TEST REPORT

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1. Report No : DRRFCC1911-0109
2. Customer
   - Name : POINTMOBILE CO., LTD.
   - Address : B-9F, Kabul Great Valley 32 Digital-ro 9-gil, Geumcheon-gu Seoul South Korea 153-709
3. Use of Report : FCC Original Grant
4. Product Name / Model Name : Mobile Computer / PM90W1

   FCC ID : V2X-PM90W1
5. Test Method Used : IEEE 1528-2013, FCC SAR KDB Publications (Details in test report)

   Test Specification : CFR §2.1093
6. Date of Test : 2019.10.15 ~ 2019.10.24
7. Testing Environment : Refer to appended test report.
8. Test Result : Refer to attached test report.

Affirmation	Tested by Name : BumJun Park (Signature)	Reviewed by Name : HakMin Kim (Signature)

2019 . 11 . 12 .

DT&C Co., Ltd.

Test Report Version

Test Report No.	Date	Description
DRRFCC1911-0109	Nov. 12, 2019	Initial issue

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1. DESCRIPTION OF DEVICE

1.1 General Information

EUT type	Mobile Computer				
FCC ID	V2X-PM90W1				
Equipment model name	PM90W1				
Equipment add model name	N/A				
Equipment serial no.	Identical prototype				
Mode(s) of Operation	2.4 G W-LAN (802.11b/g/n-HT20/n-HT40/ac-VHT20/ac-VHT40), 5 G W-LAN (802.11a/n-HT20/n-HT40/ac-VHT20/ac-VHT40/ac-VHT80), Bluetooth				
	Band	**Mode**	**Operating Modes**	**Bandwidth**	**Frequency**
TX Frequency Range	2.4 GHz W-LAN	802.11b/g/n/ac	Voice/Data	HT20/VHT20	2412 ~ 2462 MHz
		802.11 n/ac	Voice/Data	HT40/VHT40	2422 ~ 2452 MHz
	5.2 GHz W-LAN	802.11a/n/ac	Voice/Data	HT20/VHT20	5180 ~ 5240 MHz
		802.11n/ac	Voice/Data	HT40/VHT40	5190 ~ 5230 MHz
		802.11ac	Voice/Data	VHT80	5210 MHz
	5.3 GHz W-LAN	802.11a/n/ac	Voice/Data	HT20/VHT20	5260 ~ 5320 MHz
		802.11n/ac	Voice/Data	HT40/VHT40	5270 ~ 5310 MHz
		802.11ac	Voice/Data	VHT80	5290 MHz
	5.6 GHz W-LAN	802.11a/n/ac	Voice/Data	HT20/VHT20	5500 ~ 5720 MHz
		802.11n/ac	Voice/Data	HT40/VHT40	5510 ~ 5710 MHz
		802.11ac	Voice/Data	VHT80	5530 ~ 5690 MHz
	5.8 GHz W-LAN	802.11a/n/ac	Voice/Data	HT20/VHT20	5745 ~ 5825 MHz
		802.11n/ac	Voice/Data	HT40/VHT40	5755 ~ 5795 MHz
		802.11ac	Voice/Data	VHT80	5775 MHz
	Bluetooth	-	Data	-	2402 ~ 2480 MHz
RX Frequency Range	2.4 GHz W-LAN	802.11b/g/n/ac	Voice/Data	HT20/VHT20	2412 ~ 2462 MHz
		802.11 n/ac	Voice/Data	HT40/VHT40	2422 ~ 2452 MHz
	5.2 GHz W-LAN	802.11a/n/ac	Voice/Data	HT20/VHT20	5180 ~ 5240 MHz
		802.11n/ac	Voice/Data	HT40/VHT40	5190 ~ 5230 MHz
		802.11ac	Voice/Data	VHT80	5210 MHz
	5.3 GHz W-LAN	802.11a/n/ac	Voice/Data	HT20/VHT200	5260 ~ 5320 MHz
		802.11n/ac	Voice/Data	HT40/VHT40	5270 ~ 5310 MHz
		802.11ac	Voice/Data	VHT80	5290 MHz
	5.6 GHz W-LAN	802.11a/n/ac	Voice/Data	HT20/VHT20	5500 ~ 5720 MHz
		802.11n/ac	Voice/Data	HT40/VHT40	5510 ~ 5710 MHz
		802.11ac	Voice/Data	VHT80	5530 ~ 5690 MHz
	5.8 GHz W-LAN	802.11a/n/ac	Voice/Data	HT20/VHT20	5745 ~ 5825 MHz
		802.11n/ac	Voice/Data	HT40/VHT40	5755 ~ 5795 MHz
		802.11ac	Voice/Data	VHT80	5775 MHz
	Bluetooth	-	Data	-	2402 ~ 2480 MHz

Equipment Class	Band	Reported SAR		
		1g SAR (W/kg)		10g SAR (W/kg)
		Head	Body-Worn	Phablet
DTS(SISO)	2.4 GHz W-LAN	0.13	< 0.1	0.11
DTS(MIMO)	2.4 GHz W-LAN	0.11	< 0.1	0.10
U-NII-1(SISO)	5.2 GHz W-LAN	-	-	-
U-NII-1(MIMO)	5.2 GHz W-LAN	-	-	-
U-NII-2A(SISO)	5.3 GHz W-LAN	0.91	0.15	0.40
U-NII-2A(MIMO)	5.3 GHz W-LAN	0.98	0.16	0.67
U-NII-2C(SISO)	5.6 GHz W-LAN	0.57	0.11	0.61
U-NII-2C(MIMO)	5.6 GHz W-LAN	0.62	0.15	0.68
U-NII-3(SISO)	5.8 GHz W-LAN	0.41	< 0.1	0.41
U-NII-3(MIMO)	5.8 GHz W-LAN	0.34	0.16	0.53
DSS	Bluetooth	< 0.1	< 0.1	0.14
Simultaneous SAR per KDB 690783 D01v01r03		1.05	0.17	0.81

FCC Equipment Class	Part 15 Spread Spectrum Transmitter(DSS) Digital Transmission System(DTS) Unlicensed National Information Infrastructure (UNII)
Date(s) of Tests	2019.10.15 ~ 2019.10.24
Antenna Type	Internal Antenna
Functions	● VoIP is supported.

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

The Nominal and Maximum Output Power Specifications are in section 9 of this test report.

1.4 DUT Antenna Locations

The overall dimensions of this device are > 9 x 5 cm. A diagram showing the location of the device of the device antenna can be found in V2X-PM90W1_Antenna Location. Since the diagonal dimension of this device is > 160 mm and < 200 mm. it is considered a "phablet".

Mode	Device Sides for SAR Testing					
	Top	Bottom	Front	Rear	Right	Left
2.4G W-LAN Ant.1	O	X	O	O	X	O
2.4G W-LAN Ant.2	O	X	O	O	O	X
2.4G W-LAN MIMO	O	X	O	O	O	O
5G W-LAN Ant.1	O	X	O	O	X	O
5G W-LAN Ant.2	O	X	O	O	O	X
5G W-LAN MIMO	O	X	O	O	O	O
Bluetooth	O	X	O	O	X	O

Note 1: Particular DUT edges were not required to be evaluated for Phablet SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 648474 D04v01r03.The antenna document shows the distances between the transmit antennas and the edges of the device.

Note 2: O - Test / X - Not test.

Note 3: This DUT has NFC operations. The NFC antenna is integrated into the back side.
The SAR tests were performed with NFC antenna already incorporated.
A diagram showing the location of the device antenna can be found in V2X-PM90W1_Antenna Location.

1.5 Simultaneous Transmission Capabilities

The Simultaneous Transmission Capabilities are in section 11 of this test report.

1.6 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 248227 D01v02r02 (802.11 Wi-Fi SAR)
- FCC KDB Publication 447498 D01v06 (General RF Exposure Guidance)
- FCC KDB Publication 648474 D04v01r03 (Handset SAR)
- FCC KDB Publication 690783 D01v01r03 (SAR Listings on Grants)
- FCC KDB Publication 865664 D01v01r04 (SAR Measurement 100 MHz to 6 GHz)
- FCC KDB Publication 865664 D02v01r02 (RF Exposure Reporting)
- April 2015 TCB Workshop Notes (Simultaneous transmission summation clarified)
- October 2016 TCB Workshop Notes (Bluetooth Duty Factor)
- April 2019 TCB Workshop Notes (Tissue Simulating Liquids)

1.7 Device Serial Numbers

The serial numbers used for each test are indicated alongside the results in Section 10.

2. INTROCUCTION

The FCC and Industry 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.

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices. 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. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave is used for guidance in measuring 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 National Council on Radiation Protection and Measurements (NCRP) in Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86 NCRP, 1986, Bethesda, MD 20814. 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.

SAR Definition

Specific Absorption Rate (SAR) 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 Fig. 2.1)

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

Fig. 2.1 SAR Mathematical Equation

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 relations 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.

3. DOSIMETRIC ASSESSMENT

3.1 Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013:

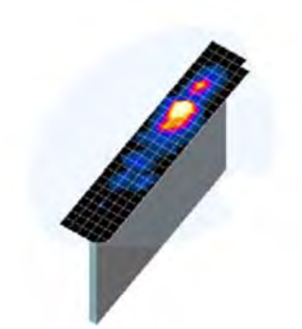

Figure 3.1
Sample SAR Area Scan

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) and IEEE1528-2013.

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) and IEEE 1528-2013. 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>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</td></tr>
<tr><td colspan="3">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 mm ± 1 mm</td><td>½·δ·ln(2) mm ± 0.5 mm</td></tr>
<tr><td colspan="3">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="3" rowspan="2">Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">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.</td></tr>
<tr><td colspan="3">Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td rowspan="3">Maximum zoom scan spatial resolution, normal to phantom surface</td><td colspan="2">uniform grid: $\Delta z_{Zoom}(n)$</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td rowspan="2">graded grid</td><td>$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface</td><td>≤ 4 mm</td><td>3 – 4 GHz: ≤ 3 mm
4 – 5 GHz: ≤ 2.5 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td>$\Delta z_{Zoom}(n>1)$: between subsequent points</td><td colspan="2">≤ 1.5·$\Delta z_{Zoom}(n-1)$ mm</td></tr>
<tr><td>Minimum zoom scan volume</td><td colspan="2">x, y, z</td><td>≥ 30 mm</td><td>3 – 4 GHz: ≥ 28 mm
4 – 5 GHz: ≥ 25 mm
5 – 6 GHz: ≥ 22 mm</td></tr>
<tr><td colspan="5">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.
* When zoom scan is required and the <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

Table 3.1 Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

4. DEFINITION OF REFERENCE POINTS

4.1 Ear Reference Point

Figure 4.1 shows the front, back and side views of the SAM Twin Phantom. The point"M" is the reference point for the center of the mouth, "LE" is the left ear reference point(ERP), and "RE" is the right ERP. The ERPs are 15 mm posterior to the entrance to the Ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 4.1. The plane Passing, through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck- Front) is perpendicular to the reference plane and passing through the RE (or LE) is called the Reference Pivoting Line (see Figure 4.1). Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning.

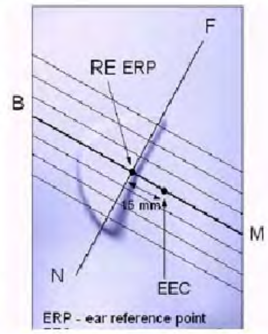

Figure 4.1 Close-up side view of ERP

4.2 Handset Reference Points

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed in a normal operating position with the "test device reference point" located along the "vertical centerline" on the front of the device aligned to the "ear reference point" (See Fig. 4.3). The "test device reference point" was than located at the same level as the center of the ear reference point. The test device was positioned so that the "vertical centerline" was bisecting the front surface of the handset at it's top and bottom edges, positioning the "ear reference point" on the outer surface of the both the left and right head phantoms on the ear reference point.

Figure 4.2 Front, back and side view SAM Twin Phantom

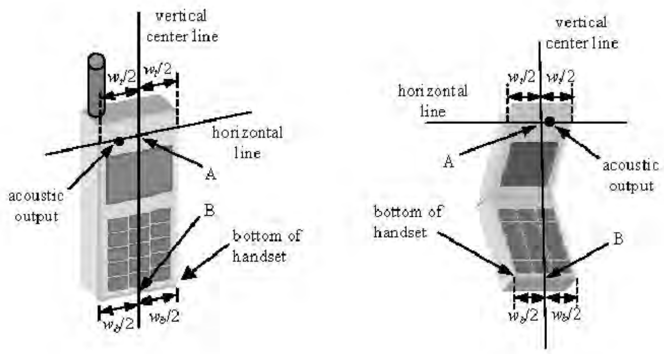

Figure 4.3 Handset Vertical Center & Horizontal Line Reference Points

5. TEST CONFIGURATION POSITIONS FOR HANDSETS

5.1 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.

5.2 Positioning for Cheek/Touch

1. The test device was positioned with the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 5.1), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.

Figure 5.1 Front, Side and Top View of Cheek/Touch Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the ear.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the plane normal to MB-NF including the line MB (reference plane).
4. The phone was hen rotated around the vertical centerline until the phone (horizontal line) was symmetrical was respect to the line NF.
5. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the phone contact with the ear, the handset was rotated about the line NF until any point on the handset made contact with a phantom point below the ear (cheek). (See Figure 5.2)

5.3 Positioning for Ear / 15 ° Tilt

With the test device aligned in the "Cheek/Touch Position":

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15 degree.
2. The phone was then rotated around the horizontal line by 15 degree.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the phone touches the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. The tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 5.3).

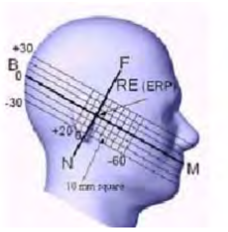

Figure 5.2 Side view w/relevant markings

Figure 5.3 Front, Side and Top View of Ear/15° Position

5.4 Body-Worn Accessory Configurations

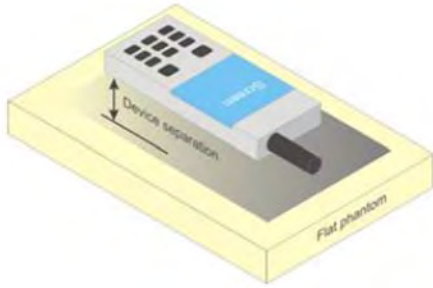

Figure 5.4 Sample Body-Worn Diagram

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 5.4). Per FCC KDB Publication 648474 D04v01r03, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented.
Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

5.5 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. The 1-g body and 10-g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D01v06 should be applied to determine SAR test requirements.

Per KDB Publication 447498 D01v06, Cell phones (handsets) are not normally designed to be used on extremities or operated in extremity only exposure conditions. The maximum output power levels of handsets generally do not require extremity SAR testing to show compliance. Therefore, extremity SAR was not evaluated for this device.

5.6 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v02r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10 mm from the front the front, rear and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. When the same wireless transmission configuration is used for testing body-worn accessory and hotspot mode SAR, respectively, in voice and data mode, SAR results for the most conservative test separation distance configuration may be used to support both SAR conditions.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitter often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each KDB Publication 447498 D01v06 procedures. The “Portable Hotspot” feature on the handset was not activated during SAR assessment, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

5.7 Phablet Configurations

For smart phones with a display diagonal > 150 mm or an overall diagonal dimension > 160 mm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the phablets procedures outlined in KDB Publication 648474 D04v01r03 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worn accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna ≤ 25mm from that surface or edge, in direct contact with the phantom, for 10g SAR. The UMPC mini-tablet 1g SAR at 5 mm is not required. When hotspot mode applies, 10g SAR is required only for the surfaces and edges with hotspot mode 1g SAR > 1.2 W/kg.

6. RF EXPOSURE LIMITS

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.

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 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 6.1.SAR Human Exposure Specified in ANSI/IEEE C95.1-1992

	HUMAN EXPOSURE LIMITS	
	General Public Exposure (W/kg) or (mW/g)	Occupational Exposure (W/kg) or (mW/g)
SPATIAL PEAK SAR * (Brain)	1.60	8.00
SPATIAL AVERAGE SAR ** (Whole Body)	0.08	0.40
SPATIAL PEAK SAR *** (Hands / Feet / Ankle / Wrist)	4.00	20.0

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.

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

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).

7. FCC MEASUREMENT PROCEDURES

Power measurements were performed using a base station simulator under digital average power.

7.1 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.

7.2 SAR Testing with 802.11 Transmitters

The normal network operating configurations are not suitable for measuring the SAR of 802.11 b/g/n transmitters. 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 248227D01v02r02 for more details.

7.2.1 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. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

A periodic duty factor is required for current generation SAR systems to measure SAR. When 802.11 frame gaps are accounted for in the 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.

7.2.2 U-NII and U-NII-2A

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following, with respect to the highest reported SAR and maximum output power specified for production units. The procedures are applied independently to each exposure configuration; for example, head, body, hotspot mode etc.

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, each band is tested independently for SAR.
2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, each band is tested independently for SAR.

7.2.3 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 Rader (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. When band gap channels are disabled, each band is tested independently according to the normally required OFDM SAR measurements and probe calibration frequency points requirements.

7.2.4 Initial Test Position Procedure

For exposure conditions with multiple test positions, such as handset operating next to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all position in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8 W/kg or all test position are measured.

7.2.5 2.4 GHz SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a 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 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; 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.

