FCC SAR Report

Report No.	:	**SESF1606057**
Client/Manufacturer	:	**Qualcomm Atheros, Inc.**
Address	:	**1700 Technology Drive, San Jose, CA 95110**
Product	:	**802.11a/b/g/n/ac + BT 4.1 M.2 2230 Type Card**
Brand	:	**Qualcomm Atheros**
Model	:	**QCNFA344A**
FCC ID	:	**PPD-QCNFA344AH**
Standards	:	**FCC 47 CFR Part 2 (2.1093) / IEEE C95.1:2005 / IEEE 1528-2013 / KDB 865664 D01 v01r04 / KDB 248227 D01 v02r02 / KDB 447498 D01 v06 / KDB 616217 D04 v01r02**
Test Date	:	**July 19th, 2016~ July 22th, 2016**

Statement of Compliance:

The SAR values measured for the test sample are below the maximum recommended level of 1.6W/kg averaged over any 1g tissue according to FCC Knowledge Data Base/ FCC 47CFR Part 2 (2.1093) / IEEE Std.1528-2013.

The test result only corresponds to the tested sample. It is not permitted to copy this report, in part or in full, without the permission of the test laboratory.

The testing described in this report has been carried out to the best of our knowledge and ability, and our responsibility is limited to the exercise of reasonable care. This certification is not intended to believe the sellers from their legal and/or contractual obligations.

Prepared By: _____
Leo Chen

Approved By: _____
Miro Chueh

Release Version

Report No.	Issue Date	Description
SESF1606057	2016-07-25	Initial release

Contents

1. Summary of Maximum SAR Value

Equipment Class	Highest Reported SAR_{1-g}(W/kg)
DTS	0.982
U-NII	1.34
DSS	0.40
Highest Simultaneous SAR	
DTS+DSS	0.992
UNII+DSS	1.34
UNII+UNII	2.602

2. Description of Equipment under Test

Product Name	802.11a/b/g/n/ac + BT 4.1 M.2 2230 Type Card	
Model No.	QCNFA344A	
Brand Name	Qualcomm Atheros	
Product Type	WLAN (2TX, 2RX)	
Antenna Type	PIFA	
Antenna Peak Gain	Main: 2400- 2500MHz: 0.15dBi 5150- 5850MHz: -0.7dBi	Aux: 2400- 2500MHz: -0.22dBi 5150- 5850MHz: -0.95dBi
Device Category	Portable	
RF Exposure Environment	Uncontrolled	
Bluetooth		
Bluetooth Frequency	2402~2480MHz	
Modulation Type	GFSK, 8DPSK	
Data Rate	Up to 3Mbps	
Channel Separation	1MHz for BT3.0, 2MHz for BLE	
Wi-Fi		
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode in 2.4GHz	
Modulation Technology	DSSS, OFDM	
Data Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n : up to 300Mbps 802.11ac: up to 866.7Mbps	
Wi-Fi Frequency	**For 15.247:** 2.4GHz: 2.412 ~ 2.472GHz	
	For 15.407: 802.11a: 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.5~5.72GHz, 5.745 ~ 5.825GHz	
Number of Channel	**For 15.247(2.4GHz):** 13 for 802.11b/g, 802.11n (HT20), VHT20 9 for 802.11n (HT40), VHT40	
	For 15.407(5GHz): 25 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 12 for 802.11n (HT40), 802.11ac (VHT40) 6 for 802.11ac (VHT80)	

Antenna information,

Manufacturer	**Part Number**
HongLin Electronics Co., Ltd	Main Antenna: 260-28100-01 / Aux Antenna: 260-28100-02

3. General Information

Host Details,

Host Manufacture	Host Type	Host Model
Lenovo	Notebook Computer	Lenovo YOGA 910-13IKB, Lenovo YOGA 910-13IKB Glass

Our Lab,

Test Site	Cerpass Technology (Suzhou) Co.,Ltd
Test Site Location	No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China

4. Basic restrictions and Standards

4.1. Test Standards

1. IEEE 1528-2013
2. FCC KDB Publication 447498 D01 General RF Exposure Guidance v06
3. FCC KDB Publication 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
4. FCC KDB Publication 616217 D04 SAR for laptop and tablets v01r02
5. FCC KDB Publication 248227 D01 802.11 Wi-Fi SAR v02r02

4.2. Environment Condition

Item	Target	Measured
Ambient Temperature(°C)	18~25	21.5±2
Temperature of Simulant(°C)	20~22	21±2
Relative Humidity(%RH)	30~70	52

4.3. RF Exposure Limits

Human Exposure	Basic restrictions for electric, magnetic and electromagnetic fields. (Unit in mW/g or W/kg)
Spatial Peak SAR[1](Head and Body)	1.60
Spatial Average SAR[2](Whole Body)	0.08
Spatial Peak SAR[3](Arms and Legs)	4.00

Notes:

1. The Spatial Peak value of the SAR averaged over any 1gram 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 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over appropriate averaging time.

5. DASY5 Measurement System

DASY5 Measurement System

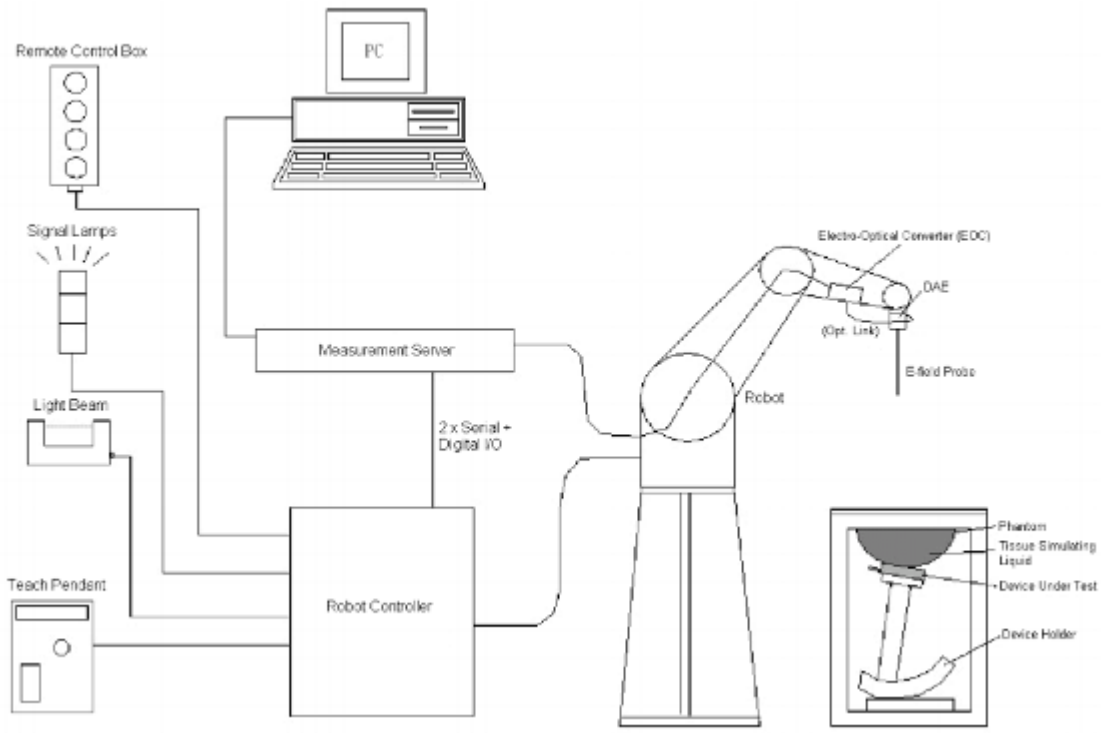


Figure 2.1 SPEAG DASY5 System Configurations

The DASY5 system for performance compliance tests is illustrated above graphically. This system consists of the following items:

- A standard high precision 6-axis robot with controller, a teach pendant and software
- A data acquisition electronic(DAE)attached to the robot arm extension
- A dosimetric probe equipped with an optical surface detector system
- The electro-optical converter(ECO)performs the conversion between optical and electrical signals
- A measurement server performs the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the accuracy of the probe positioning
- A computer operating Windows 7
- DASY5 software
- Remove control with teach pendant additional circuitry for robot safety such as warming lamps, etc.
- The SAM twin phantom
- A device holder
- Tissue simulating liquid
- Dipole for evaluating the proper functioning of the system

5.1. Uncertainty of Inter-/Extrapolation and Averaging

In order to evaluate the uncertainty of the interpolation, extrapolation and averaged SAR calculation algorithms of the Postprocessor, DASY5 allows the generation of measurement grids which are artificially predefined by analytically based test functions. Therefore, the grids of area scans and zoom scans can be filled with uncertainty test data, according to the SAR benchmark functions of IEEE 1528.The three analytical functions shown in equations as below are used to describe the possible range of the expected SAR distributions for the tested handsets. The field gradients are covered by the spatially flat distribution f1, the spatially steep distribution f3 and f2 accounts for H-field cancellation on the phantom/tissue surface.

$$f_1(x,y,z) = Ae^{-\frac{z}{2a}}\cos^2\left(\frac{\pi}{2}\frac{\sqrt{x'^2+y'^2}}{5a}\right)$$

$$f_2(x,y,z) = Ae^{-\frac{z}{a}}\frac{a^2}{a^2+x'^2}\left(3-e^{-\frac{2z}{a}}\right)\cos^2\left(\frac{\pi}{2}\frac{y'}{3a}\right)$$

$$f_3(x,y,z) = A\frac{a^2}{\frac{a^2}{4}+x'^2+y'^2}\left(e^{-\frac{2z}{a}}+\frac{a^2}{2(a+2z)^2}\right)$$

5.2. DASY5 E-Field Probe

The SAR measurement is conducted with the dosimetric probe manufactured by SPEAG. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.
SPEAG conducts the probe calibration in compliance with international and national standards (e.g. IEEE 1528, EN 62209-1, IEC 62209, etc.) under ISO 17025. The calibration data are in Appendix D.

Model	EX3DV4	
Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 µW/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)	
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

5.3. Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock. The input impedance of the DAE4 is 200M Ohm; the inputs are symmetrical and floating. Common mode rejection is above 80dB.	

5.4. Robot

The DASY5 system uses the high precision robots TX90 XL type out of the newer series from Stäubli SA (France). For the 6-axis controller DASY5 system, the CS8C robot controller version from Stäubli is used. The XL robot series have many features that are important for our application: ■ High precision (repeatability 0.02 mm) ■ High reliability (industrial design) ■ Jerk-free straight movements ■ Low ELF interference (the closed metallic construction shields against motor control fields) ■ 6-axis controller	

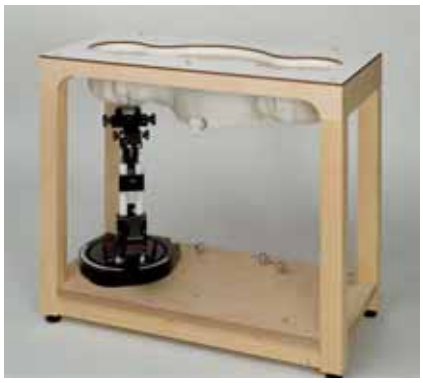
5.5. Light Beam Unit

The light beam switch allows automatic "tooling" of the probe. During the process, the actual position of the probe tip with respect to the robot arm is measured, as well as the probe length and the horizontal probe offset. The software then corrects all movements, such that the robot coordinates are valid for the probe tip. The repeatability of this process is better than 0.1 mm. If a position has been taught with an aligned probe, the same position will be reached with another aligned probe within 0.1 mm, even if the other probe has different dimensions. During probe rotations, the probe tip will keep its actual position.	

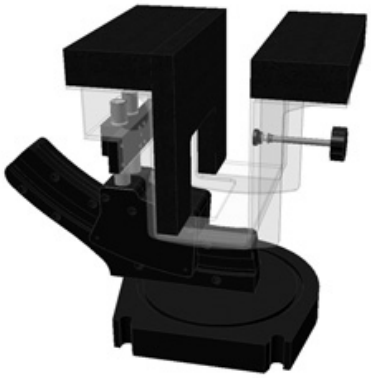
5.6. Measurement Server

The DASY5 measurement server is based on a PC/104 CPU board with a 400MHz intel ULV Celeron, 128MB chipdisk and 128MB RAM. The necessary circuits for communication with the DAE electronics box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY5 I/O board, which is directly connected to the PC/104 bus of the CPU board.	

5.7. SAM Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has three measurement areas: ■ Left head ■ Right head ■ Flat phantom	
The ELI4 Phantom also is a fiberglass shell phantom with 2mm shell thickness. It has 30 liters filling volume, and with a dimension of 600mm for major ellipse axis, 400mm for minor axis. It is intended for compliance testing of handheld and body-mounted wireless devices in frequency range of 30 MHz to 6GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.	
The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.	

5.8. Device Holder

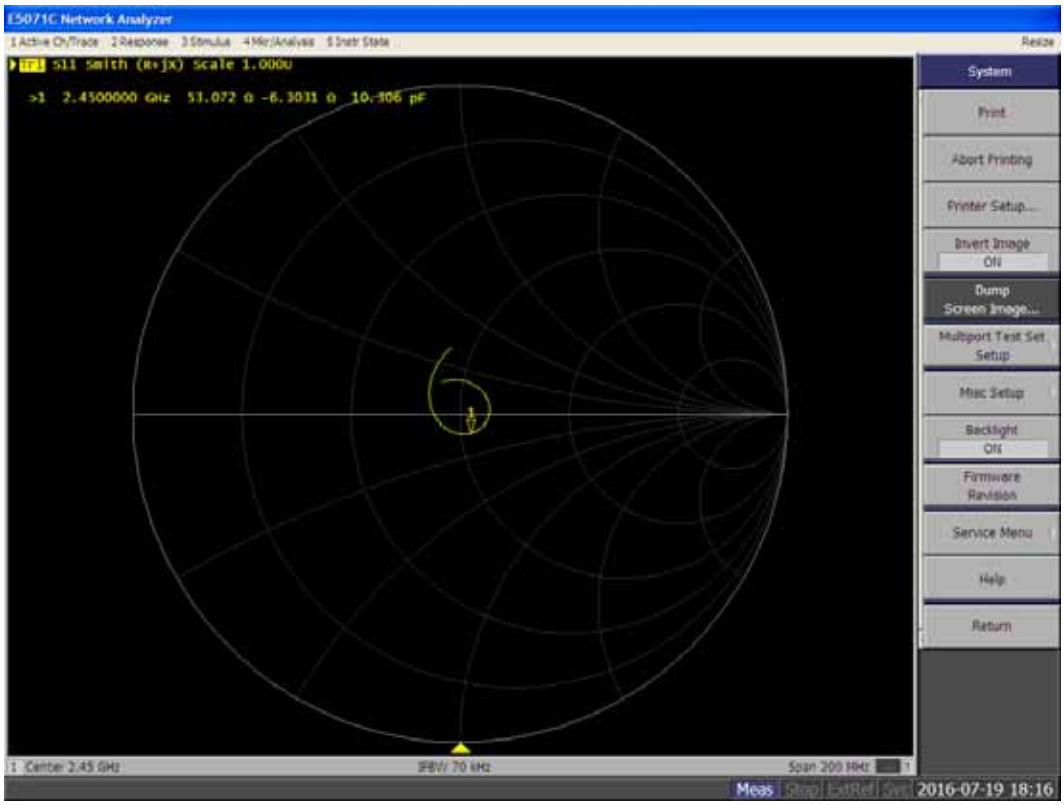
The DASY5 device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation center for both scales is the ear reference point (EPR).Thus the device needs no repositioning when changing the angles. The DASY5 device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity εr =3 and loss tangent δ = 0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.	
The laptop extension is lightweight and made of POM, acrylic glass and foam. It fits easily on upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.	

