FCC SAR TEST REPORT

APPLICANT	:	Zebra Technologies Corporation
EQUIPMENT	:	Tablet
BRAND NAME	:	Zebra
Model Name	:	ET40AB
FCC ID	:	UZ7ET40AB
STANDARD	:	FCC 47 CFR Part 2 (2.1093)

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Si Zhang

Approved by: Si Zhang

ACCREDITED
Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China

Table of Contents

1. Statement of Compliance **4**
2. Administration Data **5**
3. Guidance Applied **5**
4. Equipment Under Test (EUT) Information **6**
4.1 General Information 6
5. Proximity Sensor Triggering Test **7**
6. RF Exposure Limits **15**
6.1 Uncontrolled Environment 15
6.2 Controlled Environment 15
7. Specific Absorption Rate (SAR) **16**
7.1 Introduction 16
7.2 SAR Definition 16
8. System Description and Setup **17**
8.1 E-Field Probe 18
8.2 Data Acquisition Electronics (DAE) 18
8.3 Phantom 19
8.4 Device Holder 20
9. Measurement Procedures **21**
9.1 Spatial Peak SAR Evaluation 21
9.2 Power Reference Measurement 22
9.3 Area Scan 22
9.4 Zoom Scan 23
9.5 Volume Scan Procedures 23
9.6 Power Drift Monitoring 23
10. Test Equipment List **24**
11. System Verification **25**
11.1 Tissue Simulating Liquids 25
11.2 Tissue Verification 26
11.3 System Performance Check Results 27
12. RF Exposure Positions **28**
12.1 SAR Testing for Tablet 28
13. Conducted RF Output Power (Unit: dBm) **29**
14. Antenna Location **74**
15. SAR Test Results **76**
15.1 Body SAR 77
15.2 Repeated SAR Measurement 79
16. Simultaneous Transmission Analysis **80**
16.1 Body Exposure Conditions 80
16.2 SPLSR Evaluation and Analysis 81
17. Uncertainty Assessment **83**
18. References **84**
Appendix A. Plots of System Performance Check
Appendix B. Plots of High SAR Measurement
Appendix C. DASY Calibration Certificate
Appendix D. Test Setup Photos

History of this test report

Report No.	Version	Description	Issued Date
FA222302	Rev. 01	Initial issue of report	May 18, 2022
FA222302	Rev. 02	Updated the sensor distance of Antenna 6	Jun. 10, 2022
FA222302	Rev. 03	Correct calibration report for probe SN3887 in appendix C	Jun. 24, 2022

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Zebra Technologies Corporation, Tablet, ET40AB,** are as follows.

Highest Standalone 1g SAR Summary				
Equipment Class	Frequency Band		Body (Separation 0mm) 1g SAR (W/kg)	Highest Simultaneous Transmission 1g SAR (W/kg)
DTS	WLAN	2.4GHz WLAN	1.25	1.25
NII		5GHz WLAN	**1.30**	1.50
DSS	Bluetooth	Bluetooth	<0.10	1.50
Date of Testing:		2022/4/13 ~ 2022/4/14 and 2022/5/27 ~ 2022/6/2		

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications

2. Administration Data

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory			
Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR07-KS	CN1257	314309

Applicant	
Company Name	Zebra Technologies Corporation
Address	1 Zebra Plaza, Holtsville, NY 11742

Manufacturer	
Company Name	Zebra Technologies Corporation
Address	1 Zebra Plaza, Holtsville, NY 11742

3. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Tablet
Brand Name	Zebra
Model Name	ET40AB
FCC ID	UZ7ET40AB
S/N	220285246E0089
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5720 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC: 13.56 MHz
Mode	WLAN 2.4GHz 802.11b/g/n/ac HT20/VHT20 WLAN 2.4GHz 802.11ax HE20 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 WLAN 5GHz 802.11ax HE20/HE40/HE80 Bluetooth BR/EDR/LE NFC: ASK
HW Version	EV2-1
SW Version	ET40-userdebug 11 11-07-10.00-RG-U00-PRD-GSE MX3 release-keys
MFD	28JAN22
EUT Stage	Identical Prototype

Remark:

1. This device has no voice function.
2. 802.11n-HT40 is not supported in 2.4GHz WLAN.
3. This device has NFC operations, the NFC antenna is integrated into the device for this model, therefore, all SAR test were performed with the device which already incorporates the NFC antenna. A diagram showing the location of the antenna can be found in the operational description. According to FCC KDB publication 447498 D01v06, transmitters are consider to be operating simultaneously when there is overlapping transmission, with the exception of transmission during network hand-offs with maximum hand-off duration less than 30 seconds.
4. For WLAN ANT6 The device employs proximity sensors that detect the presence of the user's body also a finger or hand near the bottom face, edge 4 of the device, reduced power will be active for all WLAN bands. (P-sensor can't work at detecting presence of the user's body at other edges of the device.)
5. For WLAN ANT7 The device employs proximity sensors that detect the presence of the user's body also a finger or hand near the bottom face, edge 1 of the device, reduced power will be active for all WLAN bands. (P-sensor can't work at detecting presence of the user's body at other edges of the device.)

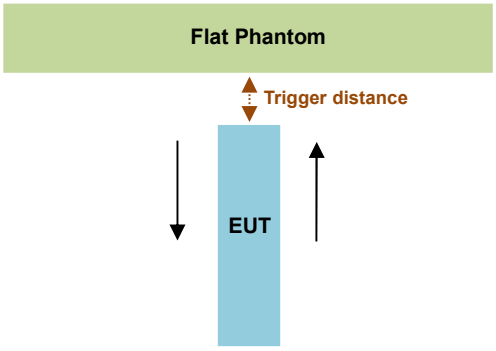
Specification of Accessory				
Battery	Brand Name	Zebra	Model Number	BT-000456

Supported Unit Used in Test Configuration and System				
AC Adapter	Brand Name	Zebra	Part Number	PWR-WUA5V12W0US
Earphone 1	Brand Name	Zebra	Part Number	HDST-35MM-PTVP-01
Earphone 2	Brand Name	Zebra	Part Number	HDST-USBC-PTT1-01
USB Cable (Type C to Type A)	Brand Name	Zebra	Part Number	CBL-TC5X-USBC2A-01
Type C-Audio Cable (Type C to 3.5mm)	Brand Name	Zebra	Part Number	ADP-USBC-35MM1-01

5. Proximity Sensor Triggering Test

<Proximity Sensor Triggering Distance (KDB 616217 D04 section 6.2)>:

1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency 5850MHz and lowest 2450MHz frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensor placed coincident with antenna elements at the Bottom Face, Edge 1/4 of the device are utilized to determine when the device comes in proximity of the user's body at the Bottom Face or Edge 1/4 side of the device. There is no need to do sensor coverage testing for the proximity sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the proximity sensor entirely covers the antenna.
3. When the sensor is active, WLAN 2.4GHz / WLAN 5.2GHz / WLAN 5.3GHz / WLAN 5.5GHz / WLAN 5.8GHz reduced power will be active.
4. The sensors used to detect the proximity of the user's body at the Bottom Face and Edge 4 side for ANT6 and Bottom Face and Edge 1 side for ANT7 of the device use a detection threshold distance. The data shown in the sections below shows the distance(s).



For ANT6

Proximity Sensor Triggering Distance (mm)				
Position	Bottom Face		Edge 4	
	Moving away	Moving towards	Moving away	Moving towards
Minimum	18	17	17	16

For ANT7

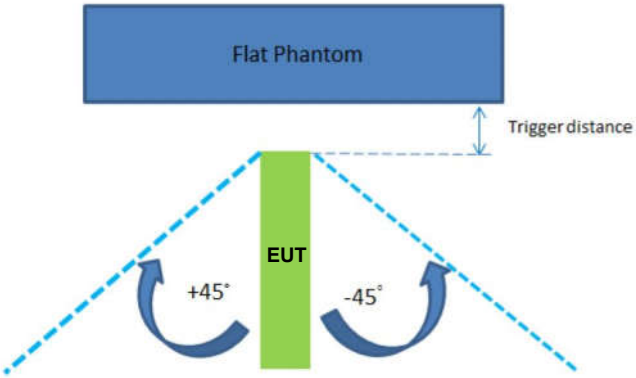
Proximity Sensor Triggering Distance (mm)				
Position	Bottom Face		Edge 1	
	Moving away	Moving towards	Moving away	Moving towards
Minimum	20	18	21	18

<Proximity Sensor Triggering Coverage (KDB 616217 D04 section 6.3)>:

If a sensor is spatially offset from the antenna(s), it is necessary to verify sensor triggering for conditions where the antenna is next to the user but the sensor is laterally further away to ensure sensor coverage is sufficient for reducing the power to maintain compliance. For p-sensor coverage testing, the device is moved and "along the direction of maximum antenna and sensor offset".
Illustrated in the internal photo exhibit, although the senor is spatially offset, there is no trigger condition where the antenna is next to the user but the sensor is laterally further away, therefore proximity sensor coverage testing is not required.
This procedure is not required because antenna and sensor are collocated and the peak SAR location is overlapping with the sensor.

<Tablet Tilt angle influences to proximity sensor triggering (KDB 616217 D04 section 6.4)>:

The influence of table tilt angles to proximity sensor triggering was determined by positioning each tablet edge that contains a transmitting antenna, perpendicular to the flat phantom, at 16mm for Edge 4 and 18mm for Edge 1 separation for WLAN bands.
Rotating the tablet around the edge next to the phantom in ≤ 10° increments until the tablet is ± 45° from the vertical position at 0°, and the maximum output power remains in the reduced mode.



For ANT6

The Sensor Trigger Distance (mm)	
Position	Edge 4
Minimum	16

For ANT7

The Sensor Trigger Distance (mm)	
Position	Edge 1
Minimum	18

Proximity sensor power reduction

For ANT6

Exposure Position / wireless mode	Bottom Face(1)	Edge 1	Edge 2	Edge 3	Edge 4(1)
WLAN 2.4GHz	2.5dB	0dB	0dB	0dB	2.5dB
WLAN 5.2GHz	9dB	0dB	0dB	0dB	9dB
WLAN 5.3GHz	9dB	0dB	0dB	0dB	9dB
WLAN 5.5GHz	9.5dB	0dB	0dB	0dB	9.5dB
WLAN 5.8GHz	10.2dB	0dB	0dB	0dB	10.2dB

For ANT7

Exposure Position / wireless mode	Bottom Face(1)	Edge 1(1)	Edge 2	Edge 3	Edge 4
WLAN 2.4GHz	3.5dB	3.5dB	0dB	0dB	0dB
WLAN 5.2GHz	7dB	7dB	0dB	0dB	0dB
WLAN 5.3GHz	7dB	7dB	0dB	0dB	0dB
WLAN 5.5GHz	7.5dB	7.5dB	0dB	0dB	0dB
WLAN 5.8GHz	4.5dB	4.5dB	0dB	0dB	0dB

Remark:

1. (1): Reduced maximum limit applied by activation of proximity sensor.
2. Tests were performed in accordance with KDB 616217 D04 section 6.1, 6.2, 6.3, 6.4 and 6.5 and compliant results are shown and described in exhibit "P-Sensor operational description
3. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance was performed:

   For ANT6
   - Bottom Face: 16 mm
   - Edge 4: 15 mm

   For ANT7
   - Bottom Face: 17 mm
   - Edge 1: 17 mm

Power Measurement during Sensor Trigger distance testing

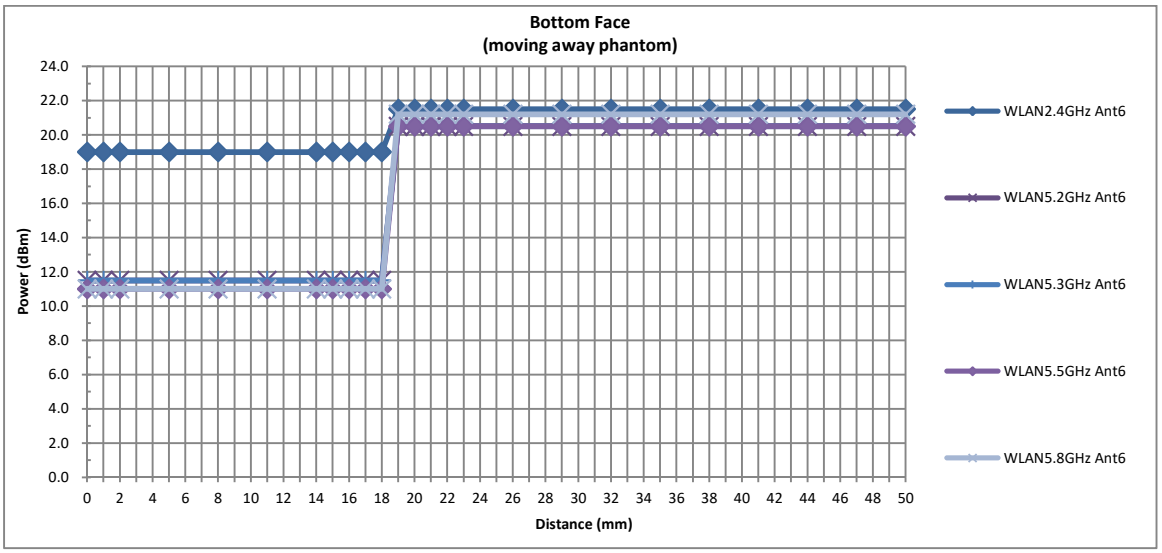
For ANT6

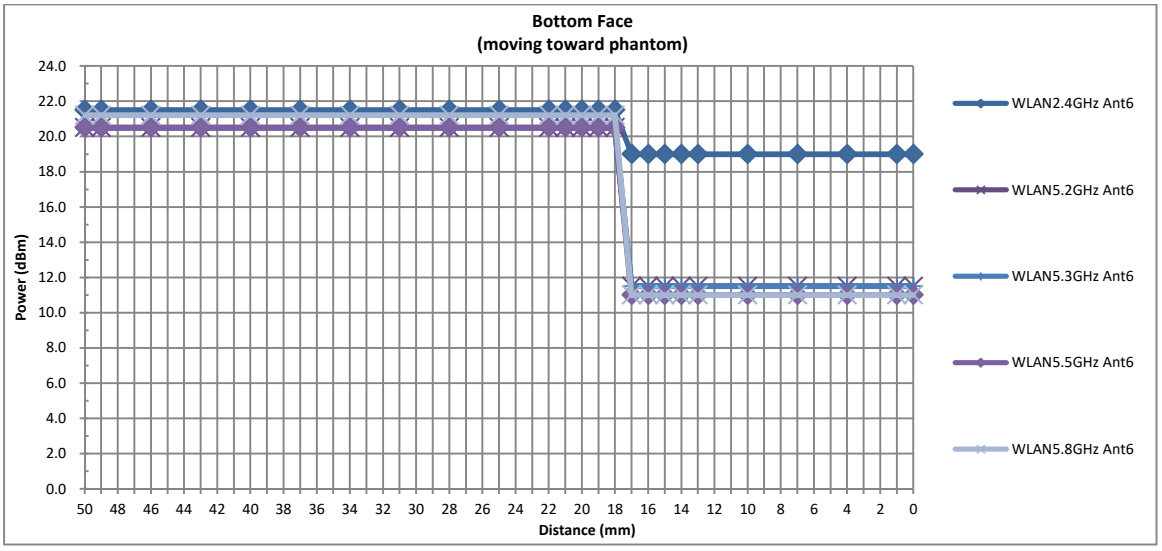
Band/Mode	Measured power reduction (dBm)		Reduction Levels
	w/o power back-off	w/ power back-off	(dB)
WLAN 2.4GHz	21.50	19.00	2.5
WLAN 5.2GHz	20.50	11.50	9
WLAN 5.3GHz	20.50	11.50	9
WLAN 5.5GHz	20.50	11.00	9.5
WLAN 5.8GHz	21.20	11.00	10.2

