequency (MHz)				
	450	700-1000	1700-2000	2300-2500	2500-2700
Water	38.56	40.30	55.24	55.00	54.92
Salt (NaCl)	3.95	1.38	0.31	0.2	0.23
Sucrose	56.32	57.90	0	0	0
HEC	0.98	0.24	0	0	0
Bactericide	0.19	0.18	0	0	0
Tween	0	0	44.45	44.80	44.85
Salt: 99+% Pure Sodium Chloride Sucrose: 98+% Pure Sucrose Water: De-ionized, 16 MΩ+ resistivity HEC: Hydroxyethyl Cellulose Tween: Polyoxyethylene (20) sorbitan monolaurate					
HSL5GHz is composed of the following ingredients: (Manufactured by SPEAG) Water: 50-65% Mineral oil: 10-30% Emulsifiers: 8-25% Sodium salt: 0-1.5%					

Table 3： Recipe of Tissue Simulate Liquid

6.1.2 Measurement for Tissue Simulate Liquid

The Conductivity (σ) and Permittivity (εr) are listed in Table 2. For the SAR measurement given in this report.

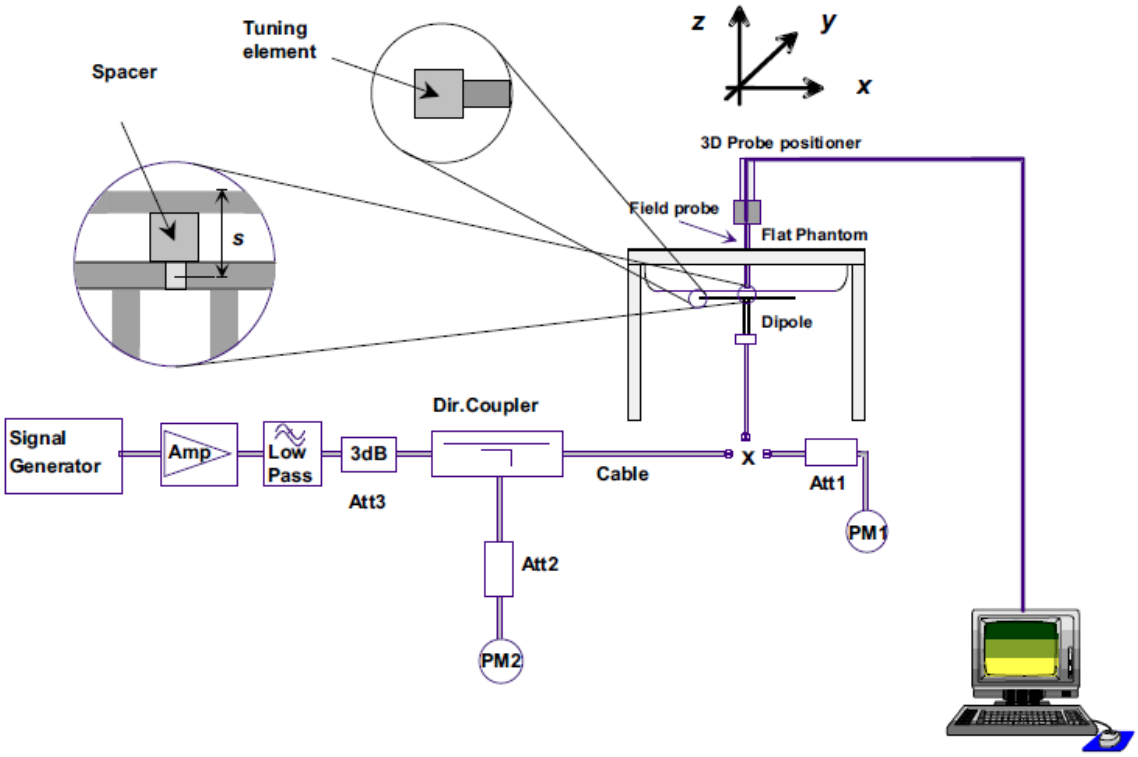
The temperature variation of the Tissue Simulate Liquids was 22±2°C.

Measurement for Tissue Simulate Liquid									
Tissue Type	Measured Frequency (MHz)	Target Tissue (±5%)		Measured Tissue		Deviation (Within ±5%)		Liquid Temp. (℃)	Test Date
		ε_r	σ(S/m)	ε_r	σ(S/m)	ε_r	σ(S/m)		
2450 Head	2450	39.2	1.80	38.900	1.760	-0.77%	-2.22%	22.5	2024-08-18
5250 Head	5250	35.9	4.71	35.700	4.580	-0.56%	-2.76%	22.1	2024-08-20
5600 Head	5600	35.5	5.07	35.000	5.060	-1.41%	-0.20%	22.3	2024-08-21
5750 Head	5750	35.4	5.22	34.700	5.220	-1.98%	0.00%	22.4	2024-08-22
6500 Head	6500	34.5	6.07	34.300	6.220	-0.58%	2.47%	22.7	2024-08-16

Table 4： Measurement result of Tissue electric parameters

6.2 SAR System Check

The microwave circuit arrangement for system Check is sketched in F-12. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the following table (A power level of 250mW (below 3GHz) or 100mW (3-6GHz) was input to the dipole antenna). During the tests, the ambient temperature of the laboratory was in the range 22±2°C, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15±0.5 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



F-12.The microwave circuit arrangement used for SAR system Check

6.2.1 Justification for Extended SAR Dipole Calibrations

1) Instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the SAR target, impedance and return loss of a dipole have remain stable according to the following requirements. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

a) There is no physical damage on the dipole;
b) System check with specific dipole is within 10% of calibrated value;
c) Return-loss is within 20% of calibrated measurement;
d) Impedance is within 5Ω from the previous measurement.

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

6.2.2 Summary System Check Result(s)

SAR System Validation Result(s)											
Validation Kit		Measured SAR 250mW	Measured SAR 250mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W) (±10%)	Target SAR (normalized to 1W) (±10%)	Deviation (Within ±10%)		Liquid Temp. (℃)	Test Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)	1-g(W/kg)	10-g(W/kg)		
D2450V2	Head	12.90	6.09	51.60	24.36	52.7	24.6	-2.09%	-0.98%	22.5	2024-08-18
Validation Kit		Measured SAR 100mW	Measured SAR 100mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W) (±10%)	Target SAR (normalized to 1W) (±10%)	Deviation (Within ±10%)		Liquid Temp. (℃)	Test Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)	1-g(W/kg)	10-g(W/kg)		
D5GHzV2	Head(5.25GHz)	8.11	2.34	81.10	23.40	77.2	21.9	5.05%	6.85%	22.1	2024-08-20
	Head(5.6GHz)	8.49	2.43	84.90	24.30	81.1	22.8	4.69%	6.58%	22.3	2024-08-21
	Head(5.75GHz)	7.88	2.25	78.80	22.50	77.8	21.7	1.29%	3.69%	22.4	2024-08-22
D6500V2	Head(6.5GHz)	29.80	5.61	298.00	56.10	291	53.9	2.41%	4.08%	22.7	2024-08-16

1） SAR System Check Result

6.2.3 Detailed System Check Results

Please see the Appendix A

7 Test Configuration

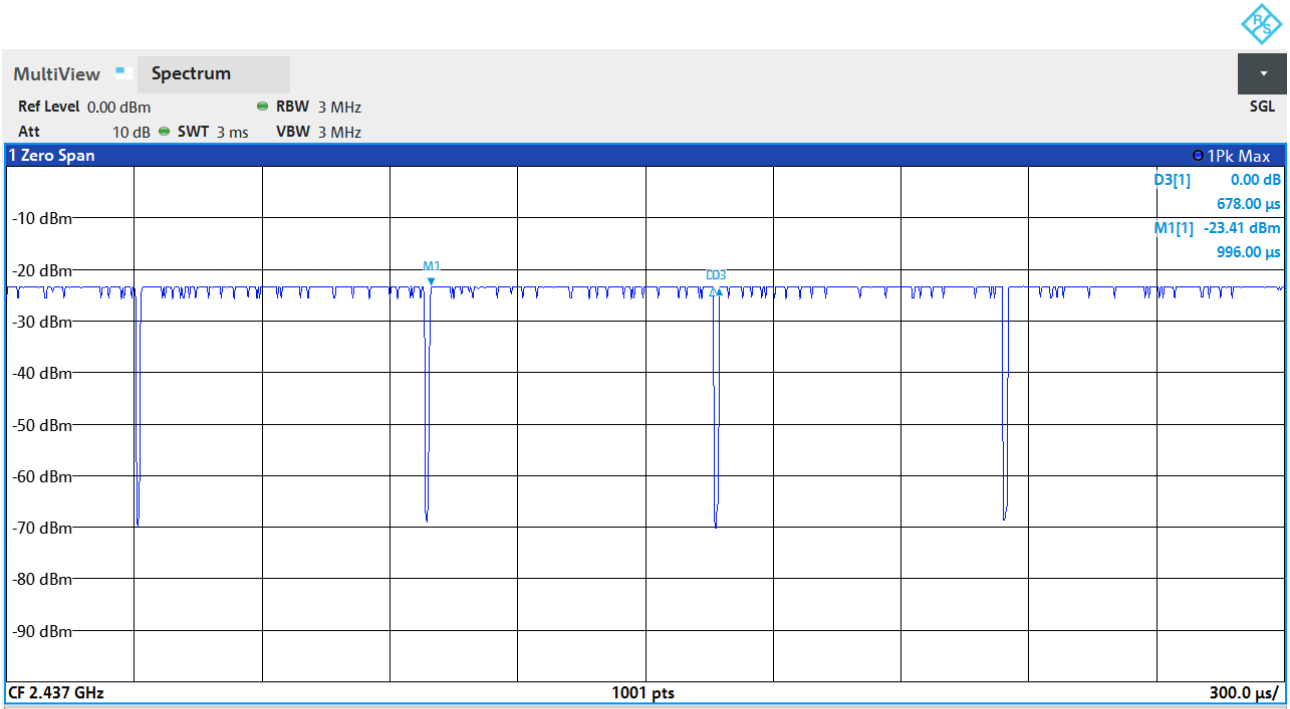
7.1 WIFI Test Configuration

A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement.