5.9. Test Equipment List

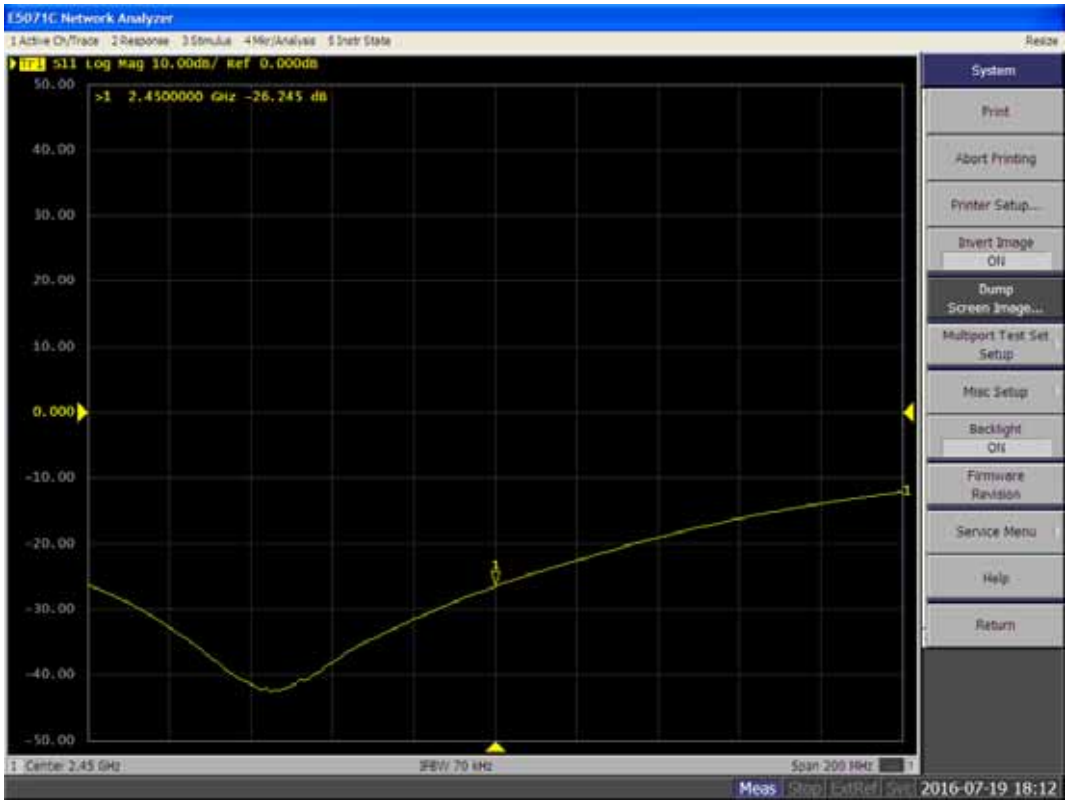
Instrument	Manufacturer	Model No.	Serial No.	Cali. Date	Cali. Due Date
Stäubli Robot TX60L	Stäubli	TX60L	5P6VA1/A/01	only once	only once
Robot Controller	Stäubli	CS8C	5P6VA1/C/01	only once	only once
Dipole Validation Kits	Speag	D2450V2	914	2016.07.19	2017.07.18
Dipole Validation Kits	Speag	D5GHzV2	1156	2016.07.19	2017.07.18
SAM ELI Phantom	Speag	SAM	1211	N/A	N/A
Laptop Holder	Speag	SM LH1 001CD	N/A	N/A	N/A
Data Acquisition Electronic	Speag	DAE4	1379	2016.05.23	2017.05.22
E-Field Probe	Speag	EX3DV4	3927	2016.05.25	2017.05.24
SAR Software	Speag	DASY5	V5.2 Build 162	N/A	N/A
Power Amplifier	Mini-Circuit	ZVA-183W-S+	MN136701248	2015.09.03	2016.09.02
Directional Coupler	Agilent	772D	MY52180104	2015.09.03	2016.09.02
Spectrum Analyzer	R&S	FSP40	100324	2016.03.23	2017.03.22
Vector Network	Agilent	E5071C	MY4631693	2016.01.15	2017.01.14
Signal Generator	R&S	SML	103287	2016.03.09	2017.03.08
Power Meter	BONN	BLWA0830-160/100/40D	76659	2016.11.11	2017.11.10
AUG Power Sensor	R&S	NRP-Z91	100384	2016.03.09	2017.03.08

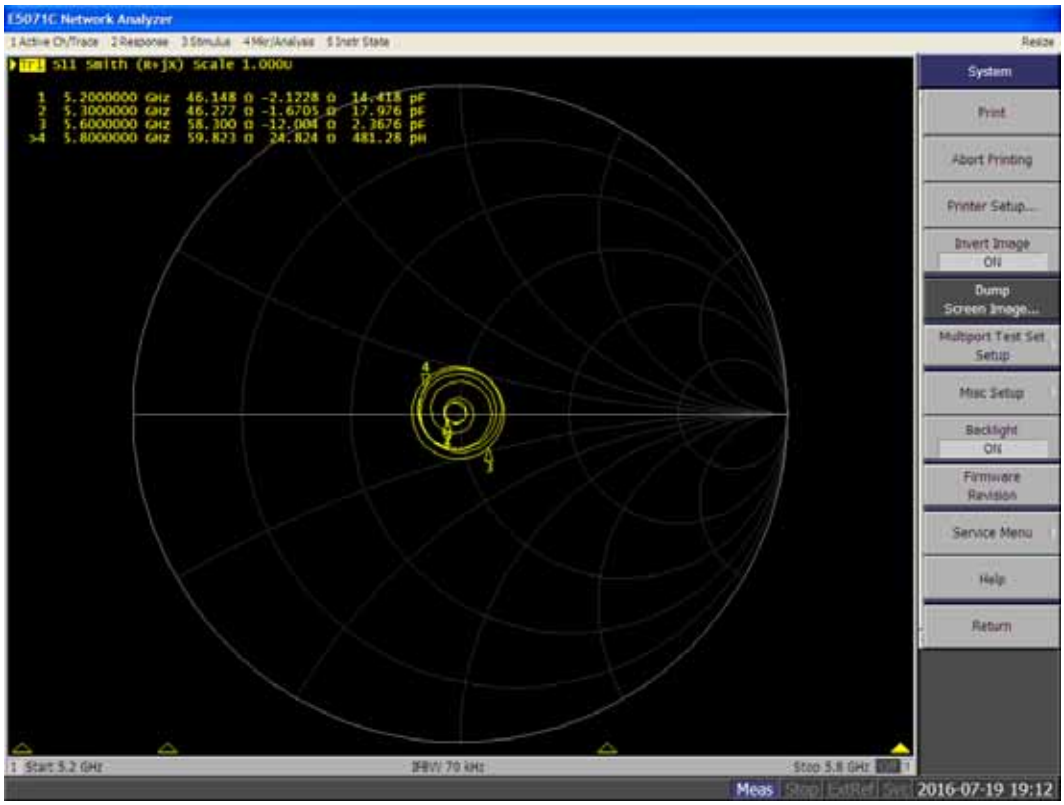
5.10. Annual Internal Check of Dipole

2450MHz Body calibrated impedance 53.027Ω; measured impedance: 53.072Ω (within 5Ω)

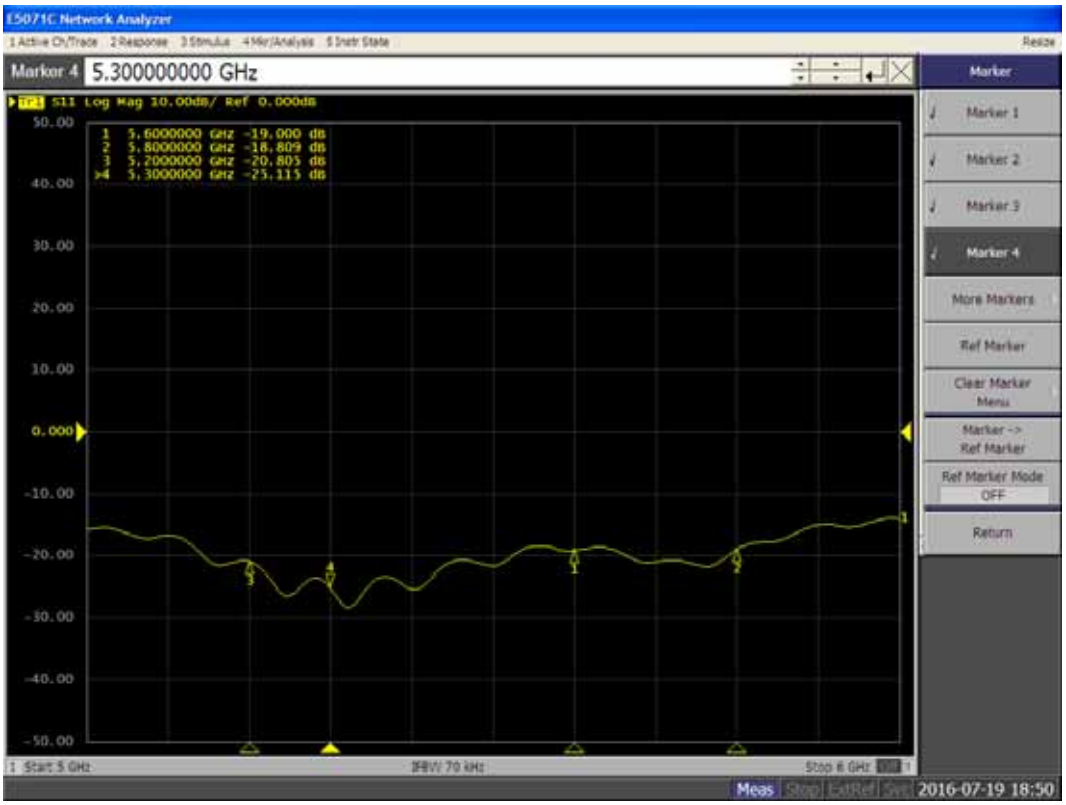


2450MHz Body calibrated return loss: -26.642 dB; Measured return loss: -26.245dB (within 20%)



5200MHz Body calibrated impedance 50.602Ω; measured impedance: 46.148Ω (within 5Ω) 5300MHz Body calibrated impedance 50.607Ω; measured impedance: 46.277Ω (within 5Ω) 5600MHz Body calibrated impedance 57.824Ω; measured impedance: 58.300Ω (within 5Ω) 5800MHz Body calibrated impedance 58.828Ω; measured impedance: 56.823Ω (within 5Ω)


5200MHz Body calibrated return loss: -24.413 dB; Measured return loss: -20.805dB (within 20%)
5300MHz Body calibrated return loss: -25.153 dB; Measured return loss: -25.115dB (within 20%)
5600MHz Body calibrated return loss: -22.766 dB; Measured return loss: -19.000dB (within 20%)
5800MHz Body calibrated return loss: -20.937 dB; Measured return loss: -18.809dB (within 20%)



6. The SAR Measurement Procedure

6.1. System Performance Check

6.1.1 Purpose

1. To verify the simulating liquids are valid for testing.
2. To verify the performance of testing system is valid for testing.

6.1.2 Tissue Dielectric Parameters for Head and Body Phantoms

Target Frequency	Head		Body	
(MHz)	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
850	41.5	0.92	55.2	0.99
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	**52.7**	**1.95**
3000	38.5	2.40	52.0	2.73
5200	36.0	4.66	**49.0**	**5.30**
5300	35.87	4.76	48.88	5.42
5600	35.5	5.07	**48.5**	**5.77**
5800	35.3	5.27	**48.2**	**6.00**

(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)

6.1.3 Tissue Calibration Result

■ The dielectric parameters of the liquids were verified prior to the SAR evaluation using DASY5 Diel -ectric Assessment Kit and Agilent Vector Network Analyzer E5071C.

Tissue parameter for body							
Fre. <MHz>	Permittivity	Conductivity	Target Permittivity	Target Conductivity	Delta Permittivity%	Delta Conductivity %	Tissue Temperature℃
19-07-2016							
2450	52.48	1.97	52.70	1.95	-0.42	1.03	21.0
2412	52.59	1.95	52.70	1.95	-0.21	0.00	21.0
2437	52.72	1.96	52.70	1.95	0.03	0.51	21.0
2462	52.46	1.99	52.70	1.95	-0.46	2.05	21.0
20-07-2016							
5180	49.20	5.31	49.00	5.30	0.41	0.19	21.0
5200	49.18	5.32	49.00	5.30	0.37	0.38	21.0
5240	49.15	5.33	49.00	5.30	0.31	0.57	21.0
5260	49.14	5.34	48.85	5.42	0.59	-1.48	21.0
5300	49.13	5.36	48.85	5.42	0.57	-1.11	21.0
5320	49.13	5.37	48.85	5.42	0.57	-0.92	21.0
21-07-2016							
5500	48.59	5.63	48.61	5.65	-0.04	-0.35	21.0
5580	48.54	5.77	48.50	5.77	0.08	0.00	21.0
5600	48.53	5.78	48.50	5.77	0.06	0.17	21.0
5640	48.44	5.81	48.40	5.83	0.08	-0.26	21.0
5660	48.38	5.83	48.40	5.83	-0.04	0.09	21.0
5680	48.34	5.85	48.34	5.88	0.00	-0.56	21.0
5720	48.31	5.86	48.34	5.88	-0.06	-0.39	21.0
22-07-2016							
5745	48.51	5.95	48.27	5.94	0.50	0.13	21.0
5785	48.46	5.97	48.20	6.00	0.54	-0.50	21.0
5800	48.43	5.98	48.20	6.00	0.48	-0.33	21.0
5825	48.41	5.99	48.20	6.00	0.44	-0.17	21.0

■ Refer to KDB 865664 D01 v01r04, The depth of body tissue-equivalent liquid in a phantom must be ≥ 15.0 cm with ≤ ± 0.5 cm variation for SAR measurements ≤ 3 GHz and ≥ 10.0 cm with ≤ ± 0.5 cm variation for measurements > 3 GHz.

6.1.4 System Performance Check Procedure

The DASY5 installation includes predefined files with recommended procedures for measurements and the system performance check. They are read-only document files and destined as fully defined but unmeasured masks, so the finished system performance check must be saved under a different name. The system performance check document requires the SAM Twin Phantom or ELI4 Phantom, so the phantom must be properly installed in your system. (User defined measurement procedures can be created by opening a new document or editing an existing document file). Before you start the system performance check, you need only to tell the system with which components (probe, medium, and device) you are performing the system performance check; the system will take care of all parameters.

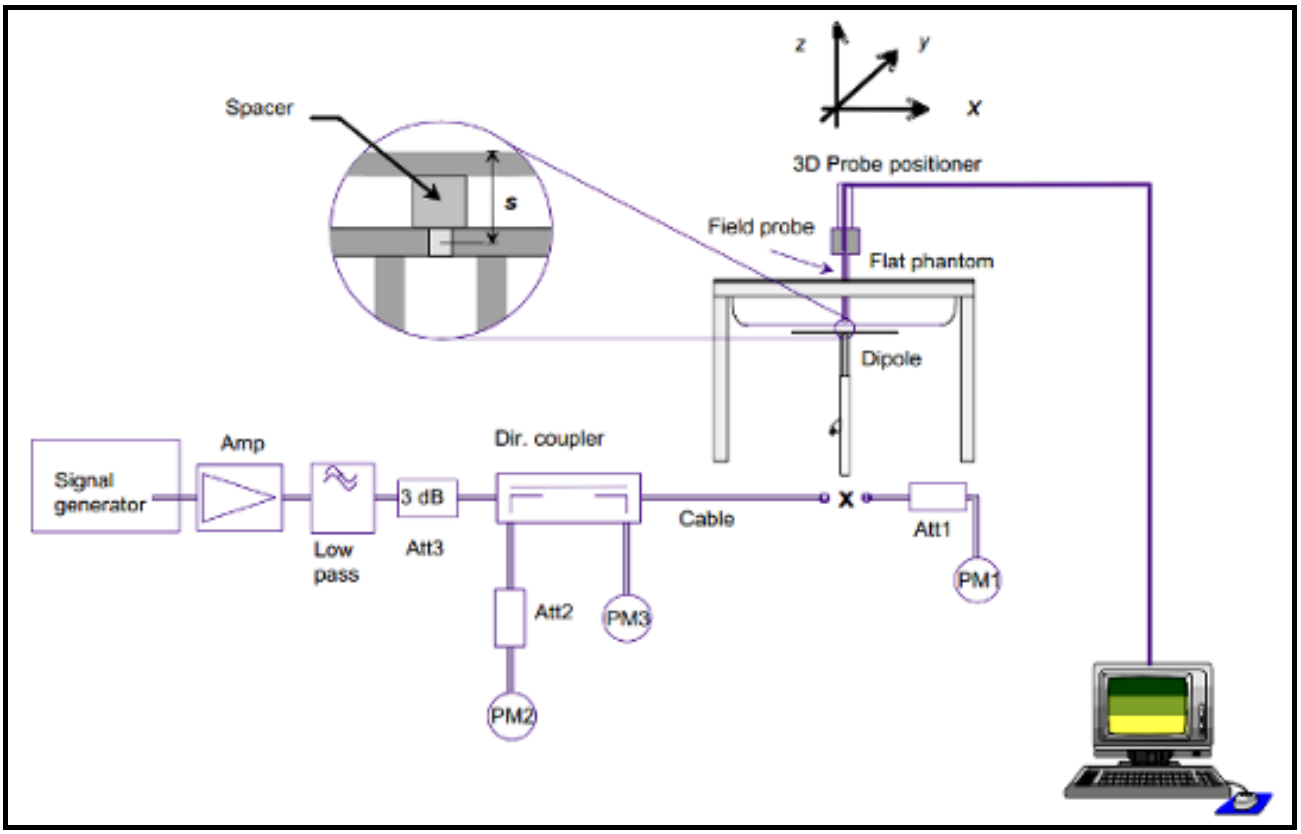
■ **The Power Reference Measurement and Power Drift Measurement** jobs are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure. The indicated drift is mainly the variation of the Dipole output power. If it is too high (above ±0.2 dB), the system performance check should be repeated;

■ **The Surface Check** job tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ±0.1mm). In that case it is better to abort the system performance check and stir the liquid;

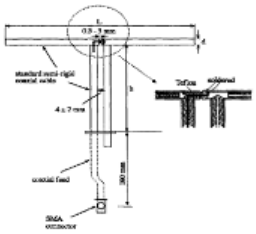
■ **The Area Scan** job measures the SAR above the dipole on a plane parallel to the surface. It is used to locate the approximate location of the peak SAR. The proposed scan uses large grid spacing for faster measurement; due to the symmetric field, the peak detection is reliable;

■ **The Zoom Scan** job measures the field in a volume around the peak SAR value assessed in the previous Area Scan job (for more information see the application note on SAR evaluation). If the system performance check gives reasonable results. The dipole input power(forward power) was 250mW, 1 g and 10 g spatial average SAR values normalized to 1W dipole input power give reference data for comparisons and it's equal to 10x(dipole forward power). The next sections analyze the expected uncertainties of these values, as well as additional checks for further information or troubleshooting.

