

SAR Test Report

Test Report No. 14926563S-A-R1

Customer	KONICA MINOLTA, INC.
Description of EUT	SKR 3000
Model Number of EUT	P-53
FCC ID	YR7SKR3000P9
Test Regulation	FCC 47CFR 2.1093
Test Result	Complied
Issue Date	May 23, 2024
Remarks	-

Representative Test EngineerHiroshi Naka
Engineer**Approved By**Toyokazu Imamura
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CERTIFICATE 1266.03

- ☐ The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan, Inc.
- ☒ There is no testing item of "Non-accreditation".

Report Cover Page -Form-ULID-003532 (DCS:13-EM-F0429) Issue# 23.0 (SAR Revision-v23.3sar240122)

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REVISION HISTORY

Original Test Report No.: 14926563S-A

This report is a revised version of 14926563S-A. 14926563S-A is replaced with this report.

Revision	Test Report No.	Date	Page Revised Contents
- (Original)	14926563S-A	February 21, 2024	-
-R1	14926563S-A-R1	May 23, 2024	(p5, clause 2.2) Corrected errors in Feature of EUT) "Model number: P-95~" (was) -> "Model number: P-53~ "(new) (p36, Appendix 3-4) Corrected errors in the attached calibration data file.

Reference : Abbreviations (Including words undescribed in this report) (radio_r0v09s06_230726)

A2LA	The American Association for Laboratory Accreditation	JAB	Japan Accreditation Board
AC	Alternating Current	LAN	Local Area Network
AFH	Adaptive Frequency Hopping	LIMS	Laboratory Information Management System
AM	Amplitude Modulation	MCS	Modulation and Coding Scheme
Amp, AMP	Amplifier	MIMO	Multiple Input Multiple Output (Radio)
ANSI	American National Standards Institute	MRA	Mutual Recognition Arrangement
Ant, ANT	Antenna	MU-MIMO	Multi-User Multiple Input Multiple Output (Radio)
AP	Access Point	N/A	Not Applicable, Not Applied
APD	Absorbed Power Density	NII	National Information Infrastructure (Radio)
ASK	Amplitude Shift Keying	NIST	National Institute of Standards and Technology
Atten., ATT	Attenuator	NR	New Radio
AV	Average	NS	No signal detect.
BPSK	Binary Phase-Shift Keying	NSA	Normalized Site Attenuation
BR	Bluetooth Basic Rate	OBW	Occupied Band Width
BT	Bluetooth	OFDM	Orthogonal Frequency Division Multiplexing
BT LE	Bluetooth Low Energy	PD	Power Density
BW	BandWidth	P/M	Power meter
Cal Int	Calibration Interval	PCB	Printed Circuit Board
CCK	Complementary Code Keying	PER	Packet Error Rate
CDD	Cyclic Delay Diversity	PHY	Physical Layer
CFR	Code of Federal Regulations	PK	Peak
Ch., CH	Channel	PN	Pseudo random Noise
CISPR	Comite International Special des Perturbations Radioelectriques	PRBS	Pseudo-Random Bit Sequence
CW	Continuous Wave	PSD	Power Spectral Density
DBPSK	Differential BPSK	QAM	Quadrature Amplitude Modulation
DC	Direct Current	QP	Quasi-Peak
D-factor	Distance factor	QPSK	Quadrature Phase Shift Keying
DFS	Dynamic Frequency Selection	RBW	Resolution Band Width
DQPSK	Differential QPSK	RDS	Radio Data System
DSSS	Direct Sequence Spread Spectrum	RE	Radio Equipment
DUT	Device Under Test	RF	Radio Frequency
EDR	Enhanced Data Rate	RMS	Root Mean Square
EIRP, e.i.r.p.	Equivalent Isotropically Radiated Power	RSS	Radio Standards Specifications
EMC	ElectroMagnetic Compatibility	RU	Resource Unit
EMI	ElectroMagnetic Interference	Rx	Receiving
EN	European Norm	SA, S/A	Spectrum Analyzer
ERP, e.r.p.	Effective Radiated Power	SAR	Specific Absorption Rate
ETSI	European Telecommunications Standards Institute	SDM	Space Division Multiplexing
EU	European Union	SISO	Single Input Single Output (Radio)
EUT	Equipment Under Test	SG	Signal Generator
Fac.	Factor	SPLSR	SAR to Peak Location Separation Ratio
FCC	Federal Communications Commission	SVSWR	Site-Voltage Standing Wave Ratio
FHSS	Frequency Hopping Spread Spectrum	TSL	Tissue Simulation Liquid
FM	Frequency Modulation	T/R	Test Receiver
Freq.	Frequency	Tx	Transmitting
FSK	Frequency Shift Keying	U-NII	Unlicensed National Information Infrastructure (Radio)
GFSK	Gaussian Frequency-Shift Keying	VBW	Video BandWidth
GNSS	Global Navigation Satellite System	Vert.	Vertical
GPS	Global Positioning System	VHT	Very High Throughput (e.g. IEEE 802.11ac20VHT)
HE	High Efficiency (e.g. IEEE 802.11ax20HE)	WLAN	Wireless LAN
HT	High Throughput (e.g. IEEE 802.11n20HT)	Wi-Fi, WIFI	Wireless LAN, trademarked by Wi-Fi Alliance
Hori.	Horizontal		
ICES	Interference-Causing Equipment Standard		
IEC	International Electrotechnical Commission		
IEEE	Institute of Electrical and Electronics Engineers		
IF	Intermediate Frequency		
ILAC	International Laboratory Accreditation Conference		
IPD	Incident Power Density		
ISED	Innovation, Science and Economic Development Canada		
ISO	International Organization for Standardization		

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SECTION 1: Customer information

Company Name	KONICA MINOLTA, INC.
Address	1, Sakura-machi, Hino-shi, Tokyo, Japan 191-8511
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Contact Person	Ken Nagami

The information provided from the customer is as follows:

- Customer name, Company name, Type of Equipment, Model No., FCC ID on the cover and other relevant pages.
- SECTION 1: Customer information
- SECTION 2: Equipment under test (EUT)
- SECTION 4: Operation of EUT during testing
- Appendix 1: The part of Antenna location information, Description of EUT and Support Equipment

SECTION 2: Equipment under test (EUT)

This report contains data provided by the customer which can impact the validity of results. UL Japan, Inc. is only responsible for the validity of results after the integration of the data provided by the customer. The data provided by the customer is marked "a)" in the table below.

2.1 Identification of EUT

Type	SKR 3000
Model Number	P-53
Serial Number	AEA0-S0004
Rating	DC 15 V (Re-chargeable battery, the battery is had built-in in the EUT, and the user can not remove the battery.)
Condition of sample	Engineering prototype (Not for sale: The sample is equivalent to mass-produced items.)
Receipt Date of sample	November 6, 2023 (for power measurement) (*. No modification by the Lab.) January 9, 2024 (for SAR test) (*. No modification by the Lab.)
Test Date (SAR)	January 10~12 and 15, 2024

2.2 Product Description

General

Feature of EUT	Model number: P-53 (referred to as the EUT in this report) is a flat panel type detector "SKR 3000" which has WLAN function.
SAR Category Identified	Portable device (*. Since EUT may contact to a localized human body during wireless operation, the partial-body SAR (1g) shall be observed.)
SAR Accessory	None

Radio specification

Equipment type	Transceiver	
Frequency of operation	WLAN 2.4 GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2 GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3 GHz Band: 5260 MHz ~ 5320 MHz	WLAN 5.6 GHz Band: 5500 MHz ~ 5700 MHz WLAN 5.8 GHz Band: 5745 MHz ~ 5825 MHz
Supported modulations	WLAN 2.4 GHz band) 11b: DSSS, DBPSK/DQPSK/CCK; 11g/n: OFDM, BPSK/QPSK/16QAM/64QAM WLAN 5 GHz band) 11a/n: OFDM, BPSK/QPSK/16QAM/64QAM	
Typical and maximum transmit power	*. The specification of typical and maximum transmit power (which may occur) refer to remarks in below "Table of Typical power and Maximum tune-up tolerance limit power". The measured output power (conducted) as SAR reference power refers to section 5 in this report.	
Antenna quantity	2 pcs. (*. Separation distance between antenna 1 and antenna 2: approx. 500 mm) *. Mode of 11b, 11g, 11a: One selected Tx antenna operation. *. Mode of 11n20: One selected Tx antenna operation (MCS0~7) / Two Tx antenna operation (MCS8~13)	
Antenna ID	Antenna 1	Antenna 2
Antenna type	PIFA (Planar Inverted F Antenna)	PIFA (Planar Inverted F Antenna)
Antenna connector type	PCB side: U.FL, Antenna side: soldered	PCB side: U.FL, Antenna side: soldered
Antenna gain ^{a)} (max. gain) (*.including cable loss)	-1.95 dBi (2.4 GHz band), -0.98 dBi (5 GHz band)	-2.21 dBi (2.4 GHz band), -1.54 dBi (5 GHz band)

*. The EUT do not use the special transmitting technique such as "beam-forming" and "time-space code diversity."

*. **Table of Typical power and Maximum power (= Maximum tune-up tolerance limit power)**

Maximum tune-up tolerance limit is conducted burst average power and is defined by a customer as Duty cycle 100% (continuous transmitting).

			SISO				MIMO						
Band	Ch.	Frequency [MHz]	Mode	D/R or MCS Index	Typical [dBm]		Max. [dBm]		Mode	MCS Index	Typical [dBm]		Max. [dBm]
					Ant.#1	Ant.#2	Ant.#1	Ant.#2			Ant.1	Ant.2	
WLAN 2.4 GHz	1~11	2412~2462	11b	1~11 Mbps	10.0	10.0	13.0	13.0					
			11g	6~54 Mbps	11.0	11.0	13.5	13.5					
			11n20	MCS0~7	11.0	11.0	13.5	13.5	11n20	MCS8~15	11.0	11.0	14.0
WLAN 5.2 GHz	36~48	5180~5240	11a	6~54 Mbps	6.0	6.0	8.5	8.5					
			11n20	MCS0~7	6.0	6.0	8.5	8.5	11n20	MCS8~15	6.0	6.0	9.0
WLAN 5.3 GHz	52~64	5260~5320	11a	6~54 Mbps	6.0	6.0	8.5	8.5					
			11n20	MCS0~7	6.0	6.0	8.5	8.5	11n20	MCS8~15	6.0	6.0	9.0
WLAN 5.6 GHz	100~140	5500~5700	11a	6~54 Mbps	6.0	6.0	8.5	8.5					
			11n20	MCS0~7	6.0	6.0	8.5	8.5	11n20	MCS8~15	6.0	6.0	9.0
WLAN 5.8 GHz	149~165	5754~5825	11a	6~48 Mbps	6.0	6.0	8.5	8.5					
			11n20	MCS0~7	6.0	6.0	8.5	8.5	11n20	MCS8~15	6.0	6.0	9.0

*. Ch.: channel, D/R: data rate, Ant.: antenna, Max. Maximum tune-up limit power, N/A: Not applicable.

SECTION 3: Maximum SAR value, test specification and procedures

3.1 Summary of Maximum SAR Value

Mode / Band	Highest Reported SAR [W/kg]								
	Partial-body (Separation 0 mm, Flat phantom)			Head (Separation 0 mm, SAM phantom)			Limbs (Separation 0 mm, Flat phantom)		
	SAR type: SAR (1g)			SAR type: SAR (1g)			SAR type: SAR (10g)		
	Standalone		Simultaneous Transmission	Standalone		Simultaneous Transmission	Standalone		Simultaneous Transmission
	Antenna 1	Antenna 2		Antenna 1	Antenna 2		Antenna 1	Antenna 2	
WLAN 2.4 GHz	1.04	0.65	SPLSR: < 0.04 (*2)	N/A	N/A	N/A	N/A	N/A	N/A
WLAN 5.2 GHz	0.63	0.59	SPLSR: < 0.04 (*2)	N/A	N/A	N/A	N/A	N/A	N/A
WLAN 5.3 GHz	0.58	0.42	SPLSR: < 0.04 (*2)	N/A	N/A	N/A	N/A	N/A	N/A
WLAN 5.6 GHz	0.72	0.61	SPLSR: < 0.04 (*2)	N/A	N/A	N/A	N/A	N/A	N/A
WLAN 5.8 GHz	1.04	0.69	SPLSR: < 0.04 (*2)	N/A	N/A	N/A	N/A	N/A	N/A
Limit applied	Partial body/Head: 1.6 W/kg (SAR (1g)), Limbs: 4 W/kg (SAR (10g)), for general population/uncontrolled exposure is specified in FCC 47 CFR 2.1093.								
Test Procedure	Refer to Section 3.3 in this report. In addition; UL Japan's SAR measurement work procedures No. ULID-003599 (13-EM-W0430). UL Japan's SAR measurement equipment calibration and inspection work procedures No. ULID-003598 (13-EM-W0429).								
Category	Portable device (The devices being used within 20 cm between user and EUT.)								

*1. (KDB 248227 D01v02r02, Clause 6.1: Antenna Spatial Configurations) The SAR1g distribution of antenna 1 and antenna 2 wasn't overlapped, because the distance between the antenna 1 and antenna 2 was away sufficiently. (refer to clause 7.2, Appendix 1-1 of antenna position) Therefore, SAR from an antenna (either antenna 1 or antenna 2) was the result which indicates the higher SAR value.

*2. SPLSR is smaller than 0.04, even if the SAR(1g) values of each antenna 1 and 2 is shown to equal to the SAR (1g) limit = 1.6 W/kg. (refer to clause 7.2)

Conclusion

The SAR test values found for the device are separately below the maximum limit of 1.6 W/kg.

3.2 RF Exposure limit

SAR Exposure Limit (100 kHz ~ 6 GHz)		
	General Population / Uncontrolled Exposure (*1) [W/kg]	Occupational / Controlled Exposure (*2) [W/kg]
Spatial Peak SAR (*3) (Whole Body)	0.08	0.4
Spatial Peak SAR (*4) (Partial-Body, Head or Body)	1.6	8
Spatial Peak SAR (*5) (Hands / Feet / Ankle / Wrist)	4	20

*. For the purpose of this Regulation, FCC has adopted the SAR and RF exposure limits established in FCC 47 CFR 1.1310: Radiofrequency radiation exposure limits.

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

*2. Occupational / 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).

*3. The Spatial Average value of the SAR averaged over the whole body.

*4. 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

*5. 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

The limit applied to this device which tested in this report is;

Limit of Spatial Peak SAR (Partial-Body)	1.6 W/kg	General population / uncontrolled exposure
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3.3 Test specification

Standard	Description	Version
47 CFR 2.1093	(Limit) Radiofrequency radiation exposure evaluation: portable devices	-
ANSI/IEEE C95.1	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 KHz to 300 GHz	1992
IEEE Std. 1528	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques.	2013
KDB 248227 D01	SAR Guidance for IEEE 802.11 (Wi-Fi) transmitters	v02r02
KDB 447498 D04	Interim General RF Exposure Guidance	v01
KDB 447498 D03	OET Bulletin 65, Supplement C Cross-Reference	v01
KDB 865664 D01	SAR measurement 100 MHz to 6 GHz	v01r04
KDB 865664 D02	RF exposure compliance reporting and documentation considerations	v01r02
KDB 388624 D02	Pre-approval guidance list-APPENDIX OVER6G	v18r03

*. The measurement uncertainty budget is suggested by IEC/IEEE 62209-1528:2020 and determined by SPEAG, DASY8 Manual for Module SAR. Refer to Appendix3-3 for more details.

In addition to the above, the following information was used:

TCB workshop, 2016-10	RF Exposure Procedure, DUT Holder Perturbations; When the highest reported SAR of an antenna is > 1.2 W/kg, holder perturbation verification is required for each antenna, using the highest SAR configuration among all applicable frequency bands.
TCB workshop, 2018-04	Expedited Area Scans. (Including mother scans)
TCB workshop, 2019-04	RF Exposure Procedure, 802.11ax SAR Testing
TCB workshop, 2019-10	RF Exposure Procedure, Tissue Simulating Liquids (TSL) -FCC has permitted the use of single head tissue simulating liquid specified in IEC 62209 for all SAR tests. -If FCC parameters are used, 5 % tolerance. If IEC parameters, 10 %.

3.4 Addition, deviation and exclusion to the test procedure

No addition, exclusion nor deviation has been made from the test procedure.

3.5 Test Location

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Telephone number: +81 463 50 6400 / Facsimile number: +81 463 50 6401

*. A2LA Certificate Number: 1266.03 (FCC Test Firm Registration Number: 626366, ISED Lab Company Number: 2973D / CAB identifier: JP0001)

Place	Width × Depth × Height (m)	Size of reference ground plane (m) / horizontal conducting plane
No.7 Shielded room	2.76 × 3.76 × 2.4	2.76 × 3.76

3.6 SAR measurement procedure

3.6.1 SAR Definition

SAR is defined as 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 shown in right.	$SAR = \frac{d}{dt} \left(\frac{dW}{dm} \right) = \frac{d}{dt} \left(\frac{dW}{\rho \cdot dV} \right)$
SAR measurement can be related to the electrical field in the tissue by the equation in right. SAR is expressed in units of Watts per kilogram (W/kg). Where : σ = conductivity of the tissue (S/m), ρ = mass density of the tissue (kg/m³), E = RMS electric field strength in tissue (V/m)	$SAR = \frac{\sigma E ^2}{\rho}$

3.6.2 Full SAR measurement procedure

The SAR measurement procedures are as follows: (1) The EUT is installed engineering testing software that provides continuous transmitting signal; (2) Measure output power through RF cable and power meter; (3) Set scan area, grid size and other setting on the DASY software; (4) Find out the largest SAR result on these testing positions of each band; (5) Measure SAR results for other channels in worst SAR testing position if the SAR of highest power channel is larger than 0.8 W/kg.

- * According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:
Step 1) Power measurement -> SAR: Step 2) Power reference measurement -> Step 3) Area scan -> Step 4) Zoom scan -> Step 5) Power drift measurement

Step 1: Confirmation before SAR testing

Before SAR test, the RF wiring for the sample had been switched to the antenna conducted power measurement line from the antenna line and the average power was measured. This SAR reference power measurement was proceeded with the lowest data rate (which may have the higher time-based average power typically) on each operation mode and on the lower, middle (or near middle), upper and specified channels. The power measurement result is shown in Section 5.

- * The EUT transmission power used SAR test was verified that it was not more than 2 dB lower than the maximum tune-up tolerance limit. (KDB447498 D01 (v06))

Step 2: Power reference measurement

Measured psSAR value at a peak location of Fast Area Scan was used as a reference value for assessing the power drop.

Step 3: Area Scan

(Scan parameters: KDB 865664 D01, IEC/IEEE 62209-1528 (> 6GHz))
Area Scans are used to determine the peak location of the measured field before doing a finer measurement around the hotspot. Peak location can be found accurately even on coarse grids using the advanced interpolation routines implemented in DASY8. Area Scans measure a two dimensional volume covering the full device under test area. DASY8 uses Fast Averaged SAR algorithm to compute the 1 g and 10 g of simulated tissue from the Area Scan. DASY8 can either manually or automatically generates Area Scan grid settings based on device dimensions. In automatically case, the scan extent is defined by the device dimensions plus additional 15mm on each side. In manually, the scan covered the entire dimension of the antenna of EUT.

Step 4: Zoom Scan and post-processing

(Scan parameters: KDB 865664 D01, IEC/IEEE 62209-1528 (> 6GHz))
Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure.

- * A minimum volume of 30 mm (x) × 30 mm (y) × 30 mm (z) was assessed by "Ratio step" method (*1), for 2.4 GHz band. (Step XY: 5 mm)
* A minimum volume of 24 mm (x) × 24 mm (y) × 24 mm (z) was assessed by "Ratio step" method (*1), for 5 GHz band (Step XY: 4 mm).
* A minimum volume of 24 mm (x) × 24 mm (y) × 24 mm (z) was assessed by "Ratio step" method (*1), for 6 GHz band (Step XY: 3.4 mm).

When the SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are proceeded for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR. If the zoom scan measured as defined above complies with both of the following criteria, or if the peak spatial-average SAR is below 0.1 W/kg, no additional measurements are needed.

- * The smallest horizontal distance from the local SAR peaks to all points 3 dB below the SAR peak shall be larger than the horizontal grid steps in both x and y directions and recorded.
* The ratio of the SAR at the second measured point to the SAR at the closest measured point at the x-y location of the measured maximum SAR value shall be at least 30 % and recorded.