7.1.1.1 Duty cycle

1) Wi-Fi 2.4GHz 802.11b Ant1&Ant5:

Duty cycle=97.79%

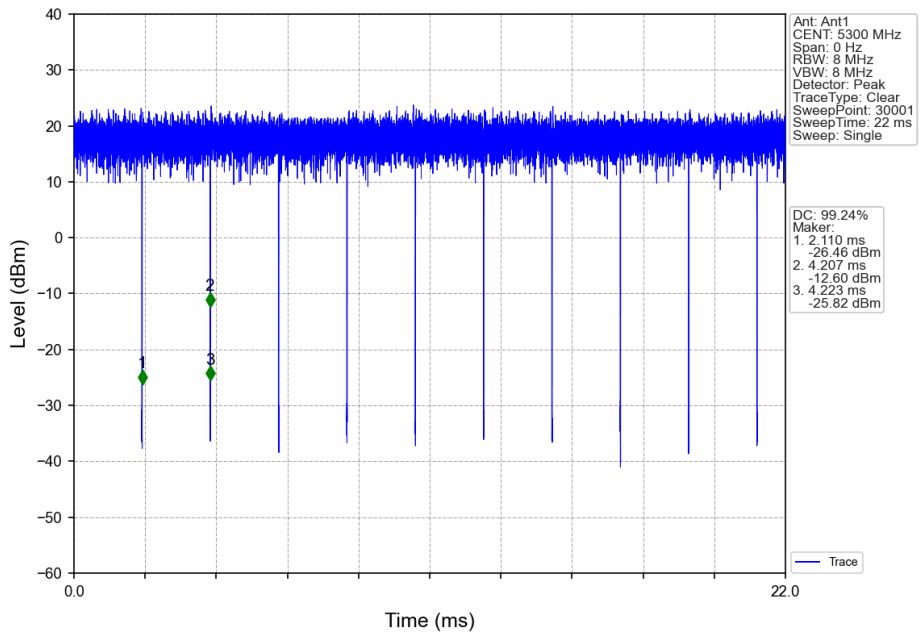


2 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	996.0 µs	-23.41 dBm		
D2	M1	1	663.0 µs	-0.03 dB		
D3	M1	1	678.0 µs	0.00 dB		

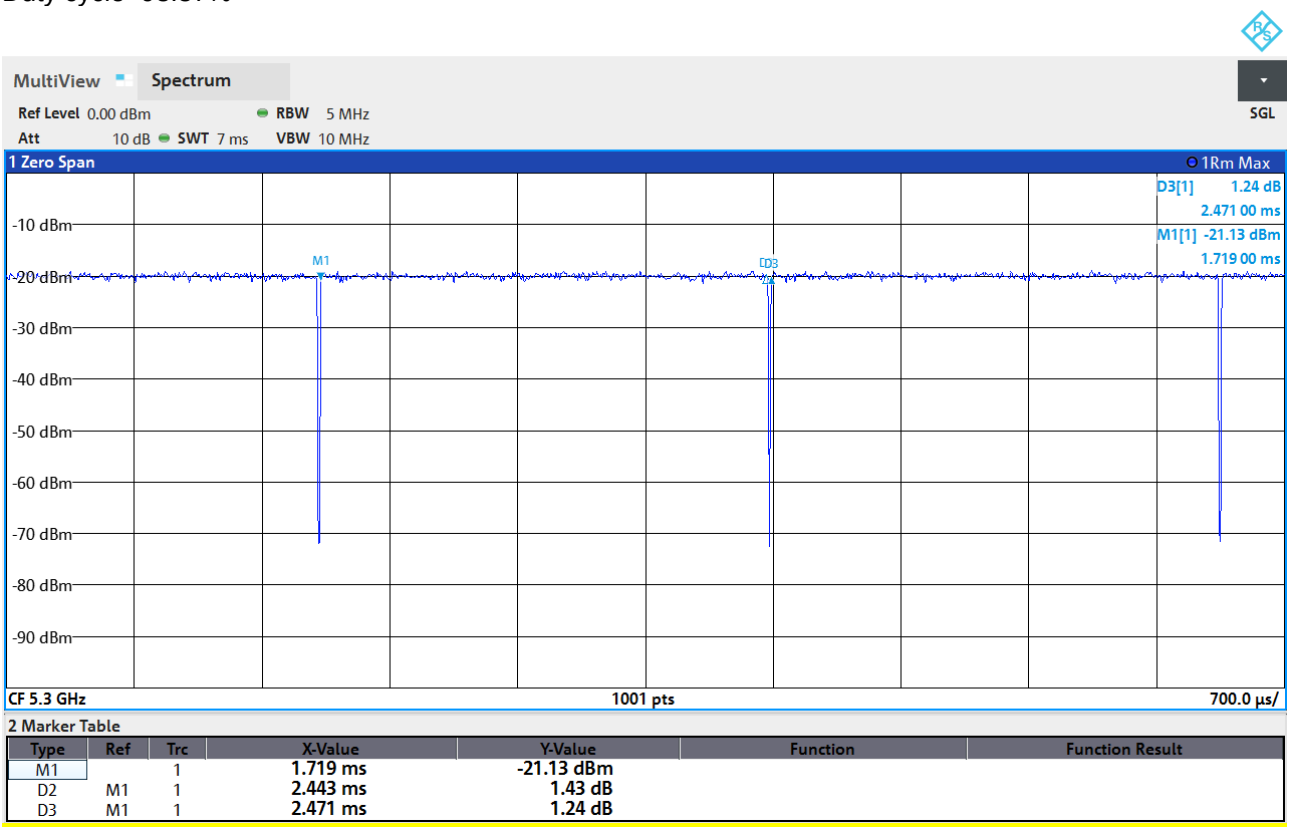
2) Wi-Fi 5GHz 802.11a Ant1&Ant5:

Duty cycle=99.24%



3) Wi-Fi 5GHz 802.11n20 Ant1&Ant5:

Duty cycle=98.87%

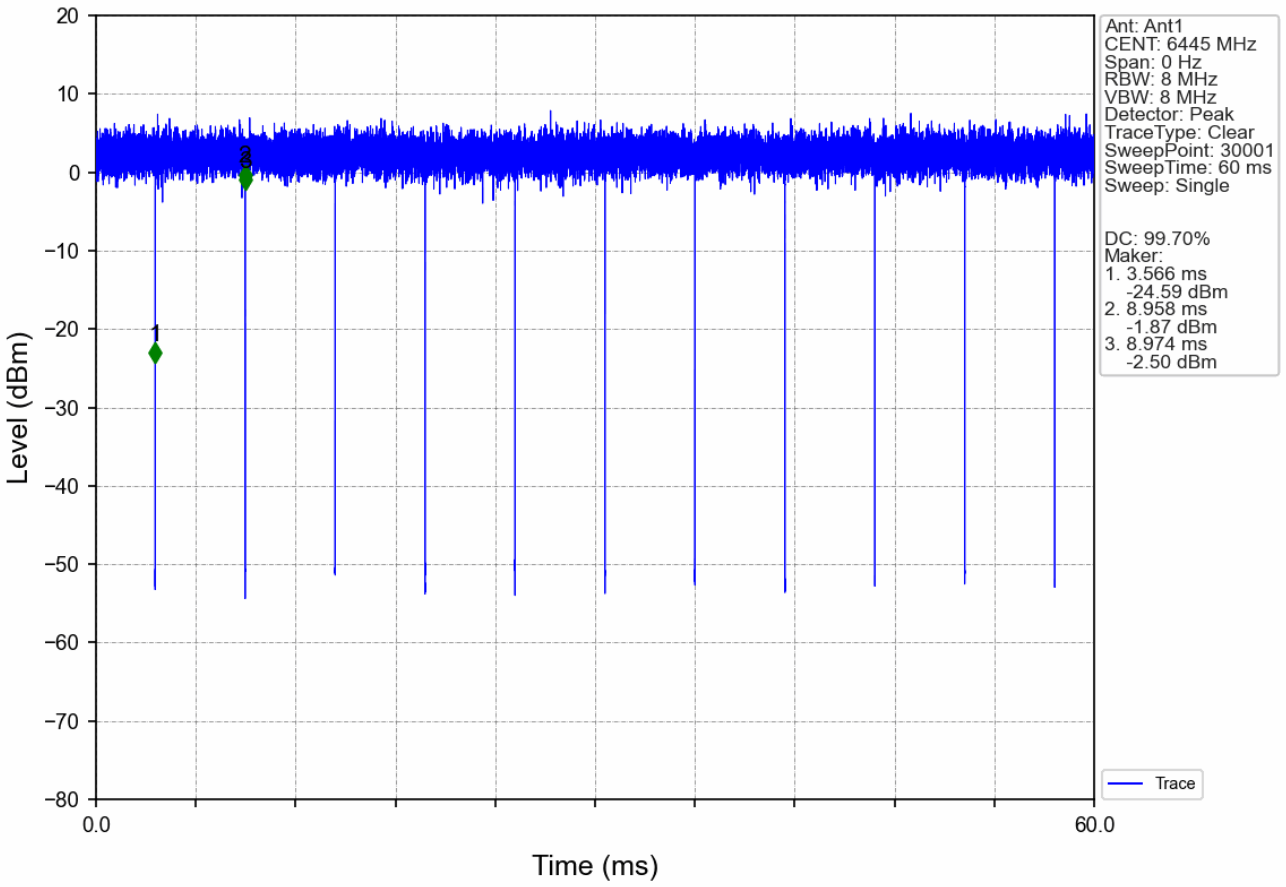


2 Marker Table

Type	Ref	Trc	X-Value	Y-Value	Function	Function Result
M1		1	1.719 ms	-21.13 dBm		
D2	M1	1	2.443 ms	1.43 dB		
D3	M1	1	2.471 ms	1.24 dB		

3) Wi-Fi 6GHz 802.11ax40 Ant1&Ant5:

Duty cycle=99.70 %



7.1.2 Initial Test Position SAR Test Reduction Procedure

DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures. The initial test position procedure is described in the following:

1）. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band. SAR is also not required for that exposure configuration in the subsequent test configuration(s).
2）. When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) are tested.
3）. For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested. a) Additional power measurements may be required for this step, which should be limited to those necessary for identifying the subsequent highest output power channels.

7.1.3 Subsequent Test Configuration Procedures

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units. The initial test position procedure is applied to next to the ear, UMPC mini-tablet and hotspot mode configurations. When the same maximum output power is specified for multiple transmission modes, 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 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）. The number of channels in the initial test configuration and subsequent test configuration can be different due to differences in channel bandwidth. When SAR measurement is required for a subsequent test configuration and the channel bandwidth is smaller than that in the initial test configuration, all channels in the subsequent test configuration that overlap with the larger bandwidth channel tested in the initial test configuration should be used to determine the highest maximum output power channel. This step requires additional power measurement to identify the highest maximum output power channel in the subsequent test configuration to determine SAR test reduction.

