



SAR TEST REPORT

Test Report No.: 13734845S-A-R1

Applicant : Canon Inc.
Type of EUT : Built-in Wireless module with Bluetooth in Flat Panel Detector
Model Number of EUT : WM01B
FCC ID : AZDWM01B
Test Standard : FCC 47CFR §2.1093
Test Result : Complied (Refer to Section 3)

| Highest Reported SAR [W/kg] | | | | Host platform | | | - | Remarks (2.4GHz band) | | | | Remarks (5GHz band) | | | | Reference SAR test report | | |
|-----------------------------|----------------|-------------|-------------|---------------|---------------------|--------|--------------|--|------|----------|--|---------------------|------|----------|-----|------------------------------|--|--|
| Partial-body | Hand | | | No. | Type | Model | | Conducted output power (Burst average) [dBm] | | | Conducted output power (Burst average) [dBm] | | | | | | | |
| Limit: 1.6 (1g) | Limit: 4 (10g) | 2.4GHz band | 5GHz band | | | | | [MHz] | Mode | Measured | Max | [MHz] | Mode | Measured | Max | | | |
| 0.22 | 0.50 | 0.38 | 0.47 | 2 | Flat Panel Detector | WMSB04 | Partial body | 2437 | b | 12.13 | 14 | 5510 | n40 | 11.19 | 13 | 13734845S-A (This report) | | |
| (Antenna 1) | (Antenna 1) | (Antenna 2) | (Antenna 1) | | | | Hand | 2412 | b | 12.84 | 14 | 5190 | n40 | 12.13 | 13 | | | |

*. This module had installed into the following host platforms under 1.2 W/kg (SAR(1g)), 3 W/kg (SAR(10g)) (KDB447498 D01 (v06); multi-platform operation requirement).

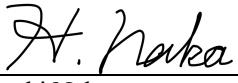
| | | | | | | | | | | | | | | | | |
|-------------|-------------|-------------|-------------|---|---------------------|--------|--------------|------|---|-------|----|------|-----|-------|----|-------------|
| 0.30 | 0.40 | 0.33 | 0.43 | 1 | Flat Panel Detector | WMSB04 | Partial body | 2412 | b | 12.37 | 14 | 5670 | n40 | 11.43 | 13 | 14033664S-A |
| (Antenna 1) | (Antenna 1) | (Antenna 2) | (Antenna 1) | | | | Hand | 2412 | b | 12.29 | 14 | 5190 | n40 | 11.55 | 13 | |

*. Highest reported SAR of all test configurations and in all tested platforms for partial-body and hand are 0.30 W/kg and 0.38 W/kg in 2.4GHz (DTS) band, 0.50 W/kg, and 0.47 W/kg in 5GHz (U-NII) band respectively.

- *. Highest estimated summed reported SAR value for simultaneous transmission BT LE + WLAN (5GHz band) in this platform is enough lower than limit.
- *. Since highest reported SAR (1g) and SAR (10g) on this platform obtained in accordance with KDB447498 D01 (v06) was kept under 1.2 W/kg (SAR (1g)), 3 W/kg (SAR(10g)), the EUT was approved to operate this "Flat Panel Detector" series single platform.
- *. Max.:Maximum, (Mode): IEEE 802.11b, n40: IEEE 802.11n(40HT).

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7. The all test items in this test report are conducted by UL Japan, Inc. Shonan EMC Lab.
8. The opinions and the interpretations to the result of the description in this report are outside scopes where UL Japan has been accredited.
9. The information provided from the customer for this report is identified in SECTION 1.
10. This report (R1) is a revised version of 13734845S-A. 13734845S-A report is replaced with this report.

Date of test: December 6~10, 2021

Test engineer: 
Hiroshi Naka (Engineer)

Approved by: 
Toyokazu Imamura (Leader)

The testing in which "Non-accreditation" is displayed is outside the accreditation scopes in UL Japan.

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



CERTIFICATE 1266.03

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(Revision Date:2021/12/20)

Report Cover Page - 13-EM-F0429 Issue # 19.0

REVISION HISTORY

| Revision | Test report No. | Date | Page revised | Contents |
|----------|-----------------|-------------------|--------------|--|
| Original | 13734845S-A | December 20, 2021 | - | - |
| - R1 | 13734845S-A-R1 | February 7, 2022 | p5, 7 | (p5, 2,4) Corrected model number; "WM5B04" (was) -> "WM5B06" (new) (p7, 3,5) Corrected mistake sentences; "approved to operate multi-platform" (was) -> "approved to operate 'Flat Panel Detector (FPD)' series single platform." (new) |

*. By issue of new revision report, the report of an old revision becomes invalid.

Reference : Abbreviations (Including words undescribed in this report) (radio_r0v09s02_211221)

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

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SECTION 1: Customer information

| | |
|------------------|---|
| Company Name | Canon Inc. |
| Address | 9-1, Imaikamicho, Nakahara-ku, Kawasaki, Kanagawa 211-8501, Japan |
| Telephone Number | +81-3-3758-2111 |
| Contact Person | Tetsuo Watanabe |

The information provided from the customer is as follows;

- Applicant, 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
- * The laboratory is exempted from liability of any test results affected from the above information in SECTION 2, SECTION 4 and Appendix 1.

SECTION 2: Equipment under test (EUT)

2.1 Identification of EUT and platform

| Type of Equipment | EUT | Host platform |
|----------------------------|---|----------------------------|
| Model Number | WM01B | WM5B06 (*2) |
| Serial Number | 34:9F:7B:EF:DB:20 | 21MED-0061 |
| Condition of sample | Engineering prototype (*1) | Engineering prototype (*1) |
| Country of Mass-production | Japan | Japan |
| Receipt Date of Sample | September 28, 2021 (for power measurement) (*. No modification by the Lab.) December 3, 2021 (for SAR test) (*. No modification by the Lab.) | |
| Category Identified | Portable device | |
| Rating (EUT) | DC3.3V supplied from the platform. | |
| Feature of EUT | The EUT is a Built-in Wireless Module with Bluetooth, model: WM01B which installs into the specified platform as "Flat Panel Detector". | |
| SAR Accessory | None | |

*1. Not for sale: The sample is equivalent to mass-produced items.

*2. Another name for the model WM5B06 is AR-E4343W or CXDI-420C Wireless.

2.2 Product Description (WM01B)

| | |
|---|--|
| Equipment type | Transceiver |
| Frequency of operation | *. The operation frequency in each operation band refer to remarks in below. |
| Channel spacing | BT-LE: 2MHz (BT-LE) / WLAN: 5 MHz (2.4GHz band), 20 MHz (5GHz band) |
| Bandwidth | BT-LE: 79 MHz (FHSS) / WLAN: 20 MHz (b, g, a, n20, ac20), 40 MHz (n40, ac40), 80 MHz (ac80) |
| Type of modulation | BT-LE: GFSK / WLAN: DSSS: DBPSK, DQPSK, CCK (b), WLAN: OFDM: BPSK, QPSK, 16QAM, 64QAM (g, a, n20, ac20, n40, ac40, ac80), 256QAM (ac80) |
| Typical power and tune-up limit (maximum) power | *. The specification of typical and maximum transmit power (which may occur) refer to remarks in below. *. The measured output power (conducted) as SAR reference power refers to section 5 in this report. |
| Antenna quantity | 2 pcs. (*3) |
| Antenna model | Antenna 2: ANT2444-16B/M-AB-285 |
| Antenna cable length | 285 mm |
| Antenna gain (*, max, peak) | 2.86 dBi (2.4GHz band), 3.05 dBi (5GHz band) (*including 285 mm cable loss) |
| Antenna type / connector type | Monopole (1/4λ) / PCB side: MHF, Antenna side: soldered |
| | Monopole (1/4λ) / PCB side: MHF, Antenna side: soldered |

*3. A transmission is performed from one of antenna 2 or antenna 1 (diversity). A transmission of WLAN(2.4GHz) and BT-LE is time-division-processing. Therefore, simultaneously transmitted SAR was only considered for the WLAN(5GHz) and BT-LE.

*. Typical power and tune-up limit power (as "maximum power")

| Tx Mode | Data rate | Output power (Typical and maximum) [dBm] (*. The measured output power (conducted) refers to section 5 in this report.) | | | | | | | | | | | | | | |
|-----------|--------------|---|---------|------------|------------|---------|------------|------------|---------|----------------------|----------------------|---------|------------|------------|---------|------|
| | | 2.4GHz | | | U-NII-1 | | | U-NII-2A | | | U-NII-2C | | | U-NII-3 | | |
| | | F [MHz] | Typical | Max. | F [MHz] | Typical | Max. | F [MHz] | Typical | Max. | F [MHz] | Typical | Max. | F [MHz] | Typical | Max. |
| BT-LE PHY | 1Mbps, 2Mbps | 2402-2480 | 3 | 5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| b | 1-11Mbps | 2412-2462 | 12 | 14 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| g | 6-54Mbps | 2412-2462 | 12 | 14 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| a | 6-54Mbps | | N/A | N/A | 5180-5240 | 11 | 13 | 5260-5320 | 11 | 13 | 5500-5580, 5660-5700 | 11 | 13 | 5745-5825 | 11 | 13 |
| n20-SISO | MCS0-7 | 2412-2462 | 12 | 14 | 5180-5240 | 11 | 13 | 5260-5320 | 11 | 13 | 5500-5580, 5660-5700 | 11 | 13 | 5745-5825 | 11 | 13 |
| ac20-SISO | MCS0-8 | N/A | N/A | 5180-5240 | 11 | 13 | 5260-5320 | 11 | 13 | 5500-5580, 5660-5700 | 11 | 13 | 5745-5825 | 11 | 13 | |
| n40-SISO | MCS0-7 | 2422-2452 | 11 | 13 | 5190, 5230 | 11 | 13 | 5270, 5310 | 11 | 13 | 5510, 5550, 5670 | 11 | 13 | 5755, 5795 | 11 | 13 |
| ac40-SISO | MCS0-9 | N/A | N/A | 5190, 5230 | 11 | 13 | 5270, 5310 | 11 | 13 | 5510, 5550, 5670 | 11 | 13 | 5755, 5795 | 11 | 13 | |
| ac80-SISO | MCS0-9 | N/A | N/A | N/A | 5210 | 8.5 | 10.5 | 5290 | 8.5 | 10.5 | 5530 | 8.5 | 10.5 | 5775 | 8.5 | 10.5 |

*. F: Frequency; Max.: maximum; N/A: Not applicable; (mode) BT-LE: Bluetooth low energy, b: IEEE 802.11b, g: IEEE 802.11g, a: IEEE 802.11a, n20: IEEE 802.11n(20HT), n40: IEEE 802.11n(40HT), ac20: IEEE 802.11ac(20VHT), ac40: IEEE 802.11n(40VHT), ac80: IEEE 802.11ac(80VHT).

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

*. The EUT only supports BT-LE, does not support BR/EDR even though the EUT supports Bluetooth 5.2.

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

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2.3 Host platform information

This EUT (Built-in Wireless Module with Bluetooth, model: WM01B) is installed into the following "Flat Panel Detector" series models. The host platform has the following "Model number" and specified "Medical equipment model number."

| Host platform information | | | | | SAR test information | |
|---------------------------|---------------------|--------------|--------------------------------|---|----------------------|------------------------------|
| No. | Type of equipment | Model number | Medical equipment model number | Remarks | SAR test status | Reference SAR test report |
| 1 | Flat Panel Detector | WM5B04 | CXDI-720C Wireless, AR-E3543W | 14"×17" detector, Wireless High-end model | Tested | 14033664S-A (latest version) |
| 2 | Flat Panel Detector | WM5B06 | CXDI-420C Wireless, AR-E4343W | 17"×17" detector, Wireless High-end model | Tested | 13734845S-A (this report) |

2.4 SAR test consideration of this host platform

This platform is a large-sized transportable equipment and has a part coming in contact directly with a patient. An operator (a patient become an operator uncommonly) maintains EUT by hand. (Refer to photographs of Appendix 1-3: Usage example)

Because there is not the KDB for the product which is such a design specifications, we decide the SAR test method in below.

Physical characteristics of platform: WM5B06

Dimensions: 460 × 460 × 15.5 mm

- This platform is a transportable equipment, but, because it is a large-sized equipment, an operator (or a patient) fixes the edge of platform to stands and pushes or supports platform to a patient's body part (head, body, arm, hand, foot, etc.) by hand at the time of use.
The X-ray imaging by platform changes the imaging part of the patient's body at every imaging after having needed several minutes for setting.
- The image transfer time (continuous transfer time) per one imaging is two or three seconds, it is short enough.
The imaging of the same part can be performed consecutively several times.
In the case of serial imaging, the image transfer time (continuous transfer time) occupies two or three seconds among the image intervals of 15 seconds. (Duty Cycle: < 20 %)
- On this account, the time when an operator (or patient) is really exposed to RF energy is short.
- In addition, an operator is only a doctor or a legally certified person because platform is medical equipment.
- Explanatory note in the manual-
"Only a physician or a legally certified operation should use the product."

In consideration of the terms of use mentioned above, we decide the SAR examination as the following contents.

a) The front (imaging area side) and side edge of platform carries out the Partial-body SAR examination.

The front of platform comes in contact with a patient directly. In addition, consecutive RF energy may be exposed to the same neighborhood part of the patient although duty cycle is less than 20%.

Because the front of platform comes in contact with a patient directly, we measure the Partial-body SAR at the position of the touch to a phantom around the antenna of the front and side-edge of platform with continuous transmission in 100% duty cycle as a worse condition.

b) The back of platform carries out the Hand SAR examination.

An operator (or a patient) fixes the edge of platform to stands and pushes or supports platform to a patient's body part (head, body, arm, hand, foot, etc.) by hand and by holding back of platform at the time of use.

In addition, consecutive RF energy may be exposed to the same neighborhood part of the patient although duty cycle is less than 20%.

We measure the Hand SAR at the position of the touch to a phantom around the antenna of the back of platform with continuous transmission in 100% duty cycle as a worse condition.

- In addition, because the following instructions for the operator are mentioned in a manual, the physical part of the operator does not touch directly the antenna part of the back.

- Explanatory note in the manual -

"Please do not adhere to your hands and body to an antenna part to restrain exposure of the RF energy when conducting an X-ray examination."

SECTION 3: Test specification, procedures and results

3.1 Test specification

FCC47CFR §2.1093: Radiofrequency radiation exposure evaluation: portable devices.

The US Federal Communications Commission has released the report and order "Guidelines for Evaluating the Environmental Effects of RF Radiation", ET Docket No. 93-62 in August 1996. The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g for an uncontrolled environment and 8.0 mW/g for an occupational/controlled environment as recommended by the ANSI/IEEE standard C95.1-1992. The device should be evaluated at maximum output power (radiated from the antenna) under "worst-case" conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling in accordance with the following measurement procedures.

The tests documented in this report were performed in accordance with FCC 47 CFR Parts 2, IEEE Std.1528-2013 (latest), the following FCC Published RF exposure KDB procedures, and TCB workshop updates.

| | |
|---------------------------------|---|
| KDB 447498 D01 (v06): | General RF exposure guidance |
| KDB 248227 D01 (v02r02): | SAR Guidance for IEEE 802.11 (Wi-Fi) transmitters |
| KDB 865664 D01 (v01r04): | SAR measurement 100MHz to 6GHz |
| IEEE Std. 1528-2013: | IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques. |

3.2 Exposure limit

| Environments of exposure limit | Whole-Body (averaged over the entire body) | Partial-Body (averaged over any 1g of tissue) | Hands, Wrists, Feet and Ankles (averaged over any 10g of tissue) |
|--|---|--|---|
| (A) Limits for Occupational /Controlled Exposure (W/kg) | 0.4 | 8.0 | 20.0 |
| (B) Limits for General population /Uncontrolled Exposure (W/kg) | 0.08 | 1.6 | 4.0 |

*. Occupational/Controlled Environments: are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure, (i.e. as a result of employment or occupation).

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

The limit applied in this test report is:

General population / uncontrolled exposure, Partial-Body (averaged over any 1g of tissue) limit: 1.6 W/kg (*. Refers to clause 2.3)
General population / uncontrolled exposure, Hands (averaged over any 10g of tissue) limit: 4 W/kg (*. Refers to clause 2.3)

3.3 Addition, deviation and exclusion to the test procedure

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

3.4 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)

| Used? | Place | Width × Depth × Height (m) | Size of reference ground plane (m) / horizontal conducting plane | Maximum measurement distance | Used? | Place | Width × Depth × Height (m) | Size of reference ground plane (m) / horizontal conducting plane |
|--------------------------|----------------------------|----------------------------|--|------------------------------|-------------------------------------|---------------------------|----------------------------|--|
| <input type="checkbox"/> | No.1 Semi-anechoic chamber | 20.6 × 11.3 × 7.65 | 20.6 × 11.3 | 10 m | <input type="checkbox"/> | No.4 Shielded room | 4.4 × 4.7 × 2.7 | 4.4 × 4.7 |
| <input type="checkbox"/> | No.2 Semi-anechoic chamber | 20.6 × 11.3 × 7.65 | 20.6 × 11.3 | 10 m | <input type="checkbox"/> | No.5 Shielded room | 7.8 × 6.4 × 2.7 | 7.8 × 6.4 |
| <input type="checkbox"/> | No.3 Semi-anechoic chamber | 12.7 × 7.7 × 5.35 | 12.7 × 7.7 | 5 m | <input type="checkbox"/> | No.6 Shielded room | 7.8 × 6.4 × 2.7 | 7.8 × 6.4 |
| <input type="checkbox"/> | No.4 Semi-anechoic chamber | 8.1 × 5.1 × 3.55 | 8.1 × 5.1 | - | <input checked="" type="checkbox"/> | No.7 Shielded room | 2.76 × 3.76 × 2.4 | 2.76 × 3.76 |
| <input type="checkbox"/> | No.1 Shielded room | 6.8 × 4.1 × 2.7 | 6.8 × 4.1 | - | <input type="checkbox"/> | No.8 Shielded room | 3.45 × 5.5 × 2.4 | 3.45 × 5.5 |
| <input type="checkbox"/> | No.2 Shielded room | 6.8 × 4.1 × 2.7 | 6.8 × 4.1 | - | <input type="checkbox"/> | No.1 Measurement room | 2.55 × 4.1 × 2.5 | 2.55 × 4.1 |
| <input type="checkbox"/> | No.3 Shielded room | 6.3 × 4.7 × 2.7 | 6.3 × 4.7 | - | | | | |

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3.5 Procedures and Results

| Test Procedure | | SAR measurement: KDB 447498 D01, KDB 248227 D01, KDB 865664 D01, IEC Std. 1528 | | | | | | | | | | | |
|--------------------|---------------------|--|--------------|----------------------------------|--------------|----------------------------------|--------------|---|--------------|------------------------------------|--------------|----------------------------------|--------------|
| Category | | FCC 47CFR §2.1093 (Portable device) | | | | SAR type | | Partial-body (SAR (1g)), Hands (SAR(10g)) | | | | | |
| | | BT-LE | | WLAN (DTS) | | WLAN (U-NII-1) | | WLAN (U-NII-2A) | | WLAN (U-NII-2C) | | WLAN (U-NII-3) | |
| Frequency [MHz] | | 2402~2480 | | 2412~2462 | | 5180~5240 | | 5260~5320 | | 5500~5700 (excluding 5600~5650) | | 5745~5825 | |
| Results (SAR) | | Complied (Low power) (Refer to Section 4) | | Complied (Refer to Section 6) | | Complied (Refer to Section 6) | | Complied (Refer to Section 6) | | Complied (Refer to Section 6) | | Complied (Refer to Section 6) | |
| SAR [W/kg] | Type | 1g Partial-body | 10g Hands | 1g Partial-body | 10g Hands | 1g Partial-body | 10g Hands | 1g Partial-body | 10g Hands | 1g Partial-body | 10g Hands | 1g Partial-body | 10g Hands |
| | Limit | 1.6 | 4 | 1.6 | 4 | 1.6 | 4 | 1.6 | 4 | 1.6 | 4 | 1.6 | 4 |
| | Scaled | n/a | n/a | 0.22 | 0.38 | 0.39 | 0.47 | 0.37 | 0.41 | 0.50 | 0.45 | 0.29 | 0.38 |
| | Measured | n/a | n/a | 0.143 | 0.293 | 0.320 | 0.381 | 0.293 | 0.325 | 0.326 | 0.293 | 0.202 | 0.265 |
| | Antenna (*1) | - | - | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | - |
| | Liquid type | - | - | Head | Head | Head | Head | Head | Head | Head | Head | Head | - |
| Operation mode | | - | - | b | b | n40 | n40 | n40 | n40 | n40 | n40 | n40 | n40 |
| Frequency [MHz] | | - | - | 2437 | 2412 | 5190 | 5190 | 5270 | 5270 | 5510 | 5510 | 5795 | 5795 |
| Output power | Measured [dBm] | - | - | 12.13 | 12.84 | 12.13 | 12.13 | 11.96 | 11.96 | 11.19 | 11.19 | 11.45 | 11.45 |
| | Tune-up limit [dBm] | 5 | 5 | 14 | 14 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| | [mW] | 3 | 3 | 25 | 25 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| | Power scaled factor | - | - | 1.54 | 1.31 | 1.22 | 1.22 | 1.27 | 1.27 | 1.52 | 1.52 | 1.43 | 1.43 |
| Duty cycle [%] | | - | - | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Duty scaled factor | | - | - | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Note: UL Japan's SAR Work Procedures No.13-EM-W0429 and 13-EM-W0430. No addition, deviation nor exclusion has been made from standards

*1. SAR value indicated the big one of either antenna 2 or antenna 1 in table and in each operation band.

*. A transmission is performed from one of antenna 2 or antenna 1 (diversity). A transmission of WLAN(2.4GHz) and BT-LE is time-division-processing. Therefore, simultaneously transmitted SAR was only considered for the WLAN(5GHz) and BT-LE.

*. (Calculating formula) Scaled SAR to tune-up limit power (W/kg) = (Measured SAR (W/kg)) × (Duty scaled factor) × (Power scaled factor)
where; Power scaled factor [-] = 1 / (10 ^ ("Amax (tune-up limit power - burst average power, dB" / 10)), Duty scaled factor [-] = 100(%) / (duty cycle, %))

*. n/a: Not applicable; (mode) b: IEEE 802.11b,n40; IEEE 802.11n(40HT).

*. "yellow marker" in the table: The highest reported SAR(1g) and SAR(10g) of each band (DTS, U-NII) is shaded with yellow marker.

The sum SAR of estimated SAR of "BT LE + WLAN (5GHz)" was smaller than limit.

Test outline: Where the EUT is built into a new platform, it was verified whether multi-platform conditions can be suited in according with section 2) of 5.2.2 in KDB447498 D01 (v06).

| | |
|------------------------------------|--|
| Consideration of the test results: | The highest reported SAR of this platform (2) was kept; ≤ 1.2 W/kg (SAR(1g)), ≤ 3 W/kg (SAR(10g)) Since highest reported SAR (1g,10g) on this EUT's platform obtained in accordance with KDB447498 D01 (v06) was kept under 1.2 W/kg (SAR(1g)), kept under 3 W/kg (SAR(10g)), this EUT was approved to "Flat Panel Detector (FPD)" series single platform. |
|------------------------------------|--|

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for partial body, 4 W/kg for hands) specified in FCC 47 CFR part 2 (2.1093) and had been tested in accordance with the measurement methods and procedures specified in FCC KDB publications and IEEE 1528-2013.

3.6 SAR measurement procedure

3.6.1 Normal SAR measurement procedure

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. The SAR test reference power measurement and the SAR test were proceeded with the lowest data rate (which has the higher time-based average power typically) on each operation mode. Therefore, the average output power was measured on the lower, middle (or near middle), upper and specified channels with the lowest data rate of each operation mode. The power of other data rate was also measured to confirm the time-base average power and when if it's required. The power measurement result is shown in Section 5.

*. The EUT transmission power was verified that it was within 2dB lower than the maximum tune-up tolerance limit when it was set the rated power. (Clause 4.1, KDB447498 D01 (v06))

Step 2: Power reference measurement

Measurement of the E-field at a fixed location above the central position of flat phantom (or/and furthermore an interpolated peak SAR location of area scan in step 2) was used as a reference value for assessing the power drop.

Step 3: Area Scan (Area scan parameters: KDB 865664 D01 (v01r04))

The SAR distribution at the exposed side of head or body position was measured at a distance of each device from the inner surface of the shell. The area covered the entire dimension of the antenna of EUT and suitable horizontal grid spacing of EUT. Based on these data, the area of the maximum absorption was determined by splines interpolation.

| | $\leq 3 \text{ GHz}$ | $> 3 \text{ GHz}$ |
|--|---|--|
| Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface | $5 \pm 1 \text{ mm}$ | $\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$ |
| Maximum probe angle from probe axis to phantom surface normal at the measurement location | $30^\circ \pm 1^\circ$ | $20^\circ \pm 1^\circ$ |
| | $\leq 2 \text{ GHz: } \leq 15 \text{ mm}$ $2 - 3 \text{ GHz: } \leq 12 \text{ mm}$ | $3 - 4 \text{ GHz: } \leq 12 \text{ mm}$ $4 - 6 \text{ GHz: } \leq 10 \text{ mm}$ |
| Maximum area scan spatial resolution: $\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$ | | 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 \leq the corresponding x or y dimension of the test device with at least one measurement point on the test device. |

Step 4: Zoom Scan and post-processing (Zoom scan parameters: KDB 865664 D01 (v01r04))

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 volume of 30 mm (X) \times 30 mm (Y) \times 30 mm (Z) (or more) was assessed by measuring 7 \times 7 \times 7 points (or more), ≤ 3 GHz.

A volume of 28 mm (X) \times 28 mm (Y) \times 24mm (Z) (or more) was assessed by measuring 8 \times 8 \times 7 points (or more) (by "Ratio step" method (*1)), > 3 GHz.