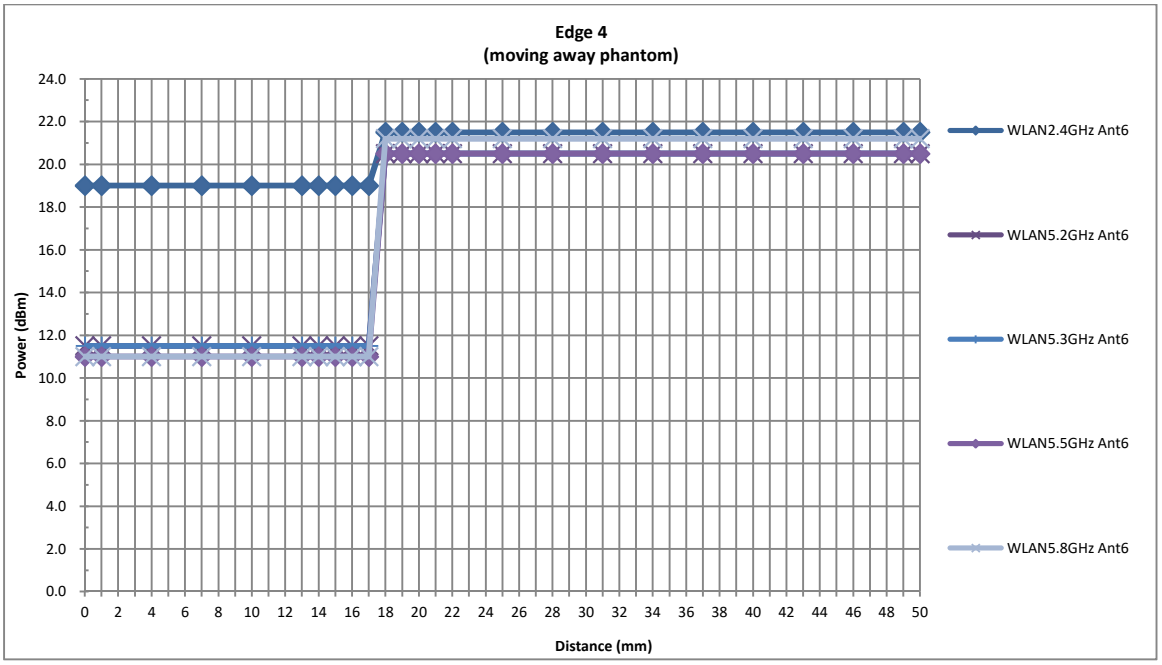
For ANT7

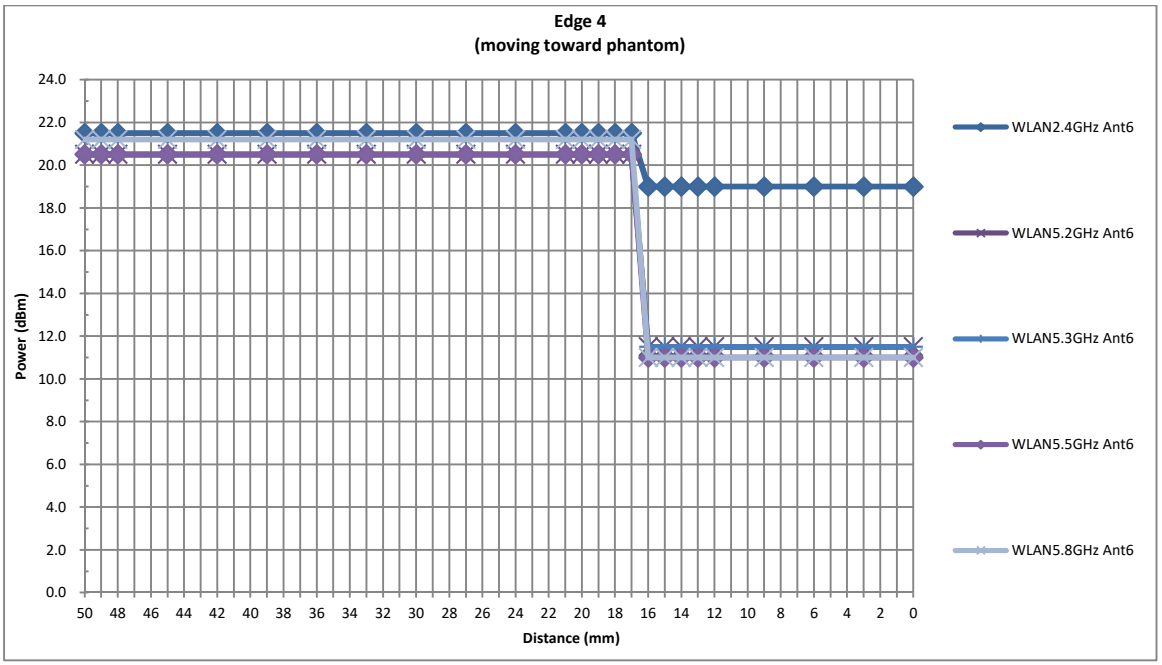
Band/Mode	Measured power reduction (dBm)		Reduction Levels
	w/o power back-off	w/ power back-off	(dB)
WLAN 2.4GHz	21.50	18.00	3.5
WLAN 5.2GHz	20.50	13.50	7
WLAN 5.3GHz	20.50	13.50	7
WLAN 5.5GHz	20.50	13.00	7.5
WLAN 5.8GHz	21.50	17.00	4.5

For ANT6

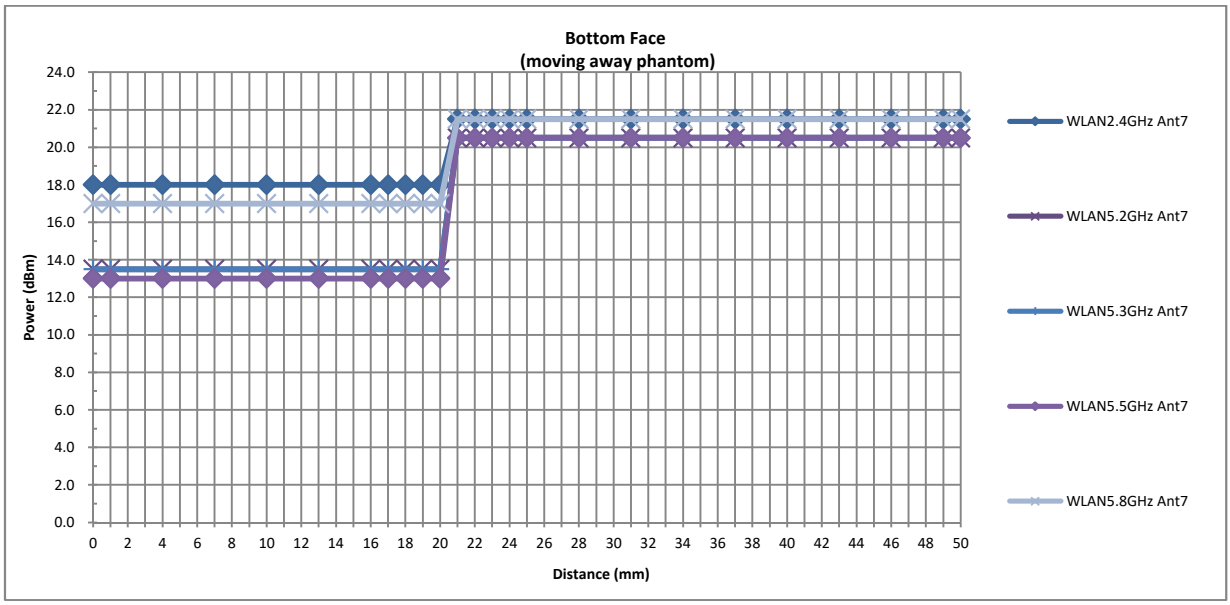

Bottom Face
(moving away phantom)
Power (dBm)
Distance (mm)
WLAN2.4GHz Ant6
WLAN5.2GHz Ant6
WLAN5.3GHz Ant6
WLAN5.5GHz Ant6
WLAN5.8GHz Ant6

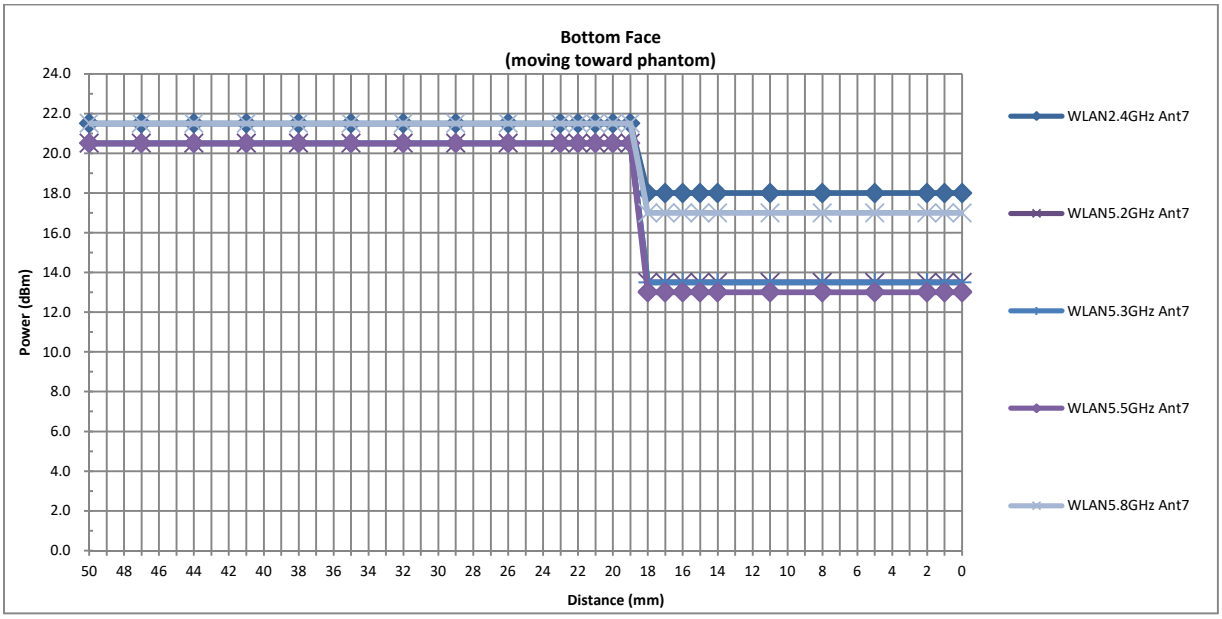

Bottom Face
(moving toward phantom)
Power (dBm)
Distance (mm)
WLAN2.4GHz Ant6
WLAN5.2GHz Ant6
WLAN5.3GHz Ant6
WLAN5.5GHz Ant6
WLAN5.8GHz Ant6

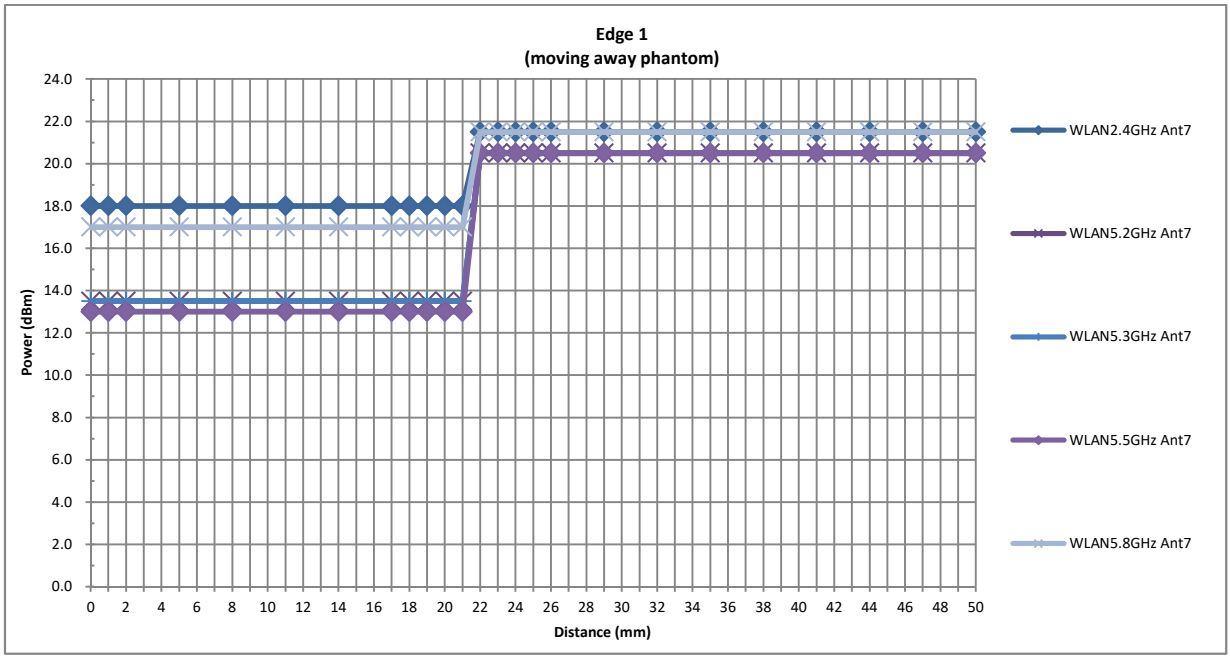

Edge 4
(moving away phantom)
Power (dBm)
Distance (mm)
WLAN2.4GHz Ant6
WLAN5.2GHz Ant6
WLAN5.3GHz Ant6
WLAN5.5GHz Ant6
WLAN5.8GHz Ant6

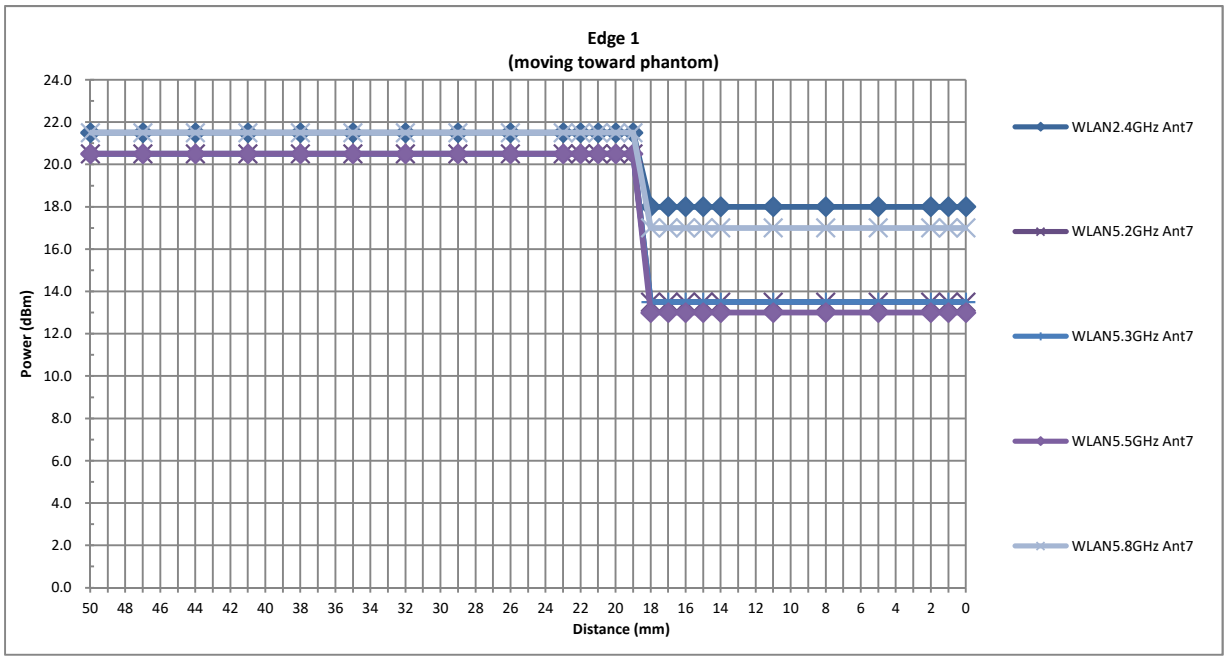

Edge 4
(moving toward phantom)
Power (dBm)
Distance (mm)
WLAN2.4GHz Ant6
WLAN5.2GHz Ant6
WLAN5.3GHz Ant6
WLAN5.5GHz Ant6
WLAN5.8GHz Ant6

For ANT7


Bottom Face
(moving away phantom)
Power (dBm)
Distance (mm)
WLAN2.4GHz Ant7
WLAN5.2GHz Ant7
WLAN5.3GHz Ant7
WLAN5.5GHz Ant7
WLAN5.8GHz Ant7


Bottom Face
(moving toward phantom)
Power (dBm)
Distance (mm)
WLAN2.4GHz Ant7
WLAN5.2GHz Ant7
WLAN5.3GHz Ant7
WLAN5.5GHz Ant7
WLAN5.8GHz Ant7


Edge 1
(moving away phantom)
Power (dBm)
Distance (mm)
WLAN2.4GHz Ant7
WLAN5.2GHz Ant7
WLAN5.3GHz Ant7
WLAN5.5GHz Ant7
WLAN5.8GHz Ant7


Edge 1
(moving toward phantom)
Power (dBm)
Distance (mm)
WLAN2.4GHz Ant7
WLAN5.2GHz Ant7
WLAN5.3GHz Ant7
WLAN5.5GHz Ant7
WLAN5.8GHz Ant7

6. RF Exposure Limits

6.1 Uncontrolled Environment

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

6.2 Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The 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.

