SAR EVALUATION REPORT

Applicant Name:
Apple, Inc.
One Apple Park Way
Cupertino, CA 95014 USA

Date of Testing:
07/27/2021 – 08/06/2021
Test Site/Location:
PCTEST Lab, Morgan Hill, CA, USA
Document Serial No.:
1C2106070042-10.BCG (Rev 1)

FCC ID: **BCG-A2474**

APPLICANT: **APPLE, INC.**

DUT Type: Watch
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model: A2474

Equipment Class	Band & Mode	Tx Frequency	SAR	
			1g Head (W/kg)	10g Extremity (W/kg)
DTS	2.4 GHz WLAN	2412 - 2472 MHz	0.35	0.01
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A
NII	U-NII-2A	5260 - 5320 MHz	< 0.1	0.01
NII	U-NII-2C	5500 - 5720 MHz	0.13	0.02
NII	U-NII-3	5745 - 5825 MHz	0.15	0.02
DSS/DTS	Bluetooth	2402 - 2480 MHz	0.31	0.01
Simultaneous SAR per KDB 690783 D01v01r03:			0.46	0.03

Note: This revised Test Report supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

This watch has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 1.8 of this report; for North American frequency bands only.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.

Randy Ortanez
President

ACCREDITED
CERT #2041.02

The SAR Tick is an initiative of the Mobile & Wireless Forum (MWF). While a product may be considered eligible, use of the SAR Tick logo requires an agreement with the MWF. Further details can be obtained by emailing: sartick@mwfai.info.

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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
2.4 GHz WLAN	Data	2412 - 2472 MHz
U-NII-1	Data	5180 - 5240 MHz
U-NII-2A	Data	5260 - 5320 MHz
U-NII-2C	Data	5500 - 5720 MHz
U-NII-3	Data	5745 - 5825 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz
UWB	Data	6489.6 - 7987.2 MHz

This device does not support network-based voice services. Head SAR was evaluated to address VoIP operations per FCC KDB Publication 447498 D010v06.

1.2 Power Reduction for SAR

There is no power reduction used for any band/mode implemented in this device for SAR purposes.

1.3 Nominal and Maximum Output Power Specifications

This device operates using the following maximum and nominal output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v06.

1.3.1 Maximum Output Power – WiFi Mode

Mode/ Band			IEEE 802.11b (2.4 GHz)		IEEE 802.11g (2.4 GHz)		IEEE 802.11n (2.4 GHz)	
		Channel	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal
Modulated Average - Single Tx Chain (dBm)	20 MHz Bandwidth	1	20.00	19.00	17.50	17.00	17.50	17.00
		2	20.00	19.00	19.00	18.50	19.00	18.50
		3	20.00	19.00	19.00	18.50	19.00	18.50
		4	20.00	19.00	19.00	18.50	19.00	18.50
		5	20.00	19.00	19.00	18.50	19.00	18.50
		6	20.00	19.00	19.00	18.50	19.00	18.50
		7	20.00	19.00	19.00	18.50	19.00	18.50
		8	20.00	19.00	19.00	18.50	19.00	18.50
		9	20.00	19.00	19.00	18.50	19.00	18.50
		10	20.00	19.00	19.00	18.50	19.00	18.50
		11	20.00	19.00	17.00	16.50	17.00	16.50
		12	20.00	19.00	14.50	14.00	14.50	14.00
		13	18.00	17.00	2.50	2.00	2.50	2.00

Mode/ Band			IEEE 802.11a (5 GHz)		IEEE 802.11n (5 GHz)	
		Channel	Maximum	Nominal	Maximum	Nominal
Modulated Average - Single Tx Chain (dBm)	20 MHz Bandwidth	36	17.00	16.00	17.00	16.00
		40	17.00	16.00	17.00	16.00
		44	17.00	16.00	17.00	16.00
		48	17.00	16.00	17.00	16.00
		52	17.00	16.00	17.00	16.00
		56	17.00	16.00	17.00	16.00
		60	17.00	16.00	17.00	16.00
		64	17.00	16.00	17.00	16.00
		100	17.00	16.00	17.00	16.00
		104	17.00	16.00	17.00	16.00
		108	17.00	16.00	17.00	16.00
		112	17.00	16.00	17.00	16.00
		116	17.00	16.00	17.00	16.00
		120	17.00	16.00	17.00	16.00
		124	17.00	16.00	17.00	16.00
		128	17.00	16.00	17.00	16.00
		132	17.00	16.00	17.00	16.00
		136	17.00	16.00	17.00	16.00
		140	13.50	12.50	13.50	12.50
		144	17.00	16.00	17.00	16.00
		149	17.00	16.00	17.00	16.00
		153	17.00	16.00	17.00	16.00
		157	17.00	16.00	17.00	16.00
		161	17.00	16.00	17.00	16.00
		165	17.00	16.00	17.00	16.00

1.3.2 Maximum Output Power – Bluetooth Mode

Mode / Band		Modulated Average - Single Tx Chain (dBm)
Bluetooth BDR/LE	Maximum	**19.00**
	Nominal	**18.00**
Bluetooth EDR	Maximum	**14.50**
	Nominal	**13.50**
Bluetooth HDR	Maximum	**14.50**
	Nominal	**13.50**

1.4 DUT Antenna Locations

A diagram showing the location of the device antennas can be found in Appendix E**.**

1.5 Near Field Communications (NFC) Antenna

This DUT has NFC operations. The NFC antenna is integrated into the device for this model. Therefore, all SAR tests were performed with the device which already incorporates the NFC antenna. A diagram showing the location of the NFC antenna can be found in Appendix E.

1.6 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be operating simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v06 4.3.2 procedures.

Table 1-1
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Extremity
1	Bluetooth + 5 GHz WI-FI	Yes	Yes

1. 2.4 GHz WLAN, and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
2. 2.4 GHz WLAN, and 5 GHz WLAN share the same antenna path and cannot transmit simultaneously.

1.7 Miscellaneous SAR Test Considerations

(A) WIFI/BT

This device supports channel 1-13 for 2.4 GHz WLAN. However, since channels 12 and 13 have equal or less maximum output power, channels 1, 6, and 11 were considered for SAR testing per KDB 248227 D01v02r02.

Since U-NII-1 and U-NII-2A bands have the same maximum output power and the highest reported SAR for U-NII-2A is less than 1.2 W/kg, SAR is not required for U-NII-1 band according to FCC KDB Publication 248227 D01v02r02.

1.8 Guidance Applied

- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance, Wrist-worn Device Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- IEEE 1528-2013

1.9 Device Serial Numbers

Several samples with identical hardware were used to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units. The serial numbers used for each test are indicated alongside the results in Section 9.

1.10 Housing Type and Wrist Band Types

Only one housing type, aluminum, is available for this model. The device can also be used with different wrist band accessories. All metallic wrist bands were tested, and the sport band non-metallic wrist band was tested fully for all required exposure conditions. Other non-metallic wrist-bands were checked to be similar or lower in SAR.

2 INTRODUCTION

The FCC and Innovation, Science, and Economic Development Canada have adopted the guidelines for evaluating the environmental effects of radio frequency (RF) radiation in ET Docket 93-62 on Aug. 6, 1996 and Health Canada Safety Code 6 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices. [1]

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [3] and Health Canada RF Exposure Guidelines Safety Code 6 [22]. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave [4] is used for guidance in measuring the Specific Absorption Rate (SAR) due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the International Committee for Non-Ionizing Radiation Protection (ICNIRP) in Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields," Report No. Vol 74. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

2.1 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Equation 2-1).

Equation 2-1
SAR Mathematical Equation

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

SAR is expressed in units of Watts per Kilogram (W/kg).

$$SAR = \frac{\sigma \cdot E^2}{\rho}$$

where:

σ = conductivity of the tissue-simulating material (S/m)
ρ = mass density of the tissue-simulating material (kg/m^3)
E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relation to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.[6]

3 DOSIMETRIC ASSESSMENT

3.1 Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04:

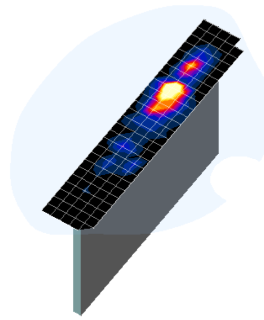

Figure 3-1
Sample SAR Area Scan

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 3-1).
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r04 (See Table 3-1). On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):
   a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 3-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).
   b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.
   c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

Table 3-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

Frequency	Maximum Area Scan Resolution (mm) (Δx_{area}, Δy_{area})	Maximum Zoom Scan Resolution (mm) (Δx_{zoom}, Δy_{zoom})	Maximum Zoom Scan Spatial Resolution (mm)			Minimum Zoom Scan Volume (mm) (x,y,z)
			Uniform Grid	Graded Grid		
			$\Delta z_{zoom}(n)$	$\Delta z_{zoom}(1)$*	$\Delta z_{zoom}(n>1)$*	
≤ 2 GHz	≤ 15	≤ 8	≤ 5	≤ 4	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 30
2-3 GHz	≤ 12	≤ 5	≤ 5	≤ 4	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 30
3-4 GHz	≤ 12	≤ 5	≤ 4	≤ 3	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 28
4-5 GHz	≤ 10	≤ 4	≤ 3	≤ 2.5	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 25
5-6 GHz	≤ 10	≤ 4	≤ 2	≤ 2	≤ 1.5*$\Delta z_{zoom}(n-1)$	≥ 22

4 TEST CONFIGURATION POSITIONS

4.1 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameters: relative permittivity ε = 3 and loss tangent δ = 0.02. Additionally, a manufacturer provided low-loss foam was used to position the device for head SAR evaluations.

4.2 Positioning for Head

Devices that are designed to be worn on the wrist may operate in speaker mode for voice communication, with the device worn on the wrist and positioned next to the mouth. When next-to-mouth SAR evaluation is required, the device is positioned at 10 mm from a flat phantom filled with head tissue-equivalent medium. The device is evaluated with wrist bands strapped together to represent normal use conditions.

4.3 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. When extremity SAR evaluation is required, the device is evaluated with the back of the device touching the flat phantom, which is filled with body tissue-equivalent medium. The device was evaluated with Sport wristband unstrapped and touching the phantom. For Metal Loop and Metal Links wristbands, the device was evaluated with wristbands strapped and the distance between wristbands and the phantom was minimized to represent the spacing created by actual use conditions.

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5 RF EXPOSURE LIMITS

5.1 Uncontrolled Environment

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

5.2 Controlled Environment

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

Table 5-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT *General Population* (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT *Occupational* (W/kg) or (mW/g)
Peak Spatial Average SAR Head	1.6	8.0
Whole Body SAR	0.08	0.4
Peak Spatial Average SAR Hands, Feet, Ankle, Wrists, etc.	4.0	20

1. The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
2. The Spatial Average value of the SAR averaged over the whole body.
3. The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

6 FCC MEASUREMENT PROCEDURES

6.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v06, when SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as *reported* SAR. The highest *reported* SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

6.2 SAR Testing with 802.11 Transmitters

The normal network operating configurations of 802.11 transmitters are not suitable for SAR measurements. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 D01v02r02 for more details.

6.2.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters.

A periodic duty factor is required for current generation SAR systems to measure SAR. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

6.2.2 U-NII-1 and U-NII-2A

For devices that operate in both U-NII-1 and U-NII-2A bands, when the same maximum output power is specified for both bands, SAR measurement using OFDM SAR test procedures is not required for U-NII-1 unless the highest reported SAR for U-NII-2A is > 1.2 W/kg. When different maximum output powers are specified for the bands, SAR measurement for the U-NII band with the lower maximum output power is not required unless the highest reported SAR for the U-NII band with the higher maximum output power, adjusted by the ratio of lower to higher specified maximum output power for the two bands, is > 1.2 W/kg. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

6.2.3 U-NII-2C and U-NII-3

The frequency range covered by U-NII-2C and U-NII-3 is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification. Unless band gap channels are permanently disabled, SAR must be considered for these channels. Each band is tested independently according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

6.2.4 2.4 GHz SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either the fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.

2) When the reported SAR is > 0.8 W/kg, SAR is required for that position using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11 g/n OFDM are additionally evaluated for SAR if the highest reported SAR for 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power, is > 1.2 W/kg. When SAR is required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

6.2.5 OFDM Transmission Mode and SAR Test Channel Selection

When the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11a, ad 802.11n or 802.11g and 802.11n with the same channel bandwidth, modulation and data rate etc., the lower order 802.11 mode i.e., 802.11a, then 802.11n or 802.11g then 802.11n, is used for SAR measurement. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

6.2.6 Initial Test Configuration Procedure

For OFDM, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order IEEE 802.11 mode. The channel of the transmission mode with the highest average RF output conducted power will be the initial test configuration.