7.2.6 OFDM Transmission Mode and SAR Test Channel Selection

For the 2.4 GHz and 5 GHz bands, 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 and 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 80211n or 802.11g then 802.11n is used for SAR measurement. When the maximum output power ware 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.

7.2.7 Initial Test Configuration Procedure

For OFDM, in both 2.4 and 5 GHz bands, 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 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, and lowest data rate. 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.

7.2.8 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 applicable. When the highest reported SAR for the initial test configuration, adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power is ≤ 1.2 W/kg, no additional SAR testing for the subsequent test configurations is required.

7.2.9 MIMO SAR Considerations

Per KDB Publication 248227 D01v02r02, the simultaneous SAR provisions in KDB Publication 447498 D01v06 should be applied to determine simultaneous transmission SAR test exclusion for WIFI MIMO. If the sum of 1g single transmission chain SAR measurements is < 1.6 W/kg, no additional SAR measurements for MIMO are required. Alternatively, SAR for MIMO can be measured with all antennas transmitting simultaneously at the specified maximum output power of MIMO operation.

8. RF CONDUCTED POWERS

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

8.1 WLAN Nominal and Maximum Output Power Spec and Conducted Powers

Band (GHz)	Mode	Ch	Modulated Average[dBm]					
			Ant.1		Ant.2		MIMO(CDD/SDM)	
			Maximum	Nominal	Maximum	Nominal	Maximum	Nominal
2.4	802.11b	1	13.5	12.5	13.5	12.5	16.5	15.5
		6	13.5	12.5	13.5	12.5	16.5	15.5
		11	13.5	12.5	13.5	12.5	16.5	15.5
	802.11g	1	13.0	12.0	13.0	12.0	16.0	15.0
		6	13.0	12.0	13.0	12.0	16.0	15.0
		11	13.0	12.0	13.0	12.0	16.0	15.0
	802.11n (HT-20)	1	13.0	12.0	13.0	12.0	16.0	15.0
		6	13.0	12.0	13.0	12.0	16.0	15.0
		11	13.0	12.0	13.0	12.0	16.0	15.0
	802.11ac (VHT-20)	1	13.0	12.0	13.0	12.0	16.0	15.0
		6	13.0	12.0	13.0	12.0	16.0	15.0
		11	13.0	12.0	13.0	12.0	16.0	15.0
	802.11n (HT-40)	3	12.5	11.5	12.5	11.5	15.5	14.5
		6	13.0	12.0	13.0	12.0	16.0	15.0
		9	12.5	11.5	12.5	11.5	15.5	14.5
	802.11ac (VHT-40)	3	12.5	11.5	12.5	11.5	15.5	14.5
		6	13.0	12.0	13.0	12.0	16.0	15.0
		9	12.5	11.5	12.5	11.5	15.5	14.5

Table 8.1.1 Nominal and Maximum Output Power Spec

Mode	Freq. (MHz)	Channel	IEEE 802.11 (2.4 GHz) Conducted Power[dBm]			
			Ant.1	Ant.2	MIMO(CDD)	MIMO(SDM)
802.11b	**2412**	**1**	12.97	13.20	16.10	-
	2437	6	13.28	13.16	16.23	-
	2472	**11**	13.48	13.08	16.29	-
802.11g	2412	1	12.63	12.84	15.75	-
	2437	6	12.76	12.85	15.82	-
	2472	11	12.75	12.87	15.82	-
802.11n (HT-20)	2412	1	12.31	12.31	15.32	15.08
	2437	6	12.56	12.75	15.67	15.45
	2472	11	12.47	12.53	15.51	15.36
802.11ac (VHT-20)	2412	1	11.97	12.00	15.00	15.38
	2437	6	12.02	12.09	15.07	15.51
	2472	11	12.13	12.13	15.14	15.43
802.11n (HT-40)	2422	3	11.67	12.16	14.93	14.84
	2437	6	12.60	12.72	15.67	15.74
	2452	9	11.83	11.76	14.81	14.84
802.11ac (VHT-40)	2422	3	11.88	12.28	15.09	14.26
	2437	6	12.43	12.53	15.49	15.74
	2452	9	12.15	11.73	14.96	14.26

Table 8.1.2 IEEE 802.11 Average RF Power

Band (GHz)	Mode	Ch	Modulated Average[dBm]							
			Ant.1		Ant.2		MIMO(CDD)		MIMO(SDM)	
			Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal
5 (UNII)	802.11a	36, 40	15.5	14.5	15.5	14.5	18.5	17.5	18.5	17.5
		44-48								
		52, 56								
		60, 64								
		100								
		104-140								
		144								
		149-153								
		157, 161, 165								
	802.11n/ac (20MHz)	36, 40	15.0	14.0	15.0	14.0	18.0	17.0	18.0	17.0
		44-48								
		52, 56								
		60, 64								
		100								
		104-140								
		144								
		149-153								
		157, 161, 165								
	802.11n/ac (40MHz)	38	13.0	12.0	13.0	12.0	16.0	15.0	14.0	13.0
		46	15.0	14.0	15.0	14.0	18.0	17.0	18.0	17.0
		54								
		62	13.0	12.0	13.0	12.0	16.0	15.0	14.0	13.0
		102	15.0	14.0	15.0	14.0	18.0	17.0	18.0	17.0
		110								
		118								
		126								
		134								
		142								
		151								
		159								
	802.11ac (80MHz)	42	7.0	6.0	7.0	6.0	10.0	9.0	15.0	14.0
		58	10.0	9.0	10.0	9.0	13.0	12.0	13.0	12.0
		106	15.0	14.0	15.0	14.0	18.0	17.0	18.0	17.0
		122								
		138								
		155	13.0	12.0	13.0	12.0	16.0	15.0	16.0	15.0

Table 8.1.5 Nominal and Maximum Output Power Spec

Mode	Freq. (MHz)	Channel	IEEE 802.11a (5 GHz) Conducted Power[dBm]			
			Ant.1	Ant.2	MIMO(CDD)	MIMO(SDM)
802.11a	5180	36	14.52	14.36	17.45	-
	5200	40	14.43	14.20	17.33	-
	5220	44	14.34	14.52	17.44	-
	5240	48	14.54	14.39	17.48	-
	5260	**52**	14.25	14.53	17.40	-
	5280	**56**	14.02	14.32	17.18	-
	5300	60	13.97	14.23	17.11	-
	5320	64	13.61	13.76	16.70	-
	5500	100	13.54	13.74	16.65	-
	5600	120	13.52	13.84	16.69	-
	5660	**132**	15.13	14.50	17.84	-
	5720	144	14.81	14.32	17.58	-
	5745	149	14.67	13.67	17.21	-
	5785	157	14.84	13.91	17.42	-
	5825	**165**	14.96	13.94	17.49	-

Table 8.1.6 IEEE 802.11a Average RF Power

Mode	Freq. (MHz)	Channel	IEEE 802.11n HT20 (5 GHz) Conducted Power[dBm]			
			Ant.1	Ant.2	MIMO(CDD)	MIMO(SDM)
802.11n (HT-20)	5180	36	13.52	13.72	16.63	17.01
	5200	40	13.72	13.57	16.66	16.85
	5220	44	13.71	13.95	16.84	17.11
	5240	48	13.86	13.58	16.73	16.92
	5260	52	13.68	13.61	16.66	17.09
	5280	56	13.55	13.78	16.68	16.91
	5300	60	13.57	13.61	16.60	16.90
	5320	64	13.51	13.37	16.45	16.63
	5500	100	13.85	13.15	16.52	16.66
	5600	120	13.24	13.63	16.45	16.53
	5660	132	14.00	14.26	17.14	17.03
	5720	144	13.60	14.23	16.94	16.87
	5745	149	13.78	13.40	16.60	16.56
	5785	157	13.78	13.49	16.65	16.53
	5825	165	14.03	13.64	16.85	16.69

Table 8.1.7 IEEE 802.11n HT20 Average RF Power

Mode	Freq. (MHz)	Channel	IEEE 802.11ac VHT20 (5 GHz) Conducted Power[dBm]			
			Ant.1	Ant.2	MIMO(CDD)	MIMO(SDM)
802.11ac (VHT-20)	5180	36	13.41	13.79	16.61	17.46
	5200	40	13.65	13.97	16.82	17.40
	5220	44	13.85	14.19	17.03	17.55
	5240	48	13.91	14.10	17.02	17.64
	5260	52	13.71	14.21	16.98	17.57
	5280	56	13.64	14.25	16.97	17.52
	5300	60	13.51	13.95	16.75	17.38
	5320	64	13.49	13.57	16.54	17.21
	5500	100	13.68	13.51	16.61	17.49
	5600	120	13.19	13.40	16.31	16.95
	5660	132	13.14	13.11	16.14	17.58
	5720	144	13.13	13.95	16.57	17.37
	5745	149	13.10	13.04	16.08	16.96
	5785	157	13.19	13.11	16.16	17.25
	5825	165	13.03	13.05	16.05	17.34

Table 8.1.8 IEEE 802.11ac VHT20 Average RF Power

Mode	Freq. (MHz)	Channel	IEEE 802.11n HT40 (5 GHz) Conducted Power[dBm]			
			Ant.1	Ant.2	MIMO(CDD)	MIMO(SDM)
802.11n (HT-40)	5190	38	12.04	12.49	15.28	12.67
	5230	46	14.16	14.19	17.19	17.31
	5270	54	14.01	14.33	17.18	17.24
	5310	62	12.57	12.84	15.72	12.80
	5510	102	14.11	13.69	16.92	16.50
	5590	118	13.16	13.52	16.35	17.62
	5670	134	14.09	14.53	17.33	17.80
	5710	142	14.02	14.60	17.33	17.57
	5755	151	14.05	13.70	16.89	17.47
	5795	159	13.98	13.81	16.91	17.81

Table 8.1.9 IEEE 802.11n HT40 Average RF Power

Mode	Freq. (MHz)	Channel	IEEE 802.11ac VHT40 (5 GHz) Conducted Power[dBm]			
			Ant.1	Ant.2	MIMO(CDD)	MIMO(SDM)
802.11ac (VHT-40)	5190	38	12.20	12.77	15.50	12.65
	5230	46	14.17	14.89	17.56	16.95
	5270	54	14.28	14.81	17.56	17.00
	5310	62	12.67	12.70	15.70	12.94
	5510	102	14.32	14.06	17.20	16.65
	5590	118	14.71	14.76	17.75	17.69
	5670	134	13.95	14.63	17.31	17.22
	5710	142	13.70	14.28	17.01	17.58
	5755	151	13.48	13.24	16.37	17.49
	5795	159	13.52	13.60	16.57	17.41

Table 8.1.10 IEEE 802.11ac VHT40 Average RF Power

Mode	Freq. (MHz)	Channel	IEEE 802.11ac VHT80 (5 GHz) Conducted Power[dBm]			
			Ant.1	Ant.2	MIMO(CDD)	MIMO(SDM)
802.11ac (VHT-80)	5210	42	5.55	5.81	8.69	13.89
	5290	58	8.44	9.22	11.86	12.30
	5530	106	13.77	14.33	17.07	16.96
	5690	138	13.78	13.88	16.84	17.30
	5775	155	11.81	12.03	14.93	14.83

Table 8.1.11 IEEE 802.11ac VHT80 Average RF Power

Justification for reduced test configurations for WIFI channels 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, duo to an even number of channels, both channels were measured.
- Output Power and SAR is not required for 802.11 g/n HT20/ac VHT20 channels when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjust SAR is ≤ 1.2 W/kg.
- The underlined data rate and channel above were tested for SAR.

The average output powers of this device were tested by below configuration.

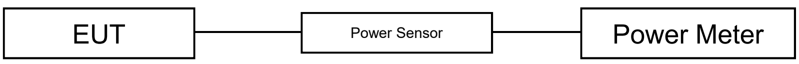

Figure 8.1 Power Measurement Setup

8.2 Bluetooth Conducted Powers

Frame Modulated Average[dBm]			
Bluetooth 1 Mbps	2402 MHz	Maximum	4.0
		Nominal	3.0
	2441 MHz	Maximum	4.0
		Nominal	3.0
	2480 MHz	Maximum	5.0
		Nominal	4.0
Bluetooth 2 Mbps		Maximum	2.0
		Nominal	1.0
Bluetooth 3 Mbps		Maximum	2.0
		Nominal	1.0

Table 8.2.1 Nominal and Maximum Output Power Spec (Frame)

Burst Modulated Average[dBm]		
Bluetooth (LE / 1Mbps)	Maximum	1.5
	Nominal	0.5
Bluetooth (LE / 2Mbps)	Maximum	1.5
	Nominal	0.5

Table 8.2.2 Nominal and Maximum Output Power Spec (Burst)

Channel	Frequency (MHz)	Frame AVG Output Power (1Mbps) (dBm)	Frame AVG Output Power (2Mbps) (dBm)	Frame AVG Output Power (3Mbps) (dBm)
Low	2402	1.98	-1.22	-1.18
Mid	**2441**	2.22	-1.05	-1.06
High	2480	4.06	1.01	1.01

Table 8.2.3 Bluetooth Frame Average RF Power

Channel	Frequency (MHz)	Burst AVG Output Power(LE / 1Mbps) (dBm)	Burst AVG Output Power(LE / 2Mbps) (dBm)
Low	2402	0.74	0.70
Mid	2440	-0.24	-0.29
High	2480	0.68	0.67

Table 8.2.4 Bluetooth LE Burst RF Power

- **Bluetooth Conducted Powers procedures**

1. Bluetooth (BDR, EDR)
   1) Enter DUT mode in EUT and operate it.
      When it operating, The EUT is transmitting at maximum power level and duty cycle fixed.
   2) Instruments and EUT were connected like Figure 8.2.1(A).
   3) The maximum output powers of BDR(1 Mbps), EDR(2, 3 Mbps) and each frequency were set by a Bluetooth Tester.
   4) Power levels were measured by a Power Meter.

2. Bluetooth (LE)
   1) Enter LE mode in EUT and operate it.
      When it operating, The EUT is transmitting at maximum power level and duty cycle fixed.
   2) Instruments and EUT were connected like Figure 8.2.1(B).
   3) The average conducted output powers of LE and each frequency can measurement according to setting program in EUT.
   4) Power levels were measured by a Power Meter.