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

b) SAR for subsequent highest measured maximum output power channels in the subsequent test configuration is required only when the reported SAR of the preceding higher maximum output power channel(s) in the subsequent test configuration is > 1.2 W/kg or until all required channels are tested. i) For channels with the same measured maximum output power, SAR should be measured using the channel closest to the center frequency of the larger channel bandwidth channel in the initial test configuration.

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

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

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

7.1.4 2.4 GHz WiFi SAR Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions. When SAR measurement is required for an OFDM configuration, the initial test configuration, subsequent test configuration and initial test position procedures are applied. The SAR test exclusion requirements for 802.11g/n OFDM configurations are described in following.

- **802.11b DSSS SAR Test Requirements**

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

1）. When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.

2）. When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

- **2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements**

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3, including sub-sections). SAR is not required for the following 2.4 GHz OFDM conditions.

1）. When KDB Publication 447498 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.

- **SAR Test Requirements for OFDM configurations**

When SAR measurement is required for 802.11 g/n OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

7.1.5 5 GHz WiFi SAR Procedures

- **U-NII-1 and U-NII-2A Bands**

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following：

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, both bands are tested independently for SAR.
2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, both bands are tested independently for SAR.
3) The two U-NII bands may be aggregated to support a 160 MHz channel on channel number 50. Without additional testing, the maximum output power for this is limited to the lower of the maximum output power certified for the two bands. When SAR measurement is required for at least one of the bands and the highest reported SAR adjusted by the ratio of specified maximum output power of aggregated to standalone band is > 1.2 W/kg, SAR is required for the 160 MHz channel. This procedure does not apply to an aggregated band with maximum output higher than the standalone band(s); the aggregated band must be tested independently for SAR. SAR is not required when the 160 MHz channel is operating at a reduced maximum power and also qualifies for SAR test exclusion.

- **U-NII-2C and U-NII-3 Bands**
  The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. when Terminal Doppler Weather Radar (TDWR) restriction applies, all channels that operate at 5.60 – 5.65 GHz must be included to apply the SAR test reduction and measurement procedures.

  When the same transmitter and antenna(s) are used for U-NII-2C band and U-NII-3 band or 5.8 GHz band of §15.247, the bands may be aggregated to enable additional channels with 20, 40 or 80 MHz bandwidth to span across the band gap, as illustrated in Appendix B. The maximum output power for the additional band gap channels is limited to the lower of those certified for the bands. Unless band gap channels are permanently disabled, they must be considered for SAR testing. The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels. When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

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OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements

The initial test configuration for 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures. When multiple configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined according to the following steps applied sequentially.

1) The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.
2) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
3) If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected.
4) When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n. After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.
   a) The channel closest to mid-band frequency is selected for SAR measurement.
   b) For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

- **SAR Test Requirements for OFDM configurations**

When SAR measurement is required for 802.11 a/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 or §15.247 band are supported, the highest maximum output power transmission mode configuration and maximum output power channel across the bands must be used to determine SAR test reduction, according to the initial test configuration and subsequent test configuration requirements. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

8 Test Result

8.1 Measurement of RF Conducted Power

8.1.1 Conducted Power of WIFI2.4G

WIFI 2.4GHz				WIFI 2.4GHz SISO Ant1		WIFI 2.4GHz SISO Ant5		WIFI 2.4GHz MIMO	
Mode	Channel	Frequency (MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up
802.11b	1	2412	1	15.64	17.00	15.72	17.00	/	/
	6	2437		15.77	17.00	15.91	17.00	/	/
	11	2462		15.37	16.50	15.83	17.00	/	/
802.11g	1	2412	6	10.61	12.00	10.80	12.00	/	/
	6	2437		10.28	11.50	10.69	12.00	/	/
	11	2462		10.35	11.50	11.04	12.50	/	/
802.11n (HT20)	1	2412	MCS0	7.27	8.50	5.75	7.00	9.59	11.00
	6	2437		6.72	8.00	4.73	6.00	8.85	10.00
	11	2462		6.91	8.00	7.47	8.50	10.21	11.50
802.11n (HT40)	3	2422	MCS0	7.46	8.50	8.34	9.50	10.93	12.00
	6	2437		7.95	9.00	5.59	7.00	9.94	11.00
	9	2452		8.07	9.50	7.98	9.00	11.04	12.50
802.11ax (HEW20)	1	2412	MCS0	7.86	9.00	5.95	7.00	10.02	11.50
	6	2437		7.56	9.00	6.23	7.50	9.96	11.00
	11	2462		8.14	9.50	7.60	9.00	10.89	12.00
802.11ax (HEW40)	3	2422	MCS0	8.46	9.50	6.53	8.00	10.61	12.00
	6	2437		8.48	9.50	7.18	8.50	10.89	12.00
	9	2452		8.13	9.50	7.61	9.00	10.89	12.00

8.1.2 Conducted Power of WIFI5G

WIFI 5G				WIFI 5G SISO Ant 1		WIFI 5G SISO Ant 5		WIFI 5G MIMO	
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up
802.11a	36	5180	6	16.57	17.5	16.03	17.5	/	/
	44	5220		16.88	17.5	17.13	17.5	/	/
	48	5240		16.65	17.5	17.05	17.5	/	/
	52	5260		16.66	17.5	15.86	17	/	/
	60	5300		16.95	17.5	17	17.5	/	/
	64	5320		16.91	17.5	16.85	17.5	/	/
	100	5500		16.53	17	16.14	17	/	/
	116	5580		16.55	17	16.56	17	/	/
	140	5700		16.41	17	15.95	17	/	/
	149	5745		16.78	18	17.29	18.5	/	/
	157	5785		16.84	18	17.23	18.5	/	/
	165	5825		17.81	18.5	17.59	18.5	/	/
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up
802.11n-HT20	36	5180	MCS0	14.44	15.5	11.94	13	16.38	17.5
	44	5220		14.71	16	12.48	13.5	16.85	18
	48	5240		14.49	15.5	13.01	14.5	16.72	18
	52	5260		13.48	14.5	12.52	14	16.04	17.5
	60	5300		13.61	15	13.1	14.5	16.57	18
	64	5320		13.75	15	13.46	14.5	16.42	17.5
	100	5500		13.05	14.5	12.73	14	15.9	17
	116	5580		13.69	15	13.28	14.5	16.45	17.5
	140	5700		13.61	15	12.55	14	16.26	17.5
	149	5745		14.18	15.5	14.48	15.5	17.34	18.5
	157	5785		14.79	16	14.83	16	17.73	19
	165	5825		14.62	16	14.71	16	17.69	19
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up
802.11n-HT40	38	5190	MCS0	13.51	15	11.11	12.5	15.48	16.5
	46	5230		13.54	15	11.81	13	15.77	17
	54	5270		12.76	14	11.65	13	15.25	16.5
	62	5310		12.72	14	12.39	13.5	15.57	17
	102	5510		12.09	13.5	11.59	13	14.86	16
	110	5550		11.95	13	11.64	13	14.81	16

	134	5670		12.85	14	11.31	12.5	15.16	16.5
	151	5755		13.25	14.5	13.25	14.5	16.26	17.5
	159	5795		13.61	15	13.59	15	16.61	18
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up
802.11ac-20	36	5180	MCS0	13.22	14.5	10.8	12	15.19	16.5
	44	5220		13.47	14.5	11.31	12.5	15.53	17
	48	5240		13.31	14.5	11.97	13	15.7	17
	52	5260		12.4	13.5	11.3	12.5	14.9	16
	60	5300		12.43	13.5	11.98	13	15.22	16.5
	64	5320		12.58	14	12.41	13.5	15.51	17
	100	5500		11.85	13	11.53	13	14.7	16
	116	5580		12.29	13.5	12.09	13.5	15.2	16.5
	140	5700		12.77	14	11.51	13	15.2	16.5
	149	5745		13.14	14.5	13.3	14.5	16.23	17.5
	157	5785		13.44	14.5	13.48	14.5	16.47	17.5
	165	5825		14.15	15.5	14.01	15.5	17.09	18.5
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up
802.11ac-40	38	5190	MCS0	13.9	15	11.4	12.5	15.84	17
	46	5230		13.92	15	11.96	13	16.06	17.5
	54	5270		13.22	14.5	11.75	13	15.56	17
	62	5310		13.16	14.5	12.33	13.5	15.78	17
	102	5510		12.48	13.5	11.63	13	15.09	16.5
	110	5550		12.25	13.5	11.71	13	15	16
	134	5670		13.19	14.5	11.26	12.5	15.34	16.5
	151	5755		13.45	14.5	13.15	14.5	16.31	17.5
	159	5795		13.82	15	13.42	14.5	16.63	18
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up
802.11ac 80M	42	5210	MCS0	12.1	13.5	9.78	11	14.1	15.5
	58	5290		11.24	12.5	10.29	11.5	13.8	15
	106	5530		10.72	12	10.47	11.5	13.61	15
	155	5775		11.98	13	11.57	13	14.79	16
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up
802.11ac 160M	50	5250	MCS0	10.69	12	10.8	12	13.76	15
	114	5570		11.5	12.5	9.47	10.5	13.61	15

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5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up
802.11ax-20	36	5180	MCS0	11.95	13	9.11	10.5	13.77	15
	44	5220		12.2	13.5	9.64	11	14.12	15.5
	48	5240		11.97	13	10.22	11.5	14.19	15.5
	52	5260		11.09	12.5	9.47	10.5	13.37	14.5
	60	5300		11.17	12.5	10.3	11.5	13.77	15
	64	5320		11.35	12.5	10.67	12	14.03	15.5
	100	5500		10.65	12	9.81	11	13.26	14.5
	116	5580		10.93	12	10.3	11.5	13.64	15
	140	5700		11.42	12.5	9.67	11	13.64	15
	149	5745		11.8	13	11.37	12.5	14.6	16
	157	5785		12.05	13.5	11.66	13	14.87	16
	165	5825		12.54	14	11.99	13	15.28	16.5
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up
802.11ax-40	38	5190	MCS0	11.46	12.5	9.05	10.5	13.43	14.5
	46	5230		11.32	12.5	9.6	11	13.55	15
	54	5270		10.69	12	9.44	10.5	13.12	14.5
	62	5310		10.63	12	10.3	11.5	13.48	14.5
	102	5510		10.13	11.5	9.45	10.5	12.81	14
	110	5550		9.84	11	9.56	11	12.71	14
	134	5670		10.73	12	8.96	10	12.94	14
	151	5755		11.27	12.5	11.05	12.5	14.17	15.5
	159	5795		11.58	13	11.31	12.5	14.46	15.5
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up
802.11ax 80M	42	5210	MCS0	12.03	13.5	9.7	11	14.03	15.5
	58	5290		11.12	12.5	10.14	11.5	13.67	15
	106	5530		10.63	12	10.3	11.5	13.48	14.5
	155	5775		11.87	13	11.41	12.5	14.66	16
5GHz	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up
802.11ax 160M	50	5250	MCS0	10.59	12	10.86	12	13.74	15
	114	5570		11.54	13	9.53	11	13.66	15

