SAR TEST REPORT

Test Report No.: 14033664S-A-R1

Applicant : **Canon Inc.**
Type of Equipment : **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)**

<table>
<tr><th colspan="4">Highest Reported SAR [W/kg]</th><th colspan="3">Host platform</th><th rowspan="4">-</th><th colspan="4">Remarks (2.4GHz band)</th><th colspan="4">Remarks (5GHz band)</th><th rowspan="4">Reference SAR test report</th></tr>
<tr><th colspan="2">Partial-body</th><th colspan="2">Hand</th><th rowspan="3">No.</th><th rowspan="3">Type</th><th rowspan="3">Model</th><th colspan="4" rowspan="2">Conducted output power (Burst average) [dBm]</th><th colspan="4" rowspan="2">Conducted output power (Burst average) [dBm]</th></tr>
<tr><th colspan="2">Limit: 1.6 (1g)</th><th colspan="2">Limit: 4 (10g)</th></tr>
<tr><th>2.4GHz band</th><th>5GHz band</th><th>2.4GHz band</th><th>5GHz band</th><th>[MHz]</th><th>Mode</th><th>Measured</th><th>Max.</th><th>[MHz]</th><th>Mode</th><th>Measured</th><th>Max</th></tr>
<tr><td rowspan="2">0.30
(Antenna 1)</td><td rowspan="2">0.40
(Antenna 1)</td><td rowspan="2">0.33
(Antenna 2)</td><td rowspan="2">0.43
(Antenna 1)</td><td rowspan="2">1</td><td rowspan="2">Flat Panel Detector</td><td rowspan="2">WM5B04</td><td>Partial body</td><td>2412</td><td>b</td><td>12.37</td><td>14</td><td>5670</td><td>n40</td><td>11.43</td><td>13</td><td rowspan="2">14033664S-A
(This report)</td></tr>
<tr><td>Hand</td><td>2412</td><td>b</td><td>12.29</td><td>14</td><td>5190</td><td>n40</td><td>11.55</td><td>13</td></tr>
</table>

***. Highest reported SAR of all test configurations and in this platform for partial-body and hand are 0.30 W/kg and 0.33 W/kg in 2.4GHz (DTS) band, 0.40 W/kg, and 0.43 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) b: IEEE 802.11b, n40: IEEE 802.11n(40HT).

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this test report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by the A2LA accreditation body.
6. This test report covers Radio technical requirements. It does not cover administrative issues such as Manual or non-Radio test related Requirements. (if applicable)
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 14033664S-A. 14033664S-A report is replaced with this report.

Date of test: October 4~8, 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

REVISION HISTORY

Revision	Test report No.	Date	Page revised	Contents
Original	14033664S-A	November 4, 2021	-	-
-R1	14033664S-A-R1	December 24, 2021	P14, 24. 25, 29, 42	Corrected description error. p14) (6.2.2) conductivity information of 2437 MHz. (conductivity [S/m]; corrected: 1.857, was: 1.833, Δσ [%]; corrected: 3.9, was: 2.5, ΔSAR(1g) [%]; corrected: 1.6, was: 0.9, ΔSAR(10g) [%]; corrected: 0.8, was: 0.5) p24) listed frequency of Plot 2d-1 title. (corrected: 5230 MHz, was: 5190 MHz) p25) listed frequency of Plot 3b-1 title. (corrected: 5670 MHz, was: 5510 MHz) p29) listed frequency of Plot 1b-5 title. (corrected: 2412 MHz, was: 2462 MHz) p42) permittivity number of daily plot data of 5600 MHz. (corrected: 34.52, was: 34.54)

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

Reference : Abbreviations (Including words undescribed in this report) (radio_r0v03_200214)

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

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Contents of appendixes

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

	EUT	Host platform
Type of Equipment	Built-in Wireless Module with Bluetooth	Flat Panel Detector
Model Number	WM01B	WM5B04 (*2)
Serial Number	f4:a9:97:ff:d0:bc	20MED-0062
Condition of sample	Engineering prototype (*1)	Engineering prototype (*1)
Country of Mass-production	Japan	Japan
Receipt Date of Sample	March 29, 2021 (for power measurement) (*. No modification by the Lab.) October 4, 2021 (for SAR test) (*. No modification by the Lab.)	
Category Identified	Portable device	
Rating (EUT)	DC3.3V supplied form 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 WM5B01 is AR-E3543W or CXDI-720C 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 1:** ANT2444-16B/M-AB-160
Antenna cable length	285 mm	160 mm
Antenna gain (*. max.peak)	2.86 dBi (2.4GHz band), 3.05 dBi (5GHz band) (*including 285 mm cable loss)	.3.22 dBi (2.4GHz band), 3.63 dBi (5GHz band) (*including 160 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")

	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	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	N/A	5180~5240	11	**13**	5260~5320	11	**13**	5500~5580, 5660~5700	11	**13**	5745~5825	11	**13**
	n20	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	MCS0~8	N/A	N/A	N/A	5180~5240	11	**13**	5260~5320	11	**13**	5500~5580, 5660~5700	11	**13**	5745~5825	11	**13**
	n40	MCS0~7	2422~2452	11	**13**	5190, 5230	11	**13**	5270, 5310	11	**13**	5510, 5550, 5670	11	**13**	5755, 5795	11	**13**
	ac40	MCS0~9	N/A	N/A	N/A	5190, 5230	11	**13**	5270, 5310	11	**13**	5510, 5550, 5670	11	**13**	5755, 5795	11	**13**
	ac80	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).

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 (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: WM5B04
Dimensions: 384 × 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

UL Japan, Inc., Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken 259-1220 JAPAN
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
☐	No.1 Semi-anechoic chamber	20.6 × 11.3 × 7.65	20.6 × 11.3	10 m	☐	No.4 Shielded room	4.4 × 4.7 × 2.7	4.4 × 4.7
☐	No.2 Semi-anechoic chamber	20.6 × 11.3 × 7.65	20.6 × 11.3	10 m	☐	No.5 Shielded room	7.8 × 6.4 × 2.7	7.8 × 6.4
☐	No.3 Semi-anechoic chamber	12.7 × 7.7 × 5.35	12.7 × 7.7	5 m	☐	No.6 Shielded room	7.8 × 6.4 × 2.7	7.8 × 6.4
☐	No.4 Semi-anechoic chamber	8.1 × 5.1 × 3.55	8.1 × 5.1	-	☒	**No.7 Shielded room**	2.76 × 3.76 × 2.4	2.76 × 3.76
☐	No.1 Shielded room	6.8 × 4.1 × 2.7	6.8 × 4.1	-	☐	No.8 Shielded room	3.45 × 5.5 × 2.4	3.45 × 5.5
☐	No.2 Shielded room	6.8 × 4.1 × 2.7	6.8 × 4.1	-	☐	No.1 Measurement room	2.55 × 4.1 × 2.5	2.55 × 4.1
☐	No.3 Shielded room	6.3 × 4.7 × 2.7	6.3 × 4.7	-				

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)		Simultaneous transmission	
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)		**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	1g Partial-body	10g Hands
	Limit	1.6	4	1.6	4	1.6	4	1.6	4	1.6	4	1.6	4	1.6	4
	Scaled	**n/a**	**n/a**	**0.30**	**0.33**	**0.30**	**0.43**	**0.38**	**0.35**	**0.40**	**0.39**	**0.39**	**0.37**	**< 1.6**	**< 4**
	Measured	n/a	n/a	0.203	0.222	0.307	0.218	0.264	0.234	0.280	0.268	0.287	0.270	(Estimated)	
	Antenna (*1)	-	-	1	2	1	1	1	1	1	1	1	1	-	-
	Liquid type	-	-	Head	Head	Head	Head	Head	Head	Head	Head	Head	Head	-	-
Operation mode		-	-	b	b	n40	n40	n40	n40	n40	n40	n40	n40	The sum SAR of estimated SAR of "BT LE + WLAN (5GHz)" was smaller than limit.	
Frequency[MHz]		-	-	2412	2412	5230	5190	5270	5270	5670	5670	5795	5795		
Output power	Measured [dBm]	-	-	12.37	12.29	11.55	11.55	11.47	11.47	11.43	11.43	11.62	11.62		
	Tune-up limit [dBm]	5	5	14	14	13	13	13	13	13	13	13	13		
	Tune-up limit [mW]	3	3	25	25	20	20	20	20	20	20	20	20		
Power scaled factor		-	-	1.46	1.48	1.38	1.40	1.42	1.42	1.44	1.44	1.37	1.37		
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 ^ ("Δmax (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.

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 (1) 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 operate multi-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.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2}\cdot\delta\cdot\ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

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) × 30 mm (Y) × 30 mm (Z) (or more) was assessed by measuring 7×7×7 points (or more), ≤ 3GHz.

A volume of 28 mm (X) × 28 mm (Y) × 24mm (Z) (or more) was assessed by measuring 8×8×7 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 ≤ 3 GHz	3 GHz < f ≤ 6 GHz
1	Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
2	Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
3		graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
4			$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ $1.5 \cdot \Delta z_{Zoom}(n-1)$ mm	
5	Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 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 ±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] =20log(Ea)/(Eb) (where, Before SAR testing: Eb[V/m] / After SAR testing: Ea[V/m])
Limit of power drift[W] = ±5%; Power drift limit (X) [dB] = 10log(P_drift)=10log(1.05/1) = 10log(1.05)-10log(1) = 0.21dB
from E-filed relations with power; S=E×H=E^2/η=P/(4×π×r^2) (η: Space impedance) → P=(E^2×4×π×r^2)/η
Therefore, The correlation of power and the E-filed
Power drift limit (X) dB=10log(P_drift) = 10log(E_drift)^2=20log(E_drift)
From the above mentioned, **the calculated power drift of DASY system must be the less than (±) 0.21dB.**

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.

*. The all 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 D01and 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	**BT LE**		**b**	**g**	**n20**	**n40**	**a**	**n20**	**ac20**	**n40**	**ac40**	**ac80**	**a**	**n20**	**ac20**	**n40**	**ac40**	**ac80**
band	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
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
Bandwidth [MHz]	1		20	20	20	40	20	20	20	40	40	80	20	20	20	40	40	80
Max.power [dBm]	5		**14**	**14**	**14**	13	**13**	**13**	**13**	**13**	**13**	10.5	**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
D/R [Mbps, MCS#]	1	2	1	6	MCS0	MCS0	6	MCS0	MCS0	MCS0	MCS0	MCS0	6	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 (*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)

Operation mode	**a**	**n20**	**ac20**	**n40**	**ac40**	**ac80**	**a**	**n20**	**ac20**	**n40**	**ac40**	**ac80**
band	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
Bandwidth [MHz]	20	20	20	40	40	80	20	20	20	40	40	80
Max.power [dBm]	**13**	**13**	**13**	**13**	**13**	10.5	**13**	**13**	**13**	**13**	**13**	10.5
Modulation	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
Frequency tested [MHz]	n/a (*6)	n/a (*6)	n/a (*6)	5510, 5550, 5670	n/a (*6)	n/a (*5)	n/a (*6)	n/a (*6)	n/a (*6)	5755, 5795	n/a	n/a (*5)

	Test name	**Software name**	**Version**	**Date**	**Storage location / Remarks**
Controlled software	Power measurement	labtool Operation	Ver.1.0 (FW Ver.41)	2021/03/25	*. Memory of platform (firmware)
	SAR test	labtool Operation	Ver.1.0 (FW Ver.42)	2021/06/08	*. Memory of platform (firmware)

*. 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) D [mm]	**Antenna 1** (switch side) SAR Tested /Reduced	**Antenna 2** (bottom side) D [mm]	**Antenna 2** (bottom side) SAR Tested /Reduced	**SAR type**
Front	A front surface (patient side) of platform was touched to the Flat phantom.	**7.79**	**Tested**	**7.79**	**Tested**	Partial-body touch
Side (Right) (Antenna 1)	A right side surface (switch, antenna 1 side) of platform was touched to the Flat phantom.	**21.3**	**Tested**	**68.5**	Reduced (*7)	
Side (Left)	A left side surface of platform was touched to the Flat phantom.	**356.7**	Reduced (>200 mm)	**265.5**	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.	**4.21**	**Tested**	**4.21**	**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: 384 × 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)] × [√f (GHz)] ≤ 3.0 (for SAR(1g)), 7.5(for SAR(10g)) ···· formula (1)

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

[SAR(1g) test exclusion thresholds, mW] = 3 × [test separation distance, mm] / [√f (GHz)] ······························· 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,

[test exclusion thresholds, mW] = [(Power allowed at numeric threshold for 50mm in formula (1))] + [(test separation distance, mm) - (50mm)] × 10 ·· 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 ≤50mm from the user, and for step 2) antenna > 50mm from the user.]

				Calculated threshold value											
Antenna #:				Antenna 1			Antenna 2			Antenna 1			Antenna 2		
Setup:				**Back**	**Front**	**Right**	**Back**	**Front**	**Bottom**	**Bottom**	**Top**	**Left**	**Right**	**Left**	**Top**
Antenna separation distance [mm]:				≤5 (4.21)	8	21	≤5 (4.21)	8	18	>50 (106)	>200 (305)	>200 (357)	>50 (69)	>200 (266)	>200 (436)
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]	Tune-up limit power (conducted) [dBm]	Tune-up limit power (conducted) [mW]	Step 1) SAR exclusion calculations for antenna ≤50mm from the user. Judge: “Exempt” when ≤ 3.0 (SAR (1g)), ≤ 7.5 (SAR (1g)); “Test” (SAR test required) when >3.0 (SAR(1g)), >7.5 (SAR (1g))						Step 2) > 50mm 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	95mW@50mm, Exempt	Since user to antenna is >200mm, SAR test is not required.		95mW@50mm, Exempt	Since user to antenna is >200mm, SAR test is not required.	
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	96mW@50mm, Exempt			96mW@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						
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	65mW@50mm, Exempt			65mW@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						
ac80	5.21	10.5	**11**	5.0, Exempt	**3.1, Test**	1.2, Exempt	5.0, Exempt	**3.1, Test**	1.4, 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	65mW@50mm, Exempt			65mW@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						
ac80	5.29	10.5	**11**	5.1, Exempt	**3.2, Test**	1.2, Exempt	5.1, Exempt	**3.2, Test**	1.4, 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	63mW@50mm, Exempt			63mW@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						
ac80	5.53	10.5	**11**	5.2, Exempt	**3.2, Test**	1.2, Exempt	5.2, Exempt	**3.2, Test**	1.4, Exempt						
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	62mW@50mm, Exempt			62mW@50mm, Exempt		
n40,ac40	5.795	13	**20**	**9.6, Test**	**6.0, Test**	2.3, Exempt	**9.6, Test**	**6.0, Test**	2.7, Exempt						
ac80	5.775	10.5	**11**	5.3, Exempt	**3.3, Test**	1.3, Exempt	5.3, Exempt	**3.3, Test**	1.5, Exempt						

*. 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. “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 ~Step 4	(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. 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.

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		Power spec.		Duty cycle			Antenna 2 (-divsw "0") power (WLAN or Bluetooth)							Antenna 1 (-divsw "1") power (WLAN or Bluetooth)						
				Typical	Tune-up limit (Max.)	Duty cycle	Duty factor	Scaled factor	Setting power	Burst average		Δ from Max.	Tune-up factor	Time average		Setting power	Burst average		Δ from Max.	Tune-up factor	Time average	
		[MHz]	CH	[dBm]	[dBm]	[%]	[dB]	[-]	[-]	[dBm]	[mW]	[dB]	[-]	[dBm]	[mW]	[-]	[dBm]	[mW]	[dB]	[-]	[dBm]	[mW]
BT LE	PHY1	2402	0	3	5	63.9	1.94	1.56	3	3.66	2.32	-1.34	1.36	1.74	1.49	3	3.72	2.36	-1.28	1.34	1.80	1.51
	PHY1	2440	19	3	5	63.9	1.94	1.56	3	3.59	2.29	-1.41	1.38	1.67	1.47	3	3.64	2.31	-1.36	1.37	1.72	1.49
	PHY1	2480	39	3	5	63.9	1.94	1.56	3	3.38	2.18	-1.62	1.45	1.46	1.40	3	3.43	2.20	-1.57	1.44	1.51	1.42
	PHY2	2402	0	3	5	34.5	4.62	2.90	3	3.60	2.29	-1.40	1.38	-1.02	0.79	3	3.65	2.32	-1.35	1.36	-0.97	0.80
	PHY2	2440	19	3	5	34.5	4.62	2.90	3	3.51	2.24	-1.49	1.41	-1.11	0.77	3	3.57	2.28	-1.43	1.39	-1.05	0.79
	PHY2	2480	39	3	5	34.5	4.62	2.90	3	3.31	2.14	-1.69	1.48	-1.31	0.74	3	3.37	2.17	-1.63	1.46	-1.25	0.75
b	1	2412	1	12	14	100	0.00	1.00	12	12.29	16.94	-1.71	1.48	12.29	16.94	12	12.37	17.26	-1.63	1.46	12.37	17.26
	1	2437	6	12	14	100	0.00	1.00	12	12.51	17.82	-1.49	1.41	12.51	17.82	12	12.60	18.20	-1.40	1.38	12.60	18.20
	1	2462	11	12	14	100	0.00	1.00	12	12.68	18.54	-1.32	1.36	12.68	18.54	12	12.78	18.97	-1.22	1.32	12.78	18.97
g	6	2412	1	12	14	100	0.00	1.00	12	12.26	16.83	-1.74	1.49	12.26	16.83	12	12.35	17.18	-1.65	1.46	12.35	17.18
	6	2437	6	12	14	100	0.00	1.00	12	12.48	17.70	-1.52	1.42	12.48	17.70	12	12.57	18.07	-1.43	1.39	12.57	18.07
	6	2462	11	12	14	100	0.00	1.00	12	12.65	18.41	-1.35	1.36	12.65	18.41	12	12.74	18.79	-1.26	1.34	12.74	18.79
n20	MCS0	2412	1	12	14	100	0.00	1.00	11	12.43	17.50	-1.57	1.44	12.43	17.50	11	12.53	17.91	-1.47	1.40	12.53	17.91
	MCS0	2437	6	12	14	100	0.00	1.00	11	12.66	18.45	-1.34	1.36	12.66	18.45	11	12.73	18.75	-1.27	1.34	12.73	18.75
	MCS0	2462	11	12	14	100	0.00	1.00	11	12.81	19.10	-1.19	1.32	12.81	19.10	11	12.91	19.54	-1.09	1.29	12.91	19.54
n40	MCS0	2422	3	11	13	100	0.00	1.00	11	11.49	14.09	-1.51	1.42	11.49	14.09	11	11.57	14.35	-1.43	1.39	11.57	14.35
	MCS0	2437	6	11	13	100	0.00	1.00	11	11.61	14.49	-1.39	1.38	11.61	14.49	11	11.70	14.79	-1.30	1.35	11.70	14.79
	MCS0	2452	9	11	13	100	0.00	1.00	11	11.72	14.86	-1.28	1.34	11.72	14.86	11	11.80	15.14	-1.20	1.32	11.80	15.14
a	6	5180	36	11	13	100	0.00	1.00	12	11.37	13.71	-1.63	1.46	11.37	13.71	12	11.40	13.80	-1.60	1.45	11.40	13.80
	6	5200	40	11	13	100	0.00	1.00	12	11.37	13.71	-1.63	1.46	11.37	13.71	12	11.40	13.80	-1.60	1.45	11.40	13.80
	6	5220	44	11	13	100	0.00	1.00	12	11.41	13.84	-1.59	1.44	11.41	13.84	12	11.49	14.09	-1.51	1.42	11.49	14.09
	6	5240	48	11	13	100	0.00	1.00	12	11.35	13.65	-1.65	1.46	11.35	13.65	12	11.41	13.84	-1.59	1.44	11.41	13.84
	6	5260	52	11	13	100	0.00	1.00	12	11.31	13.52	-1.69	1.48	11.31	13.52	12	11.39	13.77	-1.61	1.45	11.39	13.77
	6	5280	56	11	13	100	0.00	1.00	12	11.19	13.15	-1.81	1.52	11.19	13.15	12	11.27	13.40	-1.73	1.49	11.27	13.40
	6	5300	60	11	13	100	0.00	1.00	12	11.48	14.06	-1.52	1.42	11.48	14.06	12	11.59	14.42	-1.41	1.38	11.59	14.42
	6	5320	64	11	13	100	0.00	1.00	12	11.34	13.61	-1.66	1.47	11.34	13.61	12	11.44	13.93	-1.56	1.43	11.44	13.93
	6	5500	100	11	13	100	0.00	1.00	11	11.13	12.97	-1.87	1.54	11.13	12.97	11	11.18	13.12	-1.82	1.52	11.18	13.12
	6	5580	116	11	13	100	0.00	1.00	11	11.22	13.24	-1.78	1.51	11.22	13.24	11	11.20	13.18	-1.80	1.51	11.20	13.18
	6	5700	140	11	13	100	0.00	1.00	11	11.32	13.55	-1.68	1.47	11.32	13.55	11	11.21	13.21	-1.79	1.51	11.21	13.21
	6	5745	149	11	13	100	0.00	1.00	11	11.45	13.96	-1.55	1.43	11.45	13.96	11	11.35	13.65	-1.65	1.46	11.35	13.65
	6	5785	157	11	13	100	0.00	1.00	11	11.58	14.39	-1.42	1.39	11.58	14.39	11	11.45	13.96	-1.55	1.43	11.45	13.96
	6	5825	165	11	13	100	0.00	1.00	11	11.74	14.93	-1.26	1.34	11.74	14.93	11	11.59	14.42	-1.41	1.38	11.59	14.42
n20 (20HT)	MCS0	5180	36	11	13	100	0.00	1.00	12	11.54	14.26	-1.46	1.40	11.54	14.26	12	11.57	14.35	-1.43	1.39	11.57	14.35
	MCS0	5200	40	11	13	100	0.00	1.00	12	11.53	14.22	-1.47	1.40	11.53	14.22	12	11.56	14.32	-1.44	1.39	11.56	14.32
	MCS0	5220	44	11	13	100	0.00	1.00	12	11.59	14.42	-1.41	1.38	11.59	14.42	12	11.66	14.66	-1.34	1.36	11.66	14.66
	MCS0	5240	48	11	13	100	0.00	1.00	12	11.52	14.19	-1.48	1.41	11.52	14.19	12	11.58	14.39	-1.42	1.39	11.58	14.39
	MCS0	5260	52	11	13	100	0.00	1.00	12	11.48	14.06	-1.52	1.42	11.48	14.06	12	11.54	14.26	-1.46	1.40	11.54	14.26
	MCS0	5280	56	11	13	100	0.00	1.00	12	11.35	13.65	-1.65	1.46	11.35	13.65	12	11.42	13.87	-1.58	1.44	11.42	13.87
	MCS0	5300	60	11	13	100	0.00	1.00	12	11.65	14.62	-1.35	1.36	11.65	14.62	12	11.74	14.93	-1.26	1.34	11.74	14.93
	MCS0	5320	64	11	13	100	0.00	1.00	12	11.51	14.16	-1.49	1.41	11.51	14.16	12	11.61	14.49	-1.39	1.38	11.61	14.49
	MCS0	5500	100	11	13	100	0.00	1.00	11	11.32	13.55	-1.68	1.47	11.32	13.55	11	11.38	13.74	-1.62	1.45	11.38	13.74
	MCS0	5580	116	11	13	100	0.00	1.00	11	11.41	13.84	-1.59	1.44	11.41	13.84	11	11.40	13.80	-1.60	1.45	11.40	13.80
	MCS0	5700	140	11	13	100	0.00	1.00	11	11.49	14.09	-1.51	1.42	11.49	14.09	11	11.37	13.71	-1.63	1.46	11.37	13.71
	MCS0	5745	149	11	13	100	0.00	1.00	11	11.62	14.52	-1.38	1.37	11.62	14.52	11	11.49	14.09	-1.51	1.42	11.49	14.09
	MCS0	5785	157	11	13	100	0.00	1.00	11	11.75	14.96	-1.25	1.33	11.75	14.96	11	11.61	14.49	-1.39	1.38	11.61	14.49
	MCS0	5825	165	11	13	100	0.00	1.00	11	11.91	15.52	-1.09	1.29	11.91	15.52	11	11.76	15.00	-1.24	1.33	11.76	15.00
ac20 (20VHT)	MCS0	5180	36	11	13	100	0.00	1.00	12	11.54	14.26	-1.46	1.40	11.54	14.26	12	11.56	14.32	-1.44	1.39	11.56	14.32
	MCS0	5200	40	11	13	100	0.00	1.00	12	11.53	14.22	-1.47	1.40	11.53	14.22	12	11.56	14.32	-1.44	1.39	11.56	14.32
	MCS0	5220	44	11	13	100	0.00	1.00	12	11.59	14.42	-1.41	1.38	11.59	14.42	12	11.64	14.59	-1.36	1.37	11.64	14.59
	MCS0	5240	48	11	13	100	0.00	1.00	12	11.51	14.16	-1.49	1.41	11.51	14.16	12	11.57	14.35	-1.43	1.39	11.57	14.35
	MCS0	5260	52	11	13	100	0.00	1.00	12	11.48	14.06	-1.52	1.42	11.48	14.06	12	11.54	14.26	-1.46	1.40	11.54	14.26
	MCS0	5280	56	11	13	100	0.00	1.00	12	11.37	13.71	-1.63	1.46	11.37	13.71	12	11.43	13.90	-1.57	1.44	11.43	13.90
	MCS0	5300	60	11	13	100	0.00	1.00	12	11.65	14.62	-1.35	1.36	11.65	14.62	12	11.74	14.93	-1.26	1.34	11.74	14.93
	MCS0	5320	64	11	13	100	0.00	1.00	12	11.51	14.16	-1.49	1.41	11.51	14.16	12	11.61	14.49	-1.39	1.38	11.61	14.49
	MCS0	5500	100	11	13	100	0.00	1.00	11	11.31	13.52	-1.69	1.48	11.31	13.52	11	11.39	13.77	-1.61	1.45	11.39	13.77
	MCS0	5580	116	11	13	100	0.00	1.00	11	11.41	13.84	-1.59	1.44	11.41	13.84	11	11.41	13.84	-1.59	1.44	11.41	13.84
	MCS0	5700	140	11	13	100	0.00	1.00	11	11.49	14.09	-1.51	1.42	11.49	14.09	11	11.39	13.77	-1.61	1.45	11.39	13.77
	MCS0	5745	149	11	13	100	0.00	1.00	11	11.63	14.55	-1.37	1.37	11.63	14.55	11	11.49	14.09	-1.51	1.42	11.49	14.09
	MCS0	5785	157	11	13	100	0.00	1.00	11	11.75	14.96	-1.25	1.33	11.75	14.96	11	11.59	14.42	-1.41	1.38	11.59	14.42
	MCS0	5825	165	11	13	100	0.00	1.00	11	11.91	15.52	-1.09	1.29	11.91	15.52	11	11.76	15.00	-1.24	1.33	11.76	15.00
n40 (40HT)	MCS0	5190	38	11	13	100	0.00	1.00	12	11.51	14.16	-1.49	1.41	11.51	14.16	12	11.55	14.29	-1.45	1.40	11.55	14.29
	MCS0	5230	46	11	13	100	0.00	1.00	12	11.52	14.19	-1.48	1.41	11.52	14.19	12	11.60	14.45	-1.40	1.38	11.60	14.45
	MCS0	5270	54	11	13	100	0.00	1.00	12	11.39	13.77	-1.61	1.45	11.39	13.77	12	11.47	14.03	-1.53	1.42	11.47	14.03
	MCS0	5310	62	11	13	100	0.00	1.00	12	11.56	14.32	-1.44	1.39	11.56	14.32	12	11.67	14.69	-1.33	1.36	11.67	14.69
	MCS0	5510	102	11	13	100	0.00	1.00	11	11.30	13.49	-1.70	1.48	11.30	13.49	11	11.36	13.68	-1.64	1.46	11.36	13.68
	MCS0	5550	110	11	13	100	0.00	1.00	11	11.36	13.68	-1.64	1.46	11.36	13.68	11	11.40	13.80	-1.60	1.45	11.40	13.80
	MCS0	5670	134	11	13	100	0.00	1.00	11	11.54	14.26	-1.46	1.40	11.54	14.26	11	11.43	13.90	-1.57	1.44	11.43	13.90
	MCS0	5755	151	11	13	100	0.00	1.00	11	11.64	14.59	-1.36	1.37	11.64	14.59	11	11.50	14.13	-1.50	1.41	11.50	14.13
	MCS0	5795	159	11	13	100	0.00	1.00	11	11.78	15.07	-1.22	1.32	11.78	15.07	11	11.62	14.52	-1.38	1.37	11.62	14.52