		$f \leq 3$ GHz	$3 \text{ GHz} < f \leq 10$ GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface		5 mm ± 1 mm	$1/2 \times \delta \times \ln(2)$ mm ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location		5° ± 1° (flat phantom only) 30° ± 1° (other phantom)	5° ± 1° (flat phantom only) 30° ± 1° (other phantom)
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, > 6 GHz : ≤ 60/f mm, or half of the corresponding zoom scan length, whichever is smaller.
Maximum zoom scan spatial resolution: Δx_{Zoom} , Δy_{Zoom}		≤ 2 GHz : ≤ 8 mm, 2~3 GHz : ≤ 5 mm (*1)	3~4 GHz : ≤ 5 mm (*1), 4~6 GHz : ≤ 4 mm (*1), > 6 GHz : ≤ 24/f 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, > 6 GHz : ≤ 10/(f-1) mm
	graded grid $\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface $\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 4 mm	3~4 GHz : ≤ 3 mm, 4~5 GHz : ≤ 2.5 mm, 5~6 GHz : ≤ 2 mm, > 6 GHz : ≤ 12/f mm
Minimum zoom scan volume	x, y, z	≥ 30 mm	3~4 GHz : ≥ 28 mm, 4~5 GHz : ≥ 25 mm, 5~6 GHz : ≥ 22 mm, > 6 GHz : ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 (≤ 6 GHz) and IEC/IEEE 62209-1528 (≤ 10 GHz) for details.

*1. When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz. (KDB 865664 D01)

* The scan parameters of > 6GHz is defined IEC/IEEE 62209-1528.

Step 5: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same project. The Power Drift Measurement gives the SAR difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. It was checked that the power drift was within ± 5% (0.21 dB) in single SAR project run. The verification of power drift during the SAR test shown in SAR plot data of APPENDIX 2.

- * The most of SAR tests were conservatively performed with test separation distance 0 mm. The phantom bottom thickness is approx. 2mm. Therefore, the distance between the SAR probe tip to the surface of test device which is touched the bottom surface of the phantom is approx. 2.4 mm. Typical distance from probe tip to probe's dipole centers is 1mm.
*1. "Ratio step" method parameters used; the first measurement point: "1.4 mm" from the phantom surface, the initial z grid separation: "1.5 mm", subsequent graded grid ratio: "1.5" for 2.4 GHz band and the initial z grid separation: "1.4 mm", subsequent graded grid ratio: "1.4" for above 5 GHz. These parameters comply with the requirement of KDB 865664 D01 and recommended by Schmid & Partner Engineering AG (DASY8 manual).

SECTION 4: Operation of EUT during testing

4.1 Operating modes for testing

The EUT has IEEE 802.11b, 11g, 11a and 11n continuous transmitting modes. The frequency and the modulation used in the SAR testing are shown as a following.

Operation mode		11b		11g		11n20		11a		11n20		11a		11n20		11a		11n20		11a		11n20									
band		WLAN 2.4GHz						WLAN 5.2 GHz (*3)						WLAN 5.3 GHz						WLAN 5.6 GHz						WLAN 5.8 GHz					
Tx band [MHz]		2402~2462						5180~5240						5260~5320						5500~5700						5745~5825					
Antenna#		1	2	1	2	1	2	1+2	1	2	1	2	1+2	1	2	1	2	1+2	1	2	1	2	1+2	1	2	1	2	1+2			
Tune-up limit [dBm]		13	13	13.5	13.5	13.5	13.5	13.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5			
SAR test considered. (*) initial test setup and mode) (*1)	Rear	○	○	×	×	×	×	×	○	○	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×			
	Front	○	○	×	×	×	×	×	○	○	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×			
	Right (Ant.1)	○*	×	○	×	○	×	○	○*	×	○	×	○	○*	×	○	×	○	○*	×	○	×	○	○*	×	○	×	○			
	Bottom (Ant.2)	×	○*	×	○	×	○	×	○*	×	○	×	○	×	○*	×	○	×	○*	×	○	×	○*	×	○	×	○	×			
	Right	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×			
	Top	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×			
Frequency tested		(*)2	(*)2	(*)2	(*)2	n/a	n/a	n/a	(*)2	(*)2	n/a	n/a	n/a	(*)2	(*)2	n/a	n/a	n/a	(*)2	(*)2	n/a	n/a	n/a	(*)2	(*)2	n/a	n/a	n/a			
Data rate [Mbps] or MCS index#		1	1	6	6	#0	#0	#8	6	6	#0	#0	#8	6	6	#0	#0	#8	6	6	#0	#0	#8	6	6	#0	#0	#8			
Controlled software	Test name		Software name						Version		Released Date		Storage location																		
	Power measurement, SAR		Panel Firmware						V5.00R00_004		2023-07-07		EUT memory																		
			QRCT (Qualcomm Radio Control Tool)						4.0.00125		2023-11-06		Connected host PC																		

- *. Ant: antenna, Antenna: "1", "2" means SISO, "1+2" means MIMO; n/a: not applied.
 *. (KDB 248227 D01) For 2.4GHz band, DSSS mode is initial mode. For 5GHz band of OFDM, Initial SAR test was applied to the operation mode which has higher bandwidth with the highest tune-up power and lowest data rate (lowest modulation).
 *. Marks on "SAR test considered" are "o": SAR test was applied. "x": SAR test exempt (refer to clause 4.2).
 *. The tested frequencies refer to SAR test results in Section 7.
 *. SAR test of WLAN 5.2 GHz band was also applied for the reference purpose, even though the reported SAR(1g) of WLAN 5.3 GHz band were smaller than 1.2 W/kg.

*. OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements

(KDB 248227 D01, SAR Guidance for Wi-Fi Transmitters) The initial test configuration for 2.4 GHz and 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 channel bandwidth configurations in a frequency band 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.

*. SAR test reduction considerations

(KDB 447498 D04(v01), General RF Exposure Guidance) Testing of other required channels within the operating mode of a frequency band is not required when the reported 1g or 10g SAR for the mid-band or highest output power channel is:

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

The SAR has been measured with highest transmission duty factor supported by the test mode tool for WLAN and/or Bluetooth. When the transmission duty factor could not be 100%, the reported SAR will be scaled to 100% transmission duty factor to determine compliance. When SAR is not measured at the maximum power level allowed for production unit, the measured SAR will be scaled to the maximum tune-up tolerance limit to determine compliance.

(KDB 248227 D01, SAR Guidance for Wi-Fi Transmitters) (Clause 5.1.1 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:

- 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).
- 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.
- 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. Additional power measurements may be required for this step, which should be limited to those necessary for identifying the subsequent highest output power channels.

For 2.4 GHz band, the highest measured maximum output power channel of DSSS was selected for SAR measurement. When the reported SAR is ≤ 0.8 W/kg, no further SAR test is required in this exposure configuration. Otherwise, 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. 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 the adjusted SAR is ≤ 1.2 W/kg.

For 5 GHz band, the initial test configuration was selected accordance to the transmission mode with the highest maximum output power. When the reported SAR 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 the adjusted SAR is ≤ 1.2 W/kg.

4.2 RF exposure conditions (Test exemption)

Antenna separation distances in each test setup plan are shown as follows.

Setup	Explanation of EUT setup (*. Refer to Appendix 1 for test setup photographs.)	Antenna ID:	
		1	2
Right	The right surface of EUT was touched to the Flat phantom.	1.8	≈ 310
Bottom	The bottom surface (existed) of EUT was touched to the Flat phantom.	≈ 390.5	1.8
Back	The back surface of EUT was touched to the Flat phantom.	2.6	2.6
Front	The front surface (LCD) of EUT was touched to the Flat phantom.	3.7	3.7
Top	The top surface of EUT was touched to the Flat phantom.	27.5	≈ 460
Left	The left surface of EUT was touched to the Flat phantom.	≈ 384	32

*. D: Antenna separation distance. It is the distance from the antenna inside EUT to the outer surface of EUT which user may touch.

SAR test exemption consideration by KDB 447498 D04 (v01)

Tx mode	Higher Freq. [MHz]	Max. conducted output power [dBm] [mW]	Judge of SAR test exemption ("Test" or "Exempt") (upper row) / SAR based Threshold power (lower row)																	
			Antenna 1 separation distance [mm]									Antenna 2 separation distance [mm]								
			<5			<5			<5			<5			<5			<5		
			Gain	ERP	Gain	ERP	Gain	ERP	Gain	ERP	Gain	ERP	Gain	ERP	Gain	ERP	Gain	ERP	Gain	ERP
WLAN 2.4 GHz	2462	13.5	22	-1.95	9.40	9	-2.21	9.14	8	Test 3 mW	Test 3 mW	Test 3 mW	Exempt 73 mW	Exempt > 100 mW	Exempt > 100 mW	Test 3 mW	Test 3 mW	Test 3 mW	Exempt > 80 mW	Exempt > 100 mW
WLAN 5.2 GHz	5240	8.5	7	-0.98	5.37	3	-1.54	4.81	3	Test 1 mW	Test 1 mW	Test 1 mW	Exempt 53 mW	Exempt > 100 mW	Exempt > 100 mW	Test 1 mW	Test 1 mW	Test 1 mW	Exempt > 50 mW	Exempt > 100 mW
WLAN 5.3 GHz	5320	8.5	7	-0.98	5.37	3	-1.54	4.81	3	Test 1 mW	Test 1 mW	Test 1 mW	Exempt 52 mW	Exempt > 100 mW	Exempt > 100 mW	Test 1 mW	Test 1 mW	Test 1 mW	Exempt > 50 mW	Exempt > 100 mW
WLAN 5.6 GHz	5700	8.5	7	-0.98	5.37	3	-1.54	4.81	3	Test 1 mW	Test 1 mW	Test 1 mW	Exempt 51 mW	Exempt > 100 mW	Exempt > 100 mW	Test 1 mW	Test 1 mW	Test 1 mW	Exempt > 50 mW	Exempt > 100 mW
WLAN 5.8 GHz	5825	8.5	7	-0.98	5.37	3	-1.54	4.81	3	Test 1 mW	Test 1 mW	Test 1 mW	Exempt 50 mW	Exempt > 100 mW	Exempt > 100 mW	Test 1 mW	Test 1 mW	Test 1 mW	Exempt > 50 mW	Exempt > 100 mW

*. The table shows the upper frequency which has the maximum power (as "Tune-up limit") in each operation band, in mode and on the single antenna transmission.
*. Freq.: Frequency
*. Antenna separation distance is rounded to the nearest integer numbers (in mm) before calculation.
*. (Calculating formula) ERP (dBm) = (max. conducted output power, dBm) + (antenna gain, dBi) - 2.15

<Conclusion for consideration for SAR test reduction>

- 1) All SAR tests were conservatively performed with test separation distance 0 mm.
- 2) For antenna 1, "Right", "Back" and "Front" setups are applied SAR test.
- 3) For antenna 2, "Bottom", "Back" and "Front" setups are applied SAR test.

SAR-based thresholds (P_{th} (mW)) shown below table of "Example Power Thresholds [mW]" are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time-averaged power or maximum time-averaged effective radiated power (ERP), whichever is greater. The SAR-based exemption is calculated by Formula (B.2) in below, applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

When 10-g extremity SAR applies, SAR test exemption may be considered by applying a factor of 2.5 to the SAR-based exemption thresholds.

*. This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive).

Table: Example Power Thresholds (mW) for SAR(1g) (Bold: listed in Table B.2 of KDB 447498 D04 (v01), Italic: Calculated)																										
Distance [mm]																										
Frequency [MHz]	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
2402	3	4	5	7	9	10	12	15	17	20	22	25	28	32	35	39	42	46	50	55	59	64	68	73	78	84
2450	3	4	5	7	8	10	12	15	17	19	22	25	28	31	35	38	42	46	50	54	59	63	68	73	78	83
2462	3	4	5	7	8	10	12	14	17	19	22	25	28	31	35	38	42	46	50	54	58	63	68	73	78	83
2480	3	4	5	7	8	10	12	14	17	19	22	25	28	31	35	38	42	46	50	54	58	63	67	72	77	82
3600	2	3	4	5	6	8	10	11	13	16	18	20	23	26	29	32	35	38	42	45	49	53	57	62	66	71
5240	1	2	3	4	5	6	8	9	11	13	14	17	19	21	24	26	29	32	35	38	42	45	49	53	57	61
5320	1	2	3	4	5	6	8	9	11	12	14	16	19	21	23	26	29	32	35	38	41	45	48	52	56	60
5700	1	2	3	4	5	6	7	9	10	12	14	16	18	20	23	25	28	31	34	37	40	43	47	51	55	59
5800	1	2	3	4	5	6	7	9	10	12	14	16	18	20	22	25	28	30	33	36	40	43	47	50	54	58
5825	1	2	3	4	5	6	7	9	10	12	14	16	18	20	22	25	28	30	33	36	40	43	47	50	54	58
5885	1	2	3	4	5	6	7	8	10	12	14	16	18	20	22	25	27	30	33	36	39	43	46	50	54	58
6000	1	2	3	4	5	6	7	8	10	12	13	15	17	20	22	24	27	30	33	36	39	42	46	50	53	57

TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION				
RF Source Frequency	Minimum Distance	Threshold ERP		
f _c [MHz]	f _h [MHz]	λ _g / 2π	λ _g / 2π	W
0.3	1.34	159 m	35.6 m	1.920 R ²
1.34	30	35.6 m	1.6 m	3.450 R ² /f ²
30	300	1.6 m	159 mm	3.83 R ²
300	1,500	159 mm	31.8 mm	0.0128 R ² /f
1,500	100,000	31.8 mm	0.5 mm	19.2R ²
Subscripts L and H are low and high; λ is wavelength.				
From §1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.				
R is in meter, f is in MHz				
Threshold ERP [W] = 19.2 × R ² (—formula (A.1))				
(Distance: over 40 cm)				

Calculating formula:

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (B.1)$$

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (B.2) \quad x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

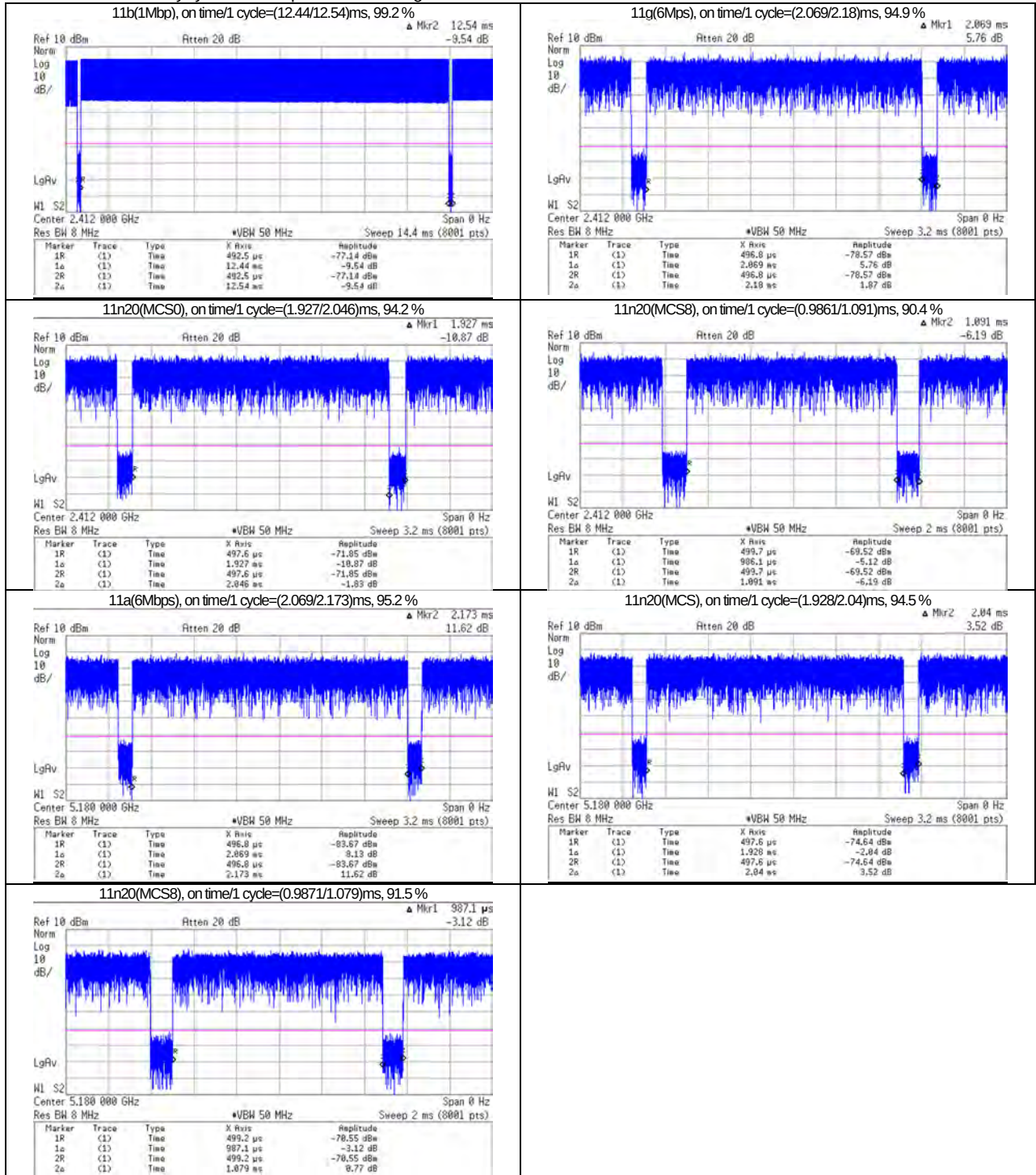
and f is in GHz, d is the separation distance (cm), and ERP_{20cm} is per Formula (B.1).