When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤ 1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurements (See Section 6.2.5). When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

6.2.7 Subsequent Test Configuration Procedures

For OFDM configurations in each frequency band and aggregated band, SAR is evaluated for initial test configuration using the fixed test position or the initial test position procedure. When the highest reported SAR (for the initial test configuration), adjusted by the ratio of the specified maximum output power of the subsequent test configuration to initial test configuration, is ≤ 1.2 W/kg, no additional SAR tests for the subsequent test configurations are required. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

7 RF CONDUCTED POWERS

7.1 WLAN Conducted Powers

Table 7-1
2.4 GHz WLAN Maximum Average RF Power

2.4GHz Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11b	802.11g	802.11n
		Average	Average	Average
2412	1	18.80	16.53	16.48
2417	2		17.66	17.70
2437	6	18.75	17.51	17.75
2457	10		17.62	17.54
2462	11	18.79	16.00	16.01

Table 7-2
5 GHz WLAN Maximum Average RF Power

5GHz (20MHz) Conducted Power [dBm]			
Freq [MHz]	Channel	IEEE Transmission Mode	
		802.11a	802.11n
		Average	Average
5180	36	16.01	16.07
5200	40	15.98	15.97
5220	44	16.06	15.94
5240	48	16.02	15.95
5260	52	16.04	15.97
5280	56	15.97	16.00
5300	60	16.05	15.98
5320	64	16.00	16.04
5500	100	16.03	16.00
5600	120	16.02	16.04
5620	124	16.07	16.08
5720	144	16.01	16.06
5745	149	16.02	15.99
5785	157	16.05	16.13
5825	165	15.97	16.02

Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02:

- Power measurements were performed for the transmission mode configuration with the highest maximum output power specified for production units.
- For transmission modes with the same maximum output power specification, powers were measured for the largest channel bandwidth, lowest order modulation and lowest data rate.
- For transmission modes with identical maximum specified output power, channel bandwidth, modulation and data rates, power measurements were required for all identical configurations.
- For each transmission mode configuration, powers were measured for the highest and lowest channels; and at the mid-band channel(s) when there were at least 3 channels supported. For configurations with multiple mid-band channels, due to an even number of channels, both channels were measured.

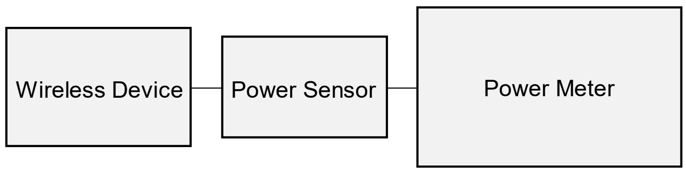

Figure 7-1
Power Measurement Setup

7.2 Bluetooth Conducted Powers

Table 7-3
Bluetooth Average RF Power

Frequency [MHz]	Modulation	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
				[dBm]	[mW]
2402	GFSK	1.0	0	18.05	63.826
2441	GFSK	1.0	39	17.84	60.814
2480	GFSK	1.0	78	17.90	61.660

Note: Bluetooth was evaluated with a test mode with 100% transmission duty factor.

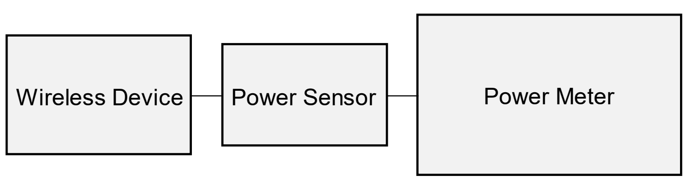

Figure 7-2
Power Measurement Setup

8.1 Tissue Verification

Table 8-1
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
07/30/2021	2450 Head	21.6	2400	1.790	39.260	1.756	39.289	1.94%	-0.07%
			2450	1.830	39.200	1.800	39.200	1.67%	0.00%
			2480	1.851	39.149	1.833	39.162	0.98%	-0.03%
08/06/2021	2450 Head	22.2	2400	1.817	39.076	1.756	39.289	3.47%	-0.54%
			2450	1.857	39.020	1.800	39.200	3.17%	-0.46%
			2480	1.878	38.962	1.833	39.162	2.45%	-0.51%
07/27/2021	5200-5800 Head	21.5	5180	4.512	36.606	4.635	36.009	-2.65%	1.66%
			5190	4.527	36.596	4.645	35.998	-2.54%	1.66%
			5200	4.541	36.589	4.655	35.986	-2.45%	1.68%
			5210	4.551	36.580	4.666	35.975	-2.46%	1.68%
			5220	4.558	36.559	4.676	35.963	-2.52%	1.66%
			5240	4.574	36.499	4.696	35.940	-2.60%	1.56%
			5250	4.586	36.459	4.706	35.929	-2.55%	1.48%
			5260	4.599	36.419	4.717	35.917	-2.50%	1.40%
			5270	4.610	36.397	4.727	35.906	-2.48%	1.37%
			5280	4.619	36.384	4.737	35.894	-2.49%	1.37%
			5290	4.631	36.372	4.748	35.883	-2.46%	1.36%
			5300	4.641	36.362	4.758	35.871	-2.46%	1.37%
			5310	4.652	36.333	4.768	35.860	-2.43%	1.32%
			5320	4.662	36.306	4.778	35.849	-2.43%	1.27%
			5500	4.879	35.997	4.963	35.643	-1.69%	0.99%
			5510	4.895	35.985	4.973	35.632	-1.57%	0.99%
			5520	4.909	35.970	4.983	35.620	-1.49%	0.98%
			5530	4.920	35.953	4.994	35.609	-1.48%	0.97%
			5540	4.930	35.943	5.004	35.597	-1.48%	0.97%
			5550	4.942	35.941	5.014	35.586	-1.44%	1.00%
			5560	4.954	35.936	5.024	35.574	-1.39%	1.02%
			5580	4.979	35.908	5.045	35.551	-1.31%	1.00%
			5600	5.005	35.886	5.065	35.529	-1.18%	1.00%
			5610	5.015	35.873	5.076	35.518	-1.20%	1.00%
			5620	5.026	35.856	5.086	35.506	-1.18%	0.99%
			5640	5.050	35.832	5.106	35.483	-1.10%	0.98%
			5660	5.072	35.813	5.127	35.460	-1.07%	1.00%
			5670	5.079	35.797	5.137	35.449	-1.13%	0.98%
			5680	5.089	35.779	5.147	35.437	-1.13%	0.97%
			5690	5.100	35.757	5.158	35.426	-1.12%	0.93%
			5700	5.109	35.728	5.168	35.414	-1.14%	0.89%
			5710	5.118	35.701	5.178	35.403	-1.16%	0.84%
			5720	5.128	35.685	5.188	35.391	-1.16%	0.83%
			5745	5.157	35.633	5.214	35.363	-1.09%	0.76%
			5750	5.162	35.617	5.219	35.357	-1.09%	0.74%
			5755	5.166	35.601	5.224	35.351	-1.11%	0.71%
			5765	5.179	35.582	5.234	35.340	-1.05%	0.68%
			5775	5.190	35.565	5.245	35.329	-1.05%	0.67%
			5785	5.203	35.534	5.255	35.317	-0.99%	0.61%
			5795	5.212	35.502	5.265	35.305	-1.01%	0.56%
			5800	5.217	35.491	5.270	35.300	-1.01%	0.54%
			5800	5.217	35.491	5.270	35.300	-1.01%	0.54%
			5805	5.224	35.480	5.275	35.294	-0.97%	0.53%
			5825	5.249	35.440	5.296	35.271	-0.89%	0.48%

Table 8-2
Measured Body Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (˚C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ε	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ε	% dev σ	% dev ε
07/29/2021	2450 Body	21.0	2400	1.946	51.447	1.902	52.767	2.31%	-2.50%
			2450	1.992	51.397	1.950	52.700	2.15%	-2.47%
			2480	2.017	51.353	1.993	52.662	1.20%	-2.49%
07/28/2021	5200-5800 Body	21.2	5180	5.319	47.672	5.276	49.041	0.82%	-2.79%
			5190	5.334	47.662	5.288	49.028	0.87%	-2.79%
			5200	5.349	47.649	5.299	49.014	0.94%	-2.78%
			5210	5.362	47.631	5.311	49.001	0.96%	-2.80%
			5220	5.373	47.605	5.323	48.987	0.94%	-2.82%
			5240	5.403	47.544	5.346	48.960	1.07%	-2.89%
			5250	5.415	47.511	5.358	48.947	1.06%	-2.93%
			5260	5.429	47.493	5.369	48.933	1.12%	-2.94%
			5270	5.445	47.475	5.381	48.919	1.19%	-2.95%
			5280	5.460	47.454	5.393	48.906	1.24%	-2.97%
			5290	5.472	47.433	5.404	48.892	1.26%	-2.98%
			5300	5.482	47.421	5.416	48.879	1.22%	-2.98%
			5310	5.497	47.402	5.428	48.865	1.27%	-2.99%
			5320	5.514	47.381	5.439	48.851	1.38%	-3.01%
			5500	5.773	47.038	5.650	48.607	2.18%	-3.23%
			5510	5.788	47.018	5.661	48.594	2.24%	-3.24%
			5520	5.805	47.004	5.673	48.580	2.33%	-3.24%
			5530	5.822	46.998	5.685	48.566	2.41%	-3.23%
			5540	5.837	46.983	5.696	48.553	2.48%	-3.23%
			5550	5.849	46.953	5.708	48.539	2.47%	-3.27%
			5560	5.864	46.928	5.720	48.526	2.52%	-3.29%
			5580	5.898	46.904	5.743	48.499	2.70%	-3.29%
			5600	5.923	46.873	5.766	48.471	2.72%	-3.30%
			5610	5.937	46.847	5.778	48.458	2.75%	-3.32%
			5620	5.952	46.820	5.790	48.444	2.80%	-3.35%
			5640	5.980	46.780	5.813	48.417	2.87%	-3.38%
			5660	6.009	46.750	5.837	48.390	2.95%	-3.39%
			5670	6.024	46.727	5.848	48.376	3.01%	-3.41%
			5680	6.037	46.697	5.860	48.363	3.02%	-3.44%
			5690	6.049	46.673	5.872	48.349	3.01%	-3.47%
			5700	6.064	46.660	5.883	48.336	3.08%	-3.47%
			5710	6.078	46.653	5.895	48.322	3.10%	-3.45%
			5720	6.095	46.631	5.907	48.309	3.18%	-3.47%
			5745	6.124	46.565	5.936	48.275	3.17%	-3.54%
			5750	6.131	46.555	5.942	48.268	3.18%	-3.55%
			5755	6.140	46.545	5.947	48.261	3.25%	-3.56%
			5765	6.158	46.531	5.959	48.248	3.34%	-3.56%
			5775	6.175	46.510	5.971	48.234	3.42%	-3.57%
			5785	6.188	46.477	5.982	48.220	3.44%	-3.61%
			5795	6.201	46.449	5.994	48.207	3.45%	-3.65%
			5800	6.209	46.434	6.000	48.200	3.48%	-3.66%
			5805	6.215	46.422	6.006	48.193	3.48%	-3.67%
			5825	6.244	46.388	6.029	48.166	3.57%	-3.69%

The above measured tissue parameters were used in the DASY software. The DASY software was used to perform interpolation to determine the dielectric parameters at the SAR test device frequencies (per KDB Publication 865664 D01v01r04). The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

8.2 Test System Verification

Prior to SAR assessment, the system is verified to ±10% of the SAR measurement on the reference dipole at the time of calibration by the calibration facility. Full system validation status and result summary can be found in Appendix D.