(cont'd)

(cont'd)

Mode	Data rate [Mbps] or Index#	Frequency [MHz]	CH	Power spec. Typical [dBm]	Power spec. Tune-up limit (Max.) [dBm]	Duty cycle [%]	Duty factor [dB]	Scaled factor [-]	Antenna 2 (-divsw "0") power (WLAN or Bluetooth) Setting power [-]	Burst average [dBm]	Burst average [mW]	Δ from Max. [dB]	Tune-up factor [-]	Time average [dBm]	Time average [mW]	Antenna 1 (-divsw "1") power (WLAN or Bluetooth) Setting power [-]	Burst average [dBm]	Burst average [mW]	Δ from Max. [dB]	Tune-up factor [-]	Time average [dBm]	Time average [mW]
ac40 (40VHT)	MCS0	5190	38	11	13	100	0.00	1.00	12	11.52	14.19	-1.48	1.41	11.52	14.19	12	11.53	14.22	-1.47	1.40	11.53	14.22
	MCS0	5230	46	11	13	100	0.00	1.00	12	11.51	14.16	-1.49	1.41	11.51	14.16	12	11.60	14.45	-1.40	1.38	11.60	14.45
	MCS0	5270	54	11	13	100	0.00	1.00	12	11.40	13.80	-1.60	1.45	11.40	13.80	12	11.53	14.22	-1.47	1.40	11.53	14.22
	MCS0	5310	62	11	13	100	0.00	1.00	12	11.56	14.32	-1.44	1.39	11.56	14.32	12	11.66	14.66	-1.34	1.36	11.66	14.66
	MCS0	5510	102	11	13	100	0.00	1.00	11	11.29	13.46	-1.71	1.48	11.29	13.46	11	11.37	13.71	-1.63	1.46	11.37	13.71
	MCS0	5550	110	11	13	100	0.00	1.00	11	11.35	13.65	-1.65	1.46	11.35	13.65	11	11.39	13.77	-1.61	1.45	11.39	13.77
	MCS0	5670	134	11	13	100	0.00	1.00	11	11.37	13.71	-1.63	1.46	11.37	13.71	11	11.43	13.90	-1.57	1.44	11.43	13.90
	MCS0	5755	151	11	13	100	0.00	1.00	11	11.65	14.62	-1.35	1.36	11.65	14.62	11	11.49	14.09	-1.51	1.42	11.49	14.09
	MCS0	5795	159	11	13	100	0.00	1.00	11	11.78	15.07	-1.22	1.32	11.78	15.07	11	11.62	14.52	-1.38	1.37	11.62	14.52
ac80 (80VHT)	MCS0	5210	42	8.5	10.5	100	0.00	1.00	9	9.01	7.96	-1.49	1.41	9.01	7.96	9	9.05	8.04	-1.45	1.40	9.05	8.04
	MCS0	5290	58	8.5	10.5	100	0.00	1.00	9	8.80	7.59	-1.70	1.48	8.80	7.59	9	8.88	7.73	-1.62	1.45	8.88	7.73
	MCS0	5530	106	8.5	10.5	100	0.00	1.00	8	8.74	7.48	-1.76	1.50	8.74	7.48	8	8.81	7.60	-1.69	1.48	8.81	7.60
	MCS0	5775	155	8.5	10.5	100	0.00	1.00	8	9.25	8.41	-1.25	1.33	9.25	8.41	8	9.10	8.13	-1.40	1.38	9.10	8.13

*. 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).

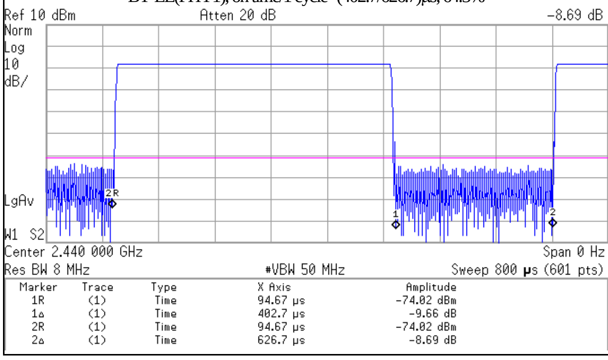
*. Calculating formula: Burst power (dBm) = (P/M Reading, dBm)+(Cable loss, dB)+(Attenuator, dB)+(duty factor, dB)
Time average power (dBm) = (P/M Reading, dBm)+(Cable loss, dB)+(Attenuator, dB)
Duty cycle: (duty cycle, %) = (Tx on time, ms) / (1 cycle time, ms) × 100, where Duty factor (dBm) = 10 × 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 form 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: May 10~11, 2021 / Measured by: H. Naka/ Place: Preparation room of No. 7 shield room. (23 deg.C./ (45~60) %RH)

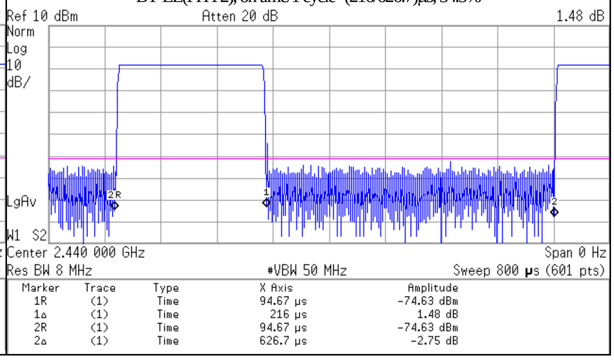
*. Uncertainty of antenna port conducted test (Average power); 0.91 dB (BW80MHz) / Uncertainty of Duty cycle and time measurement: 0.27 %

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

BT-LE(PHY1), on time/1 cycle=(402.7/626.7)µs, 64.3%



BT-LE(PHY2), on time/1 cycle=(216/626.7)µs, 34.5%



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) ≤ 0.8 W/kg or 2.0 W/kg, for 1g or 10g respectively, when the transmission band is ≤ 100 MHz
(2) ≤ 0.6 W/kg or 1.5 W/kg, for 1g or 10g respectively, when the transmission band is between 100 MHz and 200 MHz
(3) ≤ 0.4 W/kg or 1.0 W/kg, for 1g or 10g respectively, when the transmission band is ≥ 200 MHz
The SAR has been measured with highest transmission duty factor supported by the test mode tool for WLAN and/or Bluetooth. When the transmission duty factor could not be 100%, the reported SAR will be scaled to 100% transmission duty factor to determine compliance. The scaling factor for the duty factor is defined as (100% / (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 "(maximum tune-up limit (mW)) / (measured conducted power (mW))".
*. The reported SAR (scaled SAR) would be calculated by "(measured SAR) × (duty cycle scaling factor) × (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 W/kg, SAR measurement is required for subsequent next highest measured output power channel(s) in the initial test configuration until reported SAR is ≤ 1.2 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 ≤ 0.8 W/kg, no further SAR test is required in this exposure configuration. Otherwise, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel. For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

For 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 W/kg, SAR is required for the subsequent highest measured output power channel until the reported SRA result is ≤ 1.2 W/kg or all required channels are measured. For other transmission modes, SAR is not required when the highest reported SAR for initial test configuration is adjusted by the ratio of subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

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	Head		Body	
(MHz)	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	Head		Body	
(MHz)	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 parameters (*a)															ΔSAR Coefficients(*b)			Date measured
		Liquid Temp. [deg.C.]	Liquid depth of phantom [mm]	Permittivity (εr) [-]						Conductivity [S/m]							ΔSAR		Correction required? (*c)	
				Target value	Measured Value	Measured Δεr [%]	Measured Interpolated	Measured Limit [%]	Δend, >48hrs [%] (*1)	Target value	Measured Value	Measured Δσ [%]	Measured Interpolated	Measured Limit [%]	Δend, >48hrs [%] (*1)		(1g) [%]	(10g) [%]		
2412	Head	22.5	151	***39.27***	39.77	1.3	☑	10	begin	***1.766***	1.838	4.1	☑	10	begin		1.7	0.9	not required.	
2437				***39.22***	39.72	1.3	☑	10	begin	***1.788***	1.857	3.9	☑	10	begin		1.6	0.8	not required.	October 4,. 2021
2462				***39.18***	39.66	1.2	☑	10	begin	***1.803***	1.877	3.5	☑	10	begin		1.4	0.7	not required.	
5510	Head	22.5	151	***35.63***	34.67	-2.7	☐	10	begin	***4.973***	4.790	-3.7	☐	10	begin		0.7	0.9	not required.	
5550				***35.59***	34.58	-2.8	☐	10	begin	***5.014***	4.850	-3.3	☐	10	begin		0.7	0.9	not required.	October 5,. 2021
5670				***35.45***	34.39	-3.0	☐	10	begin	***5.137***	4.971	-3.2	☐	10	begin		0.7	0.9	not required.	
5755	Head	22.5	151	***35.35***	34.25	-3.1	☑	10	begin	***5.224***	5.073	-2.9	☑	10	begin		0.7	0.9	not required.	October 6,. 2021
5795				***35.31***	34.20	-3.1	☑	10	begin	***5.265***	5.123	-2.7	☑	10	begin		0.7	0.9	not required.	
5190	Head	22.5	151	***36.00***	35.22	-2.2	☐	10	< 48hrs	***4.645***	4.454	-4.1	☐	10	< 48hrs		0.5	0.8	not required.	
5230				***35.95***	35.13	-2.3	☐	10	< 48hrs	***4.686***	4.492	-4.1	☐	10	< 48hrs		0.6	0.8	not required.	October 7~8,. 2021
5270				***35.91***	35.07	-2.3	☐	10	< 48hrs	***4.727***	4.541	-3.9	☐	10	< 48hrs		0.6	0.8	not required.	
5310				***35.86***	34.99	-2.4	☐	10	< 48hrs	***4.768***	4.587	-3.8	☐	10	< 48hrs		0.6	0.8	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: "Δend(>48 hrs) (%)"" = {(dielectric properties, end of test series) / (dielectric properties, beginning of test series) -1} × 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: $\Delta SAR(1g) = C\varepsilon r \times \Delta\varepsilon r + C\sigma \times \Delta\sigma$, $C\varepsilon r = -7.854E\text{-}4 \times f^3 + 9.402E\text{-}3 \times f^2 - 2.742E\text{-}2 \times f - 0.2026$ / $C\sigma = 9.804E\text{-}3 \times f^3 - 8.661E\text{-}2 \times f^2 + 2.981E\text{-}2 \times f + 0.7829$
Calculating formula: $\Delta SAR(10g) = C\varepsilon r \times \Delta\varepsilon r + C\sigma \times \Delta\sigma$, $C\varepsilon r = 3.456 \times 10^{-3} \times f^3 - 3.531 \times 10^{-2} \times f^2 + 7.675 \times 10^{-2} \times f - 0.1860$ / $C\sigma = 4.479 \times 10^{-3} \times f^3 - 1.586 \times 10^{-2} \times f^2 - 0.1972 \times f + 0.7717$
Since the calculated ΔSAR values of the tested liquid had shown positive correction, the measured SAR was not converted by ΔSAR correction.
Calculating formula: ΔSAR corrected SAR (W/kg) = (Measured SAR (W/kg)) × (100 - (ΔSAR(%)) / 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 ± 5 0MHz of calibration frequency	7.35	± 12.0 %
Head	(5190, 5230, 5270, 5310) MHz	5250 MHz	within ± 110 MHz of calibration frequency	5.14	± 13.1 %
Head	(5510, 5550, 5670) MHz	5600 MHz	within ± 110 MHz of calibration frequency	4.56	± 13.1 %
Head	(5755, 5795) MHz	5800 MHz	within ± 110 MHz of calibration frequency	4.60	± 13.1 %

6.3 SAR results

Test setup				Mode and Frequency (*2)			Duty cycle		Power correction			SAR results [W/kg] (Max.value of multi-peak)				SAR type	SAR Limit [W/kg]	SAR plot # in Appx. 2-2	Setup photo # in Appx. 1-3	Remarks
ANT #	Test position	Gap [mm]	Source power: Battery ID	Mode (D/R) Mark with "*" is the initial mode & frequency.	[MHz]	CH	Duty [%]	Duty scaled factor	Max. tune-up limit [dBm]	Measured conducted [dBm]	Power scaled factor	Measured	ΔSAR [%]	ΔSAR corrected	Scaled (*b)					
1) 2.4GHz Band (*1)																				
2	Back	0	Battery 2	b (1Mbps)*	2462*	11	100	1.00	14	12.68	1.36	0.209	Positive	n/a (*a)	0.284	10g	4	-	P1	-
2	Back	0	Battery 2	b (1Mbps)*	2437	6	100	1.00	14	12.51	1.41	0.228	Positive	n/a (*a)	0.321	10g	4	-	P1	-
2	Back	0	Battery 1	b (1Mbps)*	2412	1	100	1.00	14	12.29	1.48	0.222	Positive	n/a (*a)	0.329	10g	4	1a-1	P1	Wide area scan
1	Back	0	Battery 1	b (1Mbps)*	2462*	11	100	1.00	14	12.78	1.32	0.170	Positive	n/a (*a)	0.224	10g	4	-	P1	-
1	Back	0	Battery 1	b (1Mbps)*	2437	6	100	1.00	14	12.60	1.38	0.166	Positive	n/a (*a)	0.229	10g	4	1a-2	P1	-
1	Back	0	Battery 1	b (1Mbps)*	2412	1	100	1.00	14	12.37	1.46	0.144	Positive	n/a (*a)	0.210	10g	4	1a-3	P1	Wide area scan
2	Front	0	Battery 1	b (1Mbps)*	2462*	11	100	1.00	14	12.68	1.36	0.00423	Positive	n/a (*a)	0.006	1g	1.6	1b-3	P2	Wide area scan
1	Front	0	Battery 1	b (1Mbps)*	2462*	11	100	1.00	14	12.78	1.32	0.040	Positive	n/a (*a)	0.053	1g	1.6	1b-4	P2	Wide area scan
2	Bottom (ant.2)	0	Battery 1	b (1Mbps)*	2462*	11	100	1.00	14	12.68	1.36	0.00906	Positive	n/a (*a)	0.012	1g	1.6	-	P3	-
2	Bottom (ant.2)	0	Battery 1	b (1Mbps)*	2437	6	100	1.00	14	12.51	1.41	0.0096	Positive	n/a (*a)	0.014	1g	1.6	1b-2	P3	-
2	Bottom (ant.2)	0	Battery 1	b (1Mbps)*	2412	1	100	1.00	14	12.29	1.48	0.00719	Positive	n/a (*a)	0.011	1g	1.6	1b-5	P3	Wide area scan
1	Side (ant.1)	0	Battery 2	b (1Mbps)*	2462*	11	100	1.00	14	12.78	1.32	0.165	Positive	n/a (*a)	0.218	1g	1.6	-	P4	-
1	Side (ant.1)	0	Battery 2	b (1Mbps)*	2437	6	100	1.00	14	12.60	1.38	0.198	Positive	n/a (*a)	0.273	1g	1.6	-	P4	-
1	Side (ant.1)	0	Battery 2	b (1Mbps)*	2412	1	100	1.00	14	12.37	1.46	0.203	Positive	n/a (*a)	0.296	1g	1.6	1b-1	P4	Wide area scan
2) U-NII-2A (5.3GHz) (and U-NII-1 (5.2GHz)) Band																				
2	Back	0	Battery2	n40(MCS0)*	5310*	62	100	1.00	13	11.56	1.39	0.238	Positive	n/a (*a)	0.331	10g	4	2a-3	P1	Wide area scan
2	Back	0	Battery1	n40(MCS0)*	5270	54	100	1.00	13	11.39	1.45	0.234	Positive	n/a (*a)	0.339	10g	4	2a-2	P1	-
1	Back	0	Battery2	n40(MCS0)*	5310*	62	100	1.00	13	11.67	1.36	0.255	Positive	n/a (*a)	0.347	10g	4	2a-4	P1	Wide area scan
1	Back	0	Battery2	n40(MCS0)*	5270	54	100	1.00	13	11.47	1.42	0.249	Positive	n/a (*a)	0.354	10g	4	2a-1	P1	-
2	Front	0	Battery2	n40(MCS0)*	5310*	62	100	1.00	13	11.56	1.39	0.0057	Positive	n/a (*a)	0.008	1g	1.6	2b-3	P2	Wide area scan
1	Front	0	Battery2	n40(MCS0)*	5310*	62	100	1.00	13	11.67	1.36	0.024	Positive	n/a (*a)	0.033	1g	1.6	2b-4	P2	Wide area scan
2	Bottom (ant.2)	0	Battery1	n40(MCS0)*	5310	62	100	1.00	13	11.56	1.39	0.020	Positive	n/a (*a)	0.028	1g	1.6	2b-2	P3	Wide area scan
1	Side (ant.1)	0	Battery2	n40(MCS0)*	5310*	62	100	1.00	13	11.67	1.36	0.270	Positive	n/a (*a)	0.367	1g	1.6	2b-5	P4	Wide area scan
1	Side (ant.1)	0	Battery2	n40(MCS0)*	5270	54	100	1.00	13	11.47	1.42	0.264	Positive	n/a (*a)	0.375	1g	1.6	2b-1	P4	-
2	Back	0	Battery 1	n40(MCS0)*	5230*	46	100	1.00	13	11.52	1.41	0.251	Positive	n/a (*a)	0.354	10g	4	-	P1	-
2	Back	0	Battery 1	n40(MCS0)*	5190	38	100	1.00	13	11.51	1.41	0.293	Positive	n/a (*a)	0.413	10g	4	2c-2	P1	-
1	Back	0	Battery 1	n40(MCS0)*	5230*	46	100	1.00	13	11.60	1.38	0.234	Positive	n/a (*a)	0.323	10g	4	-	P1	-
1	Back	0	Battery 1	n40(MCS0)*	5190	38	100	1.00	13	11.55	1.40	0.307	Positive	n/a (*a)	0.430	10g	4	2c-1	P1	-
2	Bottom (ant.2)	0	Battery1	n40(MCS0)*	5230*	46	100	1.00	13	11.60	1.38	0.015	Positive	n/a (*a)	0.021	1g	1.6	2d-2	P3	-
1	Side (ant.1)	0	Battery 2	n40(MCS0)*	5230*	46	100	1.00	13	11.60	1.38	0.218	Positive	n/a (*a)	0.301	1g	1.6	2d-1	P4	-
1	Side (ant.1)	0	Battery 2	n40(MCS0)*	5190	38	100	1.00	13	11.55	1.40	0.206	Positive	n/a (*a)	0.288	1g	1.6	-	P4	-
3) U-NII-2C (5.6GHz) Band																				
2	Back	0	Battery 1	n40(MCS0)*	5670*	134	100	1.00	13	11.54	1.40	0.237	Positive	n/a (*a)	0.332	10g	4	-	P1	-
2	Back	0	Battery 1	n40(MCS0)*	5550	110	100	1.00	13	11.36	1.46	0.250	Positive	n/a (*a)	0.365	10g	4	-	P1	-
2	Back	0	Battery 1	n40(MCS0)*	5510	102	100	1.00	13	11.31	1.48	0.254	Positive	n/a (*a)	0.376	10g	4	3a-2	P1	-
1	Back	0	Battery 1	n40(MCS0)*	5670*	134	100	1.00	13	11.43	1.44	0.268	Positive	n/a (*a)	0.386	10g	4	3a-1	P1	-
1	Back	0	Battery 1	n40(MCS0)*	5550	110	100	1.00	13	11.40	1.45	0.244	Positive	n/a (*a)	0.354	10g	4	-	P1	-
1	Back	0	Battery 1	n40(MCS0)*	5510	102	100	1.00	13	11.36	1.46	0.242	Positive	n/a (*a)	0.353	10g	4	-	P1	-
2	Front	0	Battery 1	n40(MCS0)*	5670*	134	100	1.00	13	11.54	1.40	0.011	Positive	n/a (*a)	0.015	1g	1.6	-	P2	-
1	Front	0	Battery 2	n40(MCS0)*	5670*	134	100	1.00	13	11.43	1.44	0.015	Positive	n/a (*a)	0.022	1g	1.6	-	P2	-
2	Bottom (ant.2)	0	Battery 1	n40(MCS0)*	5670*	134	100	1.00	13	11.54	1.40	0.022	Positive	n/a (*a)	0.031	1g	1.6	3b-2	P3	-
1	Side (ant.1)	0	Battery 1	n40(MCS0)*	5670*	134	100	1.00	13	11.43	1.44	0.280	Positive	n/a (*a)	0.403	1g	1.6	3b-1	P4	-
1	Side (ant.1)	0	Battery 1	n40(MCS0)*	5550	110	100	1.00	13	11.40	1.45	0.262	Positive	n/a (*a)	0.380	1g	1.6	-	P4	-
1	Side (ant.1)	0	Battery 1	n40(MCS0)*	5510	102	100	1.00	13	11.36	1.46	0.272	Positive	n/a (*a)	0.397	1g	1.6	-	P4	-
4) U-NII-3 (5.8GHz) Band																				
2	Back	0	Battery 2	n40(MCS0)*	5795*	159	100	1.00	13	11.78	1.32	0.212	Positive	n/a (*a)	0.280	10g	4	4a-2	P1	-
2	Back	0	Battery 2	n40(MCS0)*	5755	151	100	1.00	13	11.64	1.37	0.197	Positive	n/a (*a)	0.270	10g	4	-	P1	-
1	Back	0	Battery 1	n40(MCS0)*	5795*	159	100	1.00	13	11.62	1.37	0.270	Positive	n/a (*a)	0.370	10g	4	4a-1	P1	-
1	Back	0	Battery 1	n40(MCS0)*	5755	151	100	1.00	13	11.50	1.41	0.227	Positive	n/a (*a)	0.320	10g	4	-	P1	-
2	Front	0	Battery 1	n40(MCS0)*	5795	159	100	1.00	13	11.78	1.32	0.012	Positive	n/a (*a)	0.016	1g	1.6	-	P2	-
1	Front	0	Battery 1	n40(MCS0)*	5795*	159	100	1.00	13	11.62	1.37	0.018	Positive	n/a (*a)	0.025	1g	1.6	-	P2	-
2	Bottom (ant.2)	0	Battery 1	n40(MCS0)*	5795*	159	100	1.00	13	11.78	1.32	0.017	Positive	n/a (*a)	0.022	1g	1.6	4b-2	P3	-
1	Side (ant.1)	0	Battery 1	n40(MCS0)*	5795*	159	100	1.00	13	11.62	1.37	0.287	Positive	n/a (*a)	0.393	1g	1.6	4b-1	P4	-
1	Side (ant.1)	0	Battery 1	n40(MCS0)*	5755	151	100	1.00	13	11.50	1.41	0.239	Positive	n/a (*a)	0.337	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.
Calculating formula: ΔSAR corrected SAR (W/kg) = (Measured SAR (W/kg)) × (100 - (ΔSAR(%)) / 100