6.1.5 System Performance Check Setup



6.1.6 Validation Dipoles

The dipoles use is based on the IEEE Std.1528-2013 and FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04 standard, and is complied with mechanical and electrical specifications in line with the requirements of both EN62209-1 and EN62209-2. The table below provides details for the mechanical and electrical specifications for the dipoles.	

6.1.7 Result of System Performance Check: Valid Result

System Performance Check at 2450MHz, 5200MHz, 5600MHz and 5800MHz for Body.

Validation Dipole: D2450V2-SN 914

Frequency [MHz]	Description	SAR [w/kg] 1g	SAR [w/kg] 10g	Tissue Temp. [°C]
2450 MHz	Reference result ± 10% window	52.5 47.25 to 57.75	24.6 22.14 to 27.06	21.0
	19-07-2016	53.2	24.2	

Validation Dipole: D5GHzV2-SN1156

Frequency [MHz]	Description	SAR [w/kg] 1g	SAR [w/kg] 10g	Tissue Temp. [°C]
5200MHz	Reference result ± 10% window	75.0 67.5 to 82.5	21.0 18.9 to 23.1	21.0
	20-07-2016	75.5	21.3	
Frequency [MHz]	Description	SAR [w/kg] 1g	SAR [w/kg] 10g	Tissue Temp. [°C]
5600MHz	Reference result ± 10% window	79.5 71.55 to 87.45	22.0 19.8 to 24.2	21.0
	21-07-2016	80.7	22.1	
Frequency [MHz]	Description	SAR [w/kg] 1g	SAR [w/kg] 10g	Tissue Temp. [°C]
5800MHz	Reference result ± 10% window	76.6 68.94 to 84.26	21.1 18.99 to 23.21	21.0
	22-07-2016	73.2	20.4	

Note: All SAR values are normalized to 1W forward power.

6.2. Test Requirements

6.2.1 Test Procedures

Step 1 Setup a Connection

First, engineer should record the conducted power before the test. Then establish a call in handset at the maximum power level with a base station simulator via air interface, or make the EUT estimate by itself in testing band. Place the EUT to the specific test location. After the testing, must export SAR test data by SEMCAD. Then writing down the conducted power of the EUT into the report, also the SAR values tested.

Step 2 Power Reference Measurements

To measure the local E-field value at a fixed location which value will be taken as a reference value for calculating a possible power drift.

Step 3 Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01v01r04

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 4 Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 v01r04

<table>
<tr><td colspan="3"></td><td>≤ 3 GHz</td><td>> 3 GHz</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·$\Delta z_{Zoom}(n-1)$</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 draft standard IEEE P1528-2011 for details.
* When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB 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>

Step 5 Power Drift Measurements

Repetition of the E-field measurement at the fixed location mentioned in Step 1 to make sure the two results differ by less than ± 0.2 dB.

6.2.2 Test Channel

Per KDB248227 D01 v02r02, channel selection procedures below apply to both the initial test configu -ration and subsequent test configureation(s):

1) 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n.

2) The largest channel bandwidth configuration is selected among the multiple configurations in a freq -uency band with the same specified maximum output power.

3) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is sele -cted.

4) If multiple configurations have the same specified maximum output power, largest channel band -width and lowest order modulation, the lowest data rate configuration among these configurations is seleced.

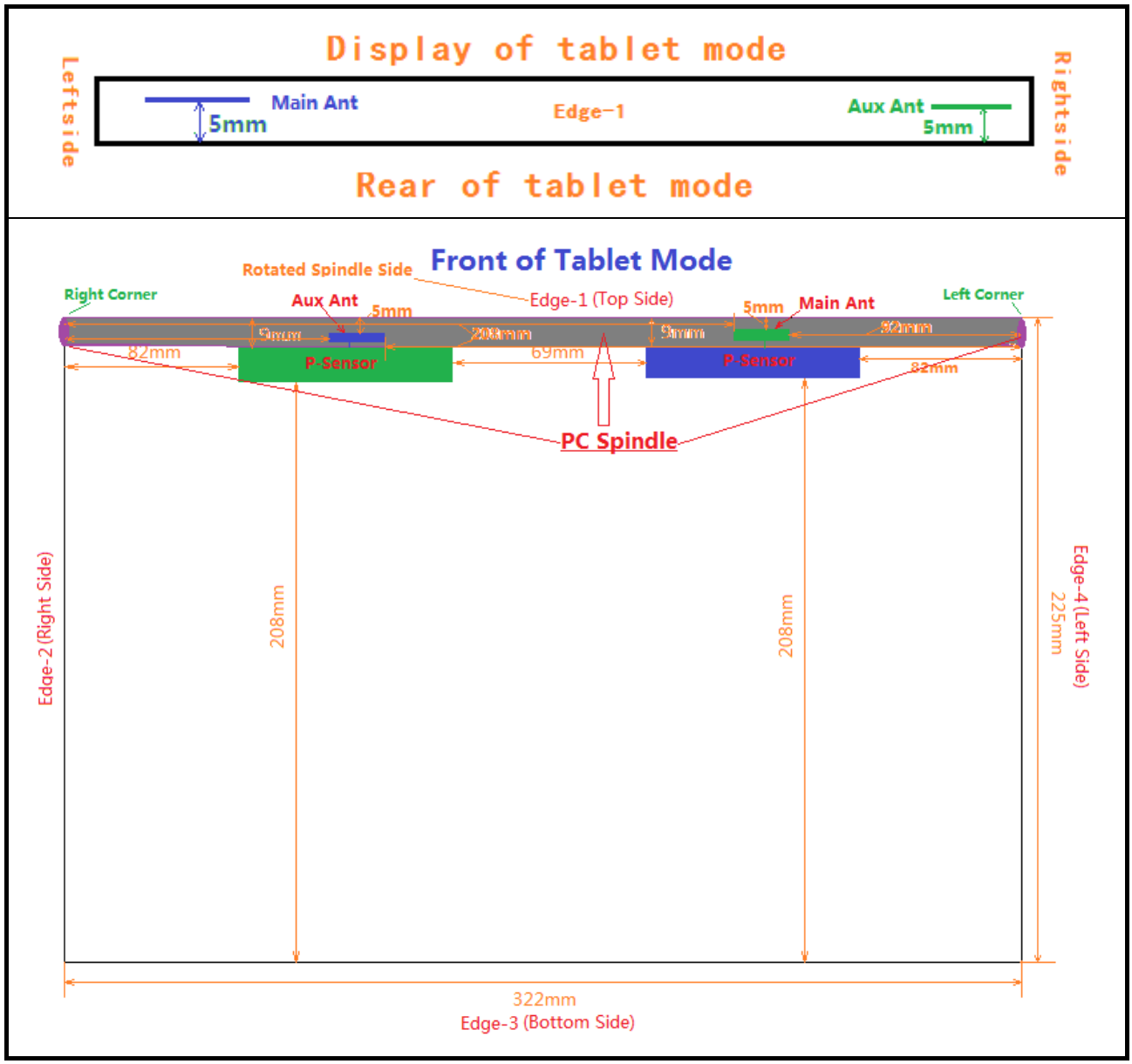
5) The same procedures also apply to subsequent highest output power channel(s) selection.

a> The channel closest to mid-band frequency is selected for SAR measurement.

b> For channels with equal separation from mid-band frequency; for example, high and low channels or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

7. Analysis of KDB 447498 D01

7.1. Antenna and Proximity Sensor Location



Antenna	Antenna Distance to Edges(mm)				
	Back	Edge_1	Edge_2	Edge_3	Edge_4
Main	5	5	82	82	208
Aux	5	5	82	82	208

7.2. Conducted Average Power

7.2.1 Maximum Tune-up Power

<QCNFA344A _WIFI 2x2Tx_ Single Chain Power>

Ch.	Freq. (MHz)	802.11b Trigger Power (dBm)					802.11HT40/VHT40 Trigger Power (dBm)				
		Notebook Mode		Tablet Mode			Notebook Mode		Tablet Mode		
		0~5mm	>5mm	0~4mm	4~7mm	>7mm	0~5mm	>5mm	0~4mm	4~7mm	>7mm
1	2412	15.0	19.0	15.0	15.0	19.0	--	--	--	--	--
3	2422	15.0	19.0	15.0	15.0	19.0	13.0	13.0	13.0	13.0	13.0
4	2427	15.0	19.0	15.0	15.0	19.0	15.0	16.0	15.0	15.0	16.0
6	2437	15.0	19.0	15.0	15.0	19.0	15.0	18.5	15.0	15.0	18.5
8	2447	15.0	19.0	15.0	15.0	19.0	15.0	16.0	15.0	15.0	16.0
9	2452	15.0	19.0	15.0	15.0	19.0	11.0	11.0	11.0	11.0	11.0
11	2462	15.0	19.0	15.0	15.0	19.0	--	--	--	--	--
Ch.	Freq. (MHz)	802.11g Trigger Power (dBm)					802.11HT20/VHT20 Trigger Power(dBm)				
		Notebook Mode		Tablet Mode			Notebook Mode		Tablet Mode		
		0~5mm	>5mm	0~4mm	4~7mm	>7mm	0~5mm	>5mm	0~4mm	4~7mm	>7mm
1	2412	15.0	18.0	15.0	15.0	18.0	15.0	17.0	15.0	15.0	17.0
3	2422	15.0	19.0	15.0	15.0	19.0	15.0	19.0	15.0	15.0	19.0
6	2437	15.0	19.0	15.0	15.0	19.0	15.0	19.0	15.0	15.0	19.0
9	2452	15.0	19.0	15.0	15.0	19.0	15.0	19.0	15.0	15.0	19.0
11	2462	15.0	18.0	15.0	15.0	18.0	15.0	16.0	15.0	15.0	16.0

Band	Ch.	Freq(MHz)	802.11a/HT20/VHT20 (dBm)				
			Notebook Mode		Tablet Mode		
			0~5mm	>5mm	0~4mm	4~7mm	>7mm
5.2G	36	5180	9.0	13.0	6.5	8.5	13.0
	38	5200	9.0	13.0	6.5	8.5	13.0
	44	5220	9.0	13.0	6.5	8.5	13.0
	48	5240	9.0	13.0	6.5	8.5	13.0
5.3G	52	5260	9.0	13.0	6.5	8.5	13.0
	56	5280	9.0	13.0	6.5	8.5	13.0
	60	5300	9.0	13.0	6.5	8.5	13.0
	64	5320	9.0	13.0	6.5	8.5	13.0
<5.65G	100	5500	10.5	13.0	7.5	9.5	13.0
	104	5520	10.5	13.0	7.5	9.5	13.0
	108	5540	10.5	13.0	7.5	9.5	13.0
	112	5560	10.5	13.0	7.5	9.5	13.0
	116	5580	10.5	13.0	7.5	9.5	13.0
	120	5600	10.5	13.0	7.5	9.5	13.0
	124	5620	10.5	13.0	7.5	9.5	13.0
	128	5640	10.5	13.0	7.5	9.5	13.0
>5.65G	132	5660	10.5	13.0	7.5	9.5	13.0
	136	5680	10.5	13.0	7.5	9.5	13.0
	140	5700	10.5	13.0	7.5	9.5	13.0
	144	5720	10.5	13.0	7.5	9.5	13.0
5.8G	149	5745	10.5	13.0	7.5	9.5	13.0
	153	5765	10.5	13.0	7.5	9.5	13.0
	157	5785	10.5	13.0	7.5	9.5	13.0
	161	5805	10.5	13.0	7.5	9.5	13.0
	165	5825	10.5	13.0	7.5	9.5	13.0

Band	Ch.	Freq.(MHz)	802.11HT40/VHT40 (dBm)				
			Notebook Mode		Tablet Mode		
			0~5mm	>5mm	0~4mm	4~7mm	>7mm
5.2G	38	5190	7.5	7.5	6.5	7.5	7.5
	46	5230	9.0	13.0	6.5	8.5	13.0
5.3G	54	5270	9.0	13.0	6.5	8.5	13.0
	62	5310	9.0	7.5	6.5	8.5	9.5
<5.65G	102	5510	6.5	6.5	6.5	6.5	6.5
	110	5550	10.5	13.0	7.5	9.5	13.0
	118	5590	10.5	13.0	7.5	9.5	13.0
	126	5630	10.5	13.0	7.5	9.5	13.0
>5.65G	134	5670	10.5	13.0	7.5	9.5	13.0
	142	5710	10.5	13.0	7.5	9.5	13.0
5.8G	151	5755	10.5	11.5	7.5	9.5	11.5
	159	5795	10.5	13.0	7.5	9.5	13.0

Band	Ch.	Freq(MHz)	802.11 VHT80 (dBm)				
			Notebook Mode		Tablet Mode		
			0~5mm	>5mm	0~4mm	4~7mm	>7mm
5.2G	42	5210	5.5	5.5	5.5	5.5	5.5
5.3G	58	5290	7.5	7.5	6.5	7.5	7.5
<5.65G	106	5530	5.5	5.5	5.5	5.5	5.5
	122	5610	10.5	13.0	7.5	9.5	13.0
>5.65G	138	5690	10.5	13.0	7.5	9.5	13.0
5.8G	155	5775	10.0	10.0	7.5	9.5	10.0

Note: As declared by applicant, two chains transmit the same power level when WIFI 2x2Tx is on.

<QCNFA344A _Bluetooth>

Max. Bluetooth Power	GFSK	8DPSK	LE
dBm	7	7	4.5

7.2.2 Measured Conducted Average Power

Proximity sensor reduced power declared by manufacture that under the controlling of QRC_CONN 30160 is measured by average power meter.

<QCNFA344A _WIFI 2x2Tx_ Single Chain Power> (Unit: dBm)

Ch.	Freq. (MHz)	Main Chain 802.11b Trigger Power					Aux Chain 802.11b Trigger Power				
		Notebook Mode		Tablet Mode			Notebook Mode		Tablet Mode		
		0~5mm	>5mm	0~4mm	4~7mm	>7mm	0~5mm	>5mm	0~4mm	4~7mm	>7mm
1	2412	14.71	18.66	14.71	14.71	18.66	14.73	18.68	14.73	14.73	18.68
6	2437	14.72	18.73	14.72	14.72	18.73	14.76	18.74	14.76	14.76	18.74
11	2462	14.69	18.69	14.69	14.69	18.69	14.71	18.72	14.71	14.71	18.72
Ch.	Freq. (MHz)	Main Chain 802.11 g Trigger Power					Aux Chain 802.11g Trigger Power				
		Notebook Mode		Tablet Mode			Notebook Mode		Tablet Mode		
		0~5mm	>5mm	0~4mm	4~7mm	>7mm	0~5mm	>5mm	0~4mm	4~7mm	>7mm
1	2412	14.78	17.76	14.78	14.78	17.76	14.72	17.72	14.72	14.72	17.72
6	2437	14.79	18.70	14.79	14.79	18.70	14.75	18.77	14.75	14.75	18.77
11	2462	14.77	17.78	14.77	14.77	17.78	14.80	17.78	14.80	14.80	17.78
Ch.	Freq. (MHz)	Main Chain 802.11n(HT20) Trigger Power					Aux Chain 802.11n(HT20) Trigger Power				
		Notebook Mode		Tablet Mode			Notebook Mode		Tablet Mode		
		0~5mm	>5mm	0~4mm	4~7mm	>7mm	0~5mm	>5mm	0~4mm	4~7mm	>7mm
1	2412	14.73	16.72	14.73	14.73	16.72	14.76	16.71	14.76	14.76	16.71
6	2437	14.78	18.78	14.78	14.78	18.78	14.72	18.73	14.72	14.72	18.73
11	2462	14.75	15.80	14.75	14.75	15.80	14.78	15.76	14.78	14.78	15.76
Ch.	Freq. (MHz)	Main Chain 802.11n(HT40) Trigger Power					Aux Chain 802.11n(HT40) Trigger Power				
		Notebook Mode		Tablet Mode			Notebook Mode		Tablet Mode		
		0~5mm	>5mm	0~4mm	4~7mm	>7mm	0~5mm	>5mm	0~4mm	4~7mm	>7mm
3	2422	12.79	12.73	12.79	12.79	12.73	12.75	12.70	12.75	12.75	12.70
4	2427	14.74	15.80	14.74	14.74	15.80	14.71	15.70	14.71	14.71	15.70
6	2437	14.77	18.30	14.77	14.77	18.30	14.80	18.25	14.80	14.80	18.25
8	2447	14.78	15.72	14.78	14.78	15.72	14.73	15.74	14.73	14.73	15.74
9	2452	10.78	10.76	10.78	10.78	10.76	10.72	10.76	10.72	10.72	10.76