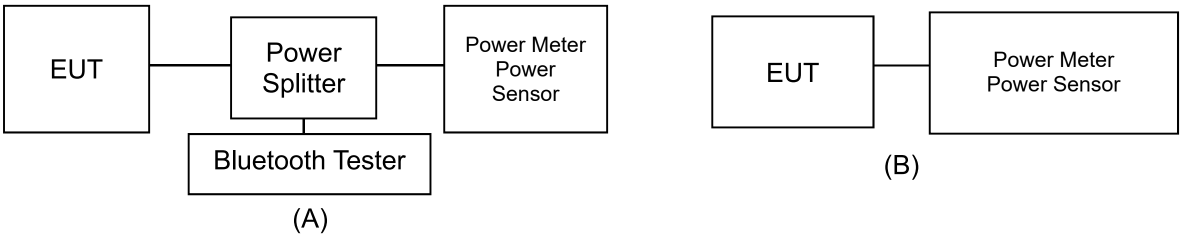

Figure 8.2.1 Average Power Measurement Setup

- **Bluetooth Transmission Plot**

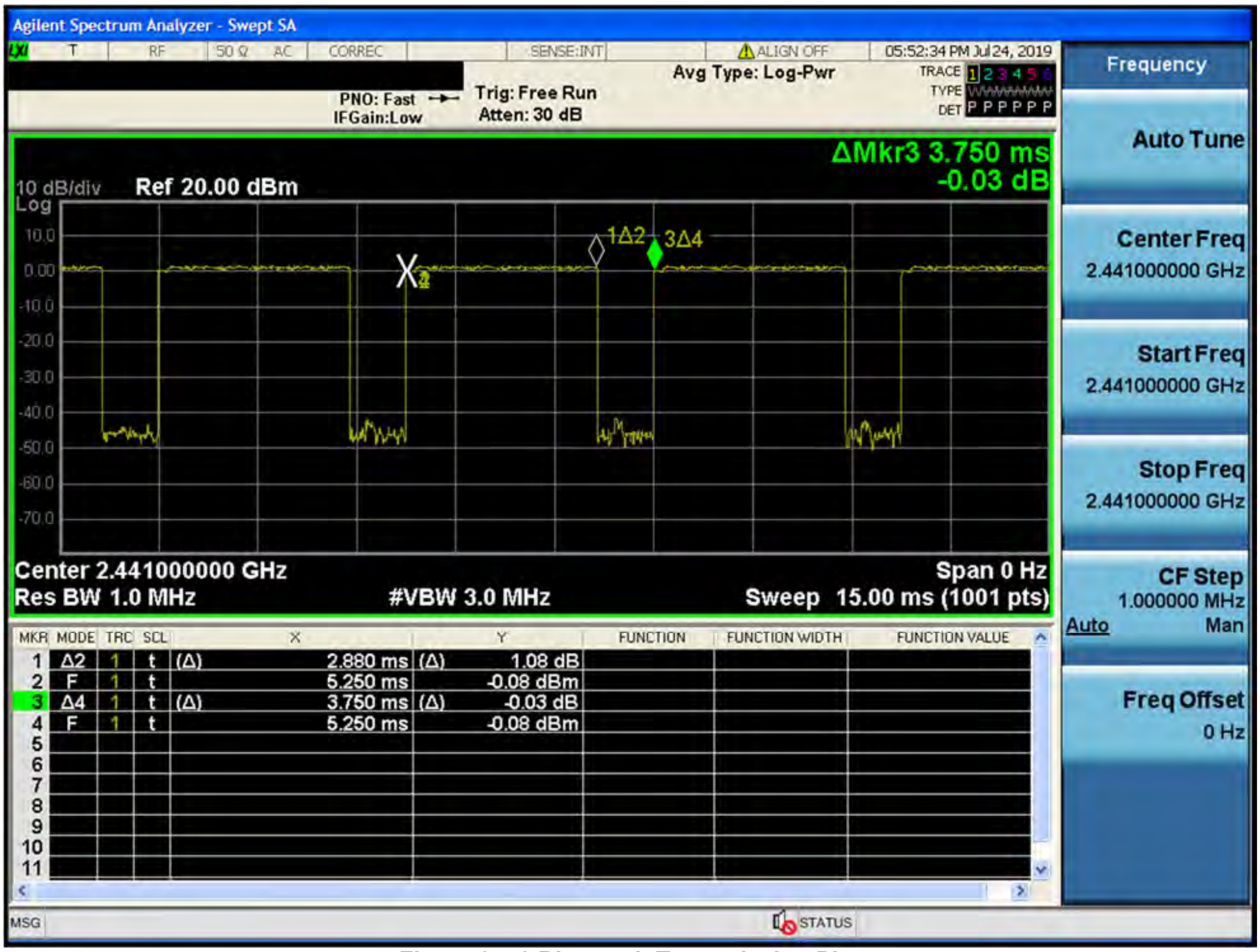

Figure 9.5.2 Bluetooth Transmission Plot

- **Bluetooth Duty Cycle Calculation**

Duty Cycle = Pulse/Period * 100% = (2.880/3.750) * 100 = 76.8%

9. SYSTEM VERIFICATION

9.1 Tissue Verification

MEASURED TISSUE PARAMETERS										
Date(s)	Tissue Type	Ambient Temp.[°C]	Liquid Temp.[°C]	Measured Frequency [MHz]	Target Dielectric Constant, εr	Target Conductivity, σ (S/m)	Measured Dielectric Constant, εr	Measured Conductivity, σ (S/m)	Er Deviation [%]	σ Deviation [%]
Oct. 15. 2019	2450 Head	21.7	21.6	2402.0	39.282	1.757	39.249	1.772	-0.08	0.85
				2412.0	39.265	1.766	39.221	1.782	-0.11	0.91
				2437.0	39.222	1.788	39.151	1.809	-0.18	1.17
				2441.0	39.215	1.792	39.137	1.814	-0.20	1.23
				2450.0	39.200	1.800	39.108	1.824	-0.23	1.33
				2462.0	39.184	1.813	39.074	1.838	-0.28	1.38
				2467.0	39.177	1.818	39.058	1.843	-0.30	1.38
				2472.0	39.171	1.823	39.043	1.849	-0.33	1.43
				2480.0	39.160	1.832	39.015	1.858	-0.37	1.42
Oct. 16. 2019	2450 Head	20.2	20.6	2402.0	39.282	1.757	38.278	1.752	-2.56	-0.28
				2412.0	39.265	1.766	38.246	1.763	-2.60	-0.17
				2437.0	39.222	1.788	38.154	1.791	-2.72	0.17
				2441.0	39.215	1.792	38.138	1.795	-2.75	0.17
				2450.0	39.200	1.800	38.103	1.806	-2.80	0.33
				2462.0	39.184	1.813	38.067	1.820	-2.85	0.39
				2467.0	39.177	1.818	38.050	1.825	-2.88	0.39
				2472.0	39.171	1.823	38.034	1.831	-2.90	0.44
				2480.0	39.160	1.832	38.004	1.840	-2.95	0.44
Oct. 17. 2019	5300 Head	22.7	21.9	5260.0	35.940	4.720	36.966	4.615	2.85	-2.22
				5270.0	35.930	4.730	36.943	4.626	2.82	-2.20
				5280.0	35.920	4.740	36.921	4.637	2.79	-2.17
				5290.0	35.910	4.750	36.898	4.648	2.75	-2.15
				5300.0	35.900	4.760	36.877	4.659	2.72	-2.12
				5310.0	35.890	4.770	36.857	4.671	2.69	-2.08
				5320.0	35.880	4.780	36.838	4.682	2.67	-2.05
Oct. 18. 2019	5300 Head	23.1	22.9	5260.0	35.940	4.720	35.272	4.673	-1.86	-1.00
				5270.0	35.930	4.730	35.252	4.684	-1.89	-0.97
				5280.0	35.920	4.740	35.241	4.694	-1.89	-0.97
				5290.0	35.910	4.750	35.234	4.700	-1.88	-1.05
				5300.0	35.900	4.760	35.210	4.709	-1.92	-1.07
				5310.0	35.890	4.770	35.177	4.721	-1.99	-1.03
				5320.0	35.880	4.780	35.150	4.737	-2.03	-0.90
Oct. 21. 2019	5600 Head	21.6	21.3	5500.0	35.650	4.965	34.521	5.059	-3.17	1.89
				5510.0	35.635	4.976	34.498	5.067	-3.19	1.83
				5530.0	35.605	4.997	34.455	5.091	-3.23	1.88
				5550.0	35.575	5.018	34.425	5.111	-3.23	1.85
				5580.0	35.530	5.049	34.360	5.148	-3.29	1.96
				5600.0	35.500	5.070	34.341	5.171	-3.26	1.99
				5660.0	35.440	5.130	34.235	5.234	-3.40	2.03
				5670.0	35.430	5.140	34.211	5.245	-3.44	2.04
				5690.0	35.410	5.160	34.168	5.273	-3.51	2.19
				5710.0	35.390	5.180	34.153	5.296	-3.50	2.24
				5720.0	35.380	5.190	34.141	5.303	-3.50	2.18
Oct. 22. 2019	5600 Head	20.3	20.2	5500.0	35.650	4.965	34.444	4.982	-3.38	0.34
				5510.0	35.635	4.976	34.423	4.991	-3.40	0.30
				5530.0	35.605	4.997	34.381	5.018	-3.44	0.42
				5550.0	35.575	5.018	34.355	5.037	-3.43	0.38
				5580.0	35.530	5.049	34.291	5.075	-3.49	0.51
				5600.0	35.500	5.070	34.273	5.098	-3.46	0.55
				5660.0	35.440	5.130	34.172	5.161	-3.58	0.60
				5670.0	35.430	5.140	34.148	5.171	-3.62	0.60
				5690.0	35.410	5.160	34.108	5.198	-3.68	0.74
				5710.0	35.390	5.180	34.091	5.220	-3.67	0.77
				5720.0	35.380	5.190	34.076	5.227	-3.69	0.71
Oct. 23. 2019	5800 Head	21.2	21.7	5745.0	35.355	5.215	34.505	5.119	-2.40	-1.84
				5755.0	35.345	5.225	34.483	5.132	-2.44	-1.78
				5775.0	35.325	5.245	34.462	5.153	-2.44	-1.75
				5785.0	35.315	5.255	34.441	5.163	-2.47	-1.75
				5795.0	35.305	5.265	34.418	5.174	-2.51	-1.73
				5800.0	35.300	5.270	34.406	5.181	-2.53	-1.69
				5825.0	35.275	5.296	34.382	5.215	-2.53	-1.53
Oct. 24. 2019	5800 Head	22.4	22.0	5745.0	35.355	5.215	35.570	5.310	0.61	1.82
				5755.0	35.345	5.225	35.551	5.325	0.58	1.91
				5775.0	35.325	5.245	35.529	5.347	0.58	1.94
				5785.0	35.315	5.255	35.510	5.358	0.55	1.96
				5795.0	35.305	5.265	35.491	5.371	0.53	2.01
				5800.0	35.300	5.270	35.481	5.378	0.51	2.05
				5825.0	35.275	5.296	35.449	5.412	0.49	2.19

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 865664 and IEEE 1528-2013 6.6.1.2). The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

Measurement Procedure for Tissue verification:

1) The network analyzer and probe system was configured and calibrated.
2) The probe was immersed in the sample which 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 , for example 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 $j = \sqrt{-1}$.

9.2 Test System Verification

Prior to assessment, the system is verified to the ± 10 % of the specifications at using the SAR Dipole kit(s). (Graphic Plots Attached)

Table 9.2.1 System Verification Results (1g)

SYSTEM DIPOLE VERIFICATION TARGET & MEASURED												
SAR System #	Freq. [MHz]	SAR Dipole kits	Date(s)	Tissue Type	Ambient Temp. [°C]	Liquid Temp. [°C]	Probe S/N	Input Power (mW)	1 W Target SAR_{1g} (W/kg)	Measured SAR_{1g} (W/kg)	1 W Normalized SAR_{1g} (W/kg)	Deviation [%]
D	2450	D2450V2, SN: 726	Oct. 15. 2019	Head	21.7	21.6	3916	100	51.2	5.23	52.30	2.15
D	2450	D2450V2, SN: 726	Oct. 16. 2019	Head	20.2	20.6	3916	100	51.2	5.13	51.30	0.20
D	5300	D5GHzV2, SN:1103	Oct. 17. 2019	Head	22.7	21.9	3916	100	82.4	8.19	81.90	-0.61
D	5300	D5GHzV2, SN:1103	Oct. 18. 2019	Head	23.1	22.9	3916	100	82.4	8.40	84.00	1.94
D	5600	D5GHzV2, SN:1103	Oct. 21. 2019	Head	21.6	21.3	3916	100	84.0	8.13	81.30	-3.21
D	5600	D5GHzV2, SN:1103	Oct. 22. 2019	Head	20.3	20.2	3916	100	84.0	8.02	80.20	-4.52
D	5800	D5GHzV2, SN:1103	Oct. 23. 2019	Head	21.2	21.7	3916	100	81.4	8.11	81.10	-0.37
D	5800	D5GHzV2, SN:1103	Oct. 24. 2019	Head	22.4	22.0	3916	100	81.4	7.90	79.00	-2.95

Table 9.2.2 System Verification Results (10g)

SYSTEM DIPOLE VERIFICATION TARGET & MEASURED												
SAR System #	Freq. [MHz]	SAR Dipole kits	Date(s)	Tissue Type	Ambient Temp. [°C]	Liquid Temp. [°C]	Probe S/N	Input Power (mW)	1 W Target SAR_{10g} (W/kg)	Measured SAR_{10g} (W/kg)	1 W Normalized SAR_{10g} (W/kg)	Deviation [%]
D	2450	D2450V2, SN: 726	Oct. 16. 2019	Head	20.2	20.6	3916	100	24.0	2.31	23.10	-3.75
D	5300	D5GHzV2, SN:1103	Oct. 18. 2019	Head	23.1	22.9	3916	100	23.5	2.42	24.20	2.98
D	5600	D5GHzV2, SN:1103	Oct. 22. 2019	Head	20.3	20.2	3916	100	24.0	2.26	22.60	-5.83
D	5800	D5GHzV2, SN:1103	Oct. 24. 2019	Head	22.4	22.0	3916	100	23.2	2.24	22.40	-3.45

Note(s):
1. System Verification was measured with input 100 mW and normalized to 1W.
2. Full system validation status and results can be found in Appendix D.
3. Effective February 19, 2019, FCC has permitted the use of single head-tissue simulating liquid specified in IEC 62209-1 for all SAR tests.

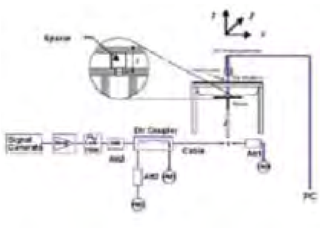


Figure 9.1 Dipole Verification Test Setup Diagram & Photo

10. SAR TEST RESULTS

10.1 Head SAR Results

Table 10.1.1 DTS Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode (Antenna)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
2462.0	11	802.11b (Ant.1)	13.50	13.48	0.030	Left Touch	FCC #1	0.045	1	99.2	0.037	1.005	1.008	0.037	
2462.0	11	802.11b (Ant.1)	13.50	13.48	0.070	Right Touch	FCC #1	0.132	1	99.2	0.131	1.005	1.008	**0.133**	A1
2462.0	11	802.11b (Ant.1)	13.50	13.48	0.010	Left Tilt	FCC #1	0.032	1	99.2	0.031	1.005	1.008	0.031	
2462.0	11	802.11b (Ant.1)	13.50	13.48	0.020	Right Tilt	FCC #1	0.041	1	99.2	0.042	1.005	1.008	0.043	
2462.0	11	802.11b (Ant.1)	13.50	13.48	0.020	Right Touch	FCC #1	0.091	1	99.2	0.093	1.005	1.008	0.094	
2412.0	1	802.11b (Ant.2)	13.50	13.20	0.000	Left Touch	FCC #1	0.017	1	99.2	0.015	1.072	1.008	**0.016**	A2
2412.0	1	802.11b (Ant.2)	13.50	13.20	0.000	Right Touch	FCC #1	0.006	1	99.2	0.006	1.072	1.008	0.006	
2412.0	1	802.11b (Ant.2)	13.50	13.20	0.000	Left Tilt	FCC #1	0.014	1	99.2	0.014	1.072	1.008	0.015	
2412.0	1	802.11b (Ant.2)	13.50	13.20	0.000	Right Tilt	FCC #1	0.009	1	99.2	0.009	1.072	1.008	0.010	
2412.0	1	802.11b (Ant.2)	13.50	13.20	0.000	Left Touch	FCC #1	0.011	1	99.2	0.012	1.072	1.008	0.013	
2462.0	11	802.11b (MIMO)	16.50	16.29	0.000	Left Touch	FCC #1	0.033	1	99.2	0.028	1.072	1.008	0.030	
2462.0	11	802.11b (MIMO)	16.50	16.29	0.040	Right Touch	FCC #1	0.099	1	99.2	0.103	1.072	1.008	**0.111**	A3
2462.0	11	802.11b (MIMO)	16.50	16.29	0.070	Left Tilt	FCC #1	0.027	1	99.2	0.026	1.072	1.008	0.028	
2462.0	11	802.11b (MIMO)	16.50	16.29	0.190	Right Tilt	FCC #1	0.057	1	99.2	0.056	1.072	1.008	0.061	
2462.0	11	802.11b (MIMO)	16.50	16.29	0.050	Right Touch	FCC #1	0.086	1	99.2	0.082	1.072	1.008	0.089	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Head 1.6 W/kg (mW/g)** averaged over 1 gram							

Note(s):
1. Blue entries represent the extended battery measurement on the worst case for standard battery measurement.

Adjusted SAR results for OFDM SAR												
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm	Ratio of OFDM to DSSS	1g Adjusted SAR (W/kg)	Determine OFDM SAR
MHz	Ch											
2462.0	11	802.11b (Ant.1)	DSSS	13.5	0.133	2437	802.11g	OFDM	13.0	0.891	**0.119**	X
2462.0	11	802.11b (Ant.1)	DSSS	13.5	0.133	2437	802.11n	OFDM	13.0	0.891	**0.119**	X
2462.0	11	802.11b (Ant.1)	DSSS	13.5	0.133	2437	802.11ac	OFDM	13.0	0.891	**0.119**	X
2412.0	1	802.11b (Ant.2)	DSSS	13.5	0.016	2437	802.11g	OFDM	13.0	0.891	**0.014**	X
2412.0	1	802.11b (Ant.2)	DSSS	13.5	0.016	2437	802.11n	OFDM	13.0	0.891	**0.014**	X
2412.0	1	802.11b (Ant.2)	DSSS	13.5	0.016	2437	802.11ac	OFDM	13.0	0.891	**0.014**	X
2462.0	11	802.11b (MIMO)	DSSS	16.5	0.111	2437	802.11g	OFDM	16.0	0.891	**0.099**	X
2462.0	11	802.11b (MIMO)	DSSS	16.5	0.111	2437	802.11n	OFDM	16.0	0.891	**0.099**	X
2462.0	11	802.11b (MIMO)	DSSS	16.5	0.111	2437	802.11ac	OFDM	16.0	0.891	**0.099**	X
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure						**Head 1.6 W/kg (mW/g)** averaged over 1 gram						

Note: SAR is not required for the following 2.4 GHz OFDM conditions. 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.