*b. Calculating formula: Scaled SAR (W/kg) = (Measured SAR (W/kg)) × (Duty scaled factor) × (Power scaled factor)
where, Duty scaled factor [-] = 100(%) / (duty cycle, %), Power scaled factor [-] = 10 ^ (((Max.tune-up limit, dBm) - (Measured conducted, dBm)) / 10)

*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 [-]	DSSS worst reported SAR value				Estimated SAR value: OFDM [W/kg]	Exclusion limit [W/kg]	Standalone SAR test of OFDM mode require?
	DSSS		OFDM									
	[dBm]	[mW] (a)	[dBm]	[mW] (b)	(b)/(a)×100	SAR type	Setup	Antenna	[W/kg]			
g	14.0	25	14.0	25	1.00	10g	Back	Antenna 2	0.329	**0.33**	**≤ 1.2**	**No**
n20	14.0	25	14.0	25	1.00	10g	Back	Antenna 2	0.329	**0.33**	**≤ 1.2**	**No**
n40	14.0	25	13.0	20	0.80	10g	Back	Antenna 2	0.329	**0.26**	**≤ 1.2**	**No**
g	14.0	25	14.0	25	1.00	1g	Side (ant.1)	Antenna 1	0.296	**0.30**	**≤ 1.2**	**No**
n20	14.0	25	14.0	25	1.00	1g	Side (ant.1)	Antenna 1	0.296	**0.30**	**≤ 1.2**	**No**
n40	14.0	25	13.0	20	0.80	1g	Side (ant.1)	Antenna 1	0.296	**0.24**	**≤ 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)]·[√ f(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 < 5mm, 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					
						Back	Front	Right	Bottom	Left	Top	Back	Front	Right	Bottom	Left	Top	Back	Front	Right	Bottom	Left	Top
						Antenna 2: BT LE						Antenna 2: WLAN(5Ghz)						limit: 1.6W/kg (1g), 4 W/kg (10g)					
		BT LE	WLAN	BT LE	WLAN	10g	1g	1g	1g	1g	1g	10g	1g	1g	1g	1g	1g	10g	1g	1g	1g	1g	1g
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)	(0.4)	**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)	(0.4)	**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)	(0.4)	**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)	(0.4)	**0.57**	**0.89**	**0.39**	(0.8)	(0.8)	(0.8)
D0: antenna 2 separation distance from surface [mm]						≤5	8	18	69	266	436	≤5	8	18	69	266	436						
						Antenna 1: BT LE						Antenna 1: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)	(0.4)	**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)	(0.4)	**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)	(0.4)	**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)	(0.4)	**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	357	≤5	8	21	106	305	357						

*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), 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), 3 W/kg (SAR(10g)), the "device holder perturbation verification" measurement is not performed.

APPENDIX 2: SAR Measurement data

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

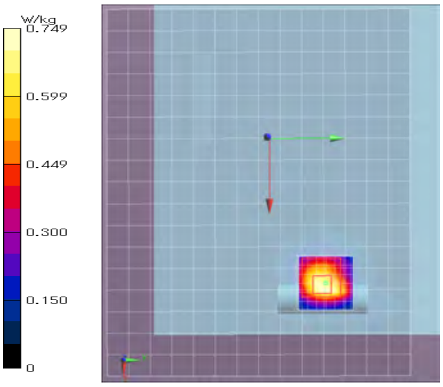
Plot 1a-1: 2.4GHz band, SAR(10g), Antenna 2; Back & touch / 11b (1Mbps) / 2412 MHz

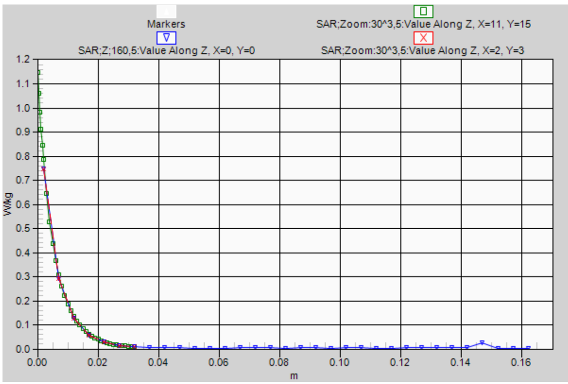
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: 11b(1Mbps, DBPSK/DSSS) (UID: 0, Wi-fi_2.4GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); **Frequency: 2412 MHz; Crest Factor: 1.0**
Medium: HSL5GHz(v6.2110; Medium parameters used (interpolated): f = 2412 MHz; σ = 1.838 mho/m; ε_r = 39.77; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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) @ 2472 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:204x168,12 (18x15x1): Measurement grid: dx=12mm, dy=12mm; Maximum value of SAR (measured) = 0.766 W/kg
Area:204x168,12 (171x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm; Maximum value of SAR (interpolated) = 0.874 W/kg
Z;160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.746 W/kg

Zoom:30^3,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 19.369 V/m; Power Drift = -0.14 dB; Maximum value of SAR (measured) = 0.749 W/kg; Peak SAR (extrapolated) = 1.147 mW/g
SAR(1 g) = 0.475 mW/g; SAR(10 g) = 0.222 mW/g (*.Smallest distance from peaks to all points 3 dB below = 6 mm; Ratio of SAR at M2 to SAR at M1 = 38.8%)





Remarks: *. Date tested: 2021/10/4; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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)

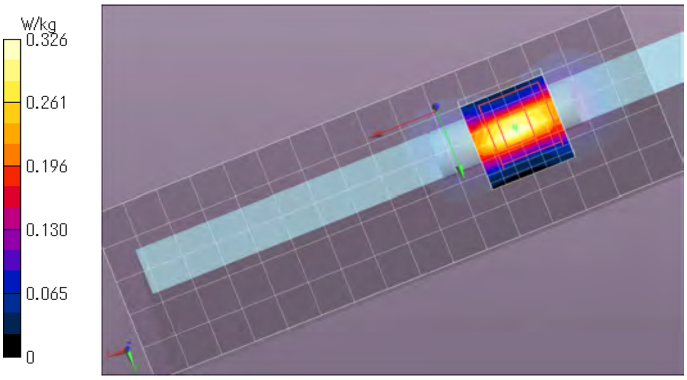
Plot 1b-1: 2.4GHz band, SAR(1g), Antenna 1; Side(antenna 1) & touch / 11b (1Mbps) / 2412 MHz

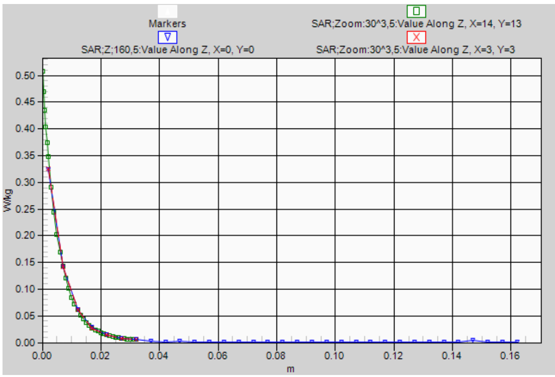
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: 11b(1Mbps, DBPSK/DSSS) (UID: 0, Wi-fi_2.4GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); **Frequency: 2412 MHz; Crest Factor: 1.0**
Medium: HSL5GHz(v6.2110; Medium parameters used (interpolated): f = 2412 MHz; σ = 1.838 S/m; ε_r = 39.77; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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,side1a/o24h24;2412,ant1,side(1)&d0,b(1m)/
Area:192x60,12 (17x6x1): Measurement grid: dx=12mm, dy=12mm; Maximum value of SAR (measured) = 0.323 W/kg
Area:192x60,12 (161x51x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm; Maximum value of SAR (interpolated) = 0.332 W/kg
Z;160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.324 W/kg

Zoom:30^3,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 13.78 V/m; Power Drift = -0.02 dB; Maximum value of SAR (measured) = 0.326 W/kg; Peak SAR (extrapolated) = 0.508 W/kg
SAR(1 g) = 0.203 W/kg; SAR(10 g) = 0.083 W/kg (*. Smallest distance from peaks to all points 3 dB below = 6 mm; Ratio of SAR at M2 to SAR at M1 = 43.4%)





Remarks: *. Date tested: 2021/10/4; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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 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/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062

Mode: n40(MCS0, BPSK/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(v6.2110; Medium parameters used: f = 5270 MHz; σ = 4.541 S/m; ε_r = 35.07; ρ = 1000 kg/m^3

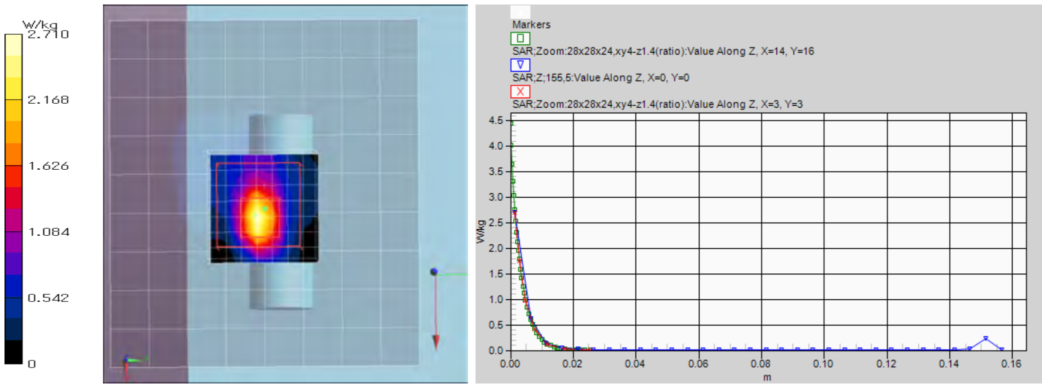
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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) = 2.44 W/kg
Area:90x80,stp10 (91x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 2.45 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.70 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 25.40 V/m; Power Drift = -0.06 dB; Maximum value of SAR (measured) = 2.71 W/kg; Peak SAR (extrapolated) = 4.44 W/kg

SAR(1 g) = 0.976 W/kg; SAR(10 g) = 0.249 W/kg (*.Smallest distance from peaks to all points 3 dB below = 4.8 mm; Ratio of SAR at M2 to SAR at M1 = 64.8%)



Remarks: *. Date tested: 2021/10/7; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %RH,
*. liquid temperature: 22.6(start)/22.6(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/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062

Mode: n40(MCS0, BPSK/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(v6.2110; Medium parameters used: f = 5270 MHz; σ = 4.541 S/m; ε_r = 35.07; ρ = 1000 kg/m^3

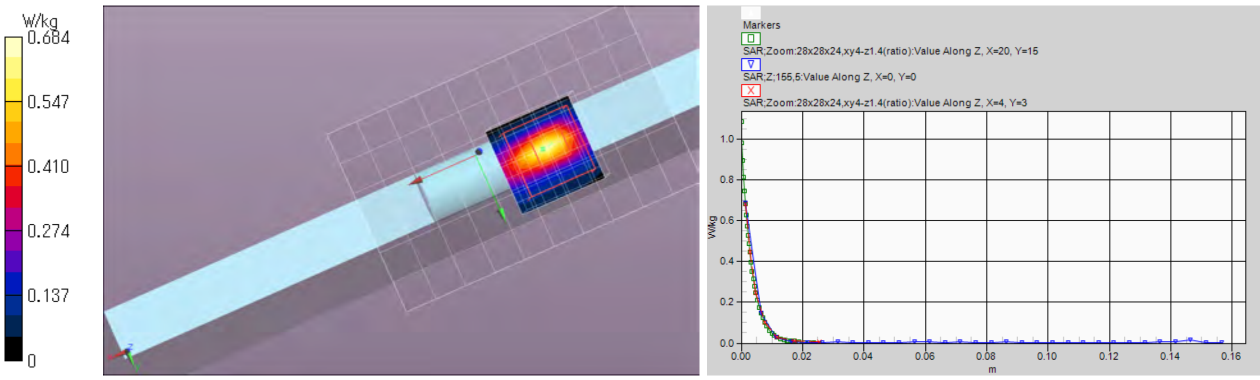
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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: 2mm (Mechanical Surface Detection), Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,side1a/o5h52.53.14,5270,ant1,side(1)&d0,n40(m0)/
Area:100x60,10 (11x7x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.542 W/kg
Area:100x60,10 (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.574 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.687 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 13.40 V/m; Power Drift = -0.01 dB; Maximum value of SAR (measured) = 0.684 W/kg; Peak SAR (extrapolated) = 1.09 W/kg

SAR(1 g) = 0.264 W/kg; SAR(10 g) = 0.078 W/kg (*.Smallest distance from peaks to all points 3 dB below = 5.4 mm; Ratio of SAR at M2 to SAR at M1 = 65.5%)



Remarks: *. Date tested: 2021/10/8; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %RH,
*. liquid temperature: 22.4(start)/22.5(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

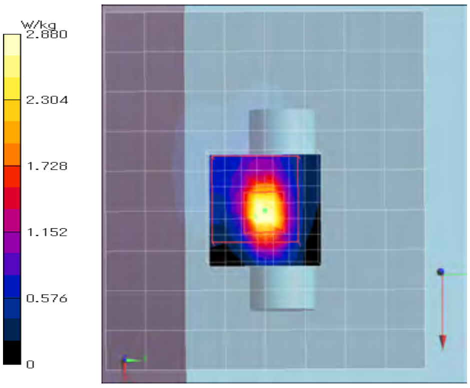
APPENDIX 2: SAR Measurement data / Appendix 2-1: Worst Scaled (Reported) SAR Plot (cont'd)

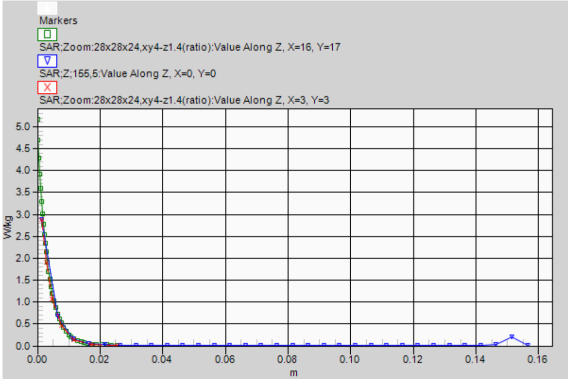
Plot 2c-1: 5.2GHz band, SAR(10g), Antenna 1; Back & touch / 11n(40HT) (MCS0) / 5190 MHz
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); **Frequency: 5190 MHz; Crest Factor: 1.0**
Medium: HSL5GHz(v6.2110; Medium parameters used: f = 5190 MHz; σ = 4.454 S/m; ε_r = 35.22; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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) = 2.92 W/kg
Area:90x80,stp10 (91x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 2.92 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.89 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 29.84 V/m; Power Drift = -0.11 dB; Maximum value of SAR (measured) = 2.88 W/kg; Peak SAR (extrapolated) = 5.16 W/kg
SAR(1 g) = 1.18 W/kg; SAR(10 g) = 0.307 W/kg (*.Smallest distance from peaks to all points 3 dB below = 4.7 mm; Ratio of SAR at M2 to SAR at M1 = 66.1%)





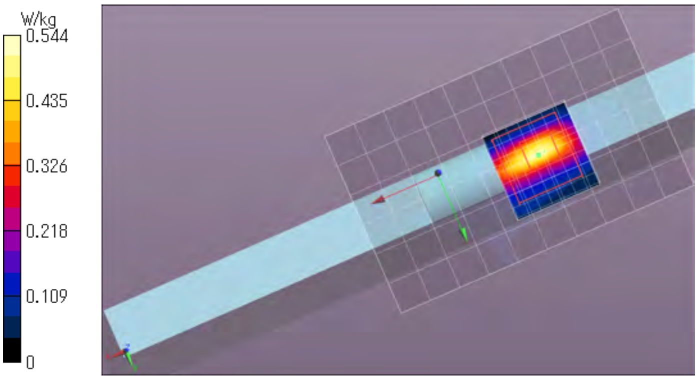
Remarks: *. Date tested: 2021/10/7; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %RH,
*. liquid temperature: 22.4(start)/22.4(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

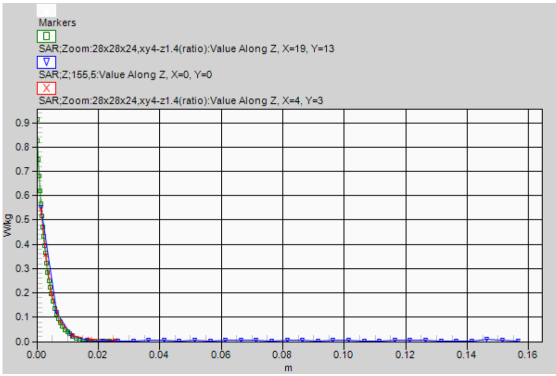
Plot 2d-1: 5.2GHz band, SAR(1g), Antenna 1; Side (antenna 1) & touch / 11n(40HT) (MCS0) / 5230 MHz
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); **Frequency: 5230 MHz; Crest Factor: 1.0**
Medium: HSL5GHz(v6.2110; Medium parameters used: f = 5230 MHz; σ = 4.492 S/m; ε_r = 35.13; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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: 2mm (Mechanical Surface Detection), Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,side1a/o5h53.52.8,5230,ant1,side(1)&d0,n40(m0)/
Area:100x60,10 (11x7x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.458 W/kg
Area:100x60,10 (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.487 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.552 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 12.13 V/m; Power Drift = 0.03 dB; Maximum value of SAR (measured) = 0.544 W/kg; Peak SAR (extrapolated) = 0.912 W/kg
SAR(1 g) = 0.218 W/kg; SAR(10 g) = 0.068 W/kg (*.Smallest distance from peaks to all points 3 dB below = 4.8 mm; Ratio of SAR at M2 to SAR at M1 = 65.3%)





Remarks: *. Date tested: 2021/10/8; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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)

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) / 5670 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062

Mode: n40(MCS0, BPSK/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(v6.2110; Medium parameters used: f = 5670 MHz; σ = 4.971 S/m; ε_r = 34.39; ρ = 1000 kg/m^3

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

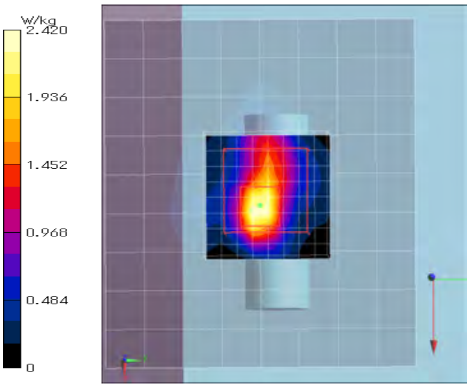
DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(4.56, 4.56, 4.56) @ 5670 MHz; Calibrated: 2021/04/21
-Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

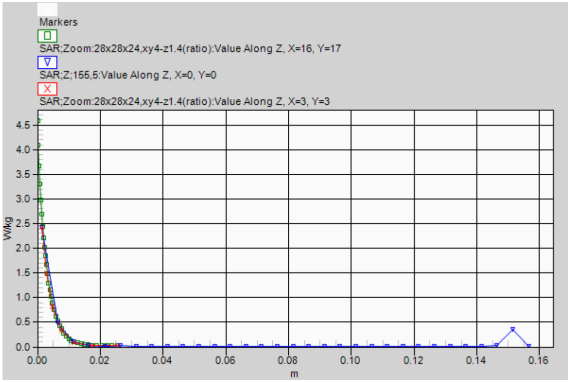
touch,back1,h5b/5h15.56.5,ant1,5670,Rear&d0,n40(m0)/

Area:90x80,stp10 (10x9x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 2.39 W/kg
Area:90x80,stp10 (91x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 2.50 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.43 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 25.45 V/m; Power Drift = -0.12 dB; Maximum value of SAR (measured) = 2.42 W/kg; Peak SAR (extrapolated) = 4.58 W/kg

