# 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 Engineer | Approved By |
|---|---|
| H. Naka | T.imamura |
| Hiroshi Naka<br>Engineer | Toyokazu Imamura<br>Engineer |

CERTIFICATE 1266.03

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☒ There is no testing item of "Non-accreditation".



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

## CONTENTS PAGE



**Contents of appendixes**

# SECTION 1: Customer information

| | |
|---|---|
| Company Name | KONICA MINOLTA, INC. |
| Address | 1, Sakura-machi, Hino-shi, Tokyo, Japan 191-8511 |
| Telephone Number | +81-42-589-8429 |
| 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.)<br>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<br>WLAN 5.2 GHz Band: 5180 MHz ~ 5240 MHz<br>WLAN 5.3 GHz Band: 5260 MHz ~ 5320 MHz | WLAN 5.6 GHz Band: 5500 MHz ~ 5700 MHz<br>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<br>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".<br>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)<br>*. Mode of 11b, 11g, 11a: One selected Tx antenna operation.<br>*. 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)<br>(*.including cable loss) | -1.95 dBi (2.4 GHz band),<br>-0.98 dBi (5 GHz band) | -2.21 dBi (2.4 GHz band),<br>-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 | Ant.1+2 | Ant.1+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 | **16.5** |
| 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 | **11.5** |
| 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 | **11.5** |
| 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 | **11.5** |
| 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 | **11.5** |

*. 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 bod y/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;<br>UL Japan's SAR measurement work procedures No. ULID-003599 (13-EM-W0430).<br>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** |

## 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)<br>-FCC has permitted the use of single head tissue simulating liquid specified in IEC 62209 for all SAR tests.<br>-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. | $SAR = \frac{d}{dt}\left(\frac{dW}{dm}\right) = \frac{d}{dt}\left(\frac{dW}{\rho * dV}\right)$ |
| 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).<br>Where : σ = conductivity of the tissue (S/m), ρ = mass density of the tissue (kg/m$^3$), E = RMS electric field strength in tissue (V/m) | $SAR = \frac{\sigma \lvert E \rvert^2}{\rho}$ |

### 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 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 × δ × 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)<br>30 ° ± 1 °(other phantom) | 5 ° ± 1 °(flat phantom only)<br>30 ° ± 1 °(other phantom) |
| Maximum area scan spatial resolution: $\Delta x_{Area}$, $\Delta y_{Area}$ | | | ≤ 2 GHz : ≤ 15 mm,<br>2~3 GHz : ≤ 12 mm | 3~4 GHz : ≤ 12 mm,<br>4~6 GHz : ≤ 10 mm<br>> 6 GHz : ≤ 60/*f* mm, or half of the corresponding zoom scan length, whichever is smaller. |
| | | | When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device. | |
| Maximum zoom scan spatial resolution: $\Delta x_{Area}$, $\Delta y_{Area}$ | | | ≤ 2 GHz : ≤ 8 mm,<br>2~3 GHz : ≤ 5 mm (*1) | 3~4 GHz : ≤ 5 mm (*1),<br>4~6 GHz : ≤ 4 mm (*1)<br>> 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,<br>4~5 GHz : ≤ 3 mm,<br>5~6 GHz : ≤ 2 mm<br>> 6 GHz : ≤ 10/(*f*-1) mm |
| | graded grid | $\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface | ≤ 4 mm | 3~4 GHz : ≤ 3 mm,<br>4~5 GHz : ≤ 2.5 mm,<br>5~6 GHz : ≤ 2 mm<br>> 6 GHz : ≤ 12/*f* mm |
| | | $\Delta z_{Zoom}(n>1)$: between subsequent points | ≤ 1.5 × $\Delta z_{zoom}$ (n-1) mm | |
| Minimum zoom scan volume | x, y, z | | ≥ 30 mm | 3~4 GHz : ≥ 28 mm,<br>4~ 5 GHz : ≥ 25 mm,<br>5~6 GHz : ≥ 22 mm<br>> 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 D01and 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 +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 | 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).
*1. Marks on "SAR test considered" are "*○": SAR test was applied. "×": SAR test exempt (refer to clause 4.2).
*2. The tested frequencies refer to SAR test results in Section 7.
*3. 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:
(1) ≤ 0.8 W/kg for 1g , or 2.0 W/kg for 10g respectively, when the transmission band is ≤ 100 MHz
(2) ≤ 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
(3) ≤ 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:
a) 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).
b) 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.
c) 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.

| | Antenna ID: | 1 | 2 |
|---|---|---|---|
| Setup | Explanation of EUT setup (*. Refer to Appendix 1 for test setup photographs.) | D [mm] | D [mm] |
| 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 | | Antenna 1 | | | Antenna 2 | | | 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] | | | | | | | |
| | | | | Gain | ERP | | Gain | ERP | | < 5 | < 5 | < 5 | 28 | >50 | >50 | < 5 | < 5 | < 5 | 32 | >50 | >50 | | |
| | | [dBm] | [mW] | [dBi] | [dBm] | [mW] | [dBi] | [dBm] | [mW] | Right | Back | Front | Top | Left | Bottom | Bottom | Back | Front | Left | Right | Top | | |
| | | | | | | | | | | SAR1g | SAR1g | SAR1g | SAR1g | SAR1g | SAR1g | SAR1g | SAR1g | SAR1g | SAR1g | SAR1g | SAR1g | | |
| 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 | 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 | 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 | 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 | 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 | Exempt > 4 W (*2) | | |

*. 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 (Pth (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 Pth (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)

| Frequency [MHz] \ Distance [mm] | 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 | 35 | 40 | 45 | 50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 112 | 144 | 180 | 220 |
| **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** | **111** | **143** | **179** | **219** |
| 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 | 111 | 143 | 179 | 219 |
| 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 | 111 | 143 | 179 | 218 |
| **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** | **96** | **125** | **158** | **195** |
| 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 | 83 | 110 | 140 | 174 |
| 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 | 83 | 109 | 139 | 173 |
| 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 | 81 | 107 | 136 | 170 |
| **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** | **80** | **106** | **136** | **169** |
| 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 | 80 | 106 | 135 | 169 |
| 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 | 80 | 105 | 135 | 168 |
| 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 | 79 | 105 | 134 | 167 |

TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

| RF Source Frequency | | | Minimum Distance | | | Threshold ERP |
|---|---|---|---|---|---|---|
| $f_L$ MHz | | $f_H$ MHz | $\lambda_L / 2\pi$ | | $\lambda_H / 2\pi$ | 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 | 19.2$R^2$ |

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:

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

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

and $f$ is in GHz, $d$ is the separation distance (cm), and $ERP_{20\text{cm}}$ 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) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Typical | Max. | 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] | [-] | [-] | [dBm] | [dB] | [-] | [dBm] | [-] | [dBm] | [dB] | [-] | [dBm] | [dBm] | [dBm] | [dBm] | [dB] | [dBm] | Ant.1 | Ant.2 |
| 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 | | | | | | Yes | Yes |
| | 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 | |
| | 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 | |
| | 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 | |
| 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 | |
| | 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 | |
| | 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 | |
| | 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 | |
| | 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 | |
| | 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 | |
| | 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 | |
| | 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 | |
| | 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 | |
| | 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 | |
| | 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 | |
| | 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 | |
| | 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 | |
| | 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 | |
| | 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 | |

*. : SAR test was applied.

