Prüfbericht-Nr.: *Test report no.:*	CN24NBPM 001	**Auftrags-Nr.:** *Order no.:*	48244922	Seite 1 von 38 *Page 1 of 38*
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2024-03-11	
Auftraggeber: *Client:*	Siemens Healthcare Diagnostics Inc. 2 Edgewater Drive Norwood, MA 02062 USA			
Prüfgegenstand: *Test item:*	Mobile Computing Device			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	PD470SH-B, PD470SH-N			
Auftrags-Inhalt: *Order content:*	Test Report for FCC SAR			
Prüfgrundlage: *Test specification:*	FCC 47 CFR §2.1093 IEEE Std 1528-2013 IEC/IEEE 62209-1528:2020 Published RF exposure KDB procedures			
Wareneingangsdatum: *Date of sample receipt:*	2024-03-14			
Prüfmuster-Nr.: *Test sample no:*	A003675718-002			
Prüfzeitraum: *Testing period:*	2024-03-30			
Ort der Prüfung: *Place of testing:*	EMC/RF Taipei Testing Site			
Prüflaboratorium: *Testing laboratory:*	Taipei Testing Laboratories			
Prüfergebnis*: *Test result*:*	Pass			
überprüft von: *compiled by:*	Morrison Huang	**genehmigt von:** authorized by:	Brenda Chen	
Datum: *Date:* 2024-04-12	Morrison Huang	**Ausstellungsdatum:** *Issue date:* 2024-04-12	Brenda Chen	
Stellung / *Position:*	Project Engineer	**Stellung** / *Position:*	Senior Project Manager	
Sonstiges / *Other:*	This report is to enable WLAN 5GHz band 2 and band 3 function. Only the tests for WLAN 5GHz band 2 and band 3 were evaluated. For the other test results, refer to report no.: RXZ190821001-23A.			

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Anmerkungen
Remarks

1	Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden. *The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.* *Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.*
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CONTENTS

HISTORY OF THIS TEST REPORT

Revision	Description	Date Issued
R01	Original Release	2024-04-12

1. General Information

1.1 Statement of Compliance

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

Equipment Class	Operating Mode	Highest Head SAR_{1g} (W/kg)	Highest Reported Body-worn SAR_{1g} (1.0 cm Gap) (W/kg)	Highest Reported Extremity SAR_{10g} (0 cm Gap) (W/kg)
NII	5.3G WLAN	1.197	0.297	0.436

Note:
The maximum results of Specific Absorption Rate (SAR) found during testing for the EUT are as follows: This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6W/kg as averaged over any 1 gram of tissue; 10-gram SAR for Product Specific 10g SAR, limit: 4.0W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

1.2 Equipment Under Test (EUT) Information

1.2.1 General Information

EUT Type	Mobile Computing Device
Model Name	PD470SH-B, PD470SH-N
FCC ID	2AUAM-PD470SH
Antenna Type	PCB Antenna
Antenna Gain	Band 2: 2.01 dBi Band 3: 2.15 dBi

1.2.2 Wireless Technologies

Tx Frequency Bands (Unit: MHz)	WLAN U-NII 2: 5250 MHz ~ 5320 MHz WLAN U-NII 3: 5470 MHz ~ 5725 MHz
Uplink Modulations	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)

1.3 Maximum Conducted Power

The maximum conducted average power (Unit: dBm) including tune-up tolerance is shown as below.

Mode	5.3G WLAN	5.6G WLAN
802.11a	8.5	9.5
802.11n HT20	8.5	9.5
802.11n HT40	8.5	9.0
802.11ac VHT20	8.5	9.5
802.11ac VHT40	8.5	9.0
802.11ac VHT80	9.0	9.5

2. Test Sites

2.1 Test Laboratory

Taipei Testing Laboratories

11F., No. 758, Sec. 4, Bade Rd., Songshan Dist., Taipei City 105 Taiwan (R.O.C.)

2.2 Test Facilities

Taipei Testing Laboratories

No. 458-18, Sec. 2, Fenliao Rd., Linkou Dist., New Taipei City 244 Taiwan (R.O.C.)

The tests at the test sites have been conducted under the supervision of a TÜV engineer.

2.3 List of Test and Measurement Instruments

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
E-field probes	SPEAG	EX3DV4	7400	2023/4/28	1 Year
Data Acquisition Electronics	SPEAG	DAE4	855	2023/4/25	1 Year
System Validation Dipole	SPEAG	D5GHzV2	1145	2024/2/21	1 Year
ENA	Agilent	E5080A	MY55200677	2024/1/17	1 Year
Power Meter	Anritsu	ML2495A	1901008	2024/3/12	1 Year
Power Sensor	Anritsu	MA2411B	1725269	2024/3/12	1 Year
Power Sensor	R&S	NRP33S	101622	2024/3/21	1 Year
Signal Analyzer	R&S	FSV40	101512	2024/2/22	1 Year
Signal Generator	R&S	SMB100A03	181248	2023/11/16	1 Year
Digital Thermometer	Testo	608-H1	45207430	2023/11/24	1 Year
Directional coupler	Fairview Microwave	FMCP1025-20	A000553136-001	N/A	N/A
Dielectric Assessment Kit	SPEAG	DAK-3.5	1292	N/A	N/A
Twin Sam Phantom	SPEAG	QD000P40CC	TP-1467	N/A	N/A
Power Amplifier	EMCI	EMC2830P	980352	N/A	N/A
Power Amplifier	mini-circuits	ZHL-42W	SN002101809	N/A	N/A

3. Measurement Uncertainty

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in table below.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor(a)	1/k(b)	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity
(b) κ is the coverage factor

Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

SAR Uncertainty Budget According to IEC/IEEE 62209-1528 (Frequency band: 4MHz - 10GHz range)								
Symbol	Input quantity *Xi* (source of uncertainty)	Unc. Value	Prob. Dist.	Div.	ci (1g)	ci (10g)	Std.Unc. (1g) (±%)	Std.Unc. (10g) (±%)
Measurement system errors								
CF	Probe calibration (±%)	18.6	N	2	1	1	9.3	9.3
***CF*drift**	Probe calibration drift (±%)	1.0	N	1	1	1	0.6	0.6
LIN	Probe linearity and detection limit (±%)	4.7	R	1.732	1	1	2.7	2.7
BBS	Broadband signal (±%)	3.0	N	1	1	1	1.7	1.7
ISO	Probe isotropy (±%)	7.6	R	2	1	1	4.4	4.4
DAE	Other probe and data acquisition errors (±%)	0.3	N	1.732	1	1	0.2	0.2
AMB	RF ambient and noise (±%)	1.8	N	1	1	1	1.8	1.8
∆*xyz*	Probe positioning errors (±mm)	0.20	N	1	0.33	0.33	0.07	0.07
DAT	Data processing errors (±%)	3.5	N	1	1	1	3.5	3.5
Phantom and device (DUT or validation antenna) errors								
***LIQ*(*σ*)**	Conductivity (meas.) DAK (±%)	2.5	N	1	0.78	0.71	2.0	1.8
***LIQ*(*T*c)**	Conductivity (temp.) (±%)	5	R	1.732	0.78	0.71	2.3	2.0
EPS	Phantom Permittivity (±%)	14	R	1.732	0.5	0.5	4.0	4.0
DIS	Distance DUT – TSL (±%)	2	N	1	2	2	4.0	4.0
Dxyz	Device Positioning (±%)	2	N	1	1	1	2.0	2.0
H	Device Holder (±%)	3.4	N	1	1	1	3.4	3.4
MOD	DUT Modulationm (±%)	2.4	R	1.732	1	1	1.4	1.4
TAS	Time-average SAR (±%)	2.4	R	1.732	1	1	1.4	1.4
***RF*drift**	DUT drift (±%)	5	N	1	1	1	5.0	5.0
VAL	Val Antenna Unc. (±%)	0	N	1	1	1	0.0	0.0
***P*in**	Unc. Input Power (±%)	0	N	1	1	1	0.0	0.0
Corrections to the SAR result								
***C*(*ε'*,*σ*)**	Deviation to Target (±%)	1.9	N	1	1	0.84	1.9	1.6
***C*(*R*)**	SAR scaling (±%)	0	R	√3	1	1	0.0	0.0
***u*(∆*SAR*)**	Combined uncertainty						14.9	14.8
	Coverage Factor for 95%						K=2	K=2
U	Expanded uncertainty					*U* =	±29.7	±29.6

Uncertainty budget for frequency range 4 MHz to 10 GHz

Per KDB865664 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.

4. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR §2.1093, IEEE STD 1528-2013, the following FCC Published RF exposure KDB procedures & manufacturer KDB inquiries:

- KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- KDB 865664 D02 RF Exposure Reporting v01r02
- KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- KDB 447498 D01 General RF Exposure Guidance DR04
- KDB 648474 D04 Handset SAR v01r03

5. RF Exposure Limits

5.1 Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

5.2 Controlled Environment

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). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

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

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is average over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

6. SAR Measurement System

6.1 Definition of Specific Absorption Rate (SAR)

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

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

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

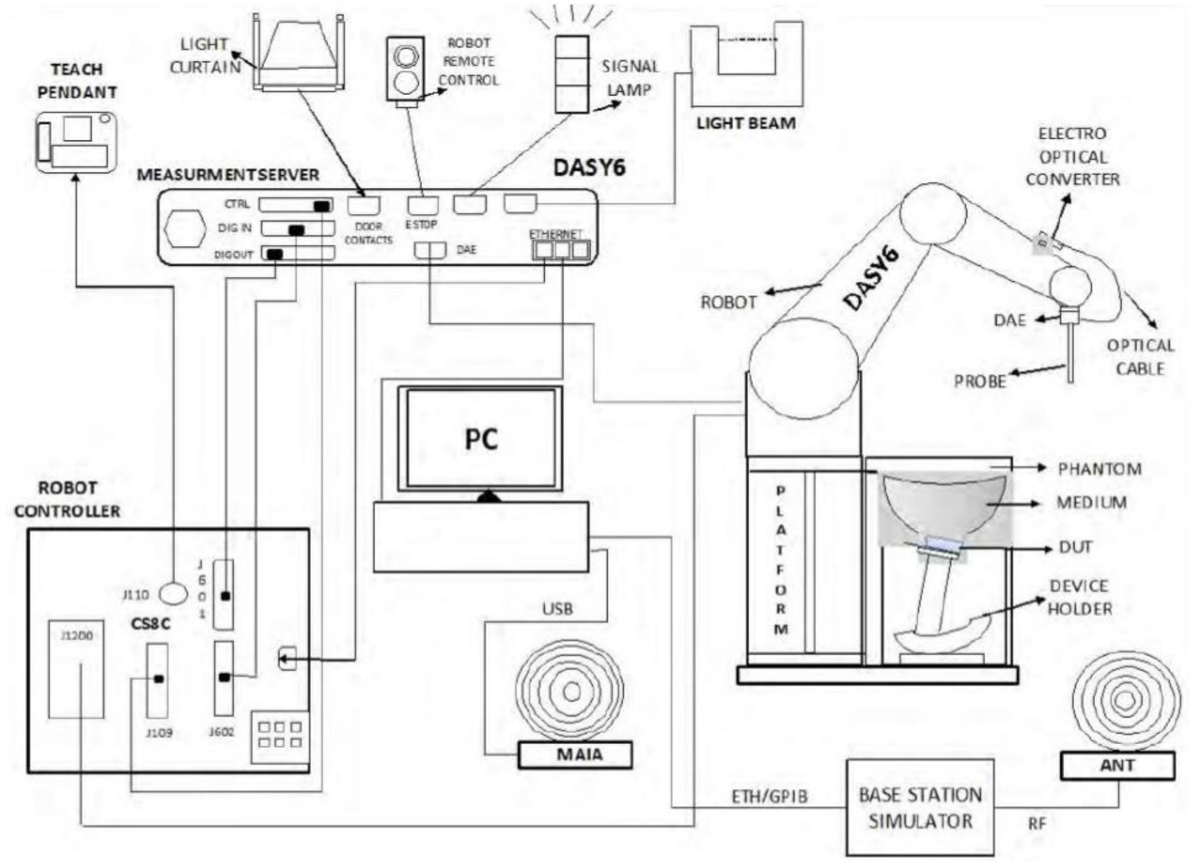
SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be related to the electrical field in the tissue by