Table 8-3
System Verification Results – 1g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Source SN	Probe SN	Measured SAR_{1g} (W/kg)	1 W Target SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	$Deviation_{1g}$ (%)
AM4b	2450	HEAD	07/30/2021	22.4	21.6	0.100	750	7640	4.920	53.100	49.200	-7.34%
AM4b	2450	HEAD	08/06/2021	22.9	22.6	0.100	750	7640	5.140	53.100	51.400	-3.20%
AM8	5250	HEAD	07/27/2021	22.9	22.0	0.050	1123	7558	3.810	82.200	76.200	-7.30%
AM8	5600	HEAD	07/27/2021	22.9	22.0	0.050	1123	7558	4.140	84.500	82.800	-2.01%
AM8	5750	HEAD	07/27/2021	22.9	22.0	0.050	1123	7558	3.780	81.300	75.600	-7.01%

Table 8-4
System Verification Results – 10g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Source SN	Probe SN	Measured SAR_{10g} (W/kg)	1 W Target SAR_{10g} (W/kg)	1 W Normalized SAR_{10g} (W/kg)	$Deviation_{10g}$ (%)
AM2	2450	BODY	07/29/2021	21.8	21.2	0.100	921	7532	2.440	23.800	24.400	2.52%
AM9	5250	BODY	07/28/2021	24.1	21.4	0.050	1123	7638	1.050	20.300	21.000	3.45%
AM9	5600	BODY	07/28/2021	24.1	21.4	0.050	1123	7638	1.120	21.200	22.400	5.66%
AM9	5750	BODY	07/28/2021	24.1	21.4	0.050	1123	7638	1.080	20.100	21.600	7.46%

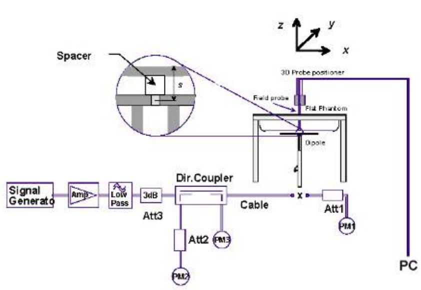

Figure 8-1
System Verification Setup Diagram

Figure 8-2
System Verification Setup Photo

9 SAR DATA SUMMARY

9.1 Standalone Head SAR Data

Table 9-1
2.4 GHz WLAN Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Side	Housing Type	Wristband Type	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.														(W/kg)			(W/kg)	
2412	1	802.11b	DSSS	22	20.0	18.80	0.02	10 mm	Front	Aluminum	Sport	HK93K6CNQ6	1	99.7	0.267	1.318	1.003	0.353	A1
2437	6	802.11b	DSSS	22	20.0	18.75	0.05	10 mm	Front	Aluminum	Sport	HK93K6CNQ6	1	99.7	0.193	1.334	1.003	0.258	
2462	11	802.11b	DSSS	22	20.0	18.79	0.02	10 mm	Front	Aluminum	Sport	HK93K6CNQ6	1	99.7	0.203	1.321	1.003	0.269	
2412	1	802.11b	DSSS	22	20.0	18.80	0.08	10 mm	Front	Aluminum	Metal Links	HK93K6CNQ6	1	99.7	0.168	1.318	1.003	0.222	
2412	1	802.11b	DSSS	22	20.0	18.80	0.02	10 mm	Front	Aluminum	Metal Loop	HK93K6CNQ6	1	99.7	0.202	1.318	1.003	0.267	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram									

Table 9-2
5 GHz WLAN Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Side	Housing Type	Wristband Type	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.														(W/kg)			(W/kg)	
5300	60	802.11a	OFDM	20	17.0	16.05	0.04	10 mm	Front	Aluminum	Sport	RYG36247X1	6	97.5	0.065	1.245	1.026	0.083	
5300	60	802.11a	OFDM	20	17.0	16.05	0.01	10 mm	Front	Aluminum	Metal Links	RYG36247X1	6	97.5	0.056	1.245	1.026	0.072	
5300	60	802.11a	OFDM	20	17.0	16.05	0.03	10 mm	Front	Aluminum	Metal Loop	RYG36247X1	6	97.5	0.057	1.245	1.026	0.073	
5620	124	802.11a	OFDM	20	17.0	16.07	-0.05	10 mm	Front	Aluminum	Sport	HK93K6CNQ6	6	97.5	0.097	1.239	1.026	0.123	
5620	124	802.11a	OFDM	20	17.0	16.07	-0.03	10 mm	Front	Aluminum	Metal Links	HK93K6CNQ6	6	97.5	0.103	1.239	1.026	0.131	
5620	124	802.11a	OFDM	20	17.0	16.07	0.09	10 mm	Front	Aluminum	Metal Loop	HK93K6CNQ6	6	97.5	0.083	1.239	1.026	0.106	
5785	157	802.11a	OFDM	20	17.0	16.05	-0.02	10 mm	Front	Aluminum	Sport	RYG36247X1	6	97.5	0.115	1.245	1.026	0.147	A2
5785	157	802.11a	OFDM	20	17.0	16.05	0.13	10 mm	Front	Aluminum	Metal Links	RYG36247X1	6	97.5	0.115	1.245	1.026	0.147	
5785	157	802.11a	OFDM	20	17.0	16.05	0.08	10 mm	Front	Aluminum	Metal Loop	RYG36247X1	6	97.5	0.105	1.245	1.026	0.134	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram									

Table 9-3
Bluetooth Head SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Side	Housing Type	Wristband Type	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													(W/kg)			(W/kg)	
2402.00	0	Bluetooth	FHSS	19.0	18.05	0.02	10 mm	Front	Aluminum	Sport	DYT779KMGJ	1	100	0.249	1.245	1.000	0.310	A3
2402.00	0	Bluetooth	FHSS	19.0	18.05	0.04	10 mm	Front	Aluminum	Metal Links	DYT779KMGJ	1	100	0.154	1.245	1.000	0.192	
2402.00	0	Bluetooth	FHSS	19.0	18.05	0.05	10 mm	Front	Aluminum	Metal Loop	DYT779KMGJ	1	100	0.186	1.245	1.000	0.232	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram									

9.2 Standalone Extremity SAR Data

Table 9-4
2.4 GHz WLAN Extremity SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Housing Type	Wristband Type	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)	(W/kg)	
2412	1	802.11b	DSSS	22	20.0	18.80	0.06	0 mm	Aluminum	Sport	DYT779KMGJ	1	back	99.7	1.318	1.003	0.006	0.008	A4
2412	1	802.11b	DSSS	22	20.0	18.80	-0.03	0 mm	Aluminum	Metal Links	DYT779KMGJ	1	back	99.7	1.318	1.003	0.002	0.003	
2412	1	802.11b	DSSS	22	20.0	18.80	-0.03	0 mm	Aluminum	Metal Loop	DYT779KMGJ	1	back	99.7	1.318	1.003	0.002	0.003	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Extremity 4.0 W/kg (mW/g) averaged over 10 gram									

Table 9-5
5 GHz WLAN Extremity SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Housing Type	Wristband Type	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.																(W/kg)	(W/kg)	
5300	60	802.11a	OFDM	20	17.0	16.05	0.02	0 mm	Aluminum	Sport	C4MG2452WV	6	back	97.5	1.245	1.026	0.003	0.004	
5300	60	802.11a	OFDM	20	17.0	16.05	0.02	0 mm	Aluminum	Metal Links	C4MG2452WV	6	back	97.5	1.245	1.026	0.006	0.008	
5300	60	802.11a	OFDM	20	17.0	16.05	-0.05	0 mm	Aluminum	Metal Loop	C4MG2452WV	6	back	97.5	1.245	1.026	0.006	0.008	
5620	124	802.11a	OFDM	20	17.0	16.07	-0.03	0 mm	Aluminum	Sport	C4MG2452WV	6	back	97.5	1.239	1.026	0.011	0.014	
5620	124	802.11a	OFDM	20	17.0	16.07	0.07	0 mm	Aluminum	Metal Links	C4MG2452WV	6	back	97.5	1.239	1.026	0.012	0.015	
5620	124	802.11a	OFDM	20	17.0	16.07	0.03	0 mm	Aluminum	Metal Loop	C4MG2452WV	6	back	97.5	1.239	1.026	0.017	0.022	
5785	157	802.11a	OFDM	20	17.0	16.05	0.03	0 mm	Aluminum	Sport	C4MG2452WV	6	back	97.5	1.245	1.026	0.011	0.014	
5745	149	802.11a	OFDM	20	17.0	16.02	-0.05	0 mm	Aluminum	Metal Links	C4MG2452WV	6	back	97.5	1.253	1.026	0.009	0.012	
5785	157	802.11a	OFDM	20	17.0	16.05	0.06	0 mm	Aluminum	Metal Links	C4MG2452WV	6	back	97.5	1.245	1.026	0.019	0.024	A6
5825	165	802.11a	OFDM	20	17.0	15.97	-0.03	0 mm	Aluminum	Metal Links	C4MG2452WV	6	back	97.5	1.268	1.026	0.011	0.014	
5785	157	802.11a	OFDM	20	17.0	16.05	-0.08	0 mm	Aluminum	Metal Loop	C4MG2452WV	6	back	97.5	1.245	1.026	0.016	0.020	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Extremity 4.0 W/kg (mW/g) averaged over 10 gram									

Table 9-6
Bluetooth Extremity SAR

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Housing Type	Wristband Type	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	SAR (10g)	Reported SAR (10g)	Plot #
MHz	Ch.															(W/kg)	(W/kg)	
2402	0	Bluetooth	FHSS	19.0	18.05	0.04	0 mm	Aluminum	Sport	DYT779KMGJ	1	back	100	1.245	1.000	0.004	0.005	A6
2402	0	Bluetooth	FHSS	19.0	18.05	0.12	0 mm	Aluminum	Metal Links	DYT779KMGJ	1	back	100	1.245	1.000	0.004	0.005	
2402	0	Bluetooth	FHSS	19.0	18.05	-0.05	0 mm	Aluminum	Metal Loop	DYT779KMGJ	1	back	100	1.245	1.000	0.004	0.005	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Extremity 4.0 W/kg (mW/g) averaged over 10 gram									

9.3 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.

4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. Per FCC KDB Publication 865664 D01v01r04, variability SAR tests were not required since measured SAR results for all frequency bands were less than 0.8 W/kg and 2.0 W/kg for 10g SAR. Please see Section 11 for variability analysis.
7. This device has one housing type: Aluminum. The non-metallic wrist accessory, sport band, was evaluated for all exposure conditions. The available metallic wrist accessories, metal links band and metal loop band, were additionally evaluated.
8. This device is a portable wrist-worn device and does not support any other use conditions. Therefore, the procedures in FCC KDB Publication 447498 D01v06 Section 6.2 have been applied for extremity and next to mouth (head) conditions.
9. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds below.
10. The orange highlights throughout the report represents the highest scaled SAR per equipment class.

WLAN Notes:

1. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 6.2.4 for more information.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg for 1g evaluations. See Section 6.2.5 for more information.
3. When the maximum reported 1g averaged SAR is ≤0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg for 1g evaluations or all test channels were measured. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.
4. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8 MHz, VBW = 50 MHz, and detector = peak per guidance of Section 6.0 b) of ANSI C63. 10-2013 and KDB 558074 D01 v04. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100.

Bluetooth Notes

1. To determine compliance, Bluetooth SAR was measured with the maximum power condition. Bluetooth was evaluated with a test mode with 100% transmission duty factor.

10 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

10.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v06 are applicable to devices with built-in unlicensed transmitters such as 802.11 and Bluetooth devices which may simultaneously transmit together.

10.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore, simultaneous transmission analysis is required. Per FCC KDB Publication 447498 D01v06 4.3.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 1g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is ≤1.6 W/kg. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1g or 10g SAR.

10.3 Head SAR Simultaneous Transmission Analysis

For SAR summation, the highest reported SAR across all housing and wristband types was used as a conservative evaluation for the simultaneous transmission analysis.

Table 10-1
Simultaneous Transmission Scenario (Head at 1.0 cm)

Exposure Condition	Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
	1	2	1+2
Head SAR	0.310	0.147	0.457

10.4 Extremity SAR Simultaneous Transmission Analysis

For SAR summation, the highest reported SAR across all housing and wristband types was used as a conservative evaluation for the simultaneous transmission analysis.

Table 10-2
Simultaneous Transmission Scenario (Extremity at 0.0 cm)

Exposure Condition	Bluetooth Aluminum SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
	1	2	1+2
Extremity SAR	0.005	0.024	0.029

10.5 Simultaneous Transmission Conclusion

The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06.

11 SAR MEASUREMENT VARIABILITY

11.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01, SAR measurement variability was not assessed for each frequency band since all measured SAR values are < 0.80 W/kg for 1g SAR and < 2.0 W/kg for 10g SAR.

11.2 Measurement Uncertainty

The measured SAR was <1.5 W/kg for 1g SAR and <3.75 W/kg for 10g SAR for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis was not required.