*1. "Yes": The power setting was adjusted so that measured average power was not more than 2 dB lower than the maximum tune-up tolerance limit. Setting parameters: the value of "Power" cell of software was adjusted so that measurement power might be satisfied within 2dB of the maximum power. (This power setting value might be different from product specification value. Any conditions under the normal use do not exceed the condition of setting. End user cannot change the power setting of product.)

*. CH: Channel; Power spec.: Power specification; Max.: Maximum; Set pwr.: Setting power by tested software; Burst Ave.: Measured burst average power; Time Ave.: Measured time-based average power; SUM Ave.: Sum of antenna 1 power and antenna 2 power; n/a: Not applied,/Not applicable.

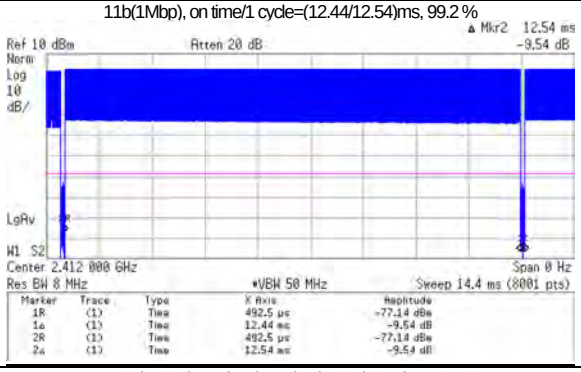
*. Calculating formula: Time average power (dBm) = (P/M Reading, dBm)+(Cable loss, dB)+(Attenuator, dB)
Burst power (dBm) = (P/M Reading, dBm)+(Cable loss, dB)+(Attenuator, dB)+(duty factor, dB)
Duty cycle: (duty cycle, %) = (Tx on time) / (1 cycle time) × 100, Duty factor (dBm) = 10 × log (100/(duty cycle, %))
Duty cycle scaled factor: Duty cycle correction factor for obtained SAR value, Duty scaled factor [-] = 100(%) / (duty cycle, %)
Δ Max. (Deviation form max. power, dB) = (Burst power measured (average, dBm)) - (Max.tune-up limit power (average, dBm))
Tune-up factor: Power tune-up factor for obtained SAR value, Tune-up factor [-] = 1 / (10 ^ ("Deviation from max., dB" / 10))

*. Date measured: December 25, 2023 / Measured by: H. Naka/ Place: Preparation room of No. 7 shield room. (23 deg.C./ 35 %RH)

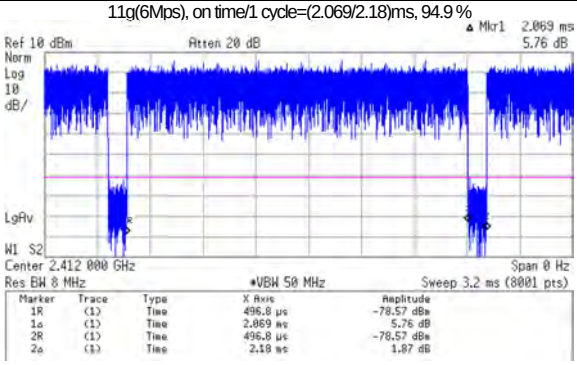
*. Uncertainty of antenna port conducted test; (±) 0.81 dB (Average power), (±) 0.27 % (duty cycle).

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

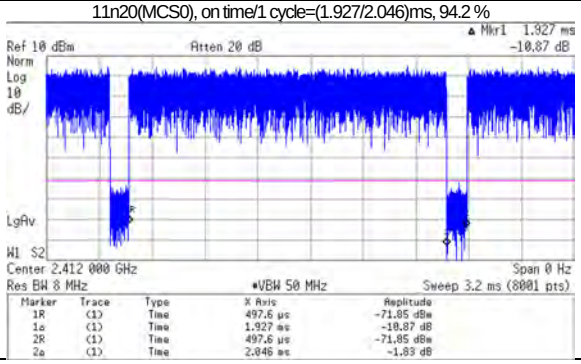
11b(1Mbp), on time/1 cycle=(12.44/12.54)ms, 99.2 %