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

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

6.2 SPEAG DASY System

DASY system consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY6 software defined. The DASY software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion form the optical into digital electric signal of the DAE and transfers data to the PC.



DASY System Setup

6.2.1 Robot

The DASY system uses the high precision robots from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY5: CS8c) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ±0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

DASY6

6.2.2 Probes

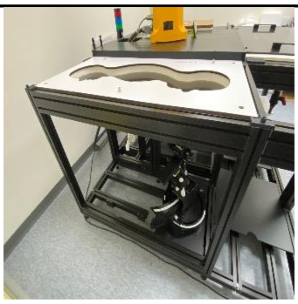
The SAR measurement is conducted with the dosimetric probe. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.

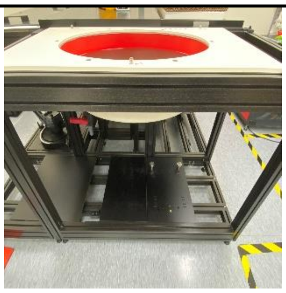
Model	EX3DV4
Construction	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).
Frequency	4 MHz to 10 GHz Linearity: ± 0.2 dB
Directivity	± 0.1 dB in TSL (rotation around probe axis) ± 0.3 dB in TSL (rotation 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

6.2.3 Data Acquisition Electronics (DAE)

Model	DAE4
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY 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 fA
Dimensions	60 x 60 x 68 mm

6.2.4 Phantoms

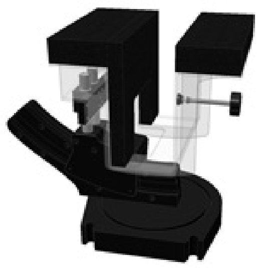
Model	Twin SAM	
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEC/IEEE 62209-1528. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents 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.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)	
Dimensions	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	approx. 25 liters	

Model	ELI	
Construction	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 4 MHz to 10 GHz. ELI is fully compatible with the IEC/IEEE 62209-1528 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.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	

6.2.5 Device Holder

Model	Mounting Device
Construction	In combination with the Twin SAM Phantom or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Rotation point is the ear opening point. Transmitter devices can be easily and accurately positioned according to IEC, IEEE, FCC or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).
Material	POM

Model	Laptop Extensions Kit
Construction	Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC/IEEE 62209-1528 (e.g., laptops, cameras, etc.). It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner.
Material	POM, Acrylic glass, Foam



6.2.6 System Validation Dipoles

Model	D-Serial
Construction	Symmetrical dipole with l/4 balun. Enables measurement of feed point impedance with NWA. Matched for use near flat phantoms filled with tissue simulating solutions.
Frequency	300 MHz to 10 GHz
Return Loss	> 20 dB
Power Capability	> 100 W (f < 1GHz), > 40 W (f > 1GHz)

6.2.7 Tissue Simulating Liquids

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed.

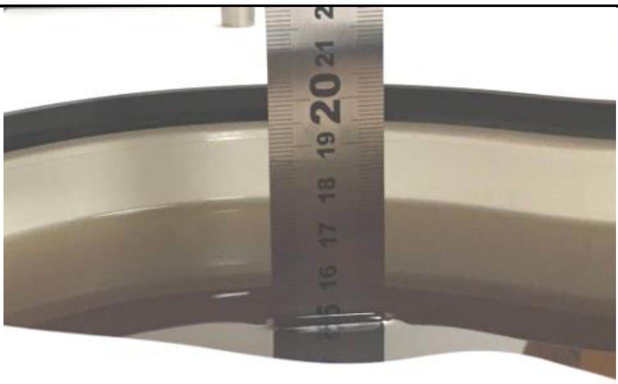


Photo of Liquid Height for Head Position

The dielectric properties of the head tissue simulating liquids are defined in IEEE 1528 Appendix A.
The workshop effective February 19, 2019, FCC has permitted the use of single head tissue simulating liquid specified in IEC 62209 1 for all SAR tests.
The dielectric properties of the tissue simulating liquids were verified prior to the SAR evaluation using a dielectric assessment kit and a network analyzer.