Band	Ch.	Freq. (MHz)	Main Chain 802.11a Trigger Power					Aux Chain 802.11a Trigger Power				
			Notebook Mode		Tablet Mode			Notebook Mode		Tablet Mode		
			0~5 mm	>5 mm	0~4 mm	4~7 mm	>7 mm	0~5 mm	>5 mm	0~4 mm	4~7 mm	>7 mm
5.2G	36	5180	8.61	12.79	6.20	8.29	12.79	8.77	12.68	6.20	8.13	12.68
	38	5200	8.65	12.71	6.20	8.25	12.71	8.76	12.66	6.20	8.14	12.66
	44	5220	8.61	12.76	6.18	8.29	12.76	8.71	12.68	6.20	8.14	12.68
	48	5240	8.62	12.80	6.20	8.29	12.80	8.79	12.69	6.20	8.16	12.69
5.3G	52	5260	8.61	12.77	6.20	8.21	12.77	8.77	12.68	6.20	8.15	12.68
	56	5280	8.65	12.78	6.20	8.22	12.78	8.76	12.68	6.20	8.16	12.68
	60	5300	8.64	12.74	6.20	8.27	12.74	8.72	12.64	6.20	8.17	12.64
	64	5320	8.73	12.72	6.20	8.29	12.72	8.77	12.66	6.20	8.16	12.66
<5.65G	100	5500	10.25	12.75	7.26	9.25	12.75	10.27	12.67	7.23	9.1	12.67
	104	5520	10.21	12.80	7.29	9.29	12.80	10.28	12.61	7.23	9.16	12.61
	108	5540	10.27	12.77	7.28	9.24	12.77	10.21	12.6	7.26	9.12	12.6
	112	5560	10.30	12.80	7.28	9.21	12.80	10.27	12.67	7.21	9.16	12.67
	116	5580	10.27	12.71	7.19	9.21	12.71	10.20	12.62	7.22	9.12	12.62
	120	5600	10.30	12.74	7.23	9.26	12.74	10.29	12.61	7.20	9.15	12.61
	124	5620	10.21	12.76	7.22	9.25	12.76	10.23	12.62	7.27	9.17	12.62
	128	5640	10.25	12.79	7.26	9.27	12.79	10.28	12.66	7.26	9.11	12.66
>5.65G	132	5660	10.26	12.79	7.29	9.24	12.79	10.28	12.64	7.22	9.17	12.64
	136	5680	10.27	12.77	7.21	9.24	12.77	10.26	12.68	7.28	9.11	12.68
	140	5700	10.28	12.74	7.23	9.21	12.74	10.29	12.61	7.24	9.14	12.61
	144	5720	10.27	12.73	7.25	9.24	12.73	10.28	12.66	7.23	9.16	12.66
5.8G	149	5745	10.26	12.76	7.30	9.26	12.76	10.26	12.64	7.21	9.16	12.64
	153	5765	10.26	12.77	7.21	9.29	12.77	10.21	12.6	7.25	9.14	12.6
	157	5785	10.24	12.72	7.29	9.23	12.72	10.25	12.62	7.22	9.16	12.62
	161	5805	10.29	12.73	7.28	9.25	12.73	10.25	12.61	7.20	9.16	12.61
	165	5825	10.29	12.79	7.29	9.25	12.79	10.20	12.67	7.24	9.2	12.67

Band	Ch.	Freq. (MHz)	Main Chain 802.11n(HT20) Trigger Power					Aux Chain 802.11 n(HT20) Trigger Power				
			Notebook Mode		Tablet Mode			Notebook Mode		Tablet Mode		
			0~5 mm	>5 mm	0~4 mm	4~7 mm	>7 mm	0~5 mm	>5 mm	0~4 mm	4~7 mm	>7 mm
5.2G	36	5180	8.60	12.70	6.20	8.20	12.70	8.75	12.74	6.20	8.30	12.74
	38	5200	8.61	12.72	6.20	8.30	12.72	8.76	12.77	6.20	8.26	12.77
	44	5220	8.73	12.74	6.20	8.29	12.74	8.72	12.79	6.20	8.25	12.79
	48	5240	8.62	12.76	6.20	8.23	12.76	8.72	12.77	6.20	8.29	12.77
5.3G	52	5260	8.66	12.78	6.20	8.27	12.78	8.72	12.74	6.18	8.23	12.74
	56	5280	8.67	12.76	6.20	8.28	12.76	8.70	12.70	6.15	8.25	12.70
	60	5300	8.69	12.73	6.20	8.27	12.73	8.74	12.74	6.19	8.27	12.74
	64	5320	8.60	12.80	6.20	8.22	12.80	8.75	12.73	6.17	8.27	12.73
<5.65G	100	5500	10.27	12.72	7.25	9.27	12.72	10.29	12.70	7.22	9.28	12.70
	104	5520	10.24	12.74	7.30	9.24	12.74	10.27	12.74	7.29	9.21	12.74
	108	5540	10.22	12.77	7.29	9.22	12.77	10.30	12.73	7.26	9.27	12.73
	112	5560	10.28	12.78	7.24	9.24	12.78	10.26	12.79	7.23	9.22	12.79
	116	5580	10.26	12.72	7.24	9.21	12.72	10.29	12.79	7.28	9.27	12.79
	120	5600	10.23	12.71	7.27	9.26	12.71	10.20	12.79	7.28	9.26	12.79
	124	5620	10.30	12.73	7.26	9.28	12.73	10.27	12.72	7.26	9.23	12.72
	128	5640	10.20	12.78	7.27	9.21	12.78	10.24	12.77	7.21	9.25	12.77
>5.65G	132	5660	10.26	12.76	7.20	9.20	12.76	10.29	12.70	7.26	9.22	12.70
	136	5680	10.26	12.75	7.22	9.28	12.75	10.25	12.74	7.27	9.28	12.74
	140	5700	10.24	12.74	7.24	9.23	12.74	10.29	12.78	7.29	9.24	12.78
	144	5720	10.28	12.71	7.23	9.21	12.71	10.27	12.71	7.26	9.22	12.71
5.8G	149	5745	10.25	12.71	7.25	9.23	12.71	10.23	12.76	7.26	9.28	12.76
	153	5765	10.28	12.80	7.29	9.29	12.80	10.25	12.77	7.22	9.22	12.77
	157	5785	10.25	12.76	7.24	9.22	12.76	10.30	12.77	7.27	9.24	12.77
	161	5805	10.29	12.79	7.28	9.28	12.79	10.20	12.76	7.26	9.21	12.76
	165	5825	10.23	12.72	7.24	9.21	12.72	10.21	12.70	7.28	9.28	12.70

Band	Ch.	Freq. (MHz)	Main Chain 802.11n(HT40) Trigger Power					Aux Chain 802.11n(HT40) Trigger Power				
			Notebook Mode		Tablet Mode			Notebook Mode		Tablet Mode		
			0~5 mm	>5 mm	0~4 mm	4~7 mm	>7 mm	0~5 mm	>5 mm	0~4 mm	4~7 mm	>7 mm
5.2G	38	5190	7.21	7.21	6.20	7.21	7.21	7.23	7.23	6.19	7.23	7.23
	46	5230	8.69	12.73	6.20	8.22	12.73	8.78	12.84	6.20	8.17	12.84
5.3G	54	5270	8.74	12.74	6.17	8.26	12.74	8.77	12.71	6.20	8.19	12.71
	62	5310	8.71	12.77	6.18	8.21	12.77	8.73	12.64	6.20	8.27	12.64
<5.65G	102	5510	6.25	6.24	6.22	6.28	6.24	6.23	6.23	6.25	6.27	6.23
	110	5550	10.27	12.71	7.24	9.23	12.71	10.29	12.79	7.22	9.29	12.79
	118	5590	10.22	12.77	7.23	9.23	12.77	10.21	12.79	7.29	9.24	12.79
	126	5630	10.29	12.76	7.29	9.22	12.76	10.24	12.71	7.22	9.30	12.71
>5.65G	134	5670	10.26	12.79	7.22	9.27	12.79	10.26	12.73	7.23	9.24	12.73
	142	5710	10.27	12.75	7.21	9.27	12.75	10.24	12.78	7.26	9.23	12.78
5.8G	151	5755	10.23	11.25	7.26	9.28	11.25	10.28	11.21	7.28	9.27	11.21
	159	5795	10.24	12.71	7.24	9.24	12.71	10.25	12.77	7.21	9.25	12.77

Band	Ch.	Freq. (MHz)	Main Chain 802.11ac(VHT80) Trigger Power					Aux Chain 802.11 ac(VHT80) Trigger Power				
			Notebook Mode		Tablet Mode			Notebook Mode		Tablet Mode		
			0~5 mm	>5 mm	0~4 mm	4~7 mm	>7 mm	0~5 mm	>5 mm	0~4 mm	4~7 mm	>7 mm
5.2G	42	5210	5.28	5.28	5.28	5.28	5.28	5.24	5.24	5.24	5.24	5.24
5.3G	58	5290	7.22	7.22	6.24	7.22	7.22	7.19	7.19	6.23	7.19	7.19
<5.65G	106	5530	5.21	5.21	5.21	5.21	5.21	5.23	5.23	5.23	5.23	5.23
	122	5610	10.27	12.71	7.22	9.24	12.71	10.23	12.77	7.27	9.20	12.77
>5.65G	138	5690	10.23	12.74	7.23	9.26	12.74	10.21	12.74	7.20	9.27	12.74
5.8G	155	5775	9.74	9.69	7.23	9.27	9.69	9.75	9.74	7.24	9.22	9.74

Note: As declared by applicant, two chains transmit the same power level when WIFI 2x2Tx is on.

< QCNFA344A _Bluetooth >

Max. Bluetooth Power	GFSK	8DPSK	LE
dBm	7	7	4.5

7.3. SAR exclusion

Per FCC KDB 447498 D01v06 for 100MHz~6GHz:

1) The 1g-SAR exclusion threshold for distances<50mm is defined by the following equation:

$$\frac{Max\ Power\ of\ \ Channel(mW)}{Test\ Separation\ Distance(mm)} \times \sqrt{Frequency(GHz)} \le 3.0$$

5mm Test Separation

Notebook Mode		Frq. (MHz)	Test Separations (mm)	Thresholds (mW)	Max. Tune-up Power (Level 1)		SAR Test (Y/N)	Max. Tune-up Power (Level 2)		SAR Test (Y/N)
					dBm	mW		dBm	mW	
BT	V3.0	2441	5	10	7	5	N	7	5	N
	V4.0	2441	5	10	4.5	3	N	4.5	3	N
DTS	802.11b	2437	5	10	15	32	Y	19	79	Y
	802.11g	2437	5	10	15	32	Y	19	79	Y
	802.11n/ac(BW20	2437	5	10	15	32	Y	19	79	Y
	802.11n/ac(BW40	2437	5	10	15	32	Y	18.5	71	Y
U-NII-1	802.11a	5220	5	7	9	8	Y	13	20	Y
	802.11n/ac(BW20	5220	5	7	9	8	Y	13	20	Y
	802.11n/ac(BW40	5230	5	7	9	8	Y	13	20	Y
	802.11ac(VHT80)	5210	5	7	5.5	4	N	5.5	4	N
U-NII-2A	802.11a	5300	5	7	9	8	Y	13	20	Y
	802.11n/ac(BW20	5300	5	7	9	8	Y	13	20	Y
	802.11n/ac(BW40	5270	5	7	9	8	Y	13	20	Y
	802.11ac(VHT80)	5290	5	7	7.5	6	N	7.5	6	N
U-NII-2C	802.11a	5600	5	6	10.5	11	Y	13	20	Y
	802.11n/ac(BW20	5600	5	6	10.5	11	Y	13	20	Y
	802.11n/ac(BW40	5590	5	6	10.5	11	Y	13	20	Y
	802.11ac(VHT80)	5610	5	6	10.5	11	Y	13	20	Y
U-NII-3	802.11a	5785	5	6	10.5	11	Y	13	20	Y
	802.11n/ac(BW20	5785	5	6	10.5	11	Y	13	20	Y
	802.11n/ac(BW40	5795	5	6	10.5	11	Y	13	20	Y
	802.11ac(VHT80)	5775	5	6	10	10	Y	10	10	Y

Tablet Mode		Frq. (MHz)	Test Separa-tions (mm)	Thre-sholds (mW)	Max. Tune-up Power (Level 1)		SAR Test (Y/N)	Max. Tune-up Power (Level 2)		SAR Test (Y/N)	Max. Tune-up Power (Level 3)		SAR Test (Y/N)
					dBm	mW		dBm	mW		dBm	mW	
BT	V3.0	2441	5	10	7	5	N	7	5	N	7	5	N
	V4.0	2441	5	10	4.5	3	N	4.5	3	N	4.5	3	N
DTS	802.11b	2437	5	10	15	32	Y	15	32	Y	19	79	Y
	802.11g	2437	5	10	15	32	Y	15	32	Y	19	79	Y
	802.11n/ac(BW20	2437	5	10	15	32	Y	15	32	Y	19	79	Y
	802.11n/ac(BW40	2437	5	10	15	32	Y	15	32	Y	19	79	Y
U-NII-1	802.11a	5220	5	7	6.5	4	N	8.5	7	Y	13	20	Y
	802.11n/ac(BW20	5220	5	7	6.5	4	N	8.5	7	Y	13	20	Y
	802.11n/ac(BW40	5230	5	7	6.5	4	N	8.5	7	Y	13	20	Y
	802.11ac(VHT80)	5210	5	7	5.5	4	N	5.5	4	N	5.5	4	N
U-NII-2A	802.11a	5300	5	7	6.5	4	N	8.5	7	Y	13	20	Y
	802.11n/ac(BW20	5300	5	7	6.5	4	N	8.5	7	Y	13	20	Y
	802.11n/ac(BW40	5270	5	7	6.5	4	N	8.5	7	Y	13	20	Y
	802.11ac(VHT80)	5290	5	7	6.5	4	N	7.5	6	N	7.5	6	Y
U-NII-2C	802.11a	5600	5	6	7.5	6	Y	9.5	9	Y	13	20	Y
	802.11n/ac(BW20	5600	5	6	7.5	6	Y	9.5	9	Y	13	20	Y
	802.11n/ac(BW40	5590	5	6	7.5	6	Y	9.5	9	Y	13	20	Y
	802.11ac(VHT80)	5610	5	6	7.5	6	Y	9.5	9	Y	13	20	Y
U-NII-3	802.11a	5785	5	6	7.5	6	Y	9.5	9	Y	13	20	Y
	802.11n/ac(BW20	5785	5	6	7.5	6	Y	9.5	9	Y	13	20	Y
	802.11n/ac(BW40	5795	5	6	7.5	6	Y	9.5	9	Y	13	20	Y
	802.11ac(VHT80)	5775	5	6	7.5	6	Y	9.5	9	Y	10	10	Y

2) At test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following:

a. [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50mm)·(f (MHz)/150)] mW, at 100 MHz to 1500 MHz

b. [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

82mm Test Separation

Notebook Mode		Frq. (MHz)	Test Separations (mm)	Thresholds (mW)	Max. Tune-up Power (Level 1)		SAR Test (Y/N)	Max. Tune-up Power (Level 2)		SAR Test (Y/N)
					dBm	mW		dBm	mW	
BT	V3.0	2441	82	416	7	5	N	7	5	N
	V4.0	2441	82	416	4.5	3	N	4.5	3	N
DTS	802.11b	2437	82	416	15	32	N	19	79	N
	802.11g	2437	82	416	15	32	N	19	79	N
	802.11n/ac(BW20	2437	82	416	15	32	N	19	79	N
	802.11n/ac(BW40	2437	82	416	15	32	N	18.5	71	N
U-NII-1	802.11a	5220	82	386	9	8	N	13	20	N
	802.11n/ac(BW20	5220	82	386	9	8	N	13	20	N
	802.11n/ac(BW40	5230	82	386	9	8	N	13	20	N
	802.11ac(VHT80)	5210	82	386	5.5	4	N	5.5	4	N
U-NII-2A	802.11a	5300	82	385	9	8	N	13	20	N
	802.11n/ac(BW20	5300	82	385	9	8	N	13	20	N
	802.11n/ac(BW40	5270	82	385	9	8	N	13	20	N
	802.11ac(VHT80)	5290	82	385	7.5	6	N	7.5	6	N
U-NII-2C	802.11a	5600	82	383	10.5	11	N	13	20	N
	802.11n/ac(BW20	5600	82	383	10.5	11	N	13	20	N
	802.11n/ac(BW40	5590	82	383	10.5	11	N	13	20	N
	802.11ac(VHT80)	5610	82	383	10.5	11	N	13	20	N
U-NII-3	802.11a	5785	82	382	10.5	11	N	13	20	N
	802.11n/ac(BW20	5785	82	382	10.5	11	N	13	20	N
	802.11n/ac(BW40	5795	82	382	10.5	11	N	13	20	N
	802.11ac(VHT80)	5775	82	382	10	10	N	10	10	N

Tablet Mode		Frq. (MHz)	Test Separa-tions (mm)	Thre-sholds (mW)	Max. Tune-up Power (Level 1)		SAR Test (Y/N)	Max. Tune-up Power (Level 2)		SAR Test (Y/N)	Max. Tune-up Power (Level 3)		SAR Test (Y/N)
					dBm	mW		dBm	mW		dBm	mW	
BT	Bluetooth3.0	2441	82	416	7	5	N	7	5	N	7	5	N
	Bluetooth4.0	2441	82	416	4.5	3	N	4.5	3	N	4.5	3	N
DTS	802.11b	2437	82	416	15	32	N	15	32	N	19	79	N
	802.11g	2437	82	416	15	32	N	15	32	N	19	79	N
	802.11n/ac(BW20	2437	82	416	15	32	N	15	32	N	19	79	N
	802.11n/ac(BW40	2437	82	416	15	32	N	15	32	N	19	79	N
U-NII-1	802.11a	5220	82	386	6.5	4	N	8.5	7	N	13	20	N
	802.11n/ac(BW20	5220	82	386	6.5	4	N	8.5	7	N	13	20	N
	802.11n/ac(BW40	5230	82	386	6.5	4	N	8.5	7	N	13	20	N
	802.11ac(VHT80)	5210	82	386	5.5	4	N	5.5	4	N	5.5	4	N
U-NII-2A	802.11a	5300	82	385	6.5	4	N	8.5	7	N	13	20	N
	802.11n/ac(BW20	5300	82	385	6.5	4	N	8.5	7	N	13	20	N
	802.11n/ac(BW40	5270	82	385	6.5	4	N	8.5	7	N	13	20	N
	802.11ac(VHT80)	5290	82	385	6.5	4	N	7.5	6	N	7.5	6	N
U-NII-2C	802.11a	5600	82	383	7.5	6	N	9.5	9	N	13	20	N
	802.11n/ac(BW20	5600	82	383	7.5	6	N	9.5	9	N	13	20	N
	802.11n/ac(BW40	5590	82	383	7.5	6	N	9.5	9	N	13	20	N
	802.11ac(VHT80)	5610	82	383	7.5	6	N	9.5	9	N	13	20	N
U-NII-3	802.11a	5785	82	382	7.5	6	N	9.5	9	N	13	20	N
	802.11n/ac(BW20	5785	82	382	7.5	6	N	9.5	9	N	13	20	N
	802.11n/ac(BW40	5795	82	382	7.5	6	N	9.5	9	N	13	20	N
	802.11ac(VHT80)	5775	82	382	7.5	6	N	9.5	9	N	10	10	N

Note: The exclusion calculation table for antenna-to-user separation distances greater than 200 mm is unnecessary since this is mobile RF exposure conditions.