Table 10.1.2 UNII Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode (Antenna)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5260.0	52	802.11a (Ant.1)	15.50	14.25	0.060	Left Touch	FCC #1	0.233	6	95.7	0.239	1.334	1.045	0.333	
5260.0	52	802.11a (Ant.1)	15.50	14.25	0.040	Right Touch	FCC #1	0.622	6	95.7	0.654	1.334	1.045	**0.912**	A4
5280.0	56	802.11a (Ant.1)	15.50	14.02	0.070	Right Touch	FCC #1	0.582	6	95.7	0.558	1.406	1.045	0.820	
5260.0	52	802.11a (Ant.1)	15.50	14.25	0.030	Left Tilt	FCC #1	0.369	6	95.7	0.389	1.334	1.045	0.542	
5260.0	52	802.11a (Ant.1)	15.50	14.25	0.030	Right Tilt	FCC #1	0.382	6	95.7	0.363	1.334	1.045	0.506	
5260.0	52	802.11a (Ant.1)	15.50	14.25	0.060	Right Touch	FCC #1	0.500	6	95.7	0.484	1.334	1.045	0.675	
5260.0	52	802.11a (Ant.2)	15.50	14.53	0.040	Left Touch	FCC #1	0.317	6	95.9	0.335	1.250	1.043	**0.437**	A5
5260.0	52	802.11a (Ant.2)	15.50	14.53	0.130	Right Touch	FCC #1	0.216	6	95.9	0.217	1.250	1.043	0.283	
5260.0	52	802.11a (Ant.2)	15.50	14.53	0.030	Left Tilt	FCC #1	0.231	6	95.9	0.232	1.250	1.043	0.302	
5260.0	52	802.11a (Ant.2)	15.50	14.53	0.040	Right Tilt	FCC #1	0.175	6	95.9	0.177	1.250	1.043	0.231	
5260.0	52	802.11a (Ant.2)	15.50	14.53	0.070	Left Touch	FCC #1	0.300	6	95.9	0.318	1.250	1.043	0.414	
5260.0	52	802.11a (MIMO)	18.50	17.40	0.180	Left Touch	FCC #1	0.424	6	95.7	0.439	1.406	1.045	0.645	
5260.0	52	802.11a (MIMO)	18.50	17.40	0.070	Right Touch	FCC #1	0.652	6	95.7	0.666	1.406	1.045	**0.978**	A6
5280.0	56	802.11a (MIMO)	18.50	17.18	0.090	Right Touch	FCC #1	0.683	6	95.7	0.628	1.406	1.045	0.923	
5260.0	52	802.11a (MIMO)	18.50	17.40	0.040	Left Tilt	FCC #1	0.387	6	95.7	0.405	1.406	1.045	0.595	
5260.0	52	802.11a (MIMO)	18.50	17.40	0.040	Right Tilt	FCC #1	0.437	6	95.7	0.414	1.406	1.045	0.608	
5260.0	52	802.11a (MIMO)	18.50	17.40	-0.110	Right Touch	FCC #1	0.542	6	95.7	0.511	1.406	1.045	0.751	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								**Head 1.6 W/kg (mW/g)** averaged over 1 gram							

Note(s):
1. Blue entries represent the extended battery measurement on the worst case for standard battery measurement.

Adjusted SAR results for UNII-1 and UNII-2A SAR												
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm	Adjusted Factor	1g Adjusted SAR (W/kg)	**SAR for** the band with lower maximum output power
MHz	Ch											
5260.0	52	802.11a (Ant.1)	OFDM	15.5	0.912	5240	802.11a	OFDM	15.5	1.000	**0.912**	X
5260.0	52	802.11a (Ant.2)	OFDM	15.5	0.437	5240	802.11a	OFDM	15.5	1.000	**0.437**	X
5260.0	52	802.11a (MIMO)	OFDM	18.5	0.978	5240	802.11a	OFDM	18.5	1.000	**0.978**	X
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure						**Head 1.6 W/kg (mW/g)** averaged over 1 gram						

Note(s):
1. U-NII-1 and U-NII-2A Bands: When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration.

Table 10.1.3 UNII Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode (Antenna)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5660.0	132	802.11a (Ant.1)	15.50	15.13	0.070	Left Touch	FCC #1	0.191	6	95.7	0.200	1.089	1.045	0.228	
5660.0	132	802.11a (Ant.1)	15.50	15.13	0.130	Right Touch	FCC #1	0.489	6	95.7	0.498	1.089	1.045	**0.567**	A7
5660.0	132	802.11a (Ant.1)	15.50	15.13	0.030	Left Tilt	FCC #1	0.374	6	95.7	0.393	1.089	1.045	0.447	
5660.0	132	802.11a (Ant.1)	15.50	15.13	0.080	Right Tilt	FCC #1	0.209	6	95.7	0.214	1.089	1.045	0.244	
5660.0	132	802.11a (Ant.1)	15.50	15.13	-0.130	Right Touch	FCC #1	0.278	6	95.7	0.289	1.089	1.045	0.329	
5660.0	132	802.11a (Ant.2)	15.50	14.50	0.030	Left Touch	FCC #1	0.241	6	95.7	0.240	1.259	1.045	0.316	
5660.0	132	802.11a (Ant.2)	15.50	14.50	0.120	Right Touch	FCC #1	0.248	6	95.7	0.263	1.259	1.045	0.346	
5660.0	132	802.11a (Ant.2)	15.50	14.50	0.190	Left Tilt	FCC #1	0.258	6	95.7	0.264	1.259	1.045	0.347	
5660.0	132	802.11a (Ant.2)	15.50	14.50	0.100	Right Tilt	FCC #1	0.274	6	95.7	0.292	1.259	1.045	**0.384**	A8
5660.0	132	802.11a (Ant.2)	15.50	14.50	0.020	Right Tilt	FCC #1	0.304	6	95.7	0.280	1.259	1.045	0.368	
5660.0	132	802.11a (MIMO)	18.50	17.84	0.080	Left Touch	FCC #1	0.272	6	95.6	0.283	1.259	1.046	0.373	
5660.0	132	802.11a (MIMO)	18.50	17.84	0.070	Right Touch	FCC #1	0.280	6	95.6	0.281	1.259	1.046	0.370	
5660.0	132	802.11a (MIMO)	18.50	17.84	0.090	Left Tilt	FCC #1	0.437	6	95.6	0.468	1.259	1.046	**0.616**	A9
5660.0	132	802.11a (MIMO)	18.50	17.84	0.110	Right Tilt	FCC #1	0.289	6	95.6	0.274	1.259	1.046	0.361	
5660.0	132	802.11a (MIMO)	18.50	17.84	0.190	Left Tilt	FCC #1	0.433	6	95.6	0.464	1.259	1.046	0.611	
5825.0	165	802.11a (Ant.1)	15.50	14.96	-0.110	Left Touch	FCC #1	0.084	6	95.9	0.069	1.132	1.043	0.081	
5825.0	165	802.11a (Ant.1)	15.50	14.96	0.070	Right Touch	FCC #1	0.110	6	95.9	0.112	1.132	1.043	**0.132**	A10
5825.0	165	802.11a (Ant.1)	15.50	14.96	-0.110	Left Tilt	FCC #1	0.096	6	95.9	0.073	1.132	1.043	0.086	
5825.0	165	802.11a (Ant.1)	15.50	14.96	0.190	Right Tilt	FCC #1	0.088	6	95.9	0.076	1.132	1.043	0.090	
5825.0	165	802.11a (Ant.1)	15.50	14.96	0.180	Right Touch	FCC #1	0.087	6	95.9	0.075	1.132	1.043	0.089	
5825.0	165	802.11a (Ant.2)	15.50	13.94	0.050	Left Touch	FCC #1	0.230	6	95.8	0.234	1.432	1.044	0.350	
5825.0	165	802.11a (Ant.2)	15.50	13.94	0.110	Right Touch	FCC #1	0.237	6	95.8	0.256	1.432	1.044	0.383	
5825.0	165	802.11a (Ant.2)	15.50	13.94	0.180	Left Tilt	FCC #1	0.246	6	95.8	0.257	1.432	1.044	0.384	
5825.0	165	802.11a (Ant.2)	15.50	13.94	0.130	Right Tilt	FCC #1	0.291	6	95.8	0.273	1.432	1.044	**0.408**	A11
5825.0	165	802.11a (Ant.2)	15.50	13.94	0.120	Right Tilt	FCC #1	0.283	6	95.8	0.270	1.432	1.044	0.404	
5825.0	165	802.11a (MIMO)	18.50	17.49	0.170	Left Touch	FCC #1	0.175	6	95.8	0.176	1.432	1.044	0.263	
5825.0	165	802.11a (MIMO)	18.50	17.49	-0.110	Right Touch	FCC #1	0.219	6	95.8	0.226	1.432	1.044	**0.338**	
5825.0	165	802.11a (MIMO)	18.50	17.49	0.110	Left Tilt	FCC #1	0.192	6	95.8	0.189	1.432	1.044	0.283	
5825.0	165	802.11a (MIMO)	18.50	17.49	-0.040	Right Tilt	FCC #1	0.221	6	95.8	0.226	1.432	1.044	**0.338**	A12
5825.0	165	802.11a (MIMO)	18.50	17.49	0.170	Right Tilt	FCC #1	0.220	6	95.8	0.226	1.432	1.044	0.338	
ANSI / IEEE C95.1-1992– SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population Exposure**								**Head** **1.6 W/kg (mW/g)** averaged over 1 gram							

Note(s):
1. Blue entries represent the extended battery measurement on the worst case for standard battery measurement.

Table 10.1.4 Bluetooth Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Rate [Mbps]	Duty Cycle (%)	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch													
2441.0	39	Bluetooth	4.00	2.22	0.030	Left Touch	FCC #1	1	76.8	0.011	1.507	1.302	0.022	
2441.0	39	Bluetooth	4.00	2.22	0.120	Right Touch	FCC #1	1	76.8	0.036	1.507	1.302	**0.071**	A13
2441.0	39	Bluetooth	4.00	2.22	0.070	Left Tilt	FCC #1	1	76.8	0.009	1.507	1.302	0.018	
2441.0	39	Bluetooth	4.00	2.22	0.080	Right Tilt	FCC #1	1	76.8	0.023	1.507	1.302	0.045	
2441.0	39	Bluetooth	4.00	2.22	0.070	Right Touch	FCC #1	1	76.8	0.003	1.507	1.302	0.006	
ANSI / IEEE C95.1-1992– SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population Exposure**								**Head** **1.6 W/kg (mW/g)** averaged over 1 gram						

Note(s):
1. Blue entries represent the extended battery measurement on the worst case for standard battery measurement.

10.2 Standalone Body-Worn SAR Worn SAR Results

Table 10.2.1 DTS Body-Worn SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	SAR (W/kg)	Plots #
MHz	Ch														
2462.0	11	802.11b (Ant.1)	13.50	13.48	0.010	15 mm [Front]	FCC #1	0.015	1	99.2	0.016	1.005	1.008	**0.016**	A14
2462.0	11	802.11b (Ant.1)	13.50	13.48	0.110	15 mm [Rear]	FCC #1	0.013	1	99.2	0.013	1.005	1.008	0.013	
2462.0	11	802.11b (Ant.1)	13.50	13.48	0.060	15 mm [Front]	FCC #1	0.013	1	99.2	0.012	1.005	1.008	0.012	
2412.0	1	802.11b (Ant.2)	13.50	13.20	0.000	15 mm [Front]	FCC #1	0.004	1	99.2	0.003	1.072	1.008	0.003	
2412.0	1	802.11b (Ant.2)	13.50	13.20	0.000	15 mm [Rear]	FCC #1	0.005	1	99.2	0.005	1.072	1.008	**0.005**	A15
2412.0	1	802.11b (Ant.2)	13.50	13.20	0.000	15 mm [Rear]	FCC #1	0.004	1	99.2	0.004	1.072	1.008	0.005	
2462.0	11	802.11b (MIMO)	16.50	16.29	0.070	15 mm [Front]	FCC #1	0.015	1	99.2	0.012	1.072	1.008	0.013	
2462.0	11	802.11b (MIMO)	16.50	16.29	0.090	15 mm [Rear]	FCC #1	0.017	1	99.2	0.017	1.072	1.008	**0.018**	A16
2462.0	11	802.11b (MIMO)	16.50	16.29	0.060	15 mm [Rear]	FCC #1	0.013	1	99.2	0.013	1.072	1.008	0.014	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Body 1.6 W/kg (mW/g) averaged over 1 gram							

Note(s):
1. Blue entries represent the extended battery measurement on the worst case for standard battery measurement.

Adjusted SAR results for OFDM SAR												
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm	Ratio of OFDM to DSSS	1g Adjusted SAR (W/kg)	Determine OFDM SAR
MHz	Ch											
2462.0	11	802.11b (Ant.1)	DSSS	13.5	0.016	2437	802.11g	OFDM	13.0	0.891	**0.014**	X
2462.0	11	802.11b (Ant.1)	DSSS	13.5	0.016	2437	802.11n	OFDM	13.0	0.891	**0.014**	X
2462.0	11	802.11b (Ant.1)	DSSS	13.5	0.016	2437	802.11ac	OFDM	13.0	0.891	**0.014**	X
2412.0	1	802.11b (Ant.2)	DSSS	13.5	0.005	2437	802.11g	OFDM	13.0	0.891	**0.004**	X
2412.0	1	802.11b (Ant.2)	DSSS	13.5	0.005	2437	802.11n	OFDM	13.0	0.891	**0.004**	X
2412.0	1	802.11b (Ant.2)	DSSS	13.5	0.005	2437	802.11ac	OFDM	13.0	0.891	**0.004**	X
2462.0	11	802.11b (MIMO)	DSSS	16.5	0.018	2437	802.11g	OFDM	16.0	0.891	**0.016**	X
2462.0	11	802.11b (MIMO)	DSSS	16.5	0.018	2437	802.11n	OFDM	16.0	0.891	**0.016**	X
2462.0	11	802.11b (MIMO)	DSSS	16.5	0.018	2437	802.11ac	OFDM	16.0	0.891	**0.016**	X
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure						Body 1.6 W/kg (mW/g) averaged over 1 gram						

Note: SAR is not required for the following 2.4 GHz OFDM conditions. 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.

Table 10.2.2 UNII Body-Worn SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5260.0	52	802.11a (Ant.1)	15.50	14.25	0.110	15 mm [Front]	FCC #1	0.073	6	95.7	0.071	1.334	1.045	**0.099**	A17
5260.0	52	802.11a (Ant.1)	15.50	14.25	0.040	15 mm [Rear]	FCC #1	0.042	6	95.7	0.034	1.334	1.045	0.047	
5260.0	52	802.11a (Ant.1)	15.50	14.25	0.050	15 mm [Front]	FCC #1	0.068	6	95.7	0.066	1.334	1.045	0.092	
5260.0	52	802.11a (Ant.2)	15.50	14.53	0.070	15 mm [Front]	FCC #1	0.045	6	95.9	0.042	1.250	1.043	0.055	
5260.0	52	802.11a (Ant.2)	15.50	14.53	0.030	15 mm [Rear]	FCC #1	0.111	6	95.9	0.112	1.250	1.043	**0.146**	A18
5260.0	52	802.11a (Ant.2)	15.50	14.53	0.050	15 mm [Rear]	FCC #1	0.096	6	95.9	0.096	1.250	1.043	0.125	
5260.0	52	802.11a (MIMO)	18.50	17.40	-0.070	15 mm [Front]	FCC #1	0.092	6	95.7	0.090	1.334	1.045	0.125	
5260.0	52	802.11a (MIMO)	18.50	17.40	-0.110	15 mm [Rear]	FCC #1	0.102	6	95.7	0.115	1.334	1.045	**0.160**	A19
5260.0	52	802.11a (MIMO)	18.50	17.40	-0.180	15 mm [Rear]	FCC #1	0.100	6	95.7	0.100	1.334	1.045	0.139	
ANSI / IEEE C95.1-2005– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Body 1.6 W/kg (mW/g) averaged over 1 gram							

Note(s):
1. Blue entries represent the extended battery measurement on the worst case for standard battery measurement.

Adjusted SAR results for UNII-1 and UNII-2A SAR												
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	1g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm	Adjusted Factor	1g Adjusted SAR (W/kg)	SAR for the band with lower maximum output power
MHz	Ch											
5260.0	52	802.11a (Ant.1)	OFDM	15.5	0.099	5240	802.11a	OFDM	15.5	1.000	**0.099**	X
5260.0	52	802.11a (Ant.2)	OFDM	15.5	0.146	5240	802.11a	OFDM	15.5	1.000	**0.146**	X
5260.0	52	802.11a (MIMO)	OFDM	18.5	0.160	5240	802.11a	OFDM	18.5	1.000	**0.160**	X
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure						Body 1.6 W/kg (mW/g) averaged over 1 gram						

Note(s):
1. U-NII-1 and U-NII-2A Bands: When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration.