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.

| | | $f \leq 3 \text{ GHz}$ | $3 \text{ GHz} < f \leq 6 \text{ GHz}$ |
|---|---|---|---|
| 1 | Maximum zoom scan spatial resolution: $\Delta x_{\text{zoom}}, \Delta y_{\text{zoom}}$ | $\leq 2 \text{ GHz: } \leq 8 \text{ mm}$ $2 - 3 \text{ GHz: } \leq 5 \text{ mm}^*$ | $3 - 4 \text{ GHz: } \leq 5 \text{ mm}^*$ $4 - 6 \text{ GHz: } \leq 4 \text{ mm}^*$ |
| 2 | Maximum zoom scan spatial resolution, normal to phantom surface | uniform grid: $\Delta z_{\text{zoom}}(n)$ | $\leq 5 \text{ mm}$ |
| 3 | | | $\leq 4 \text{ mm}$ |
| 4 | graded grid | $\Delta z_{\text{zoom}}(1):$ between 1 st two points closest to phantom surface | $3 - 4 \text{ GHz: } \leq 3 \text{ mm}$ $4 - 5 \text{ GHz: } \leq 2.5 \text{ mm}$ $5 - 6 \text{ GHz: } \leq 2 \text{ mm}$ |
| 5 | | $\Delta z_{\text{zoom}}(n > 1):$ between subsequent points | $\leq 1.5 \cdot \Delta z_{\text{zoom}}(n-1) \text{ mm}$ |
| 5 | Minimum zoom scan volume | x, y, z | $\geq 30 \text{ mm}$ |
| | * The asterisk table-footnote is per KDB Pub. 865664 D01 v01r04. NOTE For uniformity purposes the integer frequency increments of rows 1 to 3 and 5 apply, rather than the corresponding variable and fixed parameters given in IEC 62209-1:2016 and IEC 62209-2:2010/AMD1:2019. | | |

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 procedure, and with the same settings. The Power Drift Measurement gives the field 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. The measurement procedure is the same as Step 2. It was checked that the power drift is within $\pm 5\%$ in the evaluation procedure of SAR testing. The verification of power drift during the SAR test is that DASY system calculates the power drift by measuring the e-filed at the same location at beginning and the end of the scan measurement for each test position. The result is shown in SAR plot data of APPENDIX 2.

*. DASY system calculation Power drift value[dB] = $20\log(E_a/[V/m]) - 20\log(E_b/[V/m])$ (where, Before SAR testing: $E_b/[V/m]$ / After SAR testing: $E_a/[V/m]$)

Limit of power drift[W] = $\pm 5\%$; Power drift limit (X) [dB] = $10\log(P_{\text{drift}}) - 10\log(1.05/1) = 10\log(1.05) - 10\log(1) = 0.21\text{dB}$ from E-filed relations with power; $S = E \times H = E^2/2\pi\eta - P/(4\pi\eta r^2)$ (η : Space impedance) $\rightarrow P = (E^2/2 \times 4\pi\eta r^2)$ Therefore, The correlation of power and the E-filed

Power drift limit (X) dB = $10\log(P_{\text{drift}}) = 10\log(E_{\text{drift}})^2 = 20\log(E_{\text{drift}})$

From the above mentioned, **the calculated power drift of DASY system must be the less than ($\pm 0.21\text{dB}$)**.

Step 6: Z-Scan

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be larger than the step size in Z-direction.

*. All the SAR tests were conservatively performed with test separation distance 0 mm. The phantom bottom thickness is approx. 2mm. Typical distance from probe tip to dipole centers is 1mm. The distance between the SAR probe tip to the surface of test device which is touched the bottom surface of the phantom is approx. 3 mm for 2.4GHz band and 2.4 mm for 5GHz band.

*1. "Ratio step" method parameters used; the first measurement point: "1.4mm" from the phantom surface, the initial z grid separation: "1.4mm", subsequent graded grid ratio: "1.4". These parameters comply with the requirement of KDB 865664 D01 and recommended by Schmid & Partner Engineering AG (DASY5 manual).

SECTION 4: Operation of EUT during testing

4.1 Operating modes for SAR testing

The EUT has BT LE and IEEE 802.11b, g, a, n(20HT), n(40HT), ac(20VHT), ac(40VHT) and ac(80VHT) continuous transmitting modes. The frequency and the modulation used in the SAR testing are shown as a following.

| Operation mode band | BT LE | | | | b | g | n20 | n40 | a | n20 | ac20 | n40 | ac40 | ac80 | a | n20 | ac20 | n40 | ac40 | ac80 | |
|------------------------|-------------------------|-------------|------------------------|------------------------|---------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|----|
| Tx band [MHz] | 2.4GHz band | | | | U-NII-1 (*4) | | | | | | | | U-NII-2A | | | | | | | | |
| Tx band [MHz] | 2402~2480 | | 2412~2462 | | 2422~ 2452 | 5180~5240 | 5190 | 5230 | 5210 | 5260~5320 | 5270 | 5310 | 5290 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | | |
| Antenna #(*1) | 2 or 1 | | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 20 | 20 | 20 | 40 | 40 | 80 | 20 | 20 | 20 | 40 | 80 |
| Bandwidth [MHz] | 1 | | 20 | 20 | 20 | 40 | 20 | 20 | 20 | 40 | 40 | 80 | 20 | 20 | 20 | 40 | 40 | 40 | 40 | 40 | |
| Max.power [dBm] | 5 | | 14 | 14 | 14 | 13 | 13 | 13 | 13 | 13 | 10.5 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 10.5 | |
| Modulation | GFSK | | DSSS | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | |
| D/R [Mbps, MCS#] | 1 | 2 | 1 | 6 | MCS0 | MCS0 | 6 | MCS0 | MCS0 | MCS0 | MCS0 | MCS0 | MCS0 | 6 | MCS0 | MCS0 | MCS0 | MCS0 | MCS0 | MCS0 | |
| Frequency tested [MHz] | n/a (*2) | n/a (*2) | 2412, 2437, 2462 | n/a (*3) | n/a (*3) | n/a (*6) | n/a (*6) | n/a (*6) | 5190 | 5230 | n/a (*6) | n/a (*5) | n/a (*6) | n/a (*6) | n/a (*6) | 5270, 5310 | n/a (*6) | n/a (*5) | n/a (*6) | n/a (*5) | |
| Operation mode band | a | n20 | ac20 | n40 | ac40 | ac80 | a | n20 | ac20 | n40 | ac40 | ac80 | a | n20 | ac20 | n40 | ac40 | ac80 | U-NII-2C | U-NII-3 | |
| Tx band [MHz] | 5500~5580, 5660~5700 | | 5510,5550,5670 | | 5530 | 5745~5825 | | 5755,5795 | | 5775 | | | | | | | | | | | |
| Antenna #(*1) | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | 2 or 1 | |
| Bandwidth [MHz] | 20 | 20 | 20 | 40 | 40 | 80 | 20 | 20 | 20 | 40 | 40 | 80 | 20 | 20 | 20 | 40 | 40 | 80 | 20 | 20 | |
| Max.power [dBm] | 13 | 13 | 13 | 13 | 10.5 | 13 | 13 | 13 | 13 | 13 | 10.5 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 10.5 | |
| Modulation | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | OFDM | |
| D/R [Mbps, MCS#] | 6 | MCS0 | MCS0 | MCS0 | MCS0 | MCS0 | 6 | MCS0 | MCS0 | MCS0 | MCS0 | MCS0 | MCS0 | MCS0 | MCS0 | MCS0 | MCS0 | MCS0 | MCS0 | MCS0 | |
| Frequency tested [MHz] | n/a (*6) | n/a (*6) | n/a (*6) | 5510, 5550, 5670 | n/a (*5) | n/a (*6) | n/a (*6) | n/a (*6) | 5755, 5795 | n/a (*6) | n/a (*5) | n/a (*6) | n/a (*5) | n/a (*6) | n/a (*5) | n/a (*6) | n/a (*5) | n/a (*6) | n/a (*5) | n/a (*6) | |

- *. Max.power: Maximum power (tune-up limit power), D/R: Data rate, n/a: SAR test was not applied.
- *. (mode) BT LE: Bluetooth Low Energy, b: IEEE 802.11b, g: IEEE 802.11g, a: IEEE 802.11a, n20: IEEE 802.11n(20HT), n40: IEEE 802.11n(40HT), ac20: IEEE 802.11ac(20VHT), ac40: IEEE 802.11n(40VHT), ac80: IEEE 802.11ac(80VHT)
- *1. A transmission is performed from one of antenna 2 or antenna 1 (diversity). A transmission of WLAN(2.4GHz) and BT-LE is time-division-processing. Therefore, simultaneously transmitted SAR was only considered for the WLAN(5GHz) and BT-LE.
- *2. Since BT LE is enough lower power, SAR test is exempted. (refer to clause 4.3).
- *3. (KDB 248227 D01) Since reported SAR (1g, 10g) of DSSS mode which had highest output power was enough small, SAR test was only applied DSSS mode.
- *4. SAR test of U-NII-1 band was also applied for the reference purpose, even though the reported SAR(1g) and SAR(10g) of U-NII-2A band were enough low.
- *5. Since the maximum output power was lower than other mode, the SAR test was reduced.
- *6. (KDB 248227 D01) 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).

4.2 RF exposure conditions

After considering the outline of platform the SAR test was applied to the platform surface in follows.

| Setup | Explanation of SAR test setup plan (* Refer to Appendix 1 for test setup photographs which had been tested.) | Antenna 1 (switch side) | | Antenna 2 (bottom side) | | SAR type |
|-----------------------------|---|-------------------------|------------------------|-------------------------|------------------------|------------|
| | | D [mm] | SAR Tested /Reduced | D [mm] | SAR Tested /Reduced | |
| Front | A front surface (patient side) of platform was touched to the Flat phantom. | 7.76 | Tested | 7.76 | Tested | |
| Side (Right) (Antenna 1) | A right side surface (switch, antenna 1 side) of platform was touched to the Flat phantom. | 21.3 | Tested | 79.5 | Reduced (*7) | |
| Side (Left) | A left side surface of platform was touched to the Flat phantom. | 432.7 | Reduced (>200 mm) | 330.5 | Reduced (>200 mm) | |
| Top | A top side edge surface of platform was touched to the Flat phantom. | 304.5 | Reduced (>200 mm) | 435.7 | Reduced (>200 mm) | |
| Bottom | A bottom side surface (Antenna 2 side) of platform was touched to the Flat phantom. | 105.5 | Reduced (*7) | 18.3 | Tested | |
| Back | A back surface (operator handling, etc.) of platform was touched to the Flat phantom. | 4.24 | Tested | 4.24 | Tested | Hands hold |

- *. D: Antenna separation distance. It is the distance from the antenna inside platform the outer surface of platform which user may touch.
- *. Size of platform: 460 × 460 × 15.5 (thickness) [mm] (*. Size of EUT: 28 (W) × 32 (D) × 3 (thickness) [mm])
- *7. Refer to clause 4.3 "SAR test exclusion considerations accordance to KDB 447498 D01.

4.3 SAR test exclusion considerations accordance to KDB 447498 D01

The following is based on KDB447498D01.

Step 1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$[(\max. power of channel, including tune-up tolerance, mW) / (\min. test separation distance, mm)] \times [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ (for SAR(1g))}, 7.5 \text{ (for SAR(10g))} \dots \text{ formula (1)}$$

If power is calculated from the upper formula (1);

$$[\text{SAR}(1\text{g}) \text{ test exclusion thresholds, mW}] = 3 \times [\text{test separation distance, mm}] / [\sqrt{f(\text{GHz})}] \dots \text{ formula (2)}$$

1. The upper frequency of the frequency band was used in order to calculate standalone SAR test exclusion considerations.

2. Power and distance are rounded to the nearest mW and mm before calculation

3. The result is rounded to one decimal place for comparison

4. The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz.

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

When the calculated threshold value by a numerical formula above-mentioned in the following table is ≤ 3.0 (SAR1g), ≤ 7.5 (SAR10g), SAR test can be excluded.

Step 2) At 1500 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following,

$$[\text{test exclusion thresholds, mW}] = [(\text{Power allowed at numeric threshold for } 50\text{mm in formula (1)}) + [(\text{test separation distance, mm}) - (50\text{mm})] \times 10] \dots \text{ formula (3)}$$

1. The upper frequency of the frequency band was used in order to calculate standalone SAR test exclusion considerations.

2. Power and distance are rounded to the nearest mW and mm before calculation

When output power is less than the calculated threshold value by a numerical formula above-mentioned in the following table, SAR test is excluded.

[SAR exclusion calculations for step 1) antenna ≤ 50 mm from the user, and for step 2) antenna > 50 mm from the user.]

| Antenna #: | | | Calculated threshold value | | | | | | | | | | | |
|------------------------------------|------------------------------------|--------------------------------------|---|-------------|-------------|-----------------|-------------|-------------|--|---|--------------------|--------------------|--------------------|--------------------|
| Setup: | | | Antenna 1 | | | Antenna 2 | | | Antenna 1 | | | Antenna 2 | | |
| Antenna separation distance [mm]: | | | Back | Front | Right | Back | Front | Bottom | Bottom | Top | Left | Right | Left | Top |
| Antenna separation distance [mm]: | ≤ 5 (4.24) | | 8 | 21 | | ≤ 5 (4.24) | 8 | 18 | >50 (106) | >200 | >200 | >50 (80) | >200 | >200 |
| SAR type | 10g | | 1g | 1g | | 10g | 1g | 1g | 1g | 1g | 1g | 1g | 1g | 1g |
| Judge by SAR exclusion calculation | ≤ 7.5 | | ≤ 3.0 | ≤ 3.0 | | ≤ 7.5 | ≤ 3.0 | ≤ 3.0 | - | - | - | - | - | - |
| Mode | Higher Tx Frequency [GHz] [dBm] | Tune-up limit power (conducted) [mW] | Step 1) SAR exclusion calculations for antenna ≤ 50 mm from the user. Judge: "Exempt" when ≤ 3.0 (SAR (1g)), ≤ 7.5 (SAR (10g)); "Test" (SAR test required) when >3.0 (SAR(1g)), >7.5 (SAR (10g)) | | | | | | Step 2) >50 mm from the user Judge: "Exempt" when Tue-up limit power is less than calculated threshold power value. | | | | | |
| BT LE | 2.48 | 5 | 3 | 0.9, Exempt | 0.6, Exempt | 0.2, Exempt | 0.9, Exempt | 0.6, Exempt | 0.3, Exempt | 95 mW@50mm, Exempt | 95 mW@50mm, Exempt | 96 mW@50mm, Exempt | 96 mW@50mm, Exempt | 95 mW@50mm, Exempt |
| b,g,n20 | 2.462 | 14 | 25 | 7.8, Test | 4.9, Test | 1.9, Exempt | 7.8, Test | 4.9, Test | 2.2, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt |
| n40 | 2.462 | 13 | 20 | 6.3, Exempt | 3.9, Test | 1.5, Exempt | 6.3, Exempt | 3.9, Test | 1.7, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt |
| a,n20,ac20 | 5.24 | 13 | 20 | 9.2, Test | 5.7, Test | 2.2, Exempt | 9.2, Test | 5.7, Test | 2.5, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt |
| n40,ac40 | 5.23 | 13 | 20 | 9.1, Test | 5.7, Test | 2.2, Exempt | 9.1, Test | 5.7, Test | 2.5, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt |
| ac80 | 5.21 | 10.5 | 11 | 5.0, Exempt | 3.1, Test | 1.2, Exempt | 5.0, Exempt | 3.1, Test | 1.4, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt |
| a,n20,ac20 | 5.32 | 13 | 20 | 9.2, Test | 5.8, Test | 2.2, Exempt | 9.2, Test | 5.8, Test | 2.6, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt |
| n40,ac40 | 5.31 | 13 | 20 | 9.2, Test | 5.8, Test | 2.2, Exempt | 9.2, Test | 5.8, Test | 2.6, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt |
| ac80 | 5.29 | 10.5 | 11 | 5.1, Exempt | 3.2, Test | 1.2, Exempt | 5.1, Exempt | 3.2, Test | 1.4, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt | 65 mW@50mm, Exempt |
| a,n20,ac20 | 5.7 | 13 | 20 | 9.5, Test | 6.0, Test | 2.3, Exempt | 9.5, Test | 6.0, Test | 2.7, Exempt | 63 mW@50mm, Exempt | 63 mW@50mm, Exempt | 63 mW@50mm, Exempt | 63 mW@50mm, Exempt | 63 mW@50mm, Exempt |
| n40,ac40 | 5.67 | 13 | 20 | 9.5, Test | 6.0, Test | 2.3, Exempt | 9.5, Test | 6.0, Test | 2.6, Exempt | 62 mW@50mm, Exempt | 62 mW@50mm, Exempt | 62 mW@50mm, Exempt | 62 mW@50mm, Exempt | 62 mW@50mm, Exempt |
| ac80 | 5.53 | 10.5 | 11 | 5.2, Exempt | 3.2, Test | 1.2, Exempt | 5.2, Exempt | 3.2, Test | 1.4, Exempt | Since user to antenna is >200 mm, SAR test is not required. | | | | |
| a,n20,ac20 | 5.825 | 13 | 20 | 9.7, Test | 6.0, Test | 2.3, Exempt | 9.7, Test | 6.0, Test | 2.7, Exempt | Since user to antenna is >200 mm, SAR test is not required. | | | | |
| n40,ac40 | 5.795 | 13 | 20 | 9.6, Test | 6.0, Test | 2.3, Exempt | 9.6, Test | 6.0, Test | 2.7, Exempt | Since user to antenna is >200 mm, SAR test is not required. | | | | |
| ac80 | 5.775 | 10.5 | 11 | 5.3, Exempt | 3.3, Test | 1.3, Exempt | 5.3, Exempt | 3.3, Test | 1.5, Exempt | Since user to antenna is >200 mm, SAR test is not required. | | | | |

- *. 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.
- *. (mode) b: IEEE 802.11b, g: IEEE 802.11g, a: IEEE 802.11a, n20: IEEE 802.11n(20HT), n40: IEEE 802.11n(40HT), ac20: IEEE 802.11ac(20VHT), ac40: IEEE 802.11n(40VHT), ac80: IEEE 802.11ac(80VHT).

Notes: 1. Power and distance are rounded to the nearest mW and mm before calculation.

<Conclusion for consideration for SAR test reduction>

- 1) The all SAR tests were conservatively performed with test separation distance 0mm.
- 2) For WLAN operation, "Back" and "Front" setup are applied the SAR test because near antenna section. "Right" setup for antenna 1 and "Bottom" setup for antenna 2 are also applied the SAR test because of an antenna radiated slit is existed on these surface. The SAR test of other SAR test setup including "Top" and "Side (Left)" setup are reduced, because there have enough antenna separation distance and the SAR test exclusion judge was "test can be reduced".
- 3) For BT LE operation, the SAR test was exempted, because the power of BT LE was enough small and the SAR test exclusion judge was "test can be reduced".

By the determined test setup shown above, the SAR test was applied in the following procedures.

| | |
|---------|--|
| Step 1 | (KDB 248227 D01) On 2.4GHz band, worst SAR search by DSSS mode with a highest measurement output power channel. Add SAR test for OFDM mode at the worst SAR condition of DSSS mode, if it is required. |
| Step 2 | (KDB 248227 D01) On 5GHz band, Worst SAR search by largest channel bandwidth mode with a highest measurement output power channel. Add test for another bandwidth mode, if it is required. |
| ~Step 4 | Repeat same test procedure in above for U-NII-2A band (Step 2a), U-NII-2C band (Step 3) and U-NII-3 band (Step 4). Repeat same test procedure for U-NII-1 band (Step 2b), if it is required. |

- *. During SAR test, the radiated power is always monitored by Spectrum Analyzer.

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SECTION 5: Confirmation before testing

5.1 SAR reference power measurement (antenna terminal conducted average power of EUT)

| Mode | Data rate [Mbps] or Index# | Frequency [MHz] CH | Power spec. | | Duty cycle | | Antenna 2 (-divsw "0") power (WLAN or Bluetooth) | | | | Antenna 1 (-divsw "1") power (WLAN or Bluetooth) | | | | | | | | | | | | |
|--------------|----------------------------------|--------------------------|------------------|---------------------------------|----------------------|------------------------|--|-------------------------|------------------------|------------------------|--|-----------------------|-------------------------|------------------------|------------------------|--------------------------|-----------------------|-------|-------|-------|-------|-------|-------|
| | | | Typical [dBm] | Tune-up limit(Max.) [dBm] | Duty cycle [%] | Duty factor [dB] | Scaled factor [-] | Setting power [-] | Burst average [dBm] | Δ from Max. [dB] | Tune-up factor [-] | Time average [dBm] | Setting power [-] | Burst average [dBm] | Δ from Max. [dB] | Tune-up factor [-] | Time average [dBm] | [mW] | | | | | |
| BTLE | PHY1 | 2402 | 0 | 3 | 5 | 64.4 | 1.91 | 1.55 | 3 | 3.44 | 2.21 | -1.56 | 1.43 | 1.53 | 1.42 | 3 | 3.47 | 2.22 | -1.53 | 1.42 | 1.56 | 1.43 | |
| | PHY1 | 2440 | 19 | 3 | 5 | 64.4 | 1.91 | 1.55 | 3 | 3.34 | 2.16 | -1.66 | 1.47 | 1.43 | 1.39 | 3 | 3.37 | 2.17 | -1.63 | 1.46 | 1.46 | 1.40 | |
| | PHY1 | 2480 | 39 | 3 | 5 | 64.4 | 1.91 | 1.55 | 3 | 3.12 | 2.05 | -1.88 | 1.54 | 1.21 | 1.32 | 3 | 3.15 | 2.07 | -1.85 | 1.53 | 1.24 | 1.33 | |
| | PHY2 | 2402 | 0 | 3 | 5 | 34.9 | 4.57 | 2.87 | 3 | 3.36 | 2.17 | -1.64 | 1.46 | 1.21 | 0.76 | 3 | 3.37 | 2.17 | -1.63 | 1.46 | -1.20 | 0.76 | |
| | PHY2 | 2440 | 19 | 3 | 5 | 34.9 | 4.57 | 2.87 | 3 | 3.24 | 2.11 | -1.76 | 1.50 | 1.33 | 0.74 | 3 | 3.26 | 2.12 | -1.74 | 1.49 | -1.31 | 0.74 | |
| BTLE | PHY2 | 2480 | 39 | 3 | 5 | 34.9 | 4.57 | 2.87 | 3 | 3.04 | 2.01 | -1.96 | 1.57 | 1.53 | 0.70 | 3 | 3.03 | 2.01 | -1.97 | 1.57 | -1.54 | 0.70 | |
| | b | 1 | 2412 | 1 | 12 | 14 | 100 | 0.00 | 1.00 | 12 | 11.89 | 15.45 | -2.11 | 1.63 | 11.89 | 15.45 | 13 | 11.94 | 15.63 | -2.06 | 1.61 | 11.94 | 15.63 |
| | b | 1 | 2412 | 1 | 12 | 14 | 100 | 0.00 | 1.00 | 13* | 12.84 | 19.23 | -1.16 | 1.31 | 12.84 | 19.23 | 13 | 12.84 | 19.23 | -1.16 | 1.31 | 12.84 | 19.23 |
| | b | 1 | 2437 | 6 | 12 | 14 | 100 | 0.00 | 1.00 | 12 | 12.09 | 16.18 | -1.91 | 1.55 | 12.09 | 16.18 | 12 | 12.13 | 16.33 | -1.87 | 1.54 | 12.13 | 16.33 |
| | b | 1 | 2462 | 11 | 12 | 14 | 100 | 0.00 | 1.00 | 12 | 12.23 | 16.71 | -1.77 | 1.50 | 12.23 | 16.71 | 12 | 12.26 | 16.83 | -1.74 | 1.49 | 12.26 | 16.83 |
| BTLE | g | 6 | 2412 | 1 | 12 | 14 | 100 | 0.00 | 1.00 | 12 | 11.85 | 15.31 | -2.15 | 1.64 | 11.85 | 15.31 | 13 | 11.89 | 15.45 | -2.11 | 1.63 | 11.89 | 15.45 |
| | g | 6 | 2412 | 1 | 12 | 14 | 100 | 0.00 | 1.00 | 13* | 12.80 | 19.05 | -1.20 | 1.32 | 12.80 | 19.05 | 13 | 12.83 | 19.19 | -1.17 | 1.31 | 12.83 | 19.19 |
| | g | 6 | 2437 | 6 | 12 | 14 | 100 | 0.00 | 1.00 | 12 | 12.03 | 16.03 | -1.95 | 1.57 | 12.05 | 16.03 | 12 | 12.09 | 16.18 | -1.91 | 1.55 | 12.09 | 16.18 |
| | g | 6 | 2462 | 11 | 12 | 14 | 100 | 0.00 | 1.00 | 12 | 12.19 | 16.56 | -1.81 | 1.52 | 12.19 | 16.56 | 12 | 12.22 | 16.67 | -1.78 | 1.51 | 12.22 | 16.67 |
| | n20 | MCS0 | 2412 | 1 | 12 | 14 | 100 | 0.00 | 1.00 | 12 | 12.03 | 15.96 | -1.97 | 1.57 | 12.03 | 15.96 | 12 | 12.09 | 16.18 | -1.91 | 1.55 | 12.09 | 16.18 |
| n20 | MCS0 | 2437 | 6 | 12 | 14 | 100 | 0.00 | 1.00 | 12 | 12.22 | 16.67 | -1.78 | 1.51 | 12.22 | 16.67 | 12 | 12.27 | 16.87 | -1.73 | 1.49 | 12.27 | 16.87 | |
| | MCS0 | 2462 | 11 | 12 | 14 | 100 | 0.00 | 1.00 | 12 | 12.36 | 17.22 | -1.64 | 1.46 | 12.36 | 17.22 | 12 | 12.41 | 17.42 | -1.59 | 1.44 | 12.41 | 17.42 | |
| | n40 | MCS0 | 2422 | 3 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.05 | 12.74 | -1.95 | 1.57 | 11.05 | 12.74 | 11 | 11.05 | 12.74 | -1.95 | 1.57 | 11.05 | 12.74 |
| | n40 | MCS0 | 2437 | 6 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.16 | 13.06 | -1.84 | 1.53 | 11.16 | 13.06 | 11 | 11.14 | 13.00 | -1.86 | 1.53 | 11.14 | 13.00 |
| | n40 | MCS0 | 2452 | 9 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.24 | 13.30 | -1.76 | 1.50 | 11.24 | 13.30 | 11 | 11.25 | 13.34 | -1.75 | 1.50 | 11.25 | 13.34 |
| n20 (20HT) | a | 6 | 5180 | 36 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 11.90 | 15.49 | -1.10 | 1.29 | 11.90 | 15.49 | 12 | 11.98 | 15.78 | -1.02 | 1.26 | 11.98 | 15.78 |
| | a | 6 | 5200 | 40 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 11.88 | 15.42 | -1.12 | 1.29 | 11.88 | 15.42 | 12 | 11.99 | 15.81 | -1.01 | 1.26 | 11.99 | 15.81 |
| | a | 6 | 5220 | 44 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 11.99 | 15.81 | -1.01 | 1.26 | 11.99 | 15.81 | 12 | 12.07 | 16.11 | -0.93 | 1.24 | 12.07 | 16.11 |
| | a | 6 | 5240 | 48 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 11.88 | 15.42 | -1.12 | 1.29 | 11.88 | 15.42 | 12 | 11.96 | 15.70 | -1.04 | 1.27 | 11.96 | 15.70 |
| | a | 6 | 5260 | 52 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 11.79 | 15.10 | -1.21 | 1.32 | 11.79 | 15.10 | 12 | 11.88 | 15.42 | -1.12 | 1.29 | 11.88 | 15.42 |
| | a | 6 | 5280 | 56 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 11.63 | 14.55 | -1.37 | 1.37 | 11.63 | 14.55 | 12 | 11.72 | 14.86 | -1.28 | 1.34 | 11.72 | 14.86 |
| | a | 6 | 5300 | 60 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 11.97 | 15.74 | -1.03 | 1.27 | 11.97 | 15.74 | 12 | 12.03 | 15.96 | -0.97 | 1.25 | 12.03 | 15.96 |
| | a | 6 | 5320 | 64 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 11.80 | 15.14 | -1.20 | 1.32 | 11.80 | 15.14 | 12 | 11.86 | 15.35 | -1.14 | 1.30 | 11.86 | 15.35 |
| | a | 6 | 5500 | 100 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.08 | 12.82 | -1.92 | 1.56 | 11.08 | 12.82 | 11 | 11.03 | 12.68 | -1.97 | 1.57 | 11.03 | 12.68 |
| | a | 6 | 5580 | 116 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.13 | 12.97 | -1.87 | 1.54 | 11.13 | 12.97 | 11 | 11.08 | 12.82 | -1.92 | 1.56 | 11.08 | 12.82 |
| n20 (20VHT) | MCS0 | 5180 | 36 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.08 | 16.14 | -0.92 | 1.24 | 12.08 | 16.14 | 12 | 12.17 | 16.48 | -0.83 | 1.21 | 12.17 | 16.48 | |
| | MCS0 | 5200 | 40 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.08 | 16.14 | -0.92 | 1.24 | 12.08 | 16.14 | 12 | 12.18 | 16.52 | -0.82 | 1.21 | 12.18 | 16.52 | |
| | MCS0 | 5220 | 44 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.17 | 16.48 | -0.83 | 1.21 | 12.17 | 16.48 | 12 | 12.26 | 16.83 | -0.74 | 1.19 | 12.26 | 16.83 | |
| | MCS0 | 5240 | 48 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.06 | 16.07 | -0.94 | 1.24 | 12.06 | 16.07 | 12 | 12.13 | 16.33 | -0.87 | 1.22 | 12.13 | 16.33 | |
| | MCS0 | 5260 | 52 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 11.96 | 15.70 | -1.04 | 1.27 | 11.96 | 15.70 | 12 | 12.05 | 16.03 | -0.95 | 1.24 | 12.05 | 16.03 | |
| | MCS0 | 5280 | 56 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 11.80 | 15.14 | -1.20 | 1.32 | 11.80 | 15.14 | 12 | 11.89 | 15.45 | -1.11 | 1.29 | 11.89 | 15.45 | |
| | MCS0 | 5300 | 60 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.15 | 16.41 | -0.85 | 1.22 | 12.15 | 16.41 | 12 | 12.20 | 16.60 | -0.80 | 1.20 | 12.20 | 16.60 | |
| | MCS0 | 5320 | 64 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 11.97 | 15.74 | -1.03 | 1.27 | 11.97 | 15.74 | 12 | 12.03 | 15.96 | -0.97 | 1.25 | 12.03 | 15.96 | |
| | MCS0 | 5500 | 100 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.25 | 13.34 | -1.75 | 1.50 | 11.25 | 13.34 | 11 | 11.20 | 13.18 | -1.80 | 1.51 | 11.20 | 13.18 | |
| | MCS0 | 5580 | 116 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.31 | 13.52 | -1.69 | 1.48 | 11.31 | 13.52 | 11 | 11.26 | 13.37 | -1.74 | 1.49 | 11.26 | 13.37 | |
| ac20 (20VHT) | MCS0 | 5700 | 140 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.31 | 13.52 | -1.69 | 1.48 | 11.31 | 13.52 | 11 | 11.23 | 13.27 | -1.77 | 1.50 | 11.23 | 13.27 | |
| | MCS0 | 5745 | 149 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.35 | 13.65 | -1.65 | 1.46 | 11.35 | 13.65 | 11 | 11.29 | 13.46 | -1.71 | 1.48 | 11.29 | 13.46 | |
| | MCS0 | 5785 | 157 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.49 | 14.09 | -1.51 | 1.42 | 11.49 | 14.09 | 11 | 11.41 | 13.84 | -1.59 | 1.44 | 11.41 | 13.84 | |
| | MCS0 | 5825 | 165 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.68 | 14.72 | -1.32 | 1.36 | 11.68 | 14.72 | 11 | 11.56 | 14.32 | -1.44 | 1.39 | 11.56 | 14.32 | |
| | MCS0 | 5180 | 36 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.08 | 16.14 | -0.92 | 1.24 | 12.08 | 16.14 | 12 | 12.16 | 16.44 | -0.84 | 1.21 | 12.16 | 16.44 | |
| | MCS0 | 5200 | 40 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.08 | 16.14 | -0.92 | 1.24 | 12.08 | 16.14 | 12 | 12.17 | 16.48 | -0.83 | 1.21 | 12.17 | 16.48 | |
| | MCS0 | 5220 | 44 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.18 | 16.52 | -0.82 | 1.21 | 12.18 | 16.52 | 12 | 12.25 | 16.79 | -0.75 | 1.19 | 12.25 | 16.79 | |
| | MCS0 | 5240 | 48 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.06 | 16.07 | -0.94 | 1.24 | 12.06 | 16.07 | 12 | 12.13 | 16.33 | -0.87 | 1.22 | 12.13 | | |