7.4. Required Edges and Surfaces for SAR Testing

Notebook Mode		Main&Aux Antenna(Level 1)					Main&Aux Antenna(Level 2)				
		Back	--	--	--	--	Back	--	--	--	--
BT	V3.0	N	--	--	--	--	N	--	--	--	--
	V4.0	N					N				
DTS	802.11b	Y	--	--	--	--	Y	--	--	--	--
	802.11g	Y	--	--	--	--	Y	--	--	--	--
	802.11n(HT20)	Y	--	--	--	--	Y	--	--	--	--
	802.11n(HT40)	Y	--	--	--	--	Y	--	--	--	--
U-NII-1	802.11a	Y	--	--	--	--	Y	--	--	--	--
	802.11n(HT20)	Y	--	--	--	--	Y	--	--	--	--
	802.11n(HT40)	Y	--	--	--	--	Y	--	--	--	--
	802.11ac(VHT	Y	--	--	--	--	Y	--	--	--	--
U-NII-2A	802.11a	Y	--	--	--	--	Y	--	--	--	--
	802.11n(HT20)	Y	--	--	--	--	Y	--	--	--	--
	802.11n(HT40)	Y	--	--	--	--	Y	--	--	--	--
	802.11ac(VHT	Y	--	--	--	--	Y	--	--	--	--
U-NII-2C	802.11a	Y	--	--	--	--	Y	--	--	--	--
	802.11n(HT20)	Y	--	--	--	--	Y	--	--	--	--
	802.11n(HT40)	Y	--	--	--	--	Y	--	--	--	--
	802.11ac(VHT	Y	--	--	--	--	Y	--	--	--	--
U-NII-3	802.11a	Y	--	--	--	--	Y	--	--	--	--
	802.11n(HT20)	Y	--	--	--	--	Y	--	--	--	--
	802.11n(HT40)	Y	--	--	--	--	Y	--	--	--	--
	802.11ac(VHT	Y	--	--	--	--	Y	--	--	--	--

Tablet Mode		Main&Aux Antenna (Level 1)					Main&Aux Antenna (Level 2)					Main&Aux Antenna (Level 3)				
		Back	Edges				Back	Edges				Back	Edges			
			1	2	3	4		1	2	3	4		1	2	3	4
BT	V3.0	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	V4.0	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
DTS	802.11b	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11g	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11n/ac(BW20	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11n/ac(BW40	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
U-NII-1	802.11a	N	N	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11n/ac(BW20	N	N	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11n/ac(BW40	N	N	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11ac(BW80)	N	N	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
U-NII-2A	802.11a	N	N	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11n/ac(BW20	N	N	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11n/ac(BW40	N	N	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11ac(BW80)	N	N	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
U-NII-2C	802.11a	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11n/ac(BW20	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11n/ac(BW40	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11ac(BW80)	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
U-NII-3	802.11a	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11n/ac(BW20	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11n/ac(BW40	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N
	802.11ac(BW80)	Y	Y	N	N	N	Y	Y	N	N	N	Y	Y	N	N	N

Note: 1. According to KDB 248227 D01 v02r02, some SAR test configurations may be reduced.

2. For test position Back and Edge1 of U-NII-1 and U-NII-2A power level1 will be tested for conservative consideration.

7.5. Estimated SAR

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v06, simultaneous transmission SAR test exclusion may be applied when the sum of the 1-g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is≤1.6W/kg. When standalone SAR is not required to be measured, per FCC KDB 447498 D01v06 4.3.2 2, the following equation must be used to estimate the standalone 1g SAR for simultaneous transmission assessment involving that transmitter.

$$Estimated\ SAR = \frac{\sqrt{f(GHz)}}{7.5} * \frac{(Max\ Power\ of\ channel, mW)}{Min.\ Separation, mm}$$

Where: Test separation distances ≤ 50mm.

WIFI/ Bluetooth

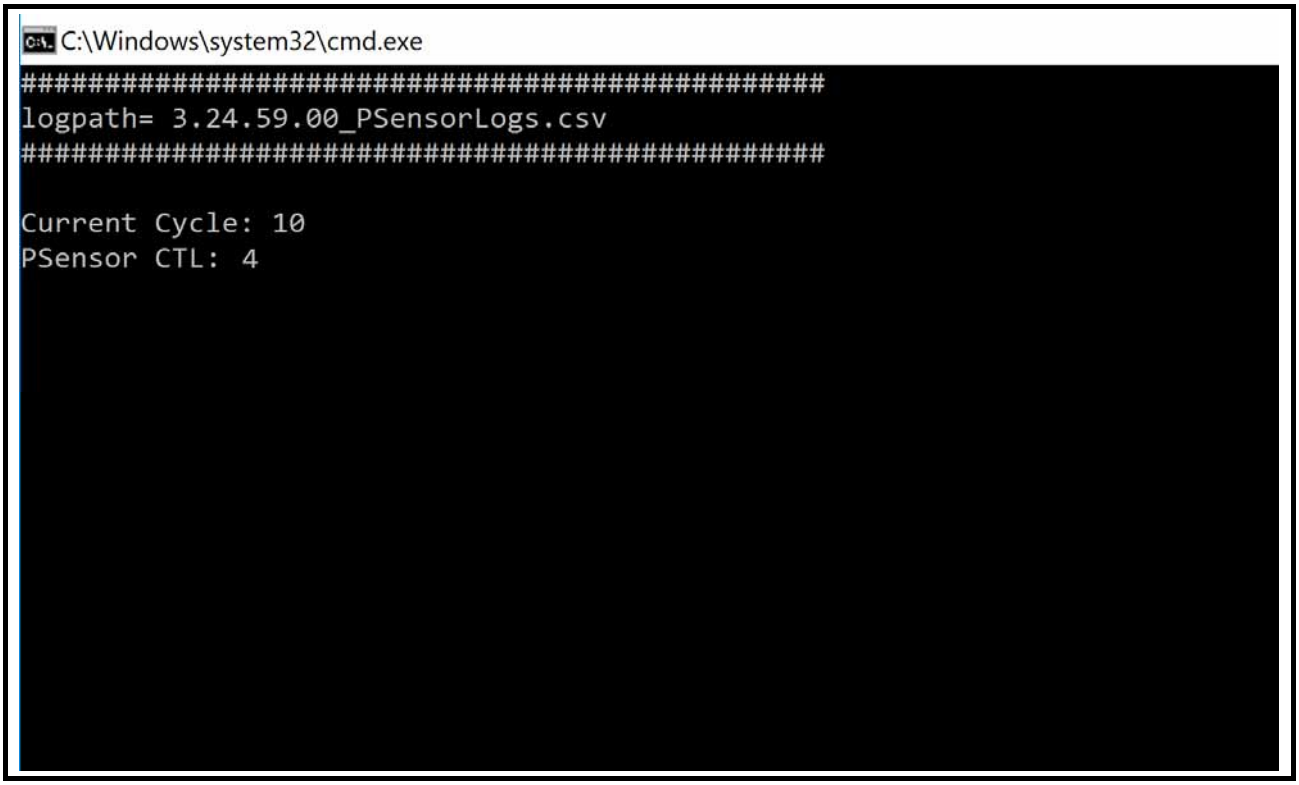
Test Mode	Frq.(MHz)	Test Position	Test Separations	Max. Tune-up Power(dBm)	Max. Tune-up Power(mW)	Estimated SAR(W/kg)
Bluetooth	2441	NB Back	5	7	5	0.29
		TB Back	5	7	5	0.29
		Edge_1	5	7	5	0.29

Note: An estimated SAR of 0.4 W/kg was used to determine simultaneous transmission SAR for test separate on distances >50mm per 447498 D01v06.

8. Analysis of Proximity Sensing

A proximity sensor for power reduction is implemented in this device to address RF exposure compliance when the Wi-Fi antenna is positioned close to the user's body. The sensor's mechanical structure is designed to fit within the enclosure design used in this device and also extended around the edge and rear of the antenna element in order to optimize sensitivity in these orientations.

The power reduction by proximity sensor triggering, test software 'PSensorTest2.bat' will represent corresponding 'PSensor CTL' value for different power levels declared by manufacturer; for example, 'PSensor CTL' value 4(as shown below)represents the P-sensor triggered power reduction level 2 for tablet mode for distance 4~7mm.



Proximity sensor operating status

	Distance	Power Level	PSensor CTL
Notebook Mode Triggering Configurations	0-5 mm	1	3
	>5mm	2	2

	Distance	Power Level	PSensor CTL
Tablet Mode Triggering Configurations	0-4mm	1	5
	4-7mm	2	4
	>7mm	3	2

8.1. Proximity Sensor Triggering Distances

Moved Towards the Phantom

Notebook Mode EUT to Phantom Distance(mm)	Rear Display Proximity Sensor Status		Rear keyboard Proximity Sensor Status	
	Trigger Level	PSensor CTL Value	Rear keyboard Trigger	PSensor CTL Value
30	Level 2	2	Level 2	2
28	Level 2	2	Level 2	2
25	Level 2	2	Level 2	2
22	Level 2	2	Level 2	2
19	Level 2	2	Level 2	2
16	Level 2	2	Level 2	2
13	Level 2	2	Level 2	2
10	Level 2	2	Level 2	2
9	Level 2	2	Level 2	2
8	Level 2	2	Level 2	2
7	Level 2	2	Level 2	2
6	Level 2	2	Level 2	2
5	Level 2	2	Level 2	2
4	Level 1	3	Level 1	3
3	Level 1	3	Level 1	3
2	Level 1	3	Level 1	3
1	Level 1	3	Level 1	3
0	Level 1	3	Level 1	3

Tablet Mode EUT to Phantom Distance(mm)	Rear Surface Proximity Sensor Status		Edge_1 Proximity Sensor Status	
	Rear Surface	PSensor CTL Value	Edge_1	PSensor CTL Value
30	Level 3	2	Level 3	2
27	Level 3	2	Level 3	2
24	Level 3	2	Level 3	2
21	Level 3	2	Level 3	2
18	Level 3	2	Level 3	2
15	Level 3	2	Level 3	2
12	Level 3	2	Level 3	2
11	Level 3	2	Level 3	2
10	Level 3	2	Level 3	2
9	Level 3	2	Level 3	2
8	Level 3	2	Level 3	2
7	Level 3	2	Level 3	2
6	Level 2	4	Level 2	4
5	Level 2	4	Level 2	4
4	Level 2	4	Level 2	4
3	Level 1	5	Level 1	5
2	Level 1	5	Level 1	5
1	Level 1	5	Level 1	5
0	Level 1	5	Level 1	5

Moved Away from Phantom

Notebook Mode EUT to Phantom Distance(mm)	Rear Display Proximity Sensor Status		Rear keyboard Proximity Sensor Status	
	Rear Display Trigger Level	PSensor CTL Value	Rear keyboard Trigger Level	PSensor CTL Value
0	Level 1	3	Level 1	3
1	Level 1	3	Level 1	3
2	Level 1	3	Level 1	3
3	Level 1	3	Level 1	3
4	Level 1	3	Level 1	3
5	Level 2	2	Level 2	2
6	Level 2	2	Level 2	2
7	Level 2	2	Level 2	2
8	Level 2	2	Level 2	2
9	Level 2	2	Level 2	2
10	Level 2	2	Level 2	2
13	Level 2	2	Level 2	2
16	Level 2	2	Level 2	2
19	Level 2	2	Level 2	2
22	Level 2	2	Level 2	2
25	Level 2	2	Level 2	2
28	Level 2	2	Level 2	2
30	Level 2	2	Level 2	2

Tablet Mode EUT to Phantom Distance(mm)	Proximity Sensor Status		Proximity Sensor Status	
	Rear Surface	PSensor CTL Value	Edge_1	PSensor CTL Value
0	Level 1	5	Level 1	5
1	Level 1	5	Level 1	5
2	Level 1	5	Level 1	5
3	Level 1	5	Level 1	5
4	Level 2	4	Level 2	4
5	Level 2	4	Level 2	4
6	Level 2	4	Level 2	4
7	Level 3	2	Level 3	2
8	Level 3	2	Level 3	2
9	Level 3	2	Level 3	2
10	Level 3	2	Level 3	2
11	Level 3	2	Level 3	2
12	Level 3	2	Level 3	2
15	Level 3	2	Level 3	2
18	Level 3	2	Level 3	2
21	Level 3	2	Level 3	2
24	Level 3	2	Level 3	2
27	Level 3	2	Level 3	2
30	Level 3	2	Level 3	2

8.2. Coverage at the Corners of the DUT

The proximity sensor coverage at the Edge1/Edge4 Corner (Left Corner) and Edge1/Edge2 Corner (Right Corner) of the device are determined by changing the angle of the device relative to the phantom, and observing the angle at which the proximity sensor are triggered.

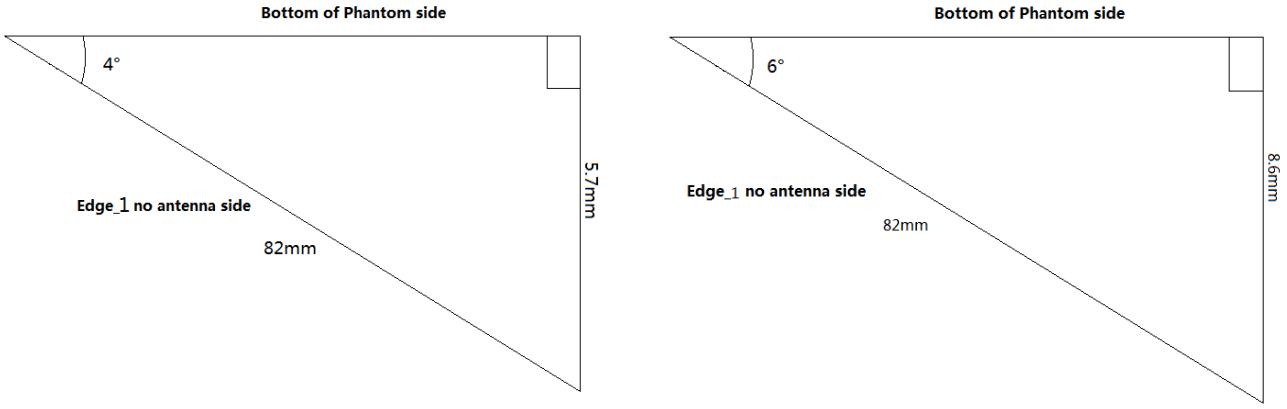
Proximity Sensor Status Table when DUT Edge1 is moving towards the phantom

Angle to EUT (Degree)	Left Corner Proximity Sensor Status		Right Corner Proximity Sensor Status	
	Left Corner	PSensor CTL Value	Right Corner	PSensor CTL Value
50	Level 3	2	Level 3	2
40	Level 3	2	Level 3	2
30	Level 3	2	Level 3	2
20	Level 3	2	Level 3	2
10	Level 3	2	Level 3	2
9	Level 3	2	Level 3	2
8	Level 3	2	Level 3	2
7	Level 3	2	Level 3	2
6	Level 3	2	Level 3	2
5	Level 2	4	Level 2	4
4	Level 2	4	Level 2	4
3	Level 1	5	Level 1	5
2	Level 1	5	Level 1	5
1	Level 1	5	Level 1	5
0	Level 1	5	Level 1	5

Proximity Sensor Status Table when DUT Edge1 is moving away from the phantom

Angle to EUT (Degree)	Left Corner Proximity Sensor Status		Right Corner Proximity Sensor Status	
	Left Corner	PSensor CTL Value	Right Corner	PSensor CTL Value
0	Level 1	5	Level 1	5
1	Level 1	5	Level 1	5
2	Level 1	5	Level 1	5
3	Level 1	5	Level 1	5
4	Level 2	4	Level 2	4
5	Level 2	4	Level 2	4
6	Level 3	2	Level 3	2
7	Level 3	2	Level 3	2
8	Level 3	2	Level 3	2
9	Level 3	2	Level 3	2
10	Level 3	2	Level 3	2
20	Level 3	2	Level 3	2
30	Level 3	2	Level 3	2
40	Level 3	2	Level 3	2
50	Level 3	2	Level 3	2

In this case, the conservative angle at which the proximity sensor is triggered is: 4° for power reducing level 2 and 6° for normal power, from the phantom.