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

7. Specific Absorption Rate (SAR)

7.1 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

7.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

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

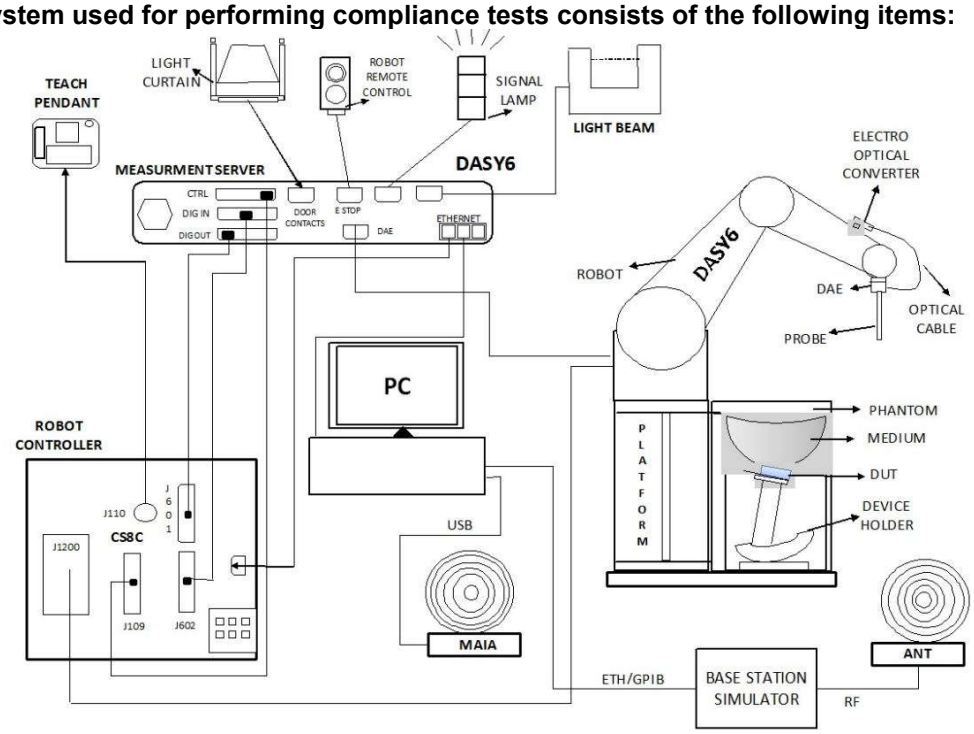
SAR is expressed in units of Watts per kilogram (W/kg)

$$\mathbf{SAR} = \frac{\boldsymbol{\sigma}|\mathbf{E}|^2}{\boldsymbol{\rho}}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

8. System Description and Setup

The DASY system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win7 or Win10 and the DASY5 or DASY6 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

8.1 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. This probe has a built in optical surface detection system to prevent from collision with phantom.

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz – >6 GHz Linearity: ±0.2 dB (30 MHz – 6 GHz)
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 μW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 μW/g)
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm

8.2 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 DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Photo of DAE

8.3 Phantom

<SAM Twin Phantom>

Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	
Filling Volume	Approx. 25 liters	
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
Measurement Areas	Left Hand, Right Hand, Flat Phantom	

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.

<ELI Phantom>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)	
Filling Volume	Approx. 30 liters	
Dimensions	Major ellipse axis: 600 mm Minor axis: 400 mm	

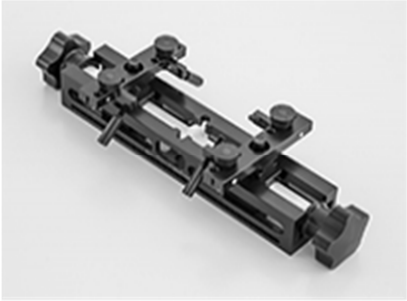
The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

8.4 Device Holder

<Mounting Device for Hand-Held Transmitter>

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.

Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

<Mounting Device for Laptops and other Body-Worn Transmitters>

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.

Mounting Device for Laptops

9. Measurement Procedures

The measurement procedures are as follows:

<Conducted power measurement>

(a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
(b) Read the WWAN RF power level from the base station simulator.
(c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
(d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

<SAR measurement>

(a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
(b) Place the EUT in the positions as Appendix D demonstrates.
(c) Set scan area, grid size and other setting on the DASY software.
(d) Measure SAR results for the highest power channel on each testing position.
(e) Find out the largest SAR result on these testing positions of each band
(f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

(a) Power reference measurement
(b) Area scan
(c) Zoom scan
(d) Power drift measurement

9.1 Spatial Peak SAR Evaluation

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

(a) Extraction of the measured data (grid and values) from the Zoom Scan
(b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
(c) Generation of a high-resolution mesh within the measured volume
(d) Interpolation of all measured values form the measurement grid to the high-resolution grid
(e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
(f) Calculation of the averaged SAR within masses of 1g and 10g

9.2 Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

9.3 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 found in the scanned area, within a range of the global maximum. The range (in dB0 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 FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

	≤ 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.	

9.4 Zoom Scan

Zoom scans are used assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube shoes 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 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

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.

9.5 Volume Scan Procedures

The volume scan is used for assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

9.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASY measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	2450MHz System Validation Kit	D2450V2	924	2020/9/2	2023/9/1
SPEAG	5000MHz System Validation Kit	D5GHzV2	1113	2019/9/24	2022/9/22
SPEAG	Data Acquisition Electronics	DAE4	1303	2021/6/18	2022/6/17
SPEAG	Data Acquisition Electronics	DAE4	1649	2022/3/30	2023/3/29
SPEAG	Dosimetric E-Field Probe	EX3DV4	7706	2022/1/20	2023/1/19
SPEAG	Dosimetric E-Field Probe	EX3DV4	3887	2021/10/22	2022/10/21
SPEAG	ELI4 Phantom	ELI 5.0	TP-2135	NCR	NCR
SPEAG	ELI4 Phantom	ELI 8.0	TP-2151	NCR	NCR
Testo	Thermo-Hygrometer	608-H1	1241332126	2022/1/6	2023/1/5
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Agilent	ENA Series Network Analyzer	E5071C	MY46106933	2021/7/31	2022/7/30
SPEAG	Dielectric Probe Kit	DAK-3.5	1138	2021/6/9	2022/6/8
Anritsu	Vector Signal Generator	MG3710A	6201682672	2022/1/6	2023/1/5
Rohde & Schwarz	Power Meter	NRVD	102081	2021/8/12	2022/8/11
Rohde & Schwarz	Power Sensor	NRV-Z5	100538	2021/8/12	2022/8/11
Rohde & Schwarz	Power Sensor	NRV-Z5	100539	2021/8/12	2022/8/11
R&S	CBT BLUETOOTH TESTER	CBT	100641	2022/1/5	2023/1/4
EXA	Spectrum Analyzer	FSV7	101631	2021/10/14	2022/10/13
FLUKE	DIGITAC THERMOMETER	51II	97240029	2021/10/23	2022/10/22
BONN	POWER AMPLIFIER	BLMA 0830-3	087193A	Note 1	
BONN	POWER AMPLIFIER	BLMA 2060-2	087193B	Note 1	
Agilent	Dual Directional Coupler	778D	20500	Note 1	
Agilent	Dual Directional Coupler	11691D	MY48151020	Note 1	
ARRA	Power Divider	A3200-2	N/A	Note 1	
MCL	Attenuation1	BW-S10W5+	N/A	Note 1	
MCL	Attenuation2	BW-S10W5+	N/A	Note 1	
MCL	Attenuation3	BW-S10W5+	N/A	Note 1	

Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.
2. Referring to KDB 865664 D01v01r04, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

11. System Verification

11.1 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 11.1.

Fig 11.1 Photo of Liquid Height for Body SAR

11.2 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
For Head								
2450	55.0	0	0	0	0	45.0	1.80	39.2

Simulating Liquid for 5GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
2450	Head	22.7	1.805	38.504	1.80	39.20	0.28	-1.78	±5	2022/4/13
5250	Head	22.7	4.573	35.971	4.71	35.90	-2.91	0.20	±5	2022/4/13
5600	Head	22.8	4.973	35.435	5.07	35.50	-1.91	-0.18	±5	2022/4/14
5750	Head	22.9	5.138	35.246	5.22	35.40	-1.57	-0.44	±5	2022/4/14
2450	Head	22.6	1.870	40.800	1.80	39.20	3.89	4.08	±5	2022/5/27
5250	Head	22.8	4.640	36.500	4.71	35.90	-1.49	1.67	±5	2022/5/29
5600	Head	22.7	4.990	35.900	5.07	35.50	-1.58	1.13	±5	2022/5/31
5750	Head	22.7	5.210	35.600	5.22	35.40	-0.19	0.56	±5	2022/6/2

11.3 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2022/4/13	2450	Head	50	924	7706	1303	2.540	51.40	50.8	-1.17
2022/4/13	5250	Head	50	1113	7706	1303	3.870	80.50	77.4	-3.85
2022/4/14	5600	Head	50	1113	7706	1303	3.980	83.40	79.6	-4.56
2022/4/14	5750	Head	50	1113	7706	1303	4.100	80.00	82	2.50
2022/5/27	2450	Head	50	924	3887	1649	2.540	51.40	50.8	-1.17
2022/5/29	5250	Head	50	1113	3887	1649	3.720	80.50	74.4	-7.58
2022/5/31	5600	Head	50	1113	3887	1649	4.330	83.40	86.6	3.84
2022/6/2	5750	Head	50	1113	3887	1649	3.980	80.00	79.6	-0.50

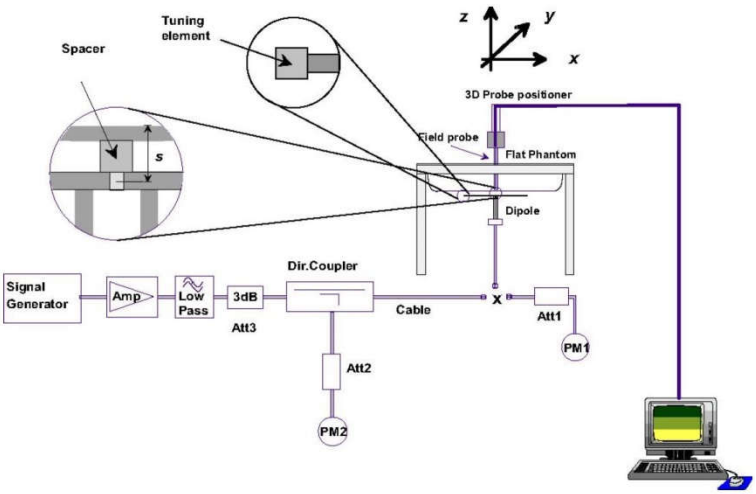


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

12. RF Exposure Positions

12.1 SAR Testing for Tablet

This device can be used also in full sized tablet exposure conditions, due to its size. Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR exclusion threshold in KDB 447498 D01v06 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

<EUT Setup Photos>

Please refer to the test setup photos.

13. Conducted RF Output Power (Unit: dBm)

<WLAN Conducted Power>

General Note:

1. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
2. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
3. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
4. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
   a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
   b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
   c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
5. 802.11ax supports full tone size and partial tone size, after verification for the partial tone power level is far less than full tone power level, so we chose full tone power to be measured in this report.
6. The 2.4GHz/5GHz WLAN can transmit in SISO/MIMO antenna mode. TX Beamforming mode is only supported in 2.4GHz WLAN 802.11ax and 5GHz WLAN 802.11n/ax.
7. Due to the single antenna RF power in WLAN SISO & MIMO (CDD) mode is larger than or very close to the single antenna RF power in Beamforming mode, so WLAN SISO & MIMO (CDD) mode SAR can represent beamforming mode SAR.

Full Power

<2.4GHz WLAN>

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	20.40	21.50	99.30
		6	2437	20.60	21.50	
		11	2462	17.40	19.00	
	802.11g 6Mbps	1	2412	15.60	17.00	95.40
		2	2417	17.40	19.00	
		6	2437	18.60	20.00	
		9	2452	17.70	19.00	
		10	2457	14.60	16.00	
		11	2462	11.80	13.50	
	802.11n-HT20 MCS0	1	2412	14.40	16.00	95.10
		2	2417	17.20	19.00	
		6	2437	18.30	20.00	
		9	2452	17.30	19.00	
		10	2457	13.90	15.50	
		11	2462	11.10	12.50	
	802.11ac-VHT20 MCS0	1	2412	14.40	16.00	93.20
		2	2417	17.20	19.00	
		6	2437	18.30	20.00	
		9	2452	17.30	19.00	
		10	2457	13.90	15.50	
		11	2462	11.10	12.50	
	802.11ax-HE20 MCS0	1	2412	14.50	16.00	97.50
		2	2417	17.30	19.00	
		6	2437	18.40	20.00	
		9	2452	17.40	19.00	
		10	2457	14.00	15.50	
		11	2462	11.20	13.00	

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	20.50	21.50	99.30
		6	2437	20.30	21.50	
		11	2462	17.60	19.00	
	802.11g 6Mbps	1	2412	16.00	17.50	95.40
		2	2417	17.80	19.00	
		6	2437	19.30	21.00	
		9	2452	17.80	19.00	
		10	2457	15.00	16.50	
		11	2462	12.60	14.00	
	802.11n-HT20 MCS0	1	2412	14.70	16.50	95.10
		2	2417	17.50	19.00	
		6	2437	18.90	19.00	
		9	2452	17.20	19.00	
		10	2457	14.20	16.00	
		11	2462	12.20	14.00	
	802.11ac-VHT20 MCS0	1	2412	14.70	16.50	93.20
		2	2417	17.50	19.00	
		6	2437	18.90	19.00	
		9	2452	17.20	19.00	
		10	2457	14.20	16.00	
		11	2462	12.20	14.00	
	802.11ax-HE20 MCS0	1	2412	14.80	16.50	97.50
		2	2417	17.60	19.00	
		6	2437	19.00	19.50	
		9	2452	17.30	19.00	
		10	2457	14.30	16.00	
		11	2462	12.30	14.00	

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	23.46	24.50	99.30
		6	2437	23.46	24.50	
		11	2462	20.51	22.00	
	802.11g 6Mbps	1	2412	18.81	20.50	95.40
		2	2417	20.61	22.00	
		6	2437	21.97	23.50	
		9	2452	20.76	22.00	
		10	2457	17.81	19.00	
		11	2462	15.23	17.00	
	802.11n-HT20 MCS0	1	2412	17.56	19.00	95.10
		2	2417	20.36	21.50	
		6	2437	21.62	22.00	
		9	2452	20.26	21.50	
		10	2457	17.06	18.50	
		11	2462	14.70	16.50	
	802.11ac-VHT20 MCS0	1	2412	17.56	19.00	93.20
		2	2417	20.36	21.50	
		6	2437	21.62	22.00	
		9	2452	20.26	21.50	
		10	2457	17.06	18.50	
		11	2462	14.70	16.50	
	802.11ax-HE20 MCS0	1	2412	17.66	19.00	97.50
		2	2417	20.46	21.50	
		6	2437	21.72	22.00	
		9	2452	20.36	21.50	
		10	2457	17.16	18.50	
		11	2462	14.80	16.50	

<5GHz WLAN>

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	17.80	19.50	93.46
		40	5200	17.90	19.50	
		44	5220	18.30	19.50	
		48	5240	18.00	19.50	
	802.11n-HT20 MCS0	36	5180	18.40	20.00	93.06
		40	5200	18.20	20.00	
		44	5220	18.30	20.00	
		48	5240	17.90	19.50	
	802.11n-HT40 MCS0	38	5190	18.00	19.50	86.84
		46	5230	19.90	20.50	
	802.11ac-VHT20 MCS0	36	5180	18.40	20.00	93.06
		40	5200	18.30	20.00	
		44	5220	18.30	20.00	
		48	5240	17.90	19.50	
	802.11ac-VHT40 MCS0	38	5190	18.00	19.50	87.01
		46	5230	19.90	20.50	
	802.11ac-VHT80 MCS0	42	5210	16.60	18.00	92.13
	802.11ax-HE20 MCS0	36	5180	18.50	20.00	97.50
		40	5200	17.90	19.50	
		44	5220	18.40	20.00	
		48	5240	18.00	19.50	
	802.11ax-HE40 MCS0	38	5190	18.10	19.50	95.19
		46	5230	20.00	20.50	
	802.11ax-HE80 MCS0	42	5210	16.70	18.00	90.74