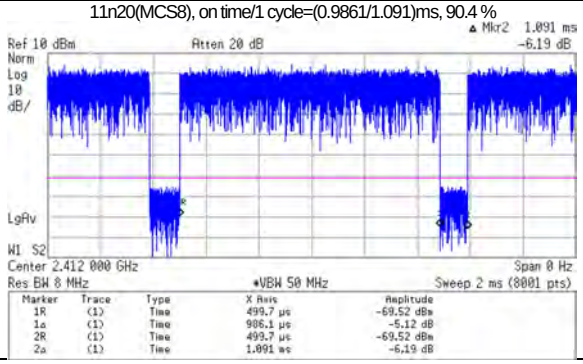

11g(6Mps), on time/1 cycle=(2.069/2.18)ms, 94.9 %



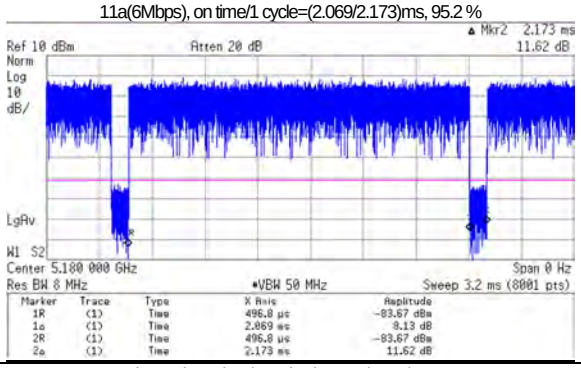

11n20(MCS0), on time/1 cycle=(1.927/2.046)ms, 94.2 %



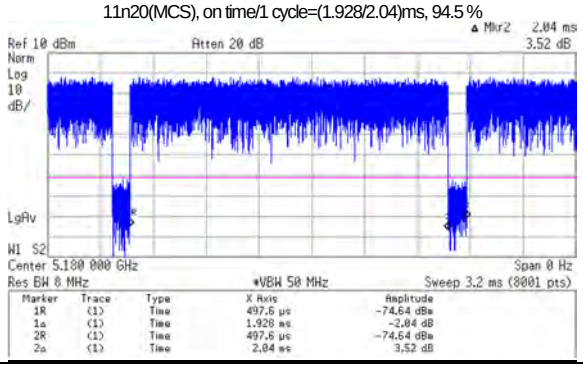

11n20(MCS8), on time/1 cycle=(0.9861/1.091)ms, 90.4 %



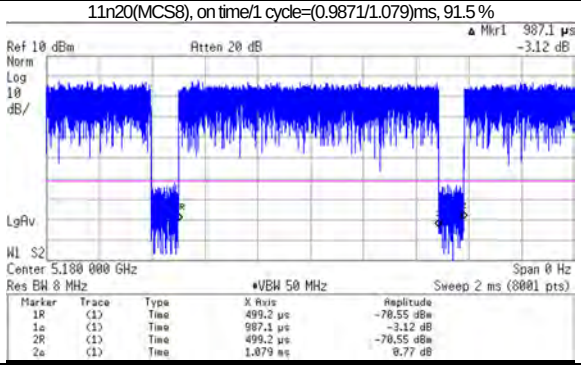

11a(6Mbps), on time/1 cycle=(2.069/2.173)ms, 95.2 %




11n20(MCS), on time/1 cycle=(1.928/2.04)ms, 94.5 %




11n20(MCS8), on time/1 cycle=(0.9871/1.079)ms, 91.5 %



# 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 (εr) [-] | | | | Conductivity [S/m] | | | | Interpolated ? ☐: No ☑: Yes | Δend, >48hrs (*1) | | ΔSAR | | ΔSAR Corrected? | |
| | | | | Target value | Measured Value | Measured Δεr [%] | Measured Limit [%] | Target value | Measured Value | Measured Δσ [%] | Measured Limit [%] | | εr [%] | σ [%] | 1g [%] | 10g [%] | | |
| 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) | |
| 5250 | - | - | - | **35.93** | 34.85 | -3.0 | 5 | **4.706** | 4.544 | -3.4 | 5 | ☐ | begin | begin | 0.7 | 0.9 | no (positive sign) | 2024-01-10, before SAR test. |
| 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) | |
| 5250 | - | - | - | **35.93** | 34.85 | -3.0 | 5 | **4.706** | 4.544 | -3.4 | 5 | ☐ | begin | begin | 0.8 | 1.0 | no (positive sign) | 2024-01-15, before SAR test. |
| 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) | |
| 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) | 2024-01-10, before SAR test. |
| 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) | |
| 5320 | | | | **35.85** | 34.49 | -3.8 | 5 | **4.778** | 4.690 | -1.8 | 5 | ☐ | - | - | 0.8 | 1.1 | no (positive sign) | 2024-01-15, before SAR test. |
| 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): $\Delta SAR(1g) = C\varepsilon r \times \Delta\varepsilon r + C\sigma \times \Delta\sigma$, $C\varepsilon = -7.854E\text{-}4 \times f^3 + 9.402E\text{-}3 \times f^2 - 2.742E\text{-}2 \times f + 0.2026$ / $C\sigma = 9.804E\text{-}3 \times f^3 - 8.661E\text{-}2 \times f^2 + 2.981E\text{-}2 \times f + 0.7829$
$\Delta SAR(10g) = C\varepsilon r \times \Delta\varepsilon r + C\sigma \times \Delta\sigma$, $C\varepsilon = 3.456 \times 10^{-3} \times f^3 - 3.531 \times 10^{-2} \times f^2 + 7.675 \times 10^{-2} \times f - 0.1860$ / $C\sigma = 4.479 \times 10^{-3} \times f^3 - 1.586 \times 10^{-2} \times f^2 - 0.1972 \times f + 0.7717$
(Calculating formula): ΔSAR corrected SAR (W/kg) = (Measured SAR (W/kg)) × (100 - (ΔSAR(%)) / 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 | Head | | Body | |
|---|---|---|---|---|
| (MHz) | $\varepsilon_r$ | σ(S/m) | $\varepsilon_r$ | σ(S/m) |
| 1800~2000 | 40.0 | 1.40 | 53.3 | 1.52 |
| 2450 | 39.2 | 1.80 | 52.7 | 1.95 |

| Target Frequency | Head | | Body | |
|---|---|---|---|---|
| (MHz) | $\varepsilon_r$ | σ(S/m) | $\varepsilon_r$ | 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-SLAAxyy-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] (Max.value of multi-peak) | | | | SAR type | SAR Limit [W/kg] | SAR plot # in Appx. 2-2 | Setup photo # in Appx. 1-3 | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ANT # | Test position / Setup | Gap [mm] | Source power | Mode (D/R) / Mark with "*" is the initial mode & frequency. | [MHz] | CH | Duty [%] | Duty scaled factor | Max. tune-up limit [dBm] | Measured conducted [dBm] | Power scaled factor | Measured | ΔSAR [%] | ΔSAR 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 (6 Mbps)* | 5180* | 36 | 95.2 | 1.05 | 8.5 | 7.55 | 1.24 | 0.481 | Positive | n/a (*a) | **0.626** | 1g | 1.6 | 2a-1 | P1 | *.additionally |
| 1 | Right | 0 | DC supply | 11a (6 Mbps)* | 5220 | 44 | 95.2 | 1.05 | 8.5 | 7.28 | 1.32 | 0.378 | Positive | n/a (*a) | **0.524** | 1g | 1.6 | - | P1 | *.additionally |
| 1 | Right | 0 | DC supply | 11a (6 Mbps)* | 5240 | 48 | 95.2 | 1.05 | 8.5 | 7.14 | 1.37 | 0.357 | Positive | n/a (*a) | **0.514** | 1g | 1.6 | - | P1 | *.additionally |
| 1 | Right | 0 | DC supply | 11n20 (MCS0) | 5180 | 36 | 94.5 | 1.06 | 8.5 | 7.46 | 1.27 | 0.463 | Positive | n/a (*a) | **0.623** | 1g | 1.6 | - | P1 | *.additionally |
| 1 | Right | 0 | DC supply | 11n20 (MCS8) | 5180 | 36 | 91.5 | 1.09 | 8.5 | 7.45 | 1.27 | 0.435 | Positive | n/a (*a) | **0.602** | 1g | 1.6 | - | P1 | *.additionally |
| 2 | Bottom | 0 | DC supply | 11a (6 Mbps)* | 5180 | 36 | 95.2 | 1.05 | 8.5 | 7.31 | 1.32 | 0.422 | Positive | n/a (*a) | **0.585** | 1g | 1.6 | 2a-2 | P2 | *.additionally |
| 2 | Bottom | 0 | DC supply | 11a (6 Mbps)* | 5220* | 44 | 95.2 | 1.05 | 8.5 | 7.40 | 1.29 | 0.361 | Positive | n/a (*a) | **0.489** | 1g | 1.6 | - | P2 | *.additionally |
| 2 | Bottom | 0 | DC supply | 11a (6 Mbps)* | 5240 | 48 | 95.2 | 1.05 | 8.5 | 7.40 | 1.29 | 0.309 | Positive | n/a (*a) | **0.419** | 1g | 1.6 | - | P2 | *.additionally |