Table 10.2.3 UNII Body-Worn SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5660.0	132	802.11a (Ant.1)	15.50	15.13	-0.050	15 mm [Front]	FCC #1	0.053	6	95.7	0.047	1.089	1.045	0.053	
5660.0	132	802.11a (Ant.1)	15.50	15.13	-0.070	15 mm [Rear]	FCC #1	0.100	6	95.7	0.098	1.089	1.045	**0.112**	A20
5660.0	132	802.11a (Ant.1)	15.50	15.13	-0.120	15 mm [Rear]	FCC #1	0.095	6	95.7	0.093	1.089	1.045	0.106	
5660.0	132	802.11a (Ant.2)	15.50	14.50	-0.050	15 mm [Front]	FCC #1	0.066	6	95.7	0.064	1.259	1.045	0.084	
5660.0	132	802.11a (Ant.2)	15.50	14.50	0.060	15 mm [Rear]	FCC #1	0.077	6	95.7	0.074	1.259	1.045	**0.097**	A21
5660.0	132	802.11a (Ant.2)	15.50	14.50	0.040	15 mm [Rear]	FCC #1	0.074	6	95.7	0.070	1.259	1.045	0.092	
5660.0	132	802.11a (MIMO)	18.50	17.84	-0.170	15 mm [Front]	FCC #1	0.089	6	95.6	0.075	1.259	1.046	0.099	
5660.0	132	802.11a (MIMO)	18.50	17.84	0.010	15 mm [Rear]	FCC #1	0.116	6	95.6	0.113	1.259	1.046	**0.149**	A22
5660.0	132	802.11a (MIMO)	18.50	17.84	0.060	15 mm [Rear]	FCC #1	0.100	6	95.6	0.097	1.259	1.046	0.128	
5825.0	165	802.11a (Ant.1)	15.50	14.96	0.060	15 mm [Front]	FCC #1	0.043	6	95.9	0.039	1.132	1.043	0.046	
5825.0	165	802.11a (Ant.1)	15.50	14.96	-0.070	15 mm [Rear]	FCC #1	0.082	6	95.9	0.083	1.132	1.043	**0.098**	A23
5825.0	165	802.11a (Ant.1)	15.50	14.96	0.030	15 mm [Rear]	FCC #1	0.077	6	95.9	0.076	1.132	1.043	0.090	
5825.0	165	802.11a (Ant.2)	15.50	13.94	0.040	15 mm [Front]	FCC #1	0.048	6	95.8	0.043	1.432	1.044	0.064	
5825.0	165	802.11a (Ant.2)	15.50	13.94	-0.020	15 mm [Rear]	FCC #1	0.057	6	95.8	0.056	1.432	1.044	**0.084**	A24
5825.0	165	802.11a (Ant.2)	15.50	13.94	0.100	15 mm [Rear]	FCC #1	0.052	6	95.8	0.052	1.432	1.044	0.078	
5825.0	165	802.11a (MIMO)	18.50	17.49	-0.150	15 mm [Front]	FCC #1	0.074	6	95.8	0.071	1.432	1.044	0.106	
5825.0	165	802.11a (MIMO)	18.50	17.49	-0.140	15 mm [Rear]	FCC #1	0.110	6	95.8	0.109	1.432	1.044	**0.163**	A25
5825.0	165	802.11a (MIMO)	18.50	17.49	-0.160	15 mm [Rear]	FCC #1	0.104	6	95.8	0.099	1.432	1.044	0.148	
ANSI / IEEE C95.1-1992– SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population Exposure**								**Body** **1.6 W/kg (mW/g)** averaged over 1 gram							

Note(s):
1. Blue entries represent the extended battery measurement on the worst case for standard battery measurement.

Table 10.2.4 Bluetooth Body-Worn SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Rate [Mbps]	Duty Cycle (%)	1g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	1g Scaled SAR (W/kg)	Plots #
MHz	Ch													
2441.0	39	Bluetooth	4.00	2.22	0.070	15 mm [Front]	FCC #1	1	76.8	0.003	1.507	1.302	**0.005**	A26
2441.0	39	Bluetooth	4.00	2.22	0.000	15 mm [Rear]	FCC #1	1	76.8	0.002	1.507	1.302	0.003	
2441.0	39	Bluetooth	4.00	2.22	0.000	15 mm [Front]	FCC #1	1	76.8	0.002	1.507	1.302	0.003	
ANSI / IEEE C95.1-1992– SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population Exposure**								**Body** **1.6 W/kg (mW/g)** averaged over 1 gram						

Note(s):
1. Blue entries represent the extended battery measurement on the worst case for standard battery measurement.

10.3 Standalone Phablet SAR Results

Table 10.3.1 DTS Phablet SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	10g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	SAR (W/kg)	Plots #
MHz	Ch														
2462.0	11	802.11b (Ant.1)	13.50	13.48	0.070	0 mm [Top]	FCC #1	0.065	1	99.2	0.067	1.005	1.008	0.068	
2462.0	11	802.11b (Ant.1)	13.50	13.48	0.070	0 mm [Front]	FCC #1	0.075	1	99.2	0.077	1.005	1.008	0.078	
2462.0	11	802.11b (Ant.1)	13.50	13.48	-0.010	0 mm [Rear]	FCC #1	0.033	1	99.2	0.035	1.005	1.008	0.035	
2462.0	11	802.11b (Ant.1)	13.50	13.48	0.020	0 mm [Left]	FCC #1	0.115	1	99.2	0.110	1.005	1.008	**0.111**	A27
2462.0	11	802.11b (Ant.1)	13.50	13.48	0.010	0 mm [Left]	FCC #1	0.088	1	99.2	0.086	1.005	1.008	0.087	
2412.0	1	802.11b (Ant.2)	13.50	13.20	0.040	0 mm [Top]	FCC #1	0.024	1	99.2	0.025	1.072	1.008	0.027	
2412.0	1	802.11b (Ant.2)	13.50	13.20	0.070	0 mm [Front]	FCC #1	0.016	1	99.2	0.015	1.072	1.008	0.016	
2412.0	1	802.11b (Ant.2)	13.50	13.20	0.000	0 mm [Rear]	FCC #1	0.011	1	99.2	0.010	1.072	1.008	0.011	
2412.0	1	802.11b (Ant.2)	13.50	13.20	-0.090	0 mm [Right]	FCC #1	0.033	1	99.2	0.031	1.072	1.008	**0.034**	A28
2412.0	1	802.11b (Ant.2)	13.50	13.20	0.020	0 mm [Right]	FCC #1	0.028	1	99.2	0.025	1.072	1.008	0.027	
2462.0	11	802.11b (MIMO)	16.50	16.29	0.010	0 mm [Top]	FCC #1	0.058	1	99.2	0.056	1.072	1.008	0.061	
2462.0	11	802.11b (MIMO)	16.50	16.29	0.190	0 mm [Front]	FCC #1	0.063	1	99.2	0.062	1.072	1.008	0.067	
2462.0	11	802.11b (MIMO)	16.50	16.29	0.090	0 mm [Rear]	FCC #1	0.034	1	99.2	0.039	1.072	1.008	0.042	
2462.0	11	802.11b (MIMO)	16.50	16.29	0.080	0 mm [Right]	FCC #1	0.034	1	99.2	0.031	1.072	1.008	0.034	
2462.0	11	802.11b (MIMO)	16.50	16.29	0.130	0 mm [Left]	FCC #1	0.092	1	99.2	0.094	1.072	1.008	**0.102**	A29
2462.0	11	802.11b (MIMO)	16.50	16.29	0.010	0 mm [Left]	FCC #1	0.091	1	99.2	0.085	1.072	1.008	0.092	
ANSI / IEEE C95.1-1992– SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population Exposure**								**Phablet** **4.0 W/kg (mW/g)** averaged over 10 gram							

Note(s):
1. Blue entries represent the extended battery measurement on the worst case for standard battery measurement.

Adjusted SAR results for OFDM SAR												
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	10g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm	Ratio of OFDM to DSSS	10g Adjusted SAR (W/kg)	Determine OFDM SAR
MHz	Ch											
2462.0	11	802.11b (Ant.1)	DSSS	13.5	0.111	2437	802.11g	OFDM	13.0	0.891	**0.099**	X
2462.0	11	802.11b (Ant.1)	DSSS	13.5	0.111	2437	802.11n	OFDM	13.0	0.891	**0.099**	X
2462.0	11	802.11b (Ant.1)	DSSS	13.5	0.111	2437	802.11ac	OFDM	13.0	0.891	**0.099**	X
2412.0	1	802.11b (Ant.2)	DSSS	13.5	0.034	2437	802.11g	OFDM	13.0	0.891	**0.030**	X
2412.0	1	802.11b (Ant.2)	DSSS	13.5	0.034	2437	802.11n	OFDM	13.0	0.891	**0.030**	X
2412.0	1	802.11b (Ant.2)	DSSS	13.5	0.034	2437	802.11ac	OFDM	13.0	0.891	**0.030**	X
2462.0	11	802.11b (MIMO)	DSSS	16.5	0.102	2437	802.11g	OFDM	16.0	0.891	**0.091**	X
2462.0	11	802.11b (MIMO)	DSSS	16.5	0.102	2437	802.11n	OFDM	16.0	0.891	**0.091**	X
2462.0	11	802.11b (MIMO)	DSSS	16.5	0.102	2437	802.11ac	OFDM	16.0	0.891	**0.091**	X
ANSI / IEEE C95.1-1992– SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population Exposure**						**Body** **1.6 W/kg (mW/g)** averaged over 1 gram						

Note: SAR is not required for the following 2.4 GHz OFDM conditions. 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.

Table 10.3.2 UNII Phablet SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	10g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	10g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5260.0	52	802.11a (Ant.1)	15.50	14.25	0.040	0 mm [Top]	FCC #1	0.078	6	95.7	0.080	1.334	1.045	0.112	
5260.0	52	802.11a (Ant.1)	15.50	14.25	0.080	0 mm [Front]	FCC #1	0.161	6	95.7	0.159	1.334	1.045	0.222	
5260.0	52	802.11a (Ant.1)	15.50	14.25	0.070	0 mm [Rear]	FCC #1	0.053	6	95.7	0.050	1.334	1.045	0.070	
5260.0	52	802.11a (Ant.1)	15.50	14.25	0.090	0 mm [Left]	FCC #1	0.270	6	95.7	0.287	1.334	1.045	**0.400**	A30
5260.0	52	802.11a (Ant.1)	15.50	14.25	0.020	0 mm [Left]	FCC #1	0.267	6	95.7	0.280	1.334	1.045	0.390	
5260.0	52	802.11a (Ant.2)	15.50	14.53	0.070	0 mm [Top]	FCC #1	0.112	6	95.9	0.113	1.250	1.043	0.147	
5260.0	52	802.11a (Ant.2)	15.50	14.53	0.080	0 mm [Front]	FCC #1	0.139	6	95.9	0.149	1.250	1.043	0.194	
5260.0	52	802.11a (Ant.2)	15.50	14.53	0.040	0 mm [Rear]	FCC #1	0.149	6	95.9	0.172	1.250	1.043	0.224	
5260.0	52	802.11a (Ant.2)	15.50	14.53	0.040	0 mm [Right]	FCC #1	0.293	6	95.9	0.308	1.250	1.043	**0.401**	A31
5260.0	52	802.11a (Ant.2)	15.50	14.53	0.110	0 mm [Right]	FCC #1	0.269	6	95.9	0.265	1.250	1.043	0.345	
5260.0	52	802.11a (MIMO)	18.50	17.40	0.070	0 mm [Top]	FCC #1	0.154	6	95.7	0.121	1.334	1.045	0.169	
5260.0	52	802.11a (MIMO)	18.50	17.40	0.110	0 mm [Front]	FCC #1	0.170	6	95.7	0.169	1.334	1.045	0.236	
5260.0	52	802.11a (MIMO)	18.50	17.40	0.120	0 mm [Rear]	FCC #1	0.185	6	95.7	0.195	1.334	1.045	0.272	
5260.0	52	802.11a (MIMO)	18.50	17.40	0.090	0 mm [Right]	FCC #1	0.346	6	95.7	0.346	1.334	1.045	0.482	
5260.0	52	802.11a (MIMO)	18.50	17.40	0.030	0 mm [Left]	FCC #1	0.514	6	95.7	0.481	1.334	1.045	**0.670**	A32
5260.0	52	802.11a (MIMO)	18.50	17.40	0.080	0 mm [Left]	FCC #1	0.446	6	95.7	0.476	1.334	1.045	0.664	
ANSI / IEEE C95.1-1992– SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population Exposure**								**Phablet** **4.0 W/kg (mW/g)** averaged over 10 gram							

Note(s):
1. Blue entries represent the extended battery measurement on the worst case for standard battery measurement.

Adjusted SAR results for UNII-1 and UNII-2A SAR												
FREQUENCY		Mode/ Antenna	Service	Maximum Allowed Power [dBm]	10g Scaled SAR (W/kg)	FREQUENCY [MHz]	Mode	Service	Maximum Allowed Power [dBm	Adjusted Factor	10g Adjusted SAR (W/kg)	**SAR for** the band with lower maximum output power
MHz	Ch											
5260.0	52	802.11a (Ant.1)	OFDM	15.5	0.400	5240	802.11a	OFDM	15.5	1.000	**0.400**	X
5260.0	52	802.11a (Ant.2)	OFDM	15.5	0.401	5240	802.11a	OFDM	15.5	1.000	**0.401**	X
5260.0	52	802.11a (MIMO)	OFDM	18.5	0.670	5240	802.11a	OFDM	18.5	1.000	**0.670**	X
ANSI / IEEE C95.1-1992– SAFETY LIMIT **Spatial Peak** **Uncontrolled Exposure/General Population Exposure**						**Head** **1.6 W/kg (mW/g)** averaged over 1 gram						

Note(s):
1. U-NII-1 and U-NII-2A Bands: When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration.

Table 10.3.3 UNII Phablet SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	10g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	10g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5660.0	132	802.11a (Ant.1)	15.50	15.13	0.020	0 mm [Top]	FCC #1	0.078	6	95.7	0.074	1.089	1.045	0.084	
5660.0	132	802.11a (Ant.1)	15.50	15.13	-0.160	0 mm [Front]	FCC #1	0.102	6	95.7	0.104	1.089	1.045	0.118	
5660.0	132	802.11a (Ant.1)	15.50	15.13	-0.040	0 mm [Rear]	FCC #1	0.080	6	95.7	0.079	1.089	1.045	0.090	
5660.0	132	802.11a (Ant.1)	15.50	15.13	-0.090	0 mm [Left]	FCC #1	0.461	6	95.7	0.533	1.089	1.045	**0.607**	A33
5660.0	132	802.11a (Ant.1)	15.50	15.13	-0.020	0 mm [Left]	FCC #1	0.439	6	95.7	0.504	1.089	1.045	0.574	
5660.0	132	802.11a (Ant.2)	15.50	14.50	0.030	0 mm [Top]	FCC #1	0.121	6	95.7	0.125	1.259	1.045	0.164	
5660.0	132	802.11a (Ant.2)	15.50	14.50	-0.070	0 mm [Front]	FCC #1	0.108	6	95.7	0.101	1.259	1.045	0.133	
5660.0	132	802.11a (Ant.2)	15.50	14.50	-0.120	0 mm [Rear]	FCC #1	0.073	6	95.7	0.075	1.259	1.045	0.099	
5660.0	132	802.11a (Ant.2)	15.50	14.50	0.050	0 mm [Right]	FCC #1	0.268	6	95.7	0.301	1.259	1.045	**0.396**	A34
5660.0	132	802.11a (Ant.2)	15.50	14.50	0.050	0 mm [Right]	FCC #1	0.258	6	95.7	0.289	1.259	1.045	0.380	
5660.0	132	802.11a (MIMO)	18.50	17.84	0.100	0 mm [Top]	FCC #1	0.143	6	95.6	0.142	1.259	1.046	0.187	
5660.0	132	802.11a (MIMO)	18.50	17.84	-0.140	0 mm [Front]	FCC #1	0.132	6	95.6	0.124	1.259	1.046	0.163	
5660.0	132	802.11a (MIMO)	18.50	17.84	-0.080	0 mm [Rear]	FCC #1	0.089	6	95.6	0.087	1.259	1.046	0.115	
5660.0	132	802.11a (MIMO)	18.50	17.84	0.070	0 mm [Right]	FCC #1	0.272	6	95.6	0.304	1.259	1.046	0.400	
5660.0	132	802.11a (MIMO)	18.50	17.84	-0.100	0 mm [Left]	FCC #1	0.444	6	95.6	0.514	1.259	1.046	**0.677**	A35
5660.0	132	802.11a (MIMO)	18.50	17.84	0.030	0 mm [Left]	FCC #1	0.396	6	95.6	0.456	1.259	1.046	0.601	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Phablet 4.0 W/kg (mW/g) averaged over 10 gram							

Note(s):
1. Blue entries represent the extended battery measurement on the worst case for standard battery measurement.

Table 10.3.4 UNII Phablet SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	10g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	10g Scaled SAR (W/kg)	Plots #
MHz	Ch														
5825.0	165	802.11a (Ant.1)	15.50	14.96	-0.020	0 mm [Top]	FCC #1	0.044	6	95.9	0.038	1.132	1.043	0.045	
5825.0	165	802.11a (Ant.1)	15.50	14.96	0.140	0 mm [Front]	FCC #1	0.063	6	95.9	0.059	1.132	1.043	0.070	
5825.0	165	802.11a (Ant.1)	15.50	14.96	0.020	0 mm [Rear]	FCC #1	0.074	6	95.9	0.072	1.132	1.043	0.085	
5825.0	165	802.11a (Ant.1)	15.50	14.96	0.130	0 mm [Left]	FCC #1	0.317	6	95.9	0.347	1.132	1.043	**0.410**	A36
5825.0	165	802.11a (Ant.1)	15.50	14.96	0.040	0 mm [Left]	FCC #1	0.252	6	95.9	0.273	1.132	1.043	0.322	
5825.0	165	802.11a (Ant.2)	15.50	13.94	0.090	0 mm [Top]	FCC #1	0.089	6	95.8	0.092	1.432	1.044	0.138	
5825.0	165	802.11a (Ant.2)	15.50	13.94	-0.020	0 mm [Front]	FCC #1	0.081	6	95.8	0.084	1.432	1.044	0.126	
5825.0	165	802.11a (Ant.2)	15.50	13.94	-0.190	0 mm [Rear]	FCC #1	0.063	6	95.8	0.068	1.432	1.044	0.102	
5825.0	165	802.11a (Ant.2)	15.50	13.94	0.140	0 mm [Right]	FCC #1	0.232	6	95.8	0.250	1.432	1.044	**0.374**	A37
5825.0	165	802.11a (Ant.2)	15.50	13.94	-0.190	0 mm [Right]	FCC #1	0.184	6	95.8	0.204	1.432	1.044	0.305	
5825.0	165	802.11a (MIMO)	18.50	17.49	-0.080	0 mm [Top]	FCC #1	0.137	6	95.8	0.147	1.432	1.044	0.220	
5825.0	165	802.11a (MIMO)	18.50	17.49	-0.130	0 mm [Front]	FCC #1	0.102	6	95.8	0.107	1.432	1.044	0.160	
5825.0	165	802.11a (MIMO)	18.50	17.49	-0.120	0 mm [Rear]	FCC #1	0.080	6	95.8	0.078	1.432	1.044	0.117	
5825.0	165	802.11a (MIMO)	18.50	17.49	0.020	0 mm [Right]	FCC #1	0.215	6	95.8	0.239	1.432	1.044	0.357	
5825.0	165	802.11a (MIMO)	18.50	17.49	-0.120	0 mm [Left]	FCC #1	0.321	6	95.8	0.357	1.432	1.044	**0.534**	A38
5825.0	165	802.11a (MIMO)	18.50	17.49	0.030	0 mm [Left]	FCC #1	0.312	6	95.8	0.332	1.432	1.044	0.496	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Phablet 4.0 W/kg (mW/g) averaged over 10 gram							

Note(s):
1. Blue entries represent the extended battery measurement on the worst case for standard battery measurement.