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	18.80	19.50	93.46
		40	5200	18.40	19.50	
		44	5220	18.80	19.50	
		48	5240	18.50	19.50	
	802.11n-HT20 MCS0	36	5180	19.20	20.50	93.06
		40	5200	18.80	20.50	
		44	5220	19.00	20.50	
		48	5240	18.40	20.00	
	802.11n-HT40 MCS0	38	5190	18.60	20.50	86.84
		46	5230	20.40	20.50	
	802.11ac-VHT20 MCS0	36	5180	19.20	20.50	93.06
		40	5200	18.90	20.50	
		44	5220	19.00	20.50	
		48	5240	18.40	20.00	
	802.11ac-VHT40 MCS0	38	5190	18.60	20.50	87.01
		46	5230	20.40	20.50	
	802.11ac-VHT80 MCS0	42	5210	17.10	18.50	92.19
	802.11ax-HE20 MCS0	36	5180	19.30	20.50	97.51
		40	5200	18.40	20.00	
		44	5220	19.10	20.50	
		48	5240	18.50	20.00	
	802.11ax-HE40 MCS0	38	5190	18.70	20.50	95.19
		46	5230	20.50	20.50	
	802.11ax-HE80 MCS0	42	5210	17.20	19.00	90.74

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	21.34	22.50	93.46
		40	5200	21.17	22.50	
		44	5220	21.57	22.50	
		48	5240	21.27	22.50	
	802.11n-HT20 MCS0	36	5180	21.83	23.50	93.06
		40	5200	21.52	23.50	
		44	5220	21.67	23.50	
		48	5240	21.17	22.50	
	802.11n-HT40 MCS0	38	5190	21.32	23.00	86.84
		46	5230	23.17	23.50	
	802.11ac-VHT20 MCS0	36	5180	21.83	23.50	93.06
		40	5200	21.62	23.50	
		44	5220	21.67	23.50	
		48	5240	21.17	22.50	
	802.11ac-VHT40 MCS0	38	5190	21.32	23.00	87.01
		46	5230	23.17	23.50	
	802.11ac-VHT80 MCS0	42	5210	19.87	21.50	92.19
	802.11ax-HE20 MCS0	36	5180	21.93	23.50	97.51
		40	5200	21.17	23.00	
		44	5220	21.77	23.50	
		48	5240	21.27	23.00	
	802.11ax-HE40 MCS0	38	5190	21.42	23.00	95.19
		46	5230	23.27	23.50	
	802.11ax-HE80 MCS0	42	5210	19.97	21.50	90.74

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	18.20	19.50	93.46
		56	5280	18.30	19.50	
		60	5300	18.70	19.50	
		64	5320	18.20	19.50	
	802.11n-HT20 MCS0	52	5260	18.30	20.00	93.06
		56	5280	18.50	20.00	
		60	5300	18.70	20.00	
		64	5320	18.30	20.00	
	802.11n-HT40 MCS0	54	5270	19.80	20.50	86.84
		62	5310	18.40	20.00	
	802.11ac-VHT20 MCS0	52	5260	18.30	20.00	93.06
		56	5280	18.40	20.00	
		60	5300	18.70	20.00	
		64	5320	18.30	20.00	
	802.11ac-VHT40 MCS0	54	5270	19.80	20.50	87.01
		62	5310	18.40	20.00	
	802.11ac-VHT80 MCS0	58	5290	16.40	18.00	92.13
	802.11ax-HE20 MCS0	52	5260	18.40	20.00	97.50
		56	5280	18.50	20.00	
		60	5300	18.80	20.50	
		64	5320	18.40	20.00	
	802.11ax-HE40 MCS0	54	5270	19.90	20.50	95.19
		62	5310	18.50	20.50	
	802.11ax-HE80 MCS0	58	5290	16.50	18.00	90.74

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	18.60	19.50	93.46
		56	5280	18.60	19.50	
		60	5300	18.80	19.50	
		64	5320	18.20	19.50	
	802.11n-HT20 MCS0	52	5260	18.70	20.50	93.06
		56	5280	18.60	20.50	
		60	5300	18.80	20.50	
		64	5320	18.60	20.00	
	802.11n-HT40 MCS0	54	5270	20.20	20.50	86.84
		62	5310	18.60	20.50	
	802.11ac-VHT20 MCS0	52	5260	18.70	20.50	93.06
		56	5280	18.50	20.50	
		60	5300	18.80	20.50	
		64	5320	18.60	20.00	
	802.11ac-VHT40 MCS0	54	5270	20.20	20.50	87.01
		62	5310	18.60	20.50	
	802.11ac-VHT80 MCS0	58	5290	16.60	18.00	92.19
	802.11ax-HE20 MCS0	52	5260	18.80	20.50	97.51
		56	5280	18.70	20.50	
		60	5300	18.90	20.50	
		64	5320	18.70	20.50	
	802.11ax-HE40 MCS0	54	5270	20.30	20.50	95.19
		62	5310	18.70	20.50	
	802.11ax-HE80 MCS0	58	5290	16.70	18.00	90.74

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	21.41	22.50	93.46
		56	5280	21.46	22.50	
		60	5300	21.76	22.50	
		64	5320	21.21	22.50	
	802.11n-HT20 MCS0	52	5260	21.51	23.00	93.06
		56	5280	21.56	23.00	
		60	5300	21.76	23.50	
		64	5320	21.46	23.00	
	802.11n-HT40 MCS0	54	5270	23.01	23.50	86.84
		62	5310	21.51	23.50	
	802.11ac-VHT20 MCS0	52	5260	21.51	23.00	93.06
		56	5280	21.46	23.00	
		60	5300	21.76	23.50	
		64	5320	21.46	23.00	
	802.11ac-VHT40 MCS0	54	5270	23.01	23.50	87.01
		62	5310	21.51	23.50	
	802.11ac-VHT80 MCS0	58	5290	19.51	21.00	92.19
	802.11ax-HE20 MCS0	52	5260	21.61	23.00	97.61
		56	5280	21.61	23.00	
		60	5300	21.86	23.50	
		64	5320	21.56	23.00	
	802.11ax-HE40 MCS0	54	5270	23.11	23.50	95.19
		62	5310	21.61	23.50	
	802.11ax-HE80 MCS0	58	5290	19.61	21.00	90.74

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	18.60	20.00	93.46
		116	5580	18.30	20.00	
		124	5620	18.30	20.00	
		132	5660	18.40	20.00	
		140	5700	18.40	20.00	
		144	5720	18.90	20.00	
	802.11n-HT20 MCS0	100	5500	18.50	20.00	93.06
		116	5580	18.40	20.00	
		124	5620	18.30	20.00	
		132	5660	18.30	20.00	
		140	5700	17.40	19.00	
		144	5720	18.90	20.50	
	802.11n-HT40 MCS0	102	5510	17.60	19.00	86.84
		110	5550	20.40	20.50	
		126	5630	20.40	20.50	
		134	5670	20.00	20.50	
		142	5710	20.10	20.50	
	802.11ac-VHT20 MCS0	100	5500	18.50	20.00	93.06
		116	5580	18.40	20.00	
		124	5620	18.30	20.00	
		132	5660	18.20	20.00	
		140	5700	17.40	19.00	
		144	5720	18.90	20.50	
	802.11ac-VHT40 MCS0	102	5510	17.60	19.00	87.01
		110	5550	20.40	20.50	
		126	5630	20.40	20.50	
		134	5670	20.00	20.50	
		142	5710	20.10	20.50	
	802.11ac-VHT80 MCS0	106	5530	17.00	18.50	92.13
		122	5610	20.30	20.50	
		138	5690	19.50	20.50	
	802.11ax-HE20 MCS0	100	5500	18.60	20.00	97.50
		116	5580	18.50	20.00	
		124	5620	18.40	20.00	
		132	5660	18.30	20.00	
		140	5700	17.50	19.00	
		144	5720	19.00	20.50	
	802.11ax-HE40 MCS0	102	5510	17.70	19.00	95.19
		110	5550	20.50	20.50	
		126	5630	20.50	20.50	
		134	5670	20.50	20.50	
		142	5710	20.20	20.50	
	802.11ax-HE80 MCS0	106	5530	17.10	18.50	90.74
		122	5610	20.40	20.50	
		138	5690	19.60	20.50	

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	18.50	20.00	93.46
		116	5580	18.60	20.00	
		124	5620	18.60	20.00	
		132	5660	19.10	20.00	
		140	5700	19.20	20.00	
		144	5720	19.50	20.00	
	802.11n-HT20 MCS0	100	5500	18.50	20.00	93.06
		116	5580	18.60	20.00	
		124	5620	18.60	20.00	
		132	5660	18.50	20.00	
		140	5700	18.20	19.50	
		144	5720	19.40	20.50	
	802.11n-HT40 MCS0	102	5510	17.70	19.00	86.84
		110	5550	20.20	20.50	
		126	5630	20.20	20.50	
		134	5670	20.40	20.50	
		142	5710	20.40	20.50	
	802.11ac-VHT20 MCS0	100	5500	18.50	20.00	93.06
		116	5580	18.60	20.00	
		124	5620	18.60	20.00	
		132	5660	18.20	20.00	
		140	5700	18.20	19.50	
		144	5720	19.40	20.50	
	802.11ac-VHT40 MCS0	102	5510	17.70	19.50	87.01
		110	5550	20.20	20.50	
		126	5630	20.20	20.50	
		134	5670	20.40	20.50	
		142	5710	20.40	20.50	
	802.11ac-VHT80 MCS0	106	5530	16.90	18.50	92.19
		122	5610	20.20	20.50	
		138	5690	20.10	20.50	
	802.11ax-HE20 MCS0	100	5500	18.60	20.00	97.51
		116	5580	18.70	20.50	
		124	5620	18.70	20.50	
		132	5660	18.50	20.50	
		140	5700	18.20	19.50	
		144	5720	19.50	20.50	
	802.11ax-HE40 MCS0	102	5510	17.80	19.50	95.19
		110	5550	20.30	20.50	
		126	5630	20.30	20.50	
		134	5670	20.30	20.50	
		142	5710	20.50	20.50	
	802.11ax-HE80 MCS0	106	5530	17.00	18.50	90.74
		122	5610	20.30	20.50	
		138	5690	20.20	20.50	

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	21.56	23.00	93.46
		116	5580	21.46	23.00	
		124	5620	21.46	23.00	
		132	5660	21.78	23.00	
		140	5700	21.83	23.00	
		144	5720	22.22	23.00	
	802.11n-HT20 MCS0	100	5500	21.51	23.00	93.06
		116	5580	21.51	23.00	
		124	5620	21.46	23.00	
		132	5660	21.41	23.00	
		140	5700	20.77	22.50	
		144	5720	22.17	23.50	
	802.11n-HT40 MCS0	102	5510	20.66	22.00	86.84
		110	5550	23.31	23.50	
		126	5630	23.21	23.50	
		134	5670	23.21	23.50	
		142	5710	23.26	23.50	
	802.11ac-VHT20 MCS0	100	5500	21.51	23.00	93.06
		116	5580	21.51	23.00	
		124	5620	21.46	23.00	
		132	5660	21.06	23.00	
		140	5700	20.77	22.50	
		144	5720	22.17	23.50	
	802.11ac-VHT40 MCS0	102	5510	20.66	22.00	87.01
		110	5550	23.31	23.50	
		126	5630	23.21	23.50	
		134	5670	23.21	23.50	
		142	5710	23.26	23.50	
	802.11ac-VHT80 MCS0	106	5530	19.96	21.50	92.19
		122	5610	23.26	23.50	
		138	5690	22.82	23.50	
	802.11ax-HE20 MCS0	100	5500	21.61	23.00	97.51
		116	5580	21.61	23.00	
		124	5620	21.56	23.00	
		132	5660	21.41	23.00	
		140	5700	20.87	22.50	
		144	5720	22.27	23.50	
	802.11ax-HE40 MCS0	102	5510	20.76	22.50	95.19
		110	5550	23.41	23.50	
		126	5630	23.31	23.50	
		134	5670	23.31	23.50	
		142	5710	23.36	23.50	
	802.11ax-HE80 MCS0	106	5530	20.06	21.50	90.74
		122	5610	23.36	23.50	
		138	5690	22.92	23.50	

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	21.10	21.10	93.46
		157	5785	21.20	21.20	
		165	5825	21.00	21.00	
	802.11n-HT20 MCS0	149	5745	20.90	21.10	93.06
		157	5785	21.00	21.10	
		165	5825	21.00	21.10	
	802.11n-HT40 MCS0	151	5755	20.10	21.10	86.84
		159	5795	20.30	21.10	
	802.11ac-VHT20 MCS0	149	5745	20.90	21.10	93.06
		157	5785	21.00	21.10	
		165	5825	21.00	21.10	
	802.11ac-VHT40 MCS0	151	5755	20.10	21.10	87.01
		159	5795	20.30	21.10	
	802.11ac-VHT80 MCS0	155	5775	20.40	21.10	92.13
	802.11ax-HE20 MCS0	149	5745	21.00	21.10	97.50
		157	5785	21.10	21.10	
		165	5825	21.10	21.10	
	802.11ax-HE40 MCS0	151	5755	20.20	21.10	95.19
		159	5795	20.40	21.10	
	802.11ax-HE80 MCS0	155	5775	20.50	21.10	90.74

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	21.30	21.50	93.46
		157	5785	21.00	21.50	
		165	5825	20.90	21.50	
	802.11n-HT20 MCS0	149	5745	21.10	21.50	93.06
		157	5785	20.90	21.50	
		165	5825	20.80	21.50	
	802.11n-HT40 MCS0	151	5755	20.20	20.50	86.84
		159	5795	20.40	20.50	
	802.11ac-VHT20 MCS0	149	5745	21.10	21.50	93.06
		157	5785	20.90	21.50	
		165	5825	20.80	21.50	
	802.11ac-VHT40 MCS0	151	5755	20.20	20.50	87.01
		159	5795	20.40	20.50	
	802.11ac-VHT80 MCS0	155	5775	20.40	20.50	92.19
	802.11ax-HE20 MCS0	149	5745	21.20	21.50	97.51
		157	5785	21.00	21.50	
		165	5825	20.90	21.50	
	802.11ax-HE40 MCS0	151	5755	20.30	20.50	95.19
		159	5795	20.50	20.50	
	802.11ax-HE80 MCS0	155	5775	20.50	20.50	90.74

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	24.21	24.50	93.46
		157	5785	24.11	24.50	
		165	5825	23.96	24.50	
	802.11n-HT20 MCS0	149	5745	24.01	24.50	93.06
		157	5785	23.96	24.50	
		165	5825	23.91	24.50	
	802.11n-HT40 MCS0	151	5755	23.16	23.50	86.84
		159	5795	23.36	23.50	
	802.11ac-VHT20 MCS0	149	5745	24.01	24.50	93.06
		157	5785	23.96	24.50	
		165	5825	23.91	24.50	
	802.11ac-VHT40 MCS0	151	5755	23.16	23.50	87.01
		159	5795	23.36	23.50	
	802.11ac-VHT80 MCS0	155	5775	23.41	23.50	92.19
	802.11ax-HE20 MCS0	149	5745	24.11	24.50	97.51
		157	5785	24.06	24.50	
		165	5825	24.01	24.50	
	802.11ax-HE40 MCS0	151	5755	23.26	23.50	95.19
		159	5795	23.46	23.50	
	802.11ax-HE80 MCS0	155	5775	23.50	23.50	90.74

Sensor on

<2.4GHz WLAN>

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	17.40	19.00	99.30
		6	2437	17.50	19.00	
		11	2462	17.40	19.00	
	802.11g 6Mbps	1	2412	15.60	17.00	95.40
		2	2417	17.40	19.00	
		6	2437	17.40	19.00	
		9	2452	17.70	19.00	
		10	2457	14.60	16.00	
		11	2462	11.80	13.50	
	802.11n-HT20 MCS0	1	2412	Not Required	16.50	95.10
		2	2417		19.00	
		6	2437		19.00	
		9	2452		19.00	
		10	2457		15.50	
		11	2462		14.50	
	802.11ac-VHT20 MCS0	1	2412		17.00	93.20
		2	2417		19.00	
		6	2437		19.00	
		9	2452		19.00	
		10	2457		15.50	
		11	2462		14.50	
	802.11ax-HE20 MCS0	1	2412		17.00	97.50
		2	2417		19.00	
		6	2437		19.00	
		9	2452		19.00	
		10	2457		15.50	
		11	2462		14.50	