8.1.3 Conducted Power of WIFI6G

WIFI 6G				WIFI 6G SISO Ant1		WIFI 6G SISO Ant5		WIFI 6G MIMO	
mode	Channel	Frequency(MHz)	Data Rate(Mbps)	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up	Average Power (dBm)	Tune up
802.11ax (HE20)	1	5955	MCS0	3.21	4.50	2.12	3.50	5.71	7.00
	97	6435		3.33	4.50	3.22	4.50	6.29	7.50
	117	6535		3.69	5.00	5.12	6.50	7.47	8.50
	189	6895		3.99	5.00	2.95	4.00	6.51	8.00
	233	7115		2.25	3.50	3.03	4.50	5.67	7.00
802.11ax (HE40)	3	5965	MCS0	4.90	6.00	3.20	4.50	7.14	8.50
	99	6445		4.61	6.00	6.35	7.50	8.58	10.00
	147	6685		3.88	5.00	4.32	5.50	7.12	9.00
	195	6925		4.92	6.00	6.33	7.50	8.69	10.00
	227	7085		3.70	5.00	4.83	6.00	7.31	8.50
802.11ax (HE80)	7	5985	MCS0	4.54	6.00	3.09	4.50	6.89	8.00
	103	6465		4.31	5.50	5.27	6.50	7.83	9.00
	151	6705		4.82	6.00	5.32	6.50	8.09	8.50
	199	6945		4.79	6.00	5.91	7.00	8.40	9.50
	215	7025		3.85	5.00	5.46	6.50	7.74	8.00
802.11ax (HE160)	15	6025	MCS0	1.85	3.00	1.21	2.50	4.55	6.00
	47	6185		1.99	3.00	0.63	2.00	4.37	5.50
	79	6345		1.74	3.00	2.19	3.50	4.98	6.00
	143	6665		2.38	3.50	3.67	5.00	6.08	7.50
	207	6985		1.10	2.50	3.14	4.50	5.25	6.50

8.1.4 Conducted Power of BT

BT ANT1			Average Conducted Power (dBm)	Tune up (dBm)
Modulation	Channel	Frequency(MHz)		
GFSK	0	2402	13.89	15.00
	39	2441	14.37	15.50
	78	2480	12.71	14.00
π/4DQPSK	0	2402	13.13	14.50
	39	2441	13.69	15.00
	78	2480	11.86	13.00
8DPSK	0	2402	13.25	14.50
	39	2441	13.80	15.00
	78	2480	12.01	13.50
BLE_1Mbps			Average Conducted Power (dBm)	Tune up (dBm)
Modulation	Channel	Frequency(MHz)		
GFSK	0	2402	6.31	7.50
	19	2440	6.96	8.00
	39	2480	5.11	6.50
BLE_2Mbps			Average Conducted Power (dBm)	Tune up (dBm)
Modulation	Channel	Frequency(MHz)		
GFSK	0	2402	6.39	7.50
	19	2440	7.03	8.50
	39	2480	5.18	6.50

BT ANT5			Average Conducted Power (dBm)	Tune up (dBm)
Modulation	Channel	Frequency(MHz)		
GFSK	0	2402	13.61	15.00
	39	2441	14.74	16.00
	78	2480	13.22	14.50
π/4DQPSK	0	2402	12.84	14.00
	39	2441	14.04	15.50
	78	2480	12.44	13.50
8DPSK	0	2402	13.00	14.00
	39	2441	14.20	15.50
	78	2480	12.64	14.00
BLE_1Mbps			Average Conducted Power (dBm)	Tune up (dBm)
Modulation	Channel	Frequency(MHz)		
GFSK	0	2402	6.08	7.50

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	19	2440	7.29	8.50
	39	2480	5.76	7.00
BLE_2Mbps			Average Conducted Power (dBm)	Tune up (dBm)
Modulation	Channel	Frequency(MHz)		
GFSK	0	2402	6.15	7.50
	19	2440	7.36	8.50
	39	2480	5.93	7.00

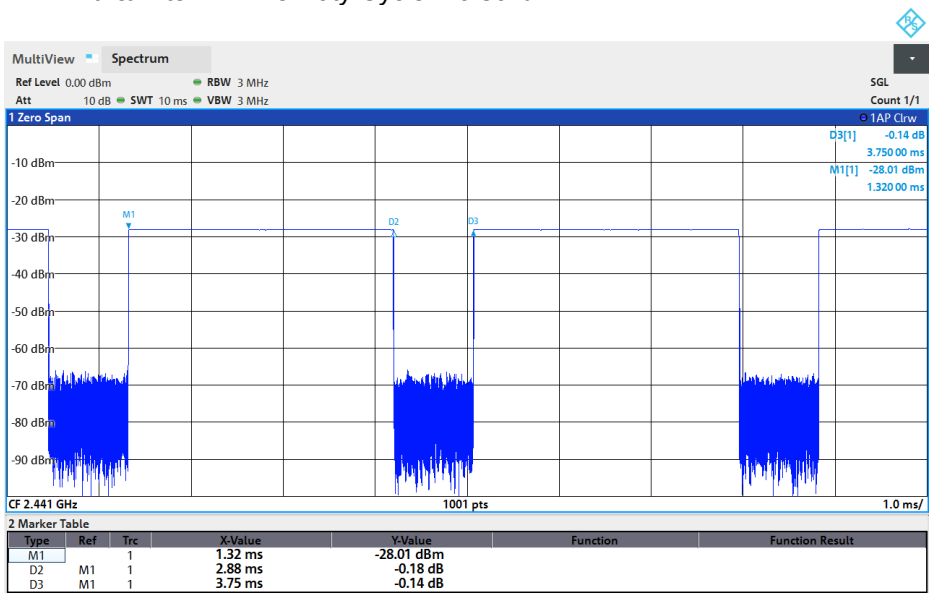
Note:

1）. For conducted power of WIFI must be measured at each transmit antenna port according to the DSSS and OFDM transmission configurations in each standalone and aggregated frequency band. For each transmission mode configuration, power must be measured for the highest and lowest channels; and at the mid-band channel(s) when there are at least 3 channels. For configurations with multiple mid-band channels, due to an even number of channels, both channels should be measured. Power measurement is required for the transmission mode configuration with the highest maximum output power specified for production units.

1) When the same highest maximum output power specification applies to multiple transmission modes, the largest channel bandwidth configuration with the lowest order modulation and lowest data rate is measured.

2) When the same highest maximum output power is specified for multiple largest channel bandwidth configurations with the same lowest order modulation or lowest order modulation and lowest data rate, power measurement is required for all equivalent 802.11 configurations with the same maximum output power.

2）. The conducted power of BT is measured with RMS detector.
Ant1&Ant5 BT DH5 Duty Cycle=76.80%



8.2 Measurement of SAR Data

Note:

1) The maximum Scaled SAR value is marked in bold. Graph results refer to Appendix B.

2) Per KDB447498 D04, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

- ≤ 0.8W/kg for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is ≤ 100MHz.
- ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
- ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz.

3) The simultaneous transmission is reduced by XdB (the detailed power reduced can be referred to Conducted Power Appendix E), therefore, those SAR of simultaneous transmission mode are estimated based on standalone results.

WiFi 2.4G:

1) When the highest reported SAR for the initial test configuration 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 test for the other 802.11 modes are not required.

WiFi 5G:

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. As the highest reported SAR for a test configuration is ⩽ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration.
2) For Wi-Fi 5G, U-NII-2A (5250-5350 MHz) and U-NII-2C (5470-5725 MHz) bands does not support hotspot function.

When the highest reported SAR for the initial test configuration 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 test for the other 802.11 modes are not

8.2.1 SAR Result of WIFI 2.4G

Wi-Fi 2.4G SAR Test Record Ant1											
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**Duty Cycle Scaled factor**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Head Test data											
Left cheek	802.11b	6/2437	97.79%	1.023	0.103	-0.04	15.77	17.00	1.327	**0.140**	22.5
Left tilted	802.11b	6/2437	97.79%	1.023	0.068	0.01	15.77	17.00	1.327	0.092	22.5
Right cheek	802.11b	6/2437	97.79%	1.023	0.078	0.05	15.77	17.00	1.327	0.106	22.5
Right tilted	802.11b	6/2437	97.79%	1.023	0.044	0.06	15.77	17.00	1.327	0.060	22.5
Body worn Test data(Separate 10mm)											
Front side	802.11b	6/2437	97.79%	1.023	0.018	0.04	15.77	17.00	1.327	0.024	22.5
Back side	802.11b	6/2437	97.79%	1.023	0.050	0.12	15.77	17.00	1.327	**0.068**	22.5
Hotspot Test data (Separate 10mm)											
Front side	802.11b	6/2437	97.79%	1.023	0.033	0.05	15.77	17.00	1.327	0.045	22.5
Back side	802.11b	6/2437	97.79%	1.023	0.086	0.01	15.77	17.00	1.327	0.117	22.5
Right side	802.11b	6/2437	97.79%	1.023	0.221	0.05	15.77	17.00	1.327	**0.300**	22.5
Top side	802.11b	6/2437	97.79%	1.023	0.031	0.08	15.77	17.00	1.327	0.042	22.5
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Product specific 10g SAR Test data(Separate 0mm 1RB)											
Front side	802.11b	6/2437	97.79%	1.023	0.081	0.03	15.77	17.00	1.327	0.110	22.5
Back side	802.11b	6/2437	97.79%	1.023	0.127	0.01	15.77	17.00	1.327	0.172	22.5
Right side	802.11b	6/2437	97.79%	1.023	0.324	-0.01	15.77	17.00	1.327	**0.440**	22.5
Top side	802.11b	6/2437	97.79%	1.023	0.084	0.08	15.77	17.00	1.327	0.114	22.5
Wi-Fi 2.4G SAR Test Record Ant5											
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**Duty Cycle Scaled factor**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Head Test data											
Left cheek	802.11b	6/2437	97.79%	1.023	0.057	0.05	15.91	17.00	1.285	0.075	22.5
Left tilted	802.11b	6/2437	97.79%	1.023	0.050	0.01	15.91	17.00	1.285	0.066	22.5
Right cheek	802.11b	6/2437	97.79%	1.023	0.066	0.06	15.91	17.00	1.285	0.087	22.5
Right tilted	802.11b	6/2437	97.79%	1.023	0.001	0.07	15.91	17.00	1.285	0.001	22.5
Body worn Test data(Separate 10mm)											
Front side	802.11b	6/2437	97.79%	1.023	0.001	0.06	15.91	17.00	1.285	0.001	22.5
Back side	802.11b	6/2437	97.79%	1.023	0.049	0.09	15.91	17.00	1.285	0.064	22.5
Hotspot Test data (Separate 10mm)											

Front side	802.11b	6/2437	97.79%	1.023	0.040	0.01	15.91	17.00	1.285	0.053	22.5
Back side	802.11b	6/2437	97.79%	1.023	0.167	0.06	15.91	17.00	1.285	0.219	22.5
Left side	802.11b	6/2437	97.79%	1.023	0.189	0.08	15.91	17.00	1.285	0.248	22.5
Top side	802.11b	6/2437	97.79%	1.023	0.054	0.01	15.91	17.00	1.285	0.071	22.5
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Product specific 10g SAR Test data(Separate 0mm 1RB)											
Front side	802.11b	6/2437	97.79%	1.023	0.022	0.06	15.91	17.00	1.285	0.029	22.5
Back side	802.11b	6/2437	97.79%	1.023	0.137	0.03	15.91	17.00	1.285	0.180	22.5
Left side	802.11b	6/2437	97.79%	1.023	0.184	0.07	15.91	17.00	1.285	0.242	22.5
Top side	802.11b	6/2437	97.79%	1.023	0.026	0.09	15.91	17.00	1.285	0.034	22.5

Table 5： SAR of WIFI 2.4G for Head, Body, Hotspot and Limbs.