| Test setup | | | | Mode and Frequency (*2) | | | Duty cycle | | Power correction | | | SAR results [W/kg] (Max.value of multi-peak) | | | | SAR type | SAR Limit [W/kg] | SAR plot # in Appx. 2-2 | Setup photo # in Appx. 1-3 | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ANT # | Test position / Setup | Gap [mm] | Source power | Mode (D/R) / Mark with "*" is the initial mode & frequency. | [MHz] | CH | Duty [%] | Duty scaled factor | Max. tune-up limit [dBm] | Measured conducted [dBm] | Power scaled factor | 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 ^ (((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 | | 1st Repeated | | | | 2nd Repeated | | | | Original | 1st Repeated | 2nd Repeated |
| | | | | | | | Highest | Judge | Measured | Judge | Ratio | Judge | Measured | Judge | Ratio | Judge | | | |
| 1 | Back | WLAN 2.4 | 11g | 2437 | SAR1g | W/kg | **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 (MCS8) | 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

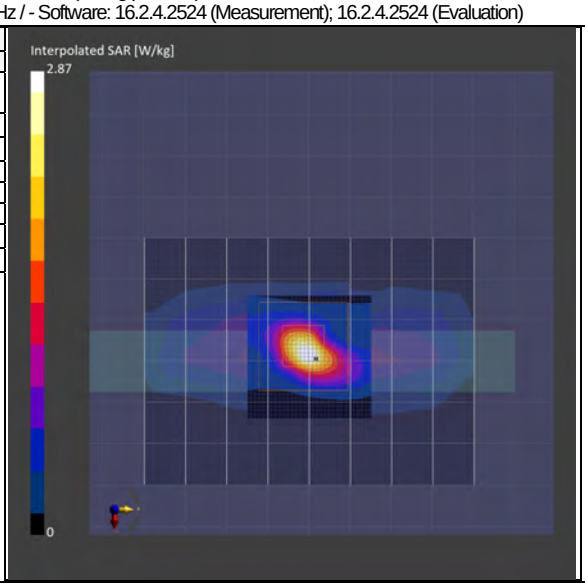
## Appendix 2-1: Plot(s) of Worst Reported Value

### 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 |



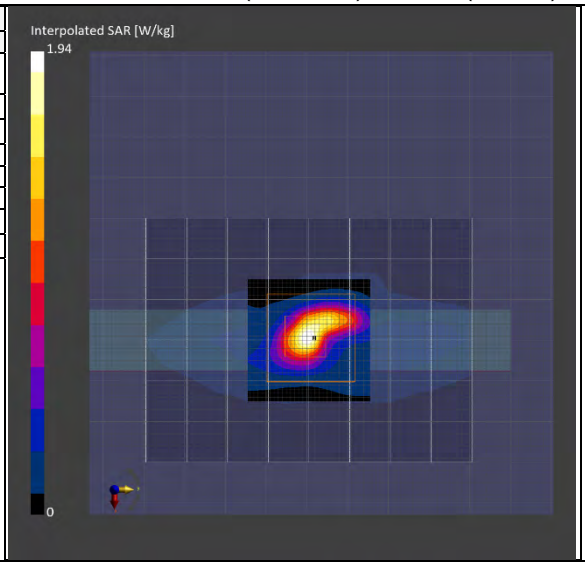

Remarks: *. Date tested: 2024-01-10;Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 23 deg.C. / (65~75) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement Group: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

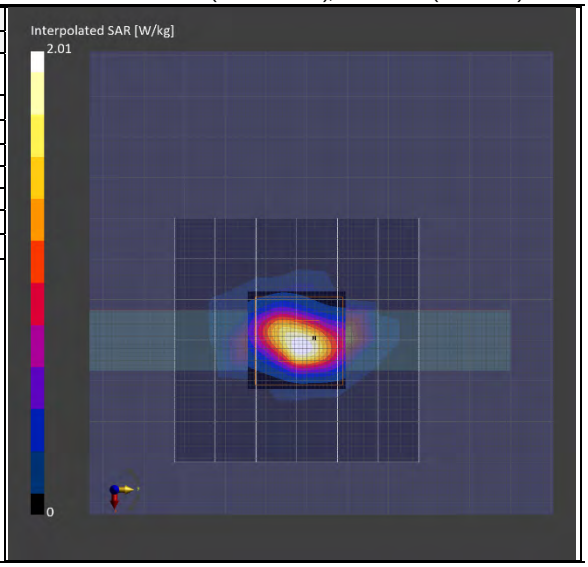
**APPENDIX 2: SAR Measurement data / Appendix 2-1: Plot(s) of Worst Reported Value (cont'd)**

## 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)

| 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] | 0.425 | **0.481** |
| Grid Steps [mm] | 10.0×10.0 | 4.0× 4.0 ×1.4 | psSAR 10g [W/kg] | 0.113 | **0.126** |
| Sensor Surface [mm] | 3.0 | 1.4 | Power Drift [dB] | 0.04 | 0.07 |
| 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 | 63.9 |
| Scan Method | Measured | Measured | Dist 3dB Peak [mm] | N/A | 4.8 |