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	17.00	18.00	99.30
		6	2437	16.80	18.00	
		11	2462	16.70	18.00	
	802.11g 6Mbps	1	2412	16.00	17.50	95.40
		2	2417	17.80	18.00	
		6	2437	16.40	18.00	
		9	2452	17.80	18.00	
		10	2457	15.00	16.50	
		11	2462	12.60	14.00	
	802.11n-HT20 MCS0	1	2412	Not Required	16.00	95.10
		2	2417		18.00	
		6	2437		18.00	
		9	2452		18.00	
		10	2457		16.00	
		11	2462		15.00	
	802.11ac-VHT20 MCS0	1	2412		16.50	93.20
		2	2417		18.00	
		6	2437		18.00	
		9	2452		18.00	
		10	2457		16.00	
		11	2462		15.00	
	802.11ax-HE20 MCS0	1	2412		16.50	97.50
		2	2417		18.00	
		6	2437		18.00	
		9	2452		18.00	
		10	2457		16.00	
		11	2462		15.00	

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	20.21	21.50	99.30
		6	2437	20.17	21.50	
		11	2462	20.07	21.50	
	802.11g 6Mbps	1	2412	Not Required	20.50	95.40
		2	2417		21.50	
		6	2437		21.50	
		9	2452		21.50	
		10	2457		19.00	
		11	2462		17.00	
	802.11n-HT20 MCS0	1	2412		19.00	95.10
		2	2417		21.50	
		6	2437		21.50	
		9	2452		21.50	
		10	2457		18.50	
		11	2462		16.50	
	802.11ac-VHT20 MCS0	1	2412		19.00	93.20
		2	2417		21.50	
		6	2437		21.50	
		9	2452		21.50	
		10	2457		18.50	
		11	2462		16.50	
	802.11ax-HE20 MCS0	1	2412		19.00	97.50
		2	2417		21.50	
		6	2437		21.50	
		9	2452		21.50	
		10	2457		18.50	
		11	2462		16.50	

<5GHz WLAN>

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	Not Required	11.50	93.46
		40	5200		11.50	
		44	5220		11.50	
		48	5240		11.50	
	802.11n-HT20 MCS0	36	5180		11.50	93.06
		40	5200		11.50	
		44	5220		11.50	
		48	5240		11.50	
	802.11n-HT40 MCS0	38	5190	10.30	11.50	86.84
		46	5230	10.90	11.50	
	802.11ac-VHT20 MCS0	36	5180	Not Required	11.50	93.06
		40	5200		11.50	
		44	5220		11.50	
		48	5240		11.50	
	802.11ac-VHT40 MCS0	38	5190		11.50	87.01
		46	5230		11.50	
	802.11ac-VHT80 MCS0	42	5210	10.40	11.50	92.13
	802.11ax-HE20 MCS0	36	5180	Not Required	11.50	97.50
		40	5200		11.50	
		44	5220		11.50	
		48	5240		11.50	
	802.11ax-HE40 MCS0	38	5190		11.50	95.19
		46	5230		11.50	
	802.11ax-HE80 MCS0	42	5210		11.50	90.74

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	Not Required	13.50	93.46
		40	5200		13.50	
		44	5220		13.50	
		48	5240		13.50	
	802.11n-HT20 MCS0	36	5180		13.50	93.06
		40	5200		13.50	
		44	5220		13.50	
		48	5240		13.50	
	802.11n-HT40 MCS0	38	5190	12.80	13.50	86.84
		46	5230	13.30	13.50	
	802.11ac-VHT20 MCS0	36	5180	Not Required	13.50	93.06
		40	5200		13.50	
		44	5220		13.50	
		48	5240		13.50	
	802.11ac-VHT40 MCS0	38	5190		13.50	87.01
		46	5230		13.50	
	802.11ac-VHT80 MCS0	42	5210	12.40	13.50	92.19
	802.11ax-HE20 MCS0	36	5180	Not Required	13.50	97.51
		40	5200		13.50	
		44	5220		13.50	
		48	5240		13.50	
	802.11ax-HE40 MCS0	38	5190		13.50	95.19
		46	5230		13.50	
	802.11ax-HE80 MCS0	42	5210		13.50	90.74

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	Not Required	15.50	93.46
		40	5200		15.50	
		44	5220		15.50	
		48	5240		15.50	
	802.11n-HT20 MCS0	36	5180		15.50	93.06
		40	5200		15.50	
		44	5220		15.50	
		48	5240		15.50	
	802.11n-HT40 MCS0	38	5190		15.50	86.84
		46	5230		15.50	
	802.11ac-VHT20 MCS0	36	5180		15.50	93.06
		40	5200		15.50	
		44	5220		15.50	
		48	5240		15.50	
	802.11ac-VHT40 MCS0	38	5190		15.50	87.01
		46	5230		15.50	
	802.11ac-VHT80 MCS0	42	5210	14.52	15.50	92.19
	802.11ax-HE20 MCS0	36	5180	Not Required	15.50	97.51
		40	5200		15.50	
		44	5220		15.50	
		48	5240		15.50	
	802.11ax-HE40 MCS0	38	5190		15.50	95.19
		46	5230		15.50	
	802.11ax-HE80 MCS0	42	5210		15.50	90.74

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	Not Required	11.50	93.46
		56	5280		11.50	
		60	5300		11.50	
		64	5320		11.50	
	802.11n-HT20 MCS0	52	5260		11.50	93.06
		56	5280		11.50	
		60	5300		11.50	
		64	5320		11.50	
	802.11n-HT40 MCS0	54	5270	10.70	11.50	86.84
		62	5310	10.80	11.50	
	802.11ac-VHT20 MCS0	52	5260	Not Required	11.50	93.06
		56	5280		11.50	
		60	5300		11.50	
		64	5320		11.50	
	802.11ac-VHT40 MCS0	54	5270		11.50	87.01
		62	5310		11.50	
	802.11ac-VHT80 MCS0	58	5290	10.40	11.50	92.13
	802.11ax-HE20 MCS0	52	5260	Not Required	11.50	97.50
		56	5280		11.50	
		60	5300		11.50	
		64	5320		11.50	
	802.11ax-HE40 MCS0	54	5270		11.50	95.19
		62	5310		11.50	
	802.11ax-HE80 MCS0	58	5290		11.50	90.74

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	Not Required	13.50	93.46
		56	5280		13.50	
		60	5300		13.50	
		64	5320		13.50	
	802.11n-HT20 MCS0	52	5260		13.50	93.06
		56	5280		13.50	
		60	5300		13.50	
		64	5320		13.50	
	802.11n-HT40 MCS0	54	5270	13.10	13.50	86.84
		62	5310	12.70	13.50	
	802.11ac-VHT20 MCS0	52	5260	Not Required	13.50	93.06
		56	5280		13.50	
		60	5300		13.50	
		64	5320		13.50	
	802.11ac-VHT40 MCS0	54	5270		13.50	87.01
		62	5310		13.50	
	802.11ac-VHT80 MCS0	58	5290	12.40	13.50	92.19
	802.11ax-HE20 MCS0	52	5260	Not Required	13.50	97.51
		56	5280		13.50	
		60	5300		13.50	
		64	5320		13.50	
	802.11ax-HE40 MCS0	54	5270		13.50	95.19
		62	5310		13.50	
	802.11ax-HE80 MCS0	58	5290		13.50	90.74

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	Not Required	15.50	93.46
		56	5280		15.50	
		60	5300		15.50	
		64	5320		15.50	
	802.11n-HT20 MCS0	52	5260		15.50	93.06
		56	5280		15.50	
		60	5300		15.50	
		64	5320		15.50	
	802.11n-HT40 MCS0	54	5270		15.50	86.84
		62	5310		15.50	
	802.11ac-VHT20 MCS0	52	5260		15.50	93.06
		56	5280		15.50	
		60	5300		15.50	
		64	5320		15.50	
	802.11ac-VHT40 MCS0	54	5270		15.50	87.01
		62	5310		15.50	
	802.11ac-VHT80 MCS0	58	5290	14.52	15.50	92.19
	802.11ax-HE20 MCS0	52	5260	Not Required	15.50	97.61
		56	5280		15.50	
		60	5300		15.50	
		64	5320		15.50	
	802.11ax-HE40 MCS0	54	5270		15.50	95.19
		62	5310		15.50	
	802.11ax-HE80 MCS0	58	5290		15.50	90.74

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	Not Required	11.00	93.46
		116	5580		11.00	
		124	5620		11.00	
		132	5660		11.00	
		140	5700		11.00	
		144	5720		11.00	
	802.11n-HT20 MCS0	100	5500		11.00	93.06
		116	5580		11.00	
		124	5620		11.00	
		132	5660		11.00	
		140	5700		11.00	
		144	5720		11.00	
	802.11n-HT40 MCS0	102	5510	10.00	11.00	86.84
		110	5550	10.10	11.00	
		126	5630	10.00	11.00	
		134	5670	9.70	11.00	
		142	5710	9.50	11.00	
	802.11ac-VHT20 MCS0	100	5500	Not Required	11.00	93.06
		116	5580		11.00	
		124	5620		11.00	
		132	5660		11.00	
		140	5700		11.00	
		144	5720		11.00	
	802.11ac-VHT40 MCS0	102	5510		11.00	87.01
		110	5550		11.00	
		126	5630		11.00	
		134	5670		11.00	
		142	5710		11.00	
	802.11ac-VHT80 MCS0	106	5530	9.90	11.00	92.13
		122	5610	9.90	11.00	
		138	5690	9.60	11.00	
	802.11ax-HE20 MCS0	100	5500	Not Required	11.00	97.50
		116	5580		11.00	
		124	5620		11.00	
		132	5660		11.00	
		140	5700		11.00	
		144	5720		11.00	
	802.11ax-HE40 MCS0	102	5510		11.00	95.19
		110	5550		11.00	
		126	5630		11.00	
		134	5670		11.00	
		142	5710		11.00	
	802.11ax-HE80 MCS0	106	5530		11.00	90.74
		122	5610		11.00	
		138	5690		11.00	

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	Not Required	13.00	93.46
		116	5580		13.00	
		124	5620		13.00	
		132	5660		13.00	
		140	5700		13.00	
		144	5720		13.00	
	802.11n-HT20 MCS0	100	5500		13.00	93.06
		116	5580		13.00	
		124	5620		13.00	
		132	5660		13.00	
		140	5700		13.00	
		144	5720		13.00	
	802.11n-HT40 MCS0	102	5510	11.70	13.00	86.84
		110	5550	11.70	13.00	
		126	5630	11.60	13.00	
		134	5670	11.50	13.00	
		142	5710	11.30	13.00	
	802.11ac-VHT20 MCS0	100	5500	Not Required	13.00	93.06
		116	5580		13.00	
		124	5620		13.00	
		132	5660		13.00	
		140	5700		13.00	
		144	5720		13.00	
	802.11ac-VHT40 MCS0	102	5510		13.00	87.01
		110	5550		13.00	
		126	5630		13.00	
		134	5670		13.00	
		142	5710		13.00	
	802.11ac-VHT80 MCS0	106	5530	11.40	13.00	92.19
		122	5610	11.40	13.00	
		138	5690	11.10	13.00	
	802.11ax-HE20 MCS0	100	5500	Not Required	13.00	97.51
		116	5580		13.00	
		124	5620		13.00	
		132	5660		13.00	
		140	5700		13.00	
		144	5720		13.00	
	802.11ax-HE40 MCS0	102	5510		13.00	95.19
		110	5550		13.00	
		126	5630		13.00	
		134	5670		13.00	
		142	5710		13.00	
	802.11ax-HE80 MCS0	106	5530		13.00	90.74
		122	5610		13.00	
		138	5690		13.00	

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	Not Required	15.00	93.46
		116	5580		15.00	
		124	5620		15.00	
		132	5660		15.00	
		140	5700		15.00	
		144	5720		15.00	
	802.11n-HT20 MCS0	100	5500		15.00	93.06
		116	5580		15.00	
		124	5620		15.00	
		132	5660		15.00	
		140	5700		15.00	
		144	5720		15.00	
	802.11n-HT40 MCS0	102	5510		15.00	86.84
		110	5550		15.00	
		126	5630		15.00	
		134	5670		15.00	
		142	5710		15.00	
	802.11ac-VHT20 MCS0	100	5500		15.00	93.06
		116	5580		15.00	
		124	5620		15.00	
		132	5660		15.00	
		140	5700		15.00	
		144	5720		15.00	
	802.11ac-VHT40 MCS0	102	5510		15.00	87.01
		110	5550		15.00	
		126	5630		15.00	
		134	5670		15.00	
		142	5710		15.00	
	802.11ac-VHT80 MCS0	106	5530	13.72	15.00	92.19
		122	5610	13.72	15.00	
		138	5690	13.72	15.00	
	802.11ax-HE20 MCS0	100	5500	Not Required	15.00	97.51
		116	5580		15.00	
		124	5620		15.00	
		132	5660		15.00	
		140	5700		15.00	
		144	5720		15.00	
	802.11ax-HE40 MCS0	102	5510		15.00	95.19
		110	5550		15.00	
		126	5630		15.00	
		134	5670		15.00	
		142	5710		15.00	
	802.11ax-HE80 MCS0	106	5530		15.00	90.74
		122	5610		15.00	
		138	5690		15.00	

5.8GHz WLAN				Ant 6		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	Not Required	11.00	93.46
		157	5785		11.00	
		165	5825		11.00	
	802.11n-HT20 MCS0	149	5745		11.00	93.06
		157	5785		11.00	
		165	5825		11.00	
	802.11n-HT40 MCS0	151	5755	10.60	11.00	86.84
		159	5795	10.80	11.00	
	802.11ac-VHT20 MCS0	149	5745	Not Required	11.00	93.06
		157	5785		11.00	
		165	5825		11.00	
	802.11ac-VHT40 MCS0	151	5755		11.00	87.01
		159	5795		11.00	
	802.11ac-VHT80 MCS0	155	5775	9.80	11.00	92.13
	802.11ax-HE20 MCS0	149	5745	Not Required	11.00	97.50
		157	5785		11.00	
		165	5825		11.00	
	802.11ax-HE40 MCS0	151	5755		11.00	95.19
		159	5795		11.00	
	802.11ax-HE80 MCS0	155	5775		11.00	90.74

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	Not Required	17.00	93.46
		157	5785		17.00	
		165	5825		17.00	
	802.11n-HT20 MCS0	149	5745		17.00	93.06
		157	5785		17.00	
		165	5825		17.00	
	802.11n-HT40 MCS0	151	5755	16.50	17.00	86.84
		159	5795	16.70	17.00	
	802.11ac-VHT20 MCS0	149	5745	Not Required	17.00	93.06
		157	5785		17.00	
		165	5825		17.00	
	802.11ac-VHT40 MCS0	151	5755		17.00	87.01
		159	5795		17.00	
	802.11ac-VHT80 MCS0	155	5775	16.10	17.00	92.19
	802.11ax-HE20 MCS0	149	5745	Not Required	17.00	97.51
		157	5785		17.00	
		165	5825		17.00	
	802.11ax-HE40 MCS0	151	5755		17.00	95.19
		159	5795		17.00	
	802.11ax-HE80 MCS0	155	5775		17.00	90.74

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	Not Required	18.00	93.46
		157	5785		18.00	
		165	5825		18.00	
	802.11n-HT20 MCS0	149	5745		18.00	93.06
		157	5785		18.00	
		165	5825		18.00	
	802.11n-HT40 MCS0	151	5755		18.00	86.84
		159	5795		18.00	
	802.11ac-VHT20 MCS0	149	5745		18.00	93.06
		157	5785		18.00	
		165	5825		18.00	
	802.11ac-VHT40 MCS0	151	5755		18.00	87.01
		159	5795		18.00	
	802.11ac-VHT80 MCS0	155	5775	17.01	18.00	92.19
	802.11ax-HE20 MCS0	149	5745	Not Required	18.00	97.51
		157	5785		18.00	
		165	5825		18.00	
	802.11ax-HE40 MCS0	151	5755		18.00	95.19
		159	5795		18.00	
	802.11ax-HE80 MCS0	155	5775		18.00	90.74

Beamforming mode

Full Power

<2.4GHz WLAN>

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11ax-HE20 MCS0	1	2412	15.30	16.00	100.00
		2	2417	17.80	19.00	
		6	2437	18.50	20.00	
		9	2452	17.00	18.50	
		10	2457	13.60	15.00	
		11	2462	12.60	14.00	