SECTION 5: Confirmation before testing

5.1 Test reference power measurement

Mode	Frequency		Data rate, Index #	Power spec. on each antenna		Duty cycle			Antenna 1 power				Antenna 2 power				MIMO power (Antenna 1+Antenna 2)					Adjusted power setting? (*1)				
						duty cycle	duty factor	scaled factor	Set pwr.	Burst Ave.	Δ Max.	Tune-up factor	Time Ave.	Set pwr.	Burst Ave.	Δ Max.	Tune-up factor	Time Ave.	MIMO target	MIMO max.	SUM Burst Ave.			Δ Max.	SUM Time Ave.	
	[MHz]	CH	[Mbps]	[dBm]	[dBm]	[%]	[dB]	[f]	[f]	[dBm]	[dB]	[f]	[dBm]	[dB]	[f]	[dBm]	[dBm]	[dBm]	[dB]	[dBm]						
11b	2412	1	1	10	13.0	99.2	0.03	1.01	11	11.71	-1.29	1.35	11.68	11	11.81	-1.19	1.32	11.78					Ant1	Ant2		
	2437	6	1	10	13.0	99.2	0.03	1.01	11	11.84	-1.16	1.31	11.81	11	11.79	-1.21	1.32	11.76					Yes	Yes		
	2462	11	1	10	13.0	99.2	0.03	1.01	11	12.05	-0.95	1.24	12.02	11	11.97	-1.03	1.27	11.94					Yes	Yes		
11g	2412	1	6	11	13.5	94.9	0.23	1.05	12	12.44	-1.06	1.28	12.21	12	12.55	-0.95	1.24	12.32					Yes	Yes		
	2437	6	6	11	13.5	94.9	0.23	1.05	12	12.51	-0.99	1.26	12.28	12	12.49	-1.01	1.26	12.26					Yes	Yes		
	2462	11	6	11	13.5	94.9	0.23	1.05	12	12.75	-0.75	1.19	12.52	12	12.72	-0.78	1.20	12.49					Yes	Yes		
11n20 SISO	2412	1	MCS0	11	13.5	94.2	0.26	1.06	12	12.30	-1.20	1.32	12.04	12	12.39	-1.11	1.29	12.13					Yes	Yes		
	2437	6	MCS0	11	13.5	94.2	0.26	1.06	12	12.43	-1.07	1.28	12.17	12	12.35	-1.15	1.30	12.09					Yes	Yes		
	2462	11	MCS0	11	13.5	94.2	0.26	1.06	12	12.65	-0.85	1.22	12.39	12	12.61	-0.89	1.23	12.35					Yes	Yes		
11n20 MIMO	2412	1	MCS8	11	13.5	90.4	0.44	1.11	12	11.99	-1.51	1.42	11.55		11.98	-1.52	1.42	11.54	14	16.5	15.00	-1.50	14.56	Yes	Yes	
	2437	6	MCS8	11	13.5	90.4	0.44	1.11	12	12.04	-1.46	1.40	11.60		11.95	-1.55	1.43	11.51	14	16.5	15.01	-1.49	14.57	Yes	Yes	
	2462	11	MCS8	11	13.5	90.4	0.44	1.11	12	12.13	-1.37	1.37	11.69		12.12	-1.38	1.37	11.68	14	16.5	15.13	-1.37	14.69	Yes	Yes	
1a	5180	36	6	6	8.5	95.2	0.21	1.05	7.5	7.55	-0.95	1.24	7.34	7.5	7.31	-1.19	1.32	7.10					Yes	Yes		
	5200	40	6	6	8.5	95.2	0.21	1.05	7.5	7.54	-0.96	1.25	7.33	7.5	7.27	-1.23	1.33	7.06					Yes	Yes		
	5220	44	6	6	8.5	95.2	0.21	1.05	7.5	7.28	-1.22	1.32	7.07	7.5	7.40	-1.10	1.29	7.19					Yes	Yes		
	5240	48	6	6	8.5	95.2	0.21	1.05	7.5	7.14	-1.36	1.37	6.93	7.5	7.40	-1.10	1.29	7.19					Yes	Yes		
	5260	52	6	6	8.5	95.2	0.21	1.05	7.5	6.95	-1.55	1.43	6.74	7.5	7.25	-1.25	1.33	7.04					Yes	Yes		
	5280	56	6	6	8.5	95.2	0.21	1.05	7.5	6.92	-1.58	1.44	6.71	7.5	6.94	-1.56	1.43	6.73					Yes	Yes		
	5300	60	6	6	8.5	95.2	0.21	1.05	7.5	7.15	-1.35	1.36	6.94	7.5	7.33	-1.17	1.31	7.12					Yes	Yes		
	5320	64	6	6	8.5	95.2	0.21	1.05	7.5	7.40	-1.10	1.29	7.19	7.5	7.38	-1.12	1.29	7.17					Yes	Yes		
	5500	100	6	6	8.5	95.2	0.21	1.05	7.5	7.27	-1.23	1.33	7.06	7.5	7.26	-1.24	1.33	7.05					Yes	Yes		
	5580	116	6	6	8.5	95.2	0.21	1.05	7.5	7.43	-1.07	1.28	7.22	7.5	7.15	-1.35	1.36	6.94					Yes	Yes		
	5600	120	6	6	8.5	95.2	0.21	1.05	7.5	7.45	-1.05	1.27	7.24	7.5	7.06	-1.44	1.39	6.85					Yes	Yes		
	5700	140	6	6	8.5	95.2	0.21	1.05	7.5	7.36	-1.14	1.30	7.15	7.5	7.21	-1.29	1.35	7.00					Yes	Yes		
	5745	149	6	6	8.5	95.2	0.21	1.05	7.5	7.19	-1.31	1.35	6.98	7.5	7.10	-1.40	1.38	6.89					Yes	Yes		
	5785	157	6	6	8.5	95.2	0.21	1.05	7.5	6.90	-1.60	1.45	6.69	7.5	6.93	-1.57	1.44	6.72					Yes	Yes		
	5825	165	6	6	8.5	95.2	0.21	1.05	7.5	6.98	-1.52	1.42	6.77	7.5	7.18	-1.32	1.36	6.97					Yes	Yes		
	11n20 SISO	5180	36	MCS0	6	8.5	94.5	0.25	1.06	7.5	7.46	-1.04	1.27	7.21	7.5	7.17	-1.33	1.36	6.92					Yes	Yes	
		5200	40	MCS0	6	8.5	94.5	0.25	1.06	7.5	7.42	-1.08	1.28	7.17	7.5	7.08	-1.42	1.39	6.83					Yes	Yes	
		5220	44	MCS0	6	8.5	94.5	0.25	1.06	7.5	7.11	-1.39	1.38	6.86	7.5	7.20	-1.30	1.35	6.95					Yes	Yes	
		5240	48	MCS0	6	8.5	94.5	0.25	1.06	7.5	7.02	-1.48	1.41	6.77	7.5	7.24	-1.26	1.34	6.99					Yes	Yes	
		5260	52	MCS0	6	8.5	94.5	0.25	1.06	7.5	6.82	-1.68	1.47	6.57	7.5	7.09	-1.41	1.38	6.84					Yes	Yes	
		5280	56	MCS0	6	8.5	94.5	0.25	1.06	7.5	6.80	-1.70	1.48	6.55	7.5	6.78	-1.72	1.49	6.53					Yes	Yes	
		5300	60	MCS0	6	8.5	94.5	0.25	1.06	7.5	7.04	-1.46	1.40	6.79	7.5	7.16	-1.34	1.36	6.91					Yes	Yes	
		5320	64	MCS0	6	8.5	94.5	0.25	1.06	7.5	7.21	-1.29	1.35	6.96	7.5	7.20	-1.30	1.35	6.95					Yes	Yes	
		5500	100	MCS0	6	8.5	94.5	0.25	1.06	7.5	7.16	-1.34	1.36	6.91	7.5	7.10	-1.40	1.38	6.85					Yes	Yes	
		5580	116	MCS0	6	8.5	94.5	0.25	1.06	7.5	7.23	-1.27	1.34	6.98	7.5	7.01	-1.49	1.41	6.76					Yes	Yes	
		5600	120	MCS0	6	8.5	94.5	0.25	1.06	7.5	7.32	-1.18	1.31	7.07	7.5	6.92	-1.58	1.44	6.67					Yes	Yes	
		5700	140	MCS0	6	8.5	95.2	0.21	1.05	7.5	7.16	-1.34	1.36	6.95	7.5	7.04	-1.46	1.40	6.83					Yes	Yes	
5745		149	MCS0	6	8.5	94.5	0.25	1.06	7.5	7.03	-1.47	1.40	6.78	7.5	6.95	-1.55	1.43	6.70					Yes	Yes		
5785		157	MCS0	6	8.5	94.5	0.25	1.06	7.5	6.76	-1.74	1.49	6.51	7.5	6.73	-1.77	1.50	6.48					Yes	Yes		
5825		165	MCS0	6	8.5	94.5	0.25	1.06	7.5	6.80	-1.70	1.48	6.55	7.5	7.01	-1.49	1.41	6.76					Yes	Yes		
11n20 MIMO		5180	36	MCS8	6	8.5	91.5	0.39	1.09	7.5	7.45	-1.05	1.27	7.06		7.26	-1.24	1.33	6.87	9	11.5	10.37	-1.13	9.98	Yes	Yes
		5200	40	MCS8	6	8.5	91.5	0.39	1.09	7.5	7.38	-1.12	1.29	6.99		7.22	-1.28	1.34	6.83	9	11.5	10.31	-1.19	9.92	Yes	Yes
		5220	44	MCS8	6	8.5	91.5	0.39	1.09	7.5	7.18	-1.32	1.36	6.79		7.38	-1.12	1.29	6.99	9	11.5	10.29	-1.21	9.90	Yes	Yes
	5240	48	MCS8	6	8.5	91.5	0.39	1.09	7.5	6.97	-1.53	1.42	6.58		7.41	-1.09	1.29	7.02	9	11.5	10.21	-1.29	9.82	Yes	Yes	
	5260	52	MCS8	6	8.5	91.5	0.39	1.09	7.5	6.73	-1.77	1.50	6.34		7.27	-1.23	1.33	6.88	9	11.5	10.02	-1.48	9.63	Yes	Yes	
	5280	56	MCS8	6	8.5	91.5	0.39	1.09	7.5	6.79	-1.71	1.48	6.40		6.97	-1.53	1.42	6.58	9	11.5	9.89	-1.61	9.50	Yes	Yes	
	5300	60	MCS8	6	8.5	91.5	0.39	1.09	7.5	7.13	-1.37	1.37	6.74		7.39	-1.11	1.29	7.00	9	11.5	10.27	-1.23	9.88	Yes	Yes	
	5320	64	MCS8	6	8.5	91.5	0.39	1.09	7.5	7.29	-1.21	1.32	6.90		7.41	-1.09	1.29	7.02	9	11.5	10.36	-1.14	9.97	Yes	Yes	
	5500	100	MCS8	6	8.5	91.5	0.39	1.09	7.5	7.14	-1.36	1.37	6.75		7.08	-1.42	1.39	6.69	9	11.5	10.12	-1.38	9.73	Yes	Yes	
	5580	116	MCS8	6	8.5	91.5	0.39	1.09	7.5	7.58	-0.92	1.24	7.19		7.29	-1.21	1.32	6.90	9	11.5	10.45	-1.05	10.06	Yes	Yes	
	5600	120	MCS8	6	8.5	91.5	0.39	1.09	7.5	7.34	-1.16	1.31	6.95		6.97	-1.53	1.42	6.58	9	11.5	10.17	-1.33	9.78	Yes	Yes	
	5700	140	MCS8	6	8.5	91.5	0.39	1.09	7.5	7.27	-1.23	1.33	6.88		7.14	-1.36	1.37	6.75	9	11.5	10.22	-1.28	9.83	Yes	Yes	
	5745	149	MCS8	6	8.5	91.5	0.39	1.09	7.5	7.10	-1.40	1.38	6.71		7.00	-1.50	1.41	6.61	9	11.5	10.06	-1.44	9.67	Yes	Yes	
	5785	157	MCS8	6	8.5	91.5	0.39	1.09	7.5	6.86	-1.64	1.46	6.47		6.81	-1.69	1.48	6.42	9	11.5	9.85	-1.65	9.46	Yes	Yes	
	5825	165	MCS8	6	8.5	91.5	0.39	1.09	7.5	6.91	-1.59	1.44	6.52		7.05	-1.45	1.40	6.66	9	11.5	9.99	-1.51	9.60	Yes	Yes	

* Chart of the worst duty cycle for each operation mode in right and in follows.



SECTION 6: Tissue simulating liquid

6.1 Liquid measurement

Frequency [MHz]	Liquid type	Liquid parameters (*a)												ΔSAR Coefficients (*b)				Date measured
		Liquid Temp. [deg.C]	Liquid depth of phantom [mm]	Permittivity (ε _r) [-]			Conductivity [S/m]			Interpolated ? □: No ☑: Yes	Δend, >48hrs (*1)		ΔSAR		ΔSAR Corrected?			
				Target value	Measured		Target value	Measured			ε _r [%]	σ [%]	1g [%]	10g [%]				
					Value	Δε [%]		Limit [%]	Value							Δσ [%]	Limit [%]	
2450	Head	22.0	151	39.2	39.52	0.8	5	1.80	1.850	2.8	5	□	begin	begin	1.2	0.6	no (positive sign)	2024-01-10, before SAR test.
5250	-	-	-	35.93	34.85	-3.0	5	4.706	4.544	-3.4	5	□	begin	begin	0.7	0.9	no (positive sign)	
5600	-	-	-	35.53	34.28	-3.5	5	5.065	4.931	-2.6	5	□	begin	begin	0.8	1.0	no (positive sign)	
5800	-	-	-	35.3	33.95	-3.8	5	5.27	5.152	-2.2	5	□	begin	begin	0.9	1.0	no (positive sign)	
2450	Head	22.0	151	39.2	39.52	0.8	5	1.80	1.850	2.8	5	□	-0.2	1.2	1.8	0.9	no (positive sign)	2024-01-12, last of SAR test period 01-10-01-12
5250	-	-	-	35.93	34.85	-3.0	5	4.706	4.544	-3.4	5	□	-0.5	1.3	0.8	1.0	no (positive sign)	
5600	-	-	-	35.53	34.28	-3.5	5	5.065	4.931	-2.6	5	□	-0.6	1.3	0.9	1.1	no (positive sign)	
5800	-	-	-	35.3	33.95	-3.8	5	5.27	5.152	-2.2	5	□	-0.7	1.4	0.9	1.2	no (positive sign)	
2450	Head	22.0	1510	39.2	39.52	0.8	5	1.80	1.850	2.8	5	□	begin	begin	1.5	0.8	no (positive sign)	2024-01-15, before SAR test.
5250	-	-	-	35.93	34.85	-3.0	5	4.706	4.544	-3.4	5	□	begin	begin	0.8	1.0	no (positive sign)	
5600	-	-	-	35.53	34.28	-3.5	5	5.065	4.931	-2.6	5	□	begin	begin	0.9	1.2	no (positive sign)	
5800	-	-	-	35.3	33.95	-3.8	5	5.27	5.152	-2.2	5	□	begin	begin	1.0	1.2	no (positive sign)	
2412	Head	22.0	151	39.27	39.59	0.8	5	1.766	1.820	3.1	5	□	-	-	1.3	0.7	no (positive sign)	2024-01-10, before SAR test.
2437				39.22	39.54	0.8	5	1.788	1.840	2.9	5	□	-	-	1.2	0.6	no (positive sign)	
2462				39.19	39.50	0.8	5	1.813	1.860	2.6	5	□	-	-	1.1	0.5	no (positive sign)	
5180				36.01	34.99	-2.8	5	4.635	4.468	-3.6	5	□	-	-	0.7	0.9	no (positive sign)	
5200				35.99	34.96	-2.9	5	4.655	4.489	-3.6	5	□	-	-	0.7	0.9	no (positive sign)	
5220				35.96	34.91	-2.9	5	4.676	4.511	-3.5	5	□	-	-	0.7	0.9	no (positive sign)	
5240				35.94	34.87	-3.0	5	4.696	4.533	-3.5	5	□	-	-	0.7	1.0	no (positive sign)	
5260				35.92	34.84	-3.0	5	4.717	4.555	-3.4	5	□	-	-	0.7	0.9	no (positive sign)	
5280				35.89	34.80	-3.1	5	4.737	4.576	-3.4	5	□	-	-	0.7	1.0	no (positive sign)	
5300				35.87	34.76	-3.1	5	4.758	4.600	-3.3	5	□	-	-	0.7	1.0	no (positive sign)	
5320				35.85	34.74	-3.1	5	4.778	4.623	-3.2	5	□	-	-	0.7	1.0	no (positive sign)	
5500				35.64	34.44	-3.4	5	4.963	4.817	-2.9	5	□	-	-	0.8	1.0	no (positive sign)	
5580				35.55	34.32	-3.5	5	5.045	4.909	-2.7	5	□	-	-	0.8	1.0	no (positive sign)	
5600				35.53	34.28	-3.5	5	5.065	4.931	-2.6	5	□	-	-	0.8	1.0	no (positive sign)	
5700				35.41	34.11	-3.7	5	5.168	5.039	-2.5	5	□	-	-	0.8	1.0	no (positive sign)	
5745				35.36	34.02	-3.8	5	5.214	5.092	-2.3	5	□	-	-	0.9	1.1	no (positive sign)	
5785				35.32	33.98	-3.8	5	5.255	5.136	-2.3	5	□	-	-	0.9	1.0	no (positive sign)	
5825				35.27	33.88	-3.9	5	5.296	5.181	-2.2	5	□	-	-	0.9	1.1	no (positive sign)	
2462	Head	22.0	151	39.19	39.51	0.8	5	1.813	1.872	3.3	5	□	-	-	1.4	0.7	no (positive sign)	2024-01-15, before SAR test.
5320				35.85	34.49	-3.8	5	4.778	4.690	-1.8	5	□	-	-	0.8	1.1	no (positive sign)	
5580				35.55	34.05	-4.2	5	5.045	4.984	-1.2	5	□	-	-	0.9	1.1	no (positive sign)	
5600				35.53	34.02	-4.3	5	5.065	5.007	-1.1	5	□	-	-	0.9	1.2	no (positive sign)	
5745				35.36	33.73	-4.6	5	5.214	5.168	-0.9	5	□	-	-	1.0	1.2	no (positive sign)	

*1. "begin": SAR test has ended within 24 hours from the liquid parameter measurement, "< 48 hrs.". Since SAR test has ended within 48 hours (2 days) from the liquid parameter measurement and a change in the liquid temperature was within 1 degree, liquid parameters measured on first day were used on next day continuously, "value (%)": Since the SAR test series took longer than 48 hours, the liquid parameters were measured on every 48 hours period and on the date which was end of test series. Since the difference of liquid parameters between the beginning and next measurement was smaller than 5%, the liquid parameters measured in beginning were used until end of each test series.

Calculating formula: "Δend(>48 hrs.) (%)"" = ((dielectric properties, end of test series) / (dielectric properties, beginning of test series) - 1) × 100

*. The dielectric parameters were checked prior to assessment using the DAKS-3.5 dielectric probe.

*a. The target values of (2000, 2450, 3000, 5800) MHz are parameters defined in Appendix A of KDB 865664 D01 (refer to clause 6.2). For other frequencies, the target nominal dielectric values shall be obtained by linear interpolation between the higher and lower tabulated figures. Above 5800MHz were obtained using linear extrapolation.

*b. The coefficients in below are parameters defined in IEEE Std.1528-2013.

(Calculating formula, 4 MHz ~ 6 GHz): $\Delta SAR(1g) = C_{\epsilon} \times \Delta \epsilon_r + C_{\sigma} \times \Delta \sigma$, $C_{\epsilon} = 7.854E-4 \times R^3 + 9.402E-3 \times R^2 - 2.742E-2 \times R + 0.2026$ / $C_{\sigma} = 9.804E-3 \times R^3 - 8.661E-2 \times R^2 + 2.981E-2 \times R + 0.7829$

$\Delta SAR(10g) = C_{\epsilon} \times \Delta \epsilon_r + C_{\sigma} \times \Delta \sigma$, $C_{\epsilon} = 3.456 \times 10^{-3} \times R^3 - 3.531 \times 10^{-2} \times R^2 + 7.675 \times 10^{-2} \times R + 0.1860$ / $C_{\sigma} = 4.479 \times 10^{-3} \times R^3 - 1.586 \times 10^{-2} \times R^2 - 0.1972 \times R + 0.7717$

(Calculating formula):

$\Delta SAR \text{ corrected SAR (W/kg)} = (\text{Measured SAR (W/kg)}) \times (100 - (\Delta SAR(\%))) / 100$

Since the calculated ΔSAR values of the tested liquid had shown positive correction, the measured SAR was not converted by ΔSAR correction conservatively.

6.2 Target of tissue simulating liquid

Nominal dielectric values of the tissue simulating liquids in the phantom are listed in the following table. (Appendix A, KDB 865664 v01R04)

Target Frequency (MHz)	Head		Body	
	ε _r	σ(S/m)	ε _r	σ(S/m)
1800~2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95

Target Frequency (MHz)	Head		Body	
	ε _r	σ(S/m)	ε _r	σ(S/m)
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

*. For other frequencies, the target nominal dielectric values shall be obtained by linear interpolation between the higher and lower tabulated figures. Above 5800MHz were obtained using linear extrapolation.

6.3 Simulated tissue composition

Liquid type	Head	Control No.	SSLHV6-01	Model No. / Product No.	HBBL600-10000V6 / SL AAH U16 BC
Ingredient: Mixture [%]	Water: >77, Ethanediol: <5.2, Sodium petroleum sulfonate: <2.9, Hexylene Glycol: <2.9, alkoxylated alcohol (>C ₁₆): <2.0				
Tolerance specification	± 10%				
Temperature gradients [% / deg.C]	permittivity: -0.19 / conductivity: -0.57 (at 2.6 GHz), permittivity: +0.31 / conductivity: -1.43 (at 5.5 GHz) (*)				
Manufacture	Schmid & Partner Engineering AG		Note: *. speag_920-SLAxy-E_1.12.15CL (Maintenance of tissue simulating liquid)		