Targets of Tissue Simulating Liquid

Frequency (MHz)	Target Permittivity	Range of ±5%	Target Conductivity	Range of ±5%
For Head				
750	41.9	39.8 ~ 44.0	0.89	0.85 ~ 0.93
835	41.5	39.4 ~ 43.6	0.90	0.86 ~ 0.95
900	41.5	39.4 ~ 43.6	0.97	0.92 ~ 1.02
1450	40.5	38.5 ~ 42.5	1.20	1.14 ~ 1.26
1640	40.3	38.3 ~ 42.3	1.29	1.23 ~ 1.35
1750	40.1	38.1 ~ 42.1	1.37	1.30 ~ 1.44
1800	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
1900	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2000	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2300	39.5	37.5 ~ 41.5	1.67	1.59 ~ 1.75
2450	39.2	37.2 ~ 41.2	1.80	1.71 ~ 1.89
2600	39.0	37.1 ~ 41.0	1.96	1.86 ~ 2.06
3500	37.9	36.0 ~ 39.8	2.91	2.76 ~ 3.06
5200	36.0	34.2 ~ 37.8	4.66	4.43 ~ 4.89
5300	35.9	34.1 ~ 37.7	4.76	4.52 ~ 5.00
5500	35.6	33.8 ~ 37.4	4.96	4.71 ~ 5.21
5600	35.5	33.7 ~ 37.3	5.07	4.82 ~ 5.32
5800	35.3	33.5 ~ 37.1	5.27	5.01 ~ 5.53
6500	34.5	32.8 ~ 36.2	6.07	6.04 ~ 6.11

7. SAR Measurement Procedure

According to the SAR test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

The SAR measurement procedures for each of test conditions are as follows:

(a) Make EUT to transmit maximum output power
(b) Measure conducted output power through RF cable
(c) Place the EUT in the specific position of phantom
(d) Perform SAR testing steps on the DASY system
(e) Record the SAR value

7.1 Area & Zoom Scan Procedure

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. According to KDB 865664 D01, the resolution for Area and Zoom scan is specified in the table below.

Items	≤ 2GHz	2-3 GHz	3-4 GHz	4-5 GHz	5-6 GHz
Area Scan (Δx, Δy)	≦15mm	≦12 mm	≦12 mm	≦10 mm	≦10 mm
Zoom Scan (Δx, Δy)	≦8 mm	≦5 mm	≦5 mm	≦4 mm	≦4 mm
Zoom Scan (Δz)	≦5 mm	≦5 mm	≦4 mm	≦3 mm	≦2 mm
Zoom Scan Volume	≧30 mm	≧30 mm	≧28 mm	≧25 mm	≧22 mm

Note:
When zoom scan is required and report SAR is ≦1.4 W/kg, the zoom scan resolution of Δx / Δy (2-3 GHz): ≦8 mm, 3-4 GHz: ≦7 mm, 4-6 GHz: ≦5 mm) may be applied.

7.2 Volume Scan Procedure

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

7.3 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drift more than 5%, the SAR will be retested.

7.4 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

7.5 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

8. SAR Measurement Evaluation

8.1 EUT Configuration and Setting

<Considerations Related to WLAN for Setup and Testing>

In general, various vendor specific external test software and chipset based internal test modes are typically used for SAR measurement. These chipset based test mode utilities are generally hardware and manufacturer dependent, and often include substantial flexibility to reconfigure or reprogram a device. 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. The test frequencies established using test mode must correspond to the actual channel frequencies. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. In addition, a periodic transmission duty factor is required for current generation SAR systems to measure SAR correctly. The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

According to KDB 248227 D01, this device has installed WLAN engineering testing software which can provide continuous transmitting RF signal. During WLAN SAR testing, this device was operated to transmit continuously at the maximum transmission duty with specified transmission mode, operating frequency, lowest data rate, and maximum output power.

Initial Test Configuration

An initial test configuration is determined for OFDM transmission modes in 2.4 GHz and 5 GHz bands according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.

Subsequent Test Configuration

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. Additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. When the highest reported SAR for the initial test configuration 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.

SAR Test Configuration and Channel Selection

When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the initial test configuration is using largest channel bandwidth, lowest order modulation, lowest data rate, and lowest order 802.11 mode (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.

1) The channel closest to mid-band frequency is selected for SAR measurement.

2) 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.

Test Reduction for U-NII-1 (5.2 GHz) and U-NII-2A (5.3 GHz) Bands

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).

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.

8.2 EUT Testing Position

According to KDB 648474 D04, handsets are tested for SAR compliance in head, body-worn accessory and other use configurations described in the following subsections.

8.2.1 Head Exposure Conditions

Head exposure is limited to next to the ear voice mode operations. Head SAR compliance is tested according to the test positions defined in IEEE Std 1528-2003 using the SAM phantom illustrated as below.

1. Define two imaginary lines on the handset

(a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.

(b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.

(c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

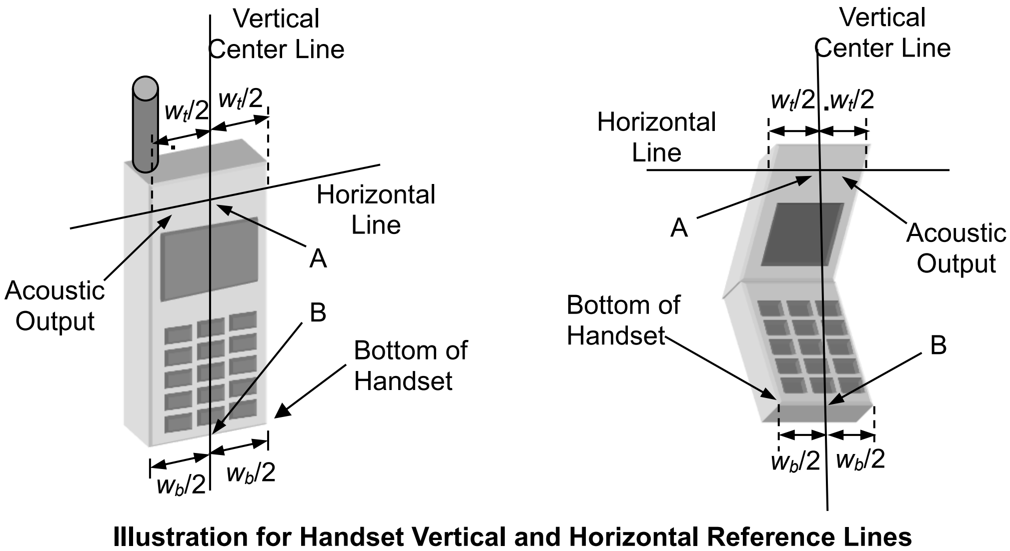


Illustration for Handset Vertical and Horizontal Reference Lines

2. Cheek Position

(a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.