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11ax-HE20 MCS0	1	2412	15.50	16.50	100.00
		2	2417	18.00	19.00	
		6	2437	18.50	19.50	
		9	2452	17.00	18.50	
		10	2457	15.50	16.00	
		11	2462	13.60	14.00	

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11ax-HE20 MCS0	1	2412	18.41	19.00	100.00
		2	2417	20.91	21.50	
		6	2437	21.51	22.00	
		9	2452	20.01	21.50	
		10	2457	17.66	18.50	
		11	2462	16.14	16.50	

<5GHz WLAN>

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11n-HT20 MCS0	36	5180	16.90	18.50	100.00
		40	5200	16.90	18.50	
		44	5220	17.30	19.00	
		48	5240	16.80	18.00	
	802.11n-HT40 MCS0	38	5190	16.20	17.50	100.00
		46	5230	19.60	20.5	
	802.11ax-HE20 MCS0	36	5180	17.00	18.50	100.00
		40	5200	17.30	19.00	
		44	5220	17.40	19.00	
		48	5240	16.90	18.50	
	802.11ax-HE40 MCS0	38	5190	16.30	18.00	100.00
		46	5230	19.70	20.50	
	802.11ax-HE80 MCS0	42	5210	16.40	18.00	100.00

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11n-HT20 MCS0	36	5180	17.70	19.00	100.00
		40	5200	17.60	19.00	
		44	5220	17.80	19.00	
		48	5240	17.20	19.00	
	802.11n-HT40 MCS0	38	5190	17.00	19.00	100.00
		46	5230	20.00	20.5	
	802.11ax-HE20 MCS0	36	5180	17.80	19.00	100.00
		40	5200	17.60	19.00	
		44	5220	17.90	19.00	
		48	5240	17.30	19.00	
	802.11ax-HE40 MCS0	38	5190	17.10	19.00	100.00
		46	5230	20.10	20.50	
	802.11ax-HE80 MCS0	42	5210	16.80	18.00	100.00

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11n-HT20 MCS0	36	5180	20.33	22.00	100.00
		40	5200	20.37	22.00	
		44	5220	20.57	22.00	
		48	5240	20.01	21.50	
	802.11n-HT40 MCS0	38	5190	19.63	21.00	100.00
		46	5230	22.81	23.50	
	802.11ax-HE20 MCS0	36	5180	20.43	22.00	100.00
		40	5200	20.61	22.00	
		44	5220	20.67	22.00	
		48	5240	20.11	21.50	
	802.11ax-HE40 MCS0	38	5190	19.73	21.50	100.00
		46	5230	22.91	23.50	
	802.11ax-HE80 MCS0	42	5210	19.61	21.50	100.00

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11n-HT20 MCS0	52	5260	16.80	18.50	100.00
		56	5280	16.90	18.50	
		60	5300	17.30	19.00	
		64	5320	17.10	18.50	
	802.11n-HT40 MCS0	54	5270	19.80	20.5	100.00
		62	5310	16.80	18.50	
	802.11ax-HE20 MCS0	52	5260	16.90	18.50	100.00
		56	5280	17.10	18.50	
		60	5300	17.40	19.00	
		64	5320	17.20	19.00	
	802.11ax-HE40 MCS0	54	5270	19.90	20.50	100.00
		62	5310	16.90	18.50	
	802.11ax-HE80 MCS0	58	5290	17.20	18.50	100.00

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11n-HT20 MCS0	52	5260	16.90	18.50	100.00
		56	5280	17.00	18.50	
		60	5300	17.10	18.50	
		64	5320	16.90	18.50	
	802.11n-HT40 MCS0	54	5270	20.10	20.5	100.00
		62	5310	16.80	18.50	
	802.11ax-HE20 MCS0	52	5260	17.00	18.50	100.00
		56	5280	16.90	18.50	
		60	5300	17.20	18.50	
		64	5320	17.00	18.50	
	802.11ax-HE40 MCS0	54	5270	20.20	20.50	100.00
		62	5310	16.90	18.50	
	802.11ax-HE80 MCS0	58	5290	17.40	18.00	100.00

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11n-HT20 MCS0	52	5260	19.86	21.50	100.00
		56	5280	20.01	21.50	
		60	5300	20.21	22.00	
		64	5320	20.01	21.50	
	802.11n-HT40 MCS0	54	5270	22.96	23.50	100.00
		62	5310	19.81	21.50	
	802.11ax-HE20 MCS0	52	5260	19.96	21.50	100.00
		56	5280	20.11	22.00	
		60	5300	20.31	22.00	
		64	5320	20.11	21.50	
	802.11ax-HE40 MCS0	54	5270	23.06	23.50	100.00
		62	5310	19.91	21.50	
	802.11ax-HE80 MCS0	58	5290	20.31	21.00	100.00

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11n-HT20 MCS0	100	5500	17.10	18.50	100.00
		116	5580	17.20	18.50	
		124	5620	17.00	18.50	
		132	5660	16.90	18.50	
		140	5700	17.00	18.50	
		144	5720	17.30	18.50	
	802.11n-HT40 MCS0	102	5510	17.20	18.50	100.00
		110	5550	20.40	20.50	
		126	5630	20.30	20.50	
		134	5670	19.30	20.50	
		142	5710	19.70	20.50	
	802.11ax-HE20 MCS0	100	5500	17.20	18.50	100.00
		116	5580	17.30	18.50	
		124	5620	17.30	18.50	
		132	5660	17.20	18.50	
		140	5700	17.10	18.50	
		144	5720	17.40	18.50	
	802.11ax-HE40 MCS0	102	5510	17.30	18.50	100.00
		110	5550	20.50	20.50	
		126	5630	20.30	20.50	
		134	5670	19.40	20.50	
		142	5710	19.80	20.50	
	802.11ax-HE80 MCS0	106	5530	18.40	18.50	100.00
		122	5610	20.00	20.50	
		138	5690	19.90	20.50	

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11n-HT20 MCS0	100	5500	16.80	18.50	100.00
		116	5580	17.40	19.00	
		124	5620	17.20	18.50	
		132	5660	17.20	18.50	
		140	5700	17.60	19.50	
		144	5720	17.60	19.00	
	802.11n-HT40 MCS0	102	5510	17.20	19.00	100.00
		110	5550	20.20	20.50	
		126	5630	20.00	20.50	
		134	5670	19.70	20.50	
		142	5710	20.20	20.50	
	802.11ax-HE20 MCS0	100	5500	16.90	18.00	100.00
		116	5580	17.50	19.00	
		124	5620	17.20	19.00	
		132	5660	17.20	19.00	
		140	5700	17.70	19.50	
		144	5720	17.70	19.00	
	802.11ax-HE40 MCS0	102	5510	17.30	19.00	100.00
		110	5550	20.30	20.50	
		126	5630	20.10	20.50	
		134	5670	19.80	20.50	
		142	5710	20.30	20.50	
	802.11ax-HE80 MCS0	106	5530	18.10	18.50	100.00
		122	5610	20.20	20.50	
		138	5690	20.20	20.50	

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11n-HT20 MCS0	100	5500	19.96	21.50	100.00
		116	5580	20.31	22.00	
		124	5620	18.50	18.50	
		132	5660	18.50	18.50	
		140	5700	20.32	22.00	
		144	5720	20.46	22.00	
	802.11n-HT40 MCS0	102	5510	20.21	22.00	100.00
		110	5550	23.31	23.50	
		126	5630	23.31	23.50	
		134	5670	22.51	23.50	
		142	5710	22.97	23.50	
	802.11ax-HE20 MCS0	100	5500	20.06	21.50	100.00
		116	5580	20.41	22.00	
		124	5620	20.36	22.00	
		132	5660	20.36	22.00	
		140	5700	20.42	22.00	
		144	5720	20.56	22.00	
	802.11ax-HE40 MCS0	102	5510	20.31	22.00	100.00
		110	5550	23.41	23.50	
		126	5630	23.26	23.50	
		134	5670	22.61	23.50	
		142	5710	23.07	23.50	
	802.11ax-HE80 MCS0	106	5530	21.06	21.50	100.00
		122	5610	23.11	23.50	
		138	5690	23.06	23.50	

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11n-HT20 MCS0	149	5745	21.00	21.10	100.00
		157	5785	21.00	21.10	
		165	5825	20.90	21.10	
	802.11n-HT40 MCS0	151	5755	20.00	20.50	100.00
		159	5795	20.10	20.50	
	802.11ax-HE20 MCS0	149	5745	21.10	21.10	97.50
		157	5785	21.10	21.10	
		165	5825	21.00	21.10	
	802.11ax-HE40 MCS0	151	5755	20.10	20.50	100.00
		159	5795	20.20	20.50	
	802.11ax-HE80 MCS0	155	5775	20.10	20.50	100.00

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11n-HT20 MCS0	149	5745	21.20	21.50	100.00
		157	5785	20.90	21.50	
		165	5825	20.80	21.50	
	802.11n-HT40 MCS0	151	5755	20.30	20.50	100.00
		159	5795	20.40	20.50	
	802.11ax-HE20 MCS0	149	5745	21.30	21.50	97.51
		157	5785	21.00	21.50	
		165	5825	20.90	21.50	
	802.11ax-HE40 MCS0	151	5755	20.40	20.50	100.00
		159	5795	20.50	20.50	
	802.11ax-HE80 MCS0	155	5775	20.40	20.50	100.00

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11n-HT20 MCS0	149	5745	24.11	24.50	100.00
		157	5785	23.96	24.50	
		165	5825	24.11	24.50	
	802.11n-HT40 MCS0	151	5755	23.16	23.50	100.00
		159	5795	23.26	23.50	
	802.11ax-HE20 MCS0	149	5745	24.21	24.50	97.51
		157	5785	24.06	24.50	
		165	5825	24.16	24.50	
	802.11ax-HE40 MCS0	151	5755	23.26	23.50	100.00
		159	5795	23.36	23.50	
	802.11ax-HE80 MCS0	155	5775	23.26	24.00	100.00

Sensor on

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11ax-HE20 MCS0	1	2412	15.30	16.00	100.00
		2	2417	17.80	19.00	
		6	2437	17.60	19.00	
		9	2452	17.00	18.50	
		10	2457	13.60	15.00	
		11	2462	12.60	13.00	

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11ax-HE20 MCS0	1	2412	15.50	16.50	100.00
		2	2417	18.00	18.00	
		6	2437	17.12	18.00	
		9	2452	17.00	18.00	
		10	2457	15.50	16.00	
		11	2462	13.60	14.00	

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11ax-HE20 MCS0	1	2412	18.41	19.00	100.00
		2	2417	20.91	21.50	
		6	2437	21.11	21.50	
		9	2452	20.01	21.50	
		10	2457	17.66	18.50	
		11	2462	16.14	16.50	

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11n-HT20 MCS0	36	5180	Not Required	11.50	100.00
		40	5200		11.50	
		44	5220		11.50	
		48	5240		11.50	
	802.11n-HT40 MCS0	38	5190		11.50	100.00
		46	5230		11.50	
	802.11ax-HE20 MCS0	36	5180		11.50	100.00
		40	5200		11.50	
		44	5220		11.50	
		48	5240		11.50	
	802.11ax-HE40 MCS0	38	5190		11.50	100.00
		46	5230		11.50	
	802.11ax-HE80 MCS0	42	5210	9.90	11.50	100.00

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11n-HT20 MCS0	36	5180	Not Required	13.50	100.00
		40	5200		13.50	
		44	5220		13.50	
		48	5240		13.50	
	802.11n-HT40 MCS0	38	5190		13.50	100.00
		46	5230		13.50	
	802.11ax-HE20 MCS0	36	5180		13.50	100.00
		40	5200		13.50	
		44	5220		13.50	
		48	5240		13.50	
	802.11ax-HE40 MCS0	38	5190		13.50	100.00
		46	5230		13.50	
	802.11ax-HE80 MCS0	42	5210	12.30	13.50	100.00

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11n-HT20 MCS0	36	5180	Not Required	15.50	100.00
		40	5200		15.50	
		44	5220		15.50	
		48	5240		15.50	
	802.11n-HT40 MCS0	38	5190		15.50	100.00
		46	5230		15.50	
	802.11ax-HE20 MCS0	36	5180		15.50	100.00
		40	5200		15.50	
		44	5220		15.50	
		48	5240		15.50	
	802.11ax-HE40 MCS0	38	5190		15.50	100.00
		46	5230		15.50	
	802.11ax-HE80 MCS0	42	5210	13.61	15.50	100.00

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11n-HT20 MCS0	52	5260	Not Required	11.50	100.00
		56	5280		11.50	
		60	5300		11.50	
		64	5320		11.50	
	802.11n-HT40 MCS0	54	5270		11.5	100.00
		62	5310		11.50	
	802.11ax-HE20 MCS0	52	5260		11.50	100.00
		56	5280		11.50	
		60	5300		11.50	
		64	5320		11.50	
	802.11ax-HE40 MCS0	54	5270		11.50	100.00
		62	5310		11.50	
	802.11ax-HE80 MCS0	58	5290	10.11	11.50	100.00

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11n-HT20 MCS0	52	5260	Not Required	13.50	100.00
		56	5280		13.50	
		60	5300		13.50	
		64	5320		13.50	
	802.11n-HT40 MCS0	54	5270		13.5	100.00
		62	5310		13.50	
	802.11ax-HE20 MCS0	52	5260		13.50	100.00
		56	5280		13.50	
		60	5300		13.50	
		64	5320		13.50	
	802.11ax-HE40 MCS0	54	5270		13.50	100.00
		62	5310		13.50	
	802.11ax-HE80 MCS0	58	5290	12.90	13.50	100.00

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11n-HT20 MCS0	52	5260	Not Required	15.50	100.00
		56	5280		15.50	
		60	5300		15.50	
		64	5320		15.50	
	802.11n-HT40 MCS0	54	5270		15.50	100.00
		62	5310		15.50	
	802.11ax-HE20 MCS0	52	5260		15.50	100.00
		56	5280		15.50	
		60	5300		15.50	
		64	5320		15.50	
	802.11ax-HE40 MCS0	54	5270		15.50	100.00
		62	5310		15.50	
	802.11ax-HE80 MCS0	58	5290	14.62	15.50	100.00

Ant 6						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11n-HT20 MCS0	100	5500	Not Required	11.00	100.00
		116	5580		11.00	
		124	5620		11.00	
		132	5660		11.00	
		140	5700		11.00	
		144	5720		11.00	
	802.11n-HT40 MCS0	102	5510		11.00	100.00
		110	5550		11.00	
		126	5630		11.00	
		134	5670		11.00	
		142	5710		11.00	
	802.11ax-HE20 MCS0	100	5500		11.00	100.00
		116	5580		11.00	
		124	5620		11.00	
		132	5660		11.00	
		140	5700		11.00	
		144	5720		11.00	
	802.11ax-HE40 MCS0	102	5510		11.00	100.00
		110	5550		11.00	
		126	5630		11.00	
		134	5670		11.00	
		142	5710		11.00	
	802.11ax-HE80 MCS0	106	5530	9.70	11.00	100.00
		122	5610	9.70	11.00	
		138	5690	9.70	11.00	

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11n-HT20 MCS0	100	5500	Not Required	13.00	100.00
		116	5580		13.00	
		124	5620		13.00	
		132	5660		13.00	
		140	5700		13.00	
		144	5720		13.00	
	802.11n-HT40 MCS0	102	5510		13.00	100.00
		110	5550		13.00	
		126	5630		13.00	
		134	5670		13.00	
		142	5710		13.00	
	802.11ax-HE20 MCS0	100	5500		13.00	100.00
		116	5580		13.00	
		124	5620		13.00	
		132	5660		13.00	
		140	5700		13.00	
		144	5720		13.00	
	802.11ax-HE40 MCS0	102	5510		13.00	100.00
		110	5550		13.00	
		126	5630		13.00	
		134	5670		13.00	
		142	5710		13.00	
	802.11ax-HE80 MCS0	106	5530	11.20	13.00	100.00
		122	5610	11.30	13.00	
		138	5690	11.20	13.00	

Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11n-HT20 MCS0	100	5500	Not Required	15.00	100.00
		116	5580		15.00	
		124	5620		15.00	
		132	5660		15.00	
		140	5700		15.00	
		144	5720		15.00	
	802.11n-HT40 MCS0	102	5510		15.00	100.00
		110	5550		15.00	
		126	5630		15.00	
		134	5670		15.00	
		142	5710		15.00	
	802.11ax-HE20 MCS0	100	5500		15.00	100.00
		116	5580		15.00	
		124	5620		15.00	
		132	5660		15.00	
		140	5700		15.00	
		144	5720		15.00	
	802.11ax-HE40 MCS0	102	5510		15.00	100.00
		110	5550		15.00	
		126	5630		15.00	
		134	5670		15.00	
		142	5710		15.00	
	802.11ax-HE80 MCS0	106	5530	13.57	15.00	100.00
		122	5610	13.62	15.00	
		138	5690	13.65	15.00	

5.8GHz WLAN				Ant 6		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11n-HT20 MCS0	149	5745	Not Required	11.00	100.00
		157	5785		11.00	
		165	5825		11.00	
	802.11n-HT40 MCS0	151	5755		11.00	100.00
		159	5795		11.00	
	802.11ax-HE20 MCS0	149	5745		11.00	97.50
		157	5785		11.00	
		165	5825		11.00	
	802.11ax-HE40 MCS0	151	5755		11.00	100.00
		159	5795		11.00	
	802.11ax-HE80 MCS0	155	5775	9.50	11.00	100.00

Ant 7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11n-HT20 MCS0	149	5745	Not Required	17.00	100.00
		157	5785		17.00	
		165	5825		17.00	
	802.11n-HT40 MCS0	151	5755		17.00	100.00
		159	5795		17.00	
	802.11ax-HE20 MCS0	149	5745		17.00	97.51
		157	5785		17.00	
		165	5825		17.00	
	802.11ax-HE40 MCS0	151	5755		17.00	100.00
		159	5795		17.00	
	802.11ax-HE80 MCS0	155	5775	15.90	17.00	100.00

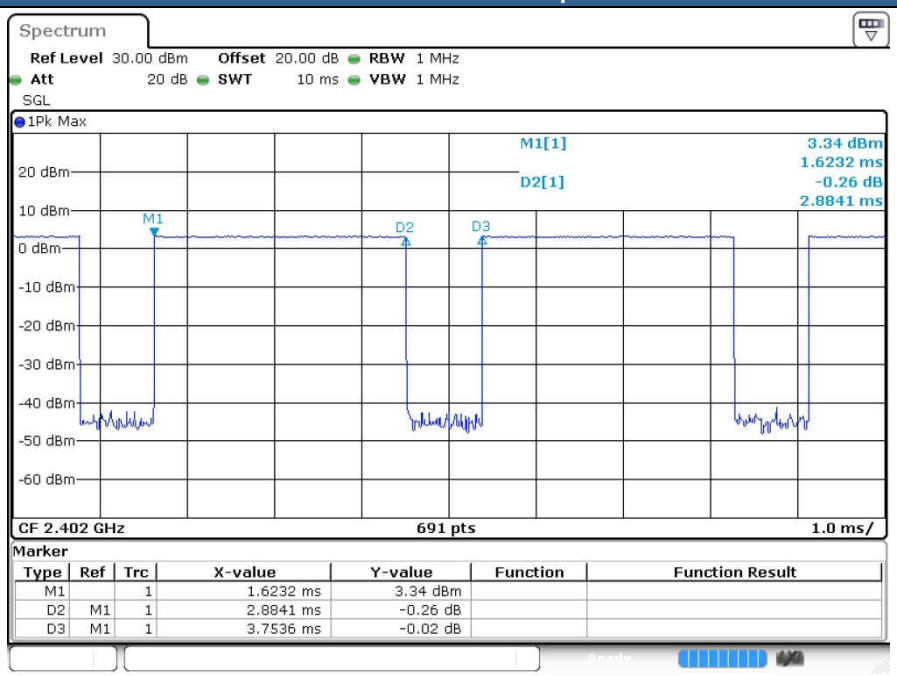
Ant 6+7						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11n-HT20 MCS0	149	5745	Not Required	18.00	100.00
		157	5785		18.00	
		165	5825		18.00	
	802.11n-HT40 MCS0	151	5755		18.00	100.00
		159	5795		18.00	
	802.11ax-HE20 MCS0	149	5745		18.00	97.51
		157	5785		18.00	
		165	5825		18.00	
	802.11ax-HE40 MCS0	151	5755		18.00	100.00
		159	5795		18.00	
	802.11ax-HE80 MCS0	155	5775	16.87	18.00	100.00

<2.4GHz Bluetooth>

General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps, due to its highest average power.
2. The Bluetooth duty cycle are 76.84 % as following figure, according to 2016 Oct. TCB workshop for Bluetooth SAR scaling need further consideration and the maximum duty cycle is 100%, therefore the actual duty cycle will be scaled up to100% for Bluetooth reported SAR calculation.

Bluetooth time-domain plot



Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	3.13	2.97	2.95
	CH 39	2441	3.58	3.49	3.49
	CH 78	2480	3.40	2.77	2.77
Tune-up Limit			4	4	4

Mode	Channel	Frequency (MHz)	Average power (dBm)
LE 1M	CH 00	2402	2.90
	CH 19	2440	3.50
	CH 39	2480	3.10
Tune-up Limit			4

Mode	Channel	Frequency (MHz)	Average power (dBm)
LE 2M	CH 00	2402	2.90
	CH 19	2440	3.50
	CH 39	2480	3.10
Tune-up Limit			4

14. Antenna Location

The detailed antenna location information can refer to SAR Test Setup Photos.

<SAR test exclusion table>

General Note:

1. The below table, when the distance is < 50 mm exclusion threshold is "Ratio", when the distance is > 50 mm exclusion threshold is "mW"
2. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
3. Per KDB 447498 D01v06, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
4. Per KDB 447498 D01v06, standalone SAR test exclusion threshold is applied; If the test separation distance is < 5mm, 5mm is used to determine SAR exclusion threshold.
5. Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
   - f(GHz) is the RF channel transmit frequency in GHz
   - Power and distance are rounded to the nearest mW and mm before calculation
   - The result is rounded to one decimal place for comparison
6. Per KDB 447498 D01v06, at 100 MHz to 6 GHz and for *test separation distances* > 50 mm, the SAR test exclusion threshold is determined according to the following
   a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz
   b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

Exposure Position	Wireless Interface	BT	2.4GHz WLAN ANT 6	2.4GHz WLAN ANT 7	5GHz WLAN ANT 6	5GHz WLAN ANT 7
	Calculated Frequency	2480MHz	2462MHz	2462MHz	5825MHz	5825MHz
	Maximum power (dBm)	4	21.5	21.5	21.2	21.5
	Maximum rated power(mW)	2.51	141.25	141.25	131.83	141.25
Bottom Face	Separation distance(mm)	5.0	5.0	5.0	5.0	5.0
	exclusion threshold	0.8	44.3	44.3	63.6	68.2
	Testing required?	No	Yes	Yes	Yes	Yes
Edge 1	Separation distance(mm)	224.0	224.0	5.0	224.0	5.0
	exclusion threshold	1835.0	1836.0	44.3	1802.0	68.2
	Testing required?	No	No	Yes	No	Yes
Edge 2	Separation distance(mm)	150.0	150.0	95.0	150.0	95.0
	exclusion threshold	1095.0	1096.0	546.0	1062.0	512.0
	Testing required?	No	No	No	No	No
Edge 3	Separation distance(mm)	11.0	11.0	240.0	11.0	240.0
	exclusion threshold	0.4	20.2	1996.0	28.9	1962.0
	Testing required?	No	Yes	No	Yes	No
Edge 4	Separation distance(mm)	5.0	5.0	30.5	5.0	30.5
	exclusion threshold	0.8	44.3	7.3	63.6	11.2
	Testing required?	No	Yes	Yes	Yes	Yes

15. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   · ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   · ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   · ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
4. For WLAN ANT6 The device employs proximity sensors that detect the presence of the user's body also a finger or hand near the bottom face, edge 4 of the device, reduced power will be active for all WLAN bands. (P-sensor can't work at detecting presence of the user's body at other edges of the device.)
5. For WLAN ANT7 The device employs proximity sensors that detect the presence of the user's body also a finger or hand near the bottom face, edge 1 of the device, reduced power will be active for all WLAN bands. (P-sensor can't work at detecting presence of the user's body at other edges of the device.)
6. For distance SAR and non-distance SAR, always chose higher SAR to do co-located analysis.

WLAN Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
3. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
4. During SAR testing the WLAN transmission was verified using a spectrum analyzer.
5. Bluetooth and WLAN share the same antenna, with similar work frequency, so for Bluetooth SAR testing, we chose the worst position of WLAN to perform.
6. The 2.4GHz/5GHz WLAN can transmit in SISO/MIMO antenna mode. TX Beamforming mode is only supported in 2.4GHz WLAN 802.11ax and 5GHz WLAN 802.11n/ax.
7. Due to the single antenna RF power in WLAN SISO & MIMO (CDD) mode is larger than or very close to the single antenna RF power in Beamforming mode, so WLAN SISO & MIMO (CDD) mode SAR can represent beamforming mode SAR.

15.1 Body SAR

<WLAN2.4GHz SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Bottom face	0mm	Ant 6	Reduced	6	2437	17.50	19.00	1.413	99.3	1.007	-0.09	0.799	1.137
	WLAN2.4GHz	802.11b 1Mbps	Bottom face	0mm	Ant 6	Reduced	1	2412	17.40	19.00	1.445	99.3	1.007	0.08	0.721	1.049
	WLAN2.4GHz	802.11b 1Mbps	Edge 3	0mm	Ant 6	Full	6	2437	20.60	21.50	1.230	99.3	1.007	0.09	0.564	0.699
	WLAN2.4GHz	802.11b 1Mbps	Edge 4	0mm	Ant 6	Reduced	6	2437	17.50	19.00	1.413	99.3	1.007	-0.02	0.189	0.269
	WLAN2.4GHz	802.11b 1Mbps	Bottom face	16mm	Ant 6	Full	6	2437	20.60	21.50	1.230	99.3	1.007	-0.05	0.105	0.130
	WLAN2.4GHz	802.11b 1Mbps	Edge 4	15mm	Ant 6	Full	6	2437	20.60	21.50	1.230	99.3	1.007	0.05	0.049	0.061
01	WLAN2.4GHz	802.11b 1Mbps	Bottom face	0mm	Ant 7	Reduced	1	2412	17.00	18.00	1.259	99.3	1.007	-0.01	0.989	**1.254**
	WLAN2.4GHz	802.11g 6Mbps	Bottom face	0mm	Ant 7	Reduced	1	2412	16.00	17.50	1.413	95.4	1.048	0.03	0.804	1.190
	WLAN2.4GHz	802.11b 1Mbps	Bottom face	0mm	Ant 7	Reduced	6	2437	16.80	18.00	1.318	99.3	1.007	0.01	0.755	1.002
	WLAN2.4GHz	802.11b 1Mbps	Bottom face	0mm	Ant 7	Reduced	11	2462	16.70	18.00	1.349	99.3	1.007	0.03	0.831	1.129
	WLAN2.4GHz	802.11b 1Mbps	Edge 1	0mm	Ant 7	Reduced	1	2412	17.00	18.00	1.259	99.3	1.007	0.08	0.412	0.522
	WLAN2.4GHz	802.11b 1Mbps	Edge 4	0mm	Ant 7	Full	1	2412	20.50	21.50	1.259	99.3	1.007	-0.05	0.142	0.180
	WLAN2.4GHz	802.11b 1Mbps	Bottom face	17mm	Ant 7	Full	1	2412	20.50	21.50	1.259	99.3	1.007	0.12	0.025	0.032
	WLAN2.4GHz	802.11b 1Mbps	Edge 1	17mm	Ant 7	Full	1	2412	20.50	21.50	1.259	99.3	1.007	0.06	0.011	0.014

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
02	Bluetooth	1Mbps	Bottom face	0mm	Ant 6	Full	39	2441	3.58	4.00	1.100	76.84	1.301	-0.06	0.019	**0.027**