(cont'd)

| Mode | Data rate [Mbps] or Index# | Frequency [MHz] | Power spec. | | Duty cycle | | | Antenna 2 (-divsw "0") power (WLAN or Bluetooth) | | | | | | Antenna 1 (-divsw "1") power (WLAN or Bluetooth) | | | | | | | | |
|-----------------|----------------------------------|--------------------|------------------|----------------------------------|----------------------|------------------------|-------------------------|--|------------------------|------------------------|--------------------------|-----------------------|-------------------------|--|------------------------|--------------------------|-----------------------|----------------------|-------|------|-------|-------|
| | | | Typical [dBm] | Tune-up limit (Max.) [dBm] | Duty cycle [%] | Duty factor [dB] | Scaled factor [-] | Setting power [-] | Burst average [dBm] | Δ from Max. [dB] | Tune-up factor [-] | Time average [dBm] | Setting power [-] | Burst average [dBm] | Δ from Max. [dB] | Tune-up factor [-] | Time average [dBm] | Time average [mW] | | | | |
| | | | CH | | | | | | | | | | | | | | | | | | | |
| n40 (40HT) | MCS0 | 5190 | 38 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.05 | 16.03 | -0.95 | 1.24 | 12.05 | 16.03 | 12 | 12.13 | 16.33 | -0.87 | 1.22 | 12.13 | 16.33 |
| | MCS0 | 5230 | 46 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.12 | 16.29 | -0.88 | 1.22 | 12.12 | 16.29 | 12 | 12.18 | 16.52 | -0.82 | 1.21 | 12.18 | 16.52 |
| | MCS0 | 5270 | 54 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 11.89 | 15.45 | -1.11 | 1.29 | 11.89 | 15.45 | 12 | 11.96 | 15.70 | -1.04 | 1.27 | 11.96 | 15.70 |
| | MCS0 | 5310 | 62 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.06 | 16.07 | -0.94 | 1.24 | 12.06 | 16.07 | 12 | 12.11 | 16.26 | -0.89 | 1.23 | 12.11 | 16.26 |
| | MCS0 | 5510 | 102 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.25 | 13.34 | -1.75 | 1.50 | 11.25 | 13.34 | 11 | 11.19 | 13.15 | -1.81 | 1.52 | 11.19 | 13.15 |
| | MCS0 | 5550 | 110 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.28 | 13.43 | -1.72 | 1.49 | 11.28 | 13.43 | 11 | 11.23 | 13.27 | -1.77 | 1.50 | 11.23 | 13.27 |
| | MCS0 | 5670 | 134 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.34 | 13.61 | -1.66 | 1.47 | 11.34 | 13.61 | 11 | 11.23 | 13.27 | -1.77 | 1.50 | 11.23 | 13.27 |
| | MCS0 | 5755 | 151 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.38 | 13.74 | -1.62 | 1.45 | 11.38 | 13.74 | 11 | 11.31 | 13.52 | -1.69 | 1.48 | 11.31 | 13.52 |
| ac40 (40VHT) | MCS0 | 5795 | 159 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.54 | 14.26 | -1.46 | 1.40 | 11.54 | 14.26 | 11 | 11.45 | 13.96 | -1.55 | 1.43 | 11.45 | 13.96 |
| | MCS0 | 5190 | 38 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.04 | 16.00 | -0.96 | 1.25 | 12.04 | 16.00 | 12 | 12.12 | 16.29 | -0.88 | 1.22 | 12.12 | 16.29 |
| | MCS0 | 5230 | 46 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.11 | 16.26 | -0.89 | 1.23 | 12.11 | 16.26 | 12 | 12.18 | 16.52 | -0.82 | 1.21 | 12.18 | 16.52 |
| | MCS0 | 5270 | 54 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 11.88 | 15.42 | -1.12 | 1.29 | 11.88 | 15.42 | 12 | 11.96 | 15.70 | -1.04 | 1.27 | 11.96 | 15.70 |
| | MCS0 | 5310 | 62 | 11 | 13 | 100 | 0.00 | 1.00 | 12 | 12.06 | 16.07 | -0.94 | 1.24 | 12.06 | 16.07 | 12 | 12.11 | 16.26 | -0.89 | 1.23 | 12.11 | 16.26 |
| | MCS0 | 5510 | 102 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.25 | 13.34 | -1.75 | 1.50 | 11.25 | 13.34 | 11 | 11.18 | 13.12 | -1.82 | 1.52 | 11.18 | 13.12 |
| | MCS0 | 5550 | 110 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.28 | 13.43 | -1.72 | 1.49 | 11.28 | 13.43 | 11 | 11.24 | 13.30 | -1.76 | 1.50 | 11.24 | 13.30 |
| | MCS0 | 5670 | 134 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.34 | 13.61 | -1.66 | 1.47 | 11.34 | 13.61 | 11 | 11.23 | 13.27 | -1.77 | 1.50 | 11.23 | 13.27 |
| ac80 (80VHT) | MCS0 | 5795 | 159 | 11 | 13 | 100 | 0.00 | 1.00 | 11 | 11.54 | 14.26 | -1.46 | 1.40 | 11.54 | 14.26 | 11 | 11.90 | 15.49 | -1.10 | 1.29 | 11.90 | 15.49 |
| | MCS0 | 5210 | 42 | 8.5 | 10.5 | 100 | 0.00 | 1.00 | 9 | 9.49 | 8.89 | -1.01 | 1.26 | 9.49 | 8.89 | 9 | 9.56 | 9.04 | -0.94 | 1.24 | 9.56 | 9.04 |
| | MCS0 | 5290 | 58 | 8.5 | 10.5 | 100 | 0.00 | 1.00 | 9 | 9.25 | 8.41 | -1.25 | 1.33 | 9.25 | 8.41 | 9 | 9.31 | 8.53 | -1.19 | 1.32 | 9.31 | 8.53 |
| | MCS0 | 5530 | 106 | 8.5 | 10.5 | 100 | 0.00 | 1.00 | 8 | 8.77 | 7.53 | -1.73 | 1.49 | 8.77 | 7.53 | 8 | 8.72 | 7.45 | -1.78 | 1.51 | 8.72 | 7.45 |

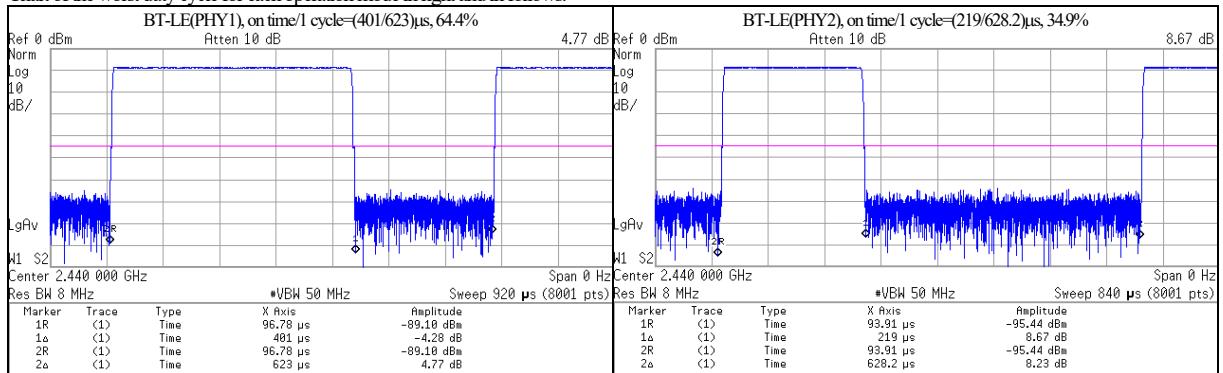
- *. The SAR test powers by setting power were not more than 2dB lower than maximum tune-up power (KDB 447498 D01 (v06) requirement).
- *. CH: Channel; Max: Maximum; n/a: not applied; (mode) BT-LE: Bluetooth Low Energy; b: IEEE 802.11b, g: IEEE 802.11g, a: IEEE 802.11a, n20: IEEE 802.11n(20HT), n40: IEEE 802.11n(40HT), ac20: IEEE 802.11ac(20VHT), ac40: IEEE 802.11n(40VHT), ac80: IEEE 802.11ac(80VHT).

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

*. Date measured: September 29, 2021 / Measured by: H. Naka / Place: Preparation room of No. 7 shield room. (25 deg.C/ 50 %RH)

*. Uncertainty of antenna port conducted test (Average power): 1.3 dB / Uncertainty of Duty cycle and time measurement: 0.27 %

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



SECTION 6: SAR Measurement results

6.1 SAR test reduction consideration

(KDB 447498 D01, General RF Exposure Guidance) Testing of other required channels within the operating mode of a frequency band is not required when the reported 1g or 10g SAR for the mid-band or highest output power channel is:

- (1) $\leq 0.8 \text{ W/kg}$ or 2.0 W/kg , for 1g or 10g respectively, when the transmission band is $\leq 100 \text{ MHz}$
- (2) $\leq 0.6 \text{ W/kg}$ or 1.5 W/kg , for 1g or 10g respectively, when the transmission band is between 100 MHz and 200 MHz
- (3) $\leq 0.4 \text{ W/kg}$ or 1.0 W/kg , for 1g or 10g respectively, when the transmission band is $\geq 200 \text{ MHz}$

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. The scaling factor for the duty factor is defined as $(100\% / (\text{transmission duty cycle} (\%)))$.

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. The scaling factor for the tune-up power is defined as $"(\text{maximum tune-up limit (mW}) / (\text{measured conducted power (mW}))"$.

*. The reported SAR (scaled SAR) would be calculated by $"(\text{measured SAR}) \times (\text{duty cycle scaling factor}) \times (\text{tune-up power scaling factor})"$.

(KDB 248227 D01, SAR Guidance for WLAN Transmitters)

When the reported SAR of the initial test configuration is $> 0.8 \text{ W/kg}$, SAR measurement is required for subsequent next highest measured output power channel(s) in the initial test configuration until reported SAR is $\leq 1.2 \text{ W/kg}$ or all required channels are tested.

For 2.4GHz band, the highest measured maximum output power channel of DSSS was selected for SAR measurement. When the reported SAR is $\leq 0.8 \text{ W/kg}$, 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 $> 1.2 \text{ W/kg}$, 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 $\leq 1.2 \text{ W/kg}$.

For 5GHz band, the initial test configuration was selected accordance to the transmission mode with the highest maximum output power. When the reported SAR is $> 0.8 \text{ W/kg}$, SAR is required for the subsequent highest measured output power channel until the reported SRA result is $\leq 1.2 \text{ W/kg}$ 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 $\leq 1.2 \text{ W/kg}$.

6.2 Tissue simulating liquid measurement

6.2.1 Target of tissue simulating liquid

Nominal dielectric values of the tissue simulating liquids in the phantom are listed in the following table. (Appendix A, KDB 865664 v01r04)

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

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

6.2.2 Liquid measurement (Liquid verification)

| Frequency [MHz] | Liquid type | Liquid Temp. [deg.C.] | Liquid depth of phantom [mm] | Liquid parameters (*a) | | | | | | | | ΔSAR Coefficients (*b) | | | Date measured | | | |
|--------------------|----------------|-----------------------------|---------------------------------------|-----------------------------------|----------|---------------------------|-------------------------------------|-----------------------------|-----------------|----------|-----------------------|------------------------|-------------------------------------|---------------------------------|---------------|-----|-----|---------------|
| | | | | Permittivity (ϵ_r) [-] | | | | Conductivity [S/m] | | | | ΔSAR | | Correction required? (*c) | | | | |
| | | | | Target value | Measured | | | Δend, >48hrs [%] (*1) | Target value | Measured | | | Δend, >48hrs [%] (*1) | (1g) [%] | (10g) [%] | | | |
| | | | | | Value | $\Delta\epsilon_r$ [%] | Interpo- lated | | | Value | $\Delta\sigma$ [%] | Interpo- lated | | | | | | |
| 5190 | Head | 22.5 | 150 | 36.00 | 35.15 | -2.4 | <input type="checkbox"/> | 10 | begin | 4.645 | 4.430 | -4.6 | <input type="checkbox"/> | 10 | begin | 0.6 | 0.8 | not required. |
| 5230 | | | | 35.95 | 35.13 | -2.3 | <input type="checkbox"/> | 10 | begin | 4.686 | 4.476 | -4.5 | <input type="checkbox"/> | 10 | begin | 0.6 | 0.8 | not required. |
| 5270 | | | | 35.91 | 35.04 | -2.4 | <input type="checkbox"/> | 10 | begin | 4.727 | 4.518 | -4.4 | <input type="checkbox"/> | 10 | begin | 0.6 | 0.8 | not required. |
| 5310 | | | | 35.86 | 34.94 | -2.6 | <input type="checkbox"/> | 10 | begin | 4.768 | 4.561 | -4.3 | <input type="checkbox"/> | 10 | begin | 0.7 | 0.9 | not required. |
| 5510 | Head | 22.5 | 150 | 35.63 | 34.63 | -2.8 | <input type="checkbox"/> | 10 | begin | 4.973 | 4.771 | -4.1 | <input type="checkbox"/> | 10 | begin | 0.7 | 0.9 | not required. |
| 5550 | | | | 35.59 | 34.58 | -2.8 | <input type="checkbox"/> | 10 | begin | 5.014 | 4.825 | -3.8 | <input type="checkbox"/> | 10 | begin | 0.7 | 0.9 | not required. |
| 5670 | | | | 35.45 | 34.40 | -3.0 | <input type="checkbox"/> | 10 | begin | 5.137 | 4.961 | -3.4 | <input type="checkbox"/> | 10 | begin | 0.7 | 0.9 | not required. |
| 5755 | | | | 35.35 | 34.25 | -3.1 | <input checked="" type="checkbox"/> | 10 | begin | 5.224 | 5.048 | -3.4 | <input checked="" type="checkbox"/> | 10 | begin | 0.8 | 0.9 | not required. |
| 5795 | | | | 35.31 | 34.18 | -3.2 | <input checked="" type="checkbox"/> | 10 | begin | 5.265 | 5.101 | -3.1 | <input checked="" type="checkbox"/> | 10 | begin | 0.8 | 0.9 | not required. |
| 2412 | Head | 22.5 | 150 | 39.27 | 39.63 | 0.9 | <input checked="" type="checkbox"/> | 10 | begin | 1.766 | 1.813 | 2.7 | <input checked="" type="checkbox"/> | 10 | begin | 1.1 | 0.6 | not required. |
| 2437 | | | | 39.22 | 39.58 | 0.9 | <input checked="" type="checkbox"/> | 10 | begin | 1.788 | 1.831 | 2.5 | <input checked="" type="checkbox"/> | 10 | begin | 1.0 | 0.5 | not required. |
| 2462 | | | | 39.18 | 39.55 | 1.0 | <input checked="" type="checkbox"/> | 10 | begin | 1.813 | 1.850 | 2.0 | <input checked="" type="checkbox"/> | 10 | begin | 0.8 | 0.4 | not required. |
| 5190 | Head | 22.5 | 150 | 36.00 | 35.14 | -2.4 | <input type="checkbox"/> | 10 | <48hrs | 4.645 | 4.425 | -4.7 | <input type="checkbox"/> | 10 | begin | 0.6 | 0.9 | not required. |
| 5230 | | | | 35.95 | 35.06 | -2.5 | <input type="checkbox"/> | 10 | <48hrs | 4.686 | 4.476 | -4.5 | <input type="checkbox"/> | 10 | begin | 0.6 | 0.9 | not required. |
| 5270 | | | | 35.91 | 34.99 | -2.6 | <input type="checkbox"/> | 10 | <48hrs | 4.727 | 4.513 | -4.5 | <input type="checkbox"/> | 10 | begin | 0.7 | 0.9 | not required. |
| 5310 | | | | 35.86 | 34.92 | -2.6 | <input type="checkbox"/> | 10 | <48hrs | 4.768 | 4.548 | -4.6 | <input type="checkbox"/> | 10 | begin | 0.7 | 0.9 | not required. |
| 5510 | Head | 22.5 | 150 | 35.63 | 34.56 | -3.0 | <input type="checkbox"/> | 10 | begin | 4.973 | 4.770 | -4.1 | <input type="checkbox"/> | 10 | begin | 0.8 | 1.0 | not required. |
| 5550 | | | | 35.59 | 34.46 | -3.2 | <input type="checkbox"/> | 10 | begin | 5.014 | 4.827 | -3.7 | <input type="checkbox"/> | 10 | begin | 0.8 | 1.0 | not required. |
| 5670 | | | | 35.45 | 34.26 | -3.3 | <input type="checkbox"/> | 10 | begin | 5.137 | 4.967 | -3.3 | <input type="checkbox"/> | 10 | begin | 0.8 | 1.0 | not required. |
| 5755 | | | | 35.35 | 34.19 | -3.3 | <input checked="" type="checkbox"/> | 10 | begin | 5.224 | 5.061 | -3.1 | <input checked="" type="checkbox"/> | 10 | begin | 0.8 | 0.9 | not required. |
| 5795 | | | | 35.31 | 34.14 | -3.3 | <input checked="" type="checkbox"/> | 10 | begin | 5.265 | 5.120 | -2.7 | <input checked="" type="checkbox"/> | 10 | begin | 0.8 | 0.9 | not required. |

*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: “ $\Delta\text{end}(>48 \text{ hrs}) (\%)$ ” = $\{(\text{dielectric properties, end of test series}) / (\text{dielectric properties, beginning of test series}) - 1 \} \times 100$

*a. The target values of (2000, 2450, 3000, 5800) MHz are parameters defined in Appendix A of KDB 865664 D01. 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: $\Delta\text{SAR}(1g) = C_{\epsilon} \times \Delta\epsilon_r + C_{\sigma} \times \Delta\sigma$, $C_{\epsilon} = 7.854E-4 \times f^3 + 9.402E-3 \times f^2 - 2.742E-2 \times f - 0.2026$ / $C_{\sigma} = 9.804E-3 \times f^3 - 8.661E-2 \times f^2 + 2.981E-2 \times f + 0.7829$

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

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

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

*. 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 | 7.35 | $\pm 12.0\%$ |
| Head | (5190, 5230, 5270, 5310) MHz | 5250 MHz | within ± 110 MHz of calibration frequency | 5.14 | $\pm 13.1\%$ |
| Head | (5510, 5550, 5670) MHz | 5600 MHz | within ± 110 MHz of calibration frequency | 4.56 | $\pm 13.1\%$ |
| Head | (5755, 5795) MHz | 5800 MHz | within ± 110 MHz of calibration frequency | 4.60 | $\pm 13.1\%$ |