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

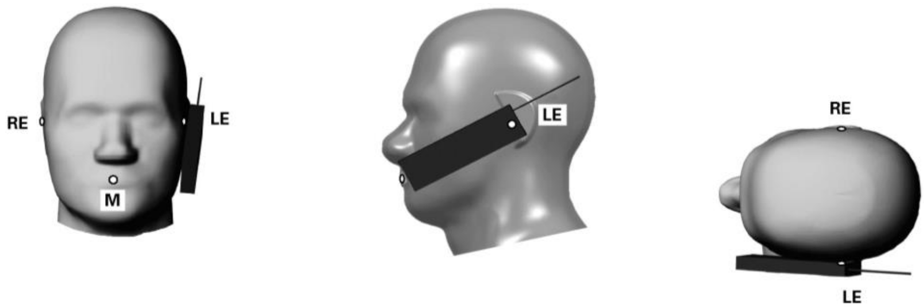


Illustration for Cheek Position

3. Tilted Position

(a) To position the device in the "cheek" position described above.

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

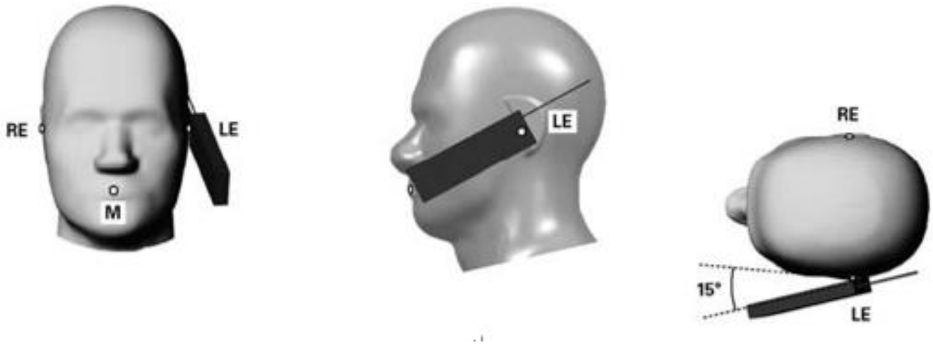


Illustration for Tilted Position

8.2.2 Body-worn Accessory Exposure Conditions

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 KDB 447498 D01 are 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 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.

Body-worn accessories that do not contain metallic or conductive components may be tested according to worst-case exposure configurations, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics. All body-worn accessories containing metallic components are tested in conjunction with the host device.

Body-worn accessory SAR compliance is based on a single minimum test separation distance for all wireless and operating modes applicable to each body-worn accessory used by the host, and according to the relevant voice and/or data mode transmissions and operations. If a body-worn accessory supports voice only operations in its normal and expected use conditions, testing of data mode for body-worn compliance is not required.

A conservative minimum test separation distance for supporting off-the-shelf body-worn accessories that may be acquired by users of consumer handsets is used to test for body-worn accessory SAR compliance. This distance is determined by the handset manufacturer, according to the requirements of Supplement C 01-01. Devices that are designed to operate on the body of users using lanyards and straps, or without requiring additional body-worn accessories, will be tested using a conservative minimum test separation distance <= 5 mm to support compliance.

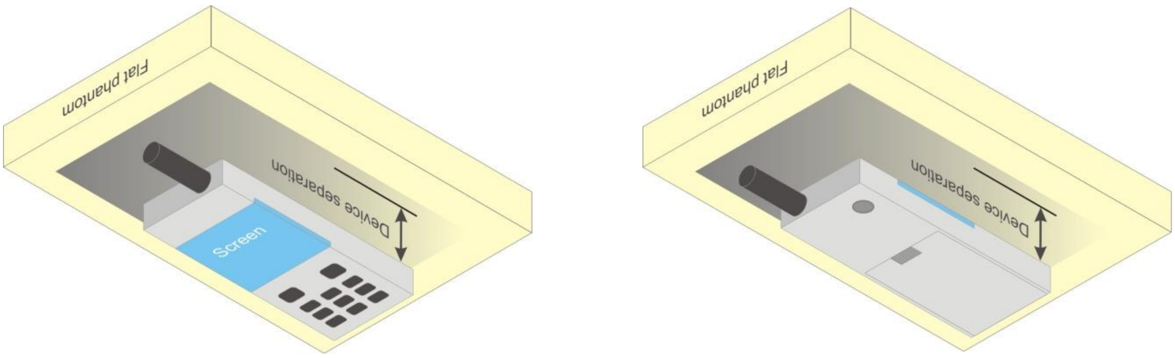


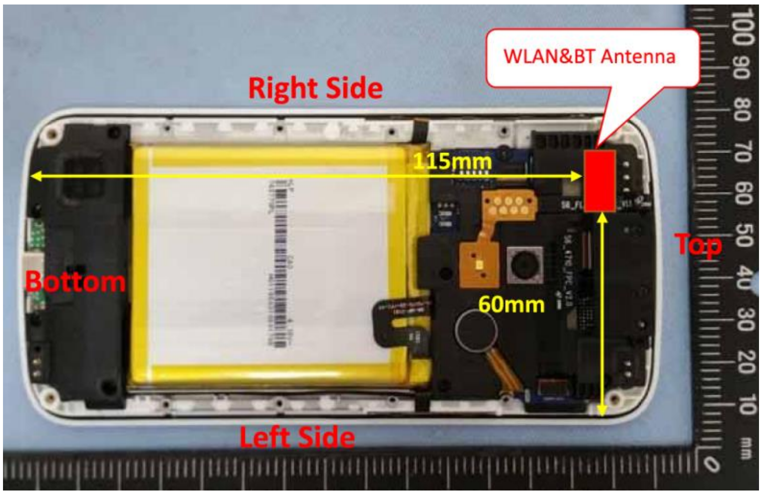
Illustration for Body Worn Position

8.2.3 Extremity Exposure Conditions

For smart phones with a display diagonal dimension > 15 cm or an overall diagonal dimension > 16 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 following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance.