SECTION 7: Measurement results

7.1 Measurement results (SAR)

Test setup				Mode and Frequency (*2)			Duty cycle			Power correction			SAR results [W/kg]				SAR type	SAR Limit [W/kg]	SAR plot # in Appx. 2-2	Setup photo # in Appx. 1-3	Remarks
ANT #	Test position	Gap [mm]	Source power	Mode (D/R)	[MHz]	CH	Duty [%]	Duty scaled factor	Max. tune-up limit [dBm]	Measured conducted [dBm]	Power scaled factor	(Max. value of multi-peak)									
	Setup			Mark with "*" is the initial mode & frequency.	Measured	ASAR [%]						ASAR corrected	Scaled (*b)								
1) WLAN 2.4GHz band																					
1	Right	0	DC supply	11b (1 Mbps)*	2412	1	99.2	1.01	13	11.71	1.35	0.587	Positive	n/a (*a)	0.800	1g	1.6	-	P1	-	
1	Right	0	DC supply	11b (1 Mbps)*	2437	6	99.2	1.01	13	11.84	1.31	0.720	Positive	n/a (*a)	0.953	1g	1.6	-	P1	-	
1	Right	0	DC supply	11b (1 Mbps)*	2462*	11	99.2	1.01	13	12.05	1.24	0.590	Positive	n/a (*a)	0.739	1g	1.6	-	P1	-	
1	Right	0	DC supply	11g (6 Mbps)	2412	1	94.9	1.05	13.5	12.44	1.28	0.653	Positive	n/a (*a)	0.878	1g	1.6	-	P1	-	
1	Right	0	DC supply	11g (6 Mbps)	2437	6	94.9	1.05	13.5	12.51	1.26	0.789	Positive	n/a (*a)	1.044	1g	1.6	1-1	P1	-	
1	Right	0	DC supply	11g (6 Mbps)	2462	11	94.9	1.05	13.5	12.75	1.19	0.648	Positive	n/a (*a)	0.810	1g	1.6	-	P1	-	
1	Right	0	DC supply	11n20 (MCS0)	2412	1	94.2	1.06	13.5	12.30	1.32	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
1	Right	0	DC supply	11n20 (MCS0)	2437	6	94.2	1.06	13.5	12.43	1.28	0.756	Positive	n/a (*a)	1.026	1g	1.6	-	P1	<1.2 w/kg	
1	Right	0	DC supply	11n20 (MCS0)	2462	11	94.2	1.06	13.5	12.65	1.22	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
1	Right	0	DC supply	11n20 (MCS8)(*1)	2412	1	90.4	1.11	13.5	11.99	1.42	0.526	Positive	n/a (*a)	0.829	1g	1.6	-	P1	-	
1	Right	0	DC supply	11n20 (MCS8)(*1)	2437	6	90.4	1.11	13.5	12.04	1.40	0.641	Positive	n/a (*a)	0.996	1g	1.6	-	P1	-	
1	Right	0	DC supply	11n20 (MCS8)(*1)	2462	11	90.4	1.11	13.5	12.13	1.37	0.513	Positive	n/a (*a)	0.780	1g	1.6	-	P1	-	
1	Back	0	DC supply	11n20 (MCS8)(*1)	2462	11	90.4	1.11	13.5	12.13	1.37	0.077	Positive	n/a (*a)	0.117	1g	1.6	-	P3	-	
1	Front	0	DC supply	11n20 (MCS8)(*1)	2462	11	90.4	1.11	13.5	12.13	1.37	0.106	Positive	n/a (*a)	0.161	1g	1.6	-	P4	-	
1	Top	0	DC supply	11n20 (MCS8)(*1)	2462	11	90.4	1.11	13.5	12.13	1.37	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt	
1	Left	0	DC supply	11n20 (MCS8)(*1)	2462	11	90.4	1.11	13.5	12.13	1.37	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt	
1	Bottom	0	DC supply	11n20 (MCS8)(*1)	2462	11	90.4	1.11	13.5	12.13	1.37	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt	
2	Bottom	0	DC supply	11b (1 Mbps)*	2412	1	99.2	1.01	13	11.81	1.32	0.257	Positive	n/a (*a)	0.343	1g	1.6	-	P2	-	
2	Bottom	0	DC supply	11b (1 Mbps)*	2437	6	99.2	1.01	13	11.79	1.32	0.388	Positive	n/a (*a)	0.517	1g	1.6	-	P2	-	
2	Bottom	0	DC supply	11b (1 Mbps)*	2462*	11	99.2	1.01	13	11.97	1.27	0.464	Positive	n/a (*a)	0.595	1g	1.6	-	P2	-	
2	Bottom	0	DC supply	11g (6 Mbps)	2412	1	94.9	1.05	13.5	12.55	1.24	0.291	Positive	n/a (*a)	0.379	1g	1.6	-	P2	-	
2	Bottom	0	DC supply	11g (6 Mbps)	2437	6	94.9	1.05	13.5	12.49	1.26	0.436	Positive	n/a (*a)	0.577	1g	1.6	-	P2	-	
2	Bottom	0	DC supply	11g (6 Mbps)	2462	11	94.9	1.05	13.5	12.72	1.20	0.523	Positive	n/a (*a)	0.659	1g	1.6	1-2	P2	<1.2 w/kg	
2	Bottom	0	DC supply	11n20 (MCS0)	2412	1	94.2	1.06	13.5	12.39	1.29	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
2	Bottom	0	DC supply	11n20 (MCS0)	2437	6	94.2	1.06	13.5	12.35	1.30	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
2	Bottom	0	DC supply	11n20 (MCS0)	2462	11	94.2	1.06	13.5	12.61	1.23	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
2	Bottom	0	DC supply	11n20 (MCS8)(*1)	2412	1	90.4	1.11	13.5	11.98	1.42	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
2	Bottom	0	DC supply	11n20 (MCS8)(*1)	2437	6	90.4	1.11	13.5	11.95	1.43	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
2	Bottom	0	DC supply	11n20 (MCS8)(*1)	2462	11	90.4	1.11	13.5	12.12	1.37	0.416	Positive	n/a (*a)	0.633	1g	1.6	-	P2	<1.2 w/kg	
2	Back	0	DC supply	11n20 (MCS8)(*1)	2462	11	90.4	1.11	13.5	12.12	1.37	0.079	Positive	n/a (*a)	0.120	1g	1.6	-	P5	-	
2	Front	0	DC supply	11n20 (MCS8)(*1)	2462	11	90.4	1.11	13.5	12.12	1.37	0.091	Positive	n/a (*a)	0.138	1g	1.6	-	P6	-	
2	Left	0	DC supply	11n20 (MCS8)(*1)	2462	11	90.4	1.11	13.5	12.12	1.37	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt	
2	Right	0	DC supply	11n20 (MCS8)(*1)	2462	11	90.4	1.11	13.5	12.12	1.37	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt	
2	Top	0	DC supply	11n20 (MCS8)(*1)	2462	11	90.4	1.11	13.5	12.12	1.37	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt	
2) WLAN 5.3GHz band (and WLAN 5.2GHz band additionally)																					
1	Right	0	DC supply	11a (6 Mbps)*	5260	52	95.2	1.05	8.5	6.95	1.43	0.348	Positive	n/a (*a)	0.523	1g	1.6	-	P1	-	
1	Right	0	DC supply	11a (6 Mbps)*	5300	60	95.2	1.05	8.5	7.15	1.36	0.374	Positive	n/a (*a)	0.534	1g	1.6	-	P1	-	
1	Right	0	DC supply	11a (6 Mbps)*	5320*	64	95.2	1.05	8.5	7.40	1.29	0.414	Positive	n/a (*a)	0.561	1g	1.6	-	P1	<1.2 w/kg	
1	Right	0	DC supply	11n20 (MCS0)	5260	52	94.5	1.06	8.5	6.82	1.47	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
1	Right	0	DC supply	11n20 (MCS0)	5300	60	94.5	1.06	8.5	7.04	1.40	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
1	Right	0	DC supply	11n20 (MCS0)	5320	64	94.5	1.06	8.5	7.21	1.35	0.403	Positive	n/a (*a)	0.577	1g	1.6	-	P1	<1.2 w/kg	
1	Right	0	DC supply	11n20 (MCS8)(*1)	5260	52	91.5	1.09	8.5	6.73	1.50	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
1	Right	0	DC supply	11n20 (MCS8)(*1)	5300	60	91.5	1.09	8.5	7.13	1.37	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
1	Right	0	DC supply	11n20 (MCS8)(*1)	5320	64	91.5	1.09	8.5	7.29	1.32	0.405	Positive	n/a (*a)	0.583	1g	1.6	2b-1	P1	<1.2 w/kg	
1	Back	0	DC supply	11n20 (MCS8)(*1)	5320	64	91.5	1.09	8.5	7.29	1.32	0.144	Positive	n/a (*a)	0.207	1g	1.6	-	P2	-	
1	Front	0	DC supply	11n20 (MCS8)(*1)	5320	64	91.5	1.09	8.5	7.29	1.32	0.106	Positive	n/a (*a)	0.153	1g	1.6	-	P3	-	
1	Top	0	DC supply	11n20 (MCS8)(*1)	5320	64	91.5	1.09	8.5	7.29	1.32	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt	
1	Left	0	DC supply	11n20 (MCS8)(*1)	5320	64	91.5	1.09	8.5	7.29	1.32	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt	
1	Bottom	0	DC supply	11n20 (MCS8)(*1)	5320	64	91.5	1.09	8.5	7.29	1.32	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt	
2	Bottom	0	DC supply	11a (6 Mbps)*	5260	52	95.2	1.05	8.5	7.25	1.33	0.264	Positive	n/a (*a)	0.369	1g	1.6	-	P2	-	
2	Bottom	0	DC supply	11a (6 Mbps)*	5300	60	95.2	1.05	8.5	7.33	1.31	0.273	Positive	n/a (*a)	0.376	1g	1.6	-	P2	-	
2	Bottom	0	DC supply	11a (6 Mbps)*	5320*	64	95.2	1.05	8.5	7.38	1.29	0.310	Positive	n/a (*a)	0.420	1g	1.6	2b-2	P2	<1.2 w/kg	
2	Bottom	0	DC supply	11n20 (MCS0)	5260	52	94.5	1.06	8.5	7.09	1.38	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
2	Bottom	0	DC supply	11n20 (MCS0)	5300	60	94.5	1.06	8.5	7.16	1.36	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
2	Bottom	0	DC supply	11n20 (MCS0)	5320	64	94.5	1.06	8.5	7.20	1.35	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
2	Bottom	0	DC supply	11n20 (MCS8)(*1)	5260	52	91.5	1.09	8.5	7.27	1.33	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
2	Bottom	0	DC supply	11n20 (MCS8)(*1)	5300	60	91.5	1.09	8.5	7.39	1.29	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-	
2	Bottom	0	DC supply	11n20 (MCS8)(*1)	5320	64	91.5	1.09	8.5	7.41	1.29	0.293	Positive	n/a (*a)	0.412	1g	1.6	-	P2	<1.2 w/kg	
2	Back	0	DC supply	11n20 (MCS8)(*1)	5320	64	91.5	1.09	8.5	7.41	1.29	0.121	Positive	n/a (*a)	0.170	1g	1.6	-	P4	-	
2	Front	0	DC supply	11n20 (MCS8)(*1)	5320	64	91.5	1.09	8.5	7.41	1.29	0.083	Positive	n/a (*a)	0.117	1g	1.6	-	P5	-	
2	Left	0	DC supply	11n20 (MCS8)(*1)	5320	64	91.5	1.09	8.5	7.41	1.29	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt	
2	Right	0	DC supply	11n20 (MCS8)(*1)	5320	64	91.5	1.09	8.5	7.41	1.29	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt	
2	Top	0	DC supply	11n20 (MCS8)(*1)	5320	64	91.5	1.09	8.5	7.41	1.29	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt	
1	Right	0	DC supply	11a																	

Test setup				Mode and Frequency (*2)			Duty cycle		Power correction			SAR results [W/kg]				SAR type	SAR Limit [W/kg]	SAR plot # in Appx. 2-2	Setup photo # in Appx. 1-3	Remarks
ANT #	Test position	Gap [mm]	Source power	Mode (D/R)	[MHz]	CH	Duty [%]	Duty scaled factor	Max. tune-up limit [dBm]	Measured conducted [dBm]	Power scaled factor	(Max. value of multi-peak)								
	Setup			Mark with "*" is the initial mode & frequency.								Measured	ΔSAR [%]	ΔSAR corrected	Scaled (*b)					
3) WLAN 5.6 GHz band																				
1	Right	0	DC supply	11a (6 Mbps)*	5500	100	95.2	1.05	8.5	7.27	1.33	0.517	Positive	n/a (*a)	0.722	1g	1.6	3-1	P1	<1.2 w/kg
1	Right	0	DC supply	11a (6 Mbps)*	5580*	116	95.2	1.05	8.5	7.43	1.28	0.352	Positive	n/a (*a)	0.473	1g	1.6	-	P1	-
1	Right	0	DC supply	11a (6 Mbps)*	5600	120	95.2	1.05	8.5	7.45	1.27	0.350	Positive	n/a (*a)	0.467	1g	1.6	-	P1	-
1	Right	0	DC supply	11a (6 Mbps)*	5700	140	95.2	1.05	8.5	7.36	1.30	0.420	Positive	n/a (*a)	0.573	1g	1.6	-	P1	-
1	Right	0	DC supply	11n20 (MCS0)	5500	100	94.5	1.06	8.5	7.16	1.36	0.480	Positive	n/a (*a)	0.692	1g	1.6	-	P1	<1.2 w/kg
1	Right	0	DC supply	11n20 (MCS0)	5580	116	94.5	1.06	8.5	7.23	1.34	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-
1	Right	0	DC supply	11n20 (MCS0)	5700	140	94.5	1.06	8.5	7.16	1.36	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-
1	Right	0	DC supply	11n20 (MCS8)*1	5500	100	91.5	1.09	8.5	7.14	1.37	0.445	Positive	n/a (*a)	0.665	1g	1.6	-	P1	<1.2 w/kg
1	Right	0	DC supply	11n20 (MCS8)*1	5580	116	91.5	1.09	8.5	7.58	1.24	0.331	Positive	n/a (*a)	0.447	1g	1.6	-	P1	-
1	Right	0	DC supply	11n20 (MCS8)*1	5700	140	91.5	1.09	8.5	7.27	1.33	0.413	Positive	n/a (*a)	0.599	1g	1.6	-	P1	-
1	Back	0	DC supply	11n20 (MCS8)*1	5580	116	91.5	1.09	8.5	7.58	1.24	0.128	Positive	n/a (*a)	0.173	1g	1.6	-	P3	-
1	Front	0	DC supply	11n20 (MCS8)*1	5580	116	91.5	1.09	8.5	7.58	1.24	0.088	Positive	n/a (*a)	0.119	1g	1.6	-	P4	-
1	Top	0	DC supply	11n20 (MCS8)*1	5580	116	91.5	1.09	8.5	7.58	1.24	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt
1	Left	0	DC supply	11n20 (MCS8)*1	5580	116	91.5	1.09	8.5	7.58	1.24	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt
1	Bottom	0	DC supply	11n20 (MCS8)*1	5580	116	91.5	1.09	8.5	7.58	1.24	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt
2	Bottom	0	DC supply	11a (6 Mbps)*	5500*	116	95.2	1.05	8.5	7.26	1.33	0.294	Positive	n/a (*a)	0.411	1g	1.6	-	P2	-
2	Bottom	0	DC supply	11a (6 Mbps)*	5580	116	95.2	1.05	8.5	7.15	1.36	0.426	Positive	n/a (*a)	0.608	1g	1.6	3-2	P2	<1.2 w/kg
2	Bottom	0	DC supply	11a (6 Mbps)*	5600	120	95.2	1.05	8.5	7.06	1.39	0.360	Positive	n/a (*a)	0.525	1g	1.6	-	P2	-
2	Bottom	0	DC supply	11a (6 Mbps)*	5700	140	95.2	1.05	8.5	7.21	1.35	0.353	Positive	n/a (*a)	0.500	1g	1.6	-	P2	-
2	Bottom	0	DC supply	11n20 (MCS0)	5500	100	94.5	1.06	8.5	7.10	1.38	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-
2	Bottom	0	DC supply	11n20 (MCS0)	5580	116	94.5	1.06	8.5	7.01	1.41	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-
2	Bottom	0	DC supply	11n20 (MCS0)	5700	140	94.5	1.06	8.5	7.04	1.40	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-
2	Bottom	0	DC supply	11n20 (MCS8)*1	5500	100	91.5	1.09	8.5	7.08	1.39	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-
2	Bottom	0	DC supply	11n20 (MCS8)*1	5580	116	91.5	1.09	8.5	7.29	1.32	0.407	Positive	n/a (*a)	0.586	1g	1.6	-	P2	<1.2 w/kg
2	Bottom	0	DC supply	11n20 (MCS8)*1	5700	140	91.5	1.09	8.5	7.14	1.37	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-
2	Back	0	DC supply	11n20 (MCS8)*1	5580	116	91.5	1.09	8.5	7.29	1.32	0.128	Positive	n/a (*a)	0.184	1g	1.6	-	P5	-
2	Front	0	DC supply	11n20 (MCS8)*1	5580	116	91.5	1.09	8.5	7.29	1.32	0.093	Positive	n/a (*a)	0.134	1g	1.6	-	P6	-
2	Left	0	DC supply	11n20 (MCS8)*1	5580	116	91.5	1.09	8.5	7.29	1.32	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt
2	Right	0	DC supply	11n20 (MCS8)*1	5580	116	91.5	1.09	8.5	7.29	1.32	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt
2	Top	0	DC supply	11n20 (MCS8)*1	5580	116	91.5	1.09	8.5	7.29	1.32	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt
4) WLAN 5.8 GHz band																				
1	Right	0	DC supply	11a (6 Mbps)*	5745*	149	95.2	1.05	8.5	7.19	1.35	0.482	Positive	n/a (*a)	0.683	1g	1.6	-	P1	-
1	Right	0	DC supply	11a (6 Mbps)*	5785	157	95.2	1.05	8.5	6.90	1.45	0.581	Positive	n/a (*a)	0.885	1g	1.6	-	P1	-
1	Right	0	DC supply	11a (6 Mbps)*	5825	165	95.2	1.05	8.5	6.98	1.42	0.678	Positive	n/a (*a)	1.011	1g	1.6	-	P1	<1.2 w/kg
1	Right	0	DC supply	11n20 (MCS0)	5745	149	94.5	1.06	8.5	7.03	1.40	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-
1	Right	0	DC supply	11n20 (MCS0)	5785	157	94.5	1.06	8.5	6.76	1.49	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-
1	Right	0	DC supply	11n20 (MCS0)	5825	165	94.5	1.06	8.5	6.80	1.48	0.662	Positive	n/a (*a)	1.039	1g	1.6	4-1	P1	<1.2 w/kg
1	Right	0	DC supply	11n20 (MCS8)*1	5745	149	91.5	1.09	8.5	7.10	1.38	0.475	Positive	n/a (*a)	0.714	1g	1.6	-	P1	-
1	Right	0	DC supply	11n20 (MCS8)*1	5785	157	91.5	1.09	8.5	6.86	1.46	0.578	Positive	n/a (*a)	0.920	1g	1.6	-	P1	-
1	Right	0	DC supply	11n20 (MCS8)*1	5825	165	91.5	1.09	8.5	6.91	1.44	0.604	Positive	n/a (*a)	0.948	1g	1.6	-	P1	<1.2 w/kg
1	Back	0	DC supply	11n20 (MCS8)*1	5745	149	91.5	1.09	8.5	7.10	1.38	0.151	Positive	n/a (*a)	0.227	1g	1.6	-	P3	-
1	Front	0	DC supply	11n20 (MCS8)*1	5745	149	91.5	1.09	8.5	7.10	1.38	0.061	Positive	n/a (*a)	0.092	1g	1.6	-	P4	-
1	Top	0	DC supply	11n20 (MCS8)*1	5745	149	91.5	1.09	8.5	7.10	1.38	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt
1	Left	0	DC supply	11n20 (MCS8)*1	5745	149	91.5	1.09	8.5	7.10	1.38	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt
1	Bottom	0	DC supply	11n20 (MCS8)*1	5745	149	91.5	1.09	8.5	7.10	1.38	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt
2	Bottom	0	DC supply	11a (6 Mbps)*	5745	149	95.2	1.05	8.5	7.10	1.38	0.378	Positive	n/a (*a)	0.548	1g	1.6	-	P2	-
2	Bottom	0	DC supply	11a (6 Mbps)*	5785	157	95.2	1.05	8.5	6.93	1.44	0.393	Positive	n/a (*a)	0.594	1g	1.6	-	P2	<1.2 w/kg
2	Bottom	0	DC supply	11a (6 Mbps)*	5825*	165	95.2	1.05	8.5	7.18	1.36	0.311	Positive	n/a (*a)	0.444	1g	1.6	-	P2	-
2	Bottom	0	DC supply	11n20 (MCS0)	5745	149	94.5	1.06	8.5	6.95	1.43	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-
2	Bottom	0	DC supply	11n20 (MCS0)	5785	157	94.5	1.06	8.5	6.73	1.50	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-
2	Bottom	0	DC supply	11n20 (MCS0)	5825	165	94.5	1.06	8.5	7.01	1.41	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-
2	Bottom	0	DC supply	11n20 (MCS8)	5745	149	91.5	1.09	8.5	7.00	1.41	0.446	Positive	n/a (*a)	0.685	1g	1.6	4-2	-	<1.2 w/kg
2	Bottom	0	DC supply	11n20 (MCS8)	5785	157	95.2	1.05	8.5	6.81	1.48	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	-
2	Bottom	0	DC supply	11n20 (MCS8)	5825	165	95.2	1.05	8.5	7.05	1.40	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	P2	-
2	Back	0	DC supply	11n20 (MCS8)	5745	149	91.5	1.09	8.5	7.00	1.41	0.135	Positive	n/a (*a)	0.207	1g	1.6	-	P5	-
2	Front	0	DC supply	11n20 (MCS8)	5745	149	91.5	1.09	8.5	7.00	1.41	0.051	Positive	n/a (*a)	0.078	1g	1.6	-	P6	-
2	Left	0	DC supply	11n20 (MCS8)	5745	149	91.5	1.09	8.5	7.00	1.41	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt
2	Right	0	DC supply	11n20 (MCS8)	5745	149	91.5	1.09	8.5	7.00	1.41	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt
2	Top	0	DC supply	11n20 (MCS8)	5745	149	91.5	1.09	8.5	7.00	1.41	n/a	Positive	n/a (*a)	n/a	1g	1.6	-	-	SAR test Exempt

*1. (KDB 248227 D01v02r02, Clause 6.1: Antenna Spatial Configurations) The SAR1g distribution of antenna 1 and antenna 2 wasn't overlapped in this setup condition because the distance between the antenna 1 and antenna 2 was away sufficiently. (refer to clause 7.2, Appendix 1-1 of antenna position) Therefore, SAR from an antenna (either antenna 1 or antenna 2) was the result which indicates the higher SAR value.

*. The higher scaled (reported) SAR in each operation band is marked (shaded yellow marker).

*. Appx. Appendix, ant: antenna; Max.: maximum.; n/a: not applied. Gap: It is the separation distance between EUT surface and the bottom outer surface of phantom.

*. During test, the EUT was operated with full charged battery.

*. During SAR test, the radiated power is always monitored by Spectrum Analyzer or/and MAIA.

*a. Since the calculated ΔSAR values of the tested liquid had shown positive correction, the measured SAR was not converted by ΔSAR correction.