SAR(1 g) = 0.950 W/kg; SAR(10 g) = 0.268 W/kg (*.Smallest distance from peaks to all points 3 dB below = 4.8 mm; Ratio of SAR at M2 to SAR at M1 = 62.5%)





Remarks: *. Date tested: 2021/10/5; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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-1: 5.6GHz band, SAR(1g), Antenna 1; Side (antenna 1) & touch / 11n(40HT) (MCS0) / 5670 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062

Mode: n40(MCS0, BPSK/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(v6.2110; Medium parameters used: f = 5670 MHz; σ = 4.971 S/m; ε_r = 34.39; ρ = 1000 kg/m^3

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

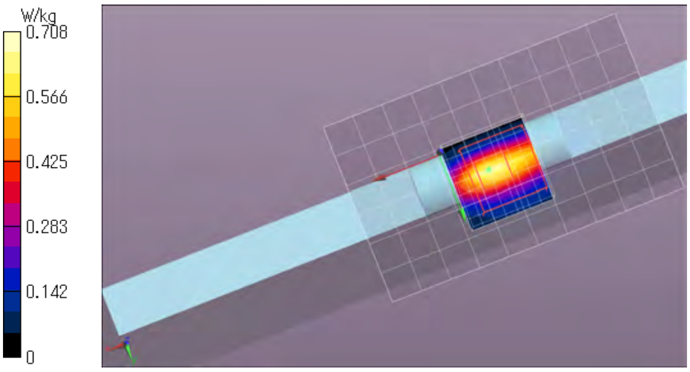
DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -Phantom: ELI v4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
-DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474) / -Probe: EX3DV4 - SN3907; ConvF(4.56, 4.56, 4.56) @ 5670 MHz; Calibrated: 2021/04/21
-Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

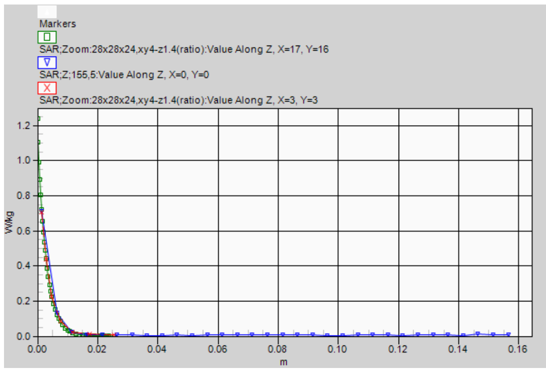
touch,side1a/5h55.56.20,5670,ant1,side(1)&d0,n40(m0)/

Area:100x60,10 (11x7x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.468 W/kg
Area:100x60,10 (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.593 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.713 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 13.25 V/m; Power Drift = 0.04 dB; Maximum value of SAR (measured) = 0.708 W/kg; Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.280 W/kg; SAR(10 g) = 0.087 W/kg (*.Smallest distance from peaks to all points 3 dB below = 5.8 mm; Ratio of SAR at M2 to SAR at M1 = 61.6%)





Remarks: *. Date tested: 2021/10/5; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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)

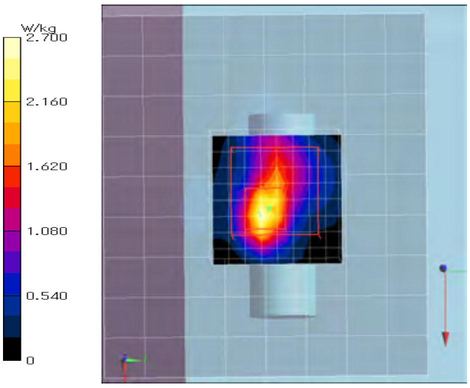
APPENDIX 2: SAR Measurement data / Appendix 2-1: Worst Scaled (Reported) SAR Plot (cont'd)

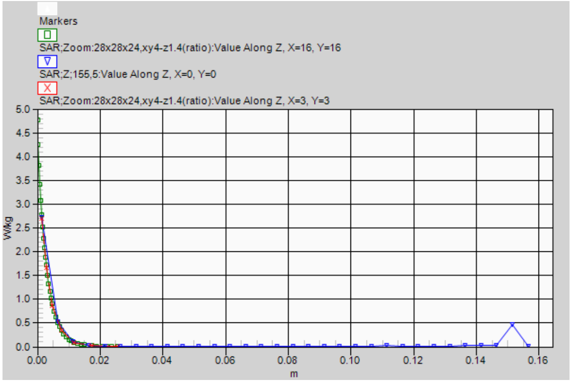
Plot 4a-1: 5.8GHz band, SAR(10g), Antenna 1; Back & touch / 11n(40HT) (MCS0) / 5795 MHz
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); **Frequency: 5795 MHz; Crest Factor: 1.0**
Medium: HSL5GHz(v6.2110; Medium parameters used (interpolated): f = 5795 MHz; σ = 5.123 S/m; ε_r = 34.2; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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) = 2.39 W/kg
Area:90x80,stp10 (91x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 2.52 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.72 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 25.17 V/m; Power Drift = -0.07 dB; Maximum value of SAR (measured) = 2.70 W/kg; Peak SAR (extrapolated) = 4.76 W/kg
SAR(1 g) = 0.964 W/kg; SAR(10 g) = 0.270 W/kg (*.Smallest distance from peaks to all points 3 dB below = 4.7 mm; Ratio of SAR at M2 to SAR at M1 = 61.6%)





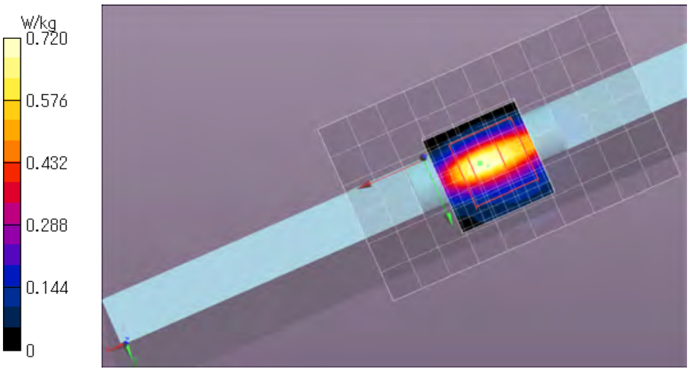
Remarks: *. Date tested: 2021/10/6; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %RH,
*. liquid temperature: 22.5(start)/22.5(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

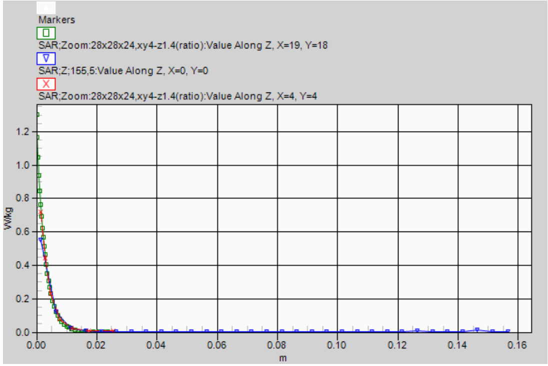
Plot 4b-1: 5.8GHz band, SAR(1g), Antenna 1; Side (antenna 1) & touch / 11n(40HT) (MCS0) / 5795 MHz
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); **Frequency: 5795 MHz; Crest Factor: 1.0**
Medium: HSL5GHz(v6.2110; Medium parameters used (interpolated): f = 5795 MHz; σ = 5.123 S/m; ε_r = 34.2; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), z = 1.0, 25.0, 156.0

touch,side1a/5h59.58.14,5795,ant1,side(1)&d0,n40(m0)/
Area:100x60,10 (11x7x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.701 W/kg
Area:100x60,10 (101x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.717 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.730 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 13.42 V/m; Power Drift = -0.01 dB; Maximum value of SAR (measured) = 0.720 W/kg; Peak SAR (extrapolated) = 1.95 W/kg
SAR(1 g) = 0.287 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 = 61.8%)





Remarks: *. Date tested: 2021/10/6; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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)

Appendix 2: SAR measurement data (cont'd)

Appendix 2-2: Other SAR Plots

Plot 1a-2: 2.4GHz band, SAR(10g), Antenna 1; Back & touch / 11b (1Mbps) / 2437 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062

Mode: 11b(1Mbps, DBPSK/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(v6.2110; Medium parameters used (interpolated): f = 2437 MHz; σ = 1.857 mho/m; ε_r = 39.72; ρ = 1000 kg/m^3

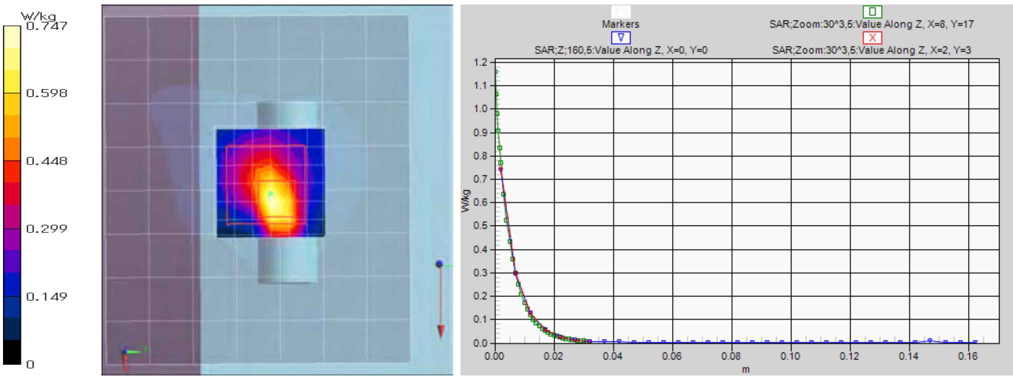
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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,back,h24b/o24h12,2437,ant1,Rear&d0,b(1m)/
Area:96x84,12 (9x8x1): Measurement grid: dx=12mm, dy=12mm; Maximum value of SAR (measured) = 0.650 W/kg
Area:96x84,12 (81x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm; Maximum value of SAR (interpolated) = 0.668 W/kg
Z;160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.739 W/kg

Zoom:30^3,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 20.125 V/m; Power Drift = -0.06 dB; Maximum value of SAR (measured) = 0.747 W/kg; Peak SAR (extrapolated) = 1.160 mW/g

SAR(1 g) = 0.416 mW/g; SAR(10 g) = 0.166 mW/g (*.Smallest distance from peaks to all points 3 dB below = 5.1 mm; Ratio of SAR at M2 to SAR at M1 = 40%)



Remarks: *. Date tested: 2021/10/4; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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 1a-3: 2.4GHz band, SAR(10g), Antenna 1; Back & touch / 11b (1Mbps) / 2412 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062

Mode: 11b(1Mbps, DBPSK/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(v6.2110; Medium parameters used (interpolated): f = 2412 MHz; σ = 1.838 mho/m; ε_r = 39.77; ρ = 1000 kg/m^3

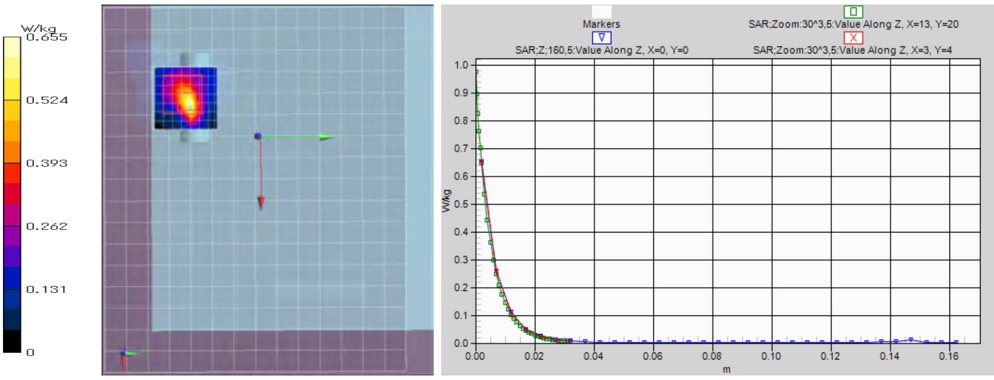
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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) @ 2472 MHz; Calibrated: 2021/04/21
-Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0, 161.0

touch,back,h24a/24h10,2412,ant1,Rear&d0,b(1m)/
Area:204x168,12 (18x15x1): Measurement grid: dx=12mm, dy=12mm; Maximum value of SAR (measured) = 0.534 W/kg
Area:204x168,12 (171x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm; Maximum value of SAR (interpolated) = 0.623 W/kg
Z;160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.653 W/kg

Zoom:30^3,5 (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 19.360 V/m; Power Drift = -0.05 dB; Maximum value of SAR (measured) = 0.655 W/kg; Peak SAR (extrapolated) = 0.976 mW/g

SAR(1 g) = 0.352 mW/g; SAR(10 g) = 0.144 mW/g (*.Smallest distance from peaks to all points 3 dB below = 5.7 mm; Ratio of SAR at M2 to SAR at M1 = 39.3%)



Remarks: *. Date tested: 2021/10/4; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %RH,
*. liquid temperature: 22.4(start)/22.5(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

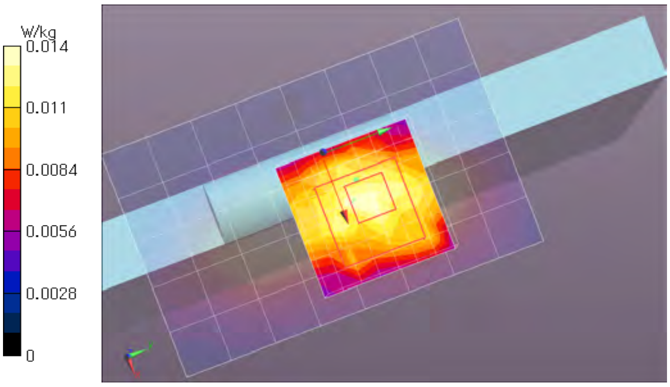
Appendix 2: SAR measurement data / Appendix 2-2: Other SAR Plots (cont'd)

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/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: 11b(1Mbps, DBPSK/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(v6.2110; Medium parameters used (interpolated): f = 2437 MHz; σ = 1.857 S/m; ε_r = 39.72; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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/o24h21;2437,ant0,side(0)&d0,b(1m)/
Area:60x96,12 (6x9x1): Measurement grid: dx=12mm, dy=12mm; Maximum value of SAR (measured) = 0.0137 W/kg
Area:60x96,12 (51x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm; Maximum value of SAR (interpolated) = 0.0188 W/kg

Zoom:30^3,5 (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 2.626 V/m; Power Drift = -0.15 dB; Maximum value of SAR (measured) = 0.0140 W/kg; Peak SAR (extrapolated) = 0.0180 W/kg
SAR(1 g) = 0.0096 W/kg; SAR(10 g) = 0.00567 W/kg (*. Ratio of SAR at M2 to SAR at M1 = 54.7%)



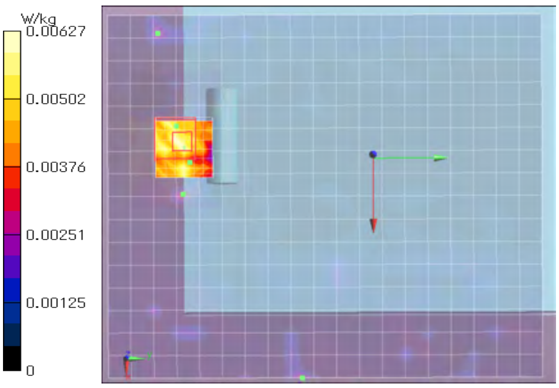
Remarks: *. Date tested: 2021/10/4; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %RH,
*. liquid temperature: 22.4(start)/22.3(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

Plot 1b-3: 2.4GHz band, SAR(1g), Antenna 2; Front & touch / 11b (1Mbps) / 2462 MHz
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: 11b(1Mbps, DBPSK/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(v6.2110; Medium parameters used (interpolated): f = 2462 MHz; σ = 1.876 S/m; ε_r = 39.66; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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

touch,front/24h32;2462,ant0,front&d0,b(1m)/
Area:192x228,12 (17x20x1): Measurement grid: dx=12mm, dy=12mm; Maximum value of SAR (measured) = 0.00572 W/kg
Area:192x228,12 (161x191x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm; Maximum value of SAR (interpolated) = 0.00829 W/kg

Zoom:30^3,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 1.421 V/m; Power Drift = -0.20 dB; Maximum value of SAR (measured) = 0.00627 W/kg; Peak SAR (extrapolated) = 0.00869 W/kg
SAR(1 g) = 0.00423 W/kg; SAR(10 g) = 0.00268 W/kg (*. Ratio of SAR at M2 to SAR at M1 = 56.4%)



Remarks: *. Date tested: 2021/10/4; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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)

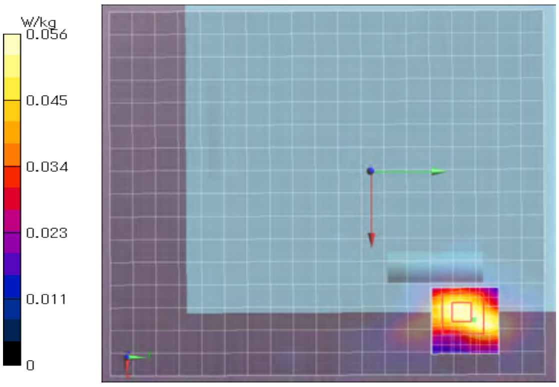
Appendix 2: SAR measurement data / Appendix 2-2: Other SAR Plots (cont'd)

Plot 1b-4: 2.4GHz band, SAR(1g), Antenna 1; Front & touch / 11b (1Mbps) / 2462 MHz
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: 11b(1Mbps, DBPSK/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(v6.2110; Medium parameters used (interpolated): f = 2462 MHz; σ = 1.876 S/m; ε_r = 39.66; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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

touch,front/24h30;2462,ant1,front&d0,b(1m)/
Area:192x228,12 (17x20x1): Measurement grid: dx=12mm, dy=12mm; Maximum value of SAR (measured) = 0.0543 W/kg
Area:192x228,12 (161x191x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm; Maximum value of SAR (interpolated) = 0.0878 W/kg

Zoom:30^3,5 (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 5.579 V/m; Power Drift = -0.07 dB; Maximum value of SAR (measured) = 0.0564 W/kg; Peak SAR (extrapolated) = 0.0770 W/kg
SAR(1 g) = 0.040 W/kg; SAR(10 g) = 0.021 W/kg (*. Ratio of SAR at M2 to SAR at M1 = 51.5%)



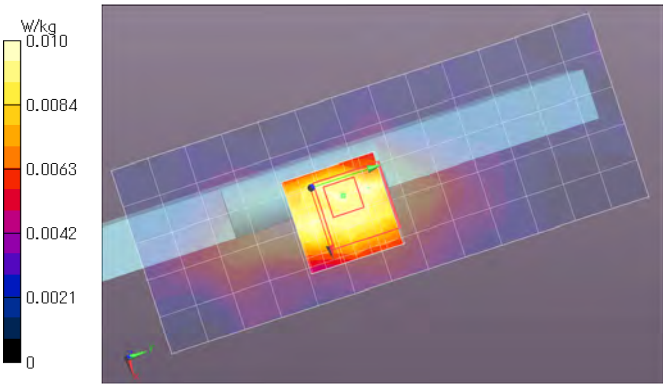
Remarks: *. Date tested: 2021/10/4; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %RH,
*. liquid temperature: 22.3(start)/22.5(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

Plot 1b-5: 2.4GHz band, SAR(1g), Antenna 2; Bottom (antenna 2) & touch / 11b (1Mbps) / 2412 MHz
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: 11b(1Mbps, DBPSK/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(v6.2110; Medium parameters used (interpolated): f = 2412 MHz; σ = 1.838 S/m; ε_r = 39.77; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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

touch,side0a/24h19;2412,ant0,side(0)&d0,b(1m)/
Area:60x156,12 (6x14x1): Measurement grid: dx=12mm, dy=12mm; Maximum value of SAR (measured) = 0.0111 W/kg
Area:60x156,12 (51x131x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm; Maximum value of SAR (interpolated) = 0.0125 W/kg

Zoom:30^3,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 2.372 V/m; Power Drift = -0.20 dB; Maximum value of SAR (measured) = 0.0105 W/kg; Peak SAR (extrapolated) = 0.0130 W/kg
SAR(1 g) = 0.00719 W/kg; SAR(10 g) = 0.00383 W/kg (*. Ratio of SAR at M2 to SAR at M1 = 60.2%)



Remarks: *. Date tested: 2021/10/4; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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)

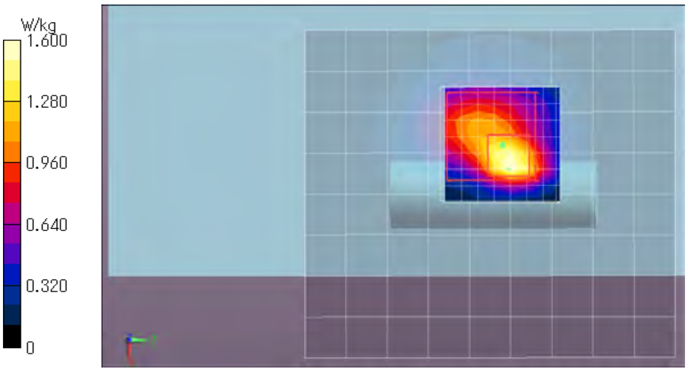
Appendix 2: SAR measurement data / Appendix 2-2: Other SAR Plots (cont'd)

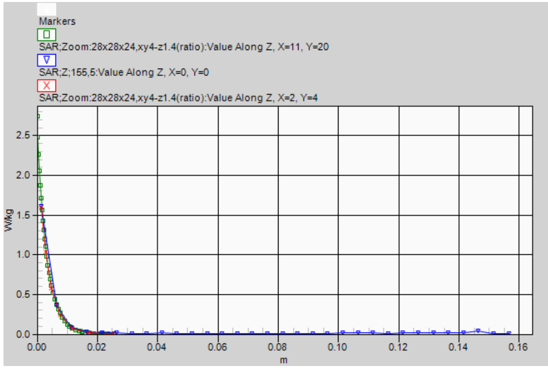
Plot 2a-2: 5.3GHz band, SAR(10g), Antenna 2; Back & touch / 11n(40HT) (MCS0) / 5270 MHz
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); **Frequency: 5270 MHz; Crest Factor: 1.0**
Medium: HSL5GHz(v6.2110; Medium parameters used: f = 5270 MHz; σ = 4.541 S/m; ε_r = 35.07; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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) = 1.53 W/kg
Area:80x90,stp10 (81x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 1.70 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 1.61 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 18.95 V/m; Power Drift = -0.20 dB; Maximum value of SAR (measured) = 1.60 W/kg; Peak SAR (extrapolated) = 2.74 W/kg
SAR(1 g) = 0.664 W/kg; SAR(10 g) = 0.234 W/kg (*.Smallest distance from peaks to all points 3 dB below = 4.8 mm; Ratio of SAR at M2 to SAR at M1 = 64.7%)





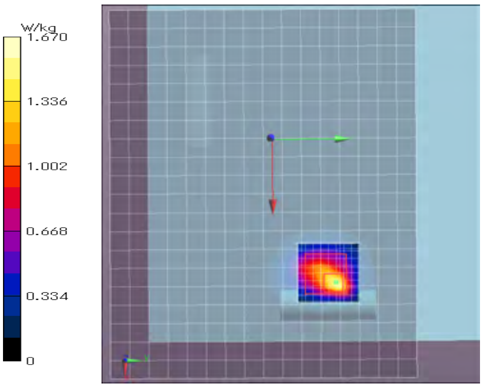
Remarks: *. Date tested: 2021/10/7; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %RH,
*. liquid temperature: 22.3(start)/22.3(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