SAR evaluation for Left and Right Corner Tilt is not performed because, the antenna-to-flat phantom distance, in this case, is 5.7mm and 8.6mm, which is more than the 4mm and 7mm for the Edge_1 (at which SAR evaluation will be performed at P-sensor power level 2 and level 3).

8.3. Coverage at the Edges of the DUT

Proximity Sensor Status Table when DUT is moving towards the phantom (Edge1 against the phantom)

Angle to EUT (Degree)	Proximity Sensor Status	
	Edge_1	PSensor CTL Value
90	level 1	5
80	level 1	5
70	level 1	5
60	level 1	5
50	level 1	5
40	level 1	5
30	level 1	5
20	level 1	5
10	level 1	5
0	level 1	5

Proximity Sensor Status Table when DUT is moving away from the phantom (Edge1 against the phantom)

Angle to EUT (Degree)	Proximity Sensor Status	
	Edge_1	PSensor CTL Value
10	level 1	5
20	level 1	5
30	level 1	5
40	level 1	5
50	level 1	5
60	level 1	5
70	level 1	5
80	level 1	5
90	level 1	5

8.4. Proximity sensor SAR test configurations

Test configurations	Proximity Sensor SAR Required	Note
Notebook Rear	Yes	
Tablet Rear	Yes	
Edge_1	Yes	
Edge_2	No	Due to proximity sensor and Wi-Fi antenna is far away from the edges, and there's no sensor coverage, so power reduced and normal power SAR is not needed.
Edge_3	No	
Edge_4	No	
Left Corner	No	The antenna-to-flat phantom distance, in this case, is 5.7mm and 8.6mm, which is more than the 4mm and 7 mm for the Rear Surface, so SAR test conducted at 4mm and 7mm is more conservative.
Right Corner	No	

9. SAR Test Results Summary

■ DTS_WLAN 2.4GHz

Plot No.	EUT Type	Ant Port	Band	Mode	Test Position	Dist. mm	Ch.	Fre.	Max. Tune-up Power(dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift(dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	NB	main	802.11b	CCK	Back	0	6	2437	15.0	14.72	1.019	-0.03	0.457	0.466
	NB	main	802.11b	CCK	Back	5	6	2437	19.0	18.73	1.014	0.14	0.867	0.879
	NB	main	802.11b	CCK	Back	5	11	2462	19.0	18.69	1.017	0.15	0.854	0.868
	NB	aux	802.11b	CCK	Back	0	6	2437	15.0	14.76	1.016	0.03	0.389	0.395
	NB	aux	802.11b	CCK	Back	5	6	2437	19.0	18.74	1.014	0.04	0.654	0.663
1	TB	main	802.11b	CCK	Edge_1	0	6	2437	15.0	14.72	1.019	-0.15	0.964	**0.982**
	TB	main	802.11b	CCK	Edge_1*	0	6	2437	15.0	14.72	1.019	0.08	0.963	0.981
	TB	main	802.11b	CCK	Edge_1	0	11	2462	15.0	14.71	1.020	0.07	0.925	0.943
	TB	main	802.11b	CCK	Edge_1/ 10° Tilt	0	6	2437	15.0	14.72	1.019	0.03	0.936	0.954
	TB	main	802.11b	CCK	Back	0	6	2437	15.0	14.72	1.019	0.06	0.237	0.241
	TB	main	802.11b	CCK	Edge_1	7	6	2437	19.0	18.73	1.014	0.07	0.634	0.643
	TB	aux	802.11b	CCK	Edge_1	0	6	2437	15.0	14.76	1.016	-0.08	0.662	0.673
	TB	aux	802.11b	CCK	Edge_1/ 10° Tilt	0	6	2437	15.0	14.76	1.016	0.12	0.634	0.644
	TB	aux	802.11b	CCK	Back	0	6	2437	15.0	14.76	1.016	0.13	0.183	0.186
	TB	aux	802.11b	CCK	Edge_1	7	6	2437	19.0	18.74	1.014	0.07	0.617	0.626

Note:

1. "NB" = Notebook mode, "TB" = Tablet mode.

2. Edge_1 tilt SAR is reduced with the tilt angle increasing, and Edge_1/ 10° tilt SAR is the worst.

3. Per KDB248227 D01 v02r02 section 5.2.1 2), when the reported SAR is > 0.8 W/kg, SAR is required for that exposure con figuration 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.

4. 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, 802.11ssg/n OFDM SAR is not required, per KDB248227 D01 v02r02 section 5.2.2 2).

5. "*", one repeated SAR is required, per KDB865664 D01 r01v04.

■ U-NII-1 _WLAN 5.2GHz

Plot No.	EUT Type	Ant Port	Band	Mode	Test Position	Dist. mm	Ch.	Fre.	Max. Tune-up Power(dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift(dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	NB	main	802.11n	HT40	Back	0	46	5230	9.0	8.69	1.04	0.14	1.13	1.17
	NB	main	802.11a	OFDM	Back	0	44	5220	9.0	8.61	1.05	-0.11	1.11	1.16
	NB	main	802.11n	HT20	Back	0	44	5220	9.0	8.73	1.03	-0.07	1.09	1.12
	NB	main	802.11n	HT40	Back	5	46	5230	13.0	12.73	1.02	0.19	0.503	0.514
	NB	aux	802.11n	HT40	Back	0	46	5230	9.0	8.78	1.03	0.01	1.02	1.05
	NB	aux	802.11n	HT40	Back	5	46	5230	13.0	12.84	1.01	-0.03	0.477	0.483
2	TB	main	802.11n	HT40	Edge_1	0	46	5230	6.5	6.20	1.05	-0.05	1.22	**1.28**
	TB	main	802.11n	HT40	Edge_1*	0	46	5230	6.5	6.20	1.05	0.04	1.21	1.27
	TB	main	802.11a	OFDM	Edge_1	0	44	5220	6.5	6.18	1.05	0.09	1.19	1.25
	TB	main	802.11n	HT20	Edge_1	0	44	5220	6.5	6.20	1.05	-0.12	1.17	1.23
	TB	main	802.11n	HT40	Back	0	46	5230	6.5	6.20	1.05	0.01	0.343	0.360
	TB	main	802.11n	HT40	Edge_1/ 10°tilt	0	46	5230	6.5	6.20	1.05	0.07	1.2	1.26
	TB	main	802.11n	HT40	Edge_1	4	46	5230	8.5	8.22	1.03	0.15	0.742	0.767
	TB	main	802.11n	HT40	Edge_1	7	46	5230	13.0	12.73	1.02	0.13	1.17	1.19
	TB	aux	802.11n	HT40	Edge_1	0	46	5230	6.5	6.20	1.05	0.15	1.13	1.18
	TB	aux	802.11n	HT40	Edge_1	0	38	5190	6.5	6.19	1.05	-0.04	1.01	1.06
	TB	aux	802.11n	HT40	Back	0	46	5230	6.5	6.20	1.05	0.16	0.204	0.214
	TB	aux	802.11n	HT40	Edge_1/ 10°tilt	0	46	5230	6.5	6.20	1.05	-0.14	1.11	1.16
	TB	aux	802.11n	HT40	Edge_1	4	46	5230	8.5	8.17	1.04	0.04	0.794	0.826
	TB	aux	802.11n	HT40	Edge_1	7	46	5230	13.0	12.84	1.01	0.14	0.974	0.986

Note:

1. "NB" = Notebook mode, "TB" = Tablet mode.

2. For test positions of U-NII-1 and U-NII-2A power level1 (test distance 0mm) of tablet mode is tested for conservative consideration.

3. Edge_1 tilt SAR is reduced with the tilt angle increasing, and Edge_1/ 10° tilt SAR is the worst.

4. When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the largest channel bandwidth configuration is selected for initial test.

5. Subsequent test configurations is required due to the adjusted SAR is >1.2W/kg.

6. "*", repeated SAR is required, per KDB865664 D01 r01v04.

■ U-NII-2A _WLAN 5.3GHz

Plot No.	EUT Type	Ant Port	Band	Mode	Test Position	Dist. mm	Ch.	Fre.	Max. Tune-up Power(dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift(dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	NB	main	802.11n	HT40	Back	0	62	5310	9.0	8.71	1.033	0.04	1.27	1.31
	NB	main	802.11a	OFDM	Back	0	60	5300	9.0	8.64	1.042	0.18	1.24	1.29
	NB	main	802.11n	HT20	Back	0	60	5300	9.0	8.69	1.036	-0.13	1.23	1.27
	NB	main	802.11a	OFDM	Back	5	60	5300	13.0	12.74	1.020	0.06	1.12	1.14
	NB	aux	802.11n	HT40	Back	0	62	5310	9.0	8.73	1.031	-0.03	1.02	1.05
	NB	aux	802.11n	HT40	Back	5	62	5310	13.0	12.64	1.028	0.12	0.621	0.639
3	TB	main	802.11a	VHT80	Edge_1	0	58	5290	6.5	6.20	1.048	0.05	1.28	**1.34**
	TB	main	802.11a	VHT80	Edge_1*	0	58	5290	6.5	6.20	1.048	0.17	1.27	1.33
	TB	main	802.11n	HT40	Edge_1	0	62	5310	6.5	6.18	1.052	0.03	1.23	1.29
	TB	main	802.11a	OFDM	Edge_1	0	60	5300	6.5	6.20	1.048	-0.01	1.24	1.30
	TB	main	802.11n	HT20	Edge_1	0	60	5300	6.5	6.20	1.048	0.19	1.22	1.28
	TB	main	802.11a	VHT80	Back	0	58	5290	6.5	6.20	1.048	0.06	0.287	0.301
	TB	main	802.11ac	VHT80	Edge_1/ 10°tilt	0	58	5290	6.5	6.20	1.048	-0.15	1.26	1.32
	TB	main	802.11n	HT40	Edge_1	4	62	5310	8.5	8.21	1.035	0.10	1.14	1.18
	TB	main	802.11n	HT40	Edge_1	7	62	5310	13.0	12.77	1.018	0.16	1.19	1.21
	TB	aux	802.11a	VHT80	Edge_1	0	58	5290	6.5	6.20	1.048	0.05	1.16	1.22
	TB	aux	802.11n	HT40	Edge_1	0	62	5310	6.5	6.20	1.048	-0.17	1.14	1.20
	TB	aux	802.11a	OFDM	Edge_1	0	60	5300	6.5	6.20	1.048	0.06	1.15	1.21
	TB	aux	802.11n	HT20	Edge_1	0	60	5300	6.5	6.19	1.050	0.04	1.13	1.19
	TB	aux	802.11a	VHT80	Back	0	58	5290	6.5	6.20	1.048	-0.15	0.279	0.293
	TB	aux	802.11ac	VHT80	Edge_1/ 10°tilt	0	58	5290	6.5	6.20	1.048	0.03	1.19	1.25
	TB	aux	802.11n	HT40	Edge_1	4	62	5310	8.5	8.27	1.028	0.15	0.766	0.787
	TB	aux	802.11n	HT40	Edge_1	7	62	5310	13.0	12.64	1.028	0.13	0.741	0.762

Note:

1. "NB" = Notebook mode, "TB" = Tablet mode.

2. For test positions of U-NII-1 and U-NII-2A power level1(test distance 0mm) of tablet mode is tested for conservative consideration.

3. Edge_1 tilt SAR is reduced with the tilt angle increasing, and Edge_1/ 10° tilt SAR is the worst.

4. When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the largest channel bandwidth configuration is selected for initial test.

5. Subsequent test configurations is required due to the adjusted SAR is >1.2W/kg.

6. "*", repeated SAR is required, per KDB865664 D01 r01v04.

■ U-NII-2C_ WLAN <5.65GHz

Plot No.	EUT Type	Ant Port	Band	Mode	Test Position	Dist. mm	Ch.	Fre.	Max. Tune-up Power(dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift(dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	NB	main	802.11a	VHT80	Back	0	122	5610	10.5	10.27	1.022	-0.15	0.922	0.943
	NB	main	802.11a	VHT80	Back	5	122	5610	13.0	12.71	1.023	0.04	0.719	0.735
	NB	aux	802.11a	VHT80	Back	0	122	5610	10.5	10.23	1.026	0.07	0.778	0.799
	NB	aux	802.11a	VHT80	Back	5	122	5610	13.0	12.77	1.018	-0.13	0.413	0.420
4	TB	main	802.11a	VHT80	Edge_1	0	122	5610	7.5	7.22	1.039	0.03	1.28	**1.33**
	TB	main	802.11a	VHT80	Edge_1*	0	122	5610	7.5	7.22	1.039	0.04	1.27	1.32
	TB	main	802.11n	HT40	Edge_1	0	118	5590	7.5	7.23	1.037	0.09	1.24	1.29
	TB	main	802.11a	OFDM	Edge_1	0	116	5580	7.5	7.19	1.043	-0.05	1.22	1.27
	TB	main	802.11n	HT20	Edge_1	0	116	5580	7.5	7.24	1.036	0.19	1.2	1.24
	TB	main	802.11a	VHT80	Back	0	122	5610	7.5	7.22	1.039	0.11	0.358	0.372
	TB	main	802.11ac	VHT80	Edge_1/ 10°tilt	0	122	5610	7.5	7.22	1.039	-0.09	1.27	1.32
	TB	main	802.11a	VHT80	Edge_1	4	122	5610	9.5	9.24	1.028	-0.05	1.25	1.29
	TB	main	802.11a	VHT80	Edge_1	7	122	5610	13.0	12.71	1.023	0.15	1.01	1.03
	TB	aux	802.11a	VHT80	Edge_1	0	122	5610	7.5	7.27	1.032	0.13	0.956	0.986
	TB	aux	802.11a	VHT80	Back	0	122	5610	7.5	7.27	1.032	0.02	0.177	0.183
	TB	aux	802.11ac	VHT80	Edge_1/ 10°tilt	0	122	5610	7.5	7.27	1.032	-0.02	0.941	0.971
	TB	aux	802.11n	VHT80	Edge_1	4	122	5610	9.5	9.20	1.033	0.07	0.517	0.534
	TB	aux	802.11n	VHT80	Edge_1	7	122	5610	13.0	12.77	1.018	0.11	0.404	0.411

Note:

1. "NB" = Notebook mode, "TB" = Tablet mode.

2. Edge_1 tilt SAR is reduced with the tilt angle increasing, and Edge_1/ 10° tilt SAR is the worst.

3. When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the largest channel bandwidth configuration is selected for initial test.

4. Subsequent test configurations is required due to the adjusted SAR is >1.2W/kg.

5. "*", repeated SAR is required, per KDB865664 D01 r01v04.

■ U-NII-2C_ WLAN >5.65GHz

Plot No.	EUT Type	Ant Port	Band	Mode	Test Position	Dist. mm	Ch.	Fre.	Max. Tune-up Power(dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift(dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	NB	main	802.11ac	VHT80	Back	0	138	5690	10.5	10.23	1.026	0.01	0.613	0.629
	NB	main	802.11ac	VHT80	Back	5	138	5690	13.0	12.74	1.020	-0.07	0.621	0.634
	NB	aux	802.11ac	VHT80	Back	0	138	5690	9.0	8.71	1.033	0.06	0.768	0.794
	NB	aux	802.11ac	VHT80	Back	5	138	5690	13.0	12.74	1.020	-0.04	0.424	0.433
	TB	main	802.11ac	VHT80	Edge_1	0	138	5690	7.5	7.23	1.037	0.12	1.23	1.28
	TB	main	802.11n	HT40	Edge_1	0	134	5670	7.5	7.18	1.045	-0.09	1.21	1.26
	TB	main	802.11a	OFDM	Edge_1	0	136	5680	7.5	7.21	1.040	0.14	1.27	1.32
	TB	main	802.11a	OFDM	Edge_1*	0	136	5680	7.5	7.21	1.040	0.13	1.25	1.30
	TB	main	802.11n	HT20	Edge_1	0	136	5680	7.5	7.22	1.039	-0.07	1.26	1.31
	TB	main	802.11a	OFDM	Back	0	136	5680	7.5	7.21	1.040	0.11	0.223	0.232
	TB	main	802.11a	OFDM	Edge_1/ 10°tilt	0	136	5680	7.5	7.21	1.040	-0.09	1.24	1.29
	TB	main	802.11a	OFDM	Edge_1	4	136	5680	9.5	9.24	1.028	0.10	0.896	0.921
	TB	main	802.11a	OFDM	Edge_1	7	136	5680	13.0	12.77	1.018	0.11	0.704	0.717
	TB	aux	802.11ac	VHT80	Edge_1	0	138	5690	7.5	7.20	1.042	0.07	0.986	1.027
	TB	aux	802.11ac	VHT80	Back	0	138	5690	7.5	7.20	1.042	-0.08	0.174	0.181
	TB	aux	802.11ac	VHT80	Edge_1/ 10°tilt	0	138	5690	7.5	7.20	1.042	0.05	0.974	1.015
	TB	aux	802.11n	VHT80	Edge_1	4	138	5690	9.5	9.27	1.025	0.09	0.621	0.636
	TB	aux	802.11n	VHT80	Edge_1	7	138	5690	13.0	12.74	1.020	0.12	0.491	0.501

Note:

1. "NB" = Notebook mode, "TB" = Tablet mode.

2. Edge_1 tilt SAR is reduced with the tilt angle increasing, and Edge_1/ 10° tilt SAR is the worst.

3. When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the largest channel bandwidth configuration is selected for initial test.

4. Subsequent test configurations is required due to the adjusted SAR is >1.2W/kg.

5. "*", repeated SAR is required, per KDB865664 D01 r01v04.