6.3 SAR results

| ANT # | Test position | Gap [mm] | Source power: Battery ID | 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] | Setup photo # in Appx. 2-2 | SAR plot # in Appx. 1-3 | Remarks |
|---|----------------|----------|--------------------------|------------|-------|-----|-------------------------|--------------------|--------------------------|----------------|------------------|---------------------|----------|--|----------------|-------------|-----|----------|------------------|----------------------------|-------------------------|---------|
| | | | | Mode (D/R) | [MHz] | CH | Duty [%] | Duty scaled factor | Max. tune up limit [dBm] | Measured [dBm] | Power conducted | Power scaled factor | Measured | ASAR [%] | ΔSAR corrected | Scaled (*b) | | | | | | |
| 1) 2.4GHz Band (*1) | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Back | 0 | Battery 2 | b (1Mbps)* | 2412* | 1 | 100 | 1.00 | 14 | 12.84 | 1.31 | 0.293 | Positive | n/a (*a) | 0.384 | 10g | 4 | 1a-1 | P1 | Wide area scan | | |
| 2 | Back | 0 | Battery 1 | b (1Mbps)* | 2462 | 11 | 100 | 1.00 | 14 | 12.23 | 1.50 | 0.194 | Positive | n/a (*a) | 0.291 | 10g | 4 | - | P1 | - | | |
| 2 | Back | 0 | Battery 1 | b (1Mbps)* | 2437 | 6 | 100 | 1.00 | 14 | 12.09 | 1.55 | 0.209 | Positive | n/a (*a) | 0.324 | 10g | 4 | - | P1 | - | | |
| 1 | Back | 0 | Battery 2 | b (1Mbps)* | 2412* | 1 | 100 | 1.00 | 14 | 12.84 | 1.31 | 0.144 | Positive | n/a (*a) | 0.189 | 10g | 4 | - | P1 | Wide area scan | | |
| 1 | Back | 0 | Battery 2 | b (1Mbps)* | 2462 | 11 | 100 | 1.00 | 14 | 12.26 | 1.49 | 0.148 | Positive | n/a (*a) | 0.221 | 10g | 4 | 1a-2 | P1 | - | | |
| 1 | Back | 0 | Battery 2 | b (1Mbps)* | 2437 | 6 | 100 | 1.00 | 14 | 12.13 | 1.54 | 0.131 | Positive | n/a (*a) | 0.202 | 10g | 4 | - | P1 | - | | |
| 2 | Front | 0 | Battery 2 | b (1Mbps)* | 2412* | 1 | 100 | 1.00 | 14 | 12.84 | 1.31 | 0.0437 | Positive | n/a (*a) | 0.006 | 1g | 1.6 | - | P2 | Wide area scan | | |
| 1 | Front | 0 | Battery 2 | b (1Mbps)* | 2412* | 1 | 100 | 1.00 | 14 | 12.84 | 1.31 | 0.034 | Positive | n/a (*a) | 0.045 | 1g | 1.6 | - | P2 | Wide area scan | | |
| 2 | Bottom (ant.2) | 0 | Battery 1 | b (1Mbps)* | 2412* | 1 | 100 | 1.00 | 14 | 12.84 | 1.31 | 0.012 | Positive | n/a (*a) | 0.016 | 1g | 1.6 | - | P3 | Wide area scan | | |
| 2 | Bottom (ant.2) | 0 | Battery 1 | b (1Mbps)* | 2462 | 11 | 100 | 1.00 | 14 | 12.23 | 1.50 | 0.011 | Positive | n/a (*a) | 0.0165 | 1g | 1.6 | - | P3 | - | | |
| 2 | Bottom (ant.2) | 0 | Battery 1 | b (1Mbps)* | 2437 | 6 | 100 | 1.00 | 14 | 12.09 | 1.55 | 0.011 | Positive | n/a (*a) | 0.0171 | 1g | 1.6 | 1b-2 | P3 | - | | |
| 1 | Side (ant.1) | 0 | Battery 1 | b (1Mbps)* | 2412* | 1 | 100 | 1.00 | 14 | 12.84 | 1.31 | 0.150 | Positive | n/a (*a) | 0.197 | 1g | 1.6 | - | P4 | Wide area scan | | |
| 1 | Side (ant.1) | 0 | Battery 1 | b (1Mbps)* | 2462 | 11 | 100 | 1.00 | 14 | 12.26 | 1.49 | 0.125 | Positive | n/a (*a) | 0.186 | 1g | 1.6 | - | P4 | - | | |
| 1 | Side (ant.1) | 0 | Battery 1 | b (1Mbps)* | 2437 | 6 | 100 | 1.00 | 14 | 12.13 | 1.54 | 0.143 | Positive | n/a (*a) | 0.220 | 1g | 1.6 | 1b-1 | P4 | - | | |
| 2) U-NII-2A (5.3GHz) (and U-NII-1 (5.2GHz) Band) | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Back | 0 | Battery 2 | n40(MCS0)* | 5310* | 62 | 100 | 1.00 | 13 | 12.06 | 1.24 | 0.267 | Positive | n/a (*a) | 0.331 | 10g | 4 | - | P1 | Wide area scan | | |
| 2 | Back | 0 | Battery 1 | n40(MCS0)* | 5270 | 54 | 100 | 1.00 | 13 | 11.89 | 1.29 | 0.286 | Positive | n/a (*a) | 0.369 | 10g | 4 | 2a-2 | P1 | - | | |
| 1 | Back | 0 | Battery 2 | n40(MCS0)* | 5310* | 62 | 100 | 1.00 | 13 | 12.11 | 1.23 | 0.314 | Positive | n/a (*a) | 0.386 | 10g | 4 | - | P1 | Wide area scan | | |
| 1 | Back | 0 | Battery 2 | n40(MCS0)* | 5270 | 54 | 100 | 1.00 | 13 | 11.96 | 1.27 | 0.325 | Positive | n/a (*a) | 0.413 | 10g | 4 | 2a-1 | P1 | - | | |
| 2 | Front | 0 | Battery 1 | n40(MCS0)* | 5310* | 62 | 100 | 1.00 | 13 | 12.06 | 1.24 | 0.00538 | Positive | n/a (*a) | 0.007 | 1g | 1.6 | - | P2 | Wide area scan | | |
| 1 | Front | 0 | Battery 1 | n40(MCS0)* | 5310* | 62 | 100 | 1.00 | 13 | 12.11 | 1.23 | 0.031 | Positive | n/a (*a) | 0.038 | 1g | 1.6 | - | P2 | Wide area scan | | |
| 2 | Bottom (ant.2) | 0 | Battery 1 | n40(MCS0)* | 5310* | 62 | 100 | 1.00 | 13 | 12.06 | 1.24 | 0.035 | Positive | n/a (*a) | 0.043 | 1g | 1.6 | 2b-2 | P3 | Wide area scan | | |
| 1 | Side (ant.1) | 0 | Battery 2 | n40(MCS0)* | 5310* | 62 | 100 | 1.00 | 13 | 12.11 | 1.23 | 0.294 | Positive | n/a (*a) | 0.362 | 1g | 1.6 | - | P4 | Wide area scan | | |
| 1 | Side (ant.1) | 0 | Battery 2 | n40(MCS0)* | 5270 | 54 | 100 | 1.00 | 13 | 11.96 | 1.27 | 0.293 | Positive | n/a (*a) | 0.372 | 1g | 1.6 | 2b-1 | P4 | - | | |
| 2 | Back | 0 | Battery 1 | n40(MCS0)* | 5230* | 46 | 100 | 1.00 | 13 | 12.12 | 1.22 | 0.301 | Positive | n/a (*a) | 0.367 | 10g | 4 | - | P1 | - | | |
| 2 | Back | 0 | Battery 1 | n40(MCS0)* | 5190 | 38 | 100 | 1.00 | 13 | 12.05 | 1.24 | 0.360 | Positive | n/a (*a) | 0.446 | 10g | 4 | 2c-2 | P1 | - | | |
| 1 | Back | 0 | Battery 2 | n40(MCS0)* | 5230* | 46 | 100 | 1.00 | 13 | 12.18 | 1.21 | 0.329 | Positive | n/a (*a) | 0.398 | 10g | 4 | - | P1 | - | | |
| 1 | Back | 0 | Battery 2 | n40(MCS0)* | 5190 | 38 | 100 | 1.00 | 13 | 12.13 | 1.22 | 0.381 | Positive | n/a (*a) | 0.465 | 10g | 4 | 2c-1 | P1 | - | | |
| 2 | Bottom (ant.2) | 0 | Battery 1 | n40(MCS0)* | 5230* | 46 | 100 | 1.00 | 13 | 12.12 | 1.22 | 0.018 | Positive | n/a (*a) | 0.022 | 1g | 1.6 | 2d-2 | P3 | - | | |
| 1 | Side (ant.1) | 0 | Battery 2 | n40(MCS0)* | 5230* | 46 | 100 | 1.00 | 13 | 12.18 | 1.21 | 0.318 | Positive | n/a (*a) | 0.385 | 1g | 1.6 | - | P4 | - | | |
| 1 | Side (ant.1) | 0 | Battery 2 | n40(MCS0)* | 5190 | 38 | 100 | 1.00 | 13 | 12.13 | 1.22 | 0.320 | Positive | n/a (*a) | 0.390 | 1g | 1.6 | 2d-1 | P4 | - | | |
| 3) U-NII-2C (5.6GHz) Band | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Back | 0 | Battery 1 | n40(MCS0)* | 5670* | 134 | 100 | 1.00 | 13 | 11.34 | 1.47 | 0.228 | Positive | n/a (*a) | 0.335 | 10g | 4 | - | P1 | - | | |
| 2 | Back | 0 | Battery 1 | n40(MCS0)* | 5550 | 110 | 100 | 1.00 | 13 | 11.28 | 1.49 | 0.237 | Positive | n/a (*a) | 0.353 | 10g | 4 | 3a-2 | P1 | - | | |
| 2 | Back | 0 | Battery 1 | n40(MCS0)* | 5510 | 102 | 100 | 1.00 | 13 | 11.25 | 1.50 | 0.226 | Positive | n/a (*a) | 0.339 | 10g | 4 | - | P1 | - | | |
| 1 | Back | 0 | Battery 1 | n40(MCS0)* | 5670* | 134 | 100 | 1.00 | 13 | 11.23 | 1.50 | 0.274 | Positive | n/a (*a) | 0.411 | 10g | 4 | - | P1 | - | | |
| 1 | Back | 0 | Battery 1 | n40(MCS0)* | 5550 | 110 | 100 | 1.00 | 13 | 11.23 | 1.50 | 0.278 | Positive | n/a (*a) | 0.417 | 10g | 4 | - | P1 | - | | |
| 1 | Back | 0 | Battery 1 | n40(MCS0)* | 5510 | 102 | 100 | 1.00 | 13 | 11.19 | 1.52 | 0.293 | Positive | n/a (*a) | 0.445 | 10g | 4 | 3a-1 | P1 | - | | |
| 2 | Front | 0 | Battery 1 | n40(MCS0)* | 5670* | 134 | 100 | 1.00 | 13 | 11.34 | 1.47 | 0.0086 | Positive | n/a (*a) | 0.013 | 1g | 1.6 | - | P2 | - | | |
| 1 | Front | 0 | Battery 1 | n40(MCS0)* | 5670* | 134 | 100 | 1.00 | 13 | 11.23 | 1.50 | 0.019 | Positive | n/a (*a) | 0.029 | 1g | 1.6 | - | P2 | - | | |
| 2 | Bottom (ant.2) | 0 | Battery 1 | n40(MCS0)* | 5670* | 134 | 100 | 1.00 | 13 | 11.34 | 1.47 | 0.039 | Positive | n/a (*a) | 0.057 | 1g | 1.6 | 3b-2 | P3 | - | | |
| 1 | Side (ant.1) | 0 | Battery 2 | n40(MCS0)* | 5670* | 134 | 100 | 1.00 | 13 | 11.23 | 1.50 | 0.198 | Positive | n/a (*a) | 0.297 | 1g | 1.6 | - | P4 | - | | |
| 1 | Side (ant.1) | 0 | Battery 2 | n40(MCS0)* | 5550 | 110 | 100 | 1.00 | 13 | 11.23 | 1.50 | 0.281 | Positive | n/a (*a) | 0.422 | 1g | 1.6 | - | P4 | - | | |
| 1 | Side (ant.1) | 0 | Battery 2 | n40(MCS0)* | 5510 | 102 | 100 | 1.00 | 13 | 11.19 | 1.52 | 0.326 | Positive | n/a (*a) | 0.496 | 1g | 1.6 | 3b-1 | P4 | - | | |
| 4) U-NII-3 (5.8GHz) Band | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Back | 0 | Battery 1 | n40(MCS0)* | 5795* | 159 | 100 | 1.00 | 13 | 11.54 | 1.40 | 0.188 | Positive | n/a (*a) | 0.263 | 10g | 4 | 4a-2 | P1 | - | | |
| 2 | Back | 0 | Battery 2 | n40(MCS0)* | 5755 | 151 | 100 | 1.00 | 13 | 11.38 | 1.45 | 0.173 | Positive | n/a (*a) | 0.251 | 10g | 4 | - | P1 | - | | |
| 1 | Back | 0 | Battery 1 | n40(MCS0)* | 5795* | 159 | 100 | 1.00 | 13 | 11.45 | 1.43 | 0.265 | Positive | n/a (*a) | 0.379 | 10g | 4 | 4a-1 | P1 | - | | |
| 1 | Back | 0 | Battery 1 | n40(MCS0)* | 5755 | 151 | 100 | 1.00 | 13 | 11.31 | 1.48 | 0.228 | Positive | n/a (*a) | 0.337 | 10g | 4 | - | P1 | - | | |
| 2 | Front | 0 | Battery 1 | n40(MCS0)* | 5795 | 159 | 100 | 1.00 | 13 | 11.54 | 1.40 | 0.00857 | Positive | n/a (*a) | 0.012 | 1g | 1.6 | - | P2 | - | | |
| 1 | Front | 0 | Battery 1 | n40(MCS0)* | 5795* | 159 | 100 | 1.00 | 13 | 11.45 | 1.43 | 0.021 | Positive | n/a (*a) | 0.030 | 1g | 1.6 | - | P2 | - | | |
| 2 | Bottom (ant.2) | 0 | Battery 1 | n40(MCS0)* | 5795* | 159 | 100 | 1.00 | 13 | 11.54 | 1.40 | 0.028 | Positive | n/a (*a) | 0.039 | 1g | 1.6 | 4b-2 | P3 | - | | |
| 1 | Side (ant.1) | 0 | Battery 1 | n40(MCS0)* | 5795* | 159 | 100 | 1.00 | 13 | 11.45 | 1.43 | 0.202 | Positive | n/a (*a) | 0.289 | 1g | 1.6 | 4b-1 | P4 | - | | |
| 1 | Side (ant.1) | 0 | Battery 1 | n40(MCS0)* | 5755 | 151 | 100 | 1.00 | 13 | 11.31 | 1.48 | 0.146 | Positive | n/a (*a) | 0.216 | 1g | 1.6 | - | P4 | - | | |

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

*: Appx. Appendix; ant: antenna; (mode) b: IEEE 802.11b, n40: IEEE 802.11n(40HT); Max.: maximum; n/a: not applied. Gap: It is the separation distance between the platform surface and the bottom outer surface of phantom; Battery ID: Refer to Appendix 1.

: During test, the EUT was operated with full charged battery and connected an IF cable (except "Side (ant 1)" setup).

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

Calcul

*1. (KDB 248227 D01) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR test of OFDM mode was reduced.

| OFDM mode | Maximum tune-up tolerance limit | | | | OFDM scaled factor [-] (b)/(a)×100 | DSSS worst reported SAR value | | | | Estimated SAR value: OFDM [W/kg] | Exclusion limit [W/kg] | Standalone SAR test of OFDM mode require? |
|-----------|---------------------------------|----------|-------|----------|---------------------------------------|-------------------------------|--------------|-----------|--------|-------------------------------------|------------------------|---|
| | DSSS | | OFDM | | | SAR type | Setup | Antenna | [W/kg] | | | |
| | [dBm] | [mW] (a) | [dBm] | [mW] (b) | | 10g | Back | Antenna 2 | 0.384 | | 0.38 | |
| g | 14.0 | 25 | 14.0 | 25 | 1.00 | 10g | Back | Antenna 2 | 0.384 | 0.38 | ≤ 1.2 | No |
| n20 | 14.0 | 25 | 14.0 | 25 | 1.00 | 10g | Back | Antenna 2 | 0.384 | 0.38 | ≤ 1.2 | No |
| n40 | 14.0 | 25 | 13.0 | 20 | 0.80 | 10g | Back | Antenna 2 | 0.384 | 0.31 | ≤ 1.2 | No |
| g | 14.0 | 25 | 14.0 | 25 | 1.00 | 1g | Side (ant.1) | Antenna 1 | 0.220 | 0.22 | ≤ 1.2 | No |
| n20 | 14.0 | 25 | 14.0 | 25 | 1.00 | 1g | Side (ant.1) | Antenna 1 | 0.220 | 0.22 | ≤ 1.2 | No |
| n40 | 14.0 | 25 | 13.0 | 20 | 0.80 | 1g | Side (ant.1) | Antenna 1 | 0.220 | 0.18 | ≤ 1.2 | No |

*. (mode) b: IEEE 802.11b, g: IEEE 802.11g, n20: IEEE 802.11n(20HT), n40: IEEE 802.11n(40HT).

6.4 Simultaneous transmission evaluation

Result: Simultaneous transmission SAR measurement (Volume Scan) was not required because the sum of the estimated SAR(1g) was within 1.6 W/kg (as SAR (1g) limit), SAR (10g) was .within 4 W/kg (as SAR (10g) limit).

According to KDB447498 D01; when standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

[(max. power of channel, including tune-up tolerance, mW)/(minimum test separation distance, mm)][$\sqrt{f(\text{GHz})x}$] W/kg

*. for test separation distances ≤ 50 mm; where $x = 7.5$ for 1-g SAR and $x = 18.75$ for 10g SAR

*. 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10g SAR, when the test separation distances is > 50 mm.

*. When the minimum separation distance is < 5 mm, the distance is used 5mm to determine SAR test exclusion.

| SISO/ MIMO | Possible of "Simultaneous transmission" condition (*1) | Upper Frequency [GHz] | Tune-up limit power (conducted) (mW) | Estimated SAR value [W/kg] | | | | | | | | Estimated Σ SAR value | | | | | | | | |
|---------------|---|-----------------------------|--|----------------------------|-------|-------|--------|------------------------|-------|-------|-------|------------------------------|--------|------|-------|------------------------|-------|-------|--------|-------------------|
| | | | | Antenna 1: BT LE | | | | Antenna 2: BT LE | | | | Antenna 1: WLAN (5GHz) | | | | Antenna 2: WLAN (5GHz) | | | | |
| | | | | Back | Front | Right | Bottom | Left | Top | Back | Front | Right | Bottom | Left | Top | Back | Front | Right | Bottom | |
| SISO | BT LE+5.2GHzWLAN | 2.48 | 5.24 | 3 | 20 | 0.05 | 0.08 | 0.03 | (0.4) | (0.4) | (0.4) | 0.49 | 0.76 | 0.34 | (0.4) | (0.4) | 0.54 | 0.84 | 0.37 | (0.8) (0.8) (0.8) |
| SISO | BT LE+5.3GHzWLAN | 2.48 | 5.32 | 3 | 20 | 0.05 | 0.08 | 0.03 | (0.4) | (0.4) | (0.4) | 0.49 | 0.77 | 0.34 | (0.4) | (0.4) | 0.54 | 0.85 | 0.37 | (0.8) (0.8) (0.8) |
| SISO | BT LE+5.6GHzWLAN | 2.48 | 5.7 | 3 | 20 | 0.05 | 0.08 | 0.03 | (0.4) | (0.4) | (0.4) | 0.51 | 0.80 | 0.35 | (0.4) | (0.4) | 0.56 | 0.88 | 0.38 | (0.8) (0.8) (0.8) |
| SISO | BT LE+5.8GHzWLAN | 2.48 | 5.825 | 3 | 20 | 0.05 | 0.08 | 0.03 | (0.4) | (0.4) | (0.4) | 0.52 | 0.81 | 0.36 | (0.4) | (0.4) | 0.57 | 0.89 | 0.39 | (0.8) (0.8) (0.8) |
| | D0: antenna 2 separation distance from surface [mm] | | | ≤5 | 8 | 18 | 80 | 331 | 436 | ≤5 | 8 | 18 | 80 | 331 | 436 | | | | | |
| | | | | Antenna 1: BT LE | | | | Antenna 1: WLAN (5GHz) | | | | Antenna 2: WLAN (5GHz) | | | | Antenna 2: WLAN (5GHz) | | | | |
| SISO | BT LE+5.2GHzWLAN | 2.48 | 5.24 | 3 | 20 | 0.05 | 0.08 | 0.03 | (0.4) | (0.4) | (0.4) | 0.49 | 0.76 | 0.29 | (0.4) | (0.4) | 0.54 | 0.84 | 0.32 | (0.8) (0.8) (0.8) |
| SISO | BT LE+5.3GHzWLAN | 2.48 | 5.32 | 3 | 20 | 0.05 | 0.08 | 0.03 | (0.4) | (0.4) | (0.4) | 0.49 | 0.77 | 0.29 | (0.4) | (0.4) | 0.54 | 0.85 | 0.32 | (0.8) (0.8) (0.8) |
| SISO | BT LE+5.6GHzWLAN | 2.48 | 5.7 | 3 | 20 | 0.05 | 0.08 | 0.03 | (0.4) | (0.4) | (0.4) | 0.51 | 0.80 | 0.30 | (0.4) | (0.4) | 0.56 | 0.88 | 0.33 | (0.8) (0.8) (0.8) |
| SISO | BT LE+5.8GHzWLAN | 2.48 | 5.825 | 3 | 20 | 0.05 | 0.08 | 0.03 | (0.4) | (0.4) | (0.4) | 0.51 | 0.80 | 0.31 | (0.4) | (0.4) | 0.56 | 0.88 | 0.34 | (0.8) (0.8) (0.8) |
| | D1: antenna 1 separation distance from surface [mm] | | | ≤5 | 8 | 21 | 106 | 305 | 433 | ≤5 | 8 | 21 | 106 | 305 | 433 | | | | | |

*1. A transmission is performed from one of antenna 2 or antenna 1 (diversity). A transmission of WLAN(2.4GHz) and BT-LE is time-division-processing. Therefore, simultaneously transmitted SAR was only considered for the WLAN(5GHz) and BT-LE.

Notes: 1. Power and distance are rounded to the nearest mW and mm before calculation.

2. The upper frequency of the frequency band had maximum output power and was used in order to calculate standalone SAR test exclusion considerations.

3. The estimated Σ SAR 1g value is calculated based on the same configuration and the same test position.

4. The estimated results (SAR value, SPLSR value) are rounded to two decimal place for comparison.

5. When standalone SAR testing is not required, an estimated SAR can be applied to determine simultaneous transmission SAR test exclusion.

6. (Calculating formula) Per KDB447498 D01(v06), SPLSR = (SAR1 + SAR2) / 1.5 / (minimum antenna separation distance, mm)

where; the minimum antenna separation distance is determined by the closest physical separation of the antennas, according to geometric center of the antennas.

<SAR Summation Analysis>

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR of all simultaneous transmitting antennas in an operating mode and exposure condition is within the SAR limit (SAR(1g): 1.6 W/kg, SAR(10g): 4 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR is greater than the SAR limit (SAR(1g): 1.6 W/kg, SAR(10g): 4 W/kg), SAR test exclusion is determined by the SPLSR.

6.5 SAR Measurement Variability (Repeated measurement requirement)

In accordance with published RF Exposure KDB procedure 865664 D01 (v01r04) 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 .

Since all the measured SAR are less than 0.8 W/kg (SAR(1g), or 2 W/kg (SAR(10g)), the repeated measurement is not required.

6.6 Device holder perturbation verification

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.

Since all the reported (scaled) SAR are less than 1.2 W/kg (SAR(1g), or 3 W/kg (SAR(10g)), the "device holder perturbation verification" measurement is not performed.

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APPENDIX 2: SAR Measurement data

Appendix 2-1: Worst Scaled (Reported) SAR Plot

Plot 1a-1: 2.4GHz band, SAR(10g), Antenna 2; Back & touch / 11b (1Mbps) / 2412 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: 11b(1Mbps, DSSS) (UID: 0, Wi-fi 2.4GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); **Frequency: 2412 MHz; Crest Factor: 1.0**

Medium: HSL5GHz(v6.2112); Medium parameters used (interpolated): f = 2412 MHz; $\sigma = 1.813 \text{ S/m}$; $\epsilon_r = 39.63$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section -DASY52.52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(7.35, 7.35, 7.35) @ 2412 MHz; Calibrated: 2021/04/21 -Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0, 161.0

touch,back,h24a/24h9;2412,ant0,Rear;&d0,b(1m)/

Area:204x180,12 (18x16x1): Measurement grid: dx=12mm, dy=12mm; Maximum value of SAR (measured) = 1.02 W/kg

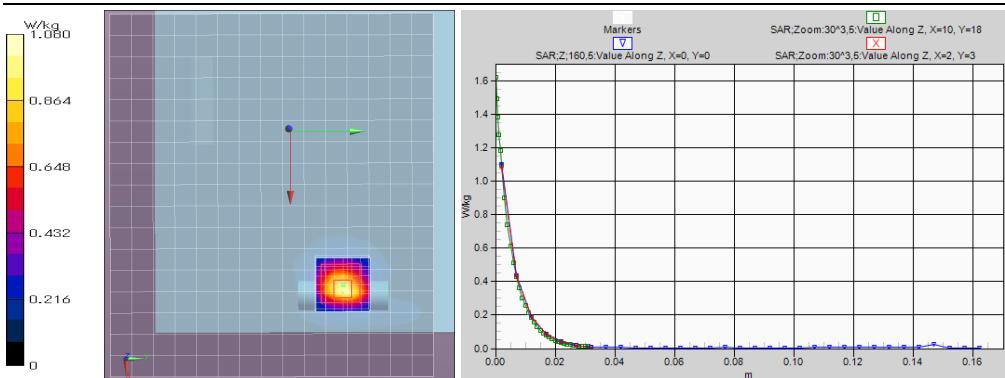
Area:204x180,12 (171x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm; Maximum value of SAR (interpolated) = 1.12 W/kg

Z;160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 1.10 W/kg

Zoom:30*3.5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;

Reference Value = 22.35 V/m; Power Drift = -0.07 dB; Maximum value of SAR (measured) = 1.08 W/kg; Peak SAR (extrapolated) = 1.62 W/kg

SAR(1 g) = 0.646 W/kg; SAR(10 g) = 0.293 W/kg (*.Smallest distance from peaks to all points 3 dB below = 7.6 mm; Ratio of SAR at M2 to SAR at M1 = 40%)



Remarks: *. Date tested: 2021/12/8; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

*. liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg.C. / (50~65) %RH,

*. liquid temperature: 22.5(start)/22.4(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

Plot 1b-1: 2.4GHz band, SAR(1g), Antenna 1; Side(antenna 1) & touch / 11b (1Mbps) / 2437 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: 11b(1Mbps, DSSS) (UID: 0, Wi-fi 2.4GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); **Frequency: 2437 MHz; Crest Factor: 1.0**

Medium: HSL5GHz(v6.2112); Medium parameters used (interpolated): f = 2437 MHz; $\sigma = 1.831 \text{ S/m}$; $\epsilon_r = 39.58$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section

-DASY52.52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(7.35, 7.35, 7.35) @ 2437 MHz; Calibrated: 2021/04/21

-Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0, 161.0

touch,side1a/24h28;2437,ant1,side(1)&d0,b(1m)/

Area:108x60,12 (10x6x1): Measurement grid: dx=12mm, dy=12mm; Maximum value of SAR (measured) = 0.224 W/kg

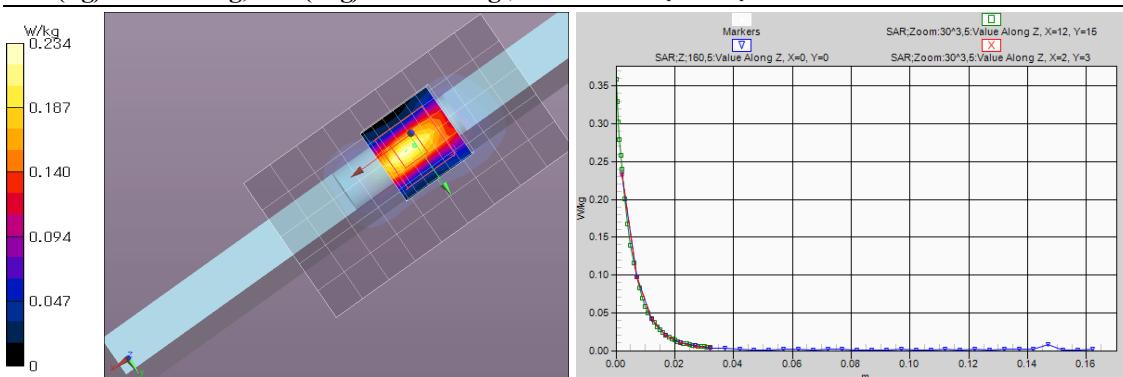
Area:108x60,12 (91x51x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm; Maximum value of SAR (interpolated) = 0.234 W/kg

Z;160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.232 W/kg

Zoom:30*3.5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;