Plot 2a-3: 5.3GHz band, SAR(10g), Antenna 2; Back & touch / 11n(40HT) (MCS0) / 5310 MHz
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/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(v6.2110; Medium parameters used: f = 5310 MHz; σ = 4.587 S/m; ε_r = 34.99; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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,back0,h5a/5h10.53.1,ant0,5310,Rear&d0,n40(m0)/
Area:200x160,stp10 (21x17x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.59 W/kg
Area:200x160,stp10 (201x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 1.90 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 20.24 V/m; Power Drift = -0.12 dB; Maximum value of SAR (measured) = 1.67 W/kg; Peak SAR (extrapolated) = 2.76 W/kg
SAR(1 g) = 0.672 W/kg; SAR(10 g) = 0.238 W/kg (*.Smallest distance from peaks to all points 3 dB below = 4.9 mm; Ratio of SAR at M2 to SAR at M1 = 65.1%)



Remarks: *. Date tested: 2021/10/7; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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)

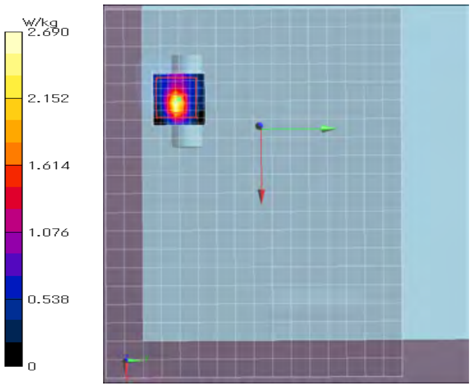
Appendix 2: SAR measurement data / Appendix 2-2: Other SAR Plots (cont'd)

Plot 2a-4: 5.3GHz band, SAR(10g), Antenna 1; Back & touch / 11n(40HT) (MCS0) / 5310 MHz
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/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(v6.2110; Medium parameters used: f = 5310 MHz; σ = 4.587 S/m; ε_r = 34.99; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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,back0,h5a/5h11.53.3,ant1,5310,Rear&d0,n40(m0)/
Area:200x160,stp10 (21x17x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 2.49 W/kg
Area:200x160,stp10 (201x161x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 2.50 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 25.14 V/m; Power Drift = -0.20 dB; Maximum value of SAR (measured) = 2.69 W/kg; Peak SAR (extrapolated) = 4.43 W/kg
SAR(1 g) = 0.971 W/kg; SAR(10 g) = 0.255 W/kg (*.Smallest distance from peaks to all points 3 dB below = 4.8 mm; Ratio of SAR at M2 to SAR at M1 = 64.6%)



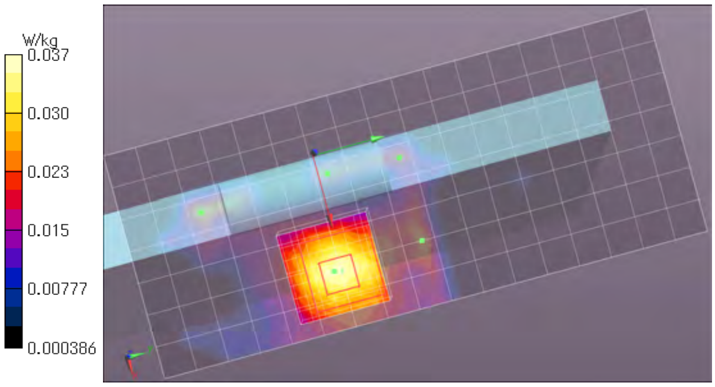
Remarks: *. Date tested: 2021/10/7; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %RH,
*. liquid temperature: 22.5(start)/22.6(end)/22.5(in check) deg.C.; *.White cubic: 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/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/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(v6.2110; Medium parameters used: f = 5310 MHz; σ = 4.587 S/m; ε_r = 34.99; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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,side0a/5h47.53.11,5310,ant0,side(0)&d0,n40(m0)/
Area:70x170,10 (8x18x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.0346 W/kg
Area:70x170,10 (71x171x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.0352 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 3.098 V/m; Power Drift = -0.20 dB; Maximum value of SAR (measured) = 0.0373 W/kg; Peak SAR (extrapolated) = 0.0650 W/kg
SAR(1 g) = 0.020 W/kg; SAR(10 g) = 0.00943 W/kg (*.Ratio of SAR at M2 to SAR at M1 = 68.2%)



Remarks: *. Date tested: 2021/10/8; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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)

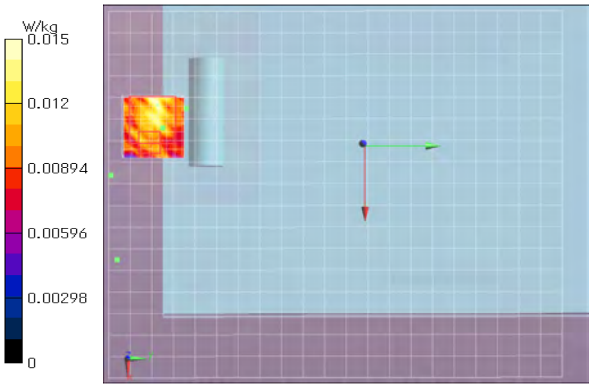
Appendix 2: SAR measurement data / Appendix 2-2: Other SAR Plots (cont'd)

Plot 2b-3: 5.3GHz band, SAR(1g), Antenna 2; Front & touch / 11n(40HT) (MCS0) / 5310 MHz
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/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(v6.2110; Medium parameters used: f = 5310 MHz; σ = 4.587 S/m; ε_r = 34.99; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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: 2mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 25.0

touch,front2/5h43.53.9,5310,ant0,front&d0,n40(m0)/
Area:170x210,10 (18x22x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.0120 W/kg
Area:170x210,10 (171x211x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.0188 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 1.322 V/m; Power Drift = -0.20 dB; Maximum value of SAR (measured) = 0.0149 W/kg; Peak SAR (extrapolated) = 0.0580 W/kg
SAR(1 g) = 0.0057 W/kg; SAR(10 g) = 0.00426 W/kg (*.Ratio of SAR at M2 to SAR at M1 = 66.4%)



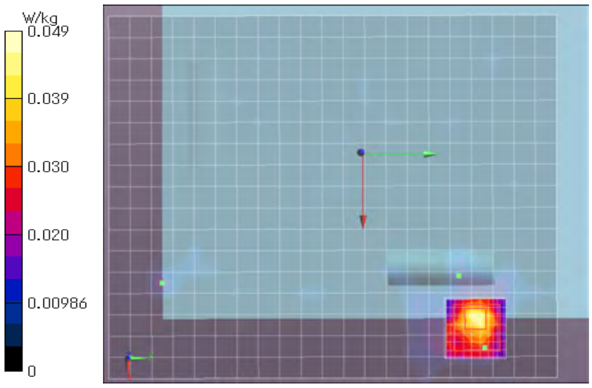
Remarks: *. Date tested: 2021/10/8; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %RH,
*. liquid temperature: 22.4(start)/22.5(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

Plot 2b-4: 5.3GHz band, SAR(1g), Antenna 1; Front & touch / 11n(40HT) (MCS0) / 5310 MHz
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/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(v6.2110; Medium parameters used: f = 5310 MHz; σ = 4.587 S/m; ε_r = 34.99; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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: 2mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 25.0

touch,front2/5h44.53.10,5310,ant1,front&d0,n40(m0)/
Area:170x210,10 (18x22x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.0365 W/kg
Area:170x210,10 (171x211x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.0494 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 2.570 V/m; Power Drift = 0.02 dB; Maximum value of SAR (measured) = 0.0493 W/kg; Peak SAR (extrapolated) = 0.0770 W/kg
SAR(1 g) = 0.024 W/kg; SAR(10 g) = 0.011 W/kg (*.Ratio of SAR at M2 to SAR at M1 = 62.6%)



Remarks: *. Date tested: 2021/10/8; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %RH,
*. liquid temperature: 22.5(start)/22.6(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

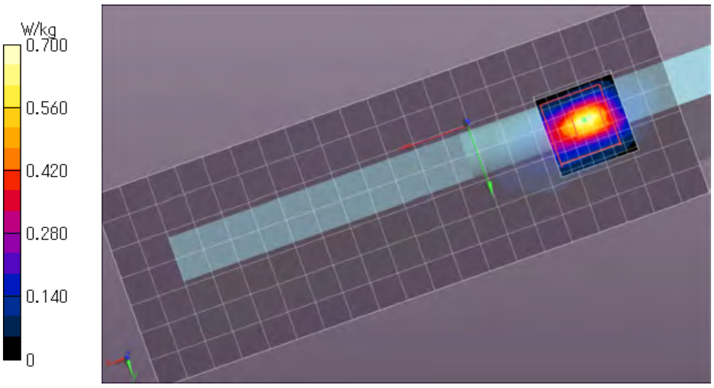
Appendix 2: SAR measurement data / Appendix 2-2: Other SAR Plots (cont'd)

Plot 2b-5: 5.3GHz band, SAR(1g), Antenna 1; Side (antenna 1) & touch / 11n(40HT) (MCS0) / 5310 MHz
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/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(v6.2110; Medium parameters used: f = 5310 MHz; σ = 4.587 S/m; ε_r = 34.99; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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,side1a/5h51.53.13,5310,ant1,side(1)&d0,n40(m0)/
Area:200x70,10 (21x8x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.584 W/kg
Area:200x70,10 (201x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.708 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 13.65 V/m; Power Drift = -0.02 dB; Maximum value of SAR (measured) = 0.700 W/kg; Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.270 W/kg; SAR(10 g) = 0.076 W/kg (*.Smallest distance from peaks to all points 3 dB below = 5.6 mm; Ratio of SAR at M2 to SAR at M1 = 64.4%)



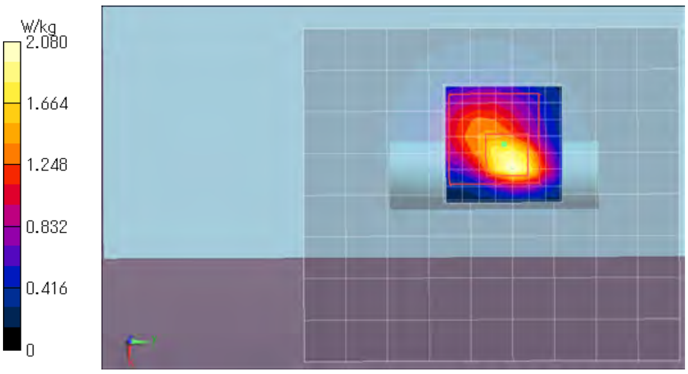
Remarks: *. Date tested: 2021/10/8; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %RH,
*. liquid temperature: 22.3(start)/22.4(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

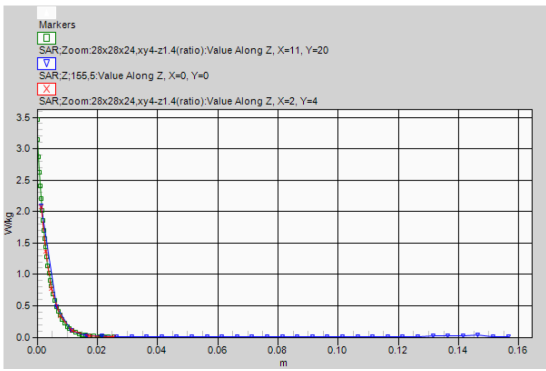
Plot 2c-2: 5.2GHz band, SAR(1g), Antenna 2; Back & touch / 11n(40HT) (MCS0) / 5190 MHz
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); **Frequency: 5190 MHz; Crest Factor: 1.0**
Medium: HSL5GHz(v6.2110; Medium parameters used: f = 5190 MHz; σ = 4.454 S/m; ε_r = 35.22; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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/5h3.52.2,ant0,5190,Rear&d0,n40(m0)/
Area:80x90,stp10 2 (9x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.77 W/kg
Area:80x90,stp10 2 (81x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 1.93 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.09 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 21.00 V/m; Power Drift = -0.14 dB; Maximum value of SAR (measured) = 2.08 W/kg; Peak SAR (extrapolated) = 3.46 W/kg
SAR(1 g) = 0.852 W/kg; SAR(10 g) = 0.293 W/kg (*.Smallest distance from peaks to all points 3 dB below = 4.3 mm; Ratio of SAR at M2 to SAR at M1 = 65.7%)





Remarks: *. Date tested: 2021/10/7; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %RH,
*. liquid temperature: 22.2(start)/22.2(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

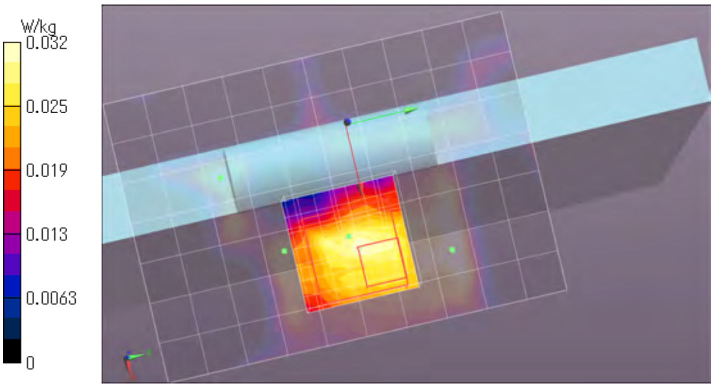
Appendix 2: SAR measurement data / Appendix 2-2: Other SAR Plots (cont'd)

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/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/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(v6.2110; Medium parameters used: f = 5230 MHz; σ = 4.492 S/m; ε_r = 35.13; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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,side0a/5h48.52.7,5230,ant0,side(0)&d0,n40(m0)/
Area:70x100,10 (8x11x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.0289 W/kg
Area:70x100,10 (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.0366 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 2.651 V/m; Power Drift = -0.20 dB; Maximum value of SAR (measured) = 0.0315 W/kg; Peak SAR (extrapolated) = 0.0710 W/kg
SAR(1 g) = 0.015 W/kg; SAR(10 g) = 0.00712 W/kg (*.Ratio of SAR at M2 to SAR at M1 = 63.2%)



Remarks: *. Date tested: 2021/10/8; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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)

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

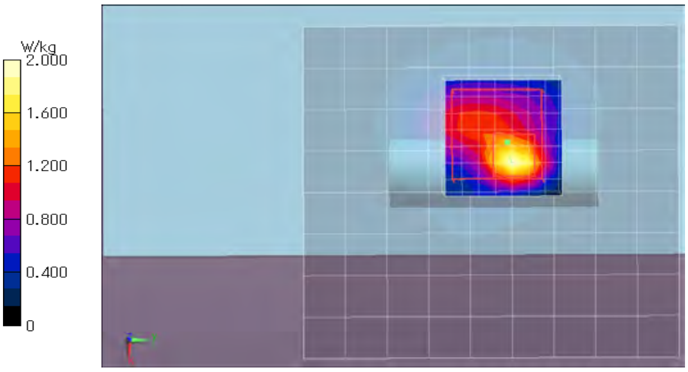
Plot 3a-2: 5.6GHz band, SAR(10g), Antenna 2; Back & touch / 11n(40HT) (MCS0) / 5510 MHz

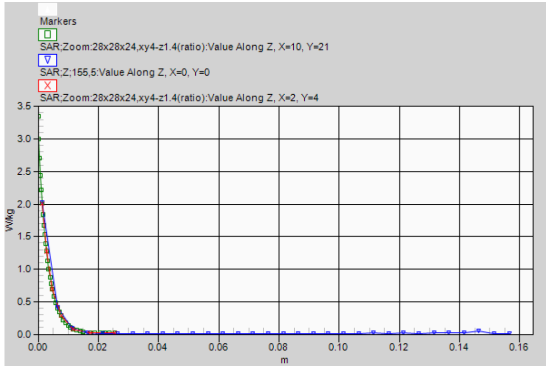
EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/OFDM) (UID: 0, Wi-fi_5GHz (0), Frame Length in ms: 0; PAR: 0; PMF: 1); **Frequency: 5510 MHz; Crest Factor: 1.0**
Medium: HSL5GHz(v6.2110; Medium parameters used: f = 5510 MHz; σ = 4.79 S/m; ε_r = 34.67; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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,back0,h5a/5h6.56.3,ant0,5510,Rear&d0,n40(m0)/
Area:80x90,stp10 (9x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.59 W/kg
Area:80x90,stp10 (81x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 1.68 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.03 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 18.75 V/m; Power Drift = -0.18 dB; Maximum value of SAR (measured) = 2.00 W/kg; Peak SAR (extrapolated) = 3.35 W/kg
SAR(1 g) = 0.745 W/kg; SAR(10 g) = 0.254 W/kg (*.Smallest distance from peaks to all points 3 dB below = 5.8 mm; Ratio of SAR at M2 to SAR at M1 = 63.3%)





Remarks: *. Date tested: 2021/10/5; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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)

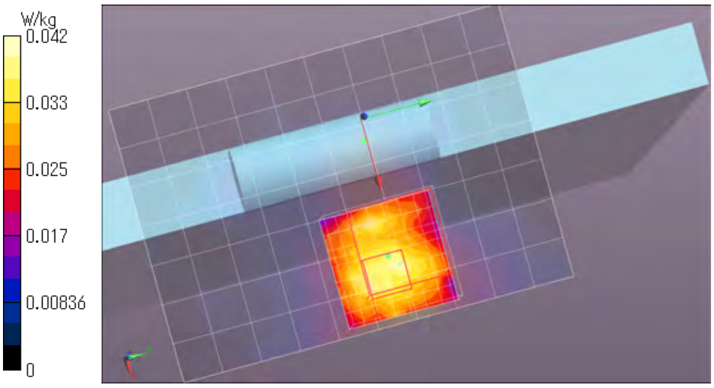
Plot 3b-2: 5.6GHz band, SAR(1g), Antenna 2; Bottom (antenna 2) & touch / 11n(40HT) (MCS0) / 5670 MHz

EUT: Built-in Wireless Module with BT/Flat Panel Detector; Type: WM01B/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/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(v6.2110; Medium parameters used: f = 5670 MHz; σ = 4.971 S/m; ε_r = 34.39; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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/o5h49.56.19,5670,ant0,side(0)&d0,n40(m0)/
Area:70x100,10 (8x11x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.0343 W/kg
Area:70x100,10 (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.0367 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 3.111 V/m; Power Drift = -0.20 dB; Maximum value of SAR (measured) = 0.0418 W/kg; Peak SAR (extrapolated) = 0.126 W/kg
SAR(1 g) = 0.022 W/kg; SAR(10 g) = 0.012 W/kg (*.Ratio of SAR at M2 to SAR at M1 = 66.6%)



Remarks: *. Date tested: 2021/10/5; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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)

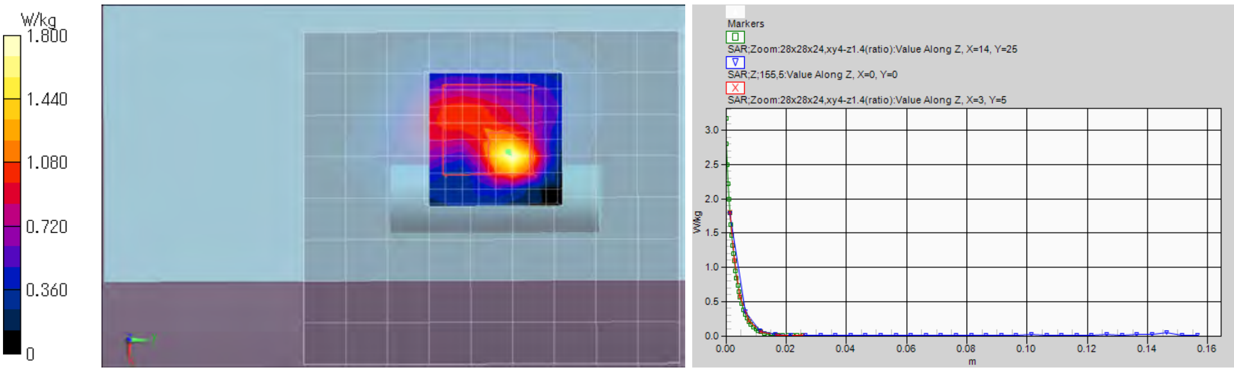
Appendix 2: SAR measurement data / Appendix 2-2: Other SAR Plots (cont'd)

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/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/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(v6.2110; Medium parameters used (interpolated): f = 5795 MHz; σ = 5.123 S/m; ε_r = 34.2; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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,back0,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) = 1.81 W/kg
Area:80x90,stp10 (81x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 1.93 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 1.79 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 20.24 V/m; Power Drift = -0.20 dB; Maximum value of SAR (measured) = 1.80 W/kg; Peak SAR (extrapolated) = 3.17 W/kg
SAR(1 g) = 0.638 W/kg; SAR(10 g) = 0.212 W/kg (*.Smallest distance from peaks to all points 3 dB below = 5.6 mm; Ratio of SAR at M2 to SAR at M1 = 61.1%)



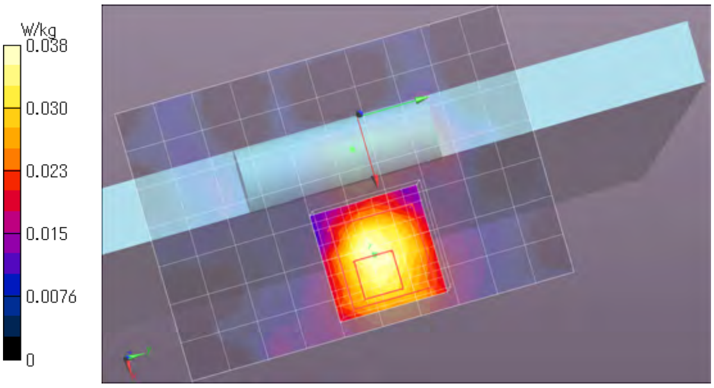
Remarks: *. Date tested: 2021/10/6; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %RH,
*. liquid temperature: 22.5(start)/22.5(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

Plot 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/WM5B04; Serial: f4:a9:97:ff:d0:bc/20MED-0062
Mode: n40(MCS0, BPSK/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(v6.2110; Medium parameters used (interpolated): f = 5795 MHz; σ = 5.123 S/m; ε_r = 34.2; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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,side0a/o5h50.58.13,5795,ant0,side(0)&d0,n40(m0)/
Area:70x100,10 (8x11x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.0383 W/kg
Area:70x100,10 (71x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 0.0415 W/kg

Zoom:28x28x24,xy4-z1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 2.846 V/m; Power Drift = 0.20 dB; Maximum value of SAR (measured) = 0.0380 W/kg; Peak SAR (extrapolated) = 0.178 W/kg
SAR(1 g) = 0.017 W/kg; SAR(10 g) = 0.00766 W/kg (*.Ratio of SAR at M2 to SAR at M1 = 68%)



Remarks: *. Date tested: 2021/10/6; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 151 mm; Position: distance of EUT to phantom: 0 mm (2 mm to liquid); ambient: (22~24) deg.C. / (60~75) %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)

APPENDIX 3: Test instruments

Appendix 3-1: Equipment used

Test Name	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Calibration Last Date	Calibration Interval (Month)
AT	KSA-08	145089	Spectrum Analyzer	Keysight Technologies Inc	E4446A	MY46180525	2020/11/24	12
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	SOS-26	191844	Humidity Indicator	CUSTOM. Inc	CTH-201	-	2020/09/30	12

*. AT (antenna terminal conducted power measurement) was measured May 10~11, 2021. (Refer to Section 5 in this report.)