Table 10.3.5 Bluetooth Phablet SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Rate [Mbps]	Duty Cycle (%)	10g SAR (W/kg)	Scaling Factor	Scaling Factor (Duty Cycle)	10g Scaled SAR (W/kg)	Plots #
MHz	Ch													
2441.0	39	Bluetooth	4.00	2.22	0.040	0 mm [Top]	FCC #2	1	76.8	0.035	1.507	1.302	0.069	
2441.0	39	Bluetooth	4.00	2.22	0.010	0 mm [Front]	FCC #2	1	76.8	0.043	1.507	1.302	0.084	
2441.0	39	Bluetooth	4.00	2.22	0.040	0 mm [Rear]	FCC #2	1	76.8	0.014	1.507	1.302	0.027	
2441.0	39	Bluetooth	4.00	2.22	0.070	0 mm [Left]	FCC #2	1	76.8	0.070	1.507	1.302	**0.137**	A39
2441.0	39	Bluetooth	4.00	2.22	0.070	0 mm [Left]	FCC #2	1	76.8	0.064	1.507	1.302	0.126	
ANSI / IEEE C95.1-1992– SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure								Phablet 4.0 W/kg (mW/g) averaged over 10 gram						

Note(s):
1. Blue entries represent the extended battery measurement on the worst case for standard battery measurement.

10.4 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements. A standard battery was used for all 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. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported boy-worn SAR was not > 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were performed.
8. SAR measurements were performed using the DASY5 automated system. The procedure for spatial peak SAR evaluation has been implemented according to the IEEE 1528 standard. During a maximum search, global and local maxima searches are automatically performed in 2-D after each area scan measurement. The algorithm will find the global maximum and all local maxima within 2 dB of the global maxima for all SAR distributions. All local maxima within 2 dB of the global maximum were searched and passed for the Zoom Scan measurement.

WLAN Notes:

1. The initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. 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 duo to the maximum allowed powers and the highest reported DSSS SAR when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output and the adjust SAR is ≤ 1.2 W/kg.
3. 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.
4. When the maximum reported 1g averaged SAR ≤ 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 or all test channels were measured.
5. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor to determine compliance.
6. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D01v06 by making a SAR measurement with both antennas transmitting simultaneously.

Bluetooth Notes:

1. Bluetooth SAR was measured with the device connected to a call with hopping disabled with DH5 operation and Tx test mode type. Per October 2016 TCB Workshop Notes, the reported SAR was scaled to the 100% transmission duty factor to determine compliance. Refer to section 9.5 for the time-domain plot and calculation for the duty factor of the device.
2. Head and hotspot Bluetooth SAR were evaluated for BT tethering applications.

11. FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

11.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v06 are applicable to handsets with built-in unlicensed transmitters such as 802.11b/g/n and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

11.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v06 4.3.2 and IEEE 1528-2013 Section 6.3.4.1.2,simultaneous transmission SAR test exclusion may be applied when the sum of the sum 1-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is $\leq$ 1.6 W/kg. The different test positon in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1-g or 10-g SAR.

11.3 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be transmitting 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.

Table 11.3.1 Simultaneous Transmission Scenarios

No.	Capable TX Configuration	WIFI 2.4GHz 802.11b/g/n/ac	WIFI 5GHz 802.11a/n/ac	Bluetooth 2.4GHz
1	WIFI 2.4GHz 802.11b/g/n/ac		Yes	No
2	WIFI 5GHz 802.11a/n/ac	Yes		Yes
3	Bluetooth 2.4GHz	No	Yes	

Table 11.3.2 Simultaneous SAR Cases

No.	Capable Transmit Configuration	Head SAR	Body-Worn SAR	Phablet SAR	Note
1	Wi-Fi 2.4 GHz Ant.1 + Wi-Fi 5GHz Ant.2	Yes	Yes	Yes	* Hotspot of UNII-1 & UNII-3 can be operated simultaneous transmission.
2	Bluetooth 2.4 GHz + Wi-Fi 5GHz	Yes	Yes	Yes	* Hotspot of UNII-1 & UNII-3 can be operated simultaneous transmission.

Notes:
1. Bluetooth and WiFi can not transmit simultaneously at 2.4G band.

11.4 Head SAR Simultaneous Transmission Analysis

Table 11.4.1 Simultaneous Transmission Scenario : 2.4 GHz W-LAN Ant.1 + 5 GHz W-LAN Ant.2 (Held to Ear)

Exposure Condition	Mode	Configuration	2.4G WLAN Ant.1 SAR (W/kg)	5G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Head SAR	5.3G W-LAN Ant.2	Left Touch	0.037	0.437	**0.474**
		Right Touch	0.133	0.283	0.416
		Left Tilt	0.031	0.302	0.333
		Right Tilt	0.043	0.231	0.274
	5.6G W-LAN Ant.2	Left Touch	0.037	0.316	0.353
		Right Touch	0.133	0.346	**0.479**
		Left Tilt	0.031	0.347	0.378
		Right Tilt	0.043	0.384	0.427
	5.8G W-LAN Ant.2	Left Touch	0.037	0.350	0.387
		Right Touch	0.133	0.383	**0.516**
		Left Tilt	0.031	0.384	0.415
		Right Tilt	0.043	0.408	0.451

Table 11.4.2 Simultaneous Transmission Scenario : Bluetooth + 5 GHz W-LAN Ant.1 (Held to Ear)

Exposure Condition	Mode	Configuration	Bluetooth SAR (W/kg)	5G W-LAN SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Head SAR	5.3G W-LAN Ant.1	Left Touch	0.022	0.333	0.355
		Right Touch	0.071	0.912	**0.983**
		Left Tilt	0.018	0.542	0.560
		Right Tilt	0.045	0.506	0.551
	5.6G W-LAN Ant.1	Left Touch	0.022	0.228	0.250
		Right Touch	0.071	0.567	**0.638**
		Left Tilt	0.018	0.447	0.465
		Right Tilt	0.045	0.244	0.289
	5.8G W-LAN Ant.1	Left Touch	0.022	0.081	0.103
		Right Touch	0.071	0.132	**0.203**
		Left Tilt	0.018	0.086	0.104
		Right Tilt	0.045	0.090	0.135

Table 11.4.3 Simultaneous Transmission Scenario : Bluetooth + 5 GHz W-LAN Ant.2 (Held to Ear)

Exposure Condition	Mode	Configuration	Bluetooth SAR (W/kg)	5G W-LAN SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Head SAR	5.3G W-LAN Ant.2	Left Touch	0.022	0.437	**0.459**
		Right Touch	0.071	0.283	0.354
		Left Tilt	0.018	0.302	0.320
		Right Tilt	0.045	0.231	0.276
	5.6G W-LAN Ant.2	Left Touch	0.022	0.316	0.338
		Right Touch	0.071	0.346	0.417
		Left Tilt	0.018	0.347	0.365
		Right Tilt	0.045	0.384	**0.429**
	5.8G W-LAN Ant.2	Left Touch	0.022	0.350	0.372
		Right Touch	0.071	0.383	**0.454**
		Left Tilt	0.018	0.384	0.402
		Right Tilt	0.045	0.408	0.453

Table 11.4.4 Simultaneous Transmission Scenario : Bluetooth + 5 GHz W-LAN MIMO (Held to Ear)

Exposure Condition	Mode	Configuration	Bluetooth SAR (W/kg)	5G W-LAN SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Head SAR	5.3G W-LAN MIMO	Left Touch	0.022	0.645	0.667
		Right Touch	**0.071**	**0.978**	**1.049**
		Left Tilt	0.018	0.595	0.613
		Right Tilt	0.045	0.608	0.653
	5.6G W-LAN MIMO	Left Touch	0.022	0.373	0.395
		Right Touch	0.071	0.370	0.441
		Left Tilt	0.018	0.616	**0.634**
		Right Tilt	0.045	0.361	0.406
	5.8G W-LAN MIMO	Left Touch	0.022	0.263	0.285
		Right Touch	0.071	0.338	**0.409**
		Left Tilt	0.018	0.283	0.301
		Right Tilt	0.045	0.338	0.383

11.5 Body-Worn Simultaneous Transmission Analysis

Table 11.5.1 Simultaneous Transmission Scenario : 2.4 GHz W-LAN Ant.1 + 5 GHz W-LAN Ant.2 (Body-Worn at 15 mm)

Exposure Condition	Mode	Configuration	2.4G WLAN Ant.1 SAR (W/kg)	5G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	5.3G W-LAN Ant.2	Front	0.016	0.055	0.071
		Rear	0.013	0.146	**0.159**
	5.6G W-LAN Ant.2	Front	0.016	0.084	0.100
		Rear	0.013	0.097	**0.110**
	5.8G W-LAN Ant.2	Front	0.016	0.064	0.080
		Rear	0.013	0.084	**0.097**

Table 11.5.2 Simultaneous Transmission Scenario : Bluetooth + 5 GHz W-LAN Ant.1 (Body-Worn at 15 mm)

Exposure Condition	Mode	Configuration	Bluetooth SAR (W/kg)	5G W-LAN SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	5.3G W-LAN Ant.1	Front	0.005	0.099	**0.104**
		Rear	0.003	0.047	0.050
	5.6G W-LAN Ant.1	Front	0.005	0.053	0.058
		Rear	0.003	0.112	**0.115**
	5.8G W-LAN Ant.1	Front	0.005	0.046	0.051
		Rear	0.003	0.098	**0.101**

Table 11.5.3 Simultaneous Transmission Scenario : Bluetooth + 5 GHz W-LAN Ant.2 (Body-Worn at 15 mm)

Exposure Condition	Mode	Configuration	Bluetooth SAR (W/kg)	5G W-LAN SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	5.3G W-LAN Ant.2	Front	0.005	0.055	0.060
		Rear	0.003	0.146	**0.149**
	5.6G W-LAN Ant.2	Front	0.005	0.084	0.089
		Rear	0.003	0.097	**0.100**
	5.8G W-LAN Ant.2	Front	0.005	0.064	0.069
		Rear	0.003	0.084	**0.087**

Table 11.5.4 Simultaneous Transmission Scenario : Bluetooth + 5 GHz W-LAN MIMO (Body-Worn at 15 mm)

Exposure Condition	Mode	Configuration	Bluetooth SAR (W/kg)	5G W-LAN SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Body-Worn SAR	5.3G W-LAN MIMO	Front	0.005	0.125	0.130
		Rear	0.003	0.160	**0.163**
	5.6G W-LAN MIMO	Front	0.005	0.099	0.104
		Rear	0.003	0.149	**0.152**
	5.8G W-LAN MIMO	Front	0.005	0.106	0.111
		Rear	**0.003**	**0.163**	**0.166**

11.6 Phablet SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 941225 D06v02r01, the device edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR ("-").

Table 11.6.1 Simultaneous Transmission Scenario : 2.4 GHz W-LAN Ant.1 + 5 GHz W-LAN Ant.2 (Phablet at 0 mm)

Exposure Condition	Mode	Configuration	2.4G WLAN Ant.1 SAR (W/kg)	5G W-LAN Ant.2 SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	5.3G W-LAN Ant.2	Top	0.068	0.147	0.215
		Bottom	-	-	-
		Front	0.078	0.194	0.272
		Rear	0.035	0.224	0.259
		Right	-	0.401	**0.401**
		Left	0.111	-	0.111
	5.6G W-LAN Ant.2	Top	0.068	0.164	0.232
		Bottom	-	-	-
		Front	0.078	0.133	0.211
		Rear	0.035	0.099	0.134
		Right	-	0.396	**0.396**
		Left	0.111	-	0.111
	5.3G W-LAN Ant.2	Top	0.068	0.138	0.206
		Bottom	-	-	-
		Front	0.078	0.126	0.204
		Rear	0.035	0.102	0.137
		Right	-	0.374	**0.374**
		Left	0.111	-	0.111

Table 11.6.2 Simultaneous Transmission Scenario : Bluetooth + 5 GHz W-LAN Ant.1 (Phablet at 0 mm)

Exposure Condition	Mode	Configuration	Bluetooth SAR (W/kg)	5G W-LAN SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	5.3G W-LAN Ant.1	Top	0.069	0.112	0.181
		Bottom	-	-	-
		Front	0.084	0.222	0.306
		Rear	0.027	0.070	0.097
		Right	-	-	-
		Left	0.137	0.400	**0.537**
	5.6G W-LAN Ant.1	Top	0.069	0.084	0.153
		Bottom	-	-	-
		Front	0.084	0.118	0.202
		Rear	0.027	0.090	0.117
		Right	-	-	-
		Left	0.137	0.607	**0.744**
	5.8G W-LAN Ant.1	Top	0.069	0.045	0.114
		Bottom	-	-	-
		Front	0.084	0.070	0.154
		Rear	0.027	0.085	0.112
		Right	-	-	-
		Left	0.137	0.410	**0.547**

Table 11.6.2 Simultaneous Transmission Scenario : Bluetooth + 5 GHz W-LAN Ant.2 (Phablet at 0 mm)

Exposure Condition	Mode	Configuration	Bluetooth SAR (W/kg)	5G W-LAN SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	5.3G W-LAN Ant.2	Top	0.069	0.147	0.216
		Bottom	-	-	-
		Front	0.084	0.194	0.278
		Rear	0.027	0.224	0.251
		Right	-	0.401	**0.401**
		Left	0.137	-	0.137
	5.3G W-LAN Ant.2	Top	0.069	0.164	0.233
		Bottom	-	-	-
		Front	0.084	0.133	0.217
		Rear	0.027	0.099	0.126
		Right	-	0.396	**0.396**
		Left	0.137	-	0.137
	5.8G W-LAN Ant.2	Top	0.069	0.138	0.207
		Bottom	-	-	-
		Front	0.084	0.126	0.210
		Rear	0.027	0.102	0.129
		Right	-	0.374	**0.374**
		Left	0.137	-	0.137

Table 11.6.2 Simultaneous Transmission Scenario : Bluetooth + 5 GHz W-LAN MIMO (Phablet at 0 mm)

Exposure Condition	Mode	Configuration	Bluetooth SAR (W/kg)	5G W-LAN SAR (W/kg)	ΣSAR (W/kg)
			1	2	1+2
Hotspot SAR	5.3G W-LAN MIMO	Top	0.069	0.169	0.238
		Bottom	-	-	-
		Front	0.084	0.236	0.320
		Rear	0.027	0.272	0.299
		Right	-	0.482	0.482
		Left	0.137	0.670	**0.807**
	5.3G W-LAN MIMO	Top	0.069	0.187	0.256
		Bottom	-	-	-
		Front	0.084	0.163	0.247
		Rear	0.027	0.115	0.142
		Right	-	0.400	0.400
		Left	**0.137**	**0.677**	**0.814**
	5.8G W-LAN MIMO	Top	0.069	0.220	0.289
		Bottom	-	-	-
		Front	0.084	0.160	0.244
		Rear	0.027	0.117	0.144
		Right	-	0.357	0.357
		Left	0.137	0.534	**0.671**

11.7 Phablet SAR Simultaneous Transmission Analysis

Per FCC KDB Publication 648474 D04 Handset SAR, Phablet SAR tests were not required of Hotspot 1g SAR (scaled to maximum output power, including tolerance) < 1.2 W/kg. Therefore no further analysis was required to for Phablet Simultaneous Transmission Analysis.

11.8 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 and IEEE 1528-2013 Section 6.3.4.1.2.

12. SAR MEASUREMENT VARIABILITY

12.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

1. When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2. A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
3. A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.
4. Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg
5. The same procedures should be adapted for measurements according to extremity exposure limits by applying a factor of 2.5 for extremity exposure to the corresponding SAR thresholds.