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.
2. 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 10-g extremity 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, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g SAR > 1.2 W/kg. The normal tablet procedures in KDB 616217 are required when the over diagonal dimension of the device is > 20 cm. Hotspot mode SAR is not required when normal tablet procedures are applied. Extremity 10-g SAR is also not required for the front (top) surface of large form factor full size tablets. The more conservative tablet SAR results can be used to support the 10-g extremity SAR for phablet mode.
3. The simultaneous transmission operating configurations applicable to voice and data transmissions for both phone and mini-tablet modes must be taken into consideration separately for 1-g and 10-g SAR to determine the simultaneous transmission SAR test exclusion and measurement requirements for the relevant wireless modes and exposure conditions.

8.2.4 Antenna Location



8.3 Simultaneous Transmission Possibilities

There is no simultaneous transmission configuration in this device.

8.4 Tissue Verification

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectic parameter are within the tolerances of the specified target values. The measured conductivity and relative permittivity should be within ± 5% of the target values.

The following materials are used for producing the tissue-equivalent materials.

Recipes of Tissue Simulating Liquid

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
H750	44	-	0.2	-	56.0	-	42.1	-
H835	44	48.4	0.2	1.3	57.0	-	41.1	-
H900	44	48.4	0.2	1.4	58.0	-	40.2	-
H1450	44	-	-	0.6	-	-	56.1	-
H1640	44	-	-	0.5	-	-	53.7	-
H1750	44	45.3	-	0.4	-	-	52.6	-
H1800	44	45.3	-	0.5	-	-	55.2	-
H1900	44	45.3	-	0.2	-	-	55.3	-
H2000	44	45.3	-	0.1	-	-	55.4	-
H2300	44	-	-	0.1	-	-	55.0	-
H2450	44	-	-	0.1	-	-	54.9	-
H2600	44	-	-	0.1	-	-	54.8	-
H3500	44	-	-	0.2	-	20.0	71.8	-
H4000	44	-	-	-	-	-	56.0	-
H5G	44	-	-	-	-	17.2	65.5	17.2
H6G	44	-	-	-	-	-	56.0	-

Salt: 99+% Pure Sodium Chloride; Sugar: 98+% Pure Sucrose; Water: De-ionized, 16M +resistivity
HEC: Hydroxyethyl Cellulose; Sorbitan monolaurate (Tween 20); Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]; Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1,3,3-tetramethylbutyl) phenyl]ether.

The measuring results for tissue simulating liquid are shown as below.

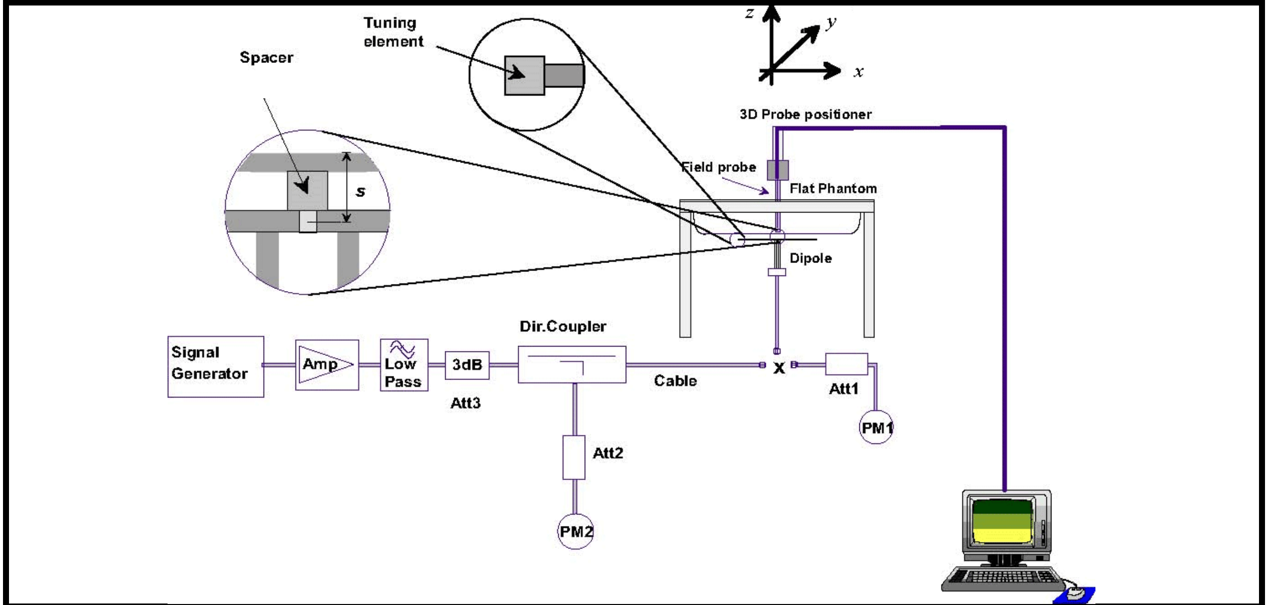
Test Date	Tissue Type	Frequency (MHz)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)
2024/3/30	Head	5600	5.087	36.289	5.07	35.5	0.34	2.22
2024/3/30	Head	5750	5.258	36.16	5.22	35.4	0.73	2.15

Note:
The dielectric properties of the tissue simulating liquid must be measured within 24 hours before the SAR testing and within ±5% of the target values. Liquid temperature during the SAR testing must be within ±2 ℃.