12 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	S-Parameter Network Analyzer	09/16/2020	Annual	09/16/2021	MY40000670
Agilent	E4438C	ESG Vector Signal Generator	12/02/2020	Annual	12/02/2021	MY42081752
Agilent	E5515C	Wireless Communications Test Set	12/15/2020	Annual	12/15/2021	GB42361078
Agilent	N5182A	MXG Vector Signal Generator	09/25/2020	Annual	09/25/2021	US46240505
Agilent	N5182A	MXG Vector Signal Generator	12/01/2020	Annual	12/01/2021	MY47420837
Agilent	N9020A	MXA Signal Analyzer	12/21/2020	Annual	12/21/2021	MY50200571
Agilent	85033E	3.5mm Standard Calibration Kit	07/07/2021	Annual	07/07/2022	MY53402352
Amplifier Research	150A100C	Amplifier	CBT	N/A	CBT	350132
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	343972
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	343971
Anritsu	MA24106A	USB Power Sensor	09/15/2020	Annual	09/15/2021	1244515
Anritsu	MA24106A	USB Power Sensor	09/15/2020	Annual	09/15/2021	1248508
Anritsu	MA24106A	USB Power Sensor	02/25/2021	Annual	02/25/2022	1520503
Anritsu	MA24106A	USB Power Sensor	02/25/2021	Annual	02/25/2022	1520501
Anritsu	MA2411B	Pulse Power Sensor	12/18/2020	Annual	12/18/2021	1126066
Anritsu	ML2495A	Power Meter	11/03/2020	Annual	11/03/2021	1039008
Anritsu	MT8820C	Radio Communication Analyzer	09/30/2020	Annual	09/30/2021	6201240328
Anritsu	MT8821C	Radio Communication Analyzer	05/21/2021	Annual	05/21/2022	6201144419
Control Company	4040	Therm./Clock/Humidity Monitor	02/17/2020	Biennial	02/17/2022	200113269
Control Company	4040	Therm./Clock/Humidity Monitor	02/17/2020	Biennial	02/17/2022	200113274
Control Company	4040	Therm./Clock/Humidity Monitor	03/06/2020	Biennial	03/06/2022	200170313
Control Company	4353	Long Stem Thermometer	10/28/2020	Biennial	10/28/2022	200670646
Control Company	4353	Long Stem Thermometer	10/28/2020	Biennial	10/28/2022	200670653
Insize	1108-150	Digital Caliper	01/17/2020	Biennial	01/17/2022	409193536
MCL	BW-N10W5+	10dB Attenuator	CBT	N/A	CBT	1611
MCL	BW-N3W5+	3dB Attenuator	CBT	N/A	CBT	1812
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1311
Mini-Circuits	NLP-1000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	ZHDC-16-63-S+	50-6000MHz Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMW500	Radio Communication Tester	04/13/2020	Annual	04/13/2022	167284
Rohde & Schwarz	CMW500	Radio Communication Tester	04/27/2021	Annual	04/27/2022	167285
Rohde & Schwarz	CMW500	Radio Communication Tester	10/16/2020	Annual	10/16/2021	101699
Rohde & Schwarz	CMW500	Radio Communication Tester	10/16/2020	Annual	10/16/2021	106578
Rohde & Schwarz	CMW500	Radio Communication Tester	10/27/2020	Annual	10/27/2021	108843
Rohde & Schwarz	FSP-7	Spectrum Analyzer	01/09/2020	Biennial	01/09/2022	100990
Rohde& Schwarz	CMW500	Wideband Radio Communication Tester	09/17/2020	Annual	09/17/2021	145663
Rosenberger	32W1006-016	Torque Wrench	12/01/2020	Annual	12/01/2021	N/A
SPEAG	DAKS-3.5	Portable DAK	09/09/2020	Annual	09/09/2021	1045
SPEAG	D2450V2	2450 MHz SAR Dipole	06/14/2019	Triennial	06/14/2022	750
SPEAG	D2450V2	2450 MHz SAR Dipole	12/03/2019	Biennial	12/03/2021	921
SPEAG	D5GHzV2	5 GHz SAR Dipole	03/10/2021	Annual	03/10/2022	1123
SPEAG	EX3DV4	SAR Probe	03/03/2021	Annual	03/03/2022	7638
SPEAG	EX3DV4	SAR Probe	04/19/2021	Annual	04/19/2022	7532
SPEAG	EX3DV4	SAR Probe	10/28/2020	Annual	10/28/2021	7558
SPEAG	EX3DV4	SAR Probe	03/03/2021	Annual	03/03/2022	7640
SPEAG	DAE4	Dasy Data Acquisition Electronics	01/11/2021	Annual	01/11/2022	1645
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/28/2020	Annual	10/28/2021	1364
SPEAG	DAE4	Dasy Data Acquisition Electronics	04/13/2021	Annual	04/13/2022	501
SPEAG	DAE4	Dasy Data Acquisition Electronics	01/11/2021	Annual	01/11/2022	1644

Note: All equipment was used strictly during the calibration period.

Note: CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.

13 MEASUREMENT UNCERTAINTIES

a	b	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	IEEE 1528 Sec.	Tol. (± %)	Prob. Dist.	Div.	c_i 1gm	c_i 10 gms	1gm u_i (± %)	10gms u_i (± %)	v_i
Measurement System									
Probe Calibration	E.2.1	7	N	1	1	1	7.0	7.0	∞
Axial Isotropy	E.2.2	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	E.2.2	1.3	N	1	0.7	0.7	0.9	0.9	∞
Boundary Effect	E.2.3	2	R	1.732	1	1	1.2	1.2	∞
Linearity	E.2.4	0.3	N	1	1	1	0.3	0.3	∞
System Detection Limits	E.2.4	0.25	R	1.732	1	1	0.1	0.1	∞
Modulation Response	E.2.5	4.8	R	1.732	1	1	2.8	2.8	∞
Readout Electronics	E.2.6	0.3	N	1	1	1	0.3	0.3	∞
Response Time	E.2.7	0.8	R	1.732	1	1	0.5	0.5	∞
Integration Time	E.2.8	2.6	R	1.732	1	1	1.5	1.5	∞
RF Ambient Conditions - Noise	E.6.1	3	R	1.732	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	3	R	1.732	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.8	R	1.732	1	1	0.5	0.5	∞
Probe Positioning w/ respect to Phantom	E.6.3	6.7	R	1.732	1	1	3.9	3.9	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	E.5	4	R	1.732	1	1	2.3	2.3	∞
Test Sample Related									
Test Sample Positioning	E.4.2	3.12	N	1	1	1	3.1	3.1	35
Device Holder Uncertainty	E.4.1	1.67	N	1	1	1	1.7	1.7	5
Output Power Variation - SAR drift measurement	E.2.9	5	R	1.732	1	1	2.9	2.9	∞
SAR Scaling	E.6.5	0	R	1.732	1	1	0.0	0.0	∞
Phantom & Tissue Parameters									
Phantom Uncertainty (Shape & Thickness tolerances)	E.3.1	7.6	R	1.73	1.0	1.0	4.4	4.4	∞
Liquid Conductivity - measurement uncertainty	E.3.3	4.3	N	1	0.78	0.71	3.3	3.0	76
Liquid Permittivity - measurement uncertainty	E.3.3	4.2	N	1	0.23	0.26	1.0	1.1	75
Liquid Conductivity - Temperature Uncertainty	E.3.4	3.4	R	1.732	0.78	0.71	1.5	1.4	∞
Liquid Permittivity - Temperature Unceritainty	E.3.4	0.6	R	1.732	0.23	0.26	0.1	0.1	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Permittivity - deviation from target values	E.3.2	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Combined Standard Uncertainty (k=1)			RSS				12.2	12.0	191
Expanded Uncertainty (95% CONFIDENCE LEVEL)			k=2				24.4	24.0	

The above measurement uncertainties are according to IEEE Std. 1528-2013

14 CONCLUSION

14.1 Measurement Conclusion

The SAR evaluation indicates that the EUT complies with the RF radiation exposure limits of the FCC and Innovation, Science, and Economic Development Canada, with respect to all parameters subject to this test. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables. [3]

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APPENDIX A: SAR TEST DATA

PCTEST

DUT: BCG-A2474; Type: Watch; Serial: HK93K6CNQ6

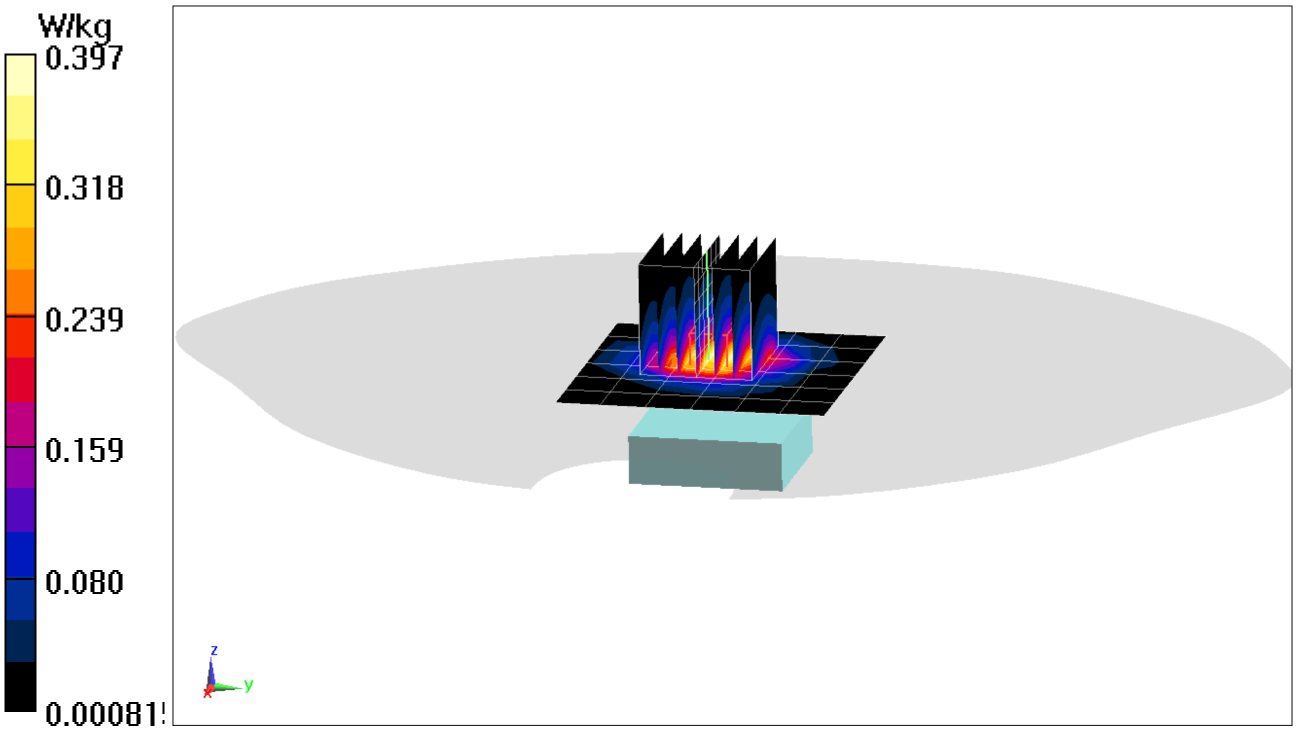
Communication System: UID 10415 - AAA, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 99pc duty cycle);
Frequency: 2412 MHz
Medium: 2450 Head; Medium parameters used (interpolated):
f = 2412 MHz; σ = 1.8 S/m; ε_r = 39.246; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 10.0 mm

Test Date: 07/30/2021; Ambient Temp: 22.4°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN7640; ConvF(8.76, 8.76, 8.76) @ 2412 MHz; Calibrated: 3/3/2021
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1645; Calibrated: 1/11/2021
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 2034
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

**Mode: IEEE 802.11b, 22 MHz Bandwidth, Head SAR, Ch 1,
1 Mbps, Front Side, Aluminum, Sport Wrist Band**

Area Scan (7x7x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.879 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.484 W/kg
SAR(1 g) = 0.267 W/kg
Smallest distance from peaks to all points 3 dB below = 9.1 mm
Ratio of SAR at M2 to SAR at M1 = 57.5%



PCTEST

DUT: BCG-A2474; Type: Watch; Serial: RYG36247X1

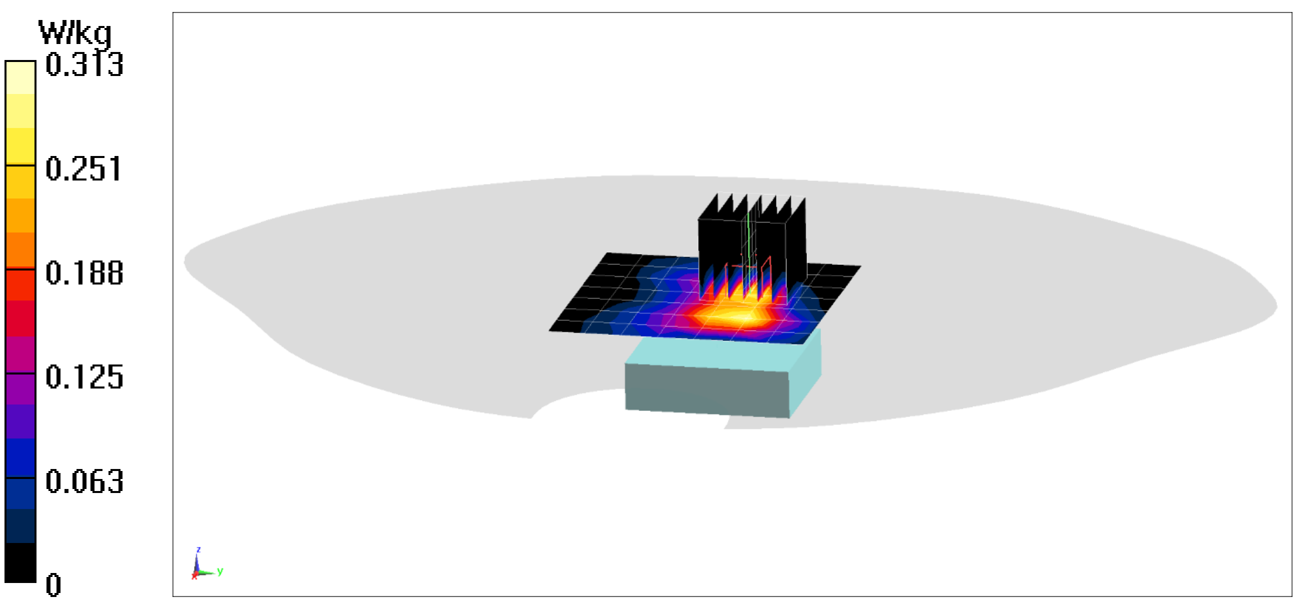
Communication System: UID 10417 - AAC, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle);
Frequency: 5785 MHz
Medium: 5200-5800 Head; Medium parameters used:
f = 5785 MHz; σ = 5.203 S/m; ε_r = 35.534; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 10.0 mm