12.2 Measurement Uncertainty

The measured SAR was < 1.5 W/kg for 1g and < 3.75 W/kg for 10g for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

13. EQUIPMENT LIST

Table 13.1.1 Test Equipment Calibration

	Type	Manufacturer	Model	Cal.Date	Next.Cal.Date	S/N
☒	SEMITEC Engineering	SEMITEC	N/A	N/A	N/A	Shield Room
☒	Robot	SPEAG	TX90XL	N/A	N/A	F13/5RR2A1/A/01
☒	Robot Controller	SPEAG	CS8C	N/A	N/A	F13/5RR2A1/C/01
☒	Joystick	SPEAG	N/A	N/A	N/A	S-13200990
☒	Intel Core i7-3770 3.40 GHz Windows 7 Professional	N/A	N/A	N/A	N/A	N/A
☒	Probe Alignment Unit LB	N/A	N/A	N/A	N/A	SE UKS 030 AA
☒	Device Holder	SPEAG	SD000H01HA	N/A	N/A	N/A
☒	Twin SAM Phantom	SPEAG	QD000P40CD	N/A	N/A	1785
☒	Twin SAM Phantom	SPEAG	QD000P40CD	N/A	N/A	1786
☒	Data Acquisition Electronics	SPEAG	DAE4V1	2019-05-23	2020-05-23	1392
☒	Dosimetric E-Field Probe	SPEAG	EX3DV4	2019-04-25	2020-04-25	3916
☒	2450MHz SAR Dipole	SPEAG	D2450V2	2019-09-19	2021-09-19	726
☒	5GHz SAR Dipole	SPEAG	D5GHzV2	2019-02-28	2021-02-28	1103
☒	Network Analyzer	Agilent	E5071C	2019-06-24	2020-06-24	MY46106970
☒	Signal Generator	Agilent	E4438C	2019-06-24	2020-06-24	US41461520
☒	Amplifier	EMPOWER	BBS3Q7ELU	2019-06-24	2020-06-24	1020
☒	High Power RF Amplifier	EMPOWER	BBS3Q8CCJ	2019-06-24	2020-06-24	1005
☒	Power Meter	HP	EPM-442A	2018-12-19	2019-12-19	GB37170267
☒	Power Meter	Anritsu	ML2495A	2019-08-02	2020-08-02	1435003
☒	Power Sensor	Anritsu	MA2490A	2019-08-02	2020-08-02	1409034
☒	Power Sensor	HP	8481A	2018-12-19	2019-12-19	3318A96566
☒	Power Sensor	HP	8481A	2018-12-19	2019-12-19	2702A65976
☒	Directional Coupler	HP	772D	2019-06-24	2020-06-24	2889A01064
☒	Low Pass Filter 3.0GHz	Micro LAB	LA-30N	2019-06-24	2020-06-24	2
☒	Low Pass Filter 6.0GHz	Micro LAB	LA-60N	2018-12-19	2019-12-19	03942
☒	Attenuators(10 dB)	WEINSCHEL	23-10-34	2018-12-19	2019-12-19	BP4387
☒	Attenuators	Cernexwave	CFADC2603U5	2019-06-27	2020-06-27	C11740
☒	Dielectric Probe kit	SPEAG	DAK-3.5	2018-11-20	2019-11-20	1092
☒	Power Splitter	Anritsu	K241B	2018-12-18	2019-12-18	1301183
☒	Bluetooth Tester	TESCOM	TC-3000B	2018-12-18	2019-12-18	3000B770243

NOTE(S):
1. The E-field probe was calibrated by SPEAG, by temperature measurement procedure. Dipole Verification measurement is performed by DT&C before each test. The brain and muscle simulating material are calibrated by DT&C using the dielectric probe system and network analyzer to determine the conductivity and permittivity (dielectric constant) of the brain and muscle-equivalent material. Each equipment item was used solely within its respective calibration period.
2. 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. 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.

14. MEASUREMENT UNCERTAINTIES

2450 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	(Ci) 10g	Standard (1g)	Standard (10g)	vi 2 or Veff
Measurement System								
Probe calibration	± 6.0	Normal	1	1	1	± 6.0 %	± 6.0 %	∞
Isotropy	± 1.3	Normal	1	1	1	± 1.3 %	± 1.3 %	∞
Boundary Effects	± 2.0	Rectangular	√3	1	1	± 1.2 %	± 1.2 %	∞
Probe Linearity	± 0.3	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Probe modulation response	± 0.0	Rectangular	√3	1	1	± 0.0 %	± 0.0 %	∞
Detection limits	± 0.25	Rectangular	√3	1	1	± 0.14 %	± 0.14 %	∞
Readout Electronics	± 0.3	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response time	± 0.8	Rectangular	√3	1	1	± 0.46 %	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
Probe Positioner	± 0.8	Rectangular	√3	1	1	± 0.46 %	± 0.46 %	∞
Probe Positioning	± 6.7	Rectangular	√3	1	1	± 3.9 %	± 3.9 %	∞
Algorithms for Max. SAR Eval.	± 4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %	∞
Test Sample Related								
Device Positioning	± 2.9	Normal	1	1	1	± 2.9 %	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	1	± 3.6 %	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %	∞
SAR Scaling	± 0.0	Rectangular	√3	1	1	± 0.0 %	± 0.0 %	∞
Physical Parameters								
Phantom Shell	± 7.6	Rectangular	√3	1	1	± 4.4 %	± 4.4 %	∞
SAR correction	± 0.0	Normal	1	1	0.84	± 0.0 %	± 0.0 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %	∞
Liquid conductivity (Meas.)	± 4.1	Normal	1	0.78	0.71	± 3.2 %	± 2.9 %	10
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.60	0.49	± 1.7 %	± 1.4 %	∞
Liquid permittivity (Meas.)	± 3.8	Normal	1	0.23	0.26	± 0.9 %	± 1.0 %	10
Temp. unc. - Conductivity	± 1.9	Rectangular	√3	0.78	0.71	± 0.9 %	± 0.8 %	∞
Temp. unc. - Permittivity	± 1.9	Rectangular	√3	0.23	0.26	± 0.3 %	± 0.3 %	∞
Combined Standard Uncertainty						**± 11.6 %**	**± 11.4 %**	330
Expanded Uncertainty (k=2)						**± 23.2 %**	**± 22.8 %**	

The above measurement uncertainties are according to IEEE Std 1528

5300 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	(Ci) 10g	Standard (1g)	Standard (10g)	vi 2 or Veff
Measurement System								
Probe calibration	± 6.55	Normal	1	1	1	± 6.6 %	± 6.6 %	∞
Isotropy	± 1.3	Normal	1	1	1	± 1.3 %	± 1.3 %	∞
Boundary Effects	± 2.0	Rectangular	√3	1	1	± 1.2 %	± 1.2 %	∞
Probe Linearity	± 0.3	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Probe modulation response	± 0.0	Rectangular	√3	1	1	± 0.0 %	± 0.0 %	∞
Detection limits	± 0.25	Rectangular	√3	1	1	± 0.14 %	± 0.14 %	∞
Readout Electronics	± 0.3	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response time	± 0.8	Rectangular	√3	1	1	± 0.46 %	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
Probe Positioner	± 0.8	Rectangular	√3	1	1	± 0.46 %	± 0.46 %	∞
Probe Positioning	± 6.7	Rectangular	√3	1	1	± 3.9 %	± 3.9 %	∞
Algorithms for Max. SAR Eval.	± 4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %	∞
Test Sample Related								
Device Positioning	± 2.9	Normal	1	1	1	± 2.9 %	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	1	± 3.6 %	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %	∞
SAR Scaling	± 0.0	Rectangular	√3	1	1	± 0.0 %	± 0.0 %	∞
Physical Parameters								
Phantom Shell	± 7.6	Rectangular	√3	1	1	± 4.4 %	± 4.4 %	∞
SAR correction	± 0.0	Normal	1	1	0.84	± 0.0 %	± 0.0 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %	∞
Liquid conductivity (Meas.)	± 3.8	Normal	1	0.78	0.71	± 3.0 %	± 2.7 %	10
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.60	0.49	± 1.7 %	± 1.4 %	∞
Liquid permittivity (Meas.)	± 4.1	Normal	1	0.23	0.26	± 0.9 %	± 1.1 %	10
Temp. unc. - Conductivity	± 1.8	Rectangular	√3	0.78	0.71	± 0.8 %	± 0.7 %	∞
Temp. unc. - Permittivity	± 1.8	Rectangular	√3	0.23	0.26	± 0.2 %	± 0.3 %	∞
Combined Standard Uncertainty						**± 11.9 %**	**± 11.7 %**	330
Expanded Uncertainty (k=2)						**± 23.8 %**	**± 23.4 %**	

The above measurement uncertainties are according to IEEE Std 1528

5600 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	(Ci) 10g	Standard (1g)	Standard (10g)	vi 2 or Veff
Measurement System								
Probe calibration	± 6.55	Normal	1	1	1	± 6.6 %	± 6.6 %	∞
Isotropy	± 1.3	Normal	1	1	1	± 1.3 %	± 1.3 %	∞
Boundary Effects	± 2.0	Rectangular	√3	1	1	± 1.2 %	± 1.2 %	∞
Probe Linearity	± 0.3	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Probe modulation response	± 0.0	Rectangular	√3	1	1	± 0.0 %	± 0.0 %	∞
Detection limits	± 0.25	Rectangular	√3	1	1	± 0.14 %	± 0.14 %	∞
Readout Electronics	± 0.3	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response time	± 0.8	Rectangular	√3	1	1	± 0.46 %	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
Probe Positioner	± 0.8	Rectangular	√3	1	1	± 0.46 %	± 0.46 %	∞
Probe Positioning	± 6.7	Rectangular	√3	1	1	± 3.9 %	± 3.9 %	∞
Algorithms for Max. SAR Eval.	± 4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %	∞
Test Sample Related								
Device Positioning	± 2.9	Normal	1	1	1	± 2.9 %	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	1	± 3.6 %	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %	∞
SAR Scaling	± 0.0	Rectangular	√3	1	1	± 0.0 %	± 0.0 %	∞
Physical Parameters								
Phantom Shell	± 7.6	Rectangular	√3	1	1	± 4.4 %	± 4.4 %	∞
SAR correction	± 0.0	Normal	1	1	0.84	± 0.0 %	± 0.0 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %	∞
Liquid conductivity (Meas.)	± 4.0	Normal	1	0.78	0.71	± 3.1 %	± 2.8 %	10
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.60	0.49	± 1.7 %	± 1.4 %	∞
Liquid permittivity (Meas.)	± 4.2	Normal	1	0.23	0.26	± 1.0 %	± 1.1 %	10
Temp. unc. - Conductivity	± 1.9	Rectangular	√3	0.78	0.71	± 0.9 %	± 0.8 %	∞
Temp. unc. - Permittivity	± 1.9	Rectangular	√3	0.23	0.26	± 0.3 %	± 0.3 %	∞
Combined Standard Uncertainty						**± 11.9 %**	**± 11.7 %**	330
Expanded Uncertainty (k=2)						**± 23.8 %**	**± 23.4 %**	

The above measurement uncertainties are according to IEEE Std 1528

5800 MHz Head

Error Description	Uncertainty value ±%	Probability Distribution	Divisor	(Ci) 1g	(Ci) 10g	Standard (1g)	Standard (10g)	vi 2 or Veff
Measurement System								
Probe calibration	± 6.55	Normal	1	1	1	± 6.6 %	± 6.6 %	∞
Isotropy	± 1.3	Normal	1	1	1	± 1.3 %	± 1.3 %	∞
Boundary Effects	± 2.0	Rectangular	√3	1	1	± 1.2 %	± 1.2 %	∞
Probe Linearity	± 0.3	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Probe modulation response	± 0.0	Rectangular	√3	1	1	± 0.0 %	± 0.0 %	∞
Detection limits	± 0.25	Rectangular	√3	1	1	± 0.14 %	± 0.14 %	∞
Readout Electronics	± 0.3	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response time	± 0.8	Rectangular	√3	1	1	± 0.46 %	± 0.46 %	∞
Integration time	± 2.6	Rectangular	√3	1	1	± 1.5 %	± 1.5 %	∞
RF Ambient Conditions – Noise	± 3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
RF Ambient Conditions – Reflections	± 3.0	Rectangular	√3	1	1	± 1.7 %	± 1.7 %	∞
Probe Positioner	± 0.8	Rectangular	√3	1	1	± 0.46 %	± 0.46 %	∞
Probe Positioning	± 6.7	Rectangular	√3	1	1	± 3.9 %	± 3.9 %	∞
Algorithms for Max. SAR Eval.	± 4.0	Rectangular	√3	1	1	± 2.3 %	± 2.3 %	∞
Test Sample Related								
Device Positioning	± 2.9	Normal	1	1	1	± 2.9 %	± 2.9 %	145
Device Holder	± 3.6	Normal	1	1	1	± 3.6 %	± 3.6 %	5
Power Drift	± 5.0	Rectangular	√3	1	1	± 2.9 %	± 2.9 %	∞
SAR Scaling	± 0.0	Rectangular	√3	1	1	± 0.0 %	± 0.0 %	∞
Physical Parameters								
Phantom Shell	± 7.6	Rectangular	√3	1	1	± 4.4 %	± 4.4 %	∞
SAR correction	± 0.0	Normal	1	1	0.84	± 0.0 %	± 0.0 %	∞
Liquid conductivity (Target)	± 5.0	Rectangular	√3	0.64	0.43	± 1.8 %	± 1.2 %	∞
Liquid conductivity (Meas.)	± 3.7	Normal	1	0.78	0.71	± 2.9 %	± 2.6 %	10
Liquid permittivity (Target)	± 5.0	Rectangular	√3	0.60	0.49	± 1.7 %	± 1.4 %	∞
Liquid permittivity (Meas.)	± 4.1	Normal	1	0.23	0.26	± 0.9 %	± 1.1 %	10
Temp. unc. - Conductivity	± 1.9	Rectangular	√3	0.78	0.71	± 0.9 %	± 0.8 %	∞
Temp. unc. - Permittivity	± 2.0	Rectangular	√3	0.23	0.26	± 0.3 %	± 0.3 %	∞
Combined Standard Uncertainty						**± 11.9 %**	**± 11.7 %**	330
Expanded Uncertainty (k=2)						**± 23.8 %**	**± 23.4 %**	

The above measurement uncertainties are according to IEEE Std 1528

15. CONCLUSION

Measurement Conclusion

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the FCC. These measurements are taken to simulate the RF effects exposure under the worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The tested device complies with the requirements in respect to all parameters subject to the test. The test results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are every 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 impossible biological effect 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 innumerable factors may interact to determine the specific biological outcome of an exposure to electromagnetic fields, any protection guide shall consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables.

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APPENDIX A. – Probe Calibration Data

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 **DT&C (Dymstec)**

Certificate No: **EX3-3916_Apr19**

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3916
Calibration procedure(s)	QA CAL-01.v9, QA CAL-14.v5, QA CAL-23.v5, QA CAL-25.v7 Calibration procedure for dosimetric E-field probes
Calibration date:	April 25, 2019

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	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-19 (No. 217-02894)	Apr-20
DAE4	SN: 660	19-Dec-18 (No. DAE4-660_Dec18)	Dec-19
Reference Probe ES3DV2	SN: 3013	31-Dec-18 (No. ES3-3013_Dec18)	Dec-19
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-18)	In house check: Jun-20
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-18)	In house check: Jun-20
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

	Name	Function	Signature
Calibrated by:	Leif Klysner	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 27, 2019

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

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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).

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3916

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.56	0.48	0.52	± 10.1 %
DCP (mV)[B]	101.7	96.9	104.5	

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	146.1	±3.8 %	± 4.7 %
		Y	0.0	0.0	1.0		139.8		
		Y	0.0	0.0	1.0		143.5		

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.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3916

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	90.9
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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3916

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	7.66	7.66	7.66	0.39	0.85	± 12.0 %
2600	39.0	1.96	7.46	7.46	7.46	0.36	0.86	± 12.0 %
5200	36.0	4.66	5.14	5.14	5.14	0.40	1.80	± 13.1 %
5300	35.9	4.76	4.94	4.94	4.94	0.40	1.80	± 13.1 %
5500	35.6	4.96	4.89	4.89	4.89	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.75	4.75	4.75	0.40	1.80	± 13.1 %
5800	35.3	5.27	4.82	4.82	4.82	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.

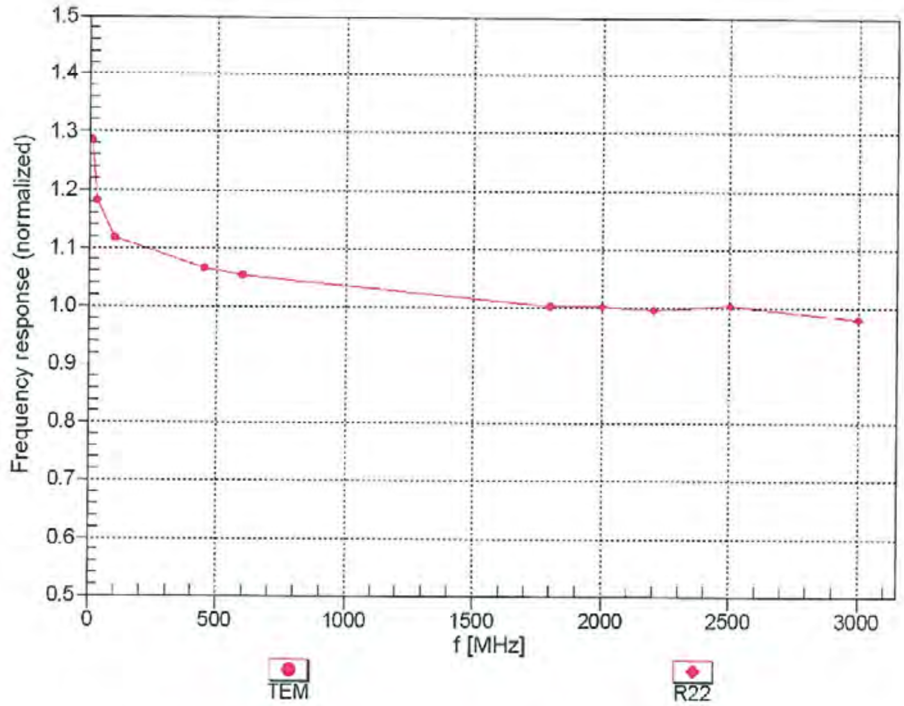
DASY/EASY - Parameters of Probe: EX3DV4 - SN:3916

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	7.62	7.62	7.62	0.34	0.85	± 12.0 %
2600	52.5	2.16	7.42	7.42	7.42	0.22	1.03	± 12.0 %
5200	49.0	5.30	4.56	4.56	4.56	0.50	1.90	± 13.1 %
5300	48.9	5.42	4.37	4.37	4.37	0.50	1.90	± 13.1 %
5500	48.6	5.65	4.14	4.14	4.14	0.50	1.90	± 13.1 %
5600	48.5	5.77	4.00	4.00	4.00	0.50	1.90	± 13.1 %
5800	48.2	6.00	4.23	4.23	4.23	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.