8.5 System Validation

System check Procedure

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



System Verification Setup

The validation dipole is placed beneath the flat phantom with the specific spacer in place. The distance spacer is touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The spectrum analyzer measures the forward power at the location of the system check dipole connector. The signal generator is adjusted for the desired forward power (250 mW is used for 700 MHz to 3 GHz, 100 mW is used for 3.5 GHz to 6 GHz) at the dipole connector and the power meter is read at that level. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter.

After system check testing, the SAR result will be normalized to 1W forward input power and compared with the reference SAR value derived from validation dipole certificate report. The deviation of system check should be within 10 %.

8.6 System Verification

The measuring results for system check are shown as below.

Test Date	Frequency (MHz)	System Validation 1g SAR				System Validation 10g SAR			
		Measured SAR (W/kg)	Normalized SAR (W/kg)	Targeted SAR (W/kg)	Deviation (%)	Measured SAR (W/kg)	Normalized SAR (W/kg)	Targeted SAR (W/kg)	Deviation (%)
2024/3/30	5600	8.11	81.1	82.3	-1.46	2.34	23.4	23.4	0.00
2024/3/30	5750	8.06	80.6	78.6	2.54	2.31	23.1	22.3	3.59

Test Date	Frequency (MHz)	Dipole S/N	Probe S/N	DAE S/N
2024/3/30	5600	1235	7400	855
2024/3/30	5750	1235	7400	855

Note:
Comparing to the reference SAR value provided by SPEAG, the validation data should be within its specification of 10 %. The result indicates the system check can meet the variation criterion and the plots can be referred to Appendix A of this report.

8.7 Maximum Output Power

8.7.1 Measured Conducted Power Result

All Rate have been tested, the Worst average power (Unit: dBm) is shown as below.

<WLAN 5G>

5.3G WIFI						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune-up
5.3G	802.11a	52	5260	6	8.03	8.5
		56	5280		8.39	8.5
		60	5300		8.41	8.5
		64	5320		8.33	8.5
	802.11n HT20	52	5260	MCS0	8.33	8.5
		56	5280		8.33	8.5
		60	5300		8.35	8.5
		64	5320		8.36	8.5
	802.11n HT40	54	5270	MCS0	8.26	8.5
		62	5310		8.14	8.5
	802.11ac VHT20	52	5260	NSS1 MCS0	8.4	8.5
		56	5280		8.38	8.5
		60	5300		8.35	8.5
		64	5320		8.39	8.5
	802.11ac VHT40	54	5270	NSS1 MCS0	8.29	8.5
		62	5310		8.17	8.5
	802.11ac VHT80	58	5290	NSS1 MCS0	8.51	9

5.3G WIFI						
Band	Mode	Channel	Frequency (MHz)	Data Rate (Mbps)	Average Power (dBm)	Max. Tune-up
5.3G	802.11a	100	5500	6	8.96	9
		116	5580		9.08	9.5
		132	5660		8.99	9
		140	5700		8.91	9
	802.11n HT20	100	5500	MCS0	8.71	9
		116	5580		8.9	9
		132	5660		9	9
		140	5700		9.11	9.5
	802.11n HT40	102	5510	MCS0	8.84	9
		110	5550		8.9	9
		134	5670		8.95	9
	802.11ac VHT20	100	5500	NSS1 MCS0	8.74	9
		116	5580		8.96	9
		132	5660		9.05	9.5
		140	5700		9.18	9.5
	802.11ac VHT40	102	5510	NSS1 MCS0	8.88	9
		110	5550		8.91	9
		134	5670		8.99	9
	802.11ac VHT80	106	5530	NSS1 MCS0	9.37	9.5

8.8 SAR Testing Results

8.8.1 SAR Test Reduction Considerations

<KDB 447498 D01, General RF Exposure Guidance>

Testing of other required channels within the operating mode of a frequency band is not required when the reported SAR for the mid-band or highest output power channel is:

(1) ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz

(2) ≤ 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

(3) ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

<KDB 248227 D01, SAR Guidance for Wi-Fi Transmitters>

(1) For handsets operating next to ear, hotspot mode or mini-tablet configurations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When the reported SAR of initial test position is <= 0.4 W/kg, SAR testing for remaining test positions is not required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is <= 0.8 W/kg or all test positions are measured.

(2) For WLAN 2.4 GHz, the highest measured maximum output power channel for DSSS was selected for SAR measurement. When the reported SAR is <= 0.8 W/kg, no further SAR testing is required. Otherwise, SAR is evaluated at the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel. For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is <= 1.2 W/kg.

(3) For WLAN 5 GHz, the initial test configuration was selected according to the transmission mode with the highest maximum output power. When the reported SAR of initial test configuration is > 0.8 W/kg, SAR is required for the subsequent highest measured output power channel until the reported SAR result is <= 1.2 W/kg or all required channels are measured. For other transmission modes, SAR is not required when the highest reported SAR for initial test configuration is adjusted by the ratio of subsequent test configuration to initial test configuration specified maximum output power and it is <= 1.2 W/kg.