Calculating formula: ΔSAR corrected SAR (W/kg) = (Measured SAR (W/kg)) × (100 - (ΔSAR(%))) / 100

Calculating formula: ΔSAR corrected SAR (W/kg) = (Measured SAR (W/kg)) × (100 - (ΔSAR(%))) / 100

*b. Calculating formula: Reported (Scaled) SAR (W/kg) = (Measured SAR (W/kg)) × (Duty scaled factor) × (Power scaled factor)

where, Duty scaled factor [-] = 100(%) / (measured duty cycle, %), Power scaled factor [-] = 10⁻¹ ((Max.tune-up limit power, dBm) - (Measured conducted power, dBm)) / 10)

*. Calibration frequency of the SAR measurement probe (and used conversion factors for each frequency.)

*. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

Liquid	SAR test frequency	Probe calibration frequency	Validity	Conversion factor	Uncertainty
Head	(2412, 2437, 2462) MHz	2450 MHz	within ± 50 MHz of calibration frequency	6.89	± 12.0 %
Head	(5180, 5220, 5240, 5260, 5300, 5320) MHz	5250 MHz	within ± 110 MHz of calibration frequency	4.75	± 13.1 %
Head	(5500, 5580, 5600, 5700) MHz	5600 MHz	within ± 110 MHz of calibration frequency	4.33	± 13.1 %
Head	(5745, 5785, 5825) MHz	5825 MHz	within ± 110 MHz of calibration frequency	4.31	± 13.1 %

7.2 Simultaneous transmission evaluation

Result: Co-location SAR test (volume scan post-processing) was not required because of the SPLSR is smaller than 0.04, even if the SAR(1g) values of each antenna 1 and 2 is shown to equal to the SAR (1g) limit = 1.6 W/kg.

According to KDB447498 D04; Volume scan SAR test exclusion was applied to antenna pair that transmits simultaneously by using SPLAR (SAR Peak Location Separation Ratio) method.

*. On the EUT, since the antenna separation distance is big enough (>300 mm) on each setup direction, SPLSR is smaller than 0.04 even if the standalone SAR(1g) of antenna 1 and antenna 2 is equal to the SAR(1g) limit (<1.6 W/kg). Therefore SAR test for co-location cannot be required.

Setup	Antenna separation distance (design based)	Max. standalone SAR(1g) [W/kg]		Σ1g SAR [W/kg]	SPLSR? (Yes/No)	SPLSR (≤ 0.04)	Volume scan Required?	Remarks
		antenna 1	antenna 2					
Front (Patient side) and Back	≈ 500 mm	1.6 (*.limit)	1.6 (*.limit)	3.2	Yes	0.01	No	-
Right (antenna 1 side)	≈ 390 mm	1.6 (*.limit)	1.6 (*.limit)	3.2	Yes	0.01	No	-
Bottom (antenna 2 side)	≈ 310 mm	1.6 (*.limit)	1.6 (*.limit)	3.2	Yes	0.02	No	-

*. (Calculating formula, KDB447498 D04) SPLSR = (SAR1 + SAR2)*1.5 / R(distance between pair of antennas, mm)
where SAR1 and SAR2 are the highest reported SAR values for the two sources in the pair.

7.3 SAR Measurement Variability (Repeated measurement requirement)

Result: Since all the measured SAR were less than 0.8 W/kg (SAR(1g)), the repeated measurement was not required.

*. In accordance with published RF Exposure KDB 865664 D01: SAR measurement 100 MHz to 6 GHz. 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.

- 1) Repeated measurement is not required when the original highest measured SAR(1g) 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.

EUT setup		Band [GHz]	Mode	Frequency [MHz]	SAR Measurement Variability Result										SAR plot # in Appendix 2 (Setup photo# in Appendix 1-3)		
Ant.	Position				Type	Unit	Original		1 st Repeated			2 nd Repeated			Original	1 st Repeated	2 nd Repeated
1	Back	WLAN 2.4	11g	2437	SAR1g	W/kg	Highest	0.789	< 0.8	n/a	-	-	-	n/a	-	-	-
1	Back	WLAN 5.2	11a	5180	SAR1g	W/kg	0.481	< 0.8	n/a	-	-	-	n/a	-	-	-	-
1	Back	WLAN 5.3	11a	5320	SAR1g	W/kg	0.414	< 0.8	n/a	-	-	-	n/a	-	-	-	-
1	Back	WLAN 5.6	11a	5500	SAR1g	W/kg	0.517	≥ 0.8	n/a	-	-	-	n/a	-	-	-	-
1	Back	WLAN 5.8	11a	5825	SAR1g	W/kg	0.678	≥ 0.8	n/a	-	-	-	n/a	-	-	-	-
2	Back	WLAN 2.4	11g	2462	SAR1g	W/kg	0.514	< 0.8	n/a	-	-	-	n/a	-	-	-	-
2	Back	WLAN 5.2	11a	5180	SAR1g	W/kg	0.422	< 0.8	n/a	-	-	-	n/a	-	-	-	-
2	Back	WLAN 5.3	11a	5320	SAR1g	W/kg	0.310	< 0.8	n/a	-	-	-	n/a	-	-	-	-
2	Back	WLAN 5.6	11a	5580	SAR1g	W/kg	0.426	≥ 0.8	n/a	-	-	-	n/a	-	-	-	-
2	Back	WLAN 5.8	11n20 (MCS9)	5745	SAR1g	W/kg	0.446	≥ 0.8	n/a	-	-	-	n/a	-	-	-	-

*. Calculating formula: "Ratio": Largest to Smallest SAR Ratio (%) = (Largest SAR (W/kg)) / Smallest SAR (W/kg)

7.4 Device holder perturbation verification (SAR)

Result: Since all the reported (scaled) SAR were less than 1.2 W/kg (SAR(1g)), the additional "device holder perturbation verification" measurement was not considered.

When the highest reported SAR of an antenna is > 1.2 W/kg, holder perturbation verification (by Urethane form alone) is required by using the highest SAR configuration among all applicable frequency bands.

7.5 Requirements on the Uncertainty Evaluation

7.5.1 SAR Uncertainty Evaluation

*. The highest measured SAR(1g) is less than 1.5 W/kg and the highest measured SAR(10g) is less than 3.75 W/kg. Therefore, per KDB 865664 D01, the extended measurement uncertainty analysis described in IEEE 1528-2013 and IEC/IEEE 62209-1528 is not required.

APPENDIX 2: Measurement data

Appendix 2-1: Plot(s) of Worst Reported Value

Plot 1-1: (2.4 GHz band) Antenna 1, Right & touch, 11g (6Mbps), 2437 MHz

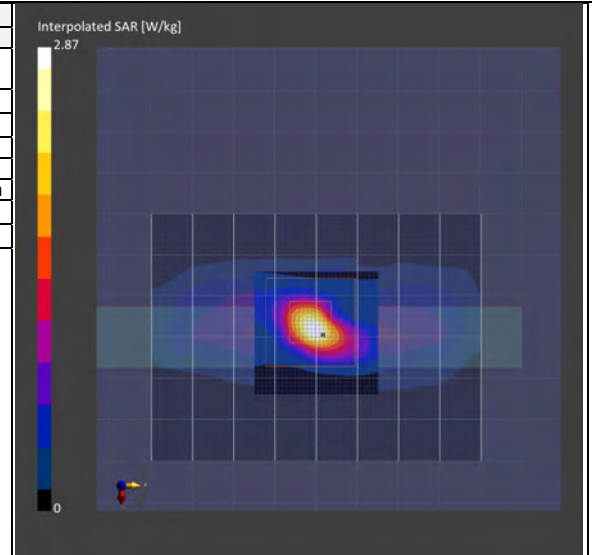
EUT: SKR 3000; Model: P-53; Serial: AEA0-S0004

Mode: 11g (6 Mbps) (UID: 0 (CW)) ; Frequency: 2437 MHz ; Test Distance: 0.00 mm

TSL parameters used: Head(v6) ; f= 2437 MHz; Conductivity: 1.840 S/m; Permittivity: 39.54

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated: 2023-04-19) / - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (6.89, 6.89, 6.89)@2437 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	60.0×80.0	30.0×30.0 ×30.0	psSAR 1g [W/kg]	0.706	0.789
Grid Steps [mm]	10.0×10.0	5.0×5.0×1.5	psSAR 10g [W/kg]	0.264	0.254
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	-0.02	0.01
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.5	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	VMS + 6p	M2/M1 [%]	N/A	63.9
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	5.1



Remarks: * Date tested: 2024-01-10; Tested by: Hiroshi Naka; Tested place: No.7 shielded room; Ambient: 23 deg.C. / (65~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar-1/10-3,24h3,at1,side,g(6),2437

Plot 1-2: (2.4 GHz band) Antenna 2, Bottom & touch, 11g (6Mbps), 2462 MHz

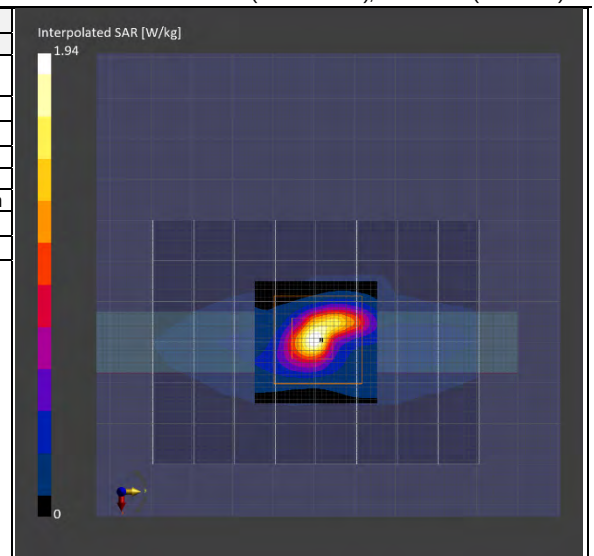
EUT: SKR 3000; Model: P-53; Serial: AEA0-S0004

Mode: 11g (6 Mbps) (UID: 0 (CW)) ; Frequency: 2462 MHz ; Test Distance: 0.00 mm

TSL parameters used: Head(v6) ; f= 2462 MHz; Conductivity: 1.860 S/m; Permittivity: 39.50

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated: 2023-04-19) / - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (6.89, 6.89, 6.89)@2462.000 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	60.0×80.0	30.0×30.0 ×30.0	psSAR 1g [W/kg]	0.497	0.523
Grid Steps [mm]	10.0×10.0	5.0×5.0×1.5	psSAR 10g [W/kg]	0.177	0.173
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.01	0.01
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.5	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	All points	All points	M2/M1 [%]	N/A	64.5
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	5.1



Remarks: * Date tested: 2024-01-10; Tested by: Hiroshi Naka; Tested place: No.7 shielded room; Ambient: 23 deg.C. / (65~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar-1/10-14,24h14,at2,side,g(6),2462

APPENDIX 2: SAR Measurement data / Appendix 2-1: Plot(s) of Worst Reported Value (cont'd)

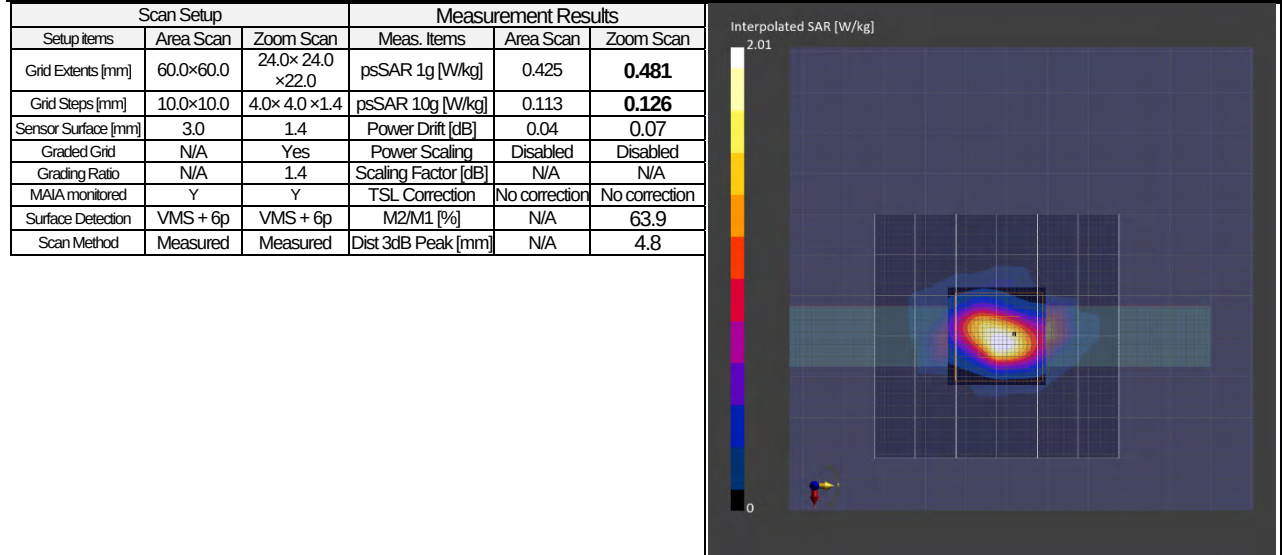
Plot 2a-1: (5.2 GHz band) Antenna 1, Right & touch, 11a (6Mbps), 5180 MHz

EUT: SKR 3000; Model: P-53; Serial:AEA0-S0004

Mode: 11a(6Mbps) (UID: 0 (CW)) ; Frequency: 5180 MHz ; Test Distance: 0.00 mm

TSL parameters used: Head(v6) ; f= 5180 MHz; Conductivity: 4.468 S/m; Permittivity: 34.99

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated: 2023-04-19) / - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.75, 4.75, 4.75)@5180 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)



Remarks: * Date tested: 2024-01-11; Tested by: Hiroshi Naka; Tested place: No.7 shielded room; Ambient: 23 deg.C. / (70~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar- 1/11-21,5h14,at1,side,a,5180

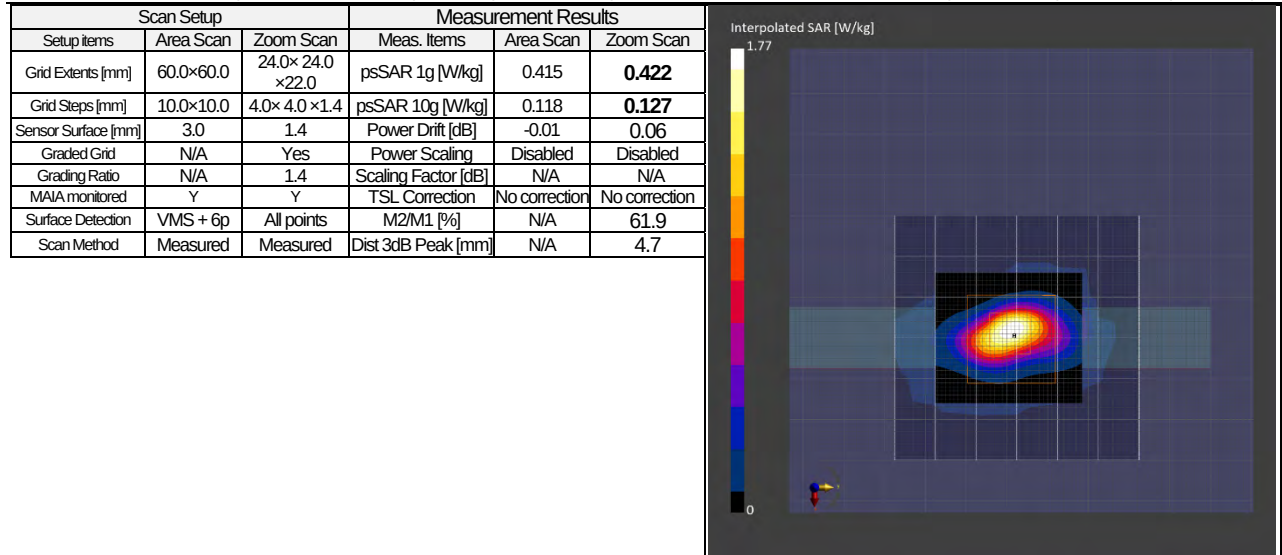
Plot 2a-2: (5.2 GHz band) Antenna 2, Bottom & touch, 11a (6Mbps), 5180 MHz

EUT: SKR 3000; Model: P-53; Serial:AEA0-S0004

Mode: 11a(6Mbps) (UID: 0 (CW)) ; Frequency: 5180 MHz ; Test Distance: 0.00 mm

TSL parameters used: Head(v6) ; f= 5180 MHz; Conductivity: 4.468 S/m; Permittivity: 34.99

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated: 2023-04-19) / - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.75, 4.75, 4.75)@5180.000 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)



Remarks: * Date tested: 2024-01-11; Tested by: Hiroshi Naka; Tested place: No.7 shielded room; Ambient: 23 deg.C. / (70~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar- 1/11-8,5h1,at2,side,a,5180

APPENDIX 2: SAR Measurement data / Appendix 2-1: Plot(s) of Worst Reported Value (cont'd)

Plot 2b-1: (5.3 GHz band) Antenna 1, Right & touch, 11n20HT (MCS8), 5320 MHz

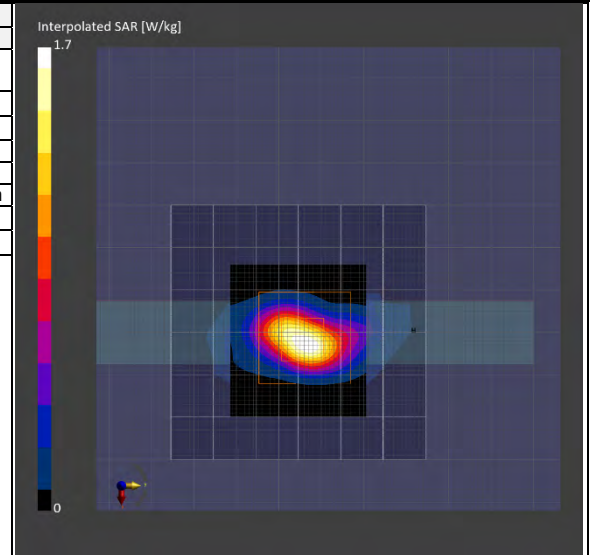
EUT: SKR 3000; Model: P-53; Serial:AEA0-S0004

Mode: 11n20(MCS8,MIMO) (UID: 0 (CW)) ; Frequency: 5320 MHz ; Test Distance: 0.00 mm

TSL parameters used: Head(v6) ; f= 5320 MHz; Conductivity: 4.623 S/m; Permittivity: 34.74

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated: 2023-04-19) / - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.75, 4.75, 4.75)@5320.000 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	60.0×60.0	24.0× 24.0 ×22.0	psSAR 1g [W/kg]	0.344	0.405
Grid Steps [mm]	10.0×10.0	4.0× 4.0 ×1.4	psSAR 10g [W/kg]	0.099	0.123
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	-0.19	-0.20
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.4	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	All points	All points	M2/M1 [%]	N/A	61.9
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	5.1



Remarks: * Date tested: 2024-01-12; Tested by: Hiroshi Naka; Tested place: No.7 shielded room; Ambient: 23 deg.C. / (70~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar- 1/12-5,5h31.at1+2,side,n20(m8),5320

Plot 2b-2: (5.3 GHz band) Antenna 2, Bottom & touch, 11a (6Mbps), 5320 MHz

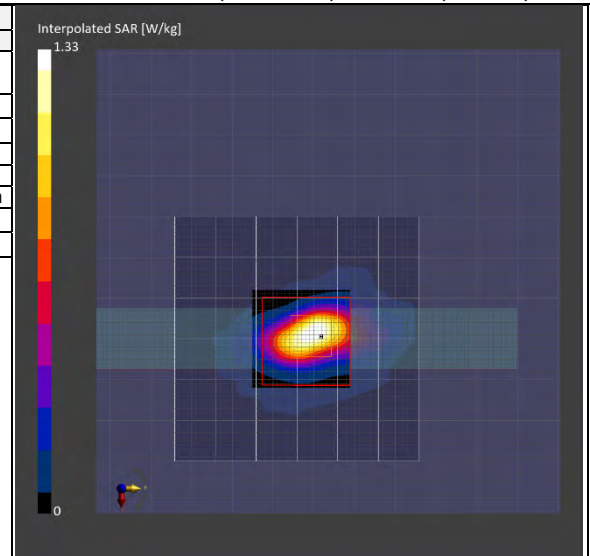
EUT: SKR 3000; Model: P-53; Serial:AEA0-S0004

Mode: 11a (6Mbps) (UID: 0 (CW)) ; Frequency: 5320 MHz ; Test Distance: 0.00 mm

TSL parameters used: Head(v6) ; f= 5320 MHz; Conductivity: 4.623 S/m; Permittivity: 34.74

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated: 2023-04-19) / - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.75, 4.75, 4.75)@5320 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	60.0×60.0	24.0× 24.0 ×22.0	psSAR 1g [W/kg]	0.303	0.310
Grid Steps [mm]	10.0×10.0	4.0× 4.0 ×1.4	psSAR 10g [W/kg]	0.086	0.096
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	-0.04	0.09
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.4	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	All points	M2/M1 [%]	N/A	62.4
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	4.8



Remarks: * Date tested: 2024-01-11; Tested by: Hiroshi Naka; Tested place: No.7 shielded room; Ambient: 23 deg.C. / (65~70) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar- 1/11-10,5h3.at2,side,a,5320