8.2.2 SAR Result of WIFI 5G

Wi-Fi 5G SAR Test Record ANT1											
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**Duty Cycle Scaled factor**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Head Test data of U-NII-2A											
Left cheek	802.11a	60/5300	99.24%	1.008	0.117	-0.01	16.95	17.50	1.135	**0.134**	22.1
Left tilted	802.11a	60/5300	99.24%	1.008	0.086	-0.15	16.95	17.50	1.135	0.098	22.1
Right cheek	802.11a	60/5300	99.24%	1.008	0.091	0.01	16.95	17.50	1.135	0.104	22.1
Right tilted	802.11a	60/5300	99.24%	1.008	0.089	0.15	16.95	17.50	1.135	0.102	22.1
Head Test data of U-NII-2C											
Left cheek	802.11a	116/5580	99.24%	1.008	0.236	0.05	16.55	17.00	1.109	**0.264**	22.3
Left tilted	802.11a	116/5580	99.24%	1.008	0.188	0.05	16.55	17.00	1.109	0.210	22.3
Right cheek	802.11a	116/5580	99.24%	1.008	0.202	0.07	16.55	17.00	1.109	0.226	22.3
Right tilted	802.11a	116/5580	99.24%	1.008	0.176	-0.16	16.55	17.00	1.109	0.197	22.3
Head Test data of U-NII-3											
Left cheek	802.11a	165/5825	99.24%	1.008	0.185	0.16	17.81	18.50	1.172	**0.219**	22.4
Left tilted	802.11a	165/5825	99.24%	1.008	0.165	0.19	17.81	18.50	1.172	0.195	22.4
Right cheek	802.11a	165/5825	99.24%	1.008	0.140	0.17	17.81	18.50	1.172	0.165	22.4
Right tilted	802.11a	165/5825	99.24%	1.008	0.119	-0.10	17.81	18.50	1.172	0.141	22.4
Body worn Test data of U-NII-2A(Separate 15mm)											
Front side	802.11a	60/5300	99.24%	1.008	0.056	-0.12	16.95	17.50	1.135	0.064	22.1
Back side	802.11a	60/5300	99.24%	1.008	0.115	-0.19	16.95	17.50	1.135	**0.132**	22.1
Body worn Test data of U-NII-2C(Separate 15mm)											
Front side	802.11a	116/5580	99.24%	1.008	0.061	0.05	16.55	17.00	1.109	0.068	22.3
Back side	802.11a	116/5580	99.24%	1.008	0.095	0.06	16.55	17.00	1.109	**0.106**	22.3
Body worn Test data of U-NII-3(Separate 15mm)											
Front side	802.11a	165/5825	99.24%	1.008	0.058	-0.11	17.81	18.50	1.172	0.069	22.4
Back side	802.11a	165/5825	99.24%	1.008	0.073	-0.05	17.81	18.50	1.172	**0.086**	22.4
Hotspot Test data of U-NII-1(Separate 10mm)											
Front side	802.11a	44/5220	99.24%	1.008	0.054	0.07	16.88	17.50	1.153	0.063	22.1
Back side	802.11a	44/5220	99.24%	1.008	0.082	-0.02	16.88	17.50	1.153	0.095	22.1
Left side	802.11a	44/5220	99.24%	1.008	0.055	0.09	16.88	17.50	1.153	0.064	22.1
Right side	802.11a	44/5220	99.24%	1.008	0.252	0.16	16.88	17.50	1.153	**0.293**	22.1
Top side	802.11a	44/5220	99.24%	1.008	0.056	0.08	16.88	17.50	1.153	0.065	22.1
Hotspot Test data of U-NII-3(Separate 10mm)											
Front side	802.11a	165/5825	99.24%	1.008	0.057	-0.16	17.81	18.50	1.172	0.067	22.4
Back side	802.11a	165/5825	99.24%	1.008	0.066	0.14	17.81	18.50	1.172	0.078	22.4
Left side	802.11a	165/5825	99.24%	1.008	0.101	-0.15	17.81	18.50	1.172	0.119	22.4
Right side	802.11a	165/5825	99.24%	1.008	0.315	0.02	17.81	18.50	1.172	**0.372**	22.4
Top side	802.11a	165/5825	99.24%	1.008	0.102	0.14	17.81	18.50	1.172	0.120	22.4
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**Duty Cycle Scaled factor**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Product specific 10gSAR Test data of U-NII-2A(Separate 0mm)											
Front side	802.11a	60/5300	99.24%	1.008	0.039	-0.09	16.95	17.50	1.135	0.045	22.1
Back side	802.11a	60/5300	99.24%	1.008	0.042	0.02	16.95	17.50	1.135	0.048	22.1
Left side	802.11a	60/5300	99.24%	1.008	0.041	-0.04	16.95	17.50	1.135	0.047	22.1
Right side	802.11a	60/5300	99.24%	1.008	0.125	0.07	16.95	17.50	1.135	**0.143**	22.1

Top side	802.11a	60/5300	99.24%	1.008	0.056	0.01	16.95	17.50	1.135	0.064	22.1
Product specific 10gSAR Test data of U-NII-2C(Separate 0mm)											
Front side	802.11a	116/5580	99.24%	1.008	0.122	0.02	16.55	17.00	1.109	0.136	22.3
Back side	802.11a	116/5580	99.24%	1.008	0.145	0.19	16.55	17.00	1.109	0.162	22.3
Left side	802.11a	116/5580	99.24%	1.008	0.233	0.11	16.55	17.00	1.109	0.260	22.3
Right side	802.11a	116/5580	99.24%	1.008	0.466	-0.08	16.55	17.00	1.109	**0.521**	22.3
Top side	802.11a	116/5580	99.24%	1.008	0.296	-0.14	16.55	17.00	1.109	0.331	22.3
Wi-Fi 5G SAR Test Record ANT5											
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**Duty Cycle Scaled factor**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Head Test data of U-NII-2A											
Left cheek	802.11a	64/5320	99.24%	1.008	0.058	-0.15	17.00	17.50	1.122	0.066	22.1
Left tilted	802.11a	64/5320	99.24%	1.008	0.046	-0.18	17.00	17.50	1.122	0.052	22.1
Right cheek	802.11a	64/5320	99.24%	1.008	0.069	0.15	17.00	17.50	1.122	**0.078**	22.1
Right tilted	802.11a	64/5320	99.24%	1.008	0.052	0.19	17.00	17.50	1.122	0.059	22.1
Head Test data of U-NII-2C											
Left cheek	802.11a	116/5580	99.24%	1.008	0.152	-0.16	16.56	17.00	1.107	0.169	22.3
Left tilted	802.11a	116/5580	99.24%	1.008	0.103	0.16	16.56	17.00	1.107	0.115	22.3
Right cheek	802.11a	116/5580	99.24%	1.008	0.166	0.19	16.56	17.00	1.107	**0.185**	22.3
Right tilted	802.11a	116/5580	99.24%	1.008	0.124	0.05	16.56	17.00	1.107	0.138	22.3
Head Test data of U-NII-3											
Left cheek	802.11a	165/5825	99.24%	1.008	0.109	0.18	17.59	18.50	1.233	0.135	22.4
Left tilted	802.11a	165/5825	99.24%	1.008	0.086	0.02	17.59	18.50	1.233	0.107	22.4
Right cheek	802.11a	165/5825	99.24%	1.008	0.122	-0.16	17.59	18.50	1.233	**0.152**	22.4
Right tilted	802.11a	165/5825	99.24%	1.008	0.099	0.13	17.59	18.50	1.233	0.123	22.4
Body worn Test data of U-NII-2A(Separate 15mm)											
Front side	802.11a	64/5320	99.24%	1.008	0.036	0.09	17.00	17.50	1.122	0.041	22.1
Back side	802.11a	64/5320	99.24%	1.008	0.071	0.11	17.00	17.50	1.122	**0.080**	22.1
Body worn Test data of U-NII-2C(Separate 15mm)											
Front side	802.11a	116/5580	99.24%	1.008	0.023	-0.13	16.56	17.00	1.107	0.026	22.3
Back side	802.11a	116/5580	99.24%	1.008	0.052	-0.05	16.56	17.00	1.107	**0.058**	22.3
Body worn Test data of U-NII-3(Separate 15mm)											
Front side	802.11a	165/5825	99.24%	1.008	0.023	-0.01	17.59	18.50	1.233	0.029	22.4
Back side	802.11a	165/5825	99.24%	1.008	0.048	-0.15	17.59	18.50	1.233	**0.060**	22.4
Hotspot Test data of U-NII-1(Separate 10mm)											
Front side	802.11a	44/5220	99.24%	1.008	0.122	-0.11	17.13	17.50	1.089	0.134	22.1
Back side	802.11a	44/5220	99.24%	1.008	0.131	0.15	17.13	17.50	1.089	0.144	22.1
Left side	802.11a	44/5220	99.24%	1.008	0.355	-0.06	17.13	17.50	1.089	**0.390**	22.1
Right side	802.11a	44/5220	99.24%	1.008	0.176	0.16	17.13	17.50	1.089	0.193	22.1
Top side	802.11a	44/5220	99.24%	1.008	0.152	0.11	17.13	17.50	1.089	0.167	22.1
Hotspot Test data of U-NII-3(Separate 10mm)											
Front side	802.11a	165/5825	99.24%	1.008	0.136	-0.12	17.59	18.50	1.233	0.169	22.4
Back side	802.11a	165/5825	99.24%	1.008	0.142	-0.05	17.59	18.50	1.233	0.176	22.4
Left side	802.11a	165/5825	99.24%	1.008	0.576	0.11	17.59	18.50	1.233	**0.716**	22.4
Right side	802.11a	165/5825	99.24%	1.008	0.255	-0.15	17.59	18.50	1.233	0.317	22.4
Top side	802.11a	165/5825	99.24%	1.008	0.206	-0.15	17.59	18.50	1.233	0.256	22.4
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**Duty Cycle Scaled factor**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**