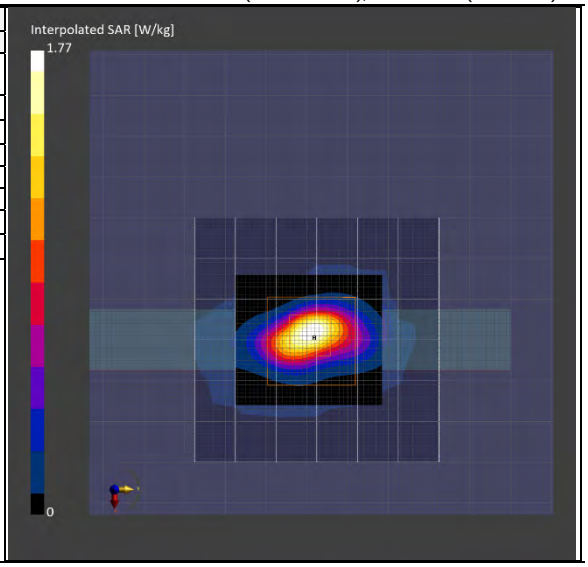

Remarks: *. Date tested: 2024-01-11;Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 23 deg.C. / (70~75) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement Group: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

| 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] | 0.415 | **0.422** |
| Grid Steps [mm] | 10.0×10.0 | 4.0× 4.0 ×1.4 | psSAR 10g [W/kg] | 0.118 | **0.127** |
| Sensor Surface [mm] | 3.0 | 1.4 | Power Drift [dB] | -0.01 | 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 | All points | M2/M1 [%] | N/A | 61.9 |
| Scan Method | Measured | Measured | Dist 3dB Peak [mm] | N/A | 4.7 |




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

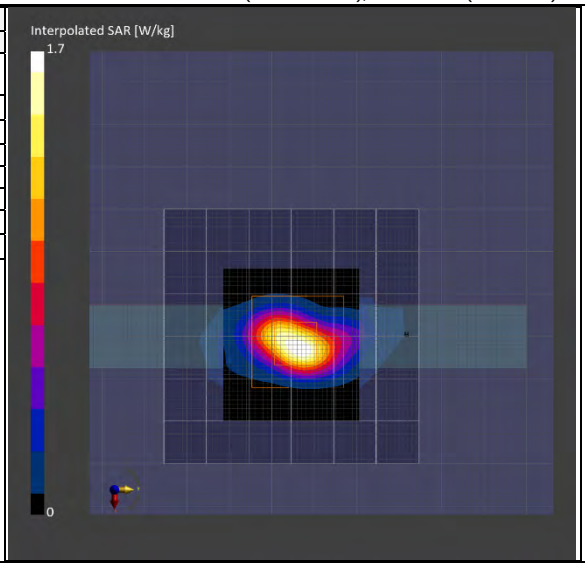
**APPENDIX 2: SAR Measurement data / Appendix 2-1: Plot(s) of Worst Reported Value (cont'd)**

## 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 |



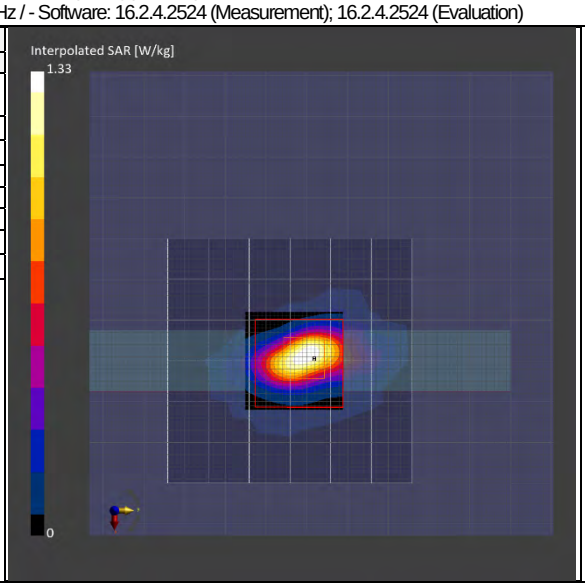

Remarks: *. Date tested: 2024-01-12;Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 23 deg.C. / (70~75) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement Group: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

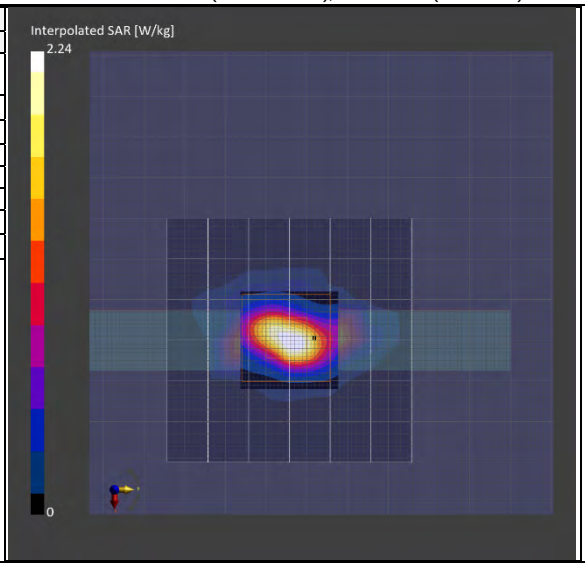
**APPENDIX 2: SAR Measurement data / Appendix 2-1: Plot(s) of Worst Reported Value (cont'd)**

## 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 |



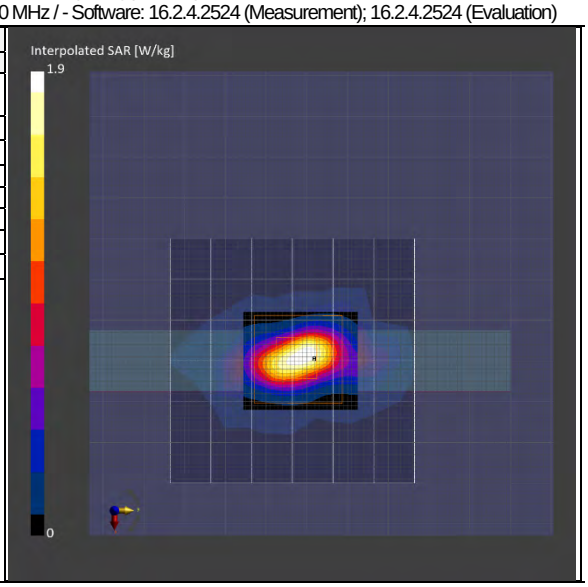

Remarks: *. Date tested: 2024-01-11;Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 23 deg.C. / (65~75) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement Group: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