Test Date: 07/27/2021; Ambient Temp: 22.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7558; ConvF(4.88, 4.88, 4.88) @ 5785 MHz; Calibrated: 10/21/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 10/12/2020
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1596
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

Mode: IEEE 802.11a, UNII-3, 20 MHz Bandwidth, Head SAR, Ch 157, 6 Mbps, Front Side, Aluminum, Sport Wrist Band

Area Scan (8x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 4.947 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.932 W/kg
SAR(1 g) = 0.115 W/kg
Smallest distance from peaks to all points 3 dB below = 6.9 mm
Ratio of SAR at M2 to SAR at M1 = 58.7%



PCTEST

DUT: BGC-A2474; Type: Watch; Serial: DYT779KMGJ

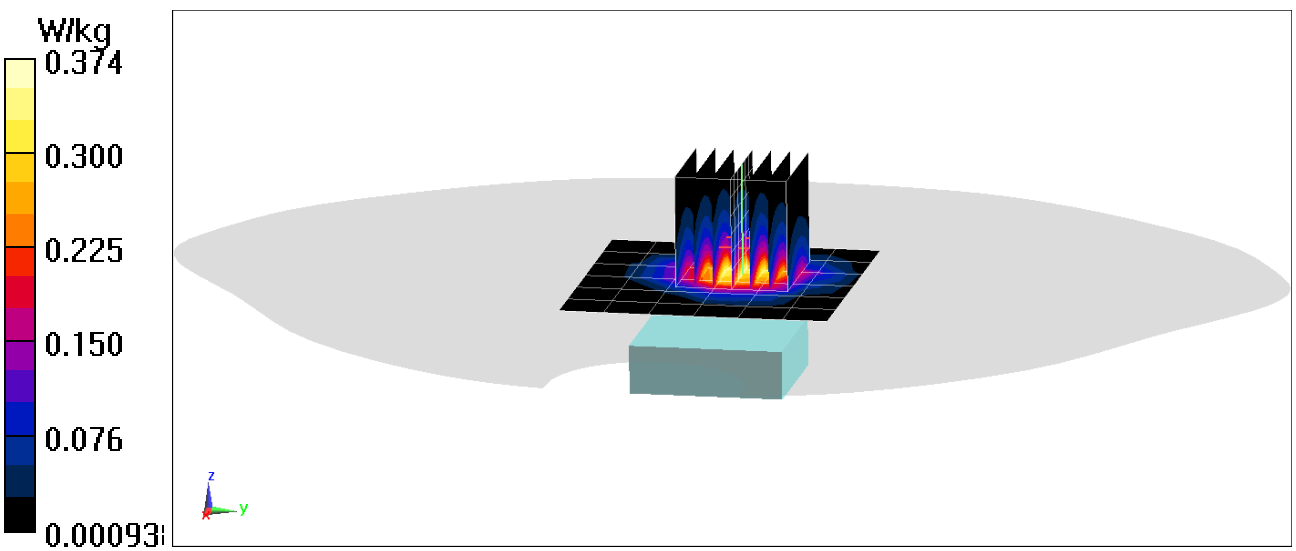
Communication System: UID 10032 - CAA, IEEE 802.15.1 Bluetooth (GFSK, DH5);
Frequency: 2402 MHz;
Medium: 2450 Head; Medium parameters used (interpolated):
f = 2402 MHz; σ = 1.819 S/m; ε_r = 39.074; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 10.0 mm

Test Date: 08/06/2021; Ambient Temp: 22.9°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN7640; ConvF(8.76, 8.76, 8.76) @ 2402 MHz; Calibrated: 3/3/2021
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1645; Calibrated: 1/11/2021
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 2034
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

Mode: Bluetooth, Head SAR, Ch 0, 1 Mbps,
Front Side, Aluminum, Sport Wrist Band

Area Scan (7x7x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.40 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.450 W/kg
SAR(1 g) = 0.249 W/kg
Smallest distance from peaks to all points 3 dB below = 10 mm
Ratio of SAR at M2 to SAR at M1 = 57%



PCTEST

DUT: BCG-A2474; Type: Watch; Serial: DYT779KMGJ

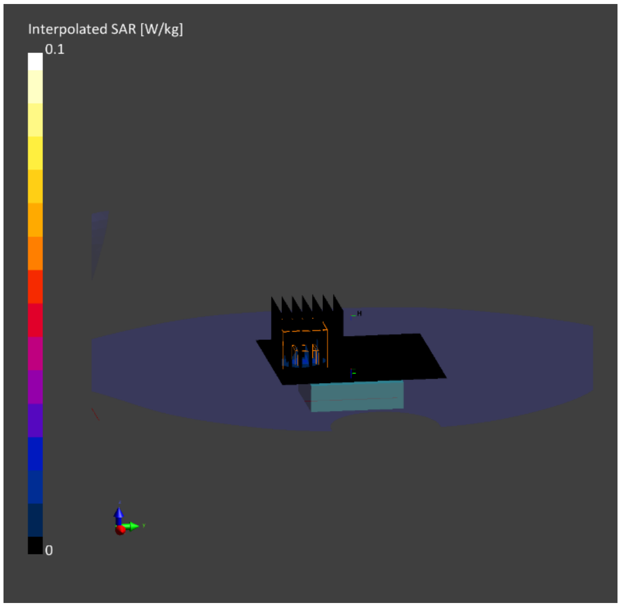
Communication System: UID:10415-AAA, WLAN; MAIA: Y; Frequency: 2412.0 MHz
Medium: 2450 Body; Medium parameters used:
f = 2412.0 MHz; cond = 1.96 S/m; perm = 51.4; density = 1000 kg/m3
Phantom Section: Flat; Space: 0.00 mm

Test Date: 07/29/2021; Ambient Temp: 21.8°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN7532; ConvF:(7.64,7.64,7.64); Calibrated: 2021-04-19
Sensor-Surface: 1.4mm (VMS + 6p)
Electronics: DAE4 Sn501; Calibrated: 2021-04-13
Phantom: Twin-SAM V4.0; Serial: 1275
Measurement SW: cDASY6 Module SAR V6.14.0.959

Mode: IEEE 802.11b, 22 MHz Bandwidth, Extremity SAR, Ch. 1, 1 Mbps, Back Side, Aluminum, Sport Wrist Band

Area Scan (80.0 x 80.0): Measurement grid: dx=10.0 mm, dy=10.0 mm
Zoom Scan (30.0 x 30.0 x 30.0): Measurement grid: dx=5.0 mm, dy=5.0 mm, dz=1.5 mm; Graded Ratio: 1.5
Reference Value = 0.02 W/kg; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.024 W/kg
SAR(10 g) = 0.006 W/kg
Smallest distance from peaks to all points 3 dB below is > 15.0 mm
Ratio of SAR at M2 to SAR at M1 = 94.4 %



PCTEST

DUT: BCG-A2474; Type: Watch; Serial: C4MG2452WV

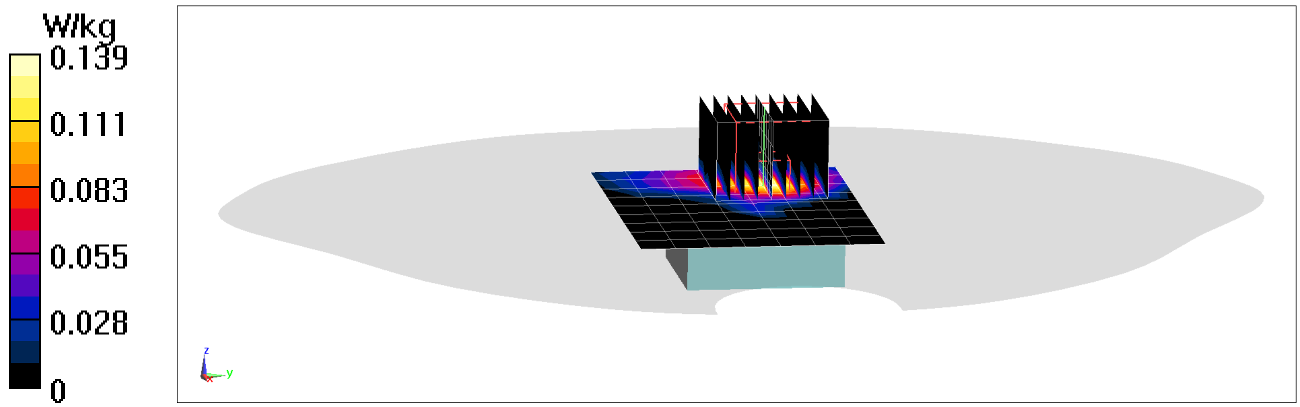
Communication System: UID 10417 - AAC, IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 99pc duty cycle);
Frequency: 5785 MHz
Medium: 5200-5800 Body; Medium parameters used:
f = 5785 MHz; σ = 6.188 S/m; ε_r = 46.477; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.00 mm

Test Date: 07/28/2021; Ambient Temp: 24.1°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN7638; ConvF(4.32, 4.32, 4.32) @ 5785 MHz; Calibrated: 3/3/2021
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1644; Calibrated: 1/11/2021
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 2027
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

Mode: IEEE 802.11a, UNII-3, 20 MHz Bandwidth, Extremity SAR, Ch 157, 6 Mbps, Back Side, Aluminum, Metal Links Wrist Band

Area Scan (10x8x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 2.773 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.557 W/kg
SAR(10 g) = 0.019 W/kg
Smallest distance from peaks to all points 3 dB below = 12.2 mm
Ratio of SAR at M2 to SAR at M1 = 52.4%



PCTEST

DUT: BCG-A2474; Type: Watch; Serial: DYT779KMGJ

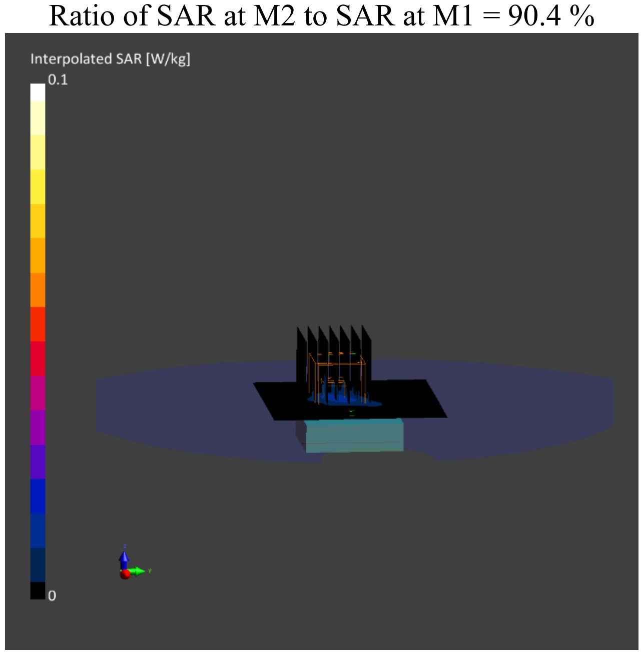
Communication System: UID:10032 - CAA, Bluetooth; MAIA: Y; Frequency: 2402.0 MHz
Medium: 2450 Body; Medium parameters used:
f = 2402.0 MHz; cond = 1.95 S/m; perm = 51.4; density = 1000 kg/m3
Phantom Section: Flat; Space: 0.00 mm

Test Date: 07/29/2021; Ambient Temp: 21.8°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN7532; ConvF:(7.64,7.64,7.64); Calibrated: 2021-04-19
Sensor-Surface: 1.4mm (VMS + 6p)
Electronics: DAE4 Sn501; Calibrated: 2021-04-13
Phantom: Twin-SAM V4.0; Serial: 1275
Measurement SW: cDASY6 Module SAR V6.14.0.959

Mode: Bluetooth, Extremity SAR, Ch.0, 1 Mbps, Back Side, Aluminum, Sport Wrist Band

Area Scan (80.0 x 80.0): Measurement grid: dx=10.0 mm, dy=10.0 mm
Zoom Scan (30.0 x 30.0 x 30.0): Measurement grid: dx=5.0 mm, dy=5.0 mm, dz=1.5 mm; Graded Ratio: 1.5
Reference Value = 0.02 W/kg; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.0229 W/kg
SAR(10 g) = 0.004 W/kg
Smallest distance from peaks to all points 3 dB below is > 15.0 mm
Ratio of SAR at M2 to SAR at M1 = 90.4 %