APPENDIX 2: SAR Measurement data / Appendix 2-1: Plot(s) of Worst Reported Value (cont'd)

Plot 3-1: (5.6 GHz band) Antenna 1, Right & touch, 11a (6Mbps), 5500 MHz

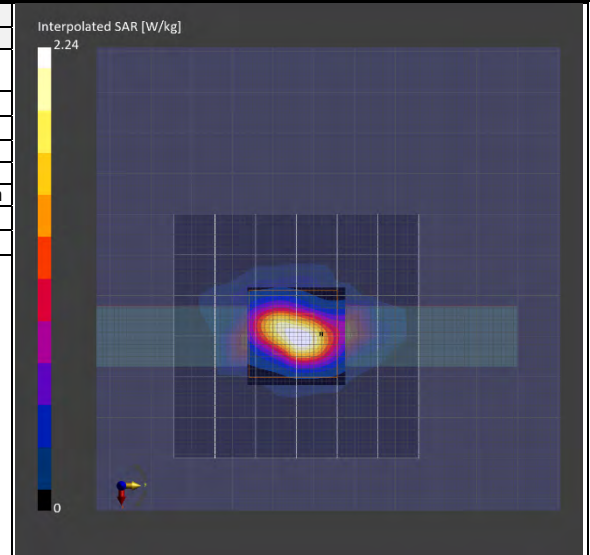
EUT: SKR 3000; Model: P-53; Serial:AEA0-S0004

Mode: 11a (6Mbps) (UID: 0 (CW)) ; Frequency: 5500 MHz ; Test Distance: 0.00 mm

TSL parameters used: Head(v6) ; f= 5500 MHz; Conductivity: 4.817 S/m; Permittivity: 34.44

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated: 2023-04-19) / - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.33, 4.33, 4.33)@5500 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	60.0×60.0	24.0× 24.0 ×22.0	psSAR 1g [W/kg]	0.468	0.517
Grid Steps [mm]	10.0×10.0	4.0× 4.0 ×1.4	psSAR 10g [W/kg]	0.123	0.137
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.03	-0.06
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.4	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	VMS + 6p	M2/M1 [%]	N/A	62.0
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	5.4



Remarks: * Date tested: 2024-01-11; Tested by: Hiroshi Naka; Tested place: No.7 shielded room; Ambient: 23 deg.C. / (65~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar- 1/11-24,5h17,at1,side,a,5500

Plot 3-2: (5.6 GHz band) Antenna 2, Bottom & touch, 11a (6Mbps), 5580 MHz

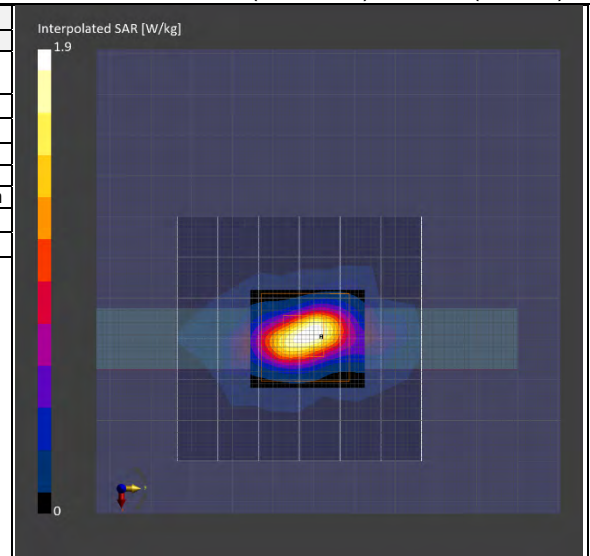
EUT: SKR 3000; Model: P-53; Serial:AEA0-S0004

Mode: 11a (6Mbps) (UID: 0 (CW)) ; Frequency: 5580 MHz ; Test Distance: 0.00 mm

TSL parameters used: Head(v6) ; f= 5580 MHz; Conductivity: 4.909 S/m; Permittivity: 34.32

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated: 2023-04-19) / - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.33, 4.33, 4.33)@5580.000 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	60.0×60.0	24.0× 24.0 ×22.0	psSAR 1g [W/kg]	0.420	0.426
Grid Steps [mm]	10.0×10.0	4.0× 4.0 ×1.4	psSAR 10g [W/kg]	0.115	0.129
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.08	-0.01
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.4	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	All points	M2/M1 [%]	N/A	60.7
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	5.4



Remarks: * Date tested: 2024-01-11; Tested by: Hiroshi Naka; Tested place: No.7 shielded room; Ambient: 23 deg.C. / (65~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar- 1/11-12,5h5,at2,side,a,5580

APPENDIX 2: SAR Measurement data / Appendix 2-1: Plot(s) of Worst Reported Value (cont'd)

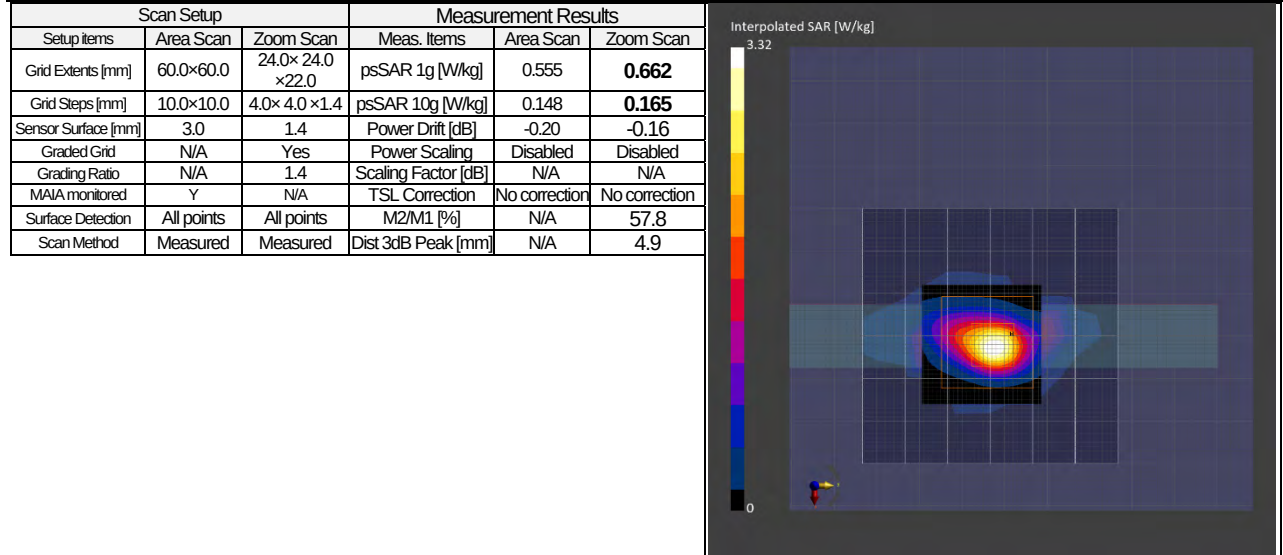
Plot 4-1: (5.8 GHz band) Antenna 1, Right & touch, 11n20HT (MCS0), 5825 MHz

EUT: SKR 3000; Model: P-53; Serial:AEA0-S0004

Mode: 11n20(MCS0) (UID: 0 (CW)) ; Frequency: 5825 MHz ; Test Distance: 0.00 mm

TSL parameters used: Head(v6) ; f= 5825 MHz; Conductivity: 5.181 S/m; Permittivity: 33.88

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated: 2023-04-19) / - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.31, 4.31, 4.31)@5825 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)



Remarks: * Date tested: 2024-01-12; Tested by: Hiroshi Naka; Tested place: No.7 shielded room; Ambient: 22 deg.C. / (60-65) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar-1/12-2,5h28,at1,side,n20(m0),5825

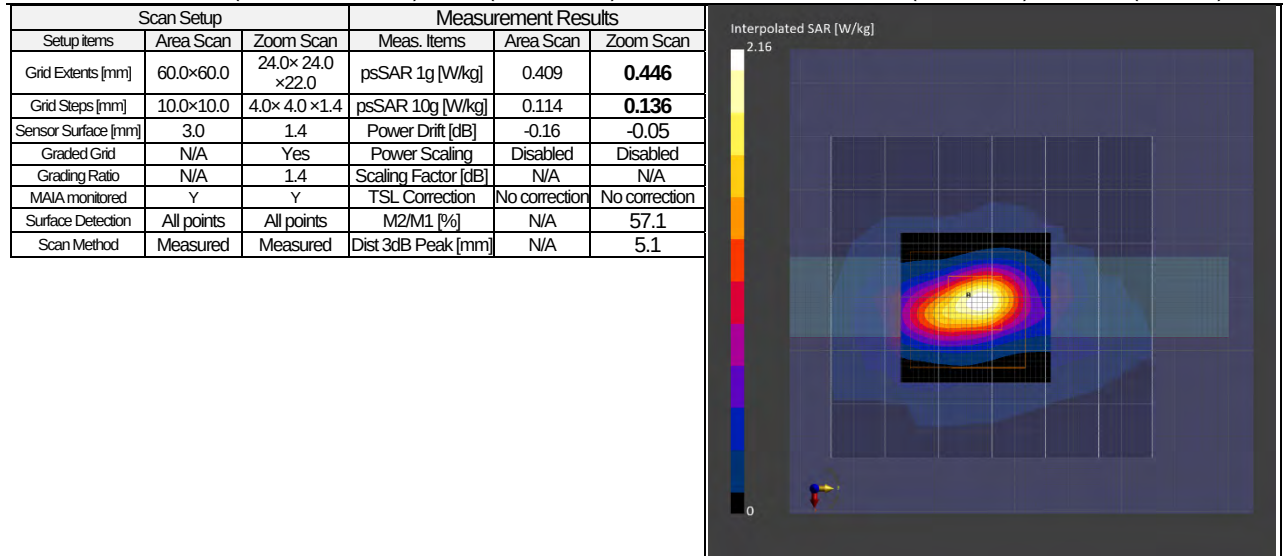
Plot 4-2: (5.8 GHz band) Antenna 1, Right & touch, 11n20HT (MCS8), 5745 MHz

EUT: SKR 3000; Model: P-53; Serial:AEA0-S0004

Mode: 11n20(MCS8, MIMO) (UID: 0 (CW)) ; Frequency: 5745 MHz ; Test Distance: 0.00 mm

TSL parameters used: Head(v6) ; f= 5745 MHz; Conductivity: 5.168 S/m; Permittivity: 33.73

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated: 2023-04-19) / - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.31, 4.31, 4.31)@5745 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)



Remarks: * Date tested: 2024-01-16; Tested by: Hiroshi Naka; Tested place: No.7 shielded room; Ambient: 23 deg.C. / (60-70) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar-1/16-5,5h53,at2+1,side,n20(m8),5745

APPENDIX 3: Test instruments

Appendix 3-1: Equipment used

Test Name	LIMS ID	Description	Manufacturer	Model	Serial	Calibration	
						Last Date	Interval (Month)
AT	145800	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY48250106	2023/03/01	12
AT	169910	Power Meter	Keysight Technologies Inc	8990B	MY51000448	2023/09/28	12
AT	169911	Power sensor	Keysight Technologies Inc	N1923A	MY57270004	2023/09/28	12
AT	169912	Power sensor	Keysight Technologies Inc	N1923A	MY57290005	2023/09/28	12
AT	196949	Coaxial Cable	Huber+Suhner	SUCOFLEX 102	803480/2	2023/03/02	12
AT	236500	Attenuator	To-Conne Co., Ltd.	SA-PJ-10	-	2023/12/04	12
AT	236504	Attenuator	To-Conne Co., Ltd.	SA-PJ-10	-	2023/12/04	12
AT,SAR	191844	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	-	2023/08/03	12
SAR	144886	Dielectric assessment kit soft	Schmid&Partner Engineering AG	DAK ver.3.0.6.14	9-0EE103A4	-	-
SAR	144986	Thermo-Hygrometer data logger	SATO KEIRYOKI	SK-L200THIIa/SK-LTHIIa-2	015246/08169	2023/08/04	12
SAR	144988	Power meter	Keysight Technologies Inc	E4417A	GB41290718	2023/09/27	12
SAR	144990	Power sensor	Keysight Technologies Inc	E9327A	US40440544	2023/09/27	12
SAR	144991	Power sensor	Anritsu Corporation	MA2411B	12088	2023/09/27	12
SAR	145086	Ruler(300mm)	SHINWA	13134	-	2023/02/08	12
SAR	145087	Ruler(100x50mm,L)	SHINWA	12101	-	2023/02/08	12
SAR	145105	Power meter	Anritsu Corporation	ML2495A	6K00003356	2023/09/27	12
SAR	145106	Ruler(150mm,L)	SHINWA	12103	-	2023/02/08	12
SAR	145558	Dipole Antenna	Schmid&Partner Engineering AG	D2450V2	765	2023/05/24	12
SAR	146112	Primepure Ethanol	Kanto Chemical Co., Inc.	14032-79	-	-	-
SAR	146176	Spectrum Analyzer	ADVANTEST	R3272	101100994	-	-
SAR	146185	DI water	MonotaRo	34557433	-	-	-
SAR	146258	Network Analyzer	Keysight Technologies Inc	8753ES	US39171777	2023/10/05	12
SAR	146308	Power sensor	Keysight Technologies Inc	E9327A	US40440545	2023/09/27	12
SAR	150560	Measuring Tool, Ruler	SHINWA	14001	-	2023/02/08	12
SAR	201967	Digital thermomoter	HANNA	Checktemp-4	A01440226111	2023/08/04	12
SAR	201968	Digital thermomoter	HANNA	Checktemp-4	A01310946111	2023/08/04	12
SAR	207714	Head Tissue Simulating Liquid	Schmid&Partner Engineering AG	HBBL600-10000V6	SL AAH U16 BC	-	-
SAR	224020	DASY8 PC	Hewlett Packard	HP Z4 G4 Workstation	CZC1198G21	-	-
SAR	224023	Robot Controller	Schmid&Partner Engineering AG	CS9spe-TX2-60	F/22/0033789/C/001	-	-
SAR	224025	Measurement Server	Schmid&Partner Engineering AG	DASY8 Measurement Server	10042	2023/12/18	12
SAR	224026	Electro-Optical Converter	Schmid&Partner Engineering AG	EOC8-60	1027	-	-
SAR	224027	Light Beam Unit	Schmid&Partner Engineering AG	LIGHTBEAM-85	2069	-	-
SAR	224028	Modulation & Audio Interference Analyser	Schmid&Partner Engineering AG	MAIA	1582	-	-
SAR	224031	DASY8 Module SAR/APD soft	Schmid&Partner Engineering AG	ver.16.2.4.2524	9-2506F07D	-	-
SAR	224032	6-axis Robot	Schmid&Partner Engineering AG	TX2-60L spe	F/22/0033789/A/001	2023/08/29	12
SAR	224034	Flat Phantom	Schmid&Partner Engineering AG	ELI V8.0	2161	2023/08/21	12
SAR	225155	Mounting Platform	Schmid&Partner Engineering AG	MP8E-TX2-60L Basic	-	-	-
SAR	225418	Directional coupler (dual)	TAP Microwave	TDC20180A20D	22100556	2023/12/04	12
SAR	226380	Dosimetric E-Field Probe	Schmid&Partner Engineering AG	EX3DV4	3745	2023/04/18	12
SAR	235176	Signal Generator	Rohde & Schwarz	SMB 100A	183690	2023/01/26	12
SAR	236501	Coaxial Cable	To-Conne Co., Ltd.	TC-038-SP-SP-200	23E09-01	2023/12/04	12
SAR	236503	Coaxial Cable	To-Conne Co., Ltd.	TC-038-SP-SP-1800	23E09-02	2023/12/04	12
SAR	243045	Data Acquisition Electronics	Schmid&Partner Engineering AG	DAE4	518	2023/04/19	12
SAR	243047	Dipole Antenna (5GHz)	Schmid&Partner Engineering AG	D5GHzV2	1039	2023/04/17	12
SAR	243048	Dielectric assessment kit	Schmid&Partner Engineering AG	DAKS-3.5	1058	2023/05/22	12

*. AT (antenna terminal conducted power measurement) was measured December 25, 2023. (Refer to Section 5 in this report.)

*. LIMS ID: 146112, the parameters of primepure Ethanol (as reference liquid) used for the simulated tissue parameter confirmation was defined the NPL Report MAT23 (<http://www.npl.co.uk/content/conpublication/4295>)

The expiration date of calibration is the end of the expired month.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chain of calibrations.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

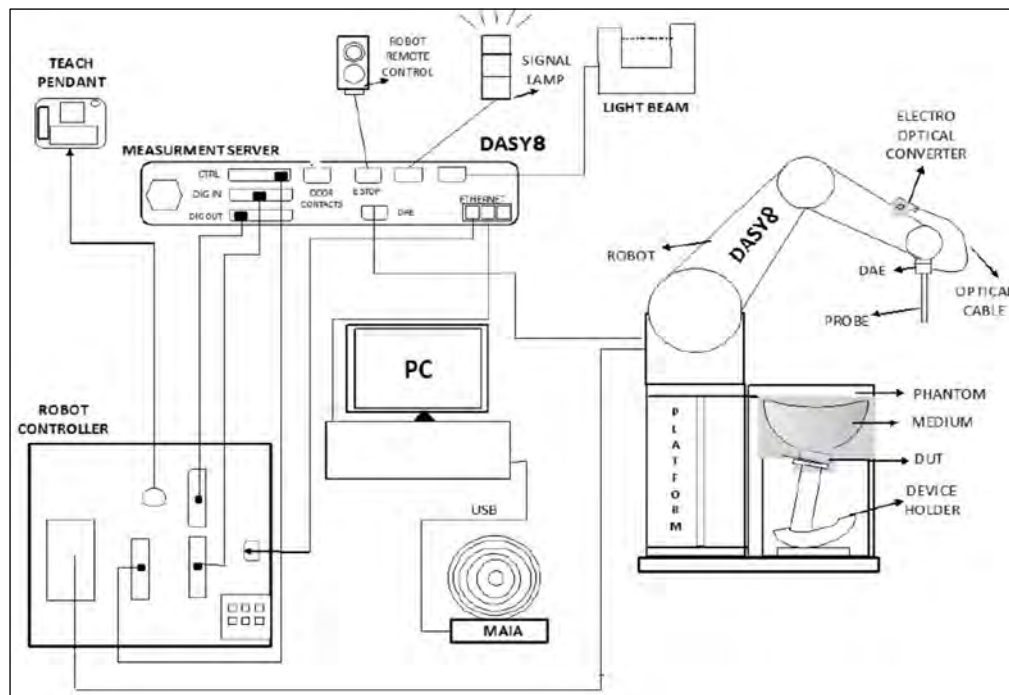
*. Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.

[Test Item] SAR: Specific Absorption Rate, AT: Antenna terminal conducted power

Appendix 3-2: Measurement System

Appendix 3-2-1: SAR Measurement System

These measurements were performed with the automated near-field scanning system DASY8 from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot, which positions the probes with a positional repeatability of better than ± 0.03 mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines to the data acquisition unit. The SAR measurements were conducted with the dosimetry probes EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.



The DASY8 SAR/APD system for performing compliance tests consist of the following items:

- 6-axis robotic arm (Stäubli TX2-60L) for positioning the probe
- Mounting Platform for keeping the phantoms at a fixed location relative to the robot
- Measurement Server for handling all time-critical tasks, such as measurement data acquisition and supervision of safety features
- EOC (Electrical to Optical Converter) for converting the optical signal from the DAE to electrical before being transmitted to the measurement server
- LB (Light-Beam unit) for probe alignment (measurement of the exact probe length and eccentricity)
- SAR probe (EX3DV4 probes) for measuring the E-field distribution in the phantom. The SAR distribution and the psSAR (peak spatial averaged SAR) are derived from the E-field measurement.
- SAR phantom that represents a physical model with an equivalent human anatomy. A Specific Anthropomorphic Mannequin (SAM) head is usually used for handheld devices, and a Flat phantom is used for body-worn devices.
- TSL (Tissue Simulating Liquid) representing the dielectric properties of used tissue, e.g. Head Simulating Liquid, HSL.
- DAE (Data Acquisition Electronics) for reading the probe voltages and transmitting it to the DASY8 PC.
- Device Holder for positioning the DUT beneath the phantom.
- MAIA (Modulation and Interference Analyzer) for confirming the accuracy of the probe linearization parameters
- Operator PC for running the DASY8 software to define/execute the measurements
- System validation kits for system check/validation purposes.

Platforms

The platform is a multi-phantom support structure made of a wood and epoxy composite ($\epsilon = 3.3$ and loss tangent $\delta < 0.07$). It is a strong and rigid structure transparent to electric and magnetic fields (nonmetallic components).

TX2-60L robot, CS9 robot controller

•Number of Axes : 6 •Repeatability : ± 0.03 mm •Manufacture : Stäubli

DASY8 Measurement server

The DASY8 Measurement Server handles all time critical tasks such as acquisition of measurement data, detection of phantom surface, control of robot movements, supervision of safety features.