Reference Value = 11.41 V/m; Power Drift = -0.01 dB; Maximum value of SAR (measured) = 0.234 W/kg; Peak SAR (extrapolated) = 0.359 W/kg

SAR(1 g) = 0.143 W/kg; SAR(10 g) = 0.058 W/kg (*.Smallest distance from peaks to all points 3 dB below = 6 mm; Ratio of SAR at M2 to SAR at M1 = 41.9%)



Remarks: *. Date tested: 2021/12/8; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

*. liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg.C. / (50~65) %RH,

*. liquid temperature: 22.4(start)/22.4(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

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

Plot 2a-1: 5.3GHz band, SAR(10g), Antenna 1; Back & touch / 11n(40HT) (MCS0) / 5270 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5270 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5270 MHz; $\sigma = 4.518 \text{ S/m}$; $\epsilon_r = 35.04$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section

-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(5.14, 5.14, 5.14) @ 5270 MHz; Calibrated: 2021/04/21

-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,back0,h5a/5h12.53.4,ant1,5270,Rear&d0,n40(m0)

Area:90x80,stp10 (10x9x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.70 W/kg

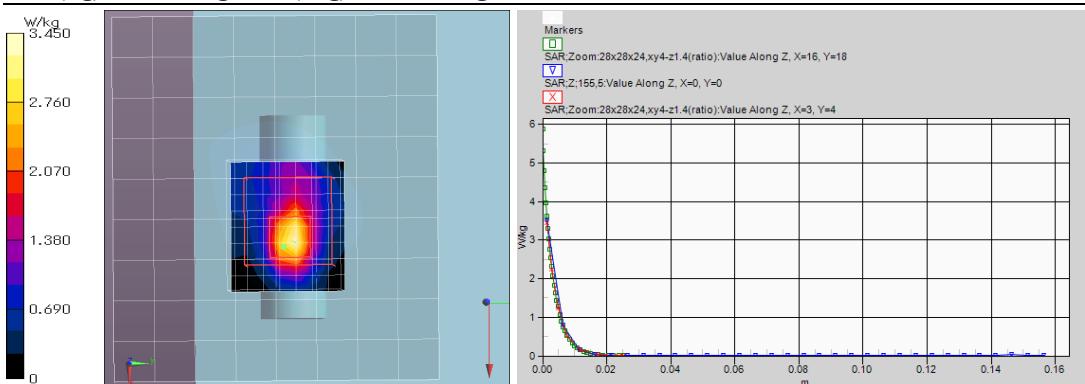
Area:90x80,stp10 (91x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 2.25 W/kg

Z;155.5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 3.51 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (9x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 28.73 V/m; Power Drift = 0.03 dB; Maximum value of SAR (measured) = 3.45 W/kg; Peak SAR (extrapolated) = 5.88 W/kg

SAR(1 g) = 1.27 W/kg; SAR(10 g) = 0.325 W/kg (*.Smallest distance from peaks to all points 3 dB below = 4.8 mm; Ratio of SAR at M2 to SAR at M1 = 65.1%)



Remarks: * Date tested: 2021/12/6; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

* liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg C. / (40~50) %RH,

* liquid temperature: 22.5(start)/22.5(end)/22.5(in check) deg C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) / small=SAR(1g)

Plot 2b-1: 5.3GHz band, SAR(1g), Antenna 1; Side(antenna 1) & touch / 11n(40HT) (MCS0) / 5270 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5270 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5270 MHz; $\sigma = 4.513 \text{ S/m}$; $\epsilon_r = 34.99$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section

-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(5.14, 5.14, 5.14) @ 5270 MHz; Calibrated: 2021/04/21

-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,side1a/h557.53.14,5270,ant1,side(1)&d0,n40(m0)/

Area:100x60,10 (11x7x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.631 W/kg

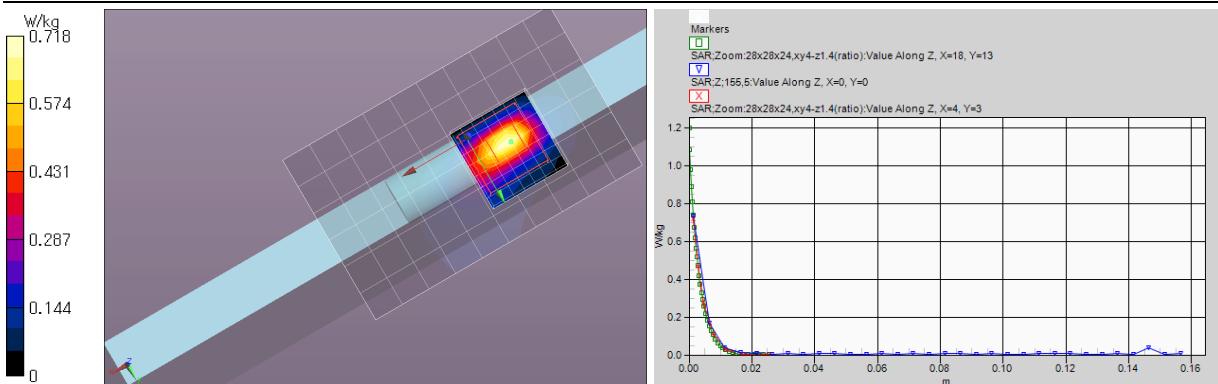
Area:100x60,10 (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.762 W/kg

Z;155.5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.736 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 13.95 V/m; Power Drift = -0.03 dB; Maximum value of SAR (measured) = 0.718 W/kg; Peak SAR (extrapolated) = 1.20 W/kg

SAR(1 g) = 0.293 W/kg; SAR(10 g) = 0.087 W/kg (*.Smallest distance from peaks to all points 3 dB below = 5.6 mm; Ratio of SAR at M2 to SAR at M1 = 65.3%)



Remarks: * Date tested: 2021/12/9; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

* liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg C. / (45~60) %RH,

* liquid temperature: 22.4(start)/22.4(end)/22.5(in check) deg C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) / small=SAR(1g)

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

Plot 2c-1: 5.2GHz band, SAR(10g), Antenna 1; Back & touch / 11n(40HT) (MCS0) / 5190 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5190 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5190 MHz; $\sigma = 4.43 \text{ S/m}$; $\epsilon_r = 35.15$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section -DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(5.14, 5.14, 5.14) @ 5190 MHz; Calibrated: 2021/04/21 -Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,back1,h5b/5h14.52.4,ant1,5190,Rear&d0,n40(m0)

Area:90x80,stp10 (10x9x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 3.32 W/kg

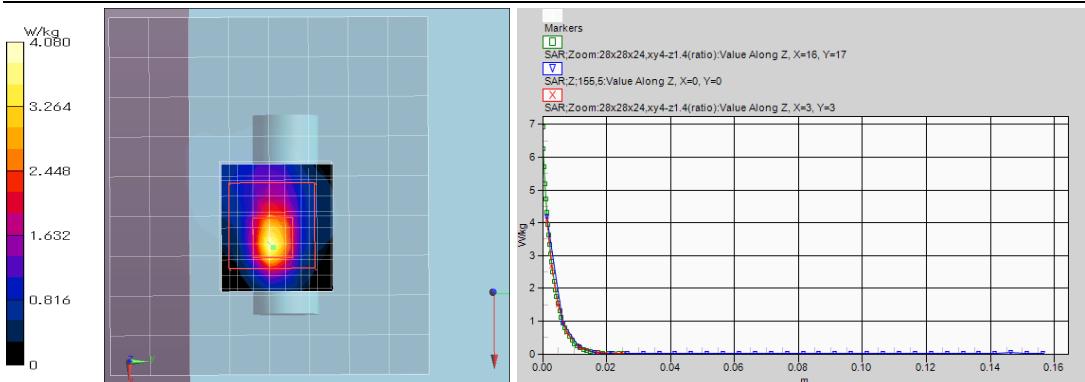
Area:90x80,stp10 (91x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 3.73 W/kg

Z;155.5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 4.17 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (9x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 34.12 V/m; Power Drift = -0.03 dB; Maximum value of SAR (measured) = 4.08 W/kg; Peak SAR (extrapolated) = 6.91 W/kg

SAR(1 g) = 1.51 W/kg; SAR(10 g) = 0.381 W/kg (*.Smallest distance from peaks to all points 3 dB below = 4.3 mm; Ratio of SAR at M2 to SAR at M1 = 65.5%)



Remarks: * Date tested: 2021/12/6; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

* liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg C. / (40~50) %RH,

* liquid temperature: 22.3(start)/22.3(end)/22.5(in check) deg C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) / small=SAR(1g)

Plot 2d-1: 5.2GHz band, SAR(1g), Antenna 1; Side (antenna 1) & touch / 11n(40HT) (MCS0) / 5190 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5190 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5190 MHz; $\sigma = 4.425 \text{ S/m}$; $\epsilon_r = 35.14$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section -DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(5.14, 5.14, 5.14) @ 5190 MHz; Calibrated: 2021/04/21 -Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,side1a/h5b/5h14.52.10,5190,ant1,side1(1)&d0,n40(m0)/

Area:100x60,10 (11x7x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.613 W/kg

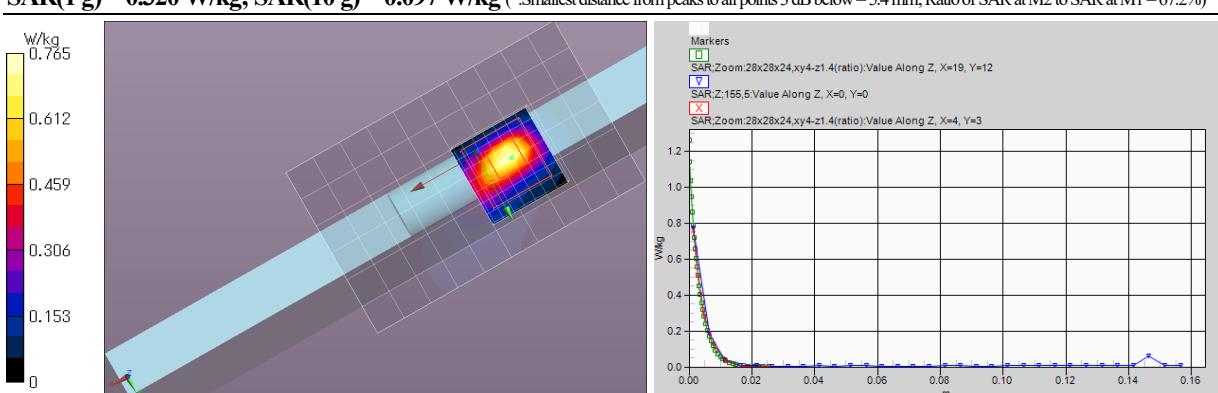
Area:100x60,10 (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.762 W/kg

Z;155.5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.775 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 14.60 V/m; Power Drift = -0.09 dB; Maximum value of SAR (measured) = 0.765 W/kg; Peak SAR (extrapolated) = 1.26 W/kg

SAR(1 g) = 0.320 W/kg; SAR(10 g) = 0.097 W/kg (*.Smallest distance from peaks to all points 3 dB below = 5.4 mm; Ratio of SAR at M2 to SAR at M1 = 67.2%)



Remarks: * Date tested: 2021/12/9; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

* liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg C. / (45~60) %RH,

* liquid temperature: 22.4(start)/22.4(end)/22.5(in check) deg C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) / small=SAR(1g)

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

Plot 3a-1: 5.6GHz band, SAR(10g), Antenna 1; Back & touch / 11n(40HT) (MCS0) / 5510 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5510 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5510 MHz; $\sigma = 4.771 \text{ S/m}$; $\epsilon_r = 34.63$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section

-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(4.56, 4.56, 4.56) @ 5510 MHz; Calibrated: 2021/04/21

-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,back1,h5b/Sh17.56.7,ant1,5510,Rear&d0,n40(m0)

Area:90x80,stp10 (10x9x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 2.23 W/kg

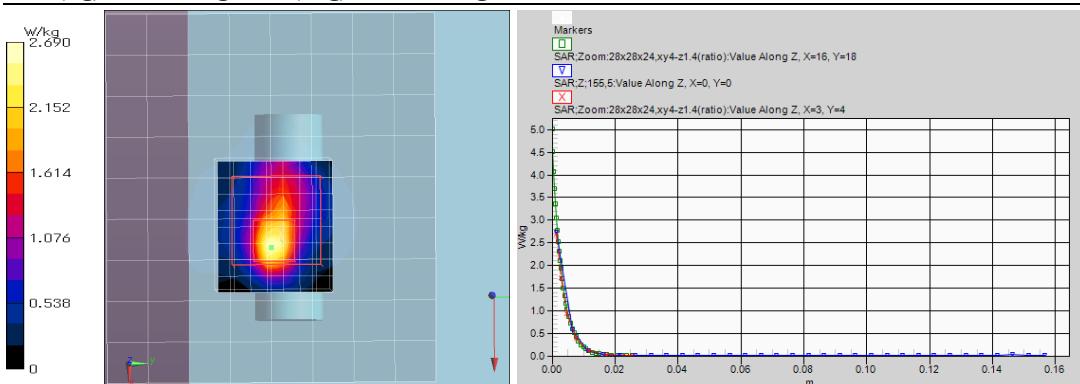
Area:90x80,stp10 (91x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 2.63 W/kg

Z;155.5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.74 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (9x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 27.32 V/m; Power Drift = 0.03 dB; Maximum value of SAR (measured) = 2.69 W/kg; Peak SAR (extrapolated) = 5.01 W/kg

SAR(1 g) = 1.06 W/kg; SAR(10 g) = 0.293 W/kg (*.Smallest distance from peaks to all points 3 dB below = 4.7 mm; Ratio of SAR at M2 to SAR at M1 = 64.2%)



Remarks: * Date tested: 2021/12/7; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

* liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg C. / (45~60) %RH,

* liquid temperature: 22.3(start)/22.4(end)/22.5(in check) deg C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) /small=SAR(1g)

Plot 3b-1: 5.6GHz band, SAR(1g), Antenna 1; Side (antenna 1) & touch / 11n(40HT) (MCS0) / 5510 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5510 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5510 MHz; $\sigma = 4.77 \text{ S/m}$; $\epsilon_r = 34.56$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section

-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(4.56, 4.56, 4.56) @ 5510 MHz; Calibrated: 2021/04/21

-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,side1a/h5b2.56.24,5510,ant1,side1)&d0,n40(m0)

Area:100x60,10 (11x7x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.637 W/kg

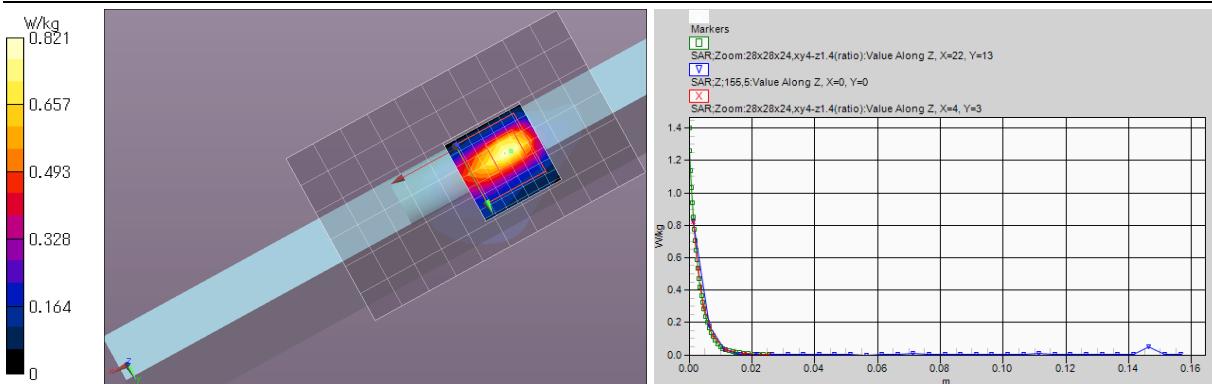
Area:100x60,10 (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.818 W/kg

Z;155.5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.823 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 14.65 V/m; Power Drift = -0.04 dB; Maximum value of SAR (measured) = 0.821 W/kg; Peak SAR (extrapolated) = 1.40 W/kg

SAR(1 g) = 0.326 W/kg; SAR(10 g) = 0.100 W/kg (*.Smallest distance from peaks to all points 3 dB below = 4.8 mm; Ratio of SAR at M2 to SAR at M1 = 65.4%)



Remarks: * Date tested: 2021/12/10; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

* liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg C. / (45~55) %RH,

* liquid temperature: 22.4(start)/22.4(end)/22.5(in check) deg C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) /small=SAR(1g)

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

Plot 4a-1: 5.8GHz band, SAR(10g), Antenna 1; Back & touch / 11n(40HT) (MCS0) / 5795 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5795 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used (interpolated): f = 5795 MHz; $\sigma = 5.101 \text{ S/m}$; $\epsilon_r = 34.18$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section

-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(4.6, 4.6, 4.6) @ 5795 MHz; Calibrated: 2021/04/21

-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,back1,h5b/5h19.58.3,ant1,5795,Rear&d0,n40(m0)

Area:90x80,stp10 (10x9x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.93 W/kg

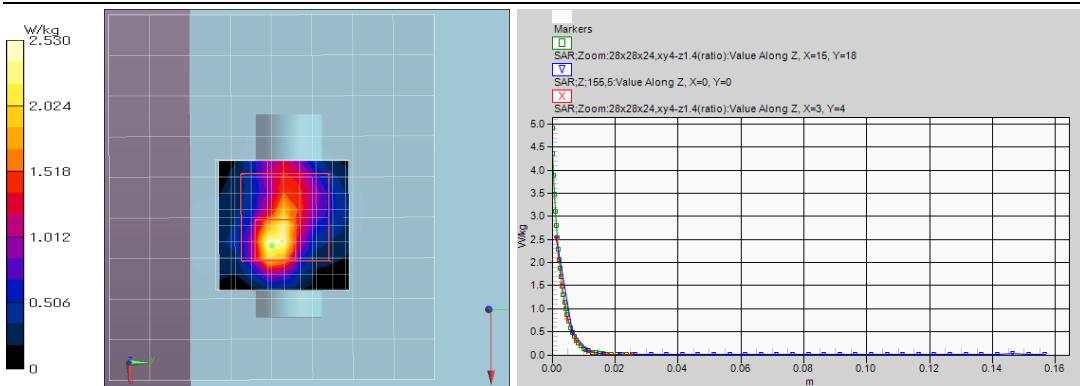
Area:90x80,stp10 (91x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 2.30 W/kg

Z;155.5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.52 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 25.08 V/m; Power Drift = -0.00 dB; Maximum value of SAR (measured) = 2.53 W/kg; Peak SAR (extrapolated) = 4.91 W/kg

SAR(1 g) = 0.948 W/kg; SAR(10 g) = 0.265 W/kg (*Smallest distance from peaks to all points 3 dB below = 4.8 mm; Ratio of SAR at M2 to SAR at M1 = 61.5%)



Remarks: *. Date tested: 2021/12/7; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

*. liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg C. / (45~60) %RH,

*. liquid temperature: 22.4(start)/22.3(end)/22.5(in check) deg C.; *. White cubic: zoom scan area, Red cubic: big=SAR(10g) / small=SAR(1g)

Plot 4b-1: 5.8GHz band, SAR(1g), Antenna 1; Side (antenna 1) & touch / 11n(40HT) (MCS0) / 5795 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5795 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used (interpolated): f = 5795 MHz; $\sigma = 5.12 \text{ S/m}$; $\epsilon_r = 34.14$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section

-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(4.6, 4.6, 4.6) @ 5795 MHz; Calibrated: 2021/04/21

-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,side1/5h63.58.15,5795,ant1,side1&d0,n40(m0)

Area:100x60,10 (11x7x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.397 W/kg

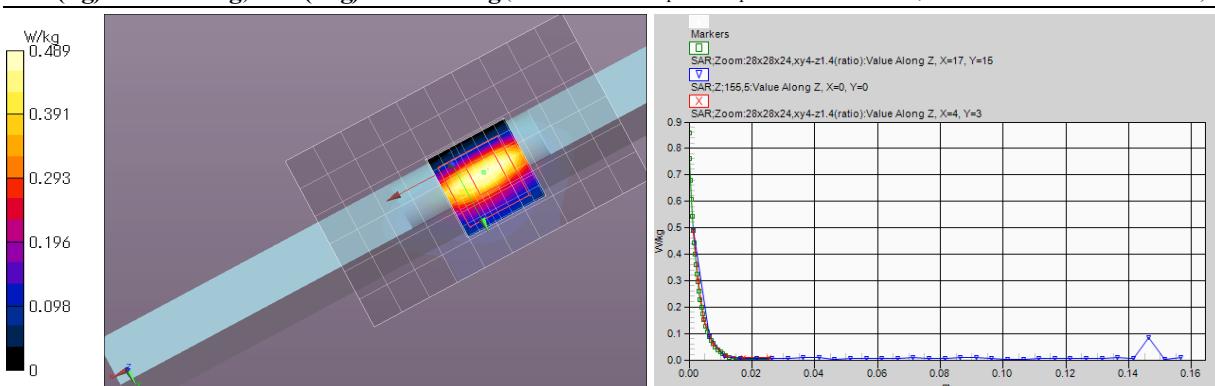
Area:100x60,10 (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.576 W/kg

Z;155.5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.493 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 10.81 V/m; Power Drift = -0.03 dB; Maximum value of SAR (measured) = 0.489 W/kg; Peak SAR (extrapolated) = 0.856 W/kg

SAR(1 g) = 0.202 W/kg; SAR(10 g) = 0.065 W/kg (*Smallest distance from peaks to all points 3 dB below = 6.4 mm; Ratio of SAR at M2 to SAR at M1 = 61.7%)



Remarks: *. Date tested: 2021/12/10; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

*. liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg C. / (45~55) %RH,

*. liquid temperature: 22.4(start)/22.4(end)/22.5(in check) deg C.; *. White cubic: zoom scan area, Red cubic: big=SAR(10g) / small=SAR(1g)

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Appendix 2: SAR measurement data (cont'd)

Appendix 2-2: Other SAR Plots

Plot 1a-2: 2.4GHz band, SAR(1g), Antenna 1; Back & touch / 11b (1Mbps) / 2462 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: 11b(1Mbps, DSSS) (UID: 0, Wi-fi_2.4GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 2462 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used (interpolated): $f = 2462$ MHz; $\sigma = 1.85$ S/m; $\epsilon_r = 39.55$; $\rho = 1000$ kg/m³

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section

-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(7.35, 7.35, 7.35) @ 2462 MHz; Calibrated: 2021/04/21

-Sensor-Surface: 2mm (Mechanical Surface Detection), $z = 1.0, 31.0, 161.0$

touch,back,h24b/24h12,2462,ant1,Rear&d0,b(1m)

Area:96x84,12 (9x8x1): Measurement grid: $dx=12$ mm, $dy=12$ mm; Maximum value of SAR (measured) = 0.552 W/kg

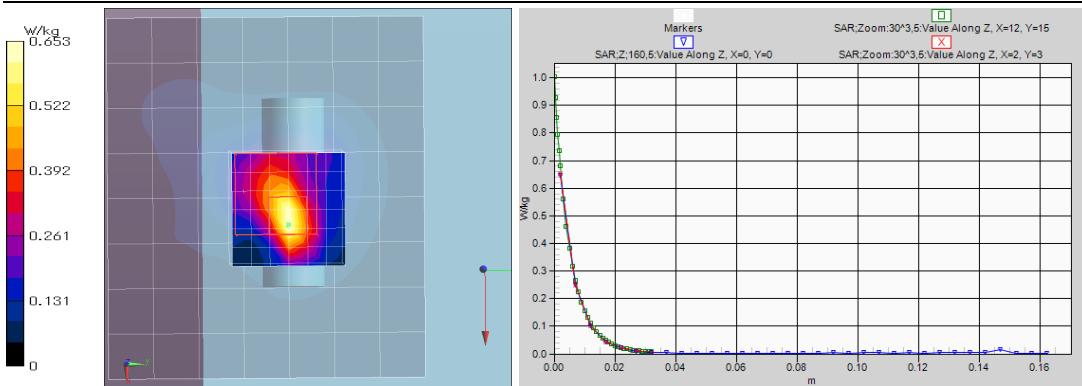
Area:96x84,12 (81x7x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm; Maximum value of SAR (interpolated) = 0.591 W/kg

Z;160,5 (1x1x33): Measurement grid: $dx=20$ mm, $dy=20$ mm, $dz=5$ mm; Maximum value of SAR (measured) = 0.646 W/kg

Zoom:30*3.5 (7x8x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm;

Reference Value = 19.53 V/m; Power Drift = 0.04 dB; Maximum value of SAR (measured) = 0.653 W/kg; Peak SAR (extrapolated) = 1.00 W/kg

SAR(1 g) = 0.359 W/kg; SAR(10 g) = 0.148 W/kg (*.Smallest distance from peaks to all points 3 dB below = 5 mm; Ratio of SAR at M2 to SAR at M1 = 38.1%)



Remarks: *. Date tested: 2021/12/8; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

*. liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg C. / (50~65) %RH,

*. liquid temperature: 22.5(start)/22.5(end)/22.5(in check) deg C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) / small=SAR(1g)

Plot 1b-2: 2.4GHz band, SAR(1g), Antenna 2; Bottom (antenna 2) & touch / 11b (1Mbps) / 2437 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: 11b(1Mbps, DSSS) (UID: 0, Wi-fi_2.4GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 2437 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.831$ S/m; $\epsilon_r = 39.583$; $\rho = 1000$ kg/m³

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section

-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(7.35, 7.35, 7.35) @ 2437 MHz; Calibrated: 2021/04/21

-Sensor-Surface: 2mm (Mechanical Surface Detection), $z = 1.0, 31.0$

touch,side0a/24h21;2437,ant0,side(0)&d0,b(1m)

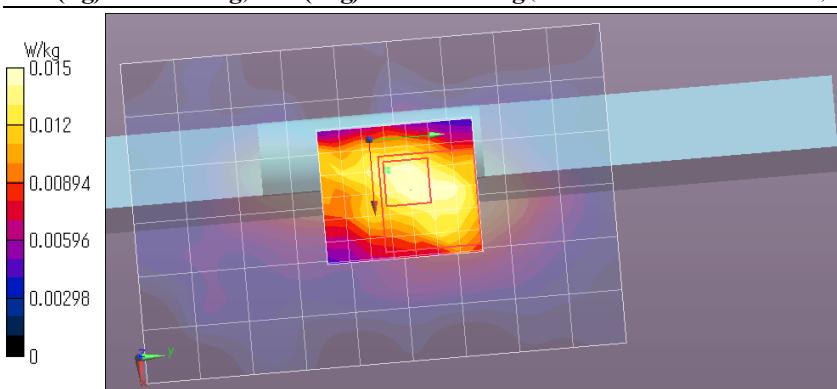
Area:72x108,12 (7x10x1): Measurement grid: $dx=12$ mm, $dy=12$ mm; Maximum value of SAR (measured) = 0.0149 W/kg