<WLAN5G SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN 5.2GHz	802.11ac-VHT80 MCS0	Bottom face	0mm	Ant 6	Reduced	42	5210	10.40	11.50	1.288	92.13	1.085	-0.02	0.787	1.100
	WLAN 5.2GHz	802.11n-HT40 MCS0	EDGE 3	0mm	Ant 6	Full	46	5230	19.90	20.50	1.148	86.84	1.152	0.03	0.487	0.644
	WLAN 5.2GHz	802.11ac-VHT80 MCS0	EDGE 4	0mm	Ant 6	Reduced	42	5210	10.40	11.50	1.288	92.13	1.085	0.01	0.709	0.991
	WLAN 5.2GHz	802.11n-HT40 MCS0	Bottom face	16mm	Ant 6	Full	46	5230	19.90	20.50	1.148	86.84	1.152	0.04	0.606	0.802
	WLAN 5.2GHz	802.11n-HT40 MCS0	Bottom face	16mm	Ant 6	Full	38	5190	18.00	19.50	1.413	86.84	1.152	0.03	0.491	0.799
	WLAN 5.2GHz	802.11n-HT40 MCS0	EDGE 4	15mm	Ant 6	Full	46	5230	19.90	20.50	1.148	86.84	1.152	0.06	0.447	0.591
	WLAN 5.2GHz	802.11ac-VHT80 MCS0	Bottom face	0mm	Ant 7	Reduced	42	5210	12.40	13.50	1.288	92.19	1.085	-0.03	0.552	0.772
06	WLAN 5.2GHz	802.11ac-VHT80 MCS0	EDGE 1	0mm	Ant 7	Reduced	42	5210	12.40	13.50	1.288	92.19	1.085	0.04	0.796	**1.113**
	WLAN 5.2GHz	802.11n-HT40 MCS0	EDGE 4	0mm	Ant 7	Full	46	5230	20.40	20.50	1.023	86.84	1.152	0.05	0.183	0.216
	WLAN 5.2GHz	802.11n-HT40 MCS0	Bottom face	17mm	Ant 7	Full	46	5230	20.40	20.50	1.023	86.84	1.152	0.02	0.065	0.077
	WLAN 5.2GHz	802.11n-HT40 MCS0	EDGE 1	17mm	Ant 7	Full	46	5230	20.40	20.50	1.023	86.84	1.152	-0.03	0.627	0.739
	WLAN 5.3GHz	802.11ac-VHT80 MCS0	Bottom face	0mm	Ant 6	Reduced	58	5290	10.40	11.50	1.288	92.13	1.085	0.03	0.886	1.238
	WLAN 5.3GHz	802.11n-HT40 MCS0	Bottom face	0mm	Ant 6	Reduced	62	5310	10.80	11.50	1.175	86.84	1.152	0.02	0.752	1.018
	WLAN 5.3GHz	802.11n-HT40 MCS0	EDGE 3	0mm	Ant 6	Full	54	5270	19.80	20.50	1.175	86.84	1.152	0.09	0.556	0.753
	WLAN 5.3GHz	802.11ac-VHT80 MCS0	EDGE 4	0mm	Ant 6	Reduced	58	5290	10.40	11.50	1.288	92.13	1.085	0.07	0.721	1.008
	WLAN 5.3GHz	802.11n-HT40 MCS0	Bottom face	16mm	Ant 6	Full	54	5270	19.80	20.50	1.175	86.84	1.152	0.01	0.711	0.962
	WLAN 5.3GHz	802.11n-HT40 MCS0	Bottom face	16mm	Ant 6	Full	62	5310	18.40	20.00	1.445	86.84	1.152	0.03	0.478	0.796
	WLAN 5.3GHz	802.11n-HT40 MCS0	EDGE 4	15mm	Ant 6	Full	54	5270	19.80	20.50	1.175	86.84	1.152	0.05	0.457	0.619
	WLAN 5.3GHz	802.11ac-VHT80 MCS0	Bottom face	0mm	Ant 7	Reduced	58	5290	12.40	13.50	1.288	92.13	1.085	0.04	0.609	0.851
03	WLAN 5.3GHz	802.11ac-VHT80 MCS0	EDGE 1	0mm	Ant 7	Reduced	58	5290	12.40	13.50	1.288	92.13	1.085	0.01	0.909	**1.271**
	WLAN 5.3GHz	802.11n-HT40 MCS0	EDGE 1	0mm	Ant 7	Reduced	54	5270	13.10	13.50	1.096	86.84	1.152	0.01	0.932	1.177
	WLAN 5.3GHz	802.11n-HT40 MCS0	EDGE 4	0mm	Ant 7	Full	54	5270	20.20	20.50	1.072	86.84	1.152	0.03	0.208	0.257
	WLAN 5.3GHz	802.11n-HT40 MCS0	Bottom face	17mm	Ant 7	Full	54	5270	20.20	20.50	1.072	86.84	1.152	0.09	0.089	0.110
	WLAN 5.3GHz	802.11n-HT40 MCS0	EDGE 1	17mm	Ant 7	Full	54	5270	20.20	20.50	1.072	86.84	1.152	0.02	0.634	0.783
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	Bottom face	0mm	Ant 6	Reduced	122	5610	9.90	11.00	1.288	92.13	1.085	-0.03	0.712	0.995
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	Bottom face	0mm	Ant 6	Reduced	106	5530	9.90	11.00	1.288	92.13	1.085	0.01	0.635	0.888
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	EDGE 3	0mm	Ant 6	Full	122	5610	20.30	20.50	1.047	92.13	1.085	-0.08	0.407	0.462
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	EDGE 4	0mm	Ant 6	Reduced	122	5610	9.90	11.00	1.288	92.13	1.085	0.04	0.886	1.238
	WLAN 5.5GHz	802.11n-HT40 MCS0	EDGE 4	0mm	Ant 6	Reduced	110	5550	10.10	11.00	1.230	86.84	1.152	0.02	0.802	1.137
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	EDGE 4	0mm	Ant 6	Reduced	106	5530	9.90	11.00	1.288	92.13	1.085	-0.07	0.801	1.120
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	EDGE 4	0mm	Ant 6	Reduced	138	5690	9.60	11.00	1.380	92.13	1.085	0.03	0.689	1.032
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	Bottom face	16mm	Ant 6	Full	122	5610	20.30	20.50	1.047	92.13	1.085	0.04	0.695	0.790
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	Bottom face	16mm	Ant 6	Full	138	5690	19.50	20.50	1.259	92.13	1.085	0.03	0.581	0.794
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	EDGE 4	15mm	Ant 6	Full	122	5610	20.30	20.50	1.047	92.13	1.085	0.03	0.436	0.495
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	Bottom face	0mm	Ant 7	Reduced	122	5610	11.40	13.00	1.445	92.19	1.085	-0.01	0.496	0.778
04	WLAN 5.5GHz	802.11ac-VHT80 MCS0	EDGE 1	0mm	Ant 7	Reduced	122	5610	11.40	13.00	1.445	92.19	1.085	0.04	0.826	**1.295**
	WLAN 5.5GHz	802.11n-HT40 MCS0	EDGE 1	0mm	Ant 7	Reduced	110	5550	11.70	13.00	1.349	86.84	1.152	-0.03	0.724	1.125
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	EDGE 1	0mm	Ant 7	Reduced	106	5530	11.40	13.00	1.445	92.19	1.085	0.02	0.789	1.237
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	EDGE 1	0mm	Ant 7	Reduced	138	5690	11.10	13.00	1.549	92.19	1.085	0.02	0.711	1.195
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	EDGE 4	0mm	Ant 7	Full	122	5610	20.20	20.50	1.072	92.19	1.085	0.11	0.193	0.224
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	Bottom face	17mm	Ant 7	Full	122	5610	20.20	20.50	1.072	92.19	1.085	-0.04	0.062	0.072
	WLAN 5.5GHz	802.11ac-VHT80 MCS0	EDGE 1	17mm	Ant 7	Full	122	5610	20.20	20.50	1.072	92.19	1.085	0.02	0.322	0.374
05	WLAN 5.8GHz	802.11ac-VHT80 MCS0	Bottom face	0mm	Ant 6	Reduced	155	5775	9.80	11.00	1.318	92.13	1.085	-0.09	0.911	**1.303**
	WLAN 5.8GHz	802.11n-HT40 MCS0	Bottom face	0mm	Ant 6	Reduced	159	5795	10.80	11.00	1.047	86.84	1.152	0.03	0.917	1.106
	WLAN 5.8GHz	802.11a 6Mbps	EDGE 3	0mm	Ant 6	Full	157	5785	21.20	21.20	1.000	93.46	1.070	0.04	0.629	0.673
	WLAN 5.8GHz	802.11ac-VHT80 MCS0	EDGE 4	0mm	Ant 6	Reduced	155	5775	9.80	11.00	1.318	92.13	1.085	-0.08	0.722	1.033
	WLAN 5.8GHz	802.11a 6Mbps	Bottom face	16mm	Ant 6	Full	149	5745	21.10	21.10	1.000	93.46	1.070	-0.09	1.070	1.145
	WLAN 5.8GHz	802.11a 6Mbps	Bottom face	16mm	Ant 6	Full	157	5785	21.20	21.20	1.000	93.46	1.070	0.09	1.160	1.241
	WLAN 5.8GHz	802.11a 6Mbps	Bottom face	16mm	Ant 6	Full	165	5825	21.00	21.00	1.000	93.46	1.070	0.03	1.110	1.188
	WLAN 5.8GHz	802.11n-HT40 MCS0	Bottom face	16mm	Ant 6	Full	159	5795	20.30	21.10	1.202	86.84	1.152	0.01	0.568	0.787
	WLAN 5.8GHz	802.11a 6Mbps	EDGE 4	15mm	Ant 6	Full	157	5785	21.20	21.20	1.000	93.46	1.070	0.07	0.704	0.753

	WLAN 5.8GHz	802.11ac-VHT80 MCS0	Bottom face	0mm	Ant 7	Reduced	155	5775	16.10	17.00	1.230	92.19	1.085	-0.06	0.521	0.695
	WLAN 5.8GHz	802.11ac-VHT80 MCS0	EDGE 1	0mm	Ant 7	Reduced	155	5775	16.10	17.00	1.230	92.19	1.085	0.05	0.952	1.271
	WLAN 5.8GHz	802.11n-HT40 MCS0	EDGE 1	0mm	Ant 7	Reduced	159	5795	16.70	17.00	1.072	86.84	1.152	0.03	0.778	0.960
	WLAN 5.8GHz	802.11a 6Mbps	EDGE 4	0mm	Ant 7	Full	149	5745	21.30	21.50	1.047	93.46	1.070	-0.07	0.199	0.223
	WLAN 5.8GHz	802.11a 6Mbps	Bottom face	17mm	Ant 7	Full	149	5745	21.30	21.50	1.047	93.46	1.070	0.03	0.034	0.038
	WLAN 5.8GHz	802.11a 6Mbps	EDGE 1	17mm	Ant 7	Full	149	5745	21.30	21.50	1.047	93.46	1.070	0.09	0.467	0.523

15.2 Repeated SAR Measurement

No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WLAN2.4GHz	802.11b 1Mbps	Bottom face	0mm	Ant 7	Reduced	1	2412	17.00	18.00	1.259	99.3	1.007	-0.01	0.989	1	1.254
2nd	WLAN2.4GHz	802.11b 1Mbps	Bottom face	0mm	Ant 7	Reduced	1	2412	17.00	18.00	1.259	99.3	1.007	0.08	0.945	1.047	1.198
1st	WLAN 5.3GHz	802.11ac-VHT80 MCS0	Edge 1	0mm	Ant 7	Reduced	58	5290	12.40	13.50	1.288	92.13	1.085	0.01	0.909	1	1.271
2nd	WLAN 5.3GHz	802.11ac-VHT80 MCS0	Edge 1	0mm	Ant 7	Reduced	58	5290	12.40	13.50	1.288	92.13	1.085	0.05	0.823	1.104	1.150
1st	WLAN 5.5GHz	802.11ac-VHT80 MCS0	Edge 4	0mm	Ant 6	Reduced	122	5610	9.90	11.00	1.288	92.13	1.085	0.04	0.886	1	1.238
2nd	WLAN 5.5GHz	802.11ac-VHT80 MCS0	Edge 4	0mm	Ant 6	Reduced	122	5610	9.90	11.00	1.288	92.13	1.085	-0.01	0.815	1.087	1.139
1st	WLAN 5.8GHz	802.11a 6Mbps	Bottom face	16mm	Ant 6	Full Power	155	5775	21.20	21.20	1.000	93.46	1.070	0.09	1.160	1	1.241
2nd	WLAN 5.8GHz	802.11a 6Mbps	Bottom face	16mm	Ant 6	Full Power	155	5775	21.20	21.20	1.000	93.46	1.070	-0.01	1.120	1.036	1.198

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

16. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Wireless Tablet
		Body
1.	WLAN2.4GHz ANT6 + WLAN2.4GHz ANT7	Yes
2.	WLAN5GHz ANT6 + WLAN5GHz ANT7	Yes
3.	WLAN5GHz ANT6 + WLAN5GHz ANT7 + Bluetooth	Yes

General Note:

1. The EUT has no voice function means data only.
2. EUT will choose either 2.4GHz WLAN or 5GHz WLAN according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
3. Above table listed transmitting simultaneous state is supported only for this device.
4. According to the EUT characteristic, WLAN 5GHz and Bluetooth can transmit simultaneously.
5. According to the EUT characteristic, WLAN 2.4GHz and Bluetooth can't transmit simultaneously.
6. For simultaneously analysis, since the SAR summation of 3 transmitters can cover others combination of 2 transmitters, therefore in this section did not additional to evaluate 2TX combination of simultaneously transmission.
7. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) 1g Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04 for 1g SAR, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg.
   v) The SPLSR calculated results please refer to section 16.2.

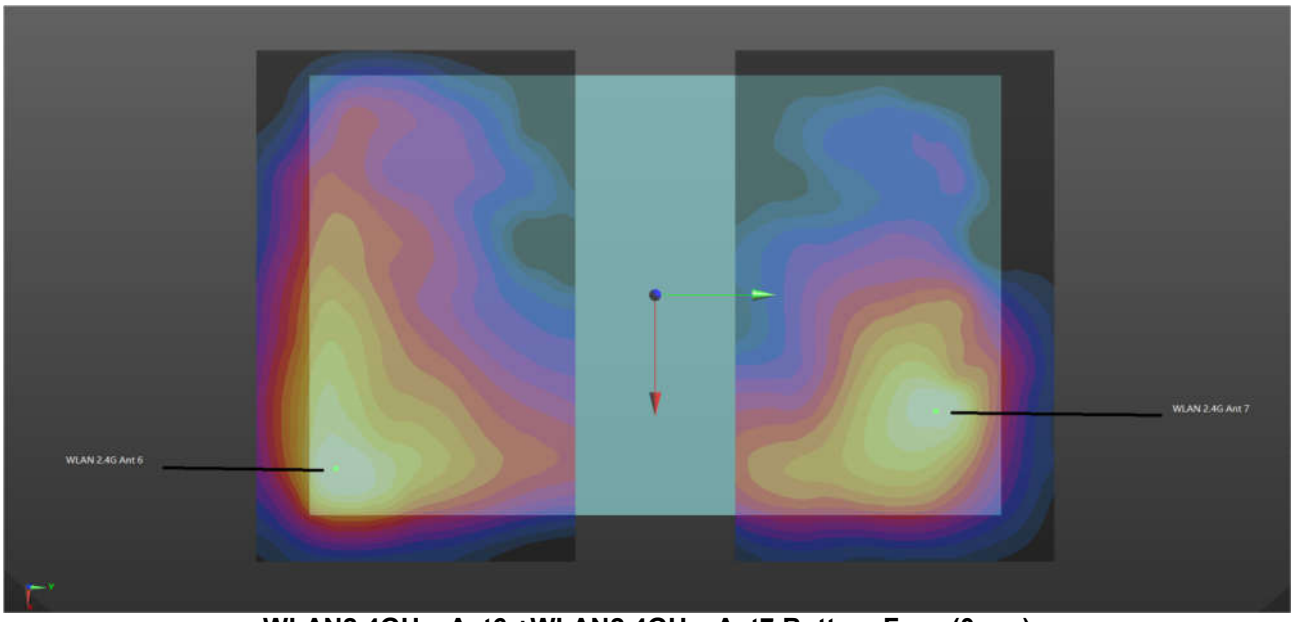
16.1 Body Exposure Conditions

Exposure Position	1	2	3	4	5	1+2 Summed 1g SAR (W/kg)	3+4+5 Summed 1g SAR (W/kg)	Case No
	WLAN2.4GHz Ant 6	WLAN2.4GHz Ant 7	WLAN5GHz Ant 6	WLAN5GHz Ant 7	Bluetooth Ant 6			
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)			
Bottom Face	1.137	1.254	1.303	0.851	0.027	**2.390**	**2.180**	**1/2**
Edge 1		0.522		1.295		0.520	1.300	
Edge 3	0.699		0.753			0.700	0.750	
Edge 4	0.269	0.180	1.238	0.257		0.450	**1.500**	

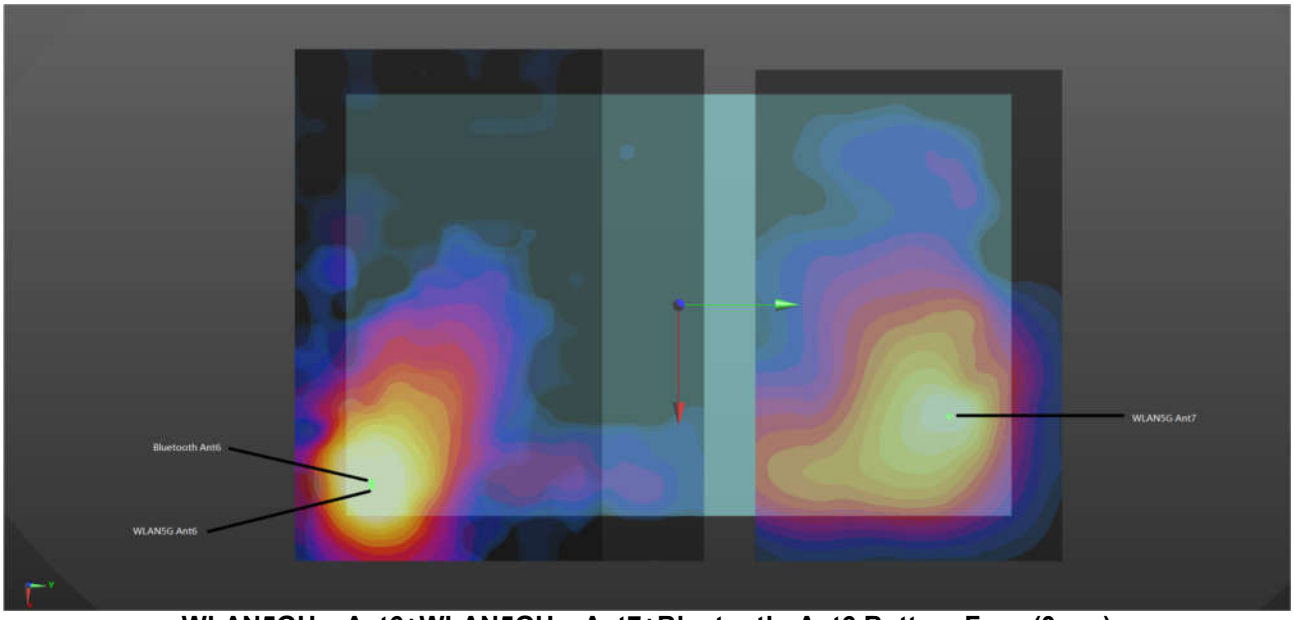
16.2 SPLSR Evaluation and Analysis

General Note:

1. When standalone SAR is measured for both antennas in the pair, the peak location separation distance is computed by the square root of [(x1−x2)2 + (y1−y2)2 + (z1−z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates in the area scans or extrapolated peak SAR locations in the zoom scans, as appropriate.
2. SPLSR = (SAR1 + SAR2)1.5 / (min. separation distance, mm). If SPLSR ≤ 0.04 for 1g SAR, simultaneously transmission SAR measurement is not necessary.



WLAN2.4GHz_Ant6 +WLAN2.4GHz_Ant7 Bottom Face (0mm)



WLAN5GHz_Ant6+WLAN5GHz_Ant7+Bluetooth_Ant6 Bottom Face (0mm)

Case No.	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
Case 1	WLAN2.4GHz Ant6	Bottom face	1.137	0	70.2	-118	-0.1	227.8	2.39	0.02	Not required
	WLAN2.4GHz Ant7		1.254	0	41.1	107.9	0.43				
Case 2	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (mm) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WLAN5GHz Ant6	Bottom face	1.303	0	72.6	-118.4	-0.09	229.0	2.18	0.01	Not required
	Bluetooth Ant6		0.027	0							
	WLAN5GHz Ant7		0.851	0	42.6	108.6	0.49				

Test Engineer : Martin Li, Varus Wang, Light Wang

17. Uncertainty Assessment

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg. Therefore, the measurement uncertainty table is not required in this report.

18. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[6] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.

[7] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[8] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

[9] FCC KDB 616217 D04 v01r02, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, Oct 2015

------THE END------