■ U-NII-3_ WLAN 5.8GHz

Plot No.	EUT Type	Ant Port	Band	Mode	Test Position	Dist. mm	Ch.	Fre.	Max. Tune-up Power(dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift(dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	NB	main	802.11n	HT40	Back	0	159	5795	10.5	10.24	1.025	-0.13	0.685	0.702
	NB	main	802.11n	HT40	Back	5	159	5795	13.0	12.71	1.023	0.08	0.436	0.446
	NB	aux	802.11n	HT40	Back	0	159	5795	10.5	10.25	1.024	-0.06	0.979	1.003
	NB	aux	802.11n	HT40	Back	5	159	5795	13.0	12.73	1.021	0.03	0.627	0.640
5	TB	main	802.11a	VHT80	Edge_1	0	155	5775	7.5	7.23	1.037	0.17	1.27	1.32
	TB	main	802.11a	VHT80	Edge_1*	0	155	5775	7.5	7.23	1.037	-0.11	1.26	1.31
	TB	main	802.11n	HT40	Edge_1	0	159	5795	7.5	7.24	1.036	0.19	1.12	1.16
	TB	main	802.11a	VHT80	Back	0	155	5775	7.5	7.23	1.037	0.06	0.287	0.298
	TB	main	802.11a	VHT80	Edge_1	4	155	5775	9.5	9.27	1.025	-0.03	0.912	0.935
	TB	main	802.11n	HT40	Edge_1	7	159	5795	13.0	12.71	1.023	0.18	0.696	0.712
	TB	aux	802.11a	VHT80	Edge_1	0	155	5775	7.5	7.24	1.036	0.06	1.24	1.28
	TB	aux	802.11n	HT40	Edge_1	0	159	5795	7.5	7.21	1.040	0.05	1.22	1.27
	TB	aux	802.11a	OFDM	Edge_1	0	157	5785	7.5	7.22	1.039	0.15	1.09	1.13
	TB	aux	802.11a	VHT80	Back	0	155	5775	7.5	7.24	1.036	0.06	0.321	0.333
	TB	aux	802.11ac	VHT80	Edge_1/ 10°tilt	0	155	5775	7.5	7.24	1.036	-0.04	1.21	1.25
	TB	aux	802.11a	VHT80	Edge_1	4	155	5775	9.5	9.22	1.030	0.03	1.2	1.24
	TB	aux	802.11n	HT40	Edge_1	7	159	5795	13.0	12.77	1.018	0.17	0.732	0.745

Note:

1. "NB" = Notebook mode, "TB" = Tablet mode.

2. Edge_1 tilt SAR is reduced with the tilt angle increasing, and Edge_1/ 10° tilt SAR is the worst.

3. When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the largest channel bandwidth configuration is selected for initial test.

4. Subsequent test configurations is required due to the adjusted SAR is >1.2W/kg.

5. "*", repeated SAR is required, per KDB865664 D01 r01v04.

■ Bluetooth

Plot No.	Ant Type	Ant Port	Band	Mode	Test Position	Dist. mm	Ch.	Fre.	Max. Tune-up Power(dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift(dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	NB	Aux	BT3.0	GFSK	Back	0	39	2441	7.00	7.00	1.00	0.00	0.0057	<0.01
	TB	Aux	BT3.0	GFSK	Back	0	39	2441	7.00	7.00	1.00	1.00	0.0064	<0.01
	TB	Aux	BT3.0	GFSK	Edge_1	0	39	2441	7.00	7.00	1.00	1.00	0.093	<0.01

Note:

1. Bluetooth SAR was carried out for conservative results.

10. Simultaneous Transmission Analysis

10.1. Max. Simultaneous SAR

■ **WLAN1 + WLAN2(Main Ant+ Aux Ant)**

Mode	EUT Type	Band	Test Position	Test Dist. (mm)	WLAN1 (W/kg)	WLAN2 (W/kg)	Σ SAR(W/kg)
DTS	Notebook	802.11b CH6	Back	5	0.879	0.663	1.542
	Tablet	802.11b CH6	Edge_1	0	0.982	0.673	1.655
U-NII-1	Notebook	802.11HT40 CH46	Back	0	1.17	1.05	2.22
	Tablet	802.11HT40 CH46	Edge_1	0	1.28	1.18	2.46
U-NII-2A	Notebook	802.11HT40 CH62	Back	0	1.31	1.05	2.36
	Tablet	802.11ac CH58	Edge_1	0	1.34	1.22	2.56
U-NII-2C	Notebook	802.11ac CH122	Back	0	0.943	0.799	1.742
	Tablet	802.11ac CH122	Edge_1	0	1.33	0.986	2.316
U-NII-3	Notebook	802.11ac CH155	Back	0	0.702	1.007	1.709
	Tablet	802.11ac CH155	Edge_1	0	1.317	1.285	2.602

Configurations	SAR1 (W/kg)	SAR2 (W/kg)	Σ SAR (W/kg)	Peak SAR1 Coordinate			Peak SAR2 Coordinates			Ri	SPLSR	SPLSR Limit	Conclusion
				x, mm	y, mm	z, mm	x, mm	y, mm	z, mm				
TB Edge_1 802.11b CH6	0.982	0.673	1.655	41.3	-57.7	-2.5	34.1	56.3	-3.1	114	0.019	0.04	Pass
NB Back 802.11HT40 CH46	1.170	1.050	2.220	42.1	-53.2	-2.3	33.3	53.2	-3.0	107	0.031	0.04	Pass
TB Edge_1 802.11HT40	1.280	1.180	2.460	41.2	-59.2	-2.2	35.3	51.5	-3.2	111	0.035	0.04	Pass
NB Back 802.11HT40 CH58	1.310	1.050	2.360	41.3	-58.7	-2.4	33.6	53.8	-3.3	113	0.032	0.04	Pass
TB Edge_1 802.11ac CH58	1.340	1.220	2.560	42.2	-51.3	-2.3	34.1	54.2	-2.9	106	0.039	0.04	Pass
NB Back 802.11ac CH122	0.943	0.799	1.742	42.8	-52.6	-2.7	33.6	53.3	-3.1	106	0.022	0.04	Pass
TB Edge_1 802.11ac CH122	1.330	0.986	2.316	42.3	-53.6	-2.8	33.7	55.3	-3.4	109	0.032	0.04	Pass
NB Back 802.11ac CH155	0.702	1.007	1.709	41.8	-53.7	-2.9	33.5	57.4	-3.3	111	0.020	0.04	Pass
TB Edge_1 802.11ac CH155	1.317	1.285	2.602	41.7	-55.9	-2.6	33.6	53.6	-3.4	110	0.038	0.04	Pass

Note: When the sum of SAR is larger than the limit, SAR test exclusion is determined by the SAR to peak location separation ratio per KDB 447498 D01v05r01; *Ratio* = $(SAR_1+SAR_2)^{1.5}/R_i \le 0.04$ for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion. The peak separation distance R_i is determined from the square root of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$, where (x_1, y_1, z_1) and (x_2, y_2, z_2) are the coordinates of the extrapolated and interpolated peak SAR locations in the zoom scan.

■ **WLAN+ Bluetooth**

No.	Configurations	Test Position	WLAN SAR(W/kg)	BT SAR(W/kg)	∑ SAR(W/kg)
1	WLAN(DTS) + BT(DSS)	NB Back	0.879	0.01	0.889
		TB Back	0.241	0.01	0.251
		TB Edge_1	0.982	0.01	0.992
		TB Edge_2	0.4	0.4	0.8
		TB Edge_3	0.4	0.4	0.8
		TB -Edge_4	0.4	0.4	0.8
2	WLAN(UNII) + BT(DSS)	NB Back	1.31	0.01	1.32
		TB Back	0.372	0.01	0.382
		TB Edge_1	1.34	0.01	1.35
		TB Edge_2	0.4	0.4	0.8
		TB Edge_3	0.4	0.4	0.8
		TB -Edge_4	0.4	0.4	0.8

Note:

1. An estimated SAR of 0.4 W/kg was used to determine simultaneous transmission SAR for test separate on distances >50mm per 447498 D01v06.

10.2. Simultaneous Transmission Conclusion

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

11. Measurement Uncertainty

Error Description	Uncert. value	Prob. Dist.	Div.	(ci) 1g	(ci) 10g	Std.Unc. (1g)	Std. nc. (10g)	(vi) veff
Measurement System								
Probe Calibration	±6.0%	N	1	1	1	±6.0%	±6.0%	∞
Axial Isotropy	±4.7%	R	$\sqrt{3}$	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	$\sqrt{3}$	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effects	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Modulation Response	±2.4%	R	$\sqrt{3}$	1	1	±1.4%	±1.4%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	$\sqrt{3}$	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.4%	R	$\sqrt{3}$	1	1	±0.2%	±0.2%	∞
Probe Positioning	±2.9%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Max.SAR Eval.	±2.0%	R	$\sqrt{3}$	1	1	±1.2%	±1.2%	∞
Test Sample Related								
Device Positioning	±2.9%	N	1	1	1	±2.9%	±2.9%	145
Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	R	$\sqrt{3}$	1	1	±2.9%	±2.9%	∞
Power Scalingp	±0%	R	$\sqrt{3}$	0	0	±0%	±0%	∞
Phantom and Setup								
Phantom Uncertainty	±6.1%	R	$\sqrt{3}$	1	1	±3.5%	±3.5%	∞
SAR correction	±1.9%	R	$\sqrt{3}$	1	0.84	±1.1%	±0.9%	∞
Liquid Conductivity (mea.)DAK	±2.5%	R	$\sqrt{3}$	0.78	0.71	±1.1%	±1.0%	∞
Liquid Permittivity (mea.)DAK	±2.5%	R	$\sqrt{3}$	0.26	0.26	±0.3%	±0.4%	∞
Temp. unc. –ConductivityBB	±3.4%	R	$\sqrt{3}$	0.78	0.71	±1.5%	±1.4%	∞
Temp. unc. – PermittivityBB	±0.4%	R	$\sqrt{3}$	0.23	0.26	±0.1%	±0.1%	∞
Combined Std. Uncertainty						±11.2%	±11.1%	361
Expanded STD Uncertainty(k=2)						**±22.3%**	**±22.2%**	

DASY5 Uncertainty Budget, according to IEEE 1528/2011 and IEC 62209-1/2011(0.3-3GHz)

Error Description	Uncert. value	Prob. Dist.	Div.	(ci) 1g	(ci) 10g	Std.Unc. (1g)	Std. nc. (10g)	(vi) veff
Measurement System								
Probe Calibration	±6.55%	N	1	0	0			
Axial Isotropy	±4.7%	R	$\sqrt{3}$	0.7	0.7	±1.9%	±1.9%	∞
Hemispherical Isotropy	±9.6%	R	$\sqrt{3}$	0.7	0.7	±3.9%	±3.9%	∞
Boundary Effects	±2.0%	R	$\sqrt{3}$	1	1	±1.2%	±1.2%	∞
Linearity	±4.7%	R	$\sqrt{3}$	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	$\sqrt{3}$	1	1	±0.6%	±0.6%	∞
Modulation Response^{m}	±2.4%	R	$\sqrt{3}$	1	1	±1.4%	±1.4%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
Response Time	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
Integration Time	±2.6%	R	$\sqrt{3}$	1	1	±1.5%	±1.5%	∞
RF Ambient Noise	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
RF Ambient Reflections	±3.0%	R	$\sqrt{3}$	1	1	±1.7%	±1.7%	∞
Probe Positioner	±0.8%	R	$\sqrt{3}$	1	1	±0.5%	±0.5%	∞
Probe Positioning	±6.7%	R	$\sqrt{3}$	1	1	±3.9%	±3.9%	∞
Max.SAR Eval.	±2.0%	R	$\sqrt{3}$	1	1	±1.2%	±1.2%	∞
Test Sample Related								
Device Positioning	±2.9%	N	1	1	1	±2.9%	±2.9%	145
Device Holder	±3.6%	N	1	1	1	±3.6%	±3.6%	5
Power Drift	±5.0%	R	$\sqrt{3}$	1	1	±2.9%	±2.9%	∞
Power Scaling^{p}	±0%	R	$\sqrt{3}$	0	0	±0%	±0%	∞
Phantom and Setup								
Phantom Uncertainty	±6.6%	R	$\sqrt{3}$	1	1	±3.8%	±3.8%	∞
SAR correction	±1.9%	R	$\sqrt{3}$	1	0.84	±1.1%	±0.9%	∞
Liquid Conductivity (mea.)^{DAK}	±2.5%	R	$\sqrt{3}$	0.78	0.71	±1.1%	±1.0%	∞
Liquid Permittivity (mea.)^{DAK}	±2.5%	R	$\sqrt{3}$	0.26	0.26	±0.3%	±0.4%	∞
Temp. unc. –Conductivity^{BB}	±3.4%	R	$\sqrt{3}$	0.78	0.71	±1.5%	±1.4%	∞
Temp. unc. – Permittivity^{BB}	±0.4%	R	$\sqrt{3}$	0.23	0.26	±0.1%	±0.1%	∞
Combined Std. Uncertainty						±12.3%	±12.2%	748
Expanded STD Uncertainty(Coverage factor=2)						**±24.6%**	**±24.5%**	

DASY5 Uncertainty Budget, according to IEEE 1528/2011 and IEC 62209-1/2011(3-6GHz)

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APPENDIX A. SAR System Verification Data

The plots for system verification with largest deviation for each SAR system combination are shown as follows.

Date/Time: 19/07/2016

Test Laboratory: Cerpass Lab

SystemPerformanceCheck-D2450 Body

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

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: f = 2450 MHz; σ = 1.97 S/m; εr = 52.48; ρ = 1000 kg/m3

Phantom section: Flat Section; Meas. Ambient Temp (celsius) -22℃; Input power-250mW

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY Configuration:

- Probe: EX3DV4 - SN3927; ConvF(7.68, 7.68, 7.68); Calibrated: 2016/5/25;
- Sensor-Surface: 4mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1379; Calibrated: 2016/5/23
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

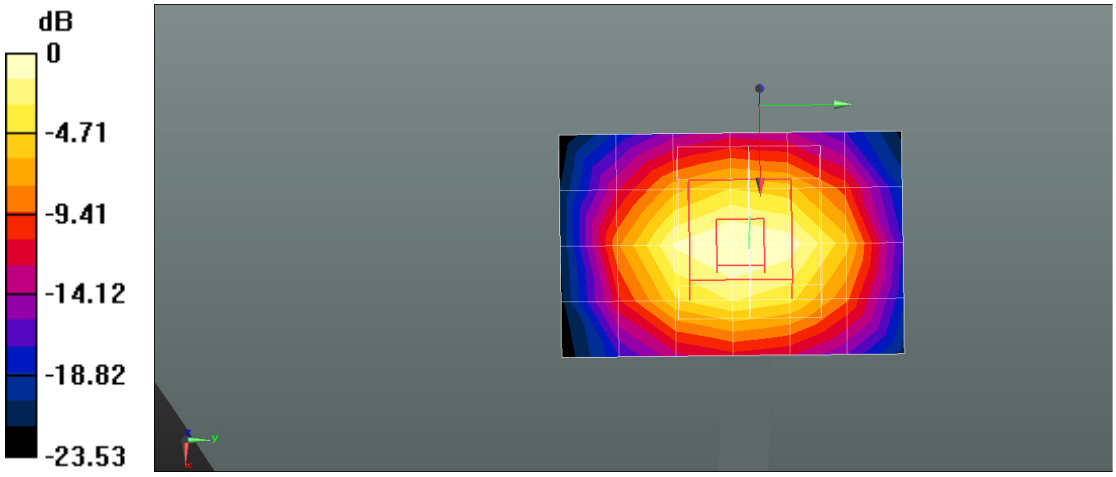
Configuration/SystemPerformanceCheck-D2450 Body/Area Scan (5x7x1):

Measurement grid: dx=12mm, dy=12mm, Maximum value of SAR (measured) = 17.7 W/kg

Configuration/SystemPerformanceCheck-D2450 Body/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm, Reference Value = 91.33 V/m; Power Drift = -0.02 dB, Peak SAR (extrapolated) = 29.3 W/kg

SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.05 W/kg Maximum value of SAR (measured) = 15.1 W/kg



0 dB = 15.1 W/kg = 11.79 dBW/kg

Date/Time: 20/07/2016

Test Laboratory: Cerpass Lab

Dipole Calibration for Body Tissue Pin=100mW, dist=10mm, f=5200 MHz

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2

Communication System: CW; Frequency: 5200 MHz

Medium parameters used: f = 5200 MHz; σ = 5.31 S/m; εr = 49.2; ρ = 1000 kg/m3

Phantom section: Flat Section; Meas. Ambient Temp (celsius) -22℃; Input power-100mW

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

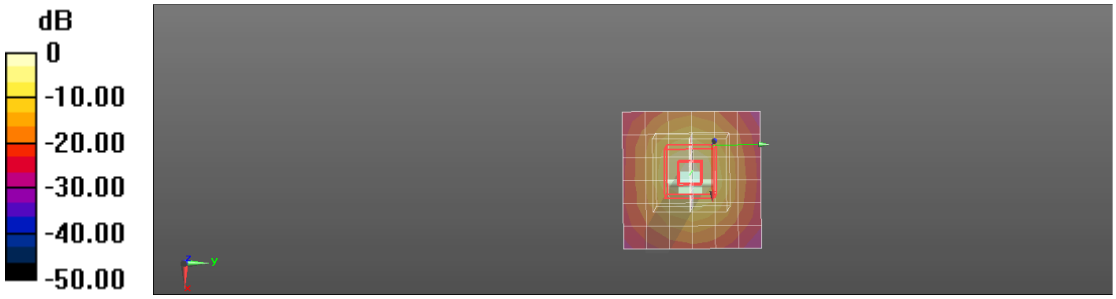
DASY Configuration:

- Probe: EX3DV4 - SN3927; ConvF(4.6, 4.6, 4.6); Calibrated: 2016/5/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1379; Calibrated: 2016/5/23
- Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA002AA;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm, Maximum value of SAR (measured) = 14.1 W/kg

Configuration/Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan (9x9x6)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm, Reference Value = 39.26 V/m; Power Drift = 0.13 Db, Peak SAR (extrapolated) = 30.5 W/kg

SAR(1 g) = 7.55 W/kg; SAR(10 g) = 2.13 W/kg Maximum value of SAR (measured) = 15.9 W/kg



0 dB = 15.9 W/kg = 12.01 dBW/kg

Date/Time: 21/07/2016

Test Laboratory: Cerpass Lab

Dipole Calibration for Body Tissue Pin=100mW, dist=10mm, f=5600 MHz

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2

Communication System: CW; Frequency: 5600 MHz

Medium parameters used: f = 5600 MHz; σ = 5.63 S/m; εr = 48.59; ρ = 1000 kg/m3

Phantom section: Flat Section; Meas. Ambient Temp (celsius) -22℃; Input power-100mW

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

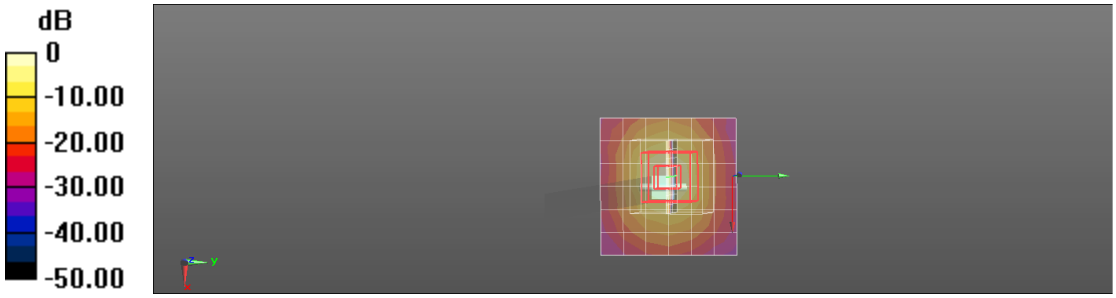
DASY Configuration:

- Probe: EX3DV4 - SN3927; ConvF(3.8, 3.8, 3.8); Calibrated: 2016/5/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1379; Calibrated: 2016/5/23
- Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA002AA;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm, Maximum value of SAR (measured) = 13.8 W/kg

Configuration/Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan (9x9x6)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm, Reference Value = 37.21 V/m; Power Drift = 0.02 dB, Peak SAR (extrapolated) = 33.2 W/kg

SAR(1 g) = 8.07 W/kg; SAR(10 g) = 2.21 W/kg Maximum value of SAR (measured) = 17.3 W/kg



0 dB = 17.3 W/kg = 12.38 dBW/kg

Date/Time: 22/07/2016

Test Laboratory: Cerpass Lab

Dipole Calibration for Body Tissue Pin=100mW, dist=10mm, f=5800 MHz

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2

Communication System: CW; Frequency: 5800 MHz

Medium parameters used: f = 5800 MHz; σ = 5.98 S/m; εr = 48.43; ρ = 1000 kg/m3

Phantom section: Flat Section; Meas. Ambient Temp (celsius) -22℃; Input power-100mW

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

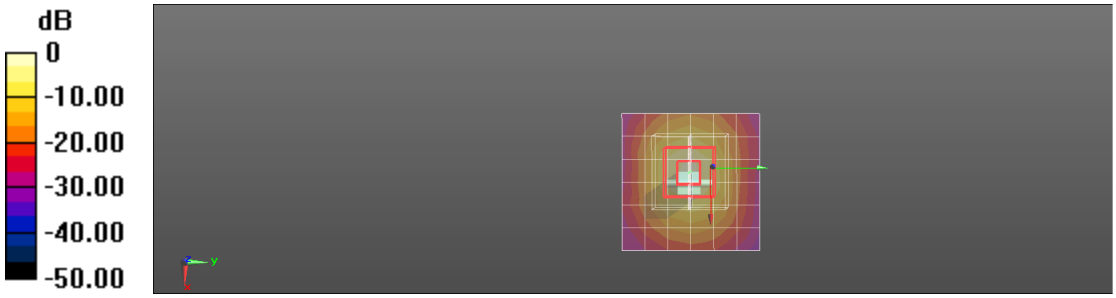
DASY Configuration:

- Probe: EX3DV4 - SN3927; ConvF(3.8, 3.8, 3.8); Calibrated: 2016/5/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection), z = 1.0, 31.0
- Electronics: DAE4 Sn1379; Calibrated: 2016/5/23
- Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA002AA;
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Configuration/Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm, Maximum value of SAR (measured) = 13.0 W/kg

Configuration/Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan (9x9x6)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm, Reference Value = 35.26 V/m; Power Drift = 0.18 dB, Peak SAR (extrapolated) = 30.8 W/kg

SAR(1 g) = 7.32 W/kg; SAR(10 g) = 2.04 W/kg Maximum value of SAR (measured) = 15.9 W/kg



0 dB = 15.9 W/kg = 12.01 dBW/kg

APPENDIX B. SAR measurement Data

The SAR plots for highest measured SAR in each exposure configuration, wireless mode and frequency band combination, and measured SAR > 1.5 W/kg are shown as follows.

Plot 1 **Date/Time: 19/07/2016**

Test Laboratory: Cerpass Lab

DUT: YOGA 910-13IKB; Type: NFA344A

Procedure Name: 802.11b 2437MHz Tablet -Edge1-main- 0mm

Communication System: 2.4GHz Wi-Fi; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): f = 2437 MHz; σ = 1.96 S/m; εr = 52.718; ρ = 1000 kg/m3; Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3927; ConvF(7.68, 7.68, 7.68); Calibrated: 2016/5/25;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1379; Calibrated: 2016/5/23
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD;
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/802.11b 2437MHz Tablet -Edge1-main- 0mm/Area Scan (5x13x1):

Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.41 W/kg

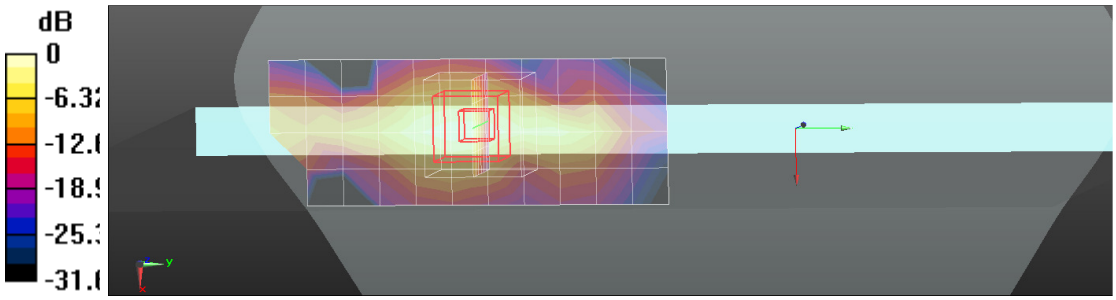
Configuration/802.11b 2437MHz Tablet -Edge1-main- 0mm/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm, Reference Value = 2.184 V/m; Power Drift = -0.15 dB, Peak SAR (extrapolated) = 2.05 W/kg

SAR(1 g) = 0.964 W/kg; SAR(10 g) = 0.420 W/kg

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.52 W/kg



0 dB = 1.52 W/kg = 1.82 dBW/kg

Plot 2 **Date/Time: 20/07/2016**

Test Laboratory: Cerpass Lab

DUT: YOGA 910-13IKB; Type: NFA344A

Procedure Name: 802.11n(40MHz) 5230MHz Tablet Edge1-Main-0mm

Communication System: 5GHz Wi-Fi (0); Frequency: 5230 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): f = 5230 MHz; σ = 5.33 S/m; εr = 49.154; ρ = 1000 kg/m3; Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3927; ConvF(4.6, 4.6, 4.6); Calibrated: 2016/5/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1379; Calibrated: 2016/5/23
- Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA002AA
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/802.11n(40MHz) 5230MHz Tablet Edge1-Main-0mm/Area Scan (6x11x1):

Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.

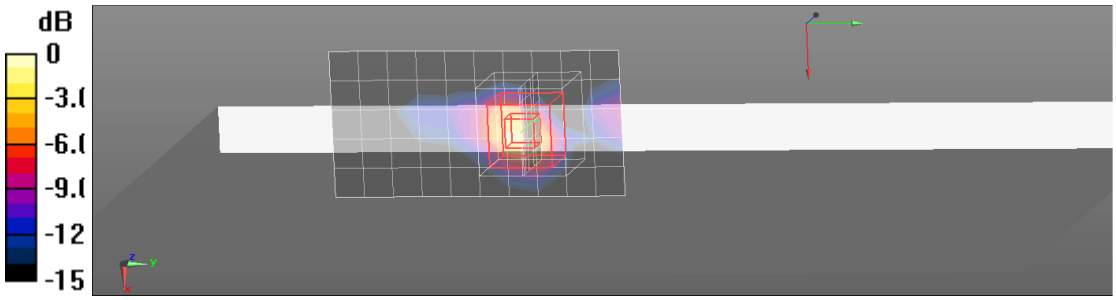
Maximum value of SAR (measured) = 1.99 W/kg

Configuration/802.11n(40MHz) 5230MHz Tablet Edge1-Main-0mm/Zoom Scan (7x7x6)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm, Reference Value = 3.756 V/m; Power Drift = -0.05 dB, Peak SAR (extrapolated) = 4.95 W/kg

SAR(1 g) = 1.22 W/kg; SAR(10 g) = 0.338 W/kg

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 2.57 W/kg



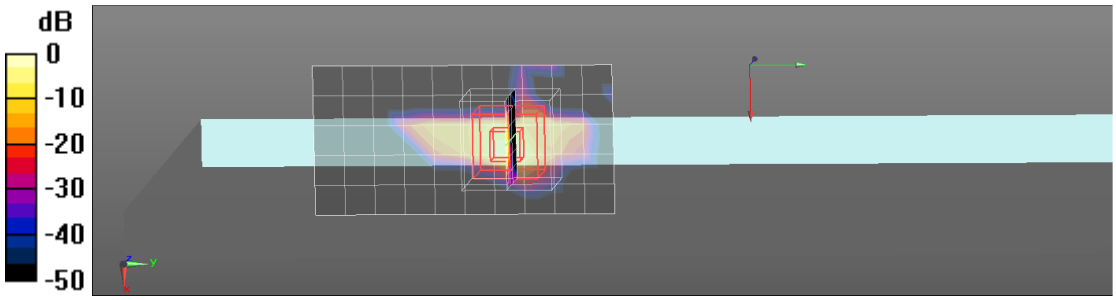
0 dB = 2.57 W/kg = 4.10 dBW/kg

Plot 3 **Date/Time: 20/07/2016**

Test Laboratory: Cerpass Lab
DUT: YOGA 910-13IKB; Type: NFA344A
Procedure Name: 802.11ac (80MHz) 5290MHz Tablet Edge1-Main-0mm
Communication System: 5GHz Wi-Fi (0); Frequency: 5290 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5290 MHz; σ = 5.36 S/m; εr = 49.134; ρ = 1000 kg/m3; Phantom section: Flat Section
DASY5 Configuration:

- Probe: EX3DV4 - SN3927; ConvF(4.28, 4.28, 4.28); Calibrated: 2016/5/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1379; Calibrated: 2016/5/23
- Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA002AA
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/802.11ac(80MHz) 5290MHz Tablet Edge1-Main-0mm/Area Scan (6x11x1):
Measurement grid: dx=10mm, dy=10mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.39 W/kg
Configuration/802.11ac(80MHz) 5290MHz Tablet Edge1-Main-0mm/Zoom Scan (7x7x6)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm, Reference Value = 0.102 V/m; Power Drift = 0.05 dB, Peak SAR (extrapolated) = 8.05 W/kg
SAR(1 g) = 1.28 W/kg; SAR(10 g) = 0.219 W/kg
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.88 W/kg



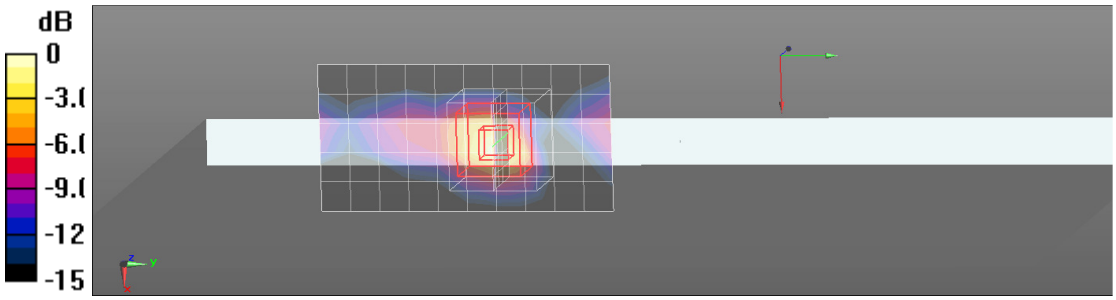
0 dB = 3.88 W/kg = 5.89 dBW/kg

Plot 4 **Date/Time: 21/07/2016**

Test Laboratory: Cerpass Lab
DUT: YOGA 910-13IKB; Type: NFA344A
Procedure Name: 802.11ac (80MHz) 5610MHz Tablet Edge1-Main-0mm
Communication System: 5GHz Wi-Fi; Frequency: 5610 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5610 MHz; σ = 5.77 S/m; εr = 48.516; ρ = 1000 kg/m3; Phantom section: Flat Section
DASY5 Configuration:

- Probe: EX3DV4 - SN3927; ConvF(3.8, 3.8, 3.8); Calibrated: 2016/5/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1379; Calibrated: 2016/5/23
- Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/802.11ac(80MHz) 5610MHz Tablet Edge1-Main-0mm/Area Scan (6x11x1):
Measurement grid: dx=10mm, dy=10mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.60 W/kg
Configuration/802.11ac(80MHz) 5610MHz Tablet Edge1-Main-0mm/Zoom Scan (7x7x6)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm, Reference Value = 3.230 V/m; Power Drift = 0.03 dB, Peak SAR (extrapolated) = 5.46 W/kg
SAR(1 g) = 1.28 W/kg; SAR(10 g) = 0.364 W/kg
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.66 W/kg



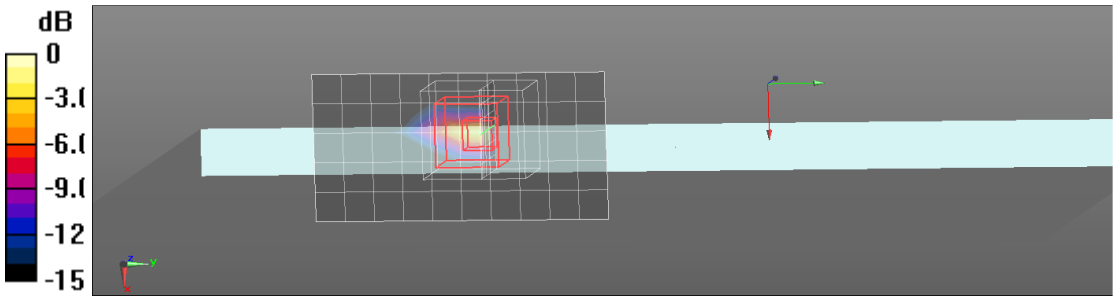
0 dB = 2.66 W/kg = 4.25 dBW/kg

Plot 5 **Date/Time: 21/07/2016**

Test Laboratory: Cerpass Lab
DUT: YOGA 910-13IKB; Type: NFA344A
Procedure Name: 802.11ac (80MHz) 5775MHz Tablet Edge1-Main-0mm
Communication System: 5GHz Wi-Fi; Frequency: 5775 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5775 MHz; σ = 5.961 S/m; εr = 48.465; ρ = 1000 kg/m3; Phantom section: Flat Section
DASY5 Configuration:

- Probe: EX3DV4 - SN3927; ConvF(3.8, 3.8, 3.8); Calibrated: 2016/5/25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1379; Calibrated: 2016/5/23
- Phantom: ELI v5.0 (20deg probe tilt); Type: QDOVA002AA; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Configuration/802.11ac(80MHz) 5775MHz Tablet Edge1-Main-0mm/Area Scan (6x11x1):
Measurement grid: dx=10mm, dy=10mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.46 W/kg
Configuration/802.11ac(80MHz) 5775MHz Tablet Edge1-Main-0mm/Zoom Scan (7x8x6)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=2mm, Reference Value = 0.123 V/m; Power Drift = 0.17 dB, Peak SAR (extrapolated) = 7.42 W/kg
SAR(1 g) = 1.27 W/kg; SAR(10 g) = 0.247 W/kg
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.50 W/kg



0 dB = 3.50 W/kg = 5.44 dBW/kg

APPENDIX C. Calibration Data for Probe, Dipole and DAE

Please refer to attached files.

APPENDIX D. Photographs of EUT and Setup

Please refer to attached files.