Area:72x108,12 (61x91x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm; Maximum value of SAR (interpolated) = 0.0201 W/kg

Zoom:30*3.5 (7x8x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm;

Reference Value = 2.840 V/m; Power Drift = 0.20 dB; Maximum value of SAR (measured) = 0.0149 W/kg; Peak SAR (extrapolated) = 0.0200 W/kg

SAR(1 g) = 0.011 W/kg; SAR(10 g) = 0.00601 W/kg (*.Ratio of SAR at M2 to SAR at M1 = 53.6%)



Remarks: *. Date tested: 2021/12/8; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

*. liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg C. / (50~65) %RH,

*. liquid temperature: 22.2(start)/22.3(end)/22.5(in check) deg C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) / small=SAR(1g)

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Appendix 2: SAR measurement data / Appendix 2-2: Other SAR Plots (cont'd)

Plot 2a-2: 5.3GHz band, SAR(1g), Antenna 2; Back & touch / 11n(40HT) (MCS0) / 5270 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5270 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5270 MHz; $\sigma = 4.518 \text{ S/m}$; $\epsilon_r = 35.04$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(5.14, 5.14, 5.14) @ 5270 MHz; Calibrated: 2021/04/21
-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,back0,h5a/5h1.53.1,ant0,5270,Rear&d0,n40(m0)

Area:80x90,stp10 (9x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.93 W/kg

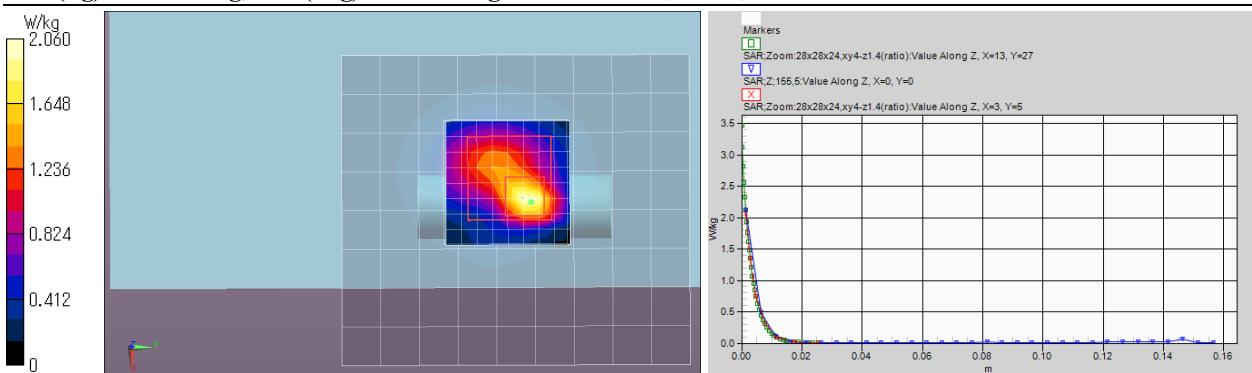
Area:80x90,stp10 (81x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 2.21 W/kg

Z;155.5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.12 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 24.58 V/m; Power Drift = -0.02 dB; Maximum value of SAR (measured) = 2.06 W/kg; Peak SAR (extrapolated) = 3.47 W/kg

SAR(1 g) = 0.819 W/kg; SAR(10 g) = 0.286 W/kg (*.Smallest distance from peaks to all points 3 dB below = 5.1 mm; Ratio of SAR at M2 to SAR at M1 = 65.8%)



Remarks: *. Date tested: 2021/12/6; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

*. liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg.C. / (40~50) %RH,

*. liquid temperature: 22.3(start)/22.3(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) /small=SAR(1g)

Plot 2b-2: 5.3GHz band, SAR(1g), Antenna 2; Bottom (antenna 2) & touch / 11n(40HT) (MCS0) / 5310 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5310 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5310 MHz; $\sigma = 4.548 \text{ S/m}$; $\epsilon_r = 34.92$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(5.14, 5.14, 5.14) @ 5310 MHz; Calibrated: 2021/04/21
-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0

touch,side0/a/5h47.53.11,5310,ant0,side0)0,n40(m0)

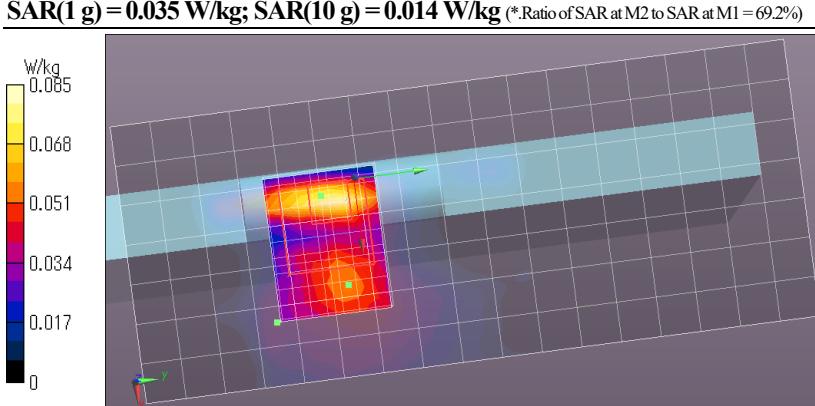
Area:70x170,10 (8x18x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.0490 W/kg

Area:70x170,10 (71x171x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.0648 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (10x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 4.851 V/m; Power Drift = -0.07 dB; Maximum value of SAR (measured) = 0.0850 W/kg; Peak SAR (extrapolated) = 0.143 W/kg

SAR(1 g) = 0.035 W/kg; SAR(10 g) = 0.014 W/kg (*.Ratio of SAR at M2 to SAR at M1 = 69.2%)



Remarks: *. Date tested: 2021/12/9; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

*. liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg.C. / (45~60) %RH,

*. liquid temperature: 22.5(start)/22.3(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) /small=SAR(1g)

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Appendix 2: SAR measurement data / Appendix 2-2: Other SAR Plots (cont'd)

Plot 2c-2: 5.2GHz band, SAR(1g), Antenna 2; Back & touch / 11n(40HT) (MCS0) / 5190 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5190 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5190 MHz; $\sigma = 4.43 \text{ S/m}$; $\epsilon_r = 35.15$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(5.14, 5.14, 5.14) @ 5190 MHz; Calibrated: 2021/04/21
-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,back0,h5a/o5h3.52.2,ant0,5190,Rear&d0,n40(m0)

Area:80x90,stp10 2 (9x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 2.38 W/kg

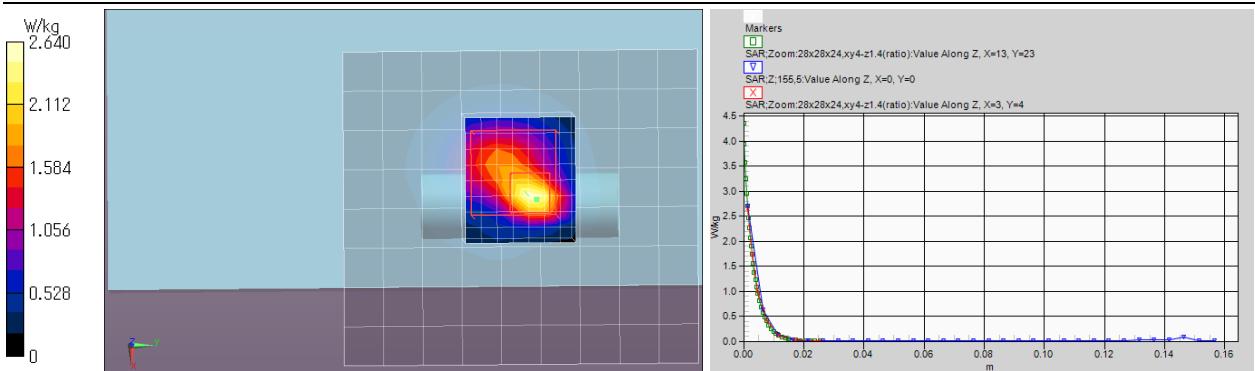
Area:80x90,stp10 2 (81x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 2.74 W/kg

Z;155.5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.69 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (9x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 28.06 V/m; Power Drift = -0.03 dB; Maximum value of SAR (measured) = 2.64 W/kg; Peak SAR (extrapolated) = 4.35 W/kg

SAR(1 g) = 1.05 W/kg; SAR(10 g) = 0.360 W/kg (*.Smallest distance from peaks to all points 3 dB below = 4.8 mm; Ratio of SAR at M2 to SAR at M1 = 66.4%)



Remarks: *. Date tested: 2021/12/6; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

*. liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg.C. / (40~50) %RH,

*. liquid temperature: 22.3(start)/22.3(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) / small=SAR(1g)

Plot 2d-2: 5.2GHz band, SAR(1g), Antenna 2; Bottom (antenna 2) & touch / 11n(40HT) (MCS0) / 5230 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5230 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5230 MHz; $\sigma = 4.476 \text{ S/m}$; $\epsilon_r = 35.06$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(5.14, 5.14, 5.14) @ 5230 MHz; Calibrated: 2021/04/21
-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0

touch,side0/a/5h49.52.7,5230,ant0,side0()&d0,n40(m0)

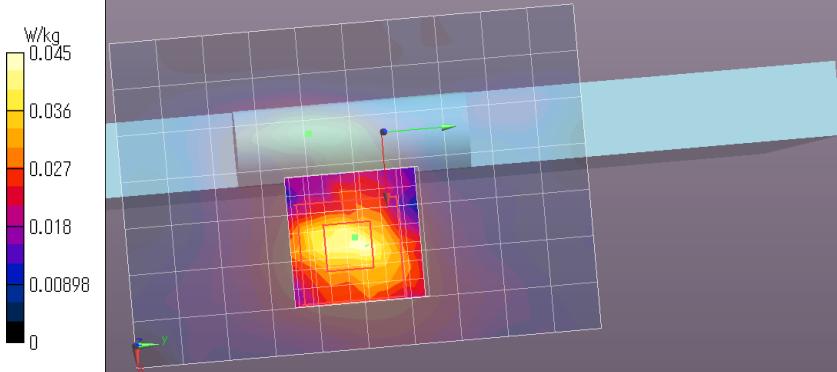
Area:70x100,10 (8x11x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.0433 W/kg

Area:70x100,10 (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.0449 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 3.190 V/m; Power Drift = -0.20 dB; Maximum value of SAR (measured) = 0.0449 W/kg; Peak SAR (extrapolated) = 0.0940 W/kg

SAR(1 g) = 0.018 W/kg; SAR(10 g) = 0.00619 W/kg (*.Ratio of SAR at M2 to SAR at M1 = 72.1%)



Remarks: *. Date tested: 2021/12/9; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

*. liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg.C. / (45~60) %RH,

*. liquid temperature: 22.4(start)/22.4(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) / small=SAR(1g)

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Appendix 2: SAR measurement data / Appendix 2-2: Other SAR Plots (cont'd)

Plot 3a-2: 5.6GHz band, SAR(1g), Antenna 2; Back & touch / 11n(40HT) (MCS0) / 5550 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5550 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5550 MHz; $\sigma = 4.825 \text{ S/m}$; $\epsilon_r = 34.58$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section

-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(4.56, 4.56, 4.56) @ 5550 MHz; Calibrated: 2021/04/21

-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,back0,h5a/5h5.56.2,ant0,5550,Rear&d0,n40(m0)

Area:80x90,stp10 (9x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.89 W/kg

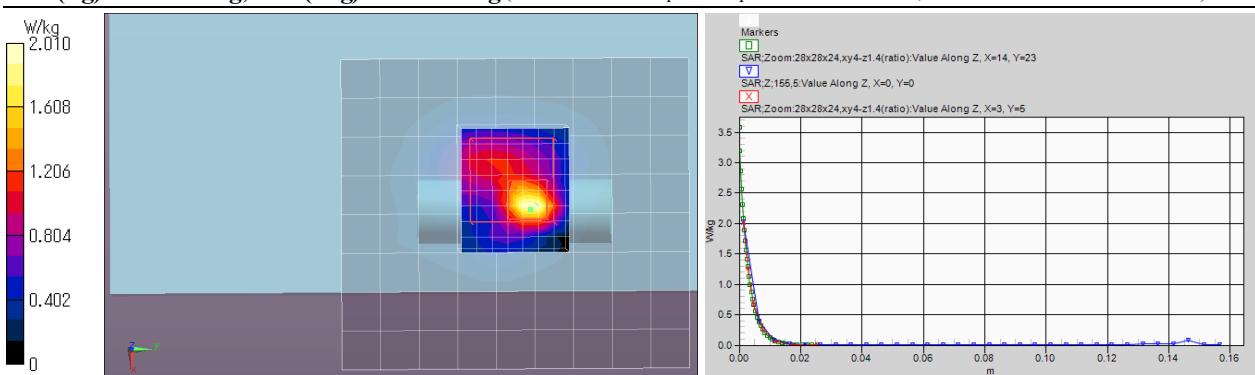
Area:80x90,stp10 (81x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 2.04 W/kg

Z;155.5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.02 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (9x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 23.17 V/m; Power Drift = -0.07 dB; Maximum value of SAR (measured) = 2.01 W/kg; Peak SAR (extrapolated) = 3.58 W/kg

SAR(1 g) = 0.736 W/kg; SAR(10 g) = 0.237 W/kg (*Smallest distance from peaks to all points 3 dB below = 5.1 mm; Ratio of SAR at M2 to SAR at M1 = 62.7%)



Remarks: *. Date tested: 2021/12/7; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

*. liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg.C. / (45~60) %RH,

*. liquid temperature: 22.4(start)/22.4(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) /small=SAR(1g)

Plot 3b-2: 5.6GHz band, SAR(1g), Antenna 2; Bottom (antenna 2) & touch / 11n(40HT) (MCS0) / 5670 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5670 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5670 MHz; $\sigma = 4.967 \text{ S/m}$; $\epsilon_r = 34.26$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section

-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(4.56, 4.56, 4.56) @ 5670 MHz; Calibrated: 2021/04/21

-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0

touch,side0a/5h51.56.19,5670,ant0,side0&0,n40(m0)

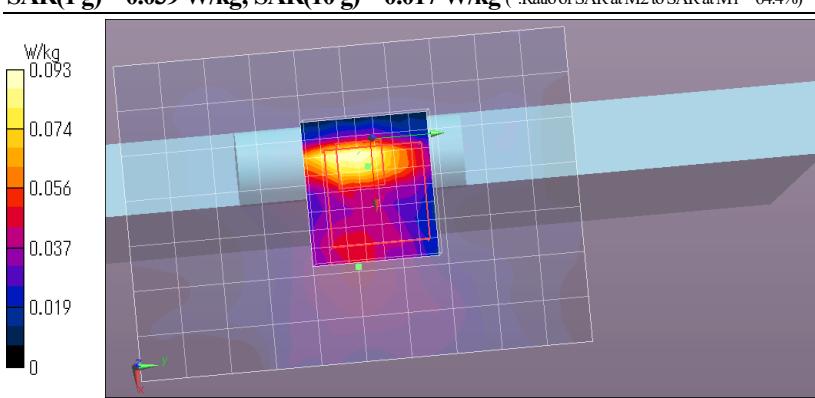
Area:70x100,10 (8x11x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.0595 W/kg

Area:70x100,10 (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.0630 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (9x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 4.421 V/m; Power Drift = -0.20 dB; Maximum value of SAR (measured) = 0.0955 W/kg; Peak SAR (extrapolated) = 0.146 W/kg

SAR(1 g) = 0.039 W/kg; SAR(10 g) = 0.017 W/kg (*Ratio of SAR at M2 to SAR at M1 = 64.4%)



Remarks: *. Date tested: 2021/12/10; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

*. liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg.C. / (45~55) %RH,

*. liquid temperature: 22.3(start)/22.3(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) /small=SAR(1g)

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Appendix 2: SAR measurement data / Appendix 2-2: Other SAR Plots (cont'd)

Plot 4a-2: 5.8GHz band, SAR(10g), Antenna 2; Back & touch / 11n(40HT) (MCS0) / 5795 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5795 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used (interpolated): f = 5795 MHz; $\sigma = 5.101 \text{ S/m}$; $\epsilon_r = 34.18$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section

-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(4.6, 4.6, 4.6) @ 5795 MHz; Calibrated: 2021/04/21

-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,back,0,h5a/5h8.58.1,ant0,5795,Rear&d0,n40(m0)

Area:80x90_stp10 (9x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.51 W/kg

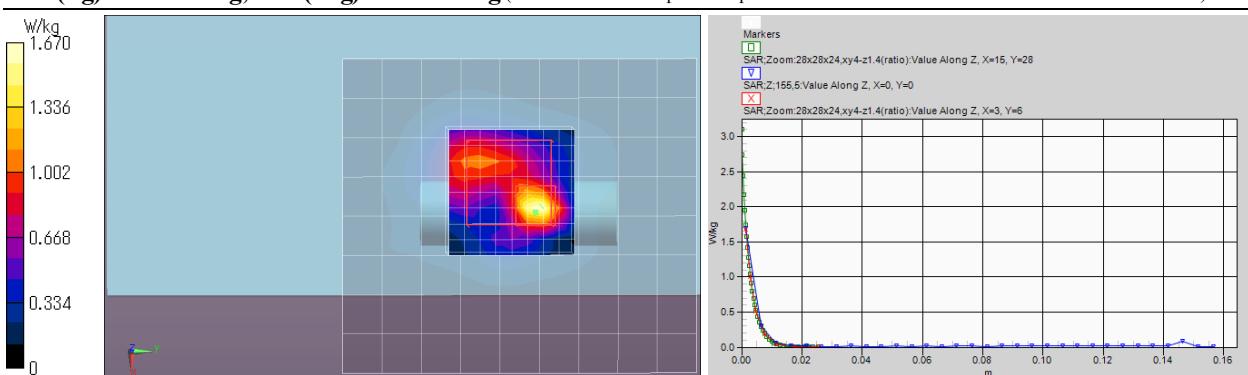
Area:80x90_stp10 (81x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 1.57 W/kg

Z;155.5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 1.69 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 20.30 V/m; Power Drift = -0.01 dB; Maximum value of SAR (measured) = 1.67 W/kg; Peak SAR (extrapolated) = 3.10 W/kg

SAR(1 g) = 0.578 W/kg; SAR(10 g) = 0.188 W/kg (*Smallest distance from peaks to all points 3 dB below = 5.4 mm; Ratio of SAR at M2 to SAR at M1 = 60.3%)



Remarks: * Date tested: 2021/12/7; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

* liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg.C. / (45~60) %RH,

* liquid temperature: 22.4(start)/22.3(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) ysmall=SAR(1g)

Plot 4b-2: 5.8GHz band, SAR(1g), Antenna 2; Bottom (antenna 2) & touch / 11n(40HT) (MCS0) / 5795 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B06; Serial: 34:9F:7B:EF:DB:20/21MED-0061

Mode: n40(MCS0, OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); Frequency: 5795 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used (interpolated): f = 5795 MHz; $\sigma = 5.12 \text{ S/m}$; $\epsilon_r = 34.14$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section

-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(4.6, 4.6, 4.6) @ 5795 MHz; Calibrated: 2021/04/21

-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0

touch,side0/5h54.58.13,5795,ant0,side0)&d0,n40(m0)/

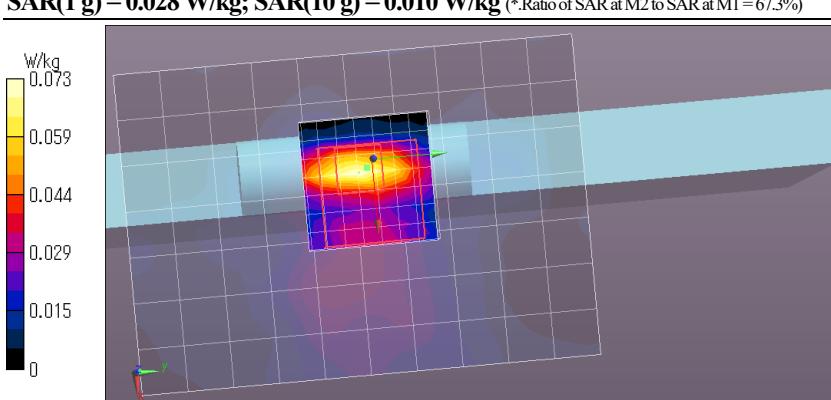
Area:70x100,10 (8x11x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.0431 W/kg

Area:70x100,10 (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.0581 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 4.202 V/m; Power Drift = 0.06 dB; Maximum value of SAR (measured) = 0.0734 W/kg; Peak SAR (extrapolated) = 0.119 W/kg

SAR(1 g) = 0.028 W/kg; SAR(10 g) = 0.010 W/kg (*Ratio of SAR at M2 to SAR at M1 = 67.3%)



Remarks: * Date tested: 2021/12/10; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

* liquid depth: 150 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (23~25) deg.C. / (45~55) %RH,

* liquid temperature: 22.3(start)/22.4(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) ysmall=SAR(1g)

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APPENDIX 3: Test instruments

Appendix 3-1: Equipment used

| Test Name | Local ID | LIMS ID | Description | Manufacturer | Model | Serial | Calibration Last Date | Interval (Month) |
|-----------|-------------|---------|--------------------|-----------------------------------|---------|------------|-----------------------|------------------|
| AT | SAT10-SARP1 | 160520 | Attenuator | Weinschel - API Technologies Corp | 4M-10 | - | 2020/12/11 | 12 |
| AT | SPM-13 | 169910 | Power Meter | Keysight Technologies Inc | 8990B | MY51000448 | 2021/01/25 | 12 |
| AT | SPSS-06 | 169911 | Power sensor | Keysight Technologies Inc | N1923A | MY57270004 | 2021/01/25 | 12 |
| AT | SRENT-15 | 160899 | Spectrum Analyzer | Keysight Technologies Inc | E4440A | MY46185516 | 2021/01/26 | 12 |
| AT | STM-G6 | 146207 | Terminator | JFW | 50T-128 | - | 2020/11/19 | 12 |
| AT | SOS-26 | 191844 | Humidity Indicator | CUSTOM. Inc | CTH-201 | - | 2021/08/02 | 12 |

*. AT (antenna terminal conducted power measurement) was measured September 29, 2021. (Refer to Section 5 in this report.)

| Test Name | Local ID | LIMS ID | Description | Manufacturer | Model | Serial | Calibration Last Date | Interval (Month) |
|-----------|--------------|---------|--------------------------------|-----------------------------------|---------------------------------|--------------------|-----------------------|------------------|
| SAR | COTS-SSAR-02 | 144885 | DASY52 software | Schmid&Partner Engineering AG | DASY5 PRO | Ver.52.10.3.1513 | - | - |
| SAR | COTS-SSEP-02 | 144886 | Dielectric assessment software | Schmid&Partner Engineering AG | DAK | Ver.DAK1.10.317.11 | - | - |
| SAR | KAT10-P1 | 144882 | Attenuator | Weinschel - API Technologies Corp | 24-10-34 | BY5927 | 2021/12/01 | 12 |
| SAR | KCPL-07 | 146100 | Directional Coupler | Pulsar Microwave Corp. | CCS30-B26 | 621 | - | - |
| SAR | KDAE-R01 | 144945 | Data Acquisition Electronics | Schmid&Partner Engineering AG | DAE4 | 554 | 2021/04/13 | 12 |
| SAR | KIU-08 | 145059 | Power sensor | Rohde & Schwarz | NRV-Z4 | 100372 | 2021/09/18 | 12 |
| SAR | KIU-09 | 145099 | Power sensor | Rohde & Schwarz | NRV-Z4 | 100371 | 2021/09/18 | 12 |
| SAR | KOS-14 | 144986 | Thermo-Hygrometer data logger | SATO KEIRYOKI | SK-L200THIIa/SK-LTHIIa-2 | 015246/08169 | 2021/10/13 | 12 |
| SAR | KPA-12 | 145359 | RF Power Amplifier | Milomega | AS2560-50 | 1018582 | - | - |
| SAR | KPFL-01 | 145560 | Flat Phantom | Schmid&Partner Engineering AG | Oval flat phantom ELI 4.0 | 1059 | 2021/08/18 | 12 |
| SAR | KPM-05 | 144988 | Power meter | Keysight Technologies Inc | E4417A | GB41290718 | 2021/04/09 | 12 |
| SAR | KPM-06 | 144989 | Power Meter | Rohde & Schwarz | NRVD | 101599 | 2021/09/18 | 12 |
| SAR | KPSS-01 | 144990 | Power sensor | Keysight Technologies Inc | E9327A | US40440544 | 2021/04/09 | 12 |
| SAR | KRU-04 | 145086 | Ruler(300mm) | SHINWA | 13134 | - | 2021/02/10 | 12 |
| SAR | KRU-05 | 145087 | Ruler(100x50mm L) | SHINWA | 12101 | - | 2021/02/10 | 12 |
| SAR | KSDA-02 | 145091 | Dipole Antenna | Schmid&Partner Engineering AG | D5GHzV2 | 1070 | 2021/04/20 | 12 |
| SAR | KSDH-01 | 145596 | Device holder | Schmid&Partner Engineering AG | Mounting device for transmitter | - | 2021/09/14 | 12 |
| SAR | KSG-08 | 145109 | Signal Generator | Rohde & Schwarz | SMT06 | 100763 | 2021/09/19 | 12 |
| SAR | SALC-01 | 146112 | Primepure Ethanol | Kanto Chemical Co., Inc. | 14032-79 | - | - | - |
| SAR | SAT20-SARP1 | 160521 | Attenuator | Weinschel - API Technologies Corp | 4M-20 | - | 2021/12/01 | 12 |
| SAR | SAT6-SAR1 | 145160 | Attenuator | Huber+Suhner | 6806.17.A | 766429-1 | 2021/12/01 | 12 |
| SAR | SCC-SAR2 | 145405 | Coaxial Cable | Huber+Suhner | SF104A/11PC3542/11N451/4M | MY699/4A | 2021/12/01 | 12 |
| SAR | SEPP-02 | 145500 | Dielectric probe | Schmid&Partner Engineering AG | DAK3.5 | 1129 | 2021/04/14 | 12 |
| SAR | SOS-26 | 191844 | Humidity Indicator | CUSTOM. Inc | CTH-201 | - | 2021/08/02 | 12 |
| SAR | SOS-SAR2 | 201967 | Digital thermomoter | HANNA | Checktemp-4 | A01440226111 | 2021/10/13 | 12 |
| SAR | SOS-SAR3 | 201968 | Digital thermomoter | HANNA | Checktemp-4 | A01310946111 | 2021/10/13 | 12 |
| SAR | SPB-02 | 146235 | Dosimetric E-Field Probe | Schmid&Partner Engineering AG | EX3DV4 | 3907 | 2021/04/21 | 12 |
| SAR | SRU-06 | 150560 | Measuring Tool, Ruler | SHINWA | 14001 | -- | 2021/02/10 | 12 |
| SAR | SSA-04 | 146176 | Spectrum Analyzer | ADVANTEST | R3272 | 101100994 | - | - |
| SAR | SSAR-02 | 146177 | SAR measurement system | Schmid&Partner Engineering AG | DASY5 | 1324 | - | - |
| SAR | SSDA-R01 | 145558 | Dipole Antenna | Schmid&Partner Engineering AG | D2450V2 | 765 | 2021/05/12 | 12 |
| SAR | SSDH-02 | 145723 | Laptop holder | Schmid&Partner Engineering AG | SM LH1 001 C | - | - | - |
| SAR | SSLHTV6-01 | 207714 | Head Tissue Simulating Liquid | Schmid&Partner Engineering AG | HBBL600-10000V6 | SL AAH U16 BC | - | - |
| SAR | SSNA-01 | 146258 | Network Analyzer | Keysight Technologies Inc | 8753ES | US39171777 | 2021/11/09 | 12 |
| SAR | SSRBT-02 | 145621 | SAR robot | Schmid&Partner Engineering AG | TX60 Lspeag | F12/5L2QA1/A/01 | 2021/09/14 | 12 |
| SAR | SWTR-03 | 146185 | DI water | MonotaRo | 34557433 | - | - | - |