APPENDIX B: SYSTEM VERIFICATION

PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 750

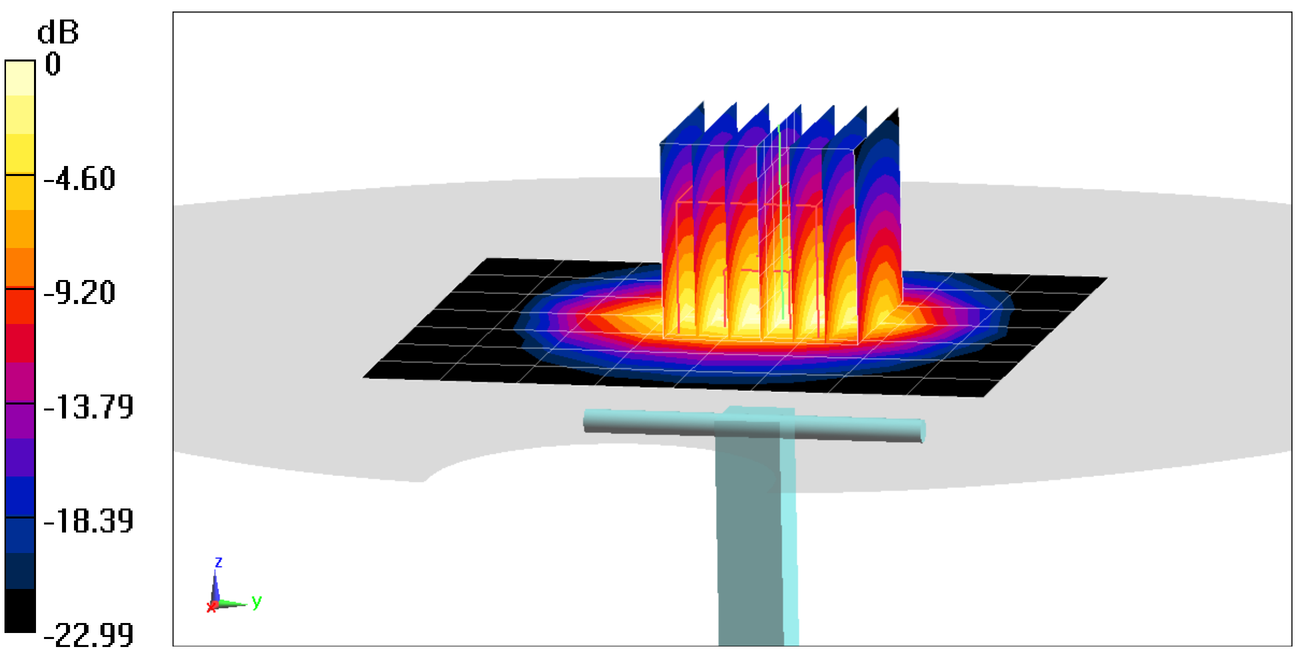
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; $\sigma = 1.83$ S/m; $\varepsilon_r = 39.2$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/30/2021; Ambient Temp: 22.4°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN7640; ConvF(8.76, 8.76, 8.76) @ 2450 MHz; Calibrated: 3/3/2021
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1645; Calibrated: 1/11/2021
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 2034
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 10.3 W/kg
SAR(1 g) = 4.92 W/kg
Deviation(1 g) = -7.34%



0 dB = 8.15 W/kg = 9.11 dBW/kg

PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 750

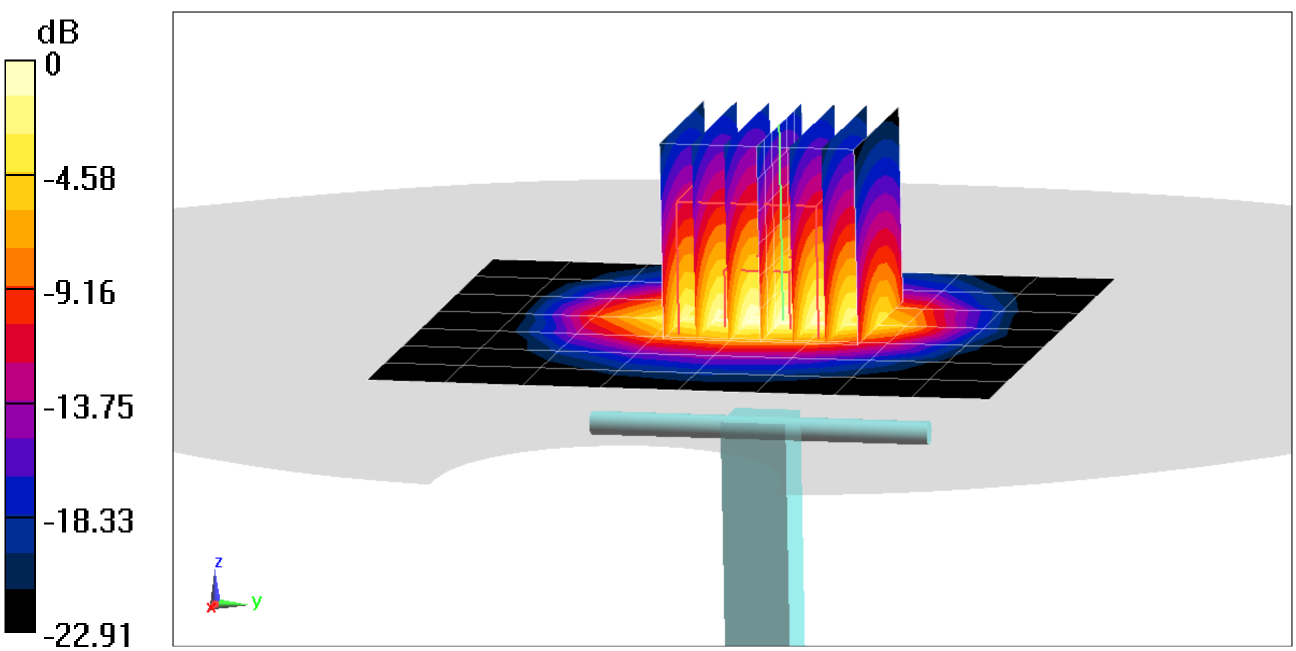
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.857 S/m; ε_r = 39.02; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08/06/2021; Ambient Temp: 22.9°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN7640; ConvF(8.76, 8.76, 8.76) @ 2450 MHz; Calibrated: 3/3/2021
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1645; Calibrated: 1/11/2021
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 2034
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 10.8 W/kg
SAR(1 g) = 5.14 W/kg
Deviation(1 g) = -3.20%



0 dB = 8.55 W/kg = 9.32 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1123

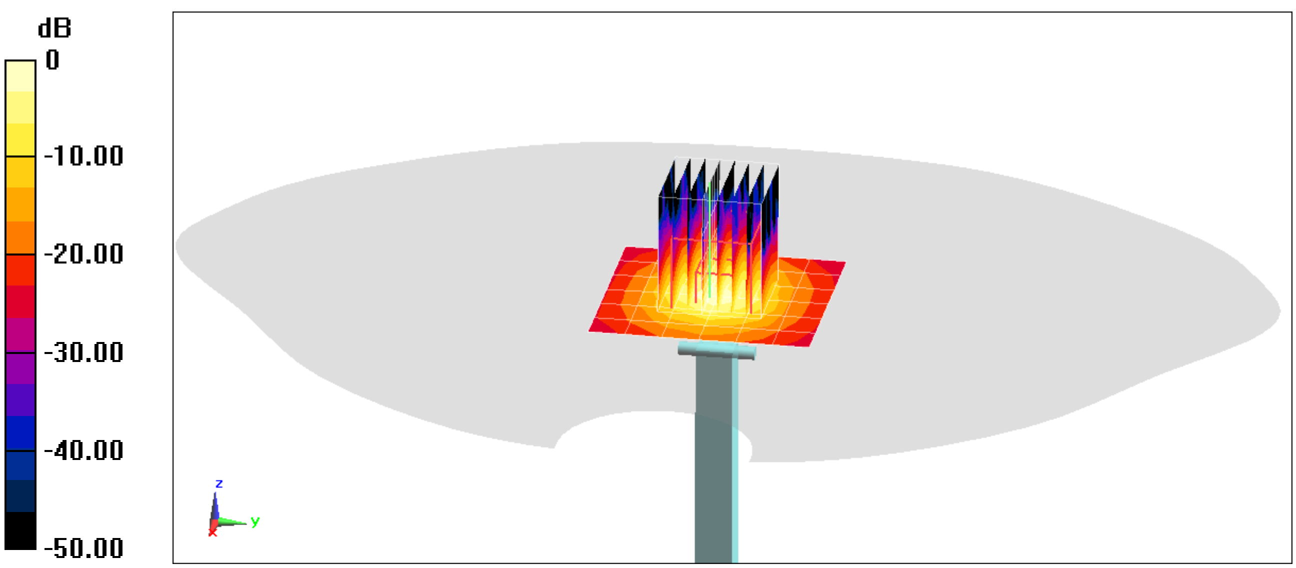
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Head Medium parameters used
f = 5250 MHz; σ = 4.586 S/m; ε_r = 36.459; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/27/2021; Ambient Temp: 22.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7558; ConvF(5.33, 5.33, 5.33) @ 5250 MHz; Calibrated: 10/21/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 10/12/2020
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1596
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5250 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 15.0 W/kg
SAR(1 g) = 3.81 W/kg
Deviation(1 g) = -7.30%



0 dB = 8.94 W/kg = 9.51 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1123

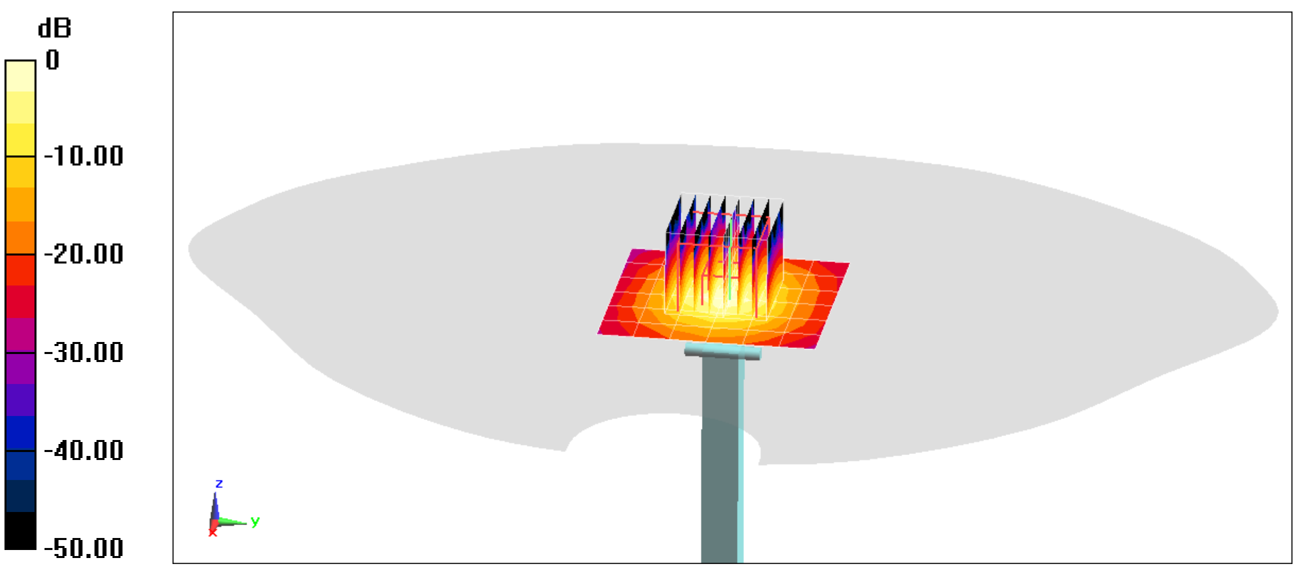
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Head Medium parameters used
f = 5600 MHz; σ = 5.005 S/m; ε_r = 35.886; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/27/2021; Ambient Temp: 22.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7558; ConvF(4.81, 4.81, 4.81) @ 5600 MHz; Calibrated: 10/21/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 10/12/2020
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1596
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5600 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 4.14 W/kg
Deviation(1 g) = -2.01%



0 dB = 9.95 W/kg = 9.98 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1123