•Manufacture : Schmid & Partner Engineering AG

Data Acquisition Electronic (DAE)

The DAE is used to acquire the probe sensor voltages and transfer them to the DASY8 Measurement Server, and to report mechanical surface detection and probe collisions. The DAE consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16-bit AD-converter, and a command decoder with a control logic unit. Transmission to the DASY8 Measurement Server is accomplished through an optical downlink for data and status information and an optical uplink for commands and the clock. The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts used for mechanical surface detection and probe collision detection.

•Measurement Range : $1 \mu\text{V}$ to $> 200 \text{ mV}$ (2 range settings: 4 mV (low), 400 mV (high))
•Input Offset voltage : $< 1 \mu\text{V}$ (with auto zero) •Input Resistance : $200 \text{ M}\Omega$
•Battery operation : > 10 hrs. (with two rechargeable 9 V battery)
•Manufacture : Schmid & Partner Engineering AG

Electro-Optical Converter (EOC8-TX2-60L)

The Electrical to Optical Converter (EOC8) supports as data exchange between the DAE and the measurement server (optical connector) and data acquisition based on Ethernet protocol.

•Manufacture : Schmid & Partner Engineering AG

Light Beam Switch

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

•Manufacture : Schmid & Partner Engineering AG

SAR measurement software

•Software version : Refer to Appendix 3-1 (Equipment used) •Manufacture : Schmid & Partner Engineering AG

E-Field Probe

•Model : EX3DV4 •Frequency: 4 MHz to 10 GHz , Linearity: $\pm 0.2 \text{ dB}$ (30 MHz to 10 GHz)
•Construction : Symmetrical design with triangular core, Built-in shielding against static charges, PEEK enclosure material (resistant to organic solvents, e.g., DGBE).
•CF : Refer to calibration data of Appendix. (CF: Conversion Factors)
•Directivity : $\pm 0.1 \text{ dB}$ in TSL (rotation around probe axis) / $\pm 0.3 \text{ dB}$ in TSL (rotation normal to probe axis)
•Dynamic Range : $10 \mu\text{W/g}$ to $> 100 \text{ mW/g}$; Linearity: $\pm 0.2 \text{ dB}$ (noise: typically $< 1 \mu\text{W/g}$)
•Dimension : Overall length: 330 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 measurement in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30% .
•Manufacture : Schmid & Partner Engineering AG

ELI Phantom

The ELI phantom is used 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 V8.0 phantom shell has optimized pretension in the bottom surface during production, such that the phantom is more robust and with reduced sagging.

•Model Number : ELI V8.0 flat phantom •Shell Material : Vinyl ester, fiberglass reinforced (VE-GF)
•Shell Thickness : $2.0 \pm 0.2 \text{ mm}$ (bottom plate) •Dimensions : $600 \text{ mm} \times 400 \text{ mm}$ (oval) (volume: Approx. 30 liters)
•Manufacture : Schmid & Partner Engineering AG

Device Holder, Laptop holder, support material

Accurate device positioning is crucial for accurate and repeatable measurements. The positions in which the devices must be measured are defined by the standards. The device holder is designed to cope with the different positions given in the standard. It has two scales for device rotation (with respect to the body axis) and device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (ERP). Thus the device needs no repositioning when changing the angles. The DASY device holder is constructed of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon=3$ and loss tangent $\delta=0.02$. 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.

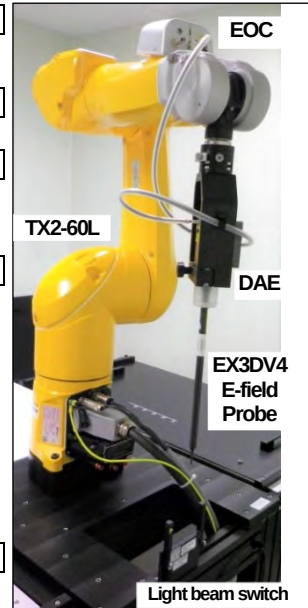
☑ Device holder: In combination with the ELI phantom, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Transmitter devices can be easily and accurately positioned. The low-loss dielectric urethane foam was used for the mounting section of device holder.

•Material : Polyoxymethylene (POM) •Manufacture: Schmid & Partner Engineering AG

☑ Laptop holder: A simple but effective and easy-to-use extension for the Mounting Device; facilitates testing of larger devices (e.g., laptops, cameras, etc.) according to IEC 62209-2.

•Material : Polyoxymethylene (POM), PET-G, Foam •Manufacture: Schmid & Partner Engineering AG

☑ Support form: Urethane foam



Data storage and evaluation (post processing)

The uplink signal transmitted by the DUT is measured inside the TSL by the probe, which is accurately positioned at a precisely known distance and with a normal orientation with respect to the phantom surface. The dipole / loop sensors at the probe tips pick up the signal and generate a voltage, which is measured by the voltmeter inside the DAE. The DAE returns digital values, which are converted to an optical signal and transmitted via the EOC to the measurement server. The data is finally transferred to the DASY8 software for further post processing. In addition, the DASY8 software periodically requests a measurement with short-circuited inputs from the DAE to compensate the amplifier offset and drift. This procedure is called DAE zeroing.

The operator has access to the following low level measurement settings:

- the integration time is the voltage acquisition time at each measurement point. It is typically 0.5 s.
- the zeroing period indicates how often the DAE zeroing is performed.

In parallel, the MAIA measures the characteristics of the uplink signal via the air interface and sends this information to the DASY8 software, which compares them to the communication system defined by the operator. A warning is issued if any difference is detected.

The measurement data is now acquired and can be post processed to compute the psSAR1g /8g /10g.

The measured voltages are not directly proportional to SAR and must be linearized. The formulas below are based on [1] (*1).

The measured voltage is first linearized using the (a, b, c, d) set of parameters specific to the communication system and sensor:

$$V_{comp i} = U_i + U_i^2 \cdot \frac{10^{\frac{d}{10}}}{d_{cp i}}$$

with	$V_{comp i}$	= compensated voltage of channel i (μV)	(i = x,y,z)
	U_i	= input voltage of channel i (μV)	(i = x,y,z)
	d	= PMR factor d (dB)	(Probe parameter)
	$d_{cp i}$	= diode compression point of channel i (μV)	(Probe parameter, i = x,y,z)

$$V_{comp i \text{ dB}\sqrt{\mu V}} = 10 \cdot \log_{10}(V_{comp i})$$

$$corr_i = a_i \cdot e^{-\left(\frac{b_i - 10 \log_{10}(V_{comp i})}{c_i}\right)^2}$$

with	$corr_i$	= correction factor of channel i (dB)	(i = x,y,z)
	$V_{comp i \text{ dB}\sqrt{\mu V}}$	= compensated voltage of channel i (dB√μV)	(i = x,y,z)
	a_i	= PMR factor a of channel i (dB)	(Probe parameter, i = x,y,z)
	b_i	= PMR factor b of channel i (dB√μV)	(Probe parameter, i = x,y,z)
	c_i	= PMR factor c of channel i (-)	(Probe parameter, i = x,y,z)

The voltage $V_{i \text{ dB}\sqrt{\mu V}}$ is the linearized voltage in dB√μV:

$$V_{i \text{ dB}\sqrt{\mu V}} = V_{comp i \text{ dB}\sqrt{\mu V}} - corr_i$$

with	$V_{i \text{ dB}\sqrt{\mu V}}$	= linearized voltage of channel i (dB√μV)	(i = x,y,z)
	$V_{comp i \text{ dB}\sqrt{\mu V}}$	= compensated voltage of channel i (dB√μV)	(i = x,y,z)
	$Corr_i$	= PMR factor a of channel i (dB)	(i = x,y,z)

Finally, the linearized voltage is converted in μV:

$$V_i = 10^{\frac{V_{i \text{ dB}\sqrt{\mu V}}}{10}}$$

with	V_i	= linearized voltage of channel i (μV)	(i = x,y,z)
	$V_{comp i \text{ dB}\sqrt{\mu V}}$	= linearized voltage of channel i (dB√μV)	(i = x,y,z)

The Field data for each channel are calculated using the linearized voltage:

$$\text{E-field probes: } E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

with	V_i	= linearized voltage of channel i in μV	(i = x,y,z)
	$Norm_i$	= sensor sensitivity of channel i in μV/(V/m) ² for E-field Probes	(i = x,y,z)
	$ConvF$	= sensitivity enhancement in solution	
	E_i	= electric field strength of channel i in V/m	(i = x,y,z)

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

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The E-field data value is used to calculate SAR :

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1000}$$

with	SAR	= local specific absorption rate in mW/g
	E_{tot}	= total field strength in V/m
	σ	= conductivity in [Ω/m] or [S/m]
	ρ	= equivalent tissue density in g/cm ³

Note: The resulting linearized voltage is only approximated because the probe UID is used 0 (CW) for the test signal in this test report.

(*1) [1] Jagadish Nadakuduti, Sven Kuehn, Marcel Fehr, Mark Douglas Katja Pokovic and Niels Kuster, "The Effect of Diode Response of electromagnetic Field Probes for the Measurements of Complex Signals." IEEE Transactions on Electromagnetic Compatibility, vol. 54, pp. 1195–1204, Dec. 2012.

Appendix 3-2-2: SAR system check results

*. Prior to the SAR assessment of EUT, the Daily check was performed to test whether the SAR system was operating within its target of $\pm 10\%$. The Daily check results are in the table below.

Daily check results (*. Abbreviations: F: Frequency, Meas.: Measured, Cal.: Calibration value, STD: Standard value, Dev.: Deviation)																
Liquid type: Head	F [MHz]	ΔSAR		SAR (1g) [W/kg] (*b)						SAR (10g) [W/kg] (*b)						Dev. Limit [%]
		1g [%]	10g [%]	Meas (*a)	1W scaled	Target		Deviation		Meas (*a)	1W scaled	Target		Deviation		
Date																
2024-01-10	2450	1.2	0.6	2.69	53.16	52.7	52.4	0.9	1.5	1.25	24.86	24.7	24	0.6	3.6	≤10
2024-01-11	5250	0.7	0.9	4.02	79.84	80.7	77.6	-1.1	2.9	1.16	23	23.1	21.9	-0.4	5.0	≤10
2024-01-11	5500	0.8	1.0	4.34	86.1	84.5	81.5	1.9	5.6	1.24	24.56	24.1	22.9	1.9	7.2	≤10
2024-01-11	5800	0.9	1.0	4.05	80.28	80	78	0.4	2.9	1.15	22.78	22.6	21.9	0.8	4.0	≤10
2024-01-12	2450	1.2	0.6	2.63	51.96	52.7	52.4	-1.4	-0.8	1.22	24.26	24.7	24	-1.8	1.1	≤10
2024-01-12	5250	0.7	0.9	4.02	79.84	80.7	77.6	-1.1	2.9	1.16	23	23.1	21.9	-0.4	5.0	≤10
2024-01-12	5500	0.8	1.0	4.32	85.7	84.5	81.5	1.4	5.2	1.24	24.56	24.1	22.9	1.9	7.2	≤10
2024-01-12	5800	0.9	1.0	4.02	79.68	80	78	-0.4	2.2	1.14	22.58	22.6	21.9	-0.1	3.1	≤10
2024-01-15	2450	1.5	0.8	2.68	52.8	52.7	52.4	0.2	0.8	1.24	24.6	24.7	24	-0.4	2.5	≤10
2024-01-15	5250	0.8	1.0	4.07	80.74	80.7	77.6	0.0	4.0	1.17	23.16	23.1	21.9	0.3	5.8	≤10
2024-01-15	5500	0.9	1.2	4.33	85.82	84.5	81.5	1.6	5.3	1.24	24.5	24.1	22.9	1.7	7.0	≤10
2024-01-15	5800	1.0	1.2	4.07	80.58	80	78	0.7	3.3	1.16	22.92	22.6	21.9	1.4	4.7	≤10

*a. The measured SAR value is obtained at 50 mW (17 dBm) for all tested frequencies

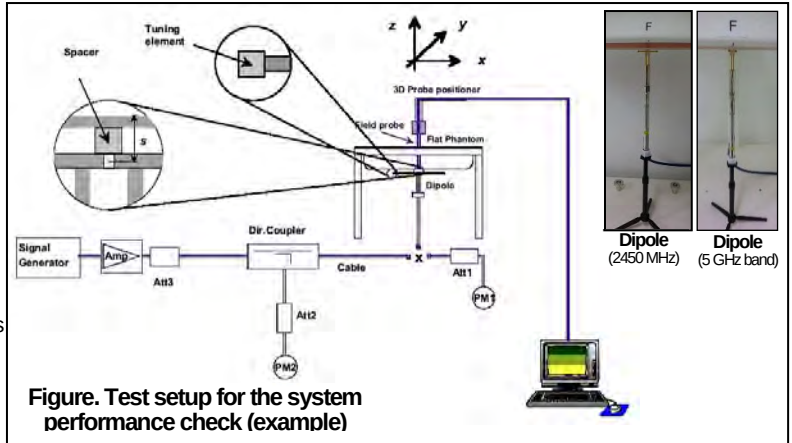
*b. The measured SAR value of Daily check was compensated for tissue dielectric deviations (Δ SAR) and scaled to 1W of output power in order to compare with the manufacture's calibration target value which was normalized.

$$\Delta\text{SAR corrected SAR (1g) (W/kg)} = (\text{Measured SAR(1g) (W/kg)}) \times (100 - (\Delta\text{SAR1g}(\%))) / 100$$

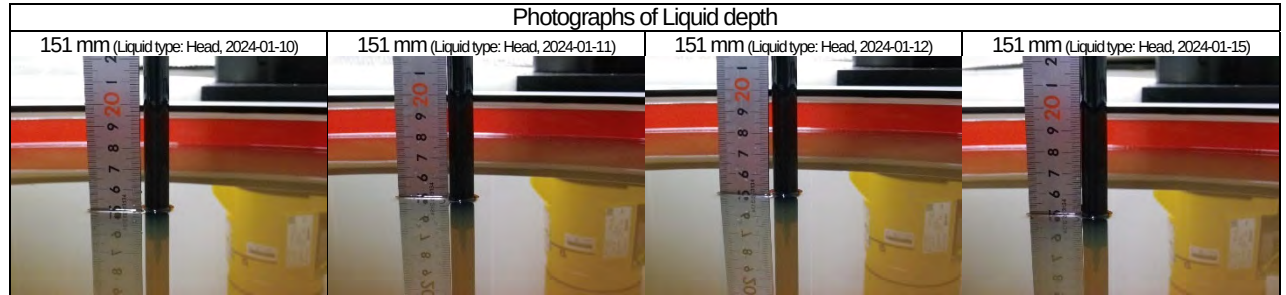
$$\Delta\text{SAR corrected SAR (10g) (W/kg)} = (\text{Measured SAR(10g) (W/kg)}) \times (100 - (\Delta\text{SAR10g}(\%))) / 100$$

*c. The target value is a parameter defined in the calibration data sheet of D2450V2(sn765) dipole and D5GHzV2(sn1039) dipole calibrated by Schmid & Partner Engineering AG, the data sheet was filed in this report when there were used.

*d. The target value (normalized to 1W) is defined in IEEE Std.1528.



Appendix 3-2-3: SAR system check measurement data

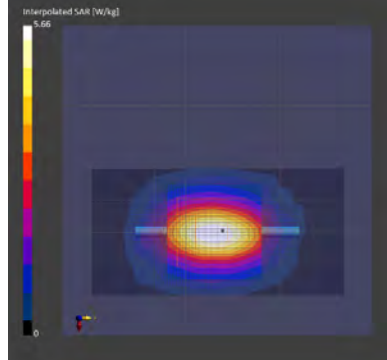


Dipole: D2450V2 - SN765 ; Mode: CW (0) ; Frequency: 2450 MHz ; Test Distance: 10 mm (dipole to liquid); Power: 17.0 dBm

TSL parameters used: Head(v6) ; f= 2450 MHz; Conductivity: 1.850 S/m; Permittivity: 39.52

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated:2023-04-19) - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat - Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (6.89, 6.89, 6.89)@2450 MHz / - Software: N/A (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	40.0×80.0	30.0×30.0 ×30.0	psSAR1g [W/kg]	2.71	2.69
Grid Steps [mm]	10.0×10.0	5.0×5.0×1.5	psSAR10g [W/kg]	1.25	1.25
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.01	0.00
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.5	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	VMS + 6p	M2/M1 [%]	N/A	79.8
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	9.0



Remarks: *. Date tested:2024-01-10 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 23 deg.C. / (55~70) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. $\pm$ 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g) / small=SAR(1g)
*. Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar- 1/10a,50mw

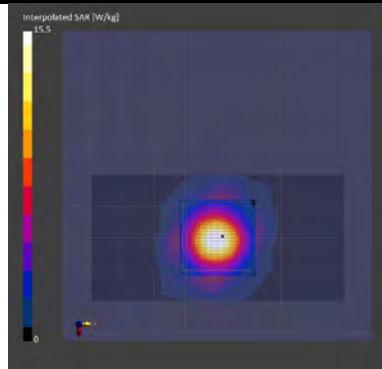
Appendix 3-2-3: SAR system check measurement data (cont'd)

Dipole: D5GHzV2 - SN1039 ; Mode: CW (0) ; Frequency: 5250 MHz ; Test Distance: 10 mm (dipole to liquid); Power: 17.0 dBm

TSL parameters used: Head(v6) ; f= 5250 MHz; Conductivity: 4.544 S/m; Permittivity: 34.85

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated:2023-04-19) - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.75, 4.75, 4.75)@5250 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	40.0×80.0	24.0× 24.0 ×22.0	psSAR1g [W/kg]	3.82	4.02
Grid Steps [mm]	10.0×10.0	4.0× 4.0 ×1.4	psSAR10g [W/kg]	1.09	1.16
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.05	0.04
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.4	Scaling Factor [dB]	N/A	N/A
MAIA monitored	N/A	N/A	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	VMS + 6p	M2/M1 [%]	N/A	65.6
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	7.3



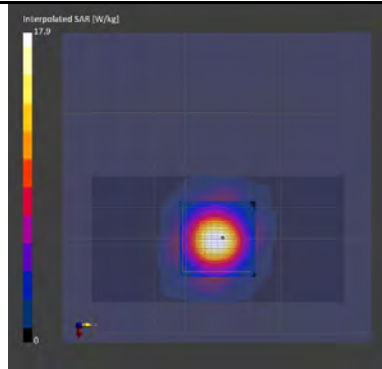
Remarks: * Date tested:2024-01-11 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: (22~23) deg.C. / (55~70) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar- 1/11b,50mw

Dipole: D5GHzV2 - SN1039 ; Mode: CW (0) ; Frequency: 5600 MHz ; Test Distance: 10 mm (dipole to liquid); Power: 17.0 dBm

TSL parameters used: Head(v6) ; f= 5600 MHz; Conductivity: 4.931 S/m; Permittivity: 34.28

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated:2023-04-19) - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.33, 4.33, 4.33)@5600 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	40.0×80.0	24.0× 24.0 ×22.0	psSAR1g [W/kg]	4.12	4.34
Grid Steps [mm]	10.0×10.0	4.0× 4.0 ×1.4	psSAR10g [W/kg]	1.15	1.24
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.06	0.04
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.4	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	VMS + 6p	M2/M1 [%]	N/A	62.9
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	7.2



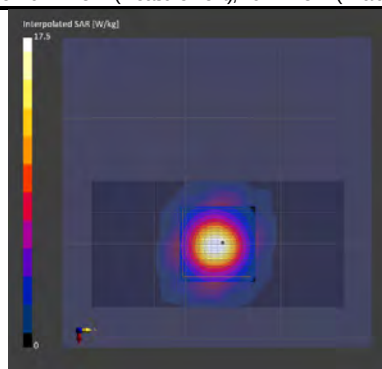
Remarks: * Date tested:2024-01-11 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: (22~23) deg.C. / (55~70) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar- 1/11c,50mw

Dipole: D5GHzV2 - SN1039 ; Mode: CW (0) ; Frequency: 5800 MHz ; Test Distance: 10 mm (dipole to liquid); Power: 17.0 dBm

TSL parameters used: Head(v6) ; f= 5800 MHz; Conductivity: 5.152 S/m; Permittivity: 33.95

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated:2023-04-19) - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.31, 4.31, 4.31)@5800 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	40.0×80.0	24.0× 24.0 ×22.0	psSAR1g [W/kg]	3.86	4.05
Grid Steps [mm]	10.0×10.0	4.0× 4.0 ×1.4	psSAR10g [W/kg]	1.07	1.15
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.01	0.02
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.4	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	VMS + 6p	M2/M1 [%]	N/A	61.2
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	7.2



Remarks: * Date tested:2024-01-11 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: (22~23) deg.C. / (55~70) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar- 1/11d,50mw

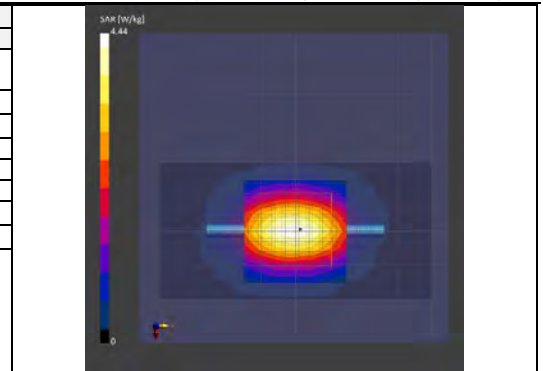
Appendix 3-2-3: SAR system check measurement data (cont'd)