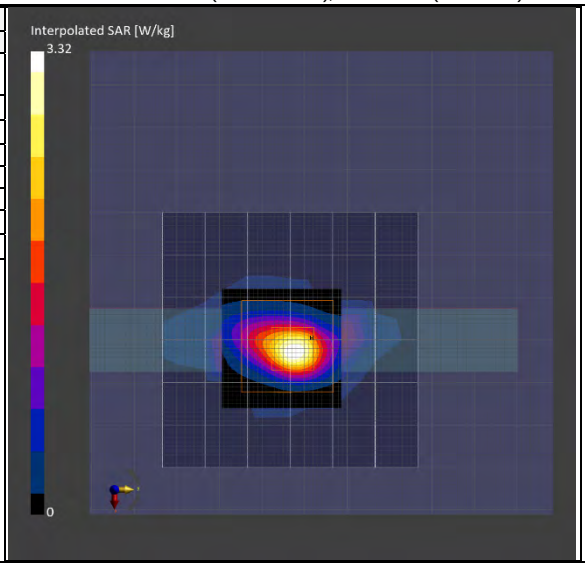
**APPENDIX 2: SAR Measurement data / Appendix 2-1: Plot(s) of Worst Reported Value (cont'd)**

## 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)

| 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] | 0.555 | **0.662** |
| Grid Steps [mm] | 10.0×10.0 | 4.0× 4.0 ×1.4 | psSAR 10g [W/kg] | 0.148 | **0.165** |
| Sensor Surface [mm] | 3.0 | 1.4 | Power Drift [dB] | -0.20 | -0.16 |
| 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 | N/A | TSL Correction | No correction | No correction |
| Surface Detection | All points | All points | M2/M1 [%] | N/A | 57.8 |
| Scan Method | Measured | Measured | Dist 3dB Peak [mm] | N/A | 4.9 |



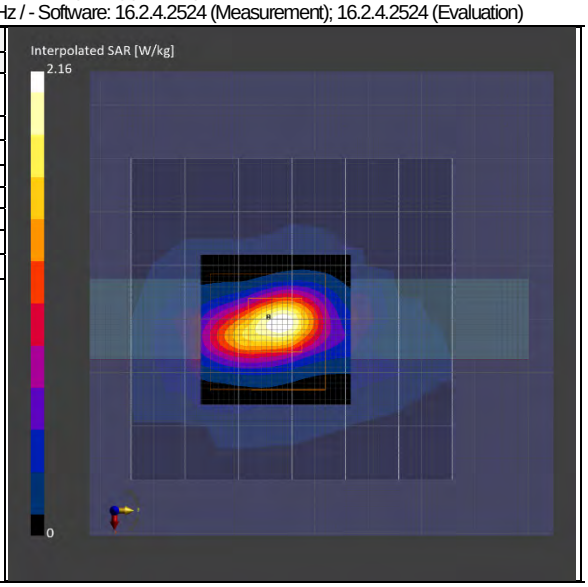

Remarks: *. Date tested: 2024-01-12;Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 22 deg.C. / (60~65) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement Group: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

| 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] | 0.409 | **0.446** |
| Grid Steps [mm] | 10.0×10.0 | 4.0× 4.0 ×1.4 | psSAR 10g [W/kg] | 0.114 | **0.136** |
| Sensor Surface [mm] | 3.0 | 1.4 | Power Drift [dB] | -0.16 | -0.05 |
| 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 | 57.1 |
| Scan Method | Measured | Measured | Dist 3dB Peak [mm] | N/A | 5.1 |




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 | Calibration 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)

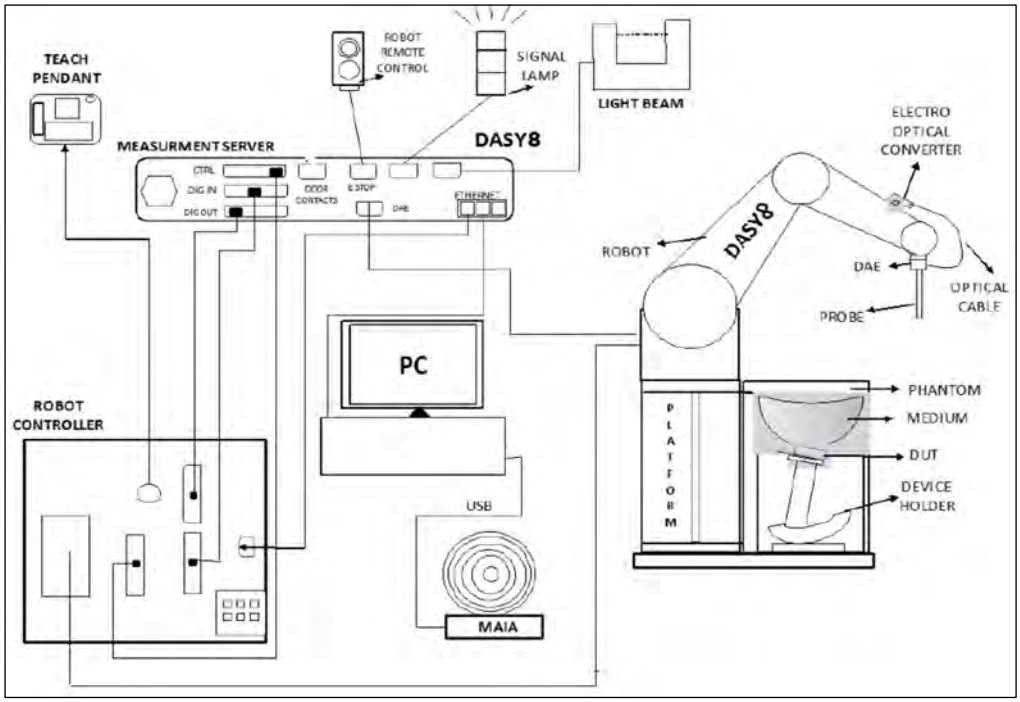
The expiration date of calibration is the end of the expired month.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chain of calibrations.
All equipment is calibrated with valid calibrations. Each measurement data is traceable 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.

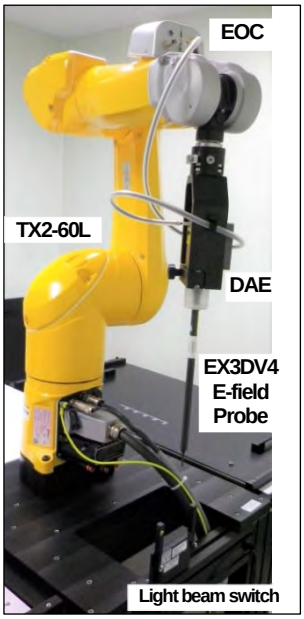



The DASY8 SAR/APD system for performing compliance tests consist of the following items:

- 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 (ε = 3.3 and loss tangent δ < 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 µV to > 200 mV (2 range settings: 4 mV (low), 400 mV (high))
•Input Offset voltage : < 1 µV (with auto zero) •Input Resistance : 200 MΩ
•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 0.1mm, 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: ±0.2 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 : ± 0.1 dB in TSL (rotation around probe axis) / ± 0.3 dB in TSL (rotation normal to probe axis)
•Dynamic Range : 10 µW/g to > 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 µW/g)
•Dimension : Overall length: 330 mm (Tip: 20 mm) / Tip diameter: 2.5 mm (Body: 12 mm)
Typical distance from probe tip to dipole centers: 1mm
•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 6GHz 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 ± 0.2 mm (bottom plate) •Dimensions : 600 mm × 400 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 ε=3 and loss tangent δ=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