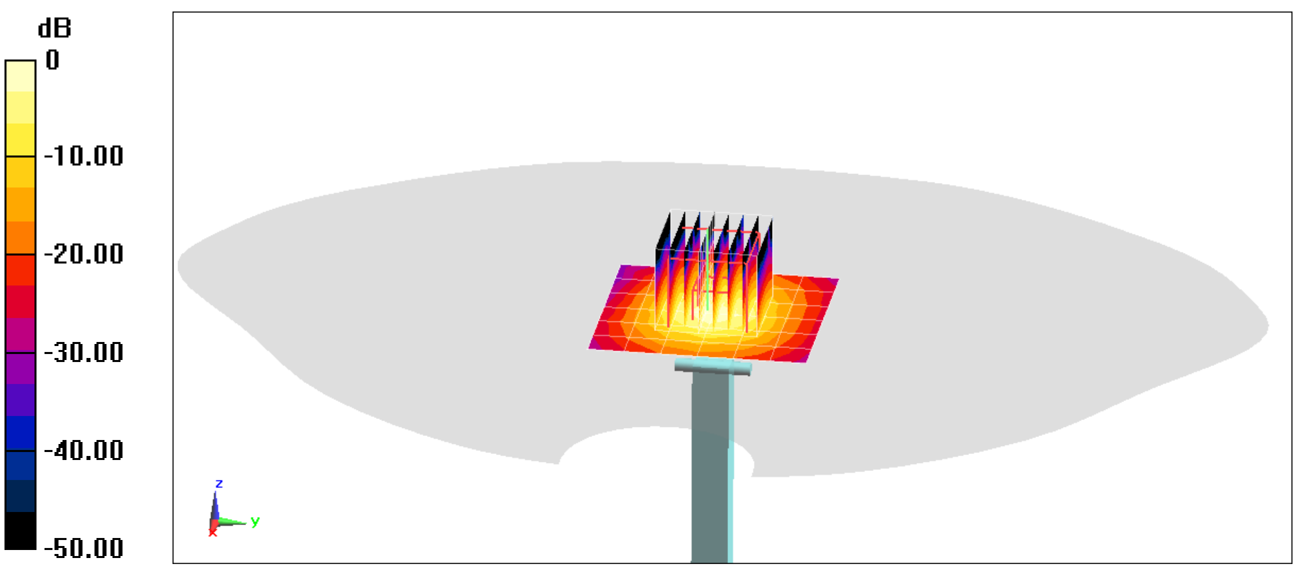
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Head Medium parameters used
f = 5750 MHz; σ = 5.162 S/m; ε_r = 35.617; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/27/2021; Ambient Temp: 22.9°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7558; ConvF(4.88, 4.88, 4.88) @ 5750 MHz; Calibrated: 10/21/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1364; Calibrated: 10/12/2020
Phantom: Twin-SAM V4.0; Type: QD 000 P40 CC; Serial: 1596
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5750 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 17.1 W/kg
SAR(1 g) = 3.78 W/kg
Deviation(1 g) = -7.01%



0 dB = 9.19 W/kg = 9.63 dBW/kg

PCTEST

DUT: Dipole 2450.0 MHz; Type: D2450V2 - SN921

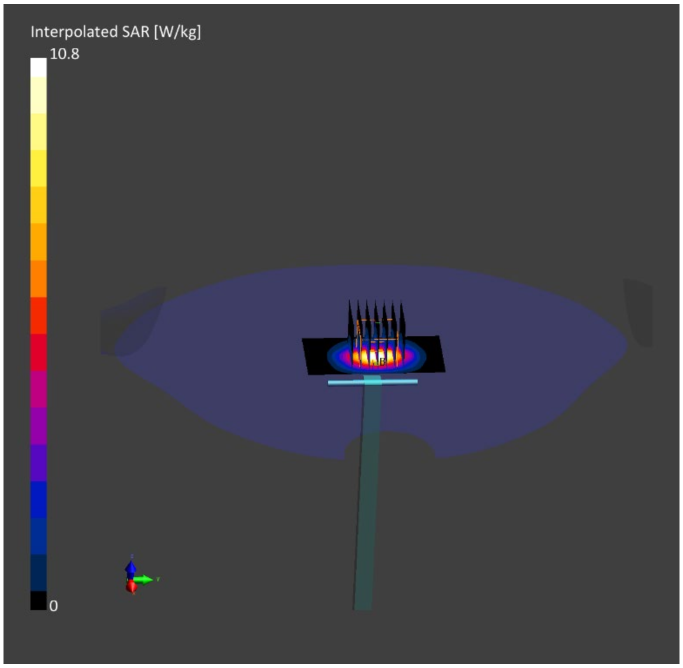
Communication System: UID: 0, CW; Frequency: 2450.0 MHz
Medium: 2450 Body; Medium parameters used:
f = 2450.0 MHz; cond = 1.99 S/m; perm = 51.4; density = 1000 kg/m3
Phantom Section: Flat; Space: 10 mm

Test Date: 07/29/2021; Ambient Temp: 21.8°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN7532; ConvF:(7.64,7.64,7.64); Calibrated: 2021-04-19
Sensor-Surface: 1.4mm (VMS + 6p)
Electronics: DAE4 Sn501; Calibrated: 2021-04-13
Phantom: Twin-SAM V4.0; Serial: 1275
Measurement SW: cDASY6 Module SAR V6.14.0.959

2450.0 MHz System Verification at 20.0 dBm

Area Scan (40.0 x 80.0): Measurement grid: dx=10.0 mm, dy=10.0 mm
Zoom Scan (30.0 x 30.0 x 30.0): Measurement grid: dx=5.0 mm, dy=5.0 mm, dz=1.5 mm; Graded Ratio: 1.5
Peak SAR (extrapolated) = 10.8 W/kg
SAR(10 g) = 2.44 W/kg
Deviation (10 g) = 2.52%;



PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1123

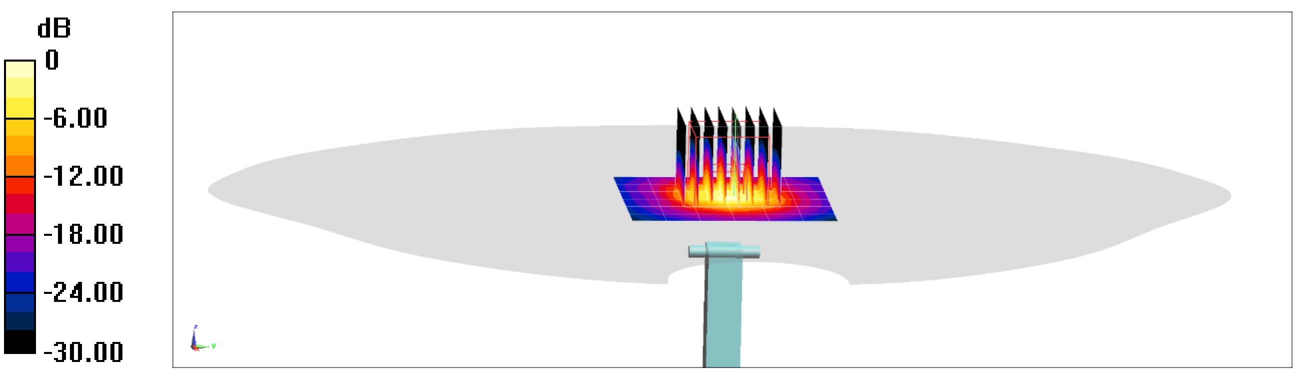
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Body; Medium parameters used:
f = 5250 MHz; σ = 5.415 S/m; ε_r = 47.511; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/28/2021; Ambient Temp: 24.1°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN7638; ConvF(4.76, 4.76, 4.76) @ 5250 MHz; Calibrated: 3/3/2021
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1644; Calibrated: 1/11/2021
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 2027
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7495)

5250 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 15.5 W/kg
SAR(10 g) = 1.05 W/kg
Deviation(10 g) = 3.45%



0 dB = 8.86 W/kg = 9.47 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1123

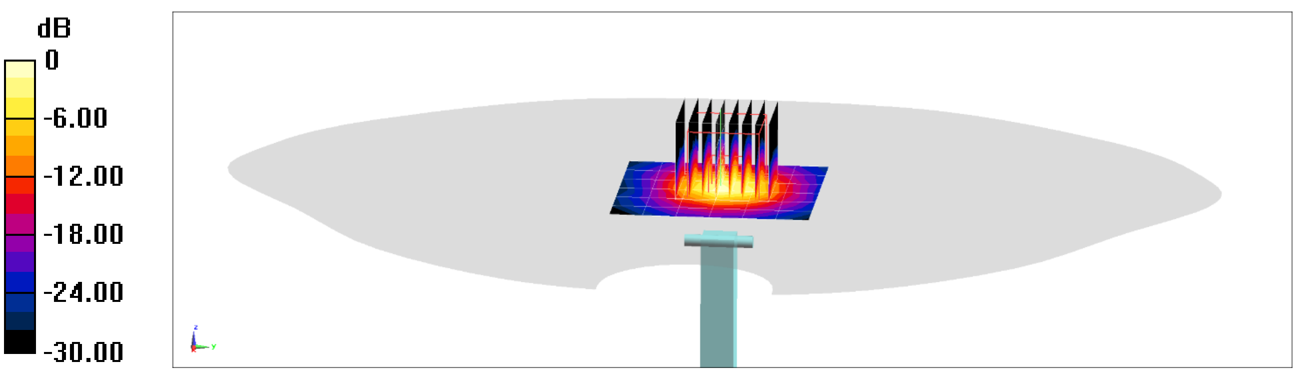
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Body; Medium parameters used:
f = 5600 MHz; σ = 5.923 S/m; ε_r = 46.873; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/28/2021; Ambient Temp: 24.1°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN7638; ConvF(4.24, 4.24, 4.24) @ 5600 MHz; Calibrated: 3/3/2021
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1644; Calibrated: 1/11/2021
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 2027
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7495)

5600 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 18.3 W/kg
SAR(10 g) = 1.12 W/kg
Deviation(10 g) = 5.66%



0 dB = 9.74 W/kg = 9.89 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1123

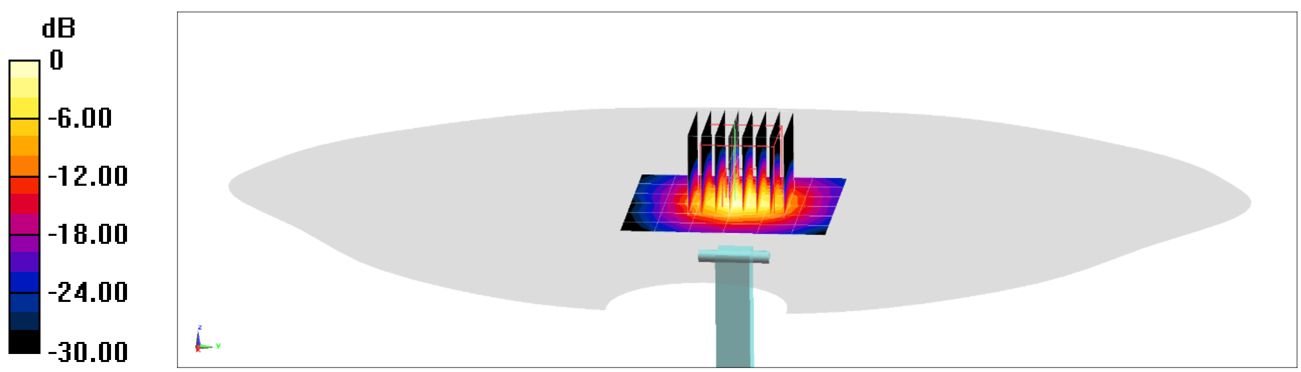
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Body; Medium parameters used:
f = 5750 MHz; σ = 6.131 S/m; ε_r = 46.555; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/28/2021; Ambient Temp: 24.1°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN7638; ConvF(4.32, 4.32, 4.32) @ 5750 MHz; Calibrated: 3/3/2021
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1644; Calibrated: 1/11/2021
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 2027
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7495)

5750 MHz System Verification at 17.0 dBm (50 mW)

Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 18.0 W/kg
SAR(10 g) = 1.08 W/kg
Deviation(10 g) = 7.46%



0 dB = 9.63 W/kg = 9.84 dBW/kg

APPENDIX C: SAR TISSUE SPECIFICATIONS

Measurement Procedure for Tissue verification:

1) The network analyzer and probe system was configured and calibrated.
2) The probe was immersed in the tissue. The tissue was placed in a nonmetallic container. Trapped air bubbles beneath the flange were minimized by placing the probe at a slight angle.
3) The complex admittance with respect to the probe aperture was measured
4) The complex relative permittivity ε' can be calculated from the below equation (Pournaropoulos and Misra):

$$Y = \frac{j2\omega\varepsilon_r\varepsilon_0}{[\ln(b/a)]^2}\int_a^b\int_a^b\int_0^\pi \cos\phi' \frac{\exp\left[-j\omega r(\mu_0\varepsilon_r'\varepsilon_0)^{1/2}\right]}{r}\, d\phi' d\rho' d\rho$$

where Y is the admittance of the probe in contact with the sample, the primed and unprimed coordinates refer to source and observation points, respectively, $r^2 = \rho^2 + \rho'^2 - 2\rho\rho'\cos\phi'$, ω is the angular frequency, and $j = \sqrt{-1}$.