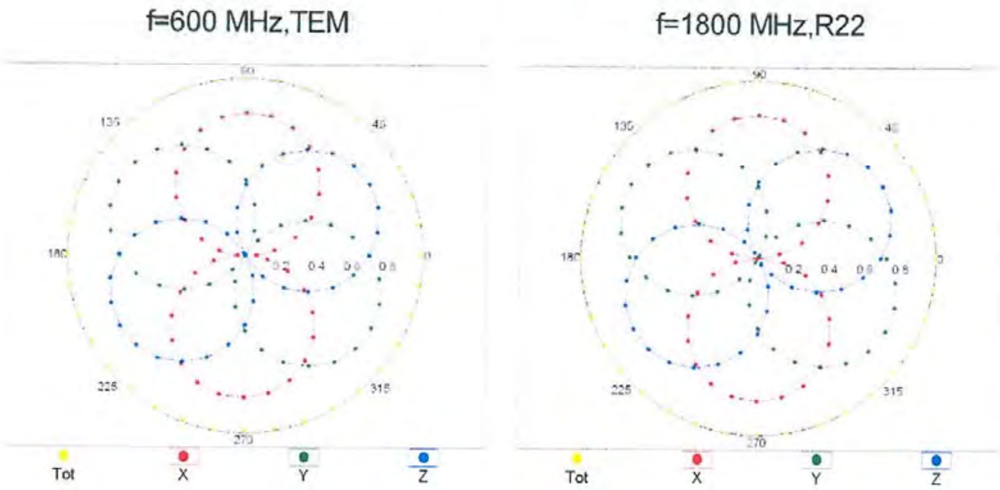
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)

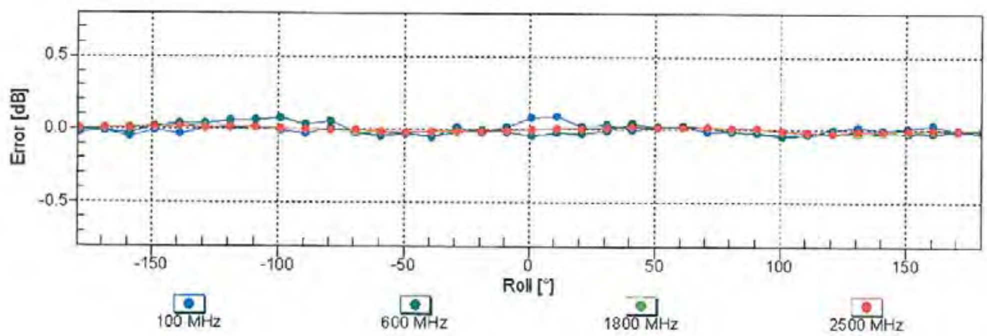


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

EX3DV4– SN:3916 April 25, 2019

Receiving Pattern (ϕ), ϑ = 0°



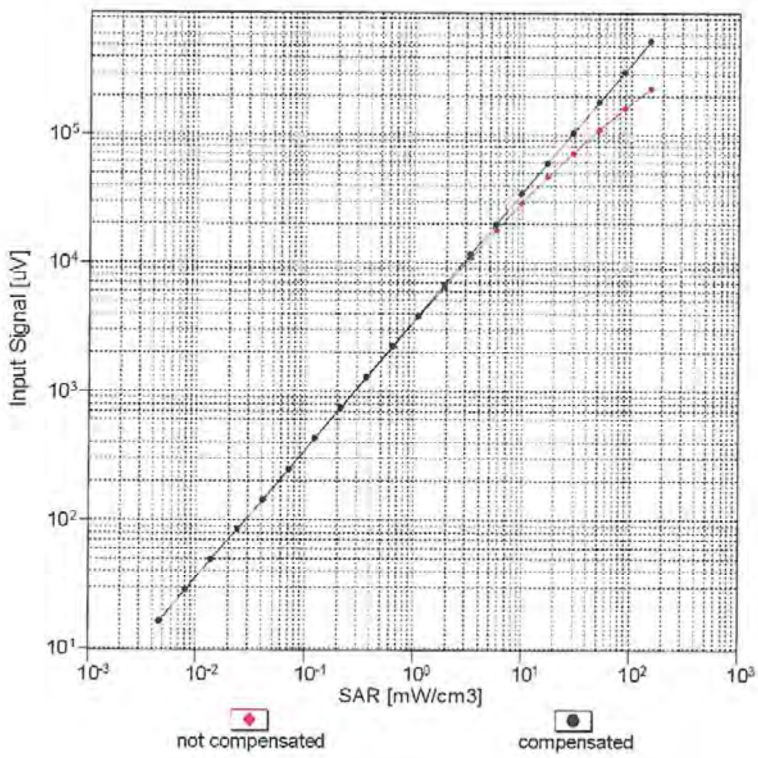


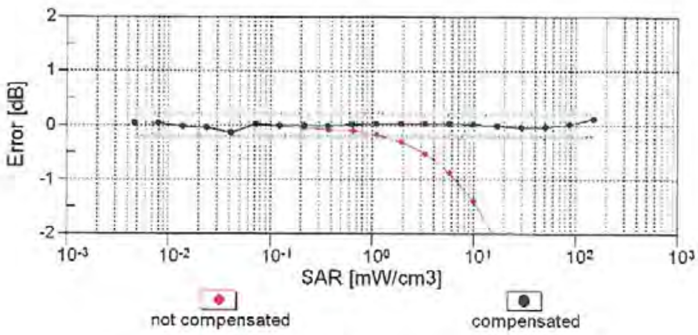
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

EX3DV4– SN:3916 April 25, 2019

Dynamic Range f(SAR_{head})

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



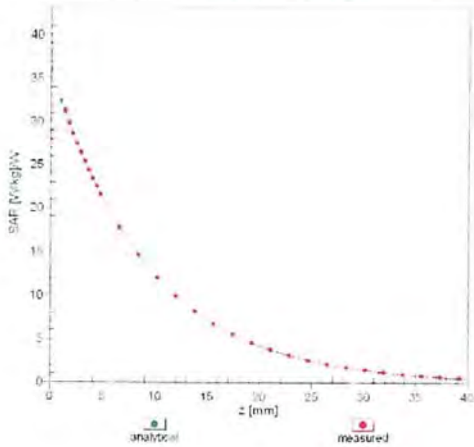


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

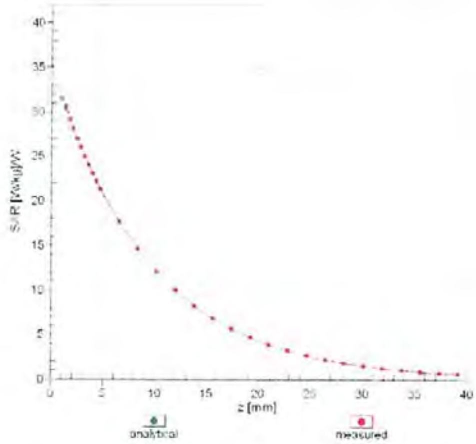
EX3DV4– SN:3916 April 25, 2019

Conversion Factor Assessment

f = 2450 MHz,WGLS R22 (H_convF)

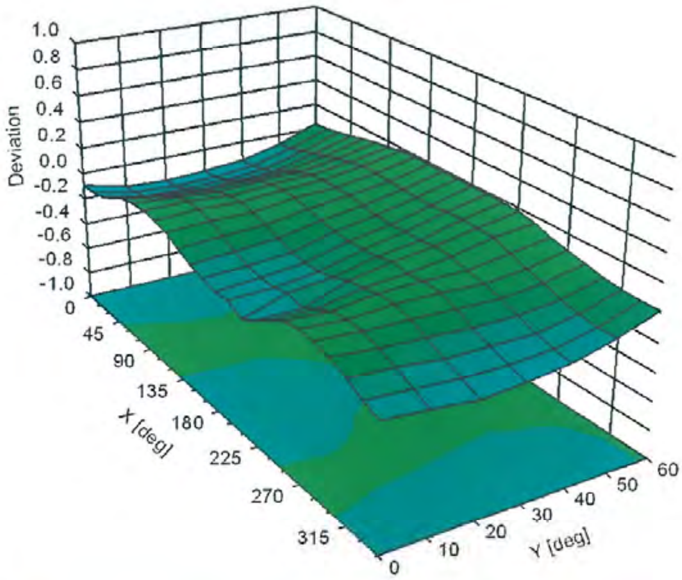


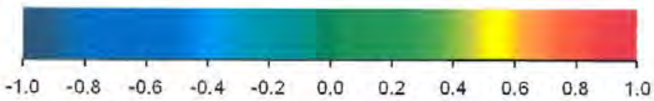
f = 2450 MHz,WGLS R22 (M_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz





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

APPENDIX B. – Dipole Calibration Data

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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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 DT&C (Dymstec)

Certificate No: D2450V2-726_Sep19

CALIBRATION CERTIFICATE

Object	D2450V2 - SN:726
Calibration procedure(s)	QA CAL-05.v11 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz
Calibration date:	September 19, 2019

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	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-19 (No. 217-02894)	Apr-20
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-19 (No. 217-02895)	Apr-20
Reference Probe EX3DV4	SN: 7349	29-May-19 (No. EX3-7349_May19)	May-20
DAE4	SN: 601	30-Apr-19 (No. DAE4-601_Apr19)	Apr-20

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Feb-19)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

	Name	Function	Signature
Calibrated by:	Manu Seitz	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 19, 2019

Calibration Laboratory of
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Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
S 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
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%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
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	37.9 ± 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	13.1 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**51.2 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.09 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**24.0 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	50.7 ± 6 %	2.04 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	13.4 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	6.25 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**24.6 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.7 Ω + 4.2 jΩ
Return Loss	- 25.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.3 Ω + 6.9 jΩ
Return Loss	- 23.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.161 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

DASY5 Validation Report for Head TSL

Date: 19.09.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:726

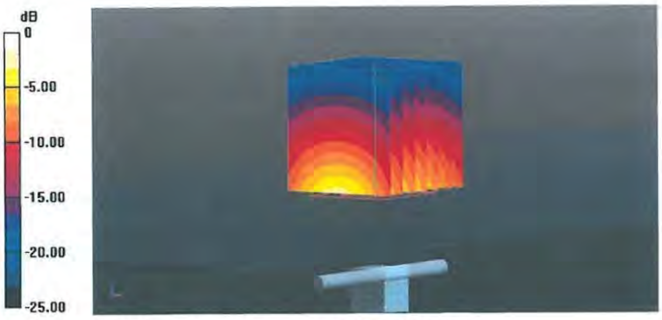
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.86 S/m; ε_r = 37.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.9, 7.9, 7.9) @ 2450 MHz; Calibrated: 29.05.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.2(1504); SEMCAD X 14.6.12(7470)

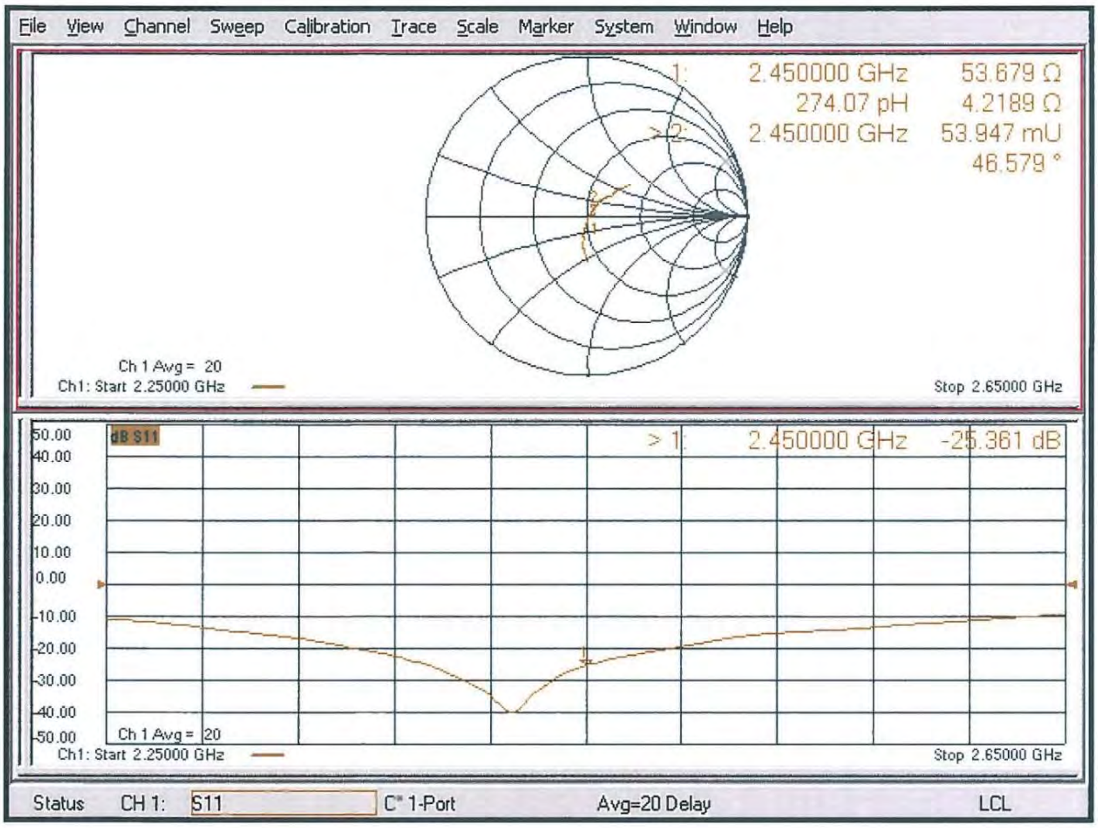
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 115.4 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 26.1 W/kg
SAR(1 g) = 13.1 W/kg; SAR(10 g) = 6.09 W/kg
Maximum value of SAR (measured) = 21.7 W/kg



0 dB = 21.7 W/kg = 13.36 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 19.09.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:726

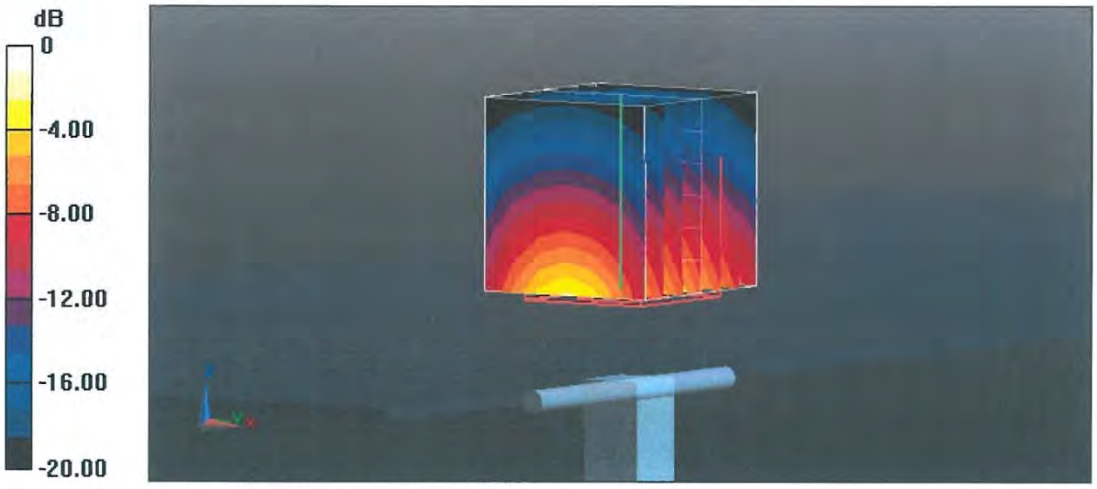
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; $\sigma = 2.04$ S/m; $\varepsilon_r = 50.7$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(7.94, 7.94, 7.94) @ 2450 MHz; Calibrated: 29.05.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2019
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.2(1504); SEMCAD X 14.6.12(7470)

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 = 110.1 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 26.5 W/kg
SAR(1 g) = 13.4 W/kg; SAR(10 g) = 6.25 W/kg
Maximum value of SAR (measured) = 22.0 W/kg



0 dB = 22.0 W/kg = 13.42 dBW/kg

Impedance Measurement Plot for Body TSL