*. Local ID: SALC-01, 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

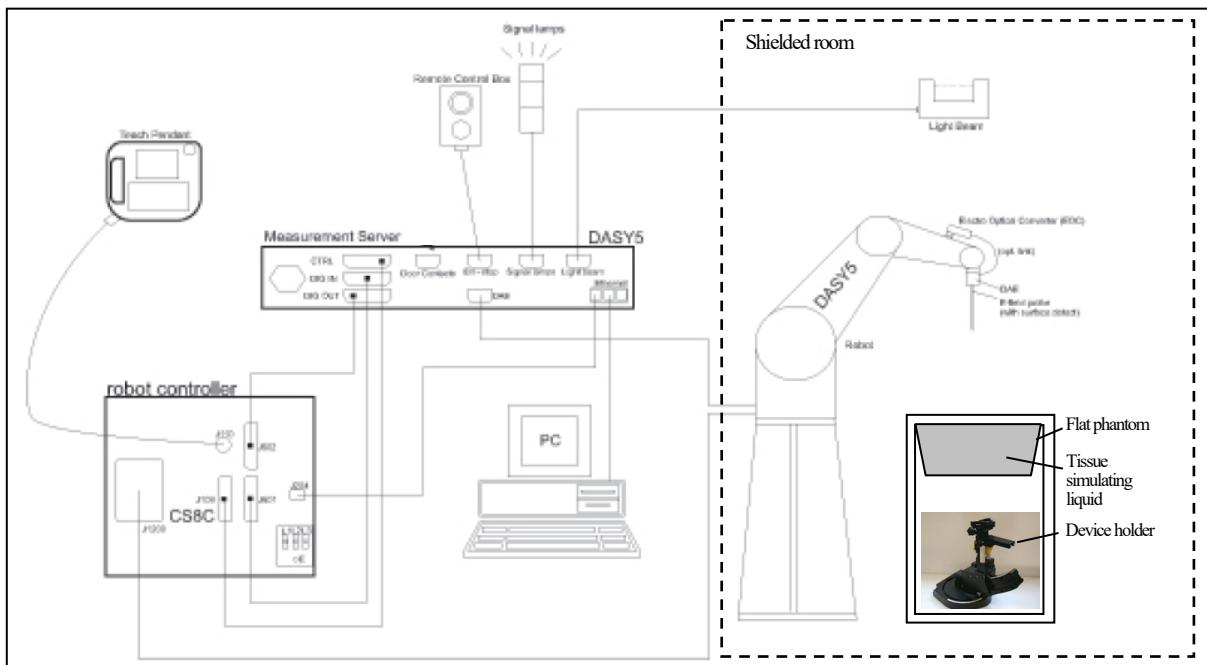
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Appendix 3-2: Configuration and peripherals

These measurements were performed with the automated near-field scanning system DASY5 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 ± 0.02 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.



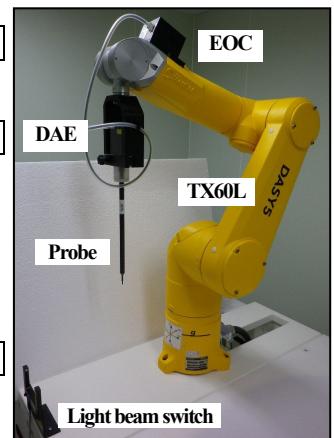
The DASY5 system for performing compliance tests consist of the following items:

| | |
|----|---|
| 1 | A standard high precision 6-axis robot (Stäubli TX/RX family) with controller, teach pendant and software. |
| | An arm extension for accommodating the data acquisition electronics (DAE). |
| 2 | An isotropic field probe optimized and calibrated for the targeted measurement. |
| 3 | A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC. |
| 4 | The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server. |
| 5 | The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts. |
| 6 | The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning. |
| 7 | A computer running Win7 professional operating system and the DASY5 software. |
| 8 | Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc. |
| 9 | The phantom. |
| 10 | The device holder for EUT. (low-loss dielectric palette) (*. when it was used.) |
| 11 | Tissue simulating liquid mixed according to the given recipes. |
| 12 | Validation dipole kits allowing to validate the proper functioning of the system. |

Appendix 3-3: Test system specification

TX60 Lsepag robot/CS8Csepag-TX60 robot controller

- Number of Axes : 6
- Repeatability : ± 0.02 mm
- Manufacture : Stäubli Unimation Corp.



DASY5 Measurement server

- Features : The DASY5 measurement server is based on a PC/104 CPU board with a 400MHz intel ULV Celeron, 128MB chip-disk and 128MB RAM. The necessary circuits for communication with the DAE4 electronics box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY5 I/O board, which is directly connected to the PC/104 bus of the CPU board.
- Calibration : No calibration required.
- Manufacture : Schmid & Partner Engineering AG



Data Acquisition Electronic (DAE)

- Features : Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY5 embedded system (fully remote controlled). 2 step probe touch detector for mechanical surface detection and emergency robot stop (not in -R version)
- Measurement Range : $1 \mu\text{V}$ to $> 200 \text{ mV}$ (16bit resolution and 2 range settings: 4 mV, 400 mV)
- Input Offset voltage : $< 1 \mu\text{V}$ (with auto zero)
- Input Resistance : $200 \text{ M}\Omega$
- Battery Power : > 10 hrs. of operation (with two 9 V battery)
- Manufacture : Schmid & Partner Engineering AG



Electro-Optical Converter (EOC61)

- Manufacture : Schmid & Partner Engineering AG

Light Beam Switch (LB5/80)

- Manufacture : Schmid & Partner Engineering AG

SAR measurement software

- Item : Dosimetric Assessment System DASY5
- Software version : Refer to Appendix 3-1 (Equipment used)
- Manufacture : Schmid & Partner Engineering AG



E-Field Probe

- Model : EX3DV4 (serial number: 3907)
- Construction : Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).
- Frequency : 10MHz to 6GHz, Linearity: ± 0.2 dB (30MHz to 6GHz)
- Conversion Factors (CF) : Head: (2.45, 5.25, 5.6, 5.8) GHz
Body: (2.45, 5.25, 5.6, 5.75) GHz
- Directivity : ± 0.3 dB in HSL (rotation around probe axis)
 ± 0.5 dB in tissue material (rotation normal to probe axis)
- Dynamic Range : $10 \mu\text{W/g}$ to $> 100 \text{ mW/g}$; Linearity: ± 0.2 dB (noise: typically $< 1 \mu\text{W/g}$)
- Dimension : Overall length: 330 mm (Tip: 20 mm)
Tip diameter: 2.5 mm (Body: 12 mm)
Typical distance from probe tip to dipole centers: 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



Phantom

- Model Number : **ELI 4.0 oval flat phantom**
- Shell Material : Fiberglass
- Shell Thickness : Bottom plate: 2 ± 0.2 mm
- Dimensions : Bottom elliptical: 600x400 mm, Depth: 190 mm (Volume: Approx. 30 liters)
- Manufacture : Schmid & Partner Engineering AG



Device Holder

- Urethane foam
- KSDH-01: In combination with the ELI4, 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
- SSDH-02: 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

Data storage and evaluation (postprocessing)

The DASY5 software stores the measured voltage acquired by the Data Acquisition Electronics (DAE) as raw data together with all the necessary software parameters for the data evaluation (probe calibration data, liquid parameters and communication system parameters) in measurement files with the extension “.da5x”. The postprocessing software evaluates the data every time the data is visualized or exported.

The fields and SAR are calculated from the measured voltage (probe voltage acquired by the DAE) and the following parameters:

| | | |
|--------------------|-------------------------------------|-----------------------------|
| Probe parameters: | - Sensitivity | <i>normi, ai0, ai1, ai2</i> |
| | - Conversion Factor | <i>convFi</i> |
| | - Diode Compression Point | <i>dcp<i>i</i></i> |
| | - Probe Modulation Response Factors | <i>ai, bi, ci, d</i> |
| Device parameters: | - Frequency | <i>f</i> |
| | - Crest factor | <i>cf</i> |
| Media parameters: | - Conductivity | <i>σ</i> |
| | - Relative Permittivity | <i>ρ</i> |

This parameters are stored in the DASY5 V52 measurement file.

These parameters must be correctly set in the DASY5 V52 software setup. They are available as configuration file and can be imported into the measurement file. The values displayed in the multimeter window are assessed using the parameters of the actual system setup. In the scan visualization and export modes, the parameters stored in the measurement file are used.

The measured voltage is not proportional to the exciting. It must be first linearized.

Approximated Probe Response Linearization using Crest Factor;

This linearization method is enabled when a custom defined communication system is measured. The compensation applied is a function of the measured voltage, the detector diode compression point and the crest factor of the measured signal.

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

| | | | |
|------|------------------------|---|------------------------------|
| with | <i>V_i</i> | = linearized voltage of channel i in μ V | (i = x,y,z) |
| | <i>U_i</i> | = measured voltage of channel i in μ V | (i = x,y,z) |
| | <i>cf</i> | = crest factor of exciting field | (DASY parameter) |
| | <i>dcp_i</i> | = diode compression point of channel i in μ V | (Probe parameter, i = x,y,z) |

The resulting linearized voltage is only approximated because the probe is not calibrated to this specific signal.

Field and SAR Calculation

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

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

| | | | |
|------|-------------------------|--|-------------|
| with | <i>V_i</i> | = linearized voltage of channel i in μ V | (i = x,y,z) |
| | <i>Norm_i</i> | = sensor sensitivity of channel i in μ V/(V/m) ² for E-field Probes | (i = x,y,z) |
| | <i>ConvF</i> | = sensitivity enhancement in solution | |
| | <i>E_i</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 primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1'000}$$

| | | |
|------|------------------------|---|
| with | <i>SAR</i> | = local specific absorption rate in mW/g |
| | <i>E_{tot}</i> | = total field strength in V/m |
| | <i>σ</i> | = conductivity in [mho/m] or [Siemens/m] |
| | <i>ρ</i> | = equivalent tissue density in g/cm^3 |

Appendix 3-4: Simulated tissue composition and parameter confirmation

| Liquid type | Head | Control No. | SSLHV6-01 | Model No. / Product No. | HBBL600-10000V6 / SLAAH 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 | | | | | $\pm 10\%$ |
| Temperature gradients [% / deg.C] | | | | permittivity: -0.19 / conductivity: -0.57 (at 2.6 GHz), permittivity: +0.31 / conductivity: -1.43 (at 5.5 GHz) (*1) | |
| Manufacture | Schmid & Partner Engineering AG | | | Note: *1. speag 920-SLAaxy-E 1.12.15CL (Maintenance of tissue simulating liquid) | |

*. The dielectric parameters were checked prior to assessment using the DAK3.5 dielectric probe kit.

| Date measured | Frequency [MHz] | Liquid type | Liquid parameters (*a) | | | | | | | | | ΔSAR (*b) | | | | | | |
|-------------------|-----------------|-------------|------------------------|----------|---------|------------------------------|-----------------------|--------|----------|--------------------|-------|-----------|--------|---------|-----|---|-----|-----|
| | | | Ambient | | | Liquid depth of phantom [mm] | Permittivity (er) [-] | | | Conductivity [S/m] | | | 1g [%] | 10g [%] | | | | |
| | | | Target | Measured | Δer [%] | | Δend, >48hrs | Target | Measured | Δσ [%] | Limit | | | | | | | |
| December 6, 2021 | 5250 | Head | 23 | 35-40 | 22.5 | 150 | 35.93 | 35.08 | -2.4 | 10% | - | 4.706 | 4.492 | -4.6 | 10% | - | 0.6 | 0.8 |
| December 7, 2021 | 5600 | Head | 23 | 40-50 | 22.5 | 150 | 35.53 | 34.51 | -2.9 | 10% | - | 5.065 | 4.878 | -3.7 | 10% | - | 0.7 | 0.9 |
| December 7, 2021 | 5800 | Head | 23 | 40-50 | 22.5 | 150 | 35.3 | 34.18 | -3.2 | 10% | - | 5.27 | 5.103 | -3.2 | 10% | - | 0.8 | 0.9 |
| December 8, 2021 | 2450 | Head | 24 | 40-50 | 22.5 | 150 | 39.2 | 39.58 | 1.0 | 10% | - | 1.80 | 1.839 | 2.2 | 10% | - | 0.8 | 0.4 |
| December 9, 2021 | 5250 | Head | 24 | 40-50 | 22.5 | 150 | 35.93 | 35.01 | -2.6 | 10% | - | 4.706 | 4.488 | -4.6 | 10% | - | 0.6 | 0.9 |
| December 10, 2021 | 5600 | Head | 24 | 45-55 | 22.5 | 150 | 35.53 | 34.39 | -3.2 | 10% | - | 5.065 | 4.886 | -3.5 | 10% | - | 0.8 | 1.0 |
| December 10, 2021 | 5800 | Head | 24 | 45-55 | 22.5 | 150 | 35.3 | 34.14 | -3.3 | 10% | - | 5.27 | 5.124 | -2.8 | 10% | - | 0.8 | 0.9 |

*. Calculating formula: $\Delta\text{end}(>48 \text{ hrs}) (\%) = \{(\text{dielectric properties, end of test series}) / (\text{dielectric properties, beginning of test series}) - 1\} \times 100$

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

| f (MHz) | Standard | | | | | | Interpolated & Extrapolated | | | | | | | | | | | | |
|-------------|-------------|-------------|---------|-------------|-------------|---------|-----------------------------|-------------|---------|-------------|-------------|---------|-------|-------|------|-------|-------|-------|-------|
| | Head Tissue | Body Tissue | f (MHz) | Head Tissue | Body Tissue | f (MHz) | Head Tissue | Body Tissue | f (MHz) | Head Tissue | Body Tissue | f (MHz) | | | | | | | |
| | er | σ [S/m] | er | σ [S/m] | er | σ [S/m] | er | σ [S/m] | er | σ [S/m] | er | σ [S/m] | | | | | | | |
| (1800)-2000 | 40.0 | 1.40 | 53.3 | 1.52 | 3000 | 38.5 | 2.40 | 52.0 | 2.73 | 5250 | 35.93 | 4.706 | 48.95 | 5.358 | 5750 | 35.36 | 5.219 | 48.27 | 5.942 |
| 2450 | 39.2 | 1.80 | 52.7 | 1.95 | 5800 | 35.3 | 5.27 | 48.2 | 6.00 | 5600 | 35.53 | 5.065 | 48.47 | 5.766 | | | | | |

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

$$\Delta\text{SAR}(1\text{g}) = \text{Cer} \times \Delta\sigma + \text{Cσ} \times \Delta\sigma, \text{Cer} = 7.854E-4\text{f}^3 + 9.402E-3 \times \text{f}^2 - 2.742E-2 \times \text{f} + 0.2026 / \text{Cσ} = 9.804E-3 \times \text{f}^3 - 8.661E-2 \times \text{f}^2 + 2.981E-2 \times \text{f} + 0.7829$$

$$\Delta\text{SAR}(10\text{g}) = \text{Cer} \times \Delta\sigma + \text{Cσ} \times \Delta\sigma, \text{Cσ} = 3.456E-3 \times \text{f}^3 - 3.531E-3 \times \text{f}^2 + 7.675E-2 \times \text{f} + 0.1860 / \text{Cσ} = 4.479E-3 \times \text{f}^3 - 1.586E-2 \times \text{f}^2 - 0.1972 \times \text{f} + 0.7717$$

Appendix 3-5: Daily check results

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

| Date | Frequency [MHz] | ΔSAR | | | | Daily check results (*). Meas.: Measured, Cal.: Calibration value, STD: Standard value) | | | | | | SAR (1g) [W/kg] (*d) | | | | | | SAR (10g) [W/kg] (*d) | | | | | |
|-------------------|-----------------|-------------|--------|---------|------------|---|------------------|----------|----------|---------|-----------|----------------------|------------|--------------|-----------|------------------|----------|-----------------------|---------|-----------|--------|------|--|
| | | Liquid Type | 1g [%] | 10g [%] | Meas. (*c) | ASAR-correct | Target Cal. (*e) | STD (*f) | Cal. [%] | STD [%] | Limit [%] | Pass ? | Meas. (*c) | ASAR-correct | 1W scaled | Target Cal. (*e) | STD (*f) | Cal. [%] | STD [%] | Limit [%] | Pass ? | | |
| | | | 1g [%] | 10g [%] | Meas. (*c) | ASAR-correct | | | | | | | | | | | | | | | | | |
| December 6, 2021 | 5250 | Head | 0.6 | 0.8 | 7.8 | 7.75 | 77.5 | 78.8 | n/a | -1.6 | - | ±10 | Pass | 2.25 | 2.23 | 22.3 | 22.6 | n/a | -1.3 | - | ±10 | Pass | |
| December 7, 2021 | 5600 | Head | 0.7 | 0.9 | 8.57 | 8.51 | 85.1 | 82.4 | n/a | 3.3 | - | ±10 | Pass | 2.42 | 2.4 | 24 | 23.4 | n/a | 2.6 | - | ±10 | Pass | |
| December 7, 2021 | 5800 | Head | 0.8 | 0.9 | 7.93 | 7.87 | 78.7 | 80.1 | 78 | -1.7 | 0.9 | ±10 | Pass | 2.26 | 2.24 | 22.4 | 22.5 | 21.9 | -0.4 | 2.3 | ±10 | Pass | |
| December 8, 2021 | 2450 | Head | 0.8 | 0.4 | 13.4 | 13.29 | 53.16 | 52.7 | 52.4 | 0.9 | 1.5 | ±10 | Pass | 6.22 | 6.2 | 24.8 | 24.5 | 24 | 1.2 | 3.3 | ±10 | Pass | |
| December 9, 2021 | 5250 | Head | 0.6 | 0.9 | 7.8 | 7.75 | 77.5 | 78.8 | n/a | -1.6 | - | ±10 | Pass | 2.25 | 2.23 | 22.3 | 22.6 | n/a | -1.3 | - | ±10 | Pass | |
| December 10, 2021 | 5600 | Head | 0.8 | 1.0 | 8.55 | 8.48 | 84.8 | 82.4 | n/a | 2.9 | - | ±10 | Pass | 2.43 | 2.41 | 24.1 | 23.4 | n/a | 3.0 | - | ±10 | Pass | |
| December 10, 2021 | 5800 | Head | 0.8 | 0.9 | 7.97 | 7.91 | 79.1 | 80.1 | 78 | -1.2 | 1.4 | ±10 | Pass | 2.27 | 2.25 | 22.5 | 22.5 | 21.9 | 0.0 | 2.7 | ±10 | Pass | |

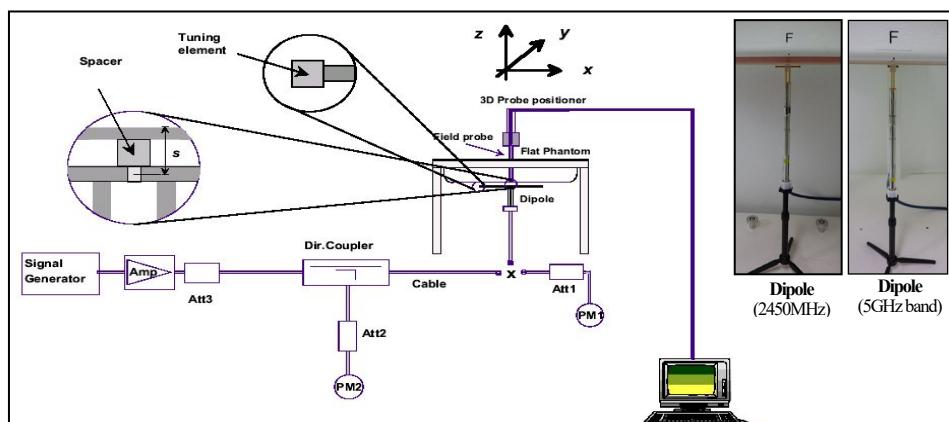
*. Calculating formula: $\Delta\text{SAR} \text{ corrected SAR (1g,10g) (W/kg)} = (\text{Measured SAR(1g,10g) (W/kg)} / (100 - (\Delta\text{SAR}(\%))) / 100$

*c. The "Meas. (Measured)" SAR value is obtained at 250 mW for 2450MHz, 100 mW for (5250, 5600, 5800) MHz

*d. 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 manufacturer's calibration target value which was normalized.

*e. The target value is a parameter defined in the calibration data sheet of D2450V2 (sn:765) and D5GHZV2 (sn:1070) dipole calibrated by Schmid & Partner Engineering AG (Certification No. D2450V2-765_May21 and D5GHzV2-1070_Apr21, the data sheet was filed in this report).

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



Test setup for the system performance check

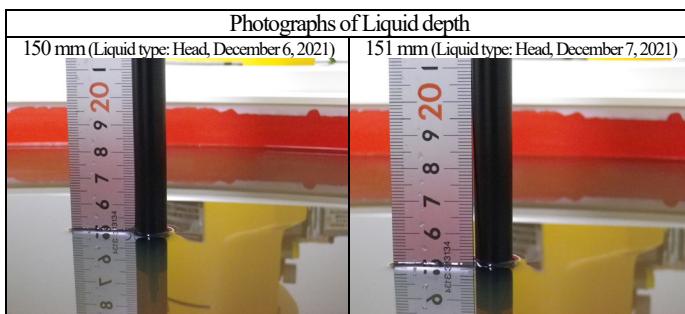
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Appendix 3-6: Daily check measurement data



EUT: Dipole(5GHz); Type: D5GHzV2; Serial: 1070; Forward conducted power: 100mW

Communication System: CW (0) (*.UID: 0, Frame Length in ms: 0; Communication System PAR: 0; PMF: 1); Frequency: 5250 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: $f = 5250$ MHz; $\sigma = 4.491$ S/m; $\epsilon_r = 35.08$; $\rho = 1000$ kg/m³

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
 -DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(5.14, 5.14, 5.14) @ 5250 MHz; Calibrated: 2021/04/21
 -Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 1.0, 25.0, 156.0$

Area:60x60,10 (7x7x1): Measurement grid: $dx=10$ mm, $dy=10$ mm; Maximum value of SAR (measured) = 19.0 W/kg

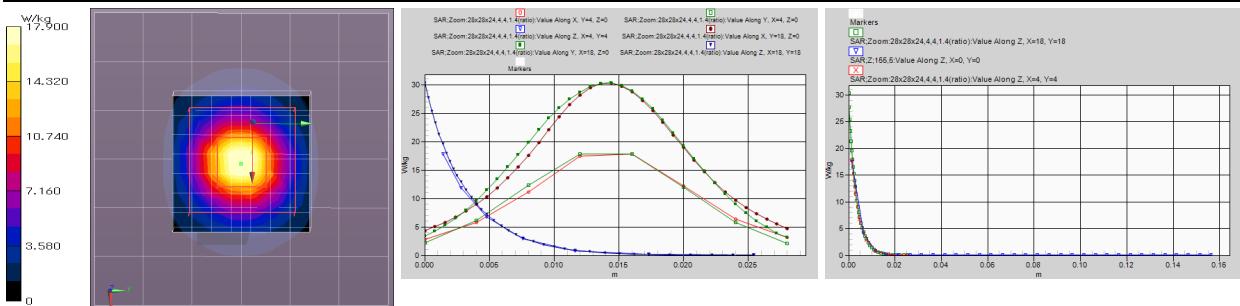
Area:60x60,10 (61x61x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm; Maximum value of SAR (interpolated) = 19.0 W/kg

Z;155,5 (1x1x32): Measurement grid: $dx=20$ mm, $dy=20$ mm, $dz=5$ mm; Maximum value of SAR (measured) = 17.6 W/kg

Zoom:28x28x24,4,4,1,4(ratio) (8x8x7)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=1.4$ mm;

Reference Value = 72.21 V/m; Power Drift = -0.05 dB; Maximum value of SAR (measured) = 17.9 W/kg; Peak SAR (extrapolated) = 30.3 W/kg

SAR(1 g) = 7.8 W/kg; SAR(10 g) = 2.25 W/kg (*.Smallest distance from peaks to all points 3 dB below = 7.2 mm; Ratio of SAR at M2 to SAR at M1 = 66.6%)



Remarks: * . Date tested: 2021/12/6; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

* . liquid depth: 150 mm; Position: distance of dipole to phantom: 8mm (10mm to liquid); ambient: 24 deg.C. / (40-45) %RH,

* . liquid temperature: 22.4(start)/22.3(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) / small=SAR(1g)

EUT: Dipole(5GHz); Type: D5GHzV2; Serial: 1070; Forward conducted power: 100mW

Communication System: CW (0) (*.UID: 0, Frame Length in ms: 0; Communication System PAR: 0; PMF: 1); Frequency: 5600 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: $f = 5600$ MHz; $\sigma = 4.878$ S/m; $\epsilon_r = 34.51$; $\rho = 1000$ kg/m³

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
 -DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(4.56, 4.56, 4.56) @ 5600 MHz; Calibrated: 2021/04/21
 -Sensor-Surface: 1.4mm (Mechanical Surface Detection), $z = 1.0, 25.0, 156.0$

Area:60x60,10 (7x7x1): Measurement grid: $dx=10$ mm, $dy=10$ mm; Maximum value of SAR (measured) = 22.1 W/kg