Product specific 10gSAR Test data of U-NII-2A(Separate 0mm)											
Front side	802.11a	60/5300	99.24%	1.008	0.057	0.14	17.00	17.50	1.122	0.064	22.1
Back side	802.11a	60/5300	99.24%	1.008	0.066	0.13	17.00	17.50	1.122	0.075	22.1
Left side	802.11a	60/5300	99.24%	1.008	0.216	0.03	17.00	17.50	1.122	**0.244**	22.1
Right side	802.11a	60/5300	99.24%	1.008	0.107	0.17	17.00	17.50	1.122	0.121	22.1
Top side	802.11a	60/5300	99.24%	1.008	0.129	-0.19	17.00	17.50	1.122	0.146	22.1
Product specific 10gSAR Test data of U-NII-2C(Separate 0mm)											
Front side	802.11a	116/5580	99.24%	1.008	0.058	0.07	16.56	17.00	1.107	0.065	22.3
Back side	802.11a	116/5580	99.24%	1.008	0.059	0.00	16.56	17.00	1.107	0.066	22.3
Left side	802.11a	116/5580	99.24%	1.008	0.355	-0.14	16.56	17.00	1.107	**0.396**	22.3
Right side	802.11a	116/5580	99.24%	1.008	0.201	-0.05	16.56	17.00	1.107	0.224	22.3
Top side	802.11a	116/5580	99.24%	1.008	0.110	0.15	16.56	17.00	1.107	0.123	22.3

Wi-Fi 5G SAR Test Record MIMO

Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(℃)
Head Test data of U-NII-2A											
Left cheek	802.11n HT20	60/5300	98.87%	1.011	0.089	0.02	16.57	18.00	1.390	**0.125**	22.1
Left tilted	802.11n HT20	60/5300	98.87%	1.011	0.079	0.03	16.57	18.00	1.390	0.111	22.1
Right cheek	802.11n HT20	60/5300	98.87%	1.011	0.087	0.01	16.57	18.00	1.390	0.122	22.1
Right tilted	802.11n HT20	60/5300	98.87%	1.011	0.061	0.08	16.57	18.00	1.390	0.086	22.1
Head Test data of U-NII-2C											
Left cheek	802.11n HT20	116/5580	98.87%	1.011	0.194	0.04	16.45	17.50	1.274	**0.250**	22.3
Left tilted	802.11n HT20	116/5580	98.87%	1.011	0.187	0.01	16.45	17.50	1.274	0.241	22.3
Right cheek	802.11n HT20	116/5580	98.87%	1.011	0.181	0.08	16.45	17.50	1.274	0.233	22.3
Right tilted	802.11n HT20	116/5580	98.87%	1.011	0.175	0.03	16.45	17.50	1.274	0.225	22.3
Head Test data of U-NII-3											
Left cheek	802.11n HT20	157/5785	98.87%	1.011	0.151	-0.17	17.73	19.00	1.340	**0.205**	22.4
Left tilted	802.11n HT20	157/5785	98.87%	1.011	0.139	0.01	17.73	19.00	1.340	0.188	22.4
Right cheek	802.11n HT20	157/5785	98.87%	1.011	0.121	0.06	17.73	19.00	1.340	0.164	22.4
Right tilted	802.11n HT20	157/5785	98.87%	1.011	0.118	0.03	17.73	19.00	1.340	0.160	22.4
Body worn Test data of U-NII-2A(Separate 15mm)											
Front side	802.11n HT20	60/5300	98.87%	1.011	0.034	0.09	16.57	18.00	1.390	0.048	22.1
Back side	802.11n HT20	60/5300	98.87%	1.011	0.083	0.08	16.57	18.00	1.390	**0.117**	22.1
Body worn Test data of U-NII-2C(Separate 15mm)											
Front side	802.11n HT20	116/5580	98.87%	1.011	0.042	0.01	16.45	17.50	1.274	0.054	22.3
Back side	802.11n HT20	116/5580	98.87%	1.011	0.067	0.01	16.45	17.50	1.274	**0.086**	22.3
Body worn Test data of U-NII-3(Separate 15mm)											
Front side	802.11n HT20	157/5785	98.87%	1.011	0.038	0.06	17.73	19.00	1.340	0.051	22.4
Back side	802.11n HT20	157/5785	98.87%	1.011	0.054	-0.09	17.73	19.00	1.340	**0.073**	22.4
Hotspot Test data of U-NII-1(Separate 10mm)											
Front side	802.11n HT20	44/5220	98.87%	1.011	0.064	0.01	16.85	18.00	1.303	0.084	22.1
Back side	802.11n HT20	44/5220	98.87%	1.011	0.101	0.08	16.85	18.00	1.303	0.133	22.1
Left side	802.11n HT20	44/5220	98.87%	1.011	0.294	0.04	16.85	18.00	1.303	**0.388**	22.1
Right side	802.11n HT20	44/5220	98.87%	1.011	0.170	0.01	16.85	18.00	1.303	0.224	22.1
Top side	802.11n HT20	44/5220	98.87%	1.011	0.125	0.05	16.85	18.00	1.303	0.165	22.1
Hotspot Test data of U-NII-3(Separate 10mm)											
Front side	802.11n HT20	157/5785	98.87%	1.011	0.097	0.06	17.73	19.00	1.340	0.131	22.4
Back side	802.11n HT20	157/5785	98.87%	1.011	0.060	0.01	17.73	19.00	1.340	0.081	22.4
Left side	802.11n HT20	157/5785	98.87%	1.011	0.484	0.03	17.73	19.00	1.340	**0.656**	22.4
Right side	802.11n HT20	157/5785	98.87%	1.011	0.229	0.03	17.73	19.00	1.340	0.310	22.4

Top side	802.11n HT20	157/5785	98.87%	1.011	0.175	0.08	17.73	19.00	1.340	0.237	22.4
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**Duty Cycle Scaled factor**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Product specific 10gSAR Test data of U-NII-2A(Separate 0mm)											
Front side	802.11n HT20	60/5300	98.87%	1.011	0.049	0.01	16.57	18.00	1.390	0.069	22.1
Back side	802.11n HT20	60/5300	98.87%	1.011	0.030	0.08	16.57	18.00	1.390	0.042	22.1
Left side	802.11n HT20	60/5300	98.87%	1.011	0.172	0.01	16.57	18.00	1.390	**0.242**	22.1
Right side	802.11n HT20	60/5300	98.87%	1.011	0.096	0.03	16.57	18.00	1.390	0.135	22.1
Top side	802.11n HT20	60/5300	98.87%	1.011	0.100	0.08	16.57	18.00	1.390	0.141	22.1
Product specific 10gSAR Test data of U-NII-2C(Separate 0mm)											
Front side	802.11n HT20	116/5580	98.87%	1.011	0.121	0.06	16.45	17.50	1.274	0.156	22.3
Back side	802.11n HT20	116/5580	98.87%	1.011	0.041	0.01	16.45	17.50	1.274	0.053	22.3
Left side	802.11n HT20	116/5580	98.87%	1.011	0.170	-0.14	16.45	17.50	1.274	0.219	22.3
Right side	802.11n HT20	116/5580	98.87%	1.011	0.385	-0.04	16.45	17.50	1.274	**0.496**	22.3
Top side	802.11n HT20	116/5580	98.87%	1.011	0.275	0.06	16.45	17.50	1.274	0.354	22.3

Table 6： SAR of WIFI 5G for Head, Body, Hotspot and Limbs.

8.2.3 SAR Result of WIFI 6G

Wi-Fi 6G SAR Test Record												
MIMO Test Record												
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Measured APD (W/m^2)	Liquid Temp. (℃)
Head Test data												
Left cheek	802.11ax HE40	147/6685	99.70%	1.003	0.027	0.03	7.12	9.00	1.542	0.042	0.147	22.7
Left cheek	802.11ax HE40	3/5965	99.70%	1.003	0.021	0.10	7.14	9.00	1.368	0.029	0.121	22.7
Left cheek	802.11ax HE40	99/6445	99.70%	1.003	0.035	0.08	8.58	10.00	1.387	0.049	0.199	22.7
Left cheek	802.11ax HE40	195/6925	99.70%	1.003	0.040	0.04	8.69	10.00	1.352	**0.054**	0.225	22.7
Left cheek	802.11ax HE40	227/7085	99.70%	1.003	0.032	0.09	7.31	8.50	1.315	0.042	0.181	22.7
Left tilted	802.11ax HE40	147/6685	99.70%	1.003	0.025	0.01	7.12	9.00	1.542	0.039	0.134	22.7
Right cheek	802.11ax HE40	147/6685	99.70%	1.003	0.019	0.03	7.12	9.00	1.542	0.029	0.109	22.7
Right tilted	802.11ax HE40	147/6685	99.70%	1.003	0.017	0.01	7.12	9.00	1.542	0.026	0.097	22.7
Body worn Test data(Separate 10mm)												
Front side	802.11ax HE40	147/6685	99.70%	1.003	0.015	0.06	7.12	9.00	1.542	0.023	0.088	22.7
Back side	802.11ax HE40	147/6685	99.70%	1.003	0.019	0.01	7.12	9.00	1.542	0.029	0.133	22.7
Back side	802.11ax HE40	3/5965	99.70%	1.003	0.014	0.05	7.14	8.50	1.368	0.019	0.112	22.7
Back side	802.11ax HE40	99/6445	99.70%	1.003	0.026	0.09	8.58	10.00	1.387	0.036	0.175	22.7
Back side	802.11ax HE40	195/6925	99.70%	1.003	0.029	0.03	8.69	10.00	1.352	**0.039**	0.209	22.7
Back side	802.11ax HE40	227/7085	99.70%	1.003	0.021	0.01	7.31	8.50	1.315	0.028	0.163	22.7
Test position	Test mode	Test ch./Freq.	Duty Cycle	Duty Cycle Scaled factor	SAR (W/kg) 10-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 10-g (W/kg)	Measured APD (W/m^2)	Liquid Temp. (℃)
Product specific 10gSAR Test data(Separate 0mm)												
Front side	802.11ax HE40	147/6685	99.70%	1.003	0.024	-0.03	7.12	9.00	1.542	0.037	0.551	22.7
Back side	802.11ax HE40	147/6685	99.70%	1.003	0.007	0.08	7.12	9.00	1.542	0.011	0.173	22.7
Left side	802.11ax HE40	147/6685	99.70%	1.003	0.078	0.01	7.12	9.00	1.542	0.120	0.182	22.7
Left side	802.11ax HE40	3/5965	99.70%	1.003	0.060	0.08	7.14	8.50	1.368	0.082	1.35	22.7
Left side	802.11ax HE40	99/6445	99.70%	1.003	0.104	0.01	8.58	10.00	1.387	0.145	2.42	22.7
Left side	802.11ax HE40	195/6925	99.70%	1.003	0.145	0.01	8.69	10.00	1.352	**0.197**	3.38	22.7
Left side	802.11ax HE40	227/7085	99.70%	1.003	0.094	0.06	7.31	8.50	1.315	0.124	2.16	22.7
Right side	802.11ax HE40	147/6685	99.70%	1.003	0.020	0.01	7.12	9.00	1.542	0.031	0.479	22.7
Top side	802.11ax HE40	147/6685	99.70%	1.003	0.010	0.09	7.12	9.00	1.542	0.015	0.233	22.7

Table 7： SAR of WIFI 6G for Head, Body and Limbs.