Dipole: D2450V2 - SN765 ; Mode: CW (0) ; Frequency: 2450 MHz ; Test Distance: 10 mm (dipole to liquid); Power: 17.0 dBm

TSL parameters used: Head(v6) ; f= 2450 MHz; Conductivity: 1.850 S/m; Permittivity: 39.52

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated:2023-04-19) - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (6.89, 6.89, 6.89)@2450 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	40.0×80.0	30.0× 30.0 ×30.0	psSAR1g [W/kg]	2.66	2.63
Grid Steps [mm]	10.0×10.0	5.0× 5.0 ×1.5	psSAR10g [W/kg]	1.23	1.22
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.00	0.00
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.5	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	VMS + 6p	M2/M1 [%]	N/A	79.6
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	9.0



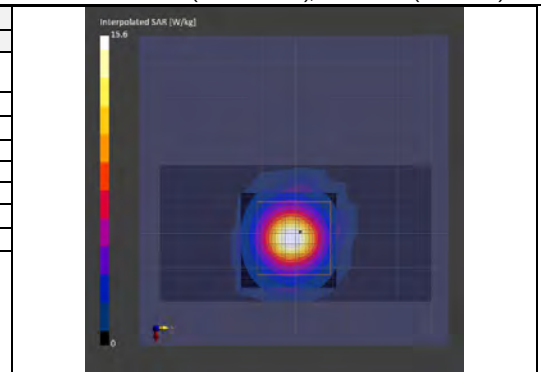
Remarks: * Date tested:2024-01-12 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 23 deg.C. / (65~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C. in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar-1/12a,50mw

Dipole: D5GHzV2 - SN1039 ; Mode: CW (0) ; Frequency: 5250 MHz ; Test Distance: 10 mm (dipole to liquid); Power: 17.0 dBm

TSL parameters used: Head(v6) ; f= 5250 MHz; Conductivity: 4.544 S/m; Permittivity: 34.93

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated:2023-04-19) - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.75, 4.75, 4.75)@5250 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	40.0×80.0	24.0× 24.0 ×22.0	psSAR1g [W/kg]	3.75	4.02
Grid Steps [mm]	10.0×10.0	4.0× 4.0 ×1.4	psSAR10g [W/kg]	1.08	1.16
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.02	0.01
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.4	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	VMS + 6p	M2/M1 [%]	N/A	65.5
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	7.2



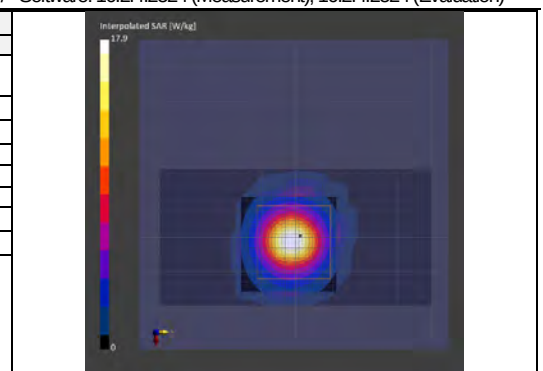
Remarks: * Date tested:2024-01-12 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 23 deg.C. / (65~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C. in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar-1/12b,50mw

Dipole: D5GHzV2 - SN1039 ; Mode: CW (0) ; Frequency: 5600 MHz ; Test Distance: 10 mm (dipole to liquid); Power: 17.0 dBm

TSL parameters used: Head(v6) ; f= 5600 MHz; Conductivity: 4.931 S/m; Permittivity: 34.28

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated:2023-04-19) - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.33, 4.33, 4.33)@5600 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	40.0×80.0	24.0× 24.0 ×22.0	psSAR1g [W/kg]	4.05	4.32
Grid Steps [mm]	10.0×10.0	4.0× 4.0 ×1.4	psSAR10g [W/kg]	1.15	1.24
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.02	0.01
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.4	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	VMS + 6p	M2/M1 [%]	N/A	62.8
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	7.4



Remarks: * Date tested:2024-01-12 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 23 deg.C. / (65~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C. in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar-1/12c,50mw

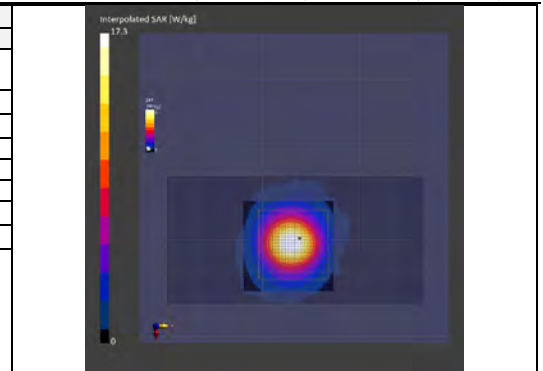
Appendix 3-2-3: SAR system check measurement data (cont'd)

Dipole: D5GHzV2 - SN1039 ; Mode: CW (0) ; Frequency: 5800 MHz ; Test Distance: 10 mm (dipole to liquid); Power: 17.0 dBm

TSL parameters used: Head(v6) ; f= 5800 MHz; Conductivity: 5.152 S/m; Permittivity: 33.95

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated:2023-04-19) - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.31, 4.31, 4.31)@5800 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	40.0×80.0	24.0×24.0 ×22.0	psSAR1g [W/kg]	3.76	4.02
Grid Steps [mm]	10.0×10.0	4.0×4.0×1.4	psSAR10g [W/kg]	1.06	1.14
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.03	0.01
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.4	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	VMS + 6p	M2/M1 [%]	N/A	61.2
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	7.4



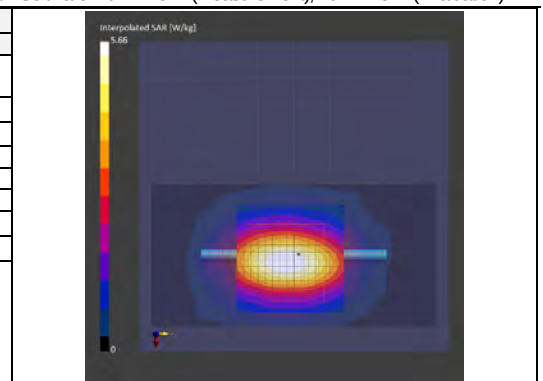
Remarks: * Date tested:2024-01-12 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 23 deg.C. / (65~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar-1/12d,50mw

Dipole: D2450V2 - SN765 ; Mode: CW (0) ; Frequency: 2450 MHz ; Test Distance: 10 mm (dipole to liquid); Power: 17.0 dBm

TSL parameters used: Head(v6) ; f= 2450 MHz; Conductivity: 1.863 S/m; Permittivity: 39.54

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated:2023-04-19) - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (6.89, 6.89, 6.89)@2450 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	40.0×80.0	30.0×30.0 ×30.0	psSAR1g [W/kg]	2.65	2.68
Grid Steps [mm]	10.0×10.0	5.0×5.0×1.5	psSAR10g [W/kg]	1.24	1.24
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.01	0.02
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.5	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	VMS + 6p	M2/M1 [%]	N/A	79.5
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	9.0



Remarks: * Date tested:2024-01-15 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: (22~23) deg.C. / (60~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar-SPC Measurement Group

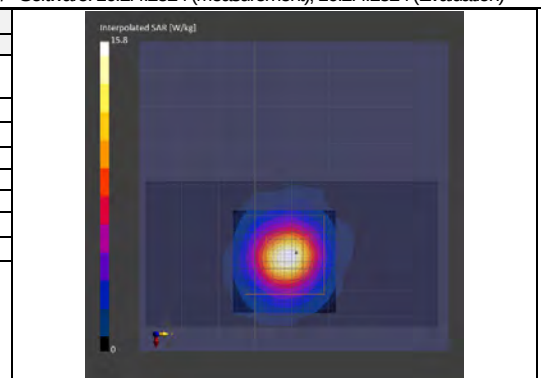
Test Location: UL Japan, Shonan EMC Lab. / Date: 2024-01-15, 09:54

Dipole: D5GHzV2 - SN1039 ; Mode: CW (0) ; Frequency: 5250 MHz ; Test Distance: 10 mm (dipole to liquid); Power: 17.0 dBm

TSL parameters used: Head(v6) ; f= 5250 MHz; Conductivity: 4.613 S/m; Permittivity: 34.63

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated:2023-04-19) - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.75, 4.75, 4.75)@5250 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	40.0×80.0	24.0×24.0 ×22.0	psSAR1g [W/kg]	3.83	4.07
Grid Steps [mm]	10.0×10.0	4.0×4.0×1.4	psSAR10g [W/kg]	1.10	1.17
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.07	0.00
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.4	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	VMS + 6p	M2/M1 [%]	N/A	65.4
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	7.4



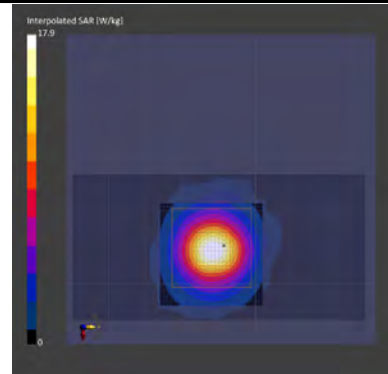
Remarks: * Date tested:2024-01-15 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: (22~23) deg.C. / (60~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar-1/15b,50mw

Appendix 3-2-3: SAR system check measurement data (cont'd)

Dipole: D5GHzV2 - SN1039 ; Mode: CW (0) ; Frequency: 5600 MHz ; Test Distance: 10 mm (dipole to liquid); Power: 17.0 dBm
TSL parameters used: Head(v6) ; f= 5600 MHz; Conductivity: 5.007 S/m; Permittivity: 34.02

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated:2023-04-19) - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.33, 4.33, 4.33)@5600 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	40.0×80.0	24.0× 24.0 ×22.0	psSAR1g [W/kg]	4.07	4.33
Grid Steps [mm]	10.0×10.0	4.0× 4.0 ×1.4	psSAR10g [W/kg]	1.15	1.24
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.03	0.01
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.4	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	VMS + 6p	M2/M1 [%]	N/A	62.8
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	7.6

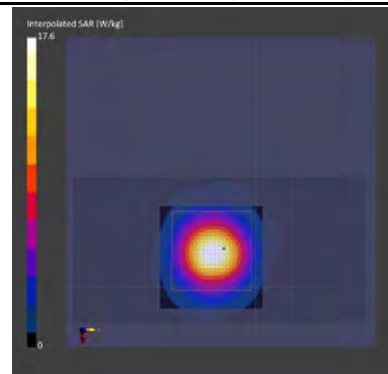


Remarks: * Date tested:2024-01-15 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: (22~23) deg.C. / (60~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar-1/15c,50mw

Dipole: D5GHzV2 - SN1039 ; Mode: CW (0) ; Frequency: 5800 MHz ; Test Distance: 10 mm (dipole to liquid); Power: 17.0 dBm
TSL parameters used: Head(v6) ; f= 5800 MHz; Conductivity: 5.230 S/m; Permittivity: 33.64

DASY8 Configuration: - Electronics: DAE4 - SN518 (Calibrated:2023-04-19) - Phantom: ELI V8.0 (20deg probe tilt) ; Serial: 2161 ; Phantom section: Flat
- Probe: EX3DV4 - SN3745(Calibrated: 2023-04-18); ConvF: (4.31, 4.31, 4.31)@5800 MHz / - Software: 16.2.4.2524 (Measurement); 16.2.4.2524 (Evaluation)

Scan Setup			Measurement Results		
Setup Items	Area Scan	Zoom Scan	Meas. Items	Area Scan	Zoom Scan
Grid Extents [mm]	40.0×80.0	24.0× 24.0 ×22.0	psSAR1g [W/kg]	3.81	4.07
Grid Steps [mm]	10.0×10.0	4.0× 4.0 ×1.4	psSAR10g [W/kg]	1.08	1.16
Sensor Surface [mm]	3.0	1.4	Power Drift [dB]	0.03	0.01
Graded Grid	N/A	Yes	Power Scaling	Disabled	Disabled
Grading Ratio	N/A	1.4	Scaling Factor [dB]	N/A	N/A
MAIA monitored	Y	Y	TSL Correction	No correction	No correction
Surface Detection	VMS + 6p	VMS + 6p	M2/M1 [%]	N/A	61.0
Scan Method	Measured	Measured	Dist 3dB Peak [mm]	N/A	7.6



Remarks: * Date tested:2024-01-15 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: (22~23) deg.C. / (60~75) %RH; Liquid depth: 151 mm;
* Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); * Red cubic: big=SAR(10g) / small=SAR(1g)
* Project file name-Measurement Group: 240110_14926563_h24&5g_p53.d8sar-1/15d,50mw

Appendix 3-3: Measurement Uncertainty

Uncertainty of SAR measurement (2.4 GHz ~ 6 GHz) (*, liquid: head(v6), DAKS-3.5, W-Fi(BT)) (v11r04)							1g SAR	10g SAR
Symbol	Error Description	Uncertainty (Unc.)	Probability distribution	Divisor	ci (1g)	ci (10g)	ui (1g) (Std. Unc.)	ui (10g) (Std. Unc.)
Measurement System (DASY8)								
CF	Probe Calibration (EX3DV4)	± 13.1 %	Normal	2	1	1	± 6.55 %	± 6.55 %
CF _{drift}	Probe Calibration Drift	± 1.7 %	Rectangular	√3	1	1	± 1.0 %	± 1.0 %
LIN	Probe Linearity	± 4.7 %	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
BBS	Broadband Signal	± 2.6 %	Rectangular	√3	1	1	± 1.5 %	± 1.5 %
ISO1	Probe Isotropy	± 7.6 %	Rectangular	√3	1	1	± 4.4 %	± 4.4 %
DAE	Data Acquisition	± 1.2 %	Normal	1	1	1	± 1.2 %	± 1.2 %
AMB	RF Ambient (noise&refraction) (< 12μW/g)	± 1.0 %	Normal	1	1	1	± 1.0 %	± 1.0 %
Δsys	Probe Positioning	± 0.5 %	Normal	1	0.33	0.33	± 0.2 %	± 0.2 %
DAT	Data Processing	± 2.3 %	Normal	1	1	1	± 2.3 %	± 2.3 %
Phantom and Device Error								
LIQ(σ)	Conductivity (measured) (DAKS-3.5)	± 5.0 %	Normal	2	0.78	0.71	± 2.0 %	± 1.8 %
LIQ(Tσ)	Conductivity (temperature) (≤ 2 deg.C.)	± 2.4 %	Rectangular	√3	0.78	0.71	± 1.1 %	± 1.0 %
EPS	Phantom Permittivity (liquid to antenna: ≥ 5 mm)	± 14.0 %	Rectangular	√3	0.25	0.25	± 2.0 %	± 2.0 %
DIS	Distance EUT-TSL	± 2.7 %	Normal	1	2	2	± 5.4 %	± 5.4 %
Dxyz	Test Sample positioning	± 1.8 %	Normal	1	1	1	± 5.0 %	± 5.0 %
H	Device holder uncertainty	± 3.6 %	Normal	1	1	1	± 3.6 %	± 3.6 %
MOD	EUT Modulation	± 2.4 %	Rectangular	√3	1	1	± 1.4 %	± 1.4 %
TAS	Time-average SAR	± 0.0 %	Rectangular	√3	1	1	± 0.0 %	± 0.0 %
RFdrift	Drift of output power (measured, < 0.2 dB)	± 4.7 %	Normal	2	1	1	± 2.4 %	± 2.4 %
Correction to the SAR results								
C(e,σ)	Deviation to Target (e',σ: ≤ 10 %, IEC head)	± 1.9 %	Normal	1	1	0.84	± 1.9 %	± 1.6 %
C(R)	SAR Scaling	± 0 %	Rectangular	√3	1	1	± 0.0 %	± 0.0 %
u(ΔSAR)	(SAR: 2.4 GHz~6 GHz) Combined Standard Uncertainty					RSS	± 12.1 %	± 12.0 %
U	(SAR: 2.4 GHz~6 GHz) Expanded Uncertainty					k=2	± 24.2 %	± 24.0 %

*. This uncertainty budget is suggested by IEC/IEEE 62209-1528:2020 and determined by SPEAG, DASY8 Module SAR Manual, 2022-08 (Chapter 6.3, DASY8 Uncertainty Budget for Hand-held/Body-worn Devices, Frequency band: 300 MHz - 3 GHz range and 3 GHz ~ 6 GHz range). All listed error components have v_{eff} equal to ∞.

Uncertainty of SAR daily check (2.4 GHz ~ 6 GHz) (*, liquid: head(v6), DAKS-3.5, CW) (v11r04)							1g SAR	10g SAR
Symbol	Error Description	Uncertainty (Unc.)	Probability distribution	Divisor	ci (1g)	ci (10g)	ui (1g) (Std. Unc.)	ui (10g) (Std. Unc.)
Measurement System (DASY8)								
CF	Probe Calibration (EX3DV4)	± 13.1 %	Normal	2	1	1	± 6.55 %	± 6.55 %
CF _{drift}	Probe Calibration Drift	± 1.7 %	Rectangular	√3	1	1	± 1.0 %	± 1.0 %
LIN	Probe Linearity	± 4.7 %	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
ISO2	Probe Isotropy	± 4.7 %	Rectangular	√3	1	1	± 2.7 %	± 2.7 %
DAE	Data Acquisition	± 1.2 %	Normal	1	1	1	± 1.2 %	± 1.2 %
AMB	RF Ambient (noise&refraction) (<12μW/g)	± 1.0 %	Normal	1	1	1	± 1.0 %	± 1.0 %
Δsys	Probe Positioning	± 0.5 %	Normal	1	0.33	0.33	± 0.2 %	± 0.2 %
DAT	Data Processing	± 2.3 %	Normal	1	1	1	± 2.3 %	± 2.3 %
Phantom and Device Error								
LIQ(σ)	Conductivity (measured) (DAKS-3.5)	± 5.0 %	Normal	2	0.78	0.71	± 2.0 %	± 1.8 %
LIQ(Tσ)	Conductivity (temperature) (≤ 2 deg.C.)	± 2.4 %	Rectangular	√3	0.78	0.71	± 1.1 %	± 1.0 %
EPS	Phantom Permittivity (liquid to antenna: ≥ 5 mm)	± 14.0 %	Rectangular	√3	0.25	0.25	± 2.0 %	± 2.0 %
VAL	Validation antenna uncertainty	± 5.5 %	Rectangular	√3	1	1	± 3.2 %	± 3.2 %
Pin	Uncertainty in accepted power	± 2.5 %	Normal	2	1	1	± 1.3 %	± 1.3 %
DIS	Distance EUT-TSL	± 2.0 %	Normal	1	2	2	± 4.0 %	± 4.0 %
Dxyz	Test Sample positioning	± 1.0 %	Normal	1	1	1	± 1.0 %	± 1.0 %
RFdrift	Drift of output power (measured, < 0.1 dB)	± 2.3 %	Rectangular	√3	1	1	± 1.3 %	± 1.3 %
Correction to the SAR results								
C(e,σ)	Deviation to Target (e',σ: ≤ 10 %, IEC head)	± 1.9 %	Normal	1	1	0.84	± 1.9 %	± 1.6 %
u(ΔSAR)	(SAR daily check: 2.4 GHz~6 GHz) Combined Standard Uncertainty					RSS	± 10.5 %	± 10.4 %
U	(SAR daily check: 2.4 GHz~6 GHz) Expanded Uncertainty					k=2	± 21.0 %	± 20.8 %

*. This uncertainty budget is suggested by IEC/IEEE 62209-1528:2020 and determined by SPEAG, DASY8 Module SAR Manual, 2022-08 (Chapter 6.2, DASY8 Uncertainty Budget for System Verification, Frequency band: 300 MHz - 6 GHz range). All listed error components have v_{eff} equal to ∞.

*. Table of uncertainties are listed for ISO/IEC 17025.

*. Although this standard determines only the limit value of uncertainty, there is no applicable rule of uncertainty in this. Therefore, the results are derived depending on whether or not laboratory uncertainty is applied.

Appendix 3-4: Calibration certificates

LIMS ID	Description	Type/Model	Serial Number	Manufacture	Calibration Certificate	Note
226380	Dosimetric E-Field Probe	EX3DV4	3745	SPEAG		-
145558	Dipole Antenna (2.45 GHz)	D2450V2	765	SPEAG		*1
243047	Dipole Antenna (5 GHz)	D5GHzV2	1039	SPEAG		*1

*1: As stated on page 2 of the certificate, the calibration was performed in accordance with the latest standard IEC/IEEE 62209-1528. Therefore, the reported SAR values are valid for any system that complies with IEC/IEEE 62209-1528 including all new versions of DASY such as DASY6 and DASY8.

-End of report-