Test Name	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Calibration Last Date	Calibration 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	2020/12/11	12
SAR	KCPL-07	146100	Directional Coupler	Pulsar Microwave Corp.	CCS30-B26	621	-	-
SAR	KDAE-01	144944	Data Acquisition Electronics	Schmid&Partner Engineering AG	DAE4	626	2020/11/17	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-L200THIIα/SK-LTHIIα-2	015246/08169	2020/10/02	12
SAR	KPA-12	145359	RF Power Amplifier	Milmega	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-03	145107	Ruler(150mm,caliper)	Niigata Seiki	SK-M150	806164	2021/03/31	12
SAR	KRU-04	145086	Ruler(300mm)	SHINWA	13134	-	2021/02/10	12
SAR	KSDA-01	145090	Dipole Antenna	Schmid&Partner Engineering AG	D2450V2	822	2020/11/10	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	-	2020/12/11	12
SAR	SAT6-SAR1	145160	Attenuator	Huber+Suhner	6806.17.A	766429-1	2020/12/11	12
SAR	SCC-SAR2	145405	Coaxial Cable	Huber+Suhner	SF104A/11PC3542/11N451/4M	MY699/4A	2020/12/11	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	2020/10/02	12
SAR	SOS-SAR3	201968	Digital thermomoter	HANNA	Checktemp-4	A01310946111	2020/10/02	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	SSDH-02	145723	Laptop holder	Schmid&Partner Engineering AG	SM LH1 001 C	-	-	-
SAR	SSLHV6-01	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	2020/11/09	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	-	-	-

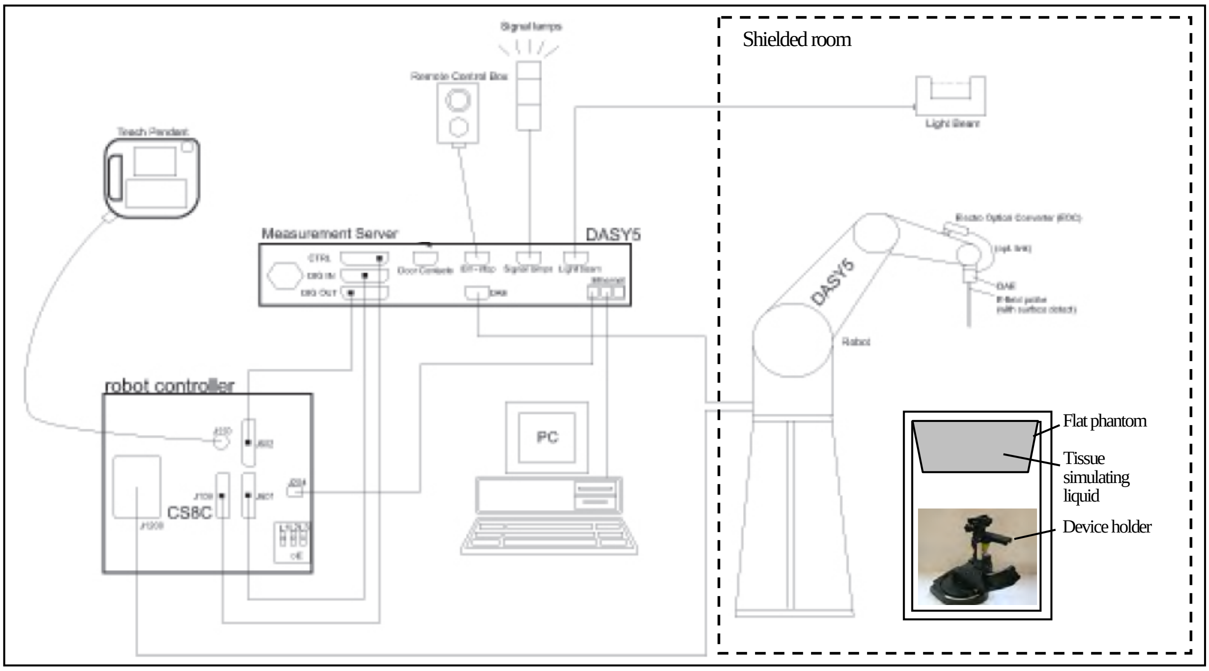
*. Local ID: SALC-01, the parameters of primepure Ethanol (as reference liquid) used for the simulated tissue parameter confirmation was defined the NPL Report MAT23 (http://www.npl.co.uk/content/conpublication/4295)

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

Appendix 3-2: Configuration and peripherals

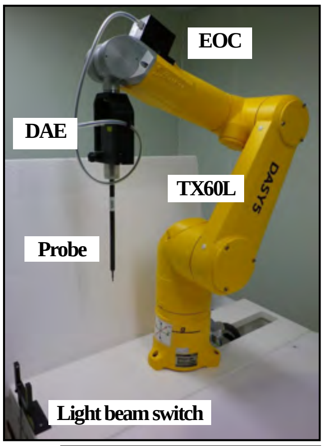
These measurements were performed with the automated near-field scanning system DASY5 from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot), which positions the probes with a positional repeatability of better than ± 0.02 mm. Special E- and H-field probes have been 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	R 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

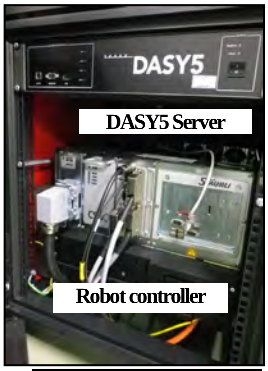
•Number of Axes : 6 •Repeatability : ±0.02 mm
•Manufacture : Stäubli Unimation Corp.

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 µV to > 200 mV (16bit resolution and 2 range settings: 4 mV, 400 mV)
•Input Offset voltage : < 1 µV (with auto zero)
•Input Resistance : 200 MΩ
•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 : 10µW/g to > 100 mW/g; Linearity: ±0.2 dB (noise: typically < 1 µW/g)
•Dimension : Overall length: 330 mm (Tip: 20 mm)
Tip diameter: 2.5 mm (Body: 12 mm)
Typical distance from probe tip to dipole centers: 1mm
•Application : High precision dosimetric measurement in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6GHz with precision of better 30%.
•Manufacture : Schmid & Partner Engineering AG

Phantom

•Model Number : **ELI 4.0 oval flat phantom**
•Shell Material : Fiberglass •Shell Thickness : Bottom plate: 2 ±0.2 mm
•Dimensions : Bottom elliptical: 600×400 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	*normi, ai0, ai1, ai2*
	- Conversion Factor	*convFi*
	- Diode Compression Point	*dcpi*
	- Probe Modulation Response Factors	*ai, bi, ci, d*
Device parameters:	- Frequency	*f*
	- Crest factor	*cf*
Media parameters:	- Conductivity	σ
	- Relative Permittivity	ρ

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	V_i	= linearized voltage of channel i in µV	(i = x,y,z)
	U_i	= measured voltage of channel i in µV	(i = x,y,z)
	cf	= crest factor of exciting field	(DASY parameter)
	dcp_i	= diode compression point of channel i in µV	(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:

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

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

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

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

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

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

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

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone: +81 463 50 6400 / Facsimile: +81 463 50 6401

Appendix 3-4: Simulated tissue composition and parameter confirmation

Liquid type	Head	Control No.	SSLHV6-01	Model No. / Product No.	HBBL600-10000V6 / SL AAH U16 BC
Ingredient: Mixture [%]	Water: >77, Ethanediol: <5.2, Sodium petroleum sulfonate:<2.9, Hexylene Glycol: <2.9, alkoxylated alcohol (>C_{16}):<2.0				
Tolerance specification	± 10%				
Temperature gradients [% / deg.C]	permittivity: -0.19 / conductivity: -0.57 (at 2.6 GHz), permittivity: +0.31 / conductivity: -1.43 (at 5.5 GHz) (*1)				
Manufacture	Schmid & Partner Engineering AG	Note: *1. speag_920-SLAAxyy-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	Ambient/		Liquid temp.	Liquid depth of phantom	Liquid parameters (*a)										ΔSAR (*b)	
							Permittivity (εr) [-]					Conductivity [S/m]					1g	10g
							Target	Measured			Δend, >48hrs	Target	Measured			Δend, >48hrs		
			[deg.C.]	[%RH]	[deg.C.]	[mm]		Meas.	Δεr[%]	Limit			Meas.	Δσ[%]	Limit		[%]	[%]
October 4, 2021	2450	Head	23	60~70	22.5	151	***39.2***	39.68	1.2	10%	-	***1.80***	1.866	3.7	10%	-	1.5	0.8
October 5, 2021	5600	Head	23	60~70	22.5	151	***35.53***	34.52	-2.8	10%	-	***5.065***	4.899	-3.3	10%	-	0.7	0.9
October 6, 2021	5800	Head	23	60~70	22.5	151	***35.3***	34.20	-3.1	10%	-	***5.27***	5.126	-2.7	10%	-	0.7	0.9
October 7~8, 2021	5250	Head	23	60~70	22.5	151	***35.93***	35.12	-2.3	10%	-	***4.706***	4.519	-4.0	10%	-	0.6	0.8

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

Standard										*Interpolated & Extrapolated*									
f (MHz)	Head Tissue		Body Tissue		f (MHz)	Head Tissue		Body Tissue		f (MHz)	Head Tissue		Body Tissue		f (MHz)	Head Tissue		Body Tissue	
	εr	σ [S/m]	εr	σ [S/m]		εr	σ [S/m]	εr	σ [S/m]		εr	σ [S/m]	εr	σ [S/m]		εr	σ [S/m]	εr	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.

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

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

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 ±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)	ΔSAR-correct	1W scaled	Target		Deviation		Limit [%]	Pass ?	Meas. (*c)	ΔSAR-correct	1W scaled	Target		Deviation		Limit [%]	Pass ?
								Cal. (*e)	STD (*f)	Cal. [%]	STD [%]						Cal. (*e)	STD (*f)	Cal. [%]	STD [%]		
October 4, 2021	2450	Head	1.5	0.8	13.3	13.1	52.4	53.6	52.4	-2.2	0.0	±10	Pass	6.18	6.13	24.52	24.9	24	-1.5	2.2	±10	Pass
October 5, 2021	5600	Head	0.7	0.9	8.45	8.39	83.9	82.4	n/a	1.8	-	±10	Pass	2.41	2.39	23.9	23.4	n/a	2.1	-	±10	Pass
October 6, 2021	5800	Head	0.7	0.9	8.04	7.98	79.8	80.1	78	-0.4	2.3	±10	Pass	2.29	2.27	22.7	22.5	21.9	0.9	3.7	±10	Pass
October 7, 2021	5250	Head	0.6	0.8	7.79	7.74	77.4	78.8	n/a	-1.8	-	±10	Pass	2.25	2.23	22.3	22.6	n/a	-1.3	-	±10	Pass
October 8, 2021	5250	Head	0.6	0.8	7.78	7.73	77.3	78.8	n/a	-1.9	-	±10	Pass	2.25	2.23	22.3	22.6	n/a	-1.3	-	±10	Pass

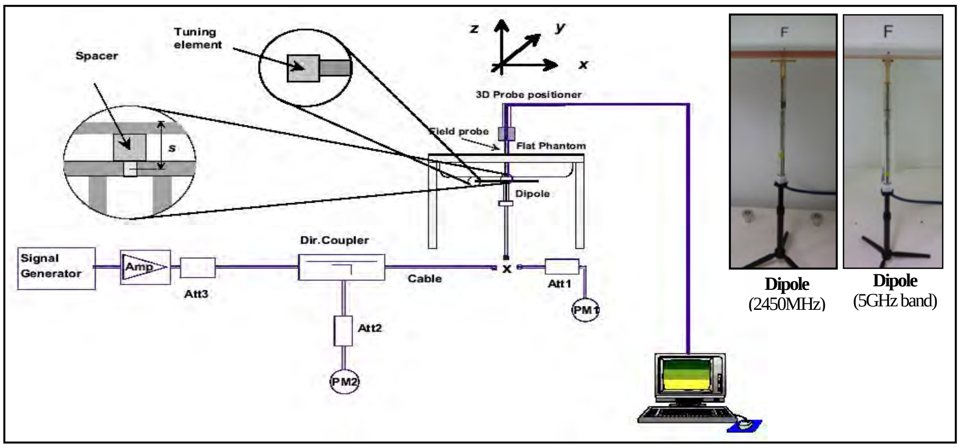
*. Calculating formula: ΔSAR corrected SAR (1g,10g) (W/kg) = (Measured SAR(1g,10g) (W/kg)) × (100 - (ΔSAR(%)) / 100

*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 manufacture's calibration target value which was normalized.

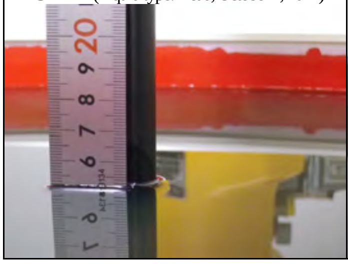
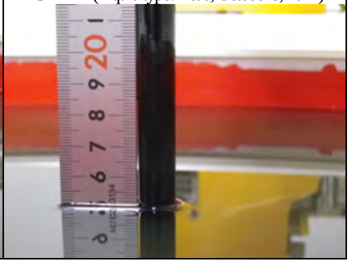
*e. The target value is a parameter defined in the calibration data sheet of D2450V2 (sn:822) and D5GHZV2 (sn:1070) dipole calibrated by Schmid & Partner Engineering AG (Certification No. D2450V2-822_Nov20 and D5GHzV2-1070_Apr21, the data sheet was filed in this report).

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



Test setup for the system performance check

Appendix 3-6: Daily check measurement data

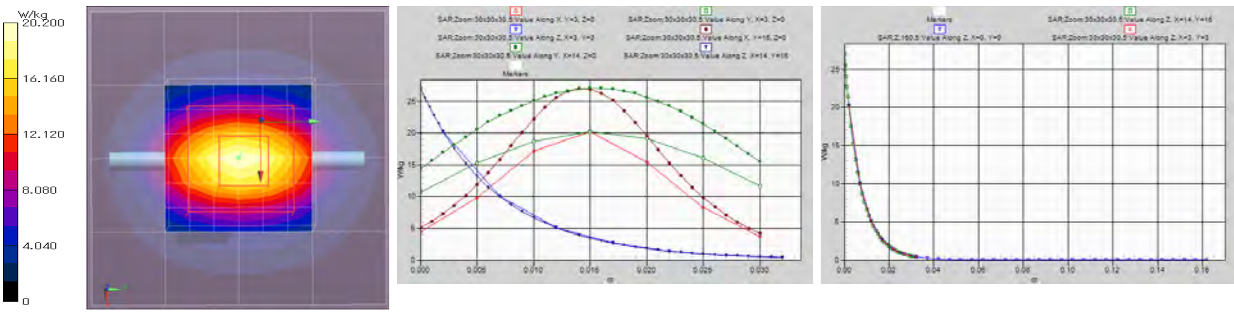
Photographs of Liquid depth	
151 mm (Liquid type: Head, October 4, 2021)	151 mm (Liquid type: Head, October 5, 2021)
	

EUT: Dipole(2.45GHz); Type: D2450V2; Serial: SN822; 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(v6.2110; Medium parameters used: f = 2450 MHz; σ = 1.866 S/m; ε_r = 39.68; ρ = 1000 kg/m³
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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) = 20.0 W/kg
Area:60x60,15 (41x41x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm; Maximum value of SAR (interpolated) = 20.0 W/kg
Z;160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 20.4 W/kg

Zoom:30x30x30,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 105.3 V/m; Power Drift = 0.03 dB; Maximum value of SAR (measured) = 20.2 W/kg; Peak SAR (extrapolated) = 27.0 W/kg
SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.18 W/kg (*.Smallest distance from peaks to all points 3 dB below = 9 mm; Ratio of SAR at M2 to SAR at M1 = 49.5%)



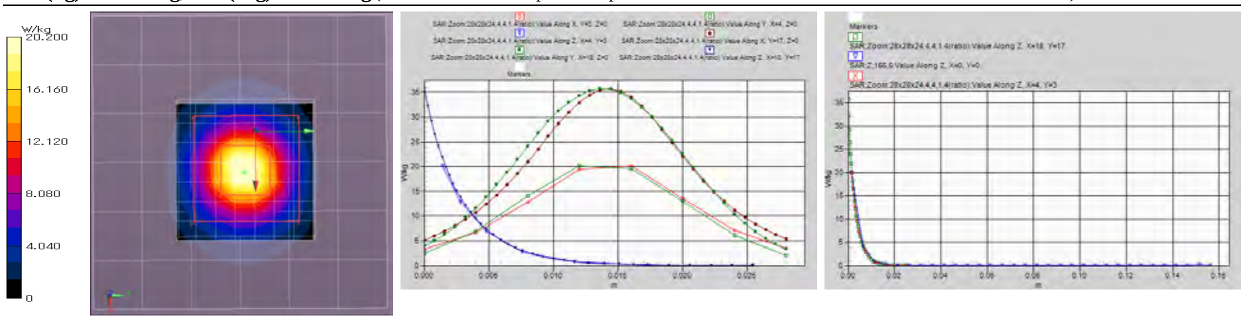
Remarks: *. Date tested: 2021/10/4; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 150 mm; Position: distance of dipole to phantom: 8mm (10mm to liquid); ambient: 23 deg.C. / (50~60) %RH,
*. liquid temperature: 22.4(start)/22.3(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

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(v6.2110; Medium parameters used: f = 5600 MHz; σ = 4.899 S/m; ε_r = 34.52; ρ = 1000 kg/m³
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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

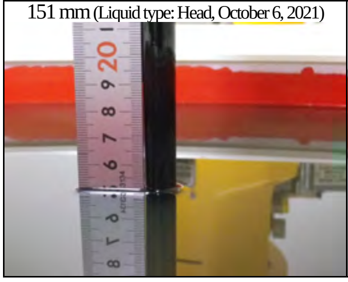
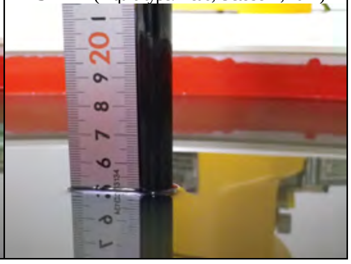
Area:60x60,10 (7x7x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 20.6 W/kg
Area:60x60,10 (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 21.5 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 20.1 W/kg

Zoom:28x28x24,4,4,1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 71.74 V/m; Power Drift = -0.05 dB; Maximum value of SAR (measured) = 20.2 W/kg; Peak SAR (extrapolated) = 35.7 W/kg
SAR(1 g) = 8.45 W/kg; SAR(10 g) = 2.41 W/kg (*.Smallest distance from peaks to all points 3 dB below = 7.2 mm; Ratio of SAR at M2 to SAR at M1 = 63.5%)



Remarks: *. Date tested: 2021/10/5; 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. / (50~60) %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)

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

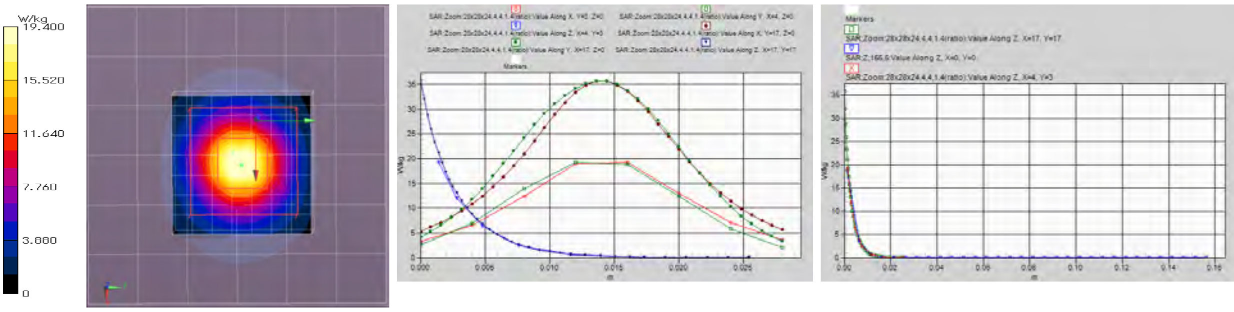
Photographs of Liquid depth	
151 mm (Liquid type: Head, October 6, 2021)	151 mm (Liquid type: Head, October 7, 2021)
	

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(v6.2110; Medium parameters used: f = 5800 MHz; σ = 5.126 S/m; ε_r = 34.20; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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) = 19.8 W/kg
Area:60x60,10 (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 20.5 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 18.4 W/kg

Zoom:28x28x24,4,4,1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 68.88 V/m; Power Drift = -0.10 dB; Maximum value of SAR (measured) = 19.4 W/kg; Peak SAR (extrapolated) = 35.7 W/kg
SAR(1 g) = 8.04 W/kg; SAR(10 g) = 2.29 W/kg (*.Smallest distance from peaks to all points 3 dB below = 7.4 mm; Ratio of SAR at M2 to SAR at M1 = 62.3%)



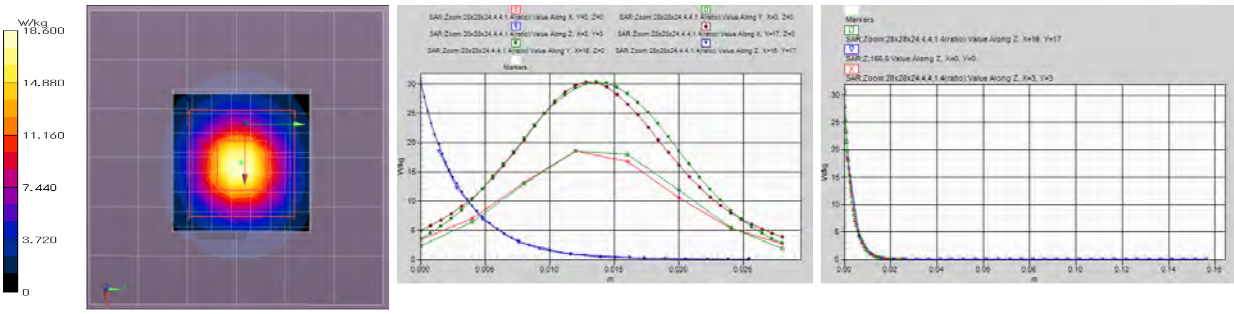
Remarks: *. Date tested: 2021/10/6; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 150 mm; Position: distance of dipole to phantom: 8mm (10mm to liquid); ambient: 23 deg.C. / (50~60) %RH,
*. liquid temperature: 22.4(start)/22.3(end)/22.5(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

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(v6.2110; Medium parameters used: f = 5250 MHz; σ = 4.519 S/m; ε_r = 35.12; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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

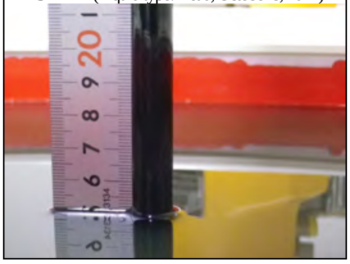
Area:60x60,10 (7x7x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 18.4 W/kg
Area:60x60,10 (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 18.8 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 18.3 W/kg

Zoom:28x28x24,4,4,1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 70.25 V/m; Power Drift = 0.04 dB; Maximum value of SAR (measured) = 18.6 W/kg; Peak SAR (extrapolated) = 30.4 W/kg
SAR(1 g) = 7.79 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 = 66.1%)



Remarks: *. Date tested: 2021/10/7; 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. / (50~60) %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)

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

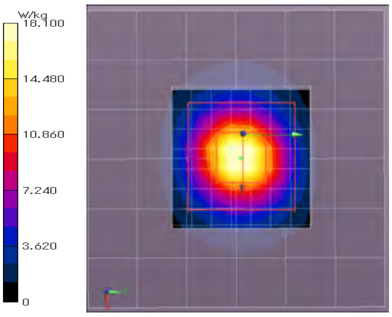
Photographs of Liquid depth
151 mm (Liquid type: Head, October 8, 2021)