3 Composition / Information on ingredients

3.2 Mixtures
Description: Aqueous solution with surfactants and inhibitors
Declarable, or hazardous components:

CAS: 107-21-1 EINECS: 203-473-3 Reg.nr.: 01-2119456816-28-0000	**Ethanediol** STOT RE 2, H373; Acute Tox. 4, H302	>1.0-4.9%
CAS: 68608-26-4 EINECS: 271-781-5 Reg.nr.: 01-2119527859-22-0000	**Sodium petroleum sulfonate** Eye Irrit. 2, H319	< 2.9%
CAS: 107-41-5 EINECS: 203-489-0 Reg.nr.: 01-2119539582-35-0000	**Hexylene Glycol / 2-Methyl-pentane-2,4-diol** Skin Irrit. 2, H315; Eye Irrit. 2, H319	< 2.9%
CAS: 68920-66-1 NLP: 500-236-9 Reg.nr.: 01-2119489407-26-0000	**Alkoxylated alcohol, > C_{16}** Aquatic Chronic 2, H411; Skin Irrit. 2, H315; Eye Irrit. 2, H319	< 2.0%

Additional information:
For the wording of the listed risk phrases refer to section 16.
Not mentioned CAS-, EINECS- or registration numbers are to be regarded as Proprietary/Confidential.
The specific chemical identity and/or exact percentage concentration of proprietary components is withheld as a trade secret.

Figure C-1

Note: Liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

Schmid & Partner Engineering AG

s p e a g

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 44 245 9700, Fax +41 44 245 9779
info@speag.com, http://www.speag.com

Measurement Certificate / Material Test

Item Name	**Body Tissue Simulating Liquid (MBBL600-6000V6)**
Product No.	SL AAM U16 BC (Batch: 181029-1)
Manufacturer	SPEAG

Measurement Method

TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters

Target parameters as defined in the KDB 865664 compliance standard.

Test Condition

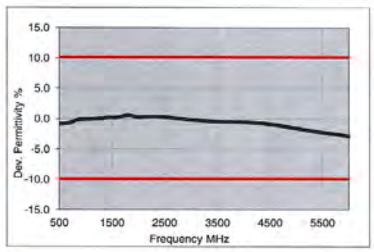
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	30-Oct-18
Operator	CL

Additional Information

TSL Density	
TSL Heat-capacity	

Results

	Measured			Target		Diff.to Target [%]	
f [MHz]	e'	e''	sigma	eps	sigma	Δ-eps	Δ-sigma
800	55.1	21.3	0.95	55.3	0.97	-0.4	-2.1
825	55.1	20.8	0.96	55.2	0.98	-0.3	-2.0
835	55.1	20.6	0.96	55.1	0.99	0.0	-2.5
850	55.1	20.4	0.96	55.2	0.99	-0.1	-3.0
900	55.0	19.7	0.98	55.0	1.05	0.0	-6.7
1400	54.2	15.6	1.22	54.1	1.28	0.2	-4.7
1450	54.1	15.4	1.24	54.0	1.30	0.2	-4.6
1500	54.1	15.3	1.27	53.9	1.33	0.3	-4.5
1550	54.0	15.1	1.30	53.9	1.36	0.2	-4.4
1600	53.9	15.0	1.33	53.8	1.39	0.2	-4.3
1625	53.9	14.9	1.35	53.8	1.41	0.3	-4.3
1640	53.9	14.9	1.36	53.7	1.42	0.3	-4.2
1650	53.8	14.9	1.36	53.7	1.43	0.2	-4.9
1700	53.8	14.8	1.40	53.6	1.46	0.4	-4.1
1750	53.7	14.7	1.43	53.4	1.49	0.5	-4.0
1800	53.7	14.6	1.46	53.3	1.52	0.8	-3.9
1810	53.7	14.6	1.47	53.3	1.52	0.8	-3.3
1825	53.7	14.6	1.48	53.3	1.52	0.8	-2.6
1850	53.6	14.5	1.50	53.3	1.52	0.6	-1.3
1900	53.5	14.5	1.53	53.3	1.52	0.4	0.7
1950	53.5	14.5	1.57	53.3	1.52	0.4	3.3
2000	53.4	14.4	1.60	53.3	1.52	0.2	5.3
2050	53.4	14.4	1.64	53.2	1.57	0.3	4.5
2100	53.3	14.4	1.68	53.2	1.62	0.2	3.7
2150	53.3	14.4	1.72	53.1	1.66	0.4	3.6
2200	53.2	14.4	1.76	53.0	1.71	0.3	2.9
2250	53.1	14.4	1.81	53.0	1.76	0.2	2.8
2300	53.1	14.4	1.85	52.9	1.81	0.4	2.2
2350	53.0	14.5	1.89	52.8	1.85	0.3	2.2
2400	52.9	14.5	1.94	52.8	1.90	0.2	2.1
2450	52.9	14.5	1.98	52.7	1.95	0.4	1.5
2500	52.8	14.6	2.03	52.6	2.02	0.3	0.5
2550	52.7	14.6	2.07	52.6	2.09	0.2	-1.0
2600	52.6	14.7	2.12	52.5	2.16	0.2	-1.9
3500	51.1	15.5	3.02	51.3	3.31	-0.4	-8.8
3700	50.8	15.7	3.24	51.1	3.55	-0.5	-8.8
5200	48.1	18.2	5.27	49.0	5.30	-1.8	-0.6
5250	48.0	18.3	5.34	49.0	5.36	-1.9	-0.4
5300	47.9	18.4	5.41	48.9	5.42	-2.0	-0.2
5500	47.5	18.6	5.70	48.6	5.65	-2.2	0.8
5600	47.3	18.8	5.84	48.5	5.77	-2.3	1.3
5700	47.1	18.9	5.99	48.3	5.88	-2.5	1.8
5800	47.0	19.0	6.14	48.2	6.00	-2.6	2.3



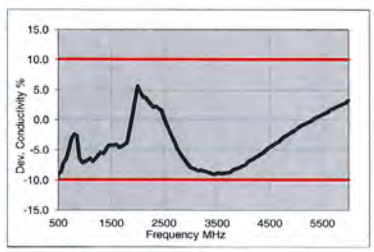


Figure C-2
600 – 5800 MHz Body Tissue Equivalent Matter

Schmid & Partner Engineering AG **s p e a g**

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 44 245 9700, Fax +41 44 245 9779
info@speag.com, http://www.speag.com

Measurement Certificate / Material Test

Item Name	**Head Tissue Simulating Liquid (HBBL600-10000V6)**
Product No.	SL AAH U16 BC (Batch: 181031-2)
Manufacturer	SPEAG

Measurement Method

TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters

Target parameters as defined in the IEEE 1528 and IEC 62209 compliance standards.

Test Condition

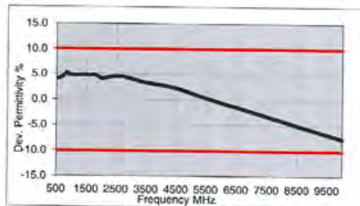
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	31-Oct-18
Operator	CL

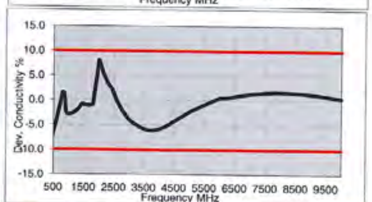
Additional Information

TSL Density
TSL Heat-capacity

Results

	Measured			Target		Diff.to Target [%]	
f [MHz]	e'	e''	sigma	eps	sigma	Δ-eps	Δ-sigma
800	43.8	20.5	0.91	41.7	0.90	5.1	1.4
825	43.8	20.1	0.92	41.6	0.91	5.3	1.5
835	43.8	19.9	0.93	41.5	0.91	5.4	2.0
850	43.7	19.7	0.93	41.5	0.92	5.3	1.5
900	43.5	18.9	0.95	41.5	0.97	4.8	-2.1
1400	42.5	15.0	1.17	40.6	1.18	4.7	-0.8
1450	42.5	14.8	1.19	40.5	1.20	4.9	-0.8
1600	42.2	14.3	1.27	40.3	1.28	4.7	-1.1
1625	42.2	14.2	1.29	40.3	1.30	4.8	-0.7
1640	42.2	14.2	1.30	40.3	1.31	4.8	-0.5
1650	42.1	14.2	1.30	40.2	1.31	4.6	-1.0
1700	42.1	14.0	1.33	40.2	1.34	4.8	-0.9
1750	42.0	13.9	1.36	40.1	1.37	4.8	-0.8
1800	41.9	13.9	1.39	40.0	1.40	4.7	-0.7
1810	41.9	13.8	1.40	40.0	1.40	4.7	0.0
1825	41.9	13.8	1.41	40.0	1.40	4.7	0.7
1850	41.8	13.8	1.42	40.0	1.40	4.5	1.4
1900	41.8	13.7	1.45	40.0	1.40	4.5	3.6
1950	41.7	13.7	1.48	40.0	1.40	4.3	5.7
2000	41.6	13.6	1.51	40.0	1.40	4.0	7.9
2050	41.6	13.6	1.55	39.9	1.44	4.2	7.3
2100	41.5	13.5	1.58	39.8	1.49	4.2	6.1
2150	41.4	13.5	1.62	39.7	1.53	4.2	5.7
2200	41.4	13.5	1.65	39.6	1.58	4.4	4.6
2250	41.3	13.5	1.69	39.6	1.62	4.4	4.2
2300	41.2	13.5	1.72	39.5	1.67	4.4	3.2
2350	41.1	13.5	1.76	39.4	1.71	4.4	2.9
2400	41.1	13.5	1.80	39.3	1.76	4.6	2.5
2450	41.0	13.5	1.84	39.2	1.80	4.6	2.2
2500	40.9	13.5	1.88	39.1	1.85	4.5	1.4
2550	40.8	13.5	1.92	39.1	1.91	4.4	0.6
2600	40.8	13.6	1.96	39.0	1.96	4.6	-0.2
3500	39.2	14.1	2.74	37.9	2.91	3.3	-5.8
3700	38.9	14.2	2.93	37.7	3.12	3.1	-6.1
5200	36.3	15.8	4.57	36.0	4.66	0.9	-1.7
5250	36.2	15.9	4.63	35.9	4.71	0.8	-1.6
5300	36.1	15.9	4.69	35.9	4.76	0.7	-1.4
5500	35.8	16.1	4.92	35.6	4.96	0.3	-0.9
5600	35.6	16.2	5.04	35.5	5.07	0.1	-0.6
5700	35.4	16.2	5.15	35.4	5.17	0.0	-0.3
5800	35.2	16.3	5.27	35.3	5.27	-0.2	0.0
6000	34.9	16.5	5.50	35.1	5.48	-0.6	0.5
6500	34.0	16.9	6.12	34.5	6.07	-1.4	0.9
7000	33.1	17.3	6.74	33.9	6.65	-2.3	1.3
7500	32.2	17.6	7.36	33.3	7.24	-3.2	1.6
8000	31.4	17.9	7.97	32.7	7.84	-4.1	1.7
8500	30.5	18.2	8.59	32.1	8.45	-5.0	1.6
9000	29.7	18.4	9.20	31.5	9.08	-5.9	1.3
9500	28.9	18.5	9.80	31.0	9.71	-6.8	0.9
10000	28.1	18.7	10.40	30.4	10.36	-7.6	0.4





TSL Dielectric Parameters

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Figure C-3
600 – 5800 MHz Head Tissue Equivalent Matter

APPENDIX D: SAR SYSTEM VALIDATION

Per FCC KDB Publication 865664 D02v01r02, SAR system validation status should be documented to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in FCC KDB Publication 865664 D01v01r04. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

Table D-1
SAR System Validation Summary – 1g

SAR System	Freq. (MHz)	Date	Probe SN	Probe Cal Point		Cond. (σ)	Perm. (εr)	CW VALIDATION			MOD. VALIDATION		
								SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
AM4b	2450	7/22/2021	7640	2450	Head	1.839	37.470	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
AM8	5250	12/20/2020	7558	5250	Head	4.476	34.870	PASS	PASS	PASS	OFDM	N/A	PASS
AM8	5600	12/20/2020	7558	5600	Head	4.855	34.300	PASS	PASS	PASS	OFDM	N/A	PASS
AM8	5750	12/20/2020	7558	5750	Head	5.036	34.018	PASS	PASS	PASS	OFDM	N/A	PASS

Table D-2
SAR System Validation Summary – 10g

SAR System	Freq. (MHz)	Date	Probe SN	Probe Cal Point		Cond. (σ)	Perm. (εr)	CW VALIDATION			MOD. VALIDATION		
								SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
AM2	2450	5/17/2021	7532	2450	Body	2.031	51.888	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
AM9	5250	5/12/2021	7638	5250	Body	5.412	47.566	PASS	PASS	PASS	OFDM	N/A	PASS
AM9	5600	5/13/2021	7638	5600	Body	5.925	46.935	PASS	PASS	PASS	OFDM	N/A	PASS
AM9	5750	5/13/2021	7638	5750	Body	6.129	46.600	PASS	PASS	PASS	OFDM	N/A	PASS

NOTE: While the probes have been calibrated for both CW and modulated signals. Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01r04 for scenarios when CW probe calibrations are used with other signal types. SAR systems were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5 dB), such as OFDM according to FCC KDB Publication 865664 D01v01r04.