8.2.4 SAR Result of BT

Bluetooth SAR Test Record Ant1											
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**Duty Cycle Scaled factor**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Head Test data											
Left cheek	DH5	39/2441	76.80%	1.302	0.045	0.03	14.37	15.50	1.297	**0.076**	22.5
Left tilted	DH5	39/2441	76.80%	1.302	0.030	0.09	14.37	15.50	1.297	0.051	22.5
Right cheek	DH5	39/2441	76.80%	1.302	0.034	0.01	14.37	15.50	1.297	0.057	22.5
Right tilted	DH5	39/2441	76.80%	1.302	0.019	0.03	14.37	15.50	1.297	0.032	22.5
Body worn Test data(Separate 10mm)											
Front side	DH5	39/2441	76.80%	1.302	0.009	0.01	14.37	15.50	1.297	0.015	22.5
Back side	DH5	39/2441	76.80%	1.302	0.024	-0.03	14.37	15.50	1.297	**0.041**	22.5
Hotspot Test data (Separate 10mm)											
Front side	DH5	39/2441	76.80%	1.302	0.016	0.08	14.37	15.50	1.297	0.027	22.5
Back side	DH5	39/2441	76.80%	1.302	0.041	0.06	14.37	15.50	1.297	0.069	22.5
Right side	DH5	39/2441	76.80%	1.302	0.106	-0.15	14.37	15.50	1.297	**0.179**	22.5
Top side	DH5	39/2441	76.80%	1.302	0.015	0.01	14.37	15.50	1.297	0.025	22.5
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Product specific 10g SAR Test data(Separate 0mm 1RB)											
Front side	DH5	39/2441	76.80%	1.302	0.040	0.05	14.37	15.50	1.297	0.068	22.5
Back side	DH5	39/2441	76.80%	1.302	0.062	0.03	14.37	15.50	1.297	0.105	22.5
Right side	DH5	39/2441	76.80%	1.302	0.154	-0.07	14.37	15.50	1.297	**0.260**	22.5
Top side	DH5	39/2441	76.80%	1.302	0.041	0.01	14.37	15.50	1.297	0.069	22.5
Bluetooth SAR Test Record Ant5											
Test position	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**Duty Cycle Scaled factor**	**SAR (W/kg) 1-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 1-g (W/kg)**	**Liquid Temp.(℃)**
Head Test data											
Left cheek	DH5	39/2441	76.80%	1.302	0.008	0.08	14.74	16.00	1.337	0.014	22.5
Left tilted	DH5	39/2441	76.80%	1.302	0.007	0.01	14.74	16.00	1.337	0.012	22.5
Right cheek	DH5	39/2441	76.80%	1.302	0.009	0.03	14.74	16.00	1.337	0.016	22.5
Right tilted	DH5	39/2441	76.80%	1.302	0.001	0.09	14.74	16.00	1.337	0.002	22.5
Body worn Test data(Separate 10mm)											
Front side	DH5	39/2441	76.80%	1.302	0.001	0.01	14.74	16.00	1.337	0.002	22.5
Back side	DH5	39/2441	76.80%	1.302	0.019	0.05	14.74	16.00	1.337	0.033	22.5
Hotspot Test data (Separate 10mm)											
Front side	DH5	39/2441	76.80%	1.302	0.013	0.08	14.74	16.00	1.337	0.023	22.5

Back side	DH5	39/2441	76.80%	1.302	0.055	0.03	14.74	16.00	1.337	0.096	22.5
Left side	DH5	39/2441	76.80%	1.302	0.061	0.01	14.74	16.00	1.337	0.106	22.5
Top side	DH5	39/2441	76.80%	1.302	0.018	0.01	14.74	16.00	1.337	0.031	22.5
Test position	**BW.**	**Test mode**	**Test ch./Freq.**	**Duty Cycle**	**SAR (W/kg) 10-g**	**Power drift (dB)**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaled factor**	**Scaled SAR 10-g (W/kg)**	**Liquid Temp.(℃)**
Product specific 10g SAR Test data(Separate 0mm 1RB)											
Front side	DH5	39/2441	76.80%	1.302	0.014	0.09	14.74	16.00	1.337	0.024	22.5
Back side	DH5	39/2441	76.80%	1.302	0.086	0.01	14.74	16.00	1.337	0.150	22.5
Left side	DH5	39/2441	76.80%	1.302	0.113	0.03	14.74	16.00	1.337	0.197	22.5
Top side	DH5	39/2441	76.80%	1.302	0.016	0.06	14.74	16.00	1.337	0.028	22.5

Table 8： SAR of BT for Head, Body, Hotspot and Limbs.

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8.3 Multiple Transmitter Evaluation

8.3.1 Simultaneous SAR test evaluation

No.	Simultaneous Tx Combination	Head	Body	Hotspot	Product Specific 10-g (0mm)
1	2.4GHz Ant1+2.4GHz Ant5	Yes	Yes	Yes	Yes
2	2.4GHz Ant1+BT Ant5	Yes	Yes	Yes	Yes
3	2.4GHz Ant5+BT Ant1	Yes	Yes	Yes	Yes
4	2.4GHz Ant1+2.4GHz Ant5+5GHz Ant1	Yes	Yes	Yes	Yes
5	2.4GHz Ant1+2.4GHz Ant5+5GHz Ant2	Yes	Yes	Yes	Yes
6	2.4GHz Ant1+2.4GHz Ant5+5GHz MIMO	Yes	Yes	Yes	Yes
7	5GHz Ant1+BT Ant1+BT Ant5	Yes	Yes	Yes	Yes
8	5GHz Ant2+BT Ant1+BT Ant5	Yes	Yes	Yes	Yes
9	5GHz MIMO+BT Ant1+BT Ant5	Yes	Yes	Yes	Yes
10	6GHz MIMO+2.4GHz Ant1+2.4GHz Ant5	Yes	Yes	/	Yes
11	6GHz MIMO+BT Ant1+BT Ant5	Yes	Yes	/	Yes

Note:
1) The device does not support DTM function.
2) For WiFi 5G,U-NII-2A and U-NII-2C band does not support hotspot function.

8.3.2 Simultaneous Transmission SAR Summation Scenario

Head:

Test position	WLAN2.4G Ant1 SAR(W/kg)	WLAN2.4G Ant5 SAR(W/kg)	WLAN 5GMIMO(W/kg)	BT Ant1 SAR(W/kg)	BT Ant5 SAR(W/kg)	WLAN 6GMIMO SAR(W/kg)	Summed SAR						
	1	2	3	4	5	6	1+2	1+5	2+4	1+2+3	3+4+5	1+2+6	4+5+6
Left cheek	0.140	0.075	0.250	0.076	0.014	0.054	0.215	0.154	0.151	0.465	0.340	0.269	0.144
Left tilted	0.092	0.066	0.241	0.051	0.012	0.034	0.158	0.104	0.117	0.399	0.304	0.192	0.097
Right cheek	0.106	0.087	0.233	0.057	0.016	0.026	0.193	0.122	0.144	0.426	0.306	0.219	0.099
Right tilted	0.060	0.001	0.225	0.032	0.002	0.023	0.061	0.062	0.033	0.286	0.259	0.084	0.057

Test position	WLAN2.4G Ant1 SAR(W/kg)	WLAN2.4G Ant5 SAR(W/kg)	WLAN 5G ANT1 (W/kg)	BT Ant1 SAR(W/kg)	BT Ant5 SAR(W/kg)	WLAN 6GMIMO SAR(W/kg)	Summed SAR						
	1	2	3	4	5	6	1+2	1+5	2+4	1+2+3	3+4+5	1+2+6	4+5+6
Left cheek	0.140	0.075	0.264	0.076	0.014	0.054	0.215	0.154	0.151	0.479	0.354	0.269	0.144
Left tilted	0.092	0.066	0.210	0.051	0.012	0.034	0.158	0.104	0.117	0.368	0.273	0.192	0.097
Right cheek	0.106	0.087	0.226	0.057	0.016	0.026	0.193	0.122	0.144	0.419	0.299	0.219	0.099
Right tilted	0.060	0.001	0.197	0.032	0.002	0.023	0.061	0.062	0.033	0.258	0.231	0.084	0.057

Test position	WLAN2.4G Ant1 SAR(W/kg)	WLAN2.4G Ant5 SAR(W/kg)	WLAN 5G ANT5 (W/kg)	BT Ant1 SAR(W/kg)	BT Ant5 SAR(W/kg)	WLAN 6GMIMO SAR(W/kg)	Summed SAR						
	1	2	3	4	5	6	1+2	1+5	2+4	1+2+3	3+4+5	1+2+6	4+5+6
Left cheek	0.140	0.075	0.169	0.076	0.014	0.054	0.215	0.154	0.151	0.384	0.259	0.269	0.144
Left tilted	0.092	0.066	0.115	0.051	0.012	0.034	0.158	0.104	0.117	0.273	0.178	0.192	0.097
Right cheek	0.106	0.087	0.185	0.057	0.016	0.026	0.193	0.122	0.144	0.378	0.258	0.219	0.099
Right tilted	0.060	0.001	0.138	0.032	0.002	0.023	0.061	0.062	0.033	0.199	0.172	0.084	0.057