8.8.2 SAR Results for Head Exposure Condition

Plot No.	Band	Mode	Test Position	Ch.	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Tune-up Scaling Factor	Duty Cycle Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Reported SAR-1g (W/kg)
	WLAN5GHz	802.11ac-VHT80	Right Cheek	58	5290	8.51	9.00	1.119	1.139	-0.14	0.768	0.979
13	WLAN5GHz	802.11ac-VHT80	Right Tilted	58	5290	8.51	9.00	1.119	1.139	-0.03	0.914	**1.165**
	WLAN5GHz	802.11ac-VHT80	Left Cheek	58	5290	8.51	9.00	1.119	1.139	-0.17	0.833	1.062
	WLAN5GHz	802.11ac-VHT80	Left Tilted	58	5290	8.51	9.00	1.119	1.139	0	0.887	1.131
	WLAN5GHz	802.11ac-VHT80	Right Cheek	106	5530	9.37	9.50	1.030	1.139	-0.05	0.920	1.080
14	WLAN5GHz	802.11ac-VHT80	Right Tilted	106	5530	9.37	9.50	1.030	1.139	0.07	1.020	**1.197**
	WLAN5GHz	802.11ac-VHT80	Left Cheek	106	5530	9.37	9.50	1.030	1.139	-0.1	0.909	1.067
	WLAN5GHz	802.11ac-VHT80	Left Tilted	106	5530	9.37	9.50	1.030	1.139	-0.18	0.952	1.117

8.8.3 SAR Results for Body-worn Exposure Condition (Separation Distance is 1.0cm Gap)

Plot No.	Band	Mode	Test Position	Headset	Ch.	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Tune-up Scaling Factor	Duty Cycle Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Reported SAR-1g (W/kg)
15	WLAN5GHz	802.11ac-VHT80	Front	-	58	5290	8.51	9.00	1.119	1.139	-0.03	0.233	**0.297**
	WLAN5GHz	802.11ac-VHT80	Front	Headset	58	5290	8.51	9.00	1.119	1.139	-0.17	0.211	0.269
	WLAN5GHz	802.11ac-VHT80	Back	-	58	5290	8.51	9.00	1.119	1.139	-0.12	0.085	0.108
16	WLAN5GHz	802.11ac-VHT80	Front	-	106	5530	9.37	9.50	1.030	1.139	-0.05	0.253	**0.297**
	WLAN5GHz	802.11ac-VHT80	Front	Headset	106	5530	9.37	9.50	1.030	1.139	-0.18	0.240	0.282
	WLAN5GHz	802.11ac-VHT80	Back	-	106	5530	9.37	9.50	1.030	1.139	-0.15	0.087	0.102

8.8.4 SAR Results for Extremity Exposure Condition (Separation Distance is 0cm Gap)

Plot No.	Band	Mode	Test Position	Ch.	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Tune-up Scaling Factor	Duty Cycle Scaling Factor	Power Drift (dB)	Measured SAR-10g (W/kg)	Reported SAR-10g (W/kg)
17	WLAN5GHz	802.11ac-VHT80	Front	58	5290	8.51	9.00	1.119	1.139	0.17	0.342	**0.436**
	WLAN5GHz	802.11ac-VHT80	Back	58	5290	8.51	9.00	1.119	1.139	-0.14	0.036	0.046
	WLAN5GHz	802.11ac-VHT80	Left Side	58	5290	8.51	9.00	1.119	1.139	-0.14	0.018	0.023
	WLAN5GHz	802.11ac-VHT80	Right Side	58	5290	8.51	9.00	1.119	1.139	-0.12	0.060	0.077
	WLAN5GHz	802.11ac-VHT80	Top Side	58	5290	8.51	9.00	1.119	1.139	-0.08	0.195	0.249
	WLAN5GHz	802.11ac-VHT80	Bottom Side	58	5290	8.51	9.00	1.119	1.139	-0.08	0.004	0.005
18	WLAN5GHz	802.11ac-VHT80	Front	106	5530	9.37	9.50	1.030	1.139	0.1	0.306	**0.359**
	WLAN5GHz	802.11ac-VHT80	Back	106	5530	9.37	9.50	1.030	1.139	-0.19	0.054	0.063
	WLAN5GHz	802.11ac-VHT80	Left Side	106	5530	9.37	9.50	1.030	1.139	-0.08	0.009	0.011
	WLAN5GHz	802.11ac-VHT80	Right Side	106	5530	9.37	9.50	1.030	1.139	0.01	0.074	0.087
	WLAN5GHz	802.11ac-VHT80	Top Side	106	5530	9.37	9.50	1.030	1.139	-0.06	0.251	0.295
	WLAN5GHz	802.11ac-VHT80	Bottom Side	106	5530	9.37	9.50	1.030	1.139	-0.04	0.020	0.023

8.8.5 SAR Measurement Variability

According to KDB 865664 D01, SAR measurement variability was assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. Alternatively, if the highest measured SAR for both head and body tissue-equivalent media are ≤ 1.45 W/kg and the ratio of these highest SAR values, i.e., largest divided by smallest value, is ≤ 1.10, the highest SAR configuration for either head or body tissue-equivalent medium may be used to perform the repeated measurement. These 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.

Since all the measured SAR are less than 0.8 W/kg, the repeated measurement is not required.

8.8.6 DUT Holder Perturbations

Depending on antenna locations, buttons locations on phones or device, form factor (e.g. dongles etc.), the measured SAR could be influenced by the relative positions of the test device and its holder.

When the highest reported SAR of an antenna is > 1.2 W/kg, holder perturbation verification is required, using the highest SAR configuration among all applicable frequency bands with and without the device holder.

All the measured SAR are less than 1.2 W/kg, so the holder perturbation verification is not required.

9. Appendixes

Appendix A – SAR Plots of System Verification

Appendix B – SAR Plots of SAR Measurement

Appendix C – Calibration Certificate for Probe and Dipole

Appendix D – Photographs of the Test Set-Up

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