☒ 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:

$$V_{compi} = U_i + U_i^2 \cdot \frac{10^{\frac{d}{10}}}{d_{cp_i}}$$

with $V_{compi}$ = 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)
$dcp_i$ = diode compression point of channel i (μV) (Probe parameter, i = x,y,z)

$$V_{compi}{}_{dB\sqrt{\mu V}} = 10 \cdot \log_{10}(V_{compi})$$

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

with $corr_i$ = correction factor of channel i (dB) (i = x,y,z)
$V_{compi}{}_{dB\sqrt{\mu V}}$ = compensated voltage of channel i ($dB\sqrt{\mu V}$) (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* ($dB\sqrt{\mu V}$) (Probe parameter, i = x,y,z)
$c_i$ = PMR factor c of channel *i* (-) (Probe parameter, i = x,y,z)

The voltage $V_{i}{}_{dB\sqrt{\mu V}}$ is the linearized voltage in $dB\sqrt{\mu V}$):

$$V_{i}{}_{dB\sqrt{\mu V}} = V_{compi}{}_{dB\sqrt{\mu V}} - corr_i$$

with $V_{i}{}_{dB\sqrt{\mu V}}$ = linearized voltage of channel i ($dB\sqrt{\mu V}$) (i = x,y,z)
$V_{compi}{}_{dB\sqrt{\mu V}}$ = compensated voltage of channel i ($dB\sqrt{\mu V}$) (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 :

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

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

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

E-filedprobes: $$E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

with $V_i$ = linearized voltage of channel i in μV (i = x,y,z)
$Norm_i$ = sensor sensitivity of channel i in $\mu V/(V/m)^2$ 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
Etot = total field strength in V/m
$\sigma$ = conductivity in [Ω/m] or [S/m]
$\rho$ = 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 ±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 / Date | F [MHz] | ΔSAR 1g [%] | ΔSAR 10g [%] | SAR (1g) [W/kg] (*b) Meas. (*a) | SAR (1g) 1W scaled | Target Cal. (*c) | Target STD (*d) | Deviation Cal. [%] | Deviation STD [%] | SAR (10g) [W/kg] (*b) Meas. (*a) | SAR (10g) 1W scaled | Target Cal. (*c) | Target STD (*d) | Deviation Cal. [%] | Deviation STD [%] | Dev. Limit [%] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 (ΔSAR) and scaled to 1W of output power in order to compare with the manufacture's calibration target value which was normalized.
ΔSAR corrected SAR (1g) (W/kg) = (Measured SAR(1g) (W/kg)) × (100 - (ΔSAR1g(%)) / 100
ΔSAR corrected SAR (10g) (W/kg) = (Measured SAR(10g) (W/kg)) × (100 - (ΔSAR10g(%)) / 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.

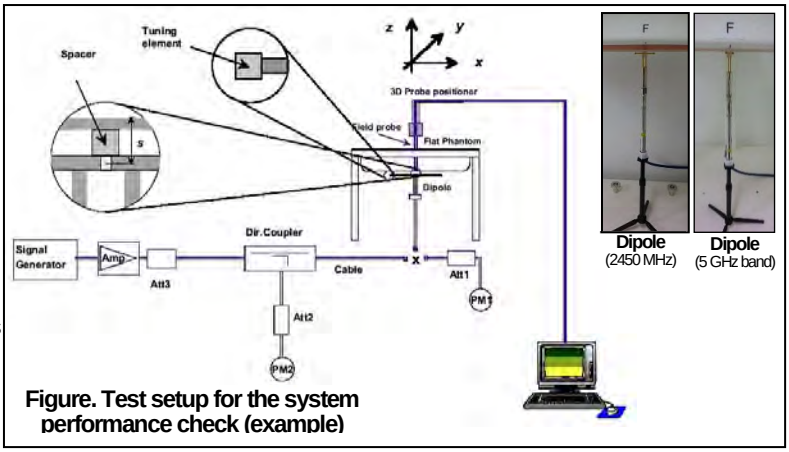
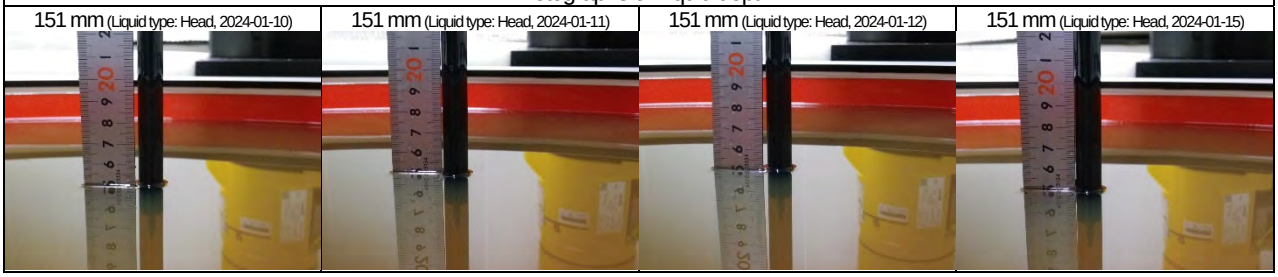



**Figure. Test setup for the system performance check (example)**

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

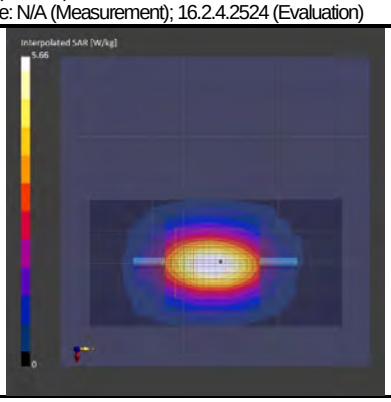
Photographs of Liquid depth




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 |



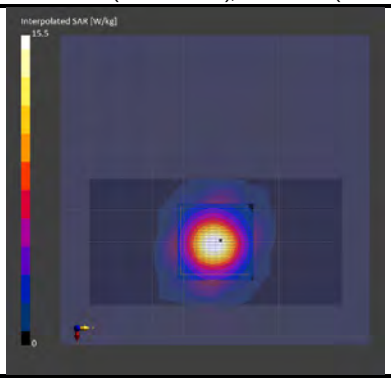

Remarks: *. Date tested:2024-01-10 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 23 deg.C. / (55~70) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement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