Body worn:

Test position	WLAN2.4G Ant1 SAR(W/kg)	WLAN2.4G Ant5 SAR(W/kg)	WLAN 5GMIMO(W/kg)	BT Ant1 SAR(W/kg)	BT Ant5 SAR(W/kg)	WLAN 6GMIMO SAR(W/kg)	Summed SAR						
	1	2	3	4	5	6	1+2	1+5	2+4	1+2+3	3+4+5	1+2+6	4+5+6
Front side	0.024	0.001	0.054	0.015	0.002	0.017	0.025	0.026	0.016	0.079	0.071	0.042	0.034
Back side	0.068	0.064	0.117	0.041	0.033	0.038	0.132	0.101	0.105	0.249	0.191	0.170	0.112

Test position	WLAN2.4G Ant1 SAR(W/kg)	WLAN2.4G Ant5 SAR(W/kg)	WLAN 5G ANT1 (W/kg)	BT Ant1 SAR(W/kg)	BT Ant5 SAR(W/kg)	WLAN 6GMIMO SAR(W/kg)	Summed SAR						
	1	2	3	4	5	6	1+2	1+5	2+4	1+2+3	3+4+5	1+2+6	4+5+6
Front side	0.024	0.001	0.069	0.015	0.002	0.017	0.025	0.026	0.016	0.094	0.086	0.042	0.034
Back side	0.068	0.064	0.132	0.041	0.033	0.038	0.132	0.101	0.105	0.264	0.206	0.170	0.112

Test position	WLAN2.4G Ant1 SAR(W/kg)	WLAN2.4G Ant5 SAR(W/kg)	WLAN 5G ANT5 (W/kg)	BT Ant1 SAR(W/kg)	BT Ant5 SAR(W/kg)	WLAN 6GMIMO SAR(W/kg)	Summed SAR						
	1	2	3	4	5	6	1+2	1+5	2+4	1+2+3	3+4+5	1+2+6	4+5+6
Front side	0.024	0.001	0.041	0.015	0.002	0.017	0.025	0.026	0.016	0.066	0.058	0.042	0.034
Back side	0.068	0.064	0.080	0.041	0.033	0.038	0.132	0.101	0.105	0.212	0.154	0.170	0.112

Hotspot:

Test position	WLAN2.4G Ant1 SAR(W/kg)	WLAN2.4G Ant5 SAR(W/kg)	WLAN 5GMIMO(W/kg)	BT Ant1 SAR(W/kg)	BT Ant5 SAR(W/kg)	Summed SAR				
	1	2	3	4	5	1+2	1+5	2+4	1+2+3	3+4+5
Front side	0.045	0.053	0.131	0.027	0.023	0.098	0.068	0.080	0.229	0.181
Back side	0.117	0.219	0.133	0.069	0.096	0.336	0.213	0.288	0.469	0.298
Left side	0.000	0.248	0.656	0.000	0.106	0.248	0.106	0.248	0.904	0.762
Right side	0.300	0.000	0.310	0.179	0.000	0.300	0.300	0.179	0.610	0.489
Top side	0.042	0.071	0.237	0.025	0.031	0.113	0.073	0.096	0.350	0.293
Test position	WLAN2.4G Ant1 SAR(W/kg)	WLAN2.4G Ant5 SAR(W/kg)	WLAN 5G ANT1 (W/kg)	BT Ant1 SAR(W/kg)	BT Ant5 SAR(W/kg)	Summed SAR				
	1	2	3	4	5	1+2	1+5	2+4	1+2+3	3+4+5
Front side	0.045	0.053	0.067	0.027	0.023	0.098	0.068	0.080	0.165	0.117
Back side	0.117	0.219	0.095	0.069	0.096	0.336	0.213	0.288	0.431	0.260
Left side	0.000	0.248	0.119	0.000	0.106	0.248	0.106	0.248	0.367	0.225
Right side	0.300	0.000	0.372	0.179	0.000	0.300	0.300	0.179	0.672	0.551
Top side	0.042	0.071	0.120	0.025	0.031	0.113	0.073	0.096	0.233	0.176
Test position	WLAN2.4G Ant1 SAR(W/kg)	WLAN2.4G Ant5 SAR(W/kg)	WLAN 5G ANT5 (W/kg)	BT Ant1 SAR(W/kg)	BT Ant5 SAR(W/kg)	Summed SAR				
	1	2	3	4	5	1+2	1+5	2+4	1+2+3	3+4+5
Front side	0.045	0.053	0.169	0.027	0.023	0.098	0.068	0.080	0.267	0.219
Back side	0.117	0.219	0.176	0.069	0.096	0.336	0.213	0.288	0.512	0.341
Left side	0.000	0.248	0.716	0.000	0.106	0.248	0.106	0.248	0.964	0.822
Right side	0.300	0.000	0.317	0.179	0.000	0.300	0.300	0.179	0.617	0.496
Top side	0.042	0.071	0.256	0.025	0.031	0.113	0.073	0.096	0.369	0.312

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Product specific 10g SAR:

Test position	WLAN2.4G Ant1 SAR(W/kg)	WLAN2.4G Ant5 SAR(W/kg)	WLAN 5GMIMO(W/kg)	BT Ant1 SAR(W/kg)	BT Ant5 SAR(W/kg)	WLAN 6GMIMO SAR(W/kg)	Summed SAR						
	1	2	3	4	5	6	1+2	1+5	2+4	1+2+3	3+4+5	1+2+6	4+5+6
Front side	0.110	0.029	0.156	0.068	0.024	0.033	0.139	0.134	0.097	0.295	0.248	0.172	0.125
Back side	0.172	0.180	0.053	0.105	0.150	0.010	0.352	0.322	0.285	0.405	0.308	0.362	0.265
Left side	0.000	0.242	0.242	0.000	0.197	0.197	0.242	0.197	0.242	0.484	0.439	0.439	0.394
Right side	0.440	0.000	0.496	0.260	0.000	0.028	0.440	0.440	0.260	0.936	0.756	0.468	0.288
Top side	0.114	0.034	0.354	0.069	0.028	0.014	0.148	0.142	0.103	0.502	0.451	0.162	0.111

Test position	WLAN2.4G Ant1 SAR(W/kg)	WLAN2.4G Ant5 SAR(W/kg)	WLAN 5G ANT1 (W/kg)	BT Ant1 SAR(W/kg)	BT Ant5 SAR(W/kg)	WLAN 6GMIMO SAR(W/kg)	Summed SAR						
	1	2	3	4	5	6	1+2	1+5	2+4	1+2+3	3+4+5	1+2+6	4+5+6
Front side	0.110	0.029	0.136	0.068	0.024	0.033	0.139	0.134	0.097	0.275	0.228	0.172	0.125
Back side	0.172	0.180	0.162	0.105	0.150	0.010	0.352	0.322	0.285	0.514	0.417	0.362	0.265
Left side	0.000	0.242	0.260	0.000	0.197	0.197	0.242	0.197	0.242	0.502	0.457	0.439	0.394
Right side	0.440	0.000	0.521	0.260	0.000	0.028	0.440	0.440	0.260	0.961	0.781	0.468	0.288
Top side	0.114	0.034	0.331	0.069	0.028	0.014	0.148	0.142	0.103	0.479	0.428	0.162	0.111

Test position	WLAN2.4G Ant1 SAR(W/kg)	WLAN2.4G Ant5 SAR(W/kg)	WLAN 5G ANT5 (W/kg)	BT Ant1 SAR(W/kg)	BT Ant5 SAR(W/kg)	WLAN 6GMIMO SAR(W/kg)	Summed SAR						
	1	2	3	4	5	6	1+2	1+5	2+4	1+2+3	3+4+5	1+2+6	4+5+6
Front side	0.110	0.029	0.065	0.068	0.024	0.033	0.139	0.134	0.097	0.204	0.157	0.172	0.125
Back side	0.172	0.180	0.075	0.105	0.150	0.010	0.352	0.322	0.285	0.427	0.330	0.362	0.265
Left side	0.000	0.242	0.396	0.000	0.197	0.197	0.242	0.197	0.242	0.638	0.593	0.439	0.394
Right side	0.440	0.000	0.224	0.260	0.000	0.028	0.440	0.440	0.260	0.664	0.484	0.468	0.288
Top side	0.114	0.034	0.146	0.069	0.028	0.014	0.148	0.142	0.103	0.294	0.243	0.162	0.111

9 Equipment list

Test Platform		SPEAG DASY8 Professional				
Description		SAR Test System (Frequency range 10MHz-10GHz)				
Software Reference		Measurement Software: cDASY8 V16.2.4.2524				
Hardware Reference						
Equipment		Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration
☒	DAE	SPEAG	DAE4ip	1826	2023-12-27	2024-12-26
☒	E-Field Probe	SPEAG	EX3DV4	7833	2023-08-24	2024-08-23
☒	Twin Phantom	SPEAG	Twin-SAM V8.0	2155	NCR	NCR
☒	Validation Kits	SPEAG	D2450V2	922	2023-08-28	2026-08-27
☒	Validation Kits	SPEAG	D5GHzV2	1174	2023-08-23	2026-08-22
☒	Validation Kits	SPEAG	D6.5GHzV2	1102	2023-09-11	2026-09-10
☒	DAK-3.5 probe	SPEAG	DAK-3.5	1102	N/A	N/A
☒	Universal Radio Communication Tester	R&S	CMW500	111637	2023-09-13	2024-09-12
☒	RF Bi-Directional Coupler	Agilent	86205-60001	MY31400031	NCR	NCR
☒	Signal Generator	R&S	SMB100A	182393	2024-02-04	2025-02-03
☒	Preamplifier	Qiji	YX28980933	202104001	NCR	NCR
☒	Power Sensor	Keysight	U2002H	121251	2023-09-13	2024-09-12
☒	Attenuator	SHX	TS2-3dB	30704	NCR	NCR
☒	Coaxial low pass filter	Mini-Circuits	VLF-2500(+)	NA	NCR	NCR
☒	Coaxial low pass filter	Microlab Fxr	LA-F13	NA	NCR	NCR
☒	DC POWER SUPPLY	SAKO	SK1730SL5A	NA	NCR	NCR
☒	Speed reading thermometer	LKM	DTM3000	NA	2023-09-15	2024-09-14
☒	Humidity and Temperature Indicator	MingGao	MingGao	NA	2023-09-15	2024-09-14

Note: All the equipment are within the valid period when the tests are performed.

10 Calibration certificate

Please see the Appendix C

11 Photographs

Please see the Appendix D

Appendix A: Detailed System Check Results

Appendix B: Detailed Test Results

Appendix C: Calibration certificate

Appendix D: Photographs

--- End of report ---

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