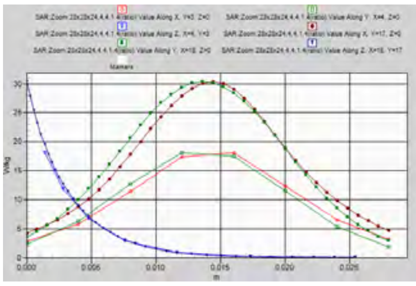
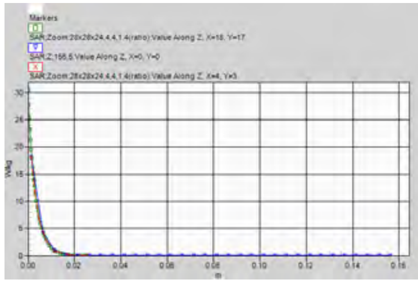
EUT: Dipole(5GHz); Type: D5GHzV2; Serial: 1070; Forward conducted power: 100mW
Communication System: CW (0) (*.UID: 0, Frame Length in ms: 0; Communication System PAR: 0; PMF: 1) **; Frequency: 5250 MHz; Crest Factor: 1.0**
Medium: HSL5GHz(v6.2110; Medium parameters used: f = 5250 MHz; σ = 4.519 S/m; ε_r = 35.12; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration: -Electronics: DAE4 Sn626; Calibrated: 2020/11/17 / -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) = 19.3 W/kg
Area:60x60,10 (61x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm; Maximum value of SAR (interpolated) = 19.4 W/kg
Z;155,5 (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 18.3 W/kg

Zoom:28x28x24,4,4,1.4(ratio) (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm;
Reference Value = 72.25 V/m; Power Drift = 0.03 dB; Maximum value of SAR (measured) = 18.1 W/kg; Peak SAR (extrapolated) = 30.4 W/kg
SAR(1 g) = 7.78 W/kg; SAR(10 g) = 2.25 W/kg (*.Smallest distance from peaks to all points 3 dB below = 7.4 mm; Ratio of SAR at M2 to SAR at M1 = 65.8%)



Remarks: *. Date tested: 2021/10/8; 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: 23 deg.C. / (50~60) %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)

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)	Vi, veff
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	√3	0.71	0.71	±1.9 %	±1.9 %	∞
3	Hemispherical isotropy Error	±9.6 %	Rectangular	√3	0.71	0.71	±3.9 %	±3.9 %	∞
4	Linearity Error	±4.7 %	Rectangular	√3	1	1	±2.7 %	±2.7 %	∞
5	Probe modulation response (v09)	±5.5 %	Rectangular	√3	1	1	±3.2 %	±3.2 %	∞
6	Sensitivity Error (detection limit)	±1.0 %	Rectangular	√3	1	1	±0.6 %	±0.6 %	∞
7	Boundary effects Error	±4.3%	Rectangular	√3	1	1	±2.5 %	±2.5 %	∞
8	Readout Electronics Error(DAE)	±0.3 %	Rectangular	√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	√3	1	1	0 %	0 %	∞
11	RF ambient conditions-noise (v09)	±1.0 %	Rectangular	√3	1	1	±0.6 %	±0.6 %	∞
12	RF ambient conditions-reflections	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
13	Probe positioner mechanical tolerance	±3.3 %	Rectangular	√3	1	1	±1.9 %	±1.9 %	∞
14	Probe Positioning with respect to phantom shell	±6.7 %	Rectangular	√3	1	1	±3.9 %	±3.9 %	∞
15	Max. SAR evaluation (Post-processing)	±4.0 %	Rectangular	√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 %	5
17	Test Sample Positioning Error (v09)	±2.1 %	Normal	1	1	1	±2.1 %	±2.1 %	10
18	Power scaling	±0 %	Rectangular	√3	1	1	±0 %	±0 %	∞
19	Drift of output power (measured, <0.2dB)	±5.0 %	Rectangular	√3	1	1	±2.9 %	±2.9 %	∞
C	**Phantom and Setup**								
20	Phantom uncertainty (shape, thickness tolerances)	±7.5 %	Rectangular	√3	1	1	±4.3 %	±4.3 %	∞
21	Algorithm for correcting SAR (e',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 %	7
23	Measurement Liquid Permittivity Error (DAK3.5)	±3.1 %	Normal	1	0.23	0.26	±0.7 %	±0.8 %	7
24	Liquid Conductivity-temp.uncertainty (≤2deg.C.v6h)	±3.0 %	Rectangular	√3	0.78	0.71	±1.4 %	±1.2 %	∞
25	Liquid Permittivity-temp.uncertainty (≤2deg.C.v6h)	±1.0 %	Rectangular	√3	0.23	0.26	±0.1 %	±0.2 %	∞
	Combined Standard Uncertainty (v09r02)						**± 13.2** %	**± 13.1** %	945
	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)	Vi, veff
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	√3	0.71	0.71	±1.9 %	±1.9 %	∞
3	Hemispherical isotropy error	±9.6 %	Rectangular	√3	0	0	0 %	0 %	∞
4	Probe linearity	±4.7 %	Rectangular	√3	1	1	±2.7 %	±2.7 %	∞
5	Probe modulation response (CW)	±0.0 %	Rectangular	√3	1	1	0 %	0 %	∞
6	System detection limit	±1.0 %	Rectangular	√3	1	1	±0.6 %	±0.6 %	∞
7	Boundary effects	±4.3 %	Rectangular	√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	√3	1	1	0 %	0 %	∞
10	Integration Time Error (CW)	±0.0 %	Rectangular	√3	1	1	0 %	0 %	∞
11	RF ambient conditions-noise	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
12	RF ambient conditions-reflections	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
13	Probe positioner mechanical tolerance	±3.3 %	Rectangular	√3	1	1	±1.9 %	±1.9 %	∞
14	Probe positioning with respect to phantom shell	±6.7 %	Rectangular	√3	1	1	±3.9 %	±3.9 %	∞
15	Max. SAR evaluation (Post-processing)	±4.0 %	Rectangular	√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	√3	1	1	±1.2 %	±1.2 %	∞
18	Drift of output power (measured, <0.1dB)	±2.3 %	Rectangular	√3	1	1	±1.3 %	±1.3 %	∞
C	**Phantom and Setup**								
19	Phantom uncertainty	±2.0 %	Rectangular	√3	1	1	±1.2 %	±1.2%	∞
20	Algorithm for correcting SAR (e',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	√3	0.78	0.71	±1.4 %	±1.2 %	∞
24	Liquid Permittivity-temp.uncertainty (≤2deg.C.v6h)	±1.0 %	Rectangular	√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.

Appendix 3-8: Calibration certificate: E-Field Probe (EX3DV4)

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **UL Japan (RCC)**

Certificate No: **EX3-3907_Apr21**

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3907

Calibration procedure(s): QA CAL-01.v9, QA CAL-14.v6, QA CAL-23.v5, QA CAL-25.v7
Calibration procedure for dosimetric E-field probes

Calibration date: April 21, 2021

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	09-Apr-21 (No. 217-03291/03292)	Apr-22
Power sensor NRP-Z91	SN: 103244	09-Apr-21 (No. 217-03291)	Apr-22
Power sensor NRP-Z91	SN: 103245	09-Apr-21 (No. 217-03292)	Apr-22
Reference 20 dB Attenuator	SN: CC2552 (20x)	09-Apr-21 (No. 217-03343)	Apr-22
DAE4	SN: 660	23-Dec-20 (No. DAE4-660_Dec20)	Dec-21
Reference Probe ES3DV2	SN: 3013	30-Dec-20 (No. ES3-3013_Dec20)	Dec-21
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-20)	In house check: Jun-22
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-21

	Name	Function	Signature
Calibrated by:	Jeffrey Katzman	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 24, 2021

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone: +81 463 50 6400 / Facsimile: +81 463 50 6401

Appendix 3-8: Calibration certificate: E-Field Probe (EX3DV4) (cont'd)

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, ", "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle:* The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

Appendix 3-8: Calibration certificate: E-Field Probe (EX3DV4) (cont'd)

EX3DV4 – SN:3907

April 21, 2021

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3907

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.45	0.58	0.54	± 10.1 %
DCP (mV)[B]	102.7	97.5	99.0	

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Max dev.	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	134.6	± 3.5 %	± 4.7 %
		Y	0.0	0.0	1.0		129.4		
		Z	0.0	0.0	1.0		129.5		

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of Norm X,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone: +81 463 50 6400 / Facsimile: +81 463 50 6401

Appendix 3-8: Calibration certificate: E-Field Probe (EX3DV4) (cont'd)

EX3DV4– SN:3907

April 21, 2021

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3907

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-143.3
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

Note: Measurement distance from surface can be increased to 3-4 mm for an *Area Scan* job.

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone: +81 463 50 6400 / Facsimile: +81 463 50 6401

Appendix 3-8: Calibration certificate: E-Field Probe (EX3DV4) (cont'd)

EX3DV4– SN:3907 April 21, 2021

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3907

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unc (k=2)
2450	39.2	1.80	7.35	7.35	7.35	0.41	0.90	± 12.0 %
5250	35.9	4.71	5.14	5.14	5.14	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.56	4.56	4.56	0.40	1.80	± 13.1 %
5800	35.3	5.27	4.60	4.60	4.60	0.40	1.80	± 13.1 %

[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

Appendix 3-8: Calibration certificate: E-Field Probe (EX3DV4) (cont'd)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3907

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unc (k=2)
2450	52.7	1.95	7.44	7.44	7.44	0.36	0.95	± 12.0 %
5250	48.9	5.36	4.49	4.49	4.49	0.50	1.90	± 13.1 %
5600	48.5	5.77	3.96	3.96	3.96	0.50	1.90	± 13.1 %
5750	48.3	5.94	4.07	4.07	4.07	0.50	1.90	± 13.1 %

[C] Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

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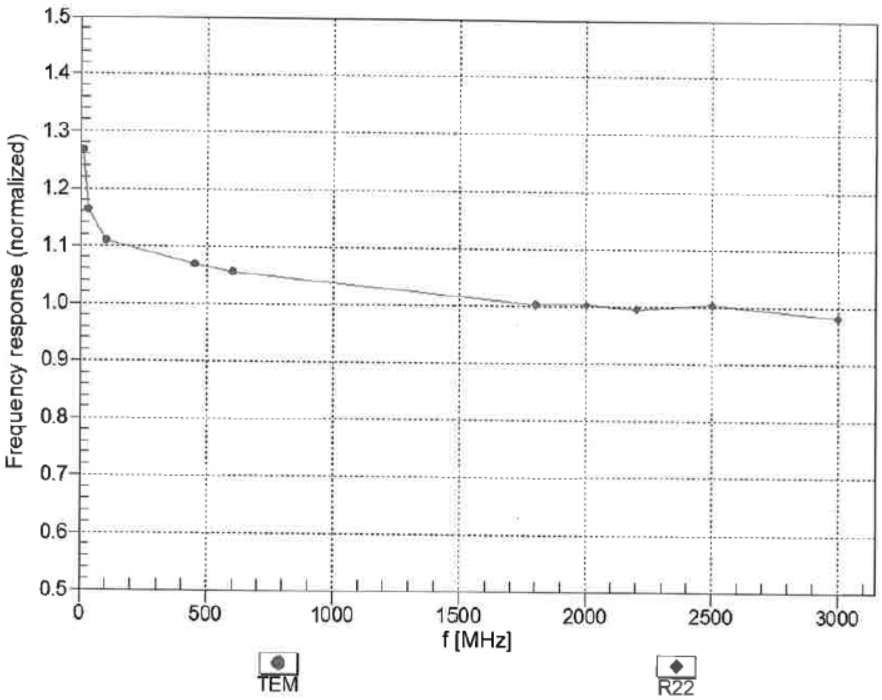
Appendix 3-8: Calibration certificate: E-Field Probe (EX3DV4) (cont'd)

EX3DV4– SN:3907

April 21, 2021

Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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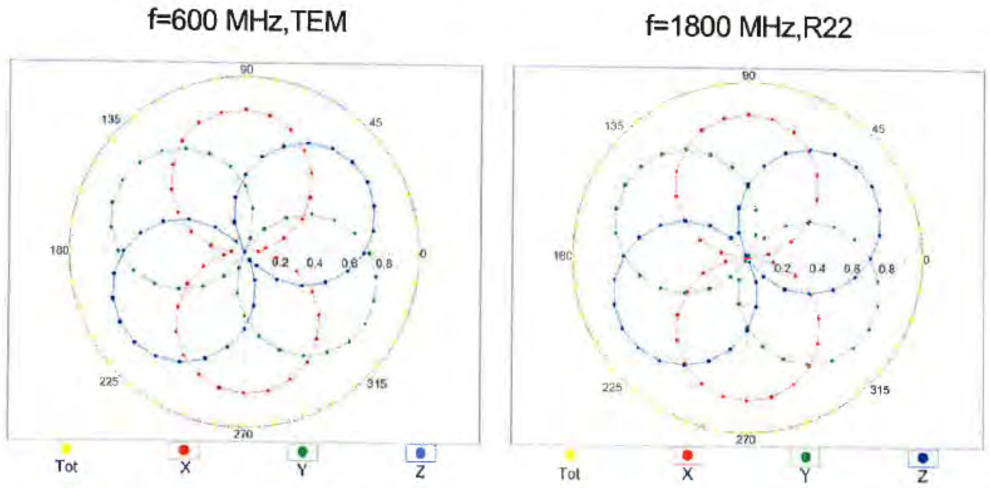
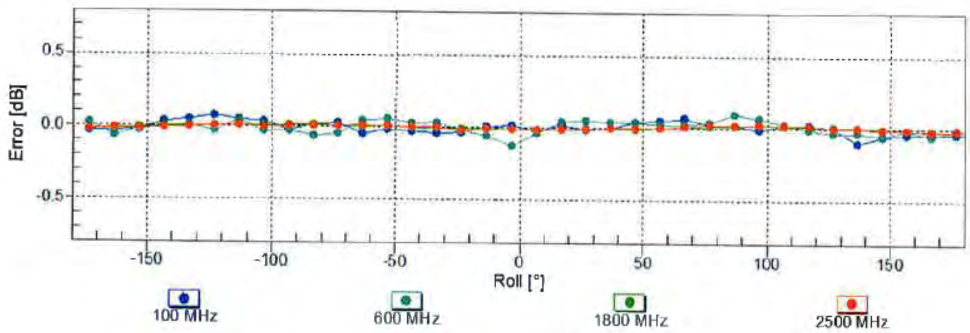
Appendix 3-8: Calibration certificate: E-Field Probe (EX3DV4) (cont'd)

Receiving Pattern (ϕ), ϑ = 0°





Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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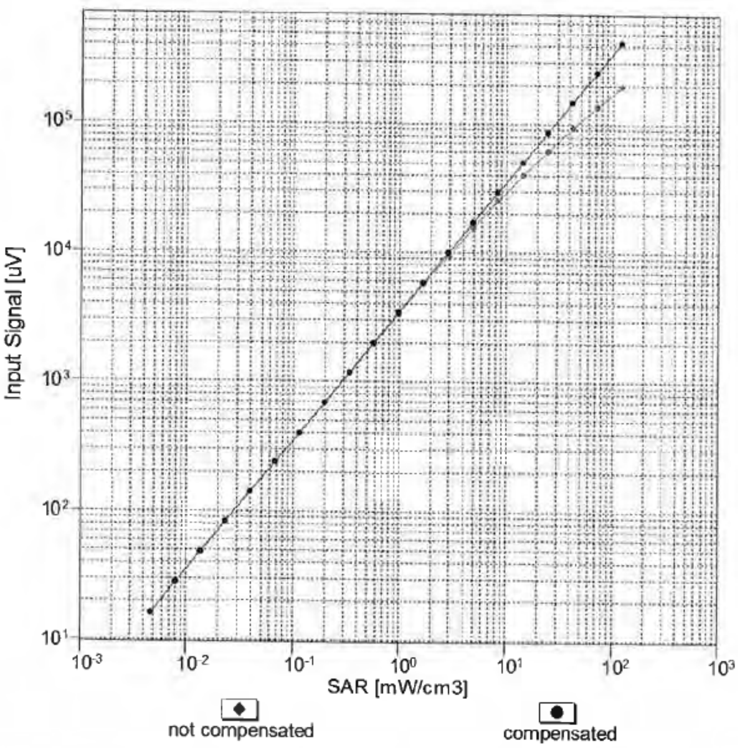
Appendix 3-8: Calibration certificate: E-Field Probe (EX3DV4) (cont'd)

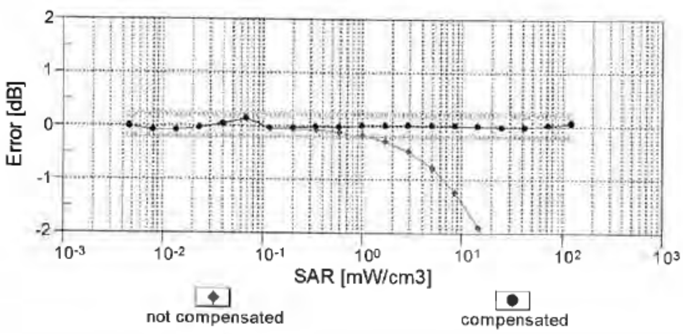
EX3DV4– SN:3907

April 21, 2021

Dynamic Range f(SAR_{head})

(TEM cell , f_{eval}= 1900 MHz)





Uncertainty of Linearity Assessment: ± 0.6% (k=2)

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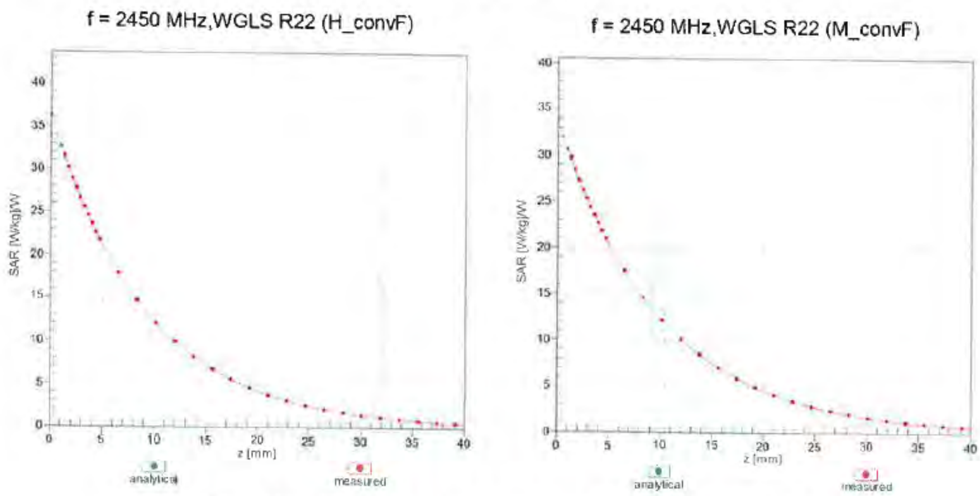
Appendix 3-8: Calibration certificate: E-Field Probe (EX3DV4) (cont'd)

EX3DV4– SN:3907

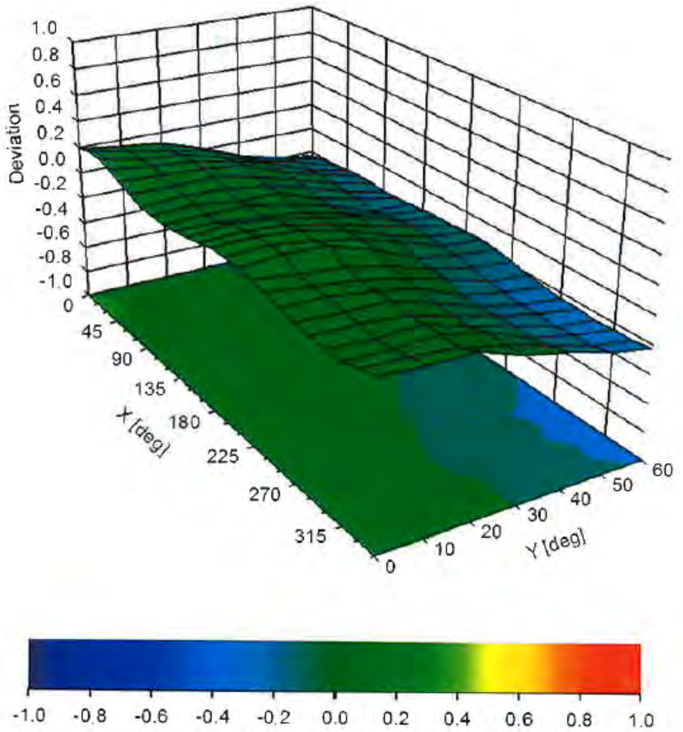
April 21, 2021

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

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Appendix 3-9: Calibration certificate: Dipole (D2450V2)

Calibration Laboratory of
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Accreditation No.: **SCS 0108**

Client **UL Japan (RCC)**

Certificate No: **D2450V2-822_Nov20**

CALIBRATION CERTIFICATE

Object: D2450V2 - SN:822

Calibration procedure(s): QA CAL-05.v11
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz

Calibration date: November 10, 2020

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	01-Apr-20 (No. 217-03100/03101)	Apr-21
Power sensor NRP-Z91	SN: 103244	01-Apr-20 (No. 217-03100)	Apr-21
Power sensor NRP-Z91	SN: 103245	01-Apr-20 (No. 217-03101)	Apr-21
Reference 20 dB Attenuator	SN: BH9394 (20k)	31-Mar-20 (No. 217-03106)	Apr-21
Type-N mismatch combination	SN: 310982 / 06327	31-Mar-20 (No. 217-03104)	Apr-21
Reference Probe EX3DV4	SN: 7405	29-Jun-20 (No. EX3-7405_Jun20)	Jun-21
DAE4	SN: 601	02-Nov-20 (No. DAE4-601_Nov20)	Nov-21

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-20)	In house check: Oct-22
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-21

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	M.Weber
Approved by:	Katja Pokovic	Technical Manager	

Issued: November 11, 2020

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Certificate No: D2450V2-822_Nov20 Page 1 of 8

Appendix 3-9: Calibration certificate: Dipole (D2450V2) (cont'd)

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Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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Appendix 3-9: Calibration certificate: Dipole (D2450V2) (cont'd)

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.1 ± 6 %	1.86 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.7 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**53.6 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.30 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.9 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.8 ± 6 %	2.03 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.3 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**52.0 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.16 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**24.3 W/kg ± 16.5 % (k=2)**

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Appendix 3-9: Calibration certificate: Dipole (D2450V2) (cont'd)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.3 Ω + 5.5 jΩ
Return Loss	- 24.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.5 Ω + 6.7 jΩ
Return Loss	- 23.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.160 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

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Appendix 3-9: Calibration certificate: Dipole (D2450V2) (cont'd)

DASY5 Validation Report for Head TSL

Date: 10.11.2020

Test Laboratory: SPEAG, Zurich, Switzerland

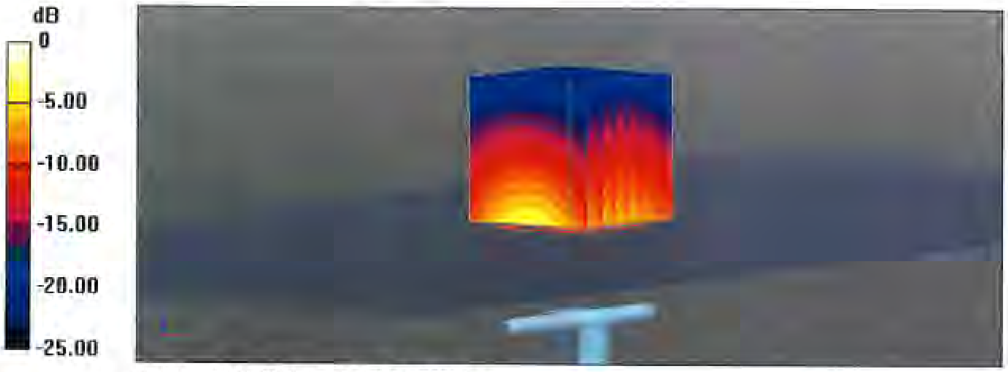
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:822

Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.86 S/m; ε_r = 38.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7405; ConvF(7.81, 7.81, 7.81) @ 2450 MHz; Calibrated: 29.06.2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.11.2020
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 116.9 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 28.4 W/kg
SAR(1 g) = 13.7 W/kg; SAR(10 g) = 6.3 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 48.4%
Maximum value of SAR (measured) = 23.1 W/kg



0 dB = 23.1 W/kg = 13.64 dBW/kg

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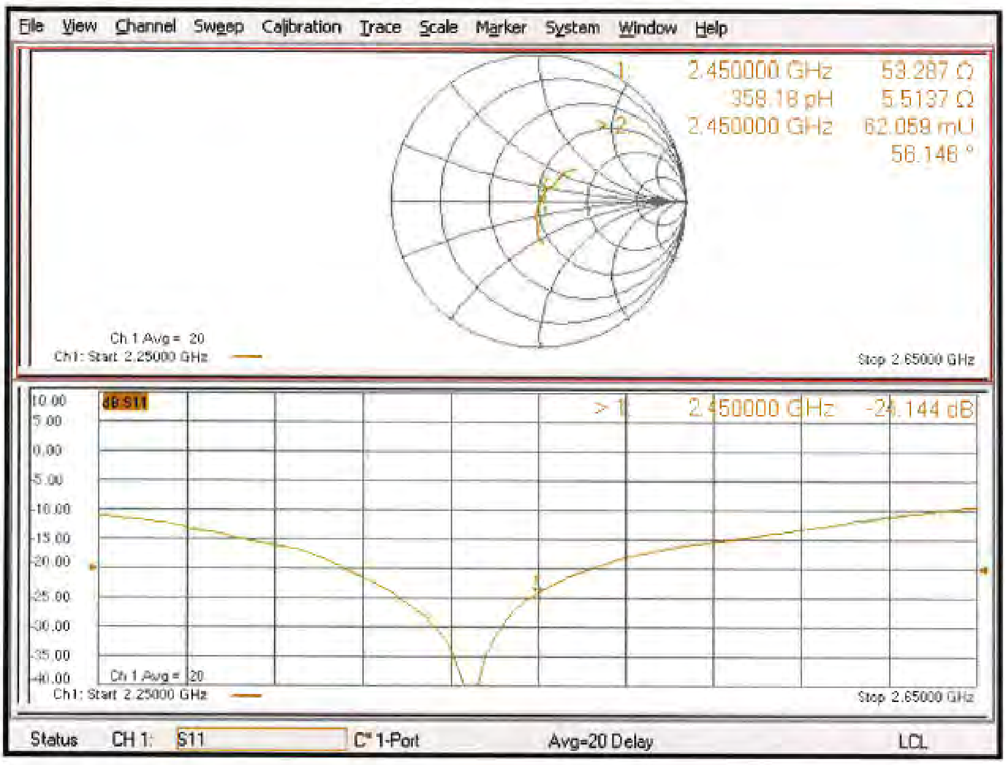
Appendix 3-9: Calibration certificate: Dipole (D2450V2) (cont'd)

Impedance Measurement Plot for Head TSL



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Appendix 3-9: Calibration certificate: Dipole (D2450V2) (cont'd)

DASY5 Validation Report for Body TSL

Date: 10.11.2020

Test Laboratory: SPEAG, Zurich, Switzerland

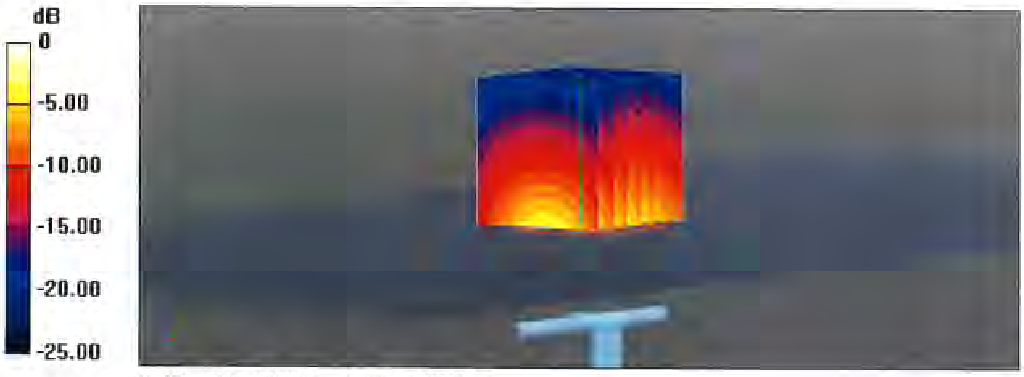
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:822

Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.03 S/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7405; ConvF(7.75, 7.75, 7.75) @ 2450 MHz; Calibrated: 29.06.2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.11.2020
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 108.1 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 27.4 W/kg
SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.16 W/kg
Smallest distance from peaks to all points 3 dB below = 8.2 mm
Ratio of SAR at M2 to SAR at M1 = 50%
Maximum value of SAR (measured) = 21.6 W/kg



0 dB = 21.6 W/kg = 13.34 dBW/kg

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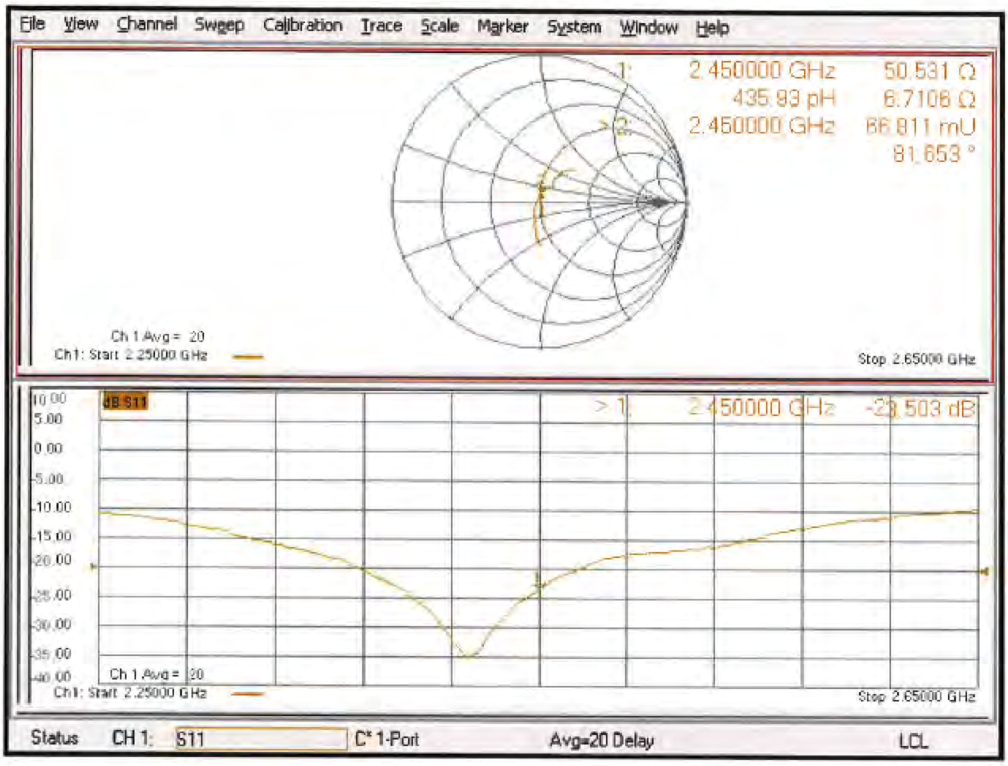
Appendix 3-9: Calibration certificate: Dipole (D2450V2) (cont'd)

Impedance Measurement Plot for Body TSL



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Appendix 3-10: Calibration certificate: Dipole (D5GHzV2)

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Accreditation No.: SCS 0108

Client **UL Japan (RCC)**

Certificate No: **D5GHzV2-1070_Apr21**

CALIBRATION CERTIFICATE

Object	D5GHzV2 - SN:1070
Calibration procedure(s)	QA CAL-22.v6 Calibration Procedure for SAR Validation Sources between 3-10 GHz
Calibration date:	April 20, 2021

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	09-Apr-21 (No. 217-03291/03292)	Apr-22
Power sensor NRP-Z91	SN: 103244	09-Apr-21 (No. 217-03291)	Apr-22
Power sensor NRP-Z91	SN: 103245	09-Apr-21 (No. 217-03292)	Apr-22
Reference 20 dB Attenuator	SN: BH9394 (20k)	09-Apr-21 (No. 217-03343)	Apr-22
Type-N mismatch combination	SN: 310982 / 06327	09-Apr-21 (No. 217-03344)	Apr-22
Reference Probe EX3DV4	SN: 3503	30-Dec-20 (No. EX3-3503_Dec20)	Dec-21
DAE4	SN: 601	02-Nov-20 (No. DAE4-601_Nov20)	Nov-21

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-20)	In house check: Oct-22
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-21

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	M.Weber
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 20, 2021

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Certificate No: D5GHzV2-1070_Apr21 Page 1 of 13

Appendix 3-10: Calibration certificate: Dipole (D5GHzV2) (cont'd)

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Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, June 2013
b) IEC 62209-1, “Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)”, July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, “SAR Measurement Requirements for 100 MHz to 6 GHz”

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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Appendix 3-10: Calibration certificate: Dipole (D5GHzV2) (cont'd)

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5250 MHz ± 1 MHz 5600 MHz ± 1 MHz 5750 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Head TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.9	4.71 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.9 ± 6 %	4.57 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5250 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.93 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**78.8 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.28 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.6 W/kg ± 19.5 % (k=2)**

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone: +81 463 50 6400 / Facsimile: +81 463 50 6401

Appendix 3-10: Calibration certificate: Dipole (D5GHzV2) (cont'd)

Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.5	5.07 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.4 ± 6 %	4.93 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5600 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.30 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**82.4 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.36 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**23.4 W/kg ± 19.5 % (k=2)**

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.1 ± 6 %	5.14 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.08 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**80.1 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.27 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**22.5 W/kg ± 19.5 % (k=2)**

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Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone: +81 463 50 6400 / Facsimile: +81 463 50 6401

Appendix 3-10: Calibration certificate: Dipole (D5GHzV2) (cont'd)

Body TSL parameters at 5250 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.9	5.36 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	48.7 ± 6 %	5.51 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5250 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.50 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**75.0 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.08 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.8 W/kg ± 19.5 % (k=2)**

Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.5	5.77 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	48.1 ± 6 %	6.00 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5600 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.96 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**79.6 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.18 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**21.8 W/kg ± 19.5 % (k=2)**

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1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone: +81 463 50 6400 / Facsimile: +81 463 50 6401

Appendix 3-10: Calibration certificate: Dipole (D5GHzV2) (cont'd)

Body TSL parameters at 5750 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.3	5.94 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.8 ± 6 %	6.21 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5750 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.53 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**75.3 W/kg ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.09 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.9 W/kg ± 19.5 % (k=2)**

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Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone: +81 463 50 6400 / Facsimile: +81 463 50 6401

Appendix 3-10: Calibration certificate: Dipole (D5GHzV2) (cont'd)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 5250 MHz

Impedance, transformed to feed point	51.4 Ω - 8.8 jΩ
Return Loss	- 21.1 dB

Antenna Parameters with Head TSL at 5600 MHz

Impedance, transformed to feed point	54.9 Ω - 7.8 jΩ
Return Loss	- 21.1 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	51.9 Ω - 1.6 jΩ
Return Loss	- 32.2 dB

Antenna Parameters with Body TSL at 5250 MHz

Impedance, transformed to feed point	53.6 Ω - 6.9 jΩ
Return Loss	- 22.5 dB

Antenna Parameters with Body TSL at 5600 MHz

Impedance, transformed to feed point	58.1 Ω - 6.6 jΩ
Return Loss	- 20.3 dB

Antenna Parameters with Body TSL at 5750 MHz

Impedance, transformed to feed point	58.4 Ω - 1.5 jΩ
Return Loss	- 22.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.202 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

Appendix 3-10: Calibration certificate: Dipole (D5GHzV2) (cont'd)

DASY5 Validation Report for Head TSL

Date: 20.04.2021

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1070

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5250 MHz; σ = 4.57 S/m; ε_r = 34.9; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5600 MHz; σ = 4.93 S/m; ε_r = 34.4; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5800 MHz; σ = 5.14 S/m; ε_r = 34.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.5, 5.5, 5.5) @ 5250 MHz, ConvF(5.1, 5.1, 5.1) @ 5600 MHz, ConvF(5.01, 5.01, 5.01) @ 5800 MHz; Calibrated: 30.12.2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.11.2020
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

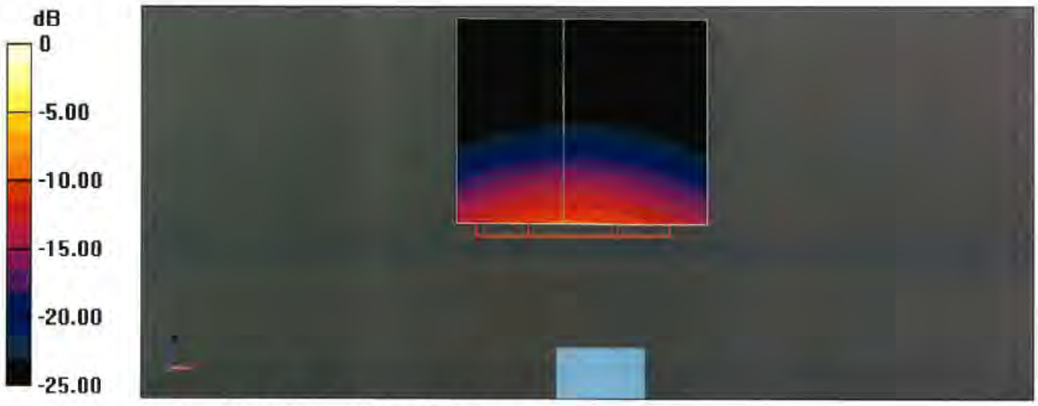
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 74.78 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 27.3 W/kg
SAR(1 g) = 7.93 W/kg; SAR(10 g) = 2.28 W/kg
Smallest distance from peaks to all points 3 dB below = 6.8 mm
Ratio of SAR at M2 to SAR at M1 = 69.9%
Maximum value of SAR (measured) = 18.2 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 75.33 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 30.7 W/kg
SAR(1 g) = 8.30 W/kg; SAR(10 g) = 2.36 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 68.7%
Maximum value of SAR (measured) = 19.6 W/kg

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone: +81 463 50 6400 / Facsimile: +81 463 50 6401

Appendix 3-10: Calibration certificate: Dipole (D5GHzV2) (cont'd)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 73.25 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 31.8 W/kg
SAR(1 g) = 8.08 W/kg; SAR(10 g) = 2.27 W/kg
Smallest distance from peaks to all points 3 dB below = 7.4 mm
Ratio of SAR at M2 to SAR at M1 = 66.5%
Maximum value of SAR (measured) = 19.8 W/kg



0 dB = 19.8 W/kg = 12.97 dBW/kg

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Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
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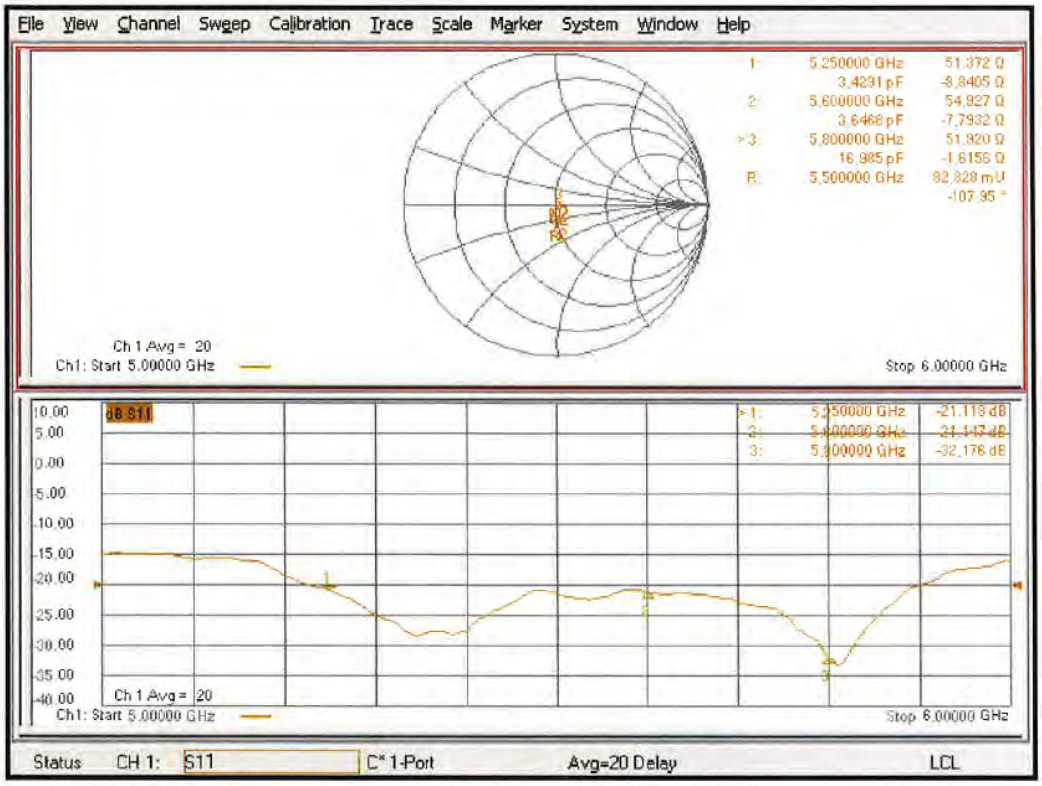
Appendix 3-10: Calibration certificate: Dipole (D5GHzV2) (cont'd)

Impedance Measurement Plot for Head TSL



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1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
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Appendix 3-10: Calibration certificate: Dipole (D5GHzV2) (cont'd)

DASY5 Validation Report for Body TSL

Date: 19.04.202

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1070

Communication System: UID 0 - CW; Frequency: 5250 MHz, Frequency: 5600 MHz, Frequency: 5750 MH
Medium parameters used: f = 5250 MHz; σ = 5.51 S/m; ε_r = 48.7; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5600 MHz; σ = 6 S/m; ε_r = 48.1; ρ = 1000 kg/m^3 ,
Medium parameters used: f = 5750 MHz; σ = 6.21 S/m; ε_r = 47.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.26, 5.26, 5.26) @ 5250 MHz, ConvF(4.79, 4.79, 4.79) @ 5600 MHz, ConvF(4.66, 4.66, 4.66) @ 5750 MHz; Calibrated: 30.12.2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.11.2020
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

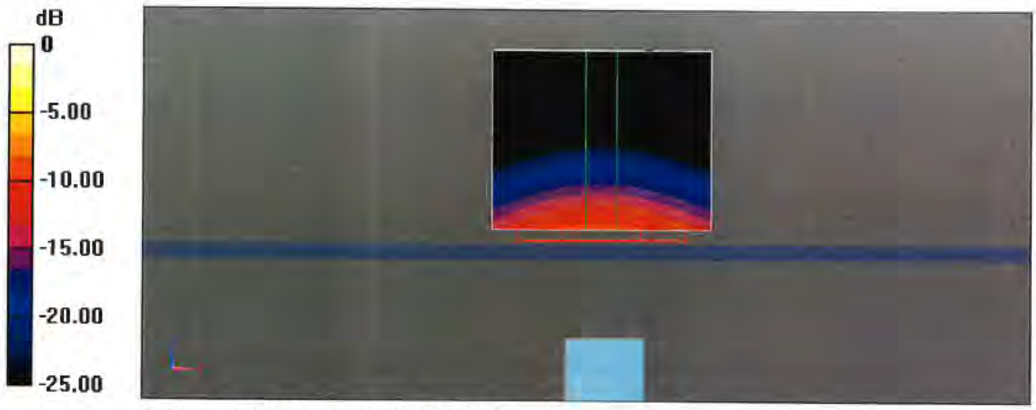
Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5250 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.14 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 28.9 W/kg
SAR(1 g) = 7.50 W/kg; SAR(10 g) = 2.08 W/kg
Smallest distance from peaks to all points 3 dB below = 6.9 mm
Ratio of SAR at M2 to SAR at M1 = 66.1%
Maximum value of SAR (measured) = 17.2 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.13 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 34.0 W/kg
SAR(1 g) = 7.96 W/kg; SAR(10 g) = 2.18 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 63.2%
Maximum value of SAR (measured) = 19.0 W/kg

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone: +81 463 50 6400 / Facsimile: +81 463 50 6401

Appendix 3-10: Calibration certificate: Dipole (D5GHzV2) (cont'd)

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5750 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 65.86 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 34.0 W/kg
SAR(1 g) = 7.53 W/kg; SAR(10 g) = 2.09 W/kg
Smallest distance from peaks to all points 3 dB below = 6.8 mm
Ratio of SAR at M2 to SAR at M1 = 62.6%
Maximum value of SAR (measured) = 18.6 W/kg

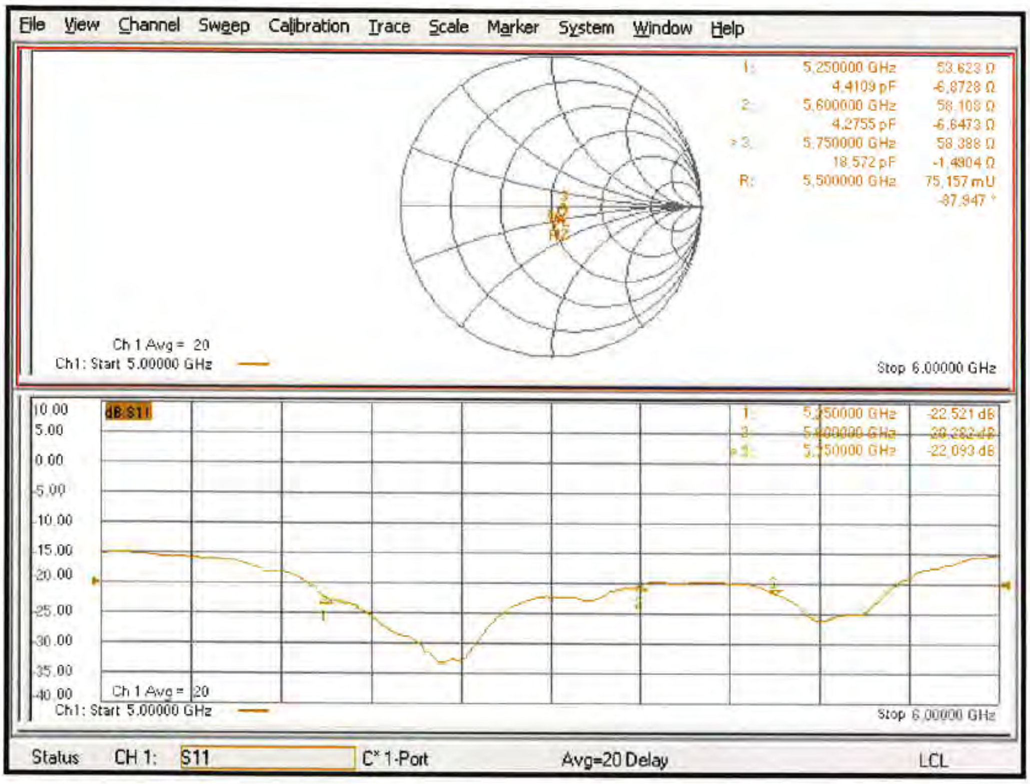


0 dB = 19.0 W/kg = 12.78 dBW/kg

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone: +81 463 50 6400 / Facsimile: +81 463 50 6401

Appendix 3-10: Calibration certificate: Dipole (D5GHzV2) (cont'd)

Impedance Measurement Plot for Body TSL



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Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone: +81 463 50 6400 / Facsimile: +81 463 50 6401