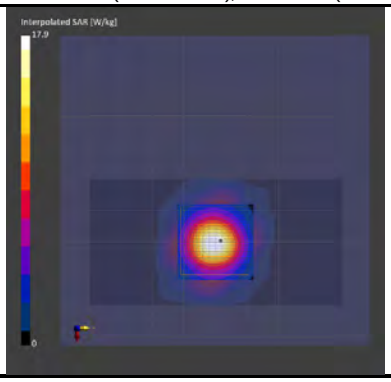



Remarks: *. Date tested:2024-01-11 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: (22~23) deg.C. / (55~70) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement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

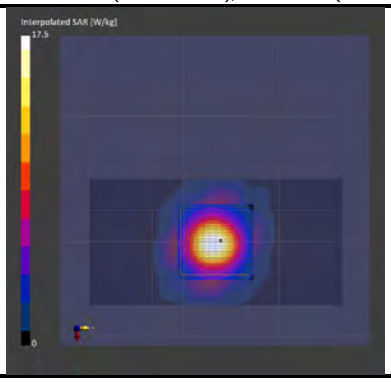



Remarks: *. Date tested:2024-01-11 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: (22~23) deg.C. / (55~70) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement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



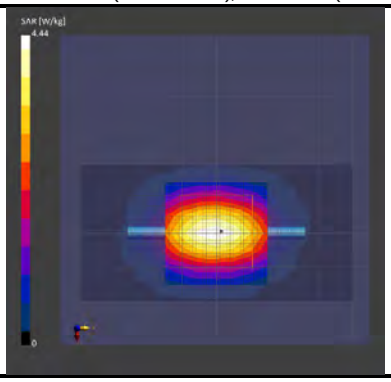

Remarks: *. Date tested:2024-01-11 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: (22~23) deg.C. / (55~70) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement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

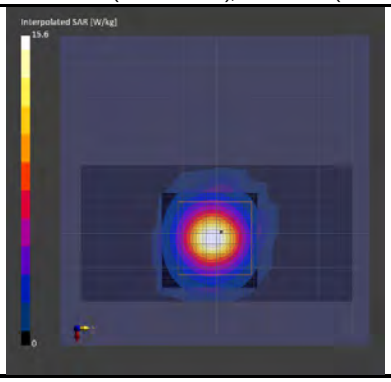



Remarks: *. Date tested:2024-01-12 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 23 deg.C. / (65~75) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement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

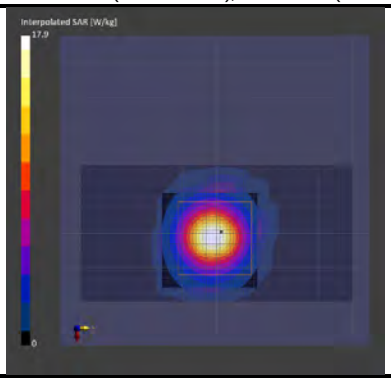



Remarks: *. Date tested:2024-01-12 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 23 deg.C. / (65~75) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement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



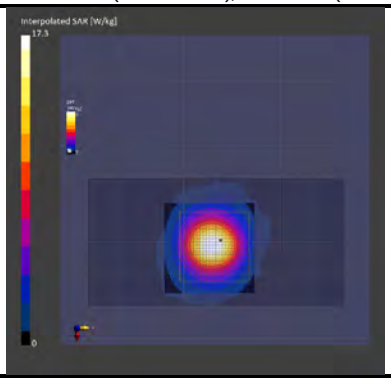

Remarks: *. Date tested:2024-01-12 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 23 deg.C. / (65~75) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement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

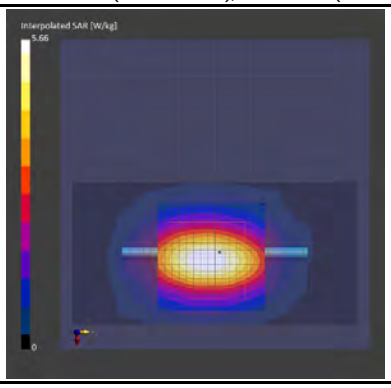



Remarks: *. Date tested:2024-01-12 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: 23 deg.C. / (65~75) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement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



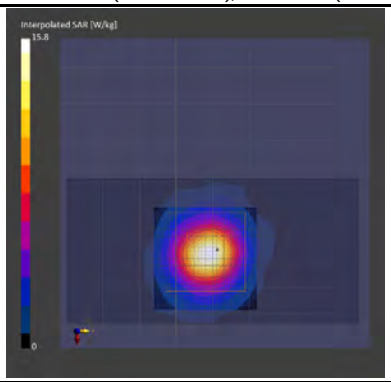

Remarks: *. Date tested:2024-01-15 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: (22~23) deg.C. / (60~75) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement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



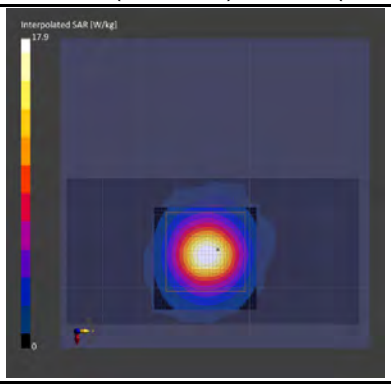

Remarks: *. Date tested:2024-01-15 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: (22~23) deg.C. / (60~75) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement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

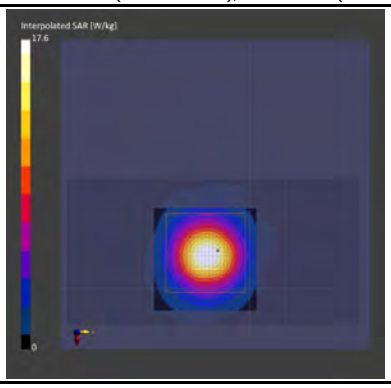



Remarks: *. Date tested:2024-01-15 ; Tested by: Hiroshi Naka; Tested place:No.7 shielded room; Ambient: (22~23) deg.C. / (60~75) %RH; Liquid depth: 151 mm;
*. Liquid temperature: 22.0 deg.C. ± 0.5 deg.C. (22.5 deg.C., in check); *. Red cubic: big=SAR(10g ) / small=SAR(1g)
*. Project file name-Measurement 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, Wi-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 % |
| CFdrift | 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&refrection) (< 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 veff 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 % |
| CFdrift | 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&refrection) (<12uW/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 veff 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-**