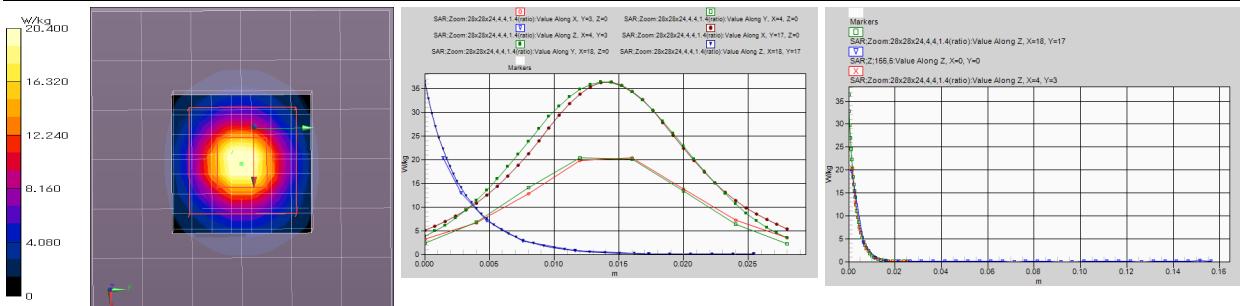
Area:60x60,10 (61x61x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm; Maximum value of SAR (interpolated) = 22.2 W/kg

Z;155,5 (1x1x32): Measurement grid: $dx=20$ mm, $dy=20$ mm, $dz=5$ mm; Maximum value of SAR (measured) = 19.6 W/kg

Zoom:28x28x24,4,4,1,4(ratio) (8x8x7)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=1.4$ mm;

Reference Value = 74.32 V/m; Power Drift = -0.09 dB; Maximum value of SAR (measured) = 20.4 W/kg; Peak SAR (extrapolated) = 36.4 W/kg

SAR(1 g) = 8.57 W/kg; SAR(10 g) = 2.42 W/kg (*.Smallest distance from peaks to all points 3 dB below = 7.2 mm; Ratio of SAR at M2 to SAR at M1 = 63.8%)



Remarks: * . Date tested: 2021/12/7; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

* . liquid depth: 150 mm; Position: distance of dipole to phantom: 8mm (10mm to liquid); ambient: 23 deg.C. / (45~50) %RH,

* . liquid temperature: 22.5(start)/22.4(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) / small=SAR(1g)

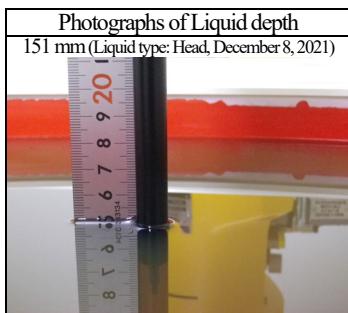
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Appendix 3-6: Daily check measurement data (cont'd)



EUT: Dipole(5GHz); Type: D5GHzV2; Serial: 1070; Forward conducted power: 100mW

Communication System: CW (0) (*.UID: 0, Frame Length in ms: 0; Communication System PAR: 0; PMF: 1); Frequency: 5800 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5800 MHz; $\sigma = 5.103 \text{ S/m}$; $\epsilon_r = 34.18$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section -DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(4.6, 4.6, 4.6) @ 5800 MHz; Calibrated: 2021/04/21 -Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

Area:60x60,10 (7x7x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 21.0 W/kg

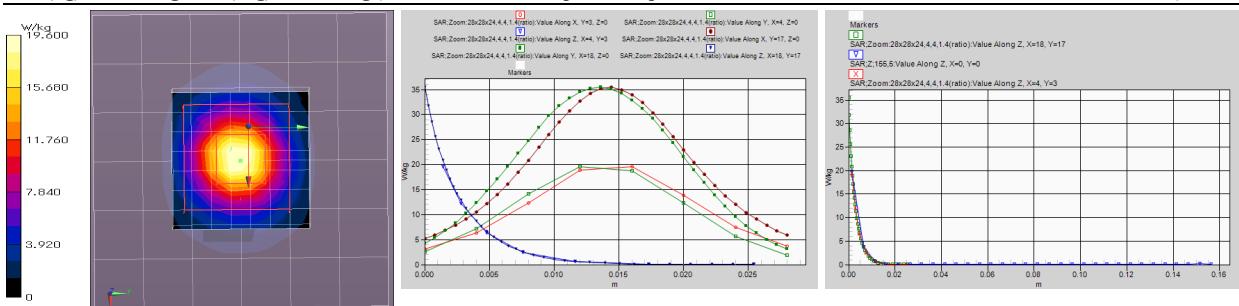
Area:60x60,10 (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 21.0 W/kg

Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 19.8 W/kg

Zoom:28x28x24,4,4,1,4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 70.39 V/m; Power Drift = 0.08 dB; Maximum value of SAR (measured) = 19.6 W/kg; Peak SAR (extrapolated) = 35.5 W/kg

SAR(1 g) = 7.93 W/kg; SAR(10 g) = 2.26 W/kg *.Smallest distance from peaks to all points 3 dB below = 7.6 mm; Ratio of SAR at M2 to SAR at M1 = 62%



Remarks: *. Date tested: 2021/12/7; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

*. liquid depth: 150 mm; Position: distance of dipole to phantom: 8mm (10mm to liquid); ambient: 24 deg.C. / (45~50) %RH,

*. liquid temperature: 22.3(start)/22.3(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10 g)/small=SAR(1g)

EUT: Dipole(2.45GHz); Type: D2450V2; Serial: SN765; Forward conducted power: 250mW

Communication System: CW (0) (*.UID: 0, Frame Length in ms: 0; Communication System PAR: 0; PMF: 1); Frequency: 2450 MHz; Crest Factor: 1.0

Medium: HSL5GHz(v6.2112); Medium parameters used: f = 2450 MHz; $\sigma = 1.839 \text{ S/m}$; $\epsilon_r = 39.58$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section -DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(7.35, 7.35, 7.35) @ 2450 MHz; Calibrated: 2021/04/21 -Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0, 161.0

Area:60x60,15 (5x5x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 19.5 W/kg

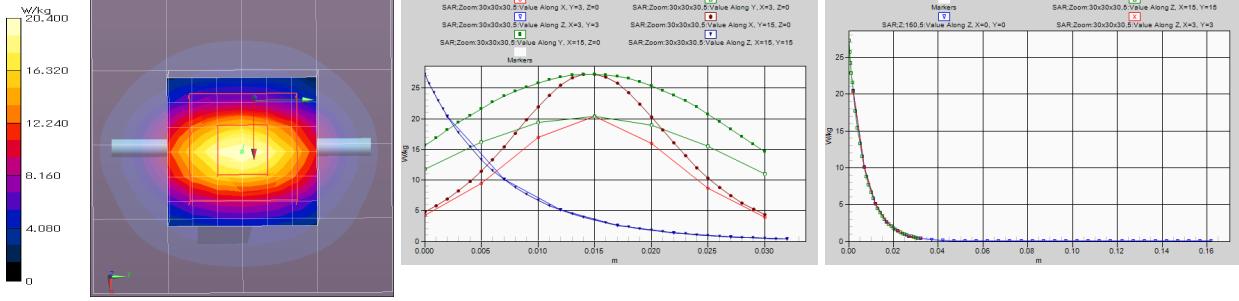
Area:60x60,15 (41x41x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm; Maximum value of SAR (interpolated) = 19.9 W/kg

Z;160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 20.5 W/kg

Zoom:30x30x30,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;

Reference Value = 105.7 V/m; Power Drift = -0.01 dB; Maximum value of SAR (measured) = 20.4 W/kg; Peak SAR (extrapolated) = 27.3 W/kg

SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.22 W/kg *.Smallest distance from peaks to all points 3 dB below = 9 mm; Ratio of SAR at M2 to SAR at M1 = 49.3%



Remarks: *. Date tested: 2021/12/8; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

*. liquid depth: 150 mm; Position: distance of dipole to phantom: 8mm (10mm to liquid); ambient: 25 deg.C. / (50~55) %RH,

*. liquid temperature: 22.3(start)/22.3(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10 g)/small=SAR(1g)

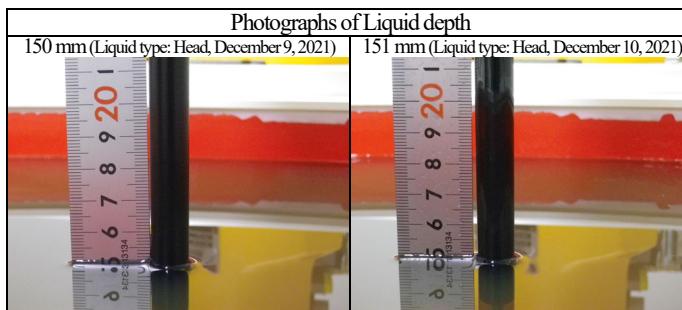
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Appendix 3-6: Daily check measurement data (cont'd)



EUT: Dipole(5GHz); Type: D5GHzV2; Serial: 1070; Forward conducted power: 100mW

Communication System: CW (0) (*.UID: 0, Frame Length in ms: 0; Communication System PAR: 0; PMF: 1); Frequency: 5250 MHz; Crest Factor: 1.0
Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5250 MHz; $\sigma = 4.488 \text{ S/m}$; $\epsilon_r = 35.01$; $\rho = 1000 \text{ kg/m}^3$
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section -DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(5.14, 5.14, 5.14) @ 5250 MHz; Calibrated: 2021/04/21 -Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

Area:60x60,10 (7x7x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 19.0 W/kg

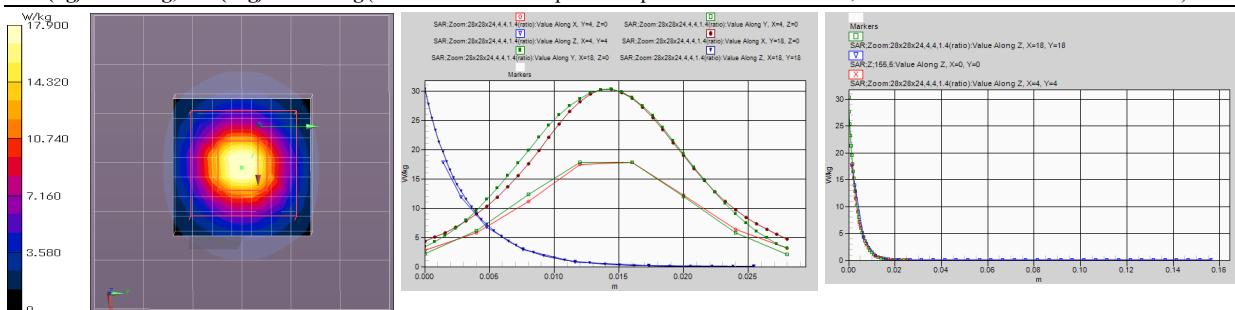
Area:60x60,10 (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 19.0 W/kg

Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 17.5 W/kg

Zoom:28x28x24,4,4,1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 72.62 V/m; Power Drift = 0.04 dB; Maximum value of SAR (measured) = 17.9 W/kg; Peak SAR (extrapolated) = 30.3 W/kg

SAR(1 g) = 7.8 W/kg; SAR(10 g) = 2.25 W/kg (*.Smallest distance from peaks to all points 3 dB below = 7.2 mm; Ratio of SAR at M2 to SAR at M1 = 66.7%)



Remarks: * Date tested: 2021/12/9; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

* liquid depth: 150 mm; Position: distance of dipole to phantom: 8mm (10mm to liquid); ambient: 24 deg.C. / (45~50) %RH,

* liquid temperature: 22.4(start)/22.4(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) ysmall=SAR(1g)

EUT: Dipole(5GHz); Type: D5GHzV2; Serial: 1070; Forward conducted power: 100mW

Communication System: CW (0) (*.UID: 0, Frame Length in ms: 0; Communication System PAR: 0; PMF: 1); Frequency: 5600 MHz; Crest Factor: 1.0
Medium: HSL5GHz(v6.2112); Medium parameters used: f = 5600 MHz; $\sigma = 4.886 \text{ S/m}$; $\epsilon_r = 34.394$; $\rho = 1000 \text{ kg/m}^3$
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section -DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(4.56, 4.56, 4.56) @ 5600 MHz; Calibrated: 2021/04/21 -Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

Area:60x60,10 (7x7x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 21.9 W/kg

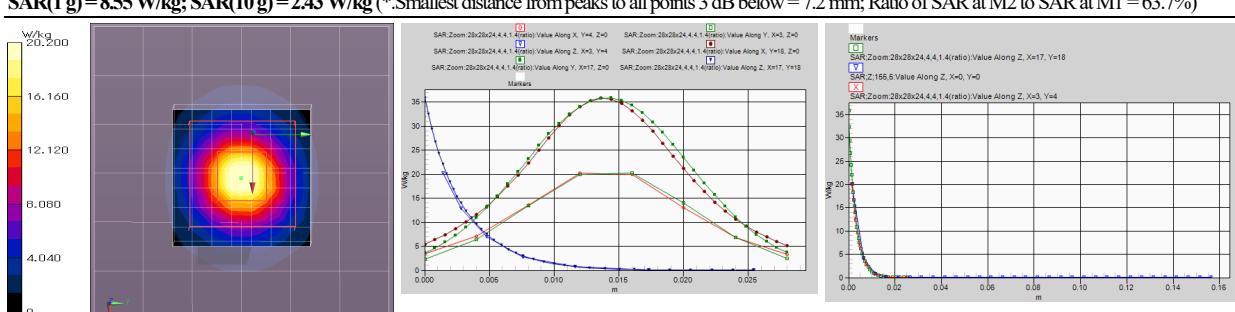
Area:60x60,10 (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 22.1 W/kg

Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 20.0 W/kg

Zoom:28x28x24,4,4,1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 74.42 V/m; Power Drift = -0.03 dB; Maximum value of SAR (measured) = 20.2 W/kg; Peak SAR (extrapolated) = 35.9 W/kg

SAR(1 g) = 8.55 W/kg; SAR(10 g) = 2.43 W/kg (*.Smallest distance from peaks to all points 3 dB below = 7.2 mm; Ratio of SAR at M2 to SAR at M1 = 63.7%)



Remarks: * Date tested: 2021/12/10; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

* liquid depth: 150 mm; Position: distance of dipole to phantom: 8mm (10mm to liquid); ambient: 24 deg.C. / (45~55) %RH,

* liquid temperature: 22.4(start)/22.4(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) ysmall=SAR(1g)

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Appendix 3-6: Daily check measurement data (cont'd)

EUT: Dipole(5GHz); Type: D5GHzV2; Serial: 1070; Forward conducted power: 100mW

Communication System: CW (0) (*.UID: 0, Frame Length in ms: 0; Communication System PAR: 0; PMF: 1); Frequency: 5600 MHz; Crest Factor: 1.0
Medium: HSL5GHz(v6.2112); Medium parameters used: $f = 5800$ MHz; $\sigma = 5.124$ S/m; $\epsilon_r = 34.14$; $\rho = 1000$ kg/m³
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn554; Calibrated: 2021/04/13 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section -DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(4.6, 4.6, 4.6)@ 5800 MHz; Calibrated: 2021/04/21
-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

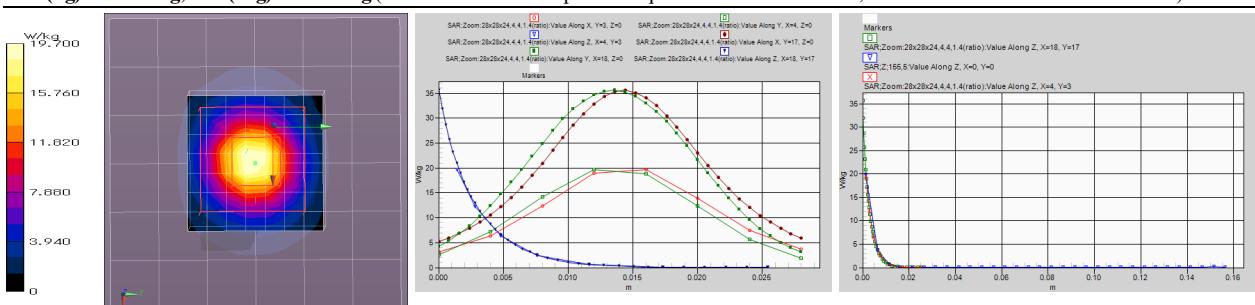
Area:60x60,10 (7x7x1): Measurement grid; dx=10mm, dy=10mm; Maximum value of SAR (measured) = 21.1 W/kg

Area:60x60,10 (61x61x1): Interpolated grid; dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 21.1 W/kg
Z:155.5 (1x1x32): Measurement grid; dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 19.9 W/kg

Zoom:28x28x24,4,4,1.4(ratio) (8x8x7)/Cube 0: Measurement grid; dx=4mm, dy=4mm, dz=1.4mm;

Reference Value = 71.02 V/m; Power Drift = 0.04 dB; Maximum value of SAR (measured) = 19.7 W/kg; Peak SAR (extrapolated) = 35.6 W/kg

SAR(1 g) = 7.97 W/kg; SAR(10 g) = 2.27 W/kg (*.Smallest distance from peaks to all points 3 dB below = 7.6 mm; Ratio of SAR at M2 to SAR at M1 = 63%)



Remarks: * Date tested: 2021/12/10; Tested by: Hiroshi Naka; Tested place: No.7 shielded room,

* liquid depth: 150 mm; Position: distance of dipole to phantom: 8mm (10mm to liquid); ambient: 24 deg.C. / (45~55) %RH,

* liquid temperature: 22.4(start)/22.4(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g) ysmall=SAR(1g)

Appendix 3-7: Uncertainty Assessment (SAR measurement/Daily check)

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

| Uncertainty of SAR measurement (2.4GHz~6GHz) (*.v6h,ε&σ: 10%, DAK3.5, Tx:~100% duty cycle) (v09r02) | | | | | | | 1g SAR | 10g SAR |
|---|--|-------------------|--------------------------|------------|---------|----------|--------------------|--------------------|
| Combined measurement uncertainty of the measurement system (k=1) | | | | | | | ± 13.2 % | ± 13.1 % |
| Expanded uncertainty (k=2) | | | | | | | ± 26.4 % | ± 26.2 % |
| | Error Description (2.4-6GHz) | Uncertainty Value | Probability distribution | Divisor | ci (1g) | ci (10g) | ui (1g) | ui (10g) |
| A | Measurement System (DASY5) | | | | | | (std. uncertainty) | (std. uncertainty) |
| 1 | Probe Calibration Error | ±7.0 % | Normal | 1 | 1 | 1 | ±7.0 % | ±7.0 % |
| 2 | Axial isotropy Error | ±4.7 % | Rectangular | $\sqrt{3}$ | 0.71 | 0.71 | ±1.9 % | ±1.9 % |
| 3 | Hemispherical isotropy Error | ±9.6 % | Rectangular | $\sqrt{3}$ | 0.71 | 0.71 | ±3.9 % | ±3.9 % |
| 4 | Linearity Error | ±4.7 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±2.7 % | ±2.7 % |
| 5 | Probe modulation response (v09) | ±5.5 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±3.2 % | ±3.2 % |
| 6 | Sensitivity Error (detection limit) | ±1.0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±0.6 % | ±0.6 % |
| 7 | Boundary effects Error | ±4.3 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±2.5 % | ±2.5 % |
| 8 | Readout Electronics Error(DAE) | ±0.3 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±0.3 % | ±0.3 % |
| 9 | Response Time Error | ±0.8 % | Normal | 1 | 1 | 1 | ±0.5 % | ±0.5 % |
| 10 | Integration Time Error (~100% duty cycle) | ±0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | 0 % | 0 % |
| 11 | RF ambient conditions-noise (v09) | ±1.0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±0.6 % | ±0.6 % |
| 12 | RF ambient conditions-reflections | ±3.0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±1.7 % | ±1.7 % |
| 13 | Probe positioner mechanical tolerance | ±3.3 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±1.9 % | ±1.9 % |
| 14 | Probe Positioning with respect to phantom shell | ±6.7 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±3.9 % | ±3.9 % |
| 15 | Max. SAR evaluation (Post-processing) | ±4.0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±2.3 % | ±2.3 % |
| B | Test Sample Related | | | | | | | |
| 16 | Device Holder or Positioner Tolerance (v09) | ±3.2 % | Normal | 1 | 1 | 1 | ±3.2 % | ±3.2 % |
| 17 | Test Sample Positioning Error (v09) | ±2.1 % | Normal | 1 | 1 | 1 | ±2.1 % | ±2.1 % |
| 18 | Power scaling | ±0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±0 % | ±0 % |
| 19 | Drift of output power (measured, <0.2dB) | ±5.0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±2.9 % | ±2.9 % |
| C | Phantom and Setup | | | | | | | |
| 20 | Phantom uncertainty (shape, thickness tolerances) | ±7.5 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±4.3 % | ±4.3 % |
| 21 | Algorithm for correcting SAR (c',σ: 10%) | ±1.9 % | Normal | 1 | 1 | 0.84 | ±1.9 % | ±1.6 % |
| 22 | Measurement Liquid Conductivity Error (DAK3.5) | ±3.0 % | Normal | 1 | 0.78 | 0.71 | ±2.3 % | ±2.1 % |
| 23 | Measurement Liquid Permittivity Error (DAK3.5) | ±3.1 % | Normal | 1 | 0.23 | 0.26 | ±0.7 % | ±0.8 % |
| 24 | Liquid Conductivity-temp.uncertainty (<2deg.C,v6h) | ±3.0 % | Rectangular | $\sqrt{3}$ | 0.78 | 0.71 | ±1.4 % | ±1.2 % |
| 25 | Liquid Permittivity-temp.uncertainty (<2deg.C,v6h) | ±1.0 % | Rectangular | $\sqrt{3}$ | 0.23 | 0.26 | ±0.1 % | ±0.2 % |
| Combined Standard Uncertainty (v09r02) | | | | | | | ± 13.2 % | ± 13.1 % |
| Expanded Uncertainty (k=2) (v09r02) | | | | | | | ± 26.4 % | ± 26.2 % |

*. This measurement uncertainty budget is suggested by IEEE Std.1528(2013) and determined by Schmid & Partner Engineering AG (DASY5 Uncertainty Budget). Per KDB 865664 D01 (v01r04) SAR Measurement 100 MHz to 6 GHz, Section 2.8.1., when the highest measured SAR(1g) within a frequency band is < 1.5W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std.1528 (2013) is not required in SAR reports submitted for equipment approval.

| Uncertainty of daily check (2.4~6GHz) (*.v6h,ε&σ tolerance: 10%, DAK3.5, CW) (v09r02) | | | | | | | 1g SAR | 10g SAR |
|---|--|-------------------|--------------------------|------------|---------|----------|--------------------|--------------------|
| Combined measurement uncertainty of the measurement system (k=1) | | | | | | | ± 10.8 % | ± 10.7 % |
| Expanded uncertainty (k=2) | | | | | | | ± 21.6 % | ± 21.4 % |
| | Error Description (2.4-6GHz) | Uncertainty Value | Probability distribution | Divisor | ci (1g) | ci (10g) | ui (1g) | ui (10g) |
| A | Measurement System (DASY5) | | | | | | (std. uncertainty) | (std. uncertainty) |
| 1 | Probe Calibration Error | ±7.0 % | Normal | 1 | 1 | 1 | ±7.0 % | ±7.0 % |
| 2 | Axial isotropy error | ±4.7 % | Rectangular | $\sqrt{3}$ | 0.71 | 0.71 | ±1.9 % | ±1.9 % |
| 3 | Hemispherical isotropy error | ±9.6 % | Rectangular | $\sqrt{3}$ | 0 | 0 | 0 % | 0 % |
| 4 | Probe linearity | ±4.7 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±2.7 % | ±2.7 % |
| 5 | Probe modulation response (CW) | ±0.0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | 0 % | 0 % |
| 6 | System detection limit | ±1.0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±0.6 % | ±0.6 % |
| 7 | Boundary effects | ±4.3 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±2.5 % | ±2.5 % |
| 8 | System readout electronics (DAE) | ±0.3 % | Normal | 1 | 1 | 1 | ±0.3 % | ±0.3 % |
| 9 | Response Time Error (<5ms/100ms wait) | ±0.0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | 0 % | 0 % |
| 10 | Integration Time Error (CW) | ±0.0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | 0 % | 0 % |
| 11 | RF ambient conditions-noise | ±3.0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±1.7 % | ±1.7 % |
| 12 | RF ambient conditions-reflections | ±3.0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±1.7 % | ±1.7 % |
| 13 | Probe positioner mechanical tolerance | ±3.3 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±1.9 % | ±1.9 % |
| 14 | Probe positioning with respect to phantom shell | ±6.7 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±3.9 % | ±3.9 % |
| 15 | Max. SAR evaluation (Post-processing) | ±4.0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±2.3 % | ±2.3 % |
| B | Test Sample Related | | | | | | | |
| 16 | Deviation of the experimental source | ±1.9 % | Normal | 1 | 1 | 1 | ±1.9 % | ±1.9 % |
| 17 | Dipole to liquid distance (10mm±0.2mm,<2deg.) | ±2.0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±1.2 % | ±1.2 % |
| 18 | Drift of output power (measured, <0.1dB) | ±2.3 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±1.3 % | ±1.3 % |
| C | Phantom and Setup | | | | | | | |
| 19 | Phantom uncertainty | ±2.0 % | Rectangular | $\sqrt{3}$ | 1 | 1 | ±1.2 % | ±1.2 % |
| 20 | Algorithm for correcting SAR (c',σ: 10%) | ±1.9 % | Normal | 1 | 1 | 0.84 | ±1.9 % | ±1.6 % |
| 21 | Liquid conductivity (meas.) (DAK3.5) | ±3.0 % | Normal | 1 | 0.78 | 0.71 | ±2.3 % | ±2.1 % |
| 22 | Liquid permittivity (meas.) (DAK3.5) | ±3.1 % | Normal | 1 | 0.23 | 0.26 | ±0.7 % | ±0.8 % |
| 23 | Liquid Conductivity-temp.uncertainty (<2deg.C,v6h) | ±3.0 % | Rectangular | $\sqrt{3}$ | 0.78 | 0.71 | ±1.4 % | ±1.2 % |
| 24 | Liquid Permittivity-temp.uncertainty (<2deg.C,v6h) | ±1.0 % | Rectangular | $\sqrt{3}$ | 0.23 | 0.26 | ±0.1 % | ±0.2 % |
| Combined Standard Uncertainty (v09r02) | | | | | | | ± 10.8 % | ± 10.7 % |
| Expanded Uncertainty (k=2) (v09r02) | | | | | | | ± 21.6 % | ± 21.4 % |

*. This measurement uncertainty budget is suggested by IEEE Std. 1528(2013) and determined by Schmid & Partner Engineering AG (DASY5 Uncertainty Budget).

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