FCC 47 CFR Parts 1 & 2
Published RF Exposure KDB Procedures
IEEE Std 1528-2003 and IEEE Std 1528a-2005

(Class II Permissive Change)

SAR EVALUATION REPORT

For

Wireless Module
(Tested inside of Panasonic Tablet PC FZ-Y1)

Model: WL14A
FCC ID: ACJ9TGWL14A

Report Number: 10691393H-A
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Prepared for

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NVLAP LAB CODE: 200572-0

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http://www.ul.com/japan/jpn/pages/services/emc/

Revision History

Rev.	Issue Date	Revisions	Revised By
--	04/15/2015	Initial Issue	T. Hatakeda

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1. Attestation of Test Results

Applicant	PANASONIC CORPORATION OF NORTH AMERICA
DUT description	Wireless Module (Tested inside of Panasonic Tablet PC FZ-Y1)
Model	WL14A
Test device is	An identical prototype
Device category	Portable
Exposure category	General Population/Uncontrolled Exposure
Date tested	March 18 to 25, 2015

Applicable Standards	Test Results
FCC 47 CFR Parts 1 & 2 FCC Published RF exposure KDB procedures, and TCB workshop updates IEEE Std 1528-2003 and IEEE Std 1528a-2005	Pass

1. This test report shall not be reproduced in full or partial, without the written approval of UL Japan, Inc.
2. The results in this report apply only to the sample tested.
3. This sample tested is in compliance with the limits of the above regulation.
4. The test results in this report are traceable to the national or international standards.
5. This test report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

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1.1. Summary of Highest 1-g SAR Results

Worst Case SAR data for each Frequency Band

RF Exposure Rule	Freq. Range	Highest Reported SAR	Limit
15.247	2400-2480 MHz	WLAN: 1.347 W/kg (Edge 1 tilt) Bluetooth: 0.007 W/kg (Edge 1 tilt)	1.6 W/kg
15.407	5150-5250 MHz	Body: 0.551 W/kg (Edge 1 tilt)	
	5250-5350 MHz	Body: 0.565 W/kg (Edge 4 tilt)	
	5500-5700 MHz	Body: 0.532 W/kg (Edge 1 tilt)	
15.247	5725-5850 MHz	Body: 0.553 W/kg (Edge 1 tilt)	
Simultaneous Transmission Condition		1.441 W/kg (refer to Section 14) (The highest across exposure conditions)	

LEGEND:

- Rear = Bottom Face
- Edge 1 = Top Edge
- Edge 2 = Left Edge
- Edge 3 = Bottom Edge
- Edge 4 = Right Edge

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2. Test Methodology

The tests documented in this report were performed in accordance with FCC 47 CFR Parts 1 & 2, IEEE STD 1528-2003, IEEE Std 1528a-2005, TCB workshop updates, and the following KDB procedures:

- o 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r03
- o 865664 D02 SAR Reporting v01r01
- o 447498 D01 General RF Exposure Guidance v05r02
- o 248227 D01 SAR Meas for 802 11abg v01r02
- o 616217 D04 SAR for laptop and tablets v01r01

3. Facilities and Accreditation

*Shielded room for SAR testings

The test sites and measurement facilities used to collect data are located at 4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN.

UL Japan, Inc. is accredited by NVLAP, Laboratory Code 200572-0

The full scope of accreditation can be viewed at

http://www.ul.com/japan/jpn/pages/services/emc/about/mark1/index.jsp#nvlap

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4. Calibration and Uncertainty

4.1. Measuring Instrument Calibration

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MAT-20	Attenuator(10dB)(above1GHz)	HIROSE ELECTRIC CO.,LTD.	AT-110	-	SAR	2015/01/08 * 12
MAT-23	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	SAR	2015/03/13 * 12
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	SAR	2014/10/16 * 12
MPSE-11	Power sensor	Anritsu	MA2411B	011737	SAR	2014/10/15 * 12
MPM-12	Power Meter	Anritsu	ML2495A	0825002	SAR	2014/06/16 * 12
MPSE-17	Power sensor	Anritsu	MA2411B	0738285	SAR	2014/06/16 * 12
MDAE-01	Data Acquisition Electronics	Schmid&Partner Engineering AG	DAE4	509	SAR	2014/07/28 * 12
MPB-07	Dosimetric E-Field Probe	Schmid&Partner Engineering AG	EX3DV4	3825	SAR	2014/12/16 * 12
MPF-02	2mm Oval Flat Phantom	Schmid&Partner Engineering AG	QDOVA001BB	1045	SAR	2014/05/30 * 12
MOS-26	Thermo-Hygrometer	CUSTOM	CTH-201	A08Q29	SAR	2014/05/20 * 12
COTS-MSAR-03	Dasy5	Schmid&Partner Engineering AG	DASY5	-	SAR	-
MRBT-02	SAR robot	Schmid&Partner Engineering AG	TX60 Lspeag	F10/5E3LA1/A/01	SAR	2014/05/09 * 12
MPM-15	Power Meter	Agilent	N1914A	MY53060017	SAR	2014/06/20 * 12
MPSE-20	Power sensor	Agilent	N8482H	MY53050001	SAR	2014/06/20 * 12
MPSE-21	Power sensor	Agilent	N8482H	MY52460010	SAR	2014/07/02 * 12
MHDC-12	Dual Directional Coupler	Hewlett Packard	772D	2839A0016	SAR(2-18GHz)	Pre Check
MRFA-24	Pre Amplifier	R&K	R&K CGA020M602-2633R	B30550	SAR	2014/06/19 * 12
MSG-13	Signal Generator	Rohde & Schwarz	SMA 100A	103764	SAR	2014/06/19 * 12
MDA-07	Dipole Antenna	Schmid&Partner Engineering AG	D2450V2	713	SAR(D2450)	2013/09/10 * 24
MDA-08	Dipole Antenna	Schmid&Partner Engineering AG	D5GHzV2	1020	SAR(D5G)	2015/01/13 * 12

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Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
MOS-37	Digital thermometer	LKM electronic	DTM3000	-	SAR	2014/07/06 * 12
MAT-78	Attenuator	Telegrartner	J01156A0011	0042294119	SAR	Pre Check
MDAE-02	Data Acquisition Electronics	Schmid&Partner Engineering AG	DAE4	1369	SAR	2014/05/14 * 12
MRENT-82	Dosimetric E-Field Probe	Schmid&Partner Engineering AG	EX3DV4	3540	SAR	2014/05/19 * 12
MPF-05	2mm Oval Flat Phantom	Schmid&Partner Engineering AG	QDOVA001BB	1095	SAR	2015/01/14 * 12
MDH-04	Device holder	Schmid&Partner Engineering AG	Mounting device for transmitter	-	SAR	Pre Check
MOS-35	Digital thermometer	HANNA	Checktemp 4	-	SAR	2014/07/06 * 12
MRBT-03	SAR robot	Schmid&Partner Engineering AG	TX60 Lspeag	F13/5PP1D1/A /01	SAR	2014/06/24 * 12
MPM-10	Dual Power Meter	Hewlett Packard	E4419A (=EPM-442A)	GB37170359	SAR	2014/07/22 * 12
MPSE-14	Power Sensor	Hewlett Packard	ECP-E18A (=E4412A)	US37181064	SAR	2014/07/22 * 12

The expiration date of the calibration is the end of the expired month.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

4.2. Measurement Uncertainty

Per KDB 865664, when no measured SAR values exceed 1.5 W/kg, measurement uncertainty analysis does not need to be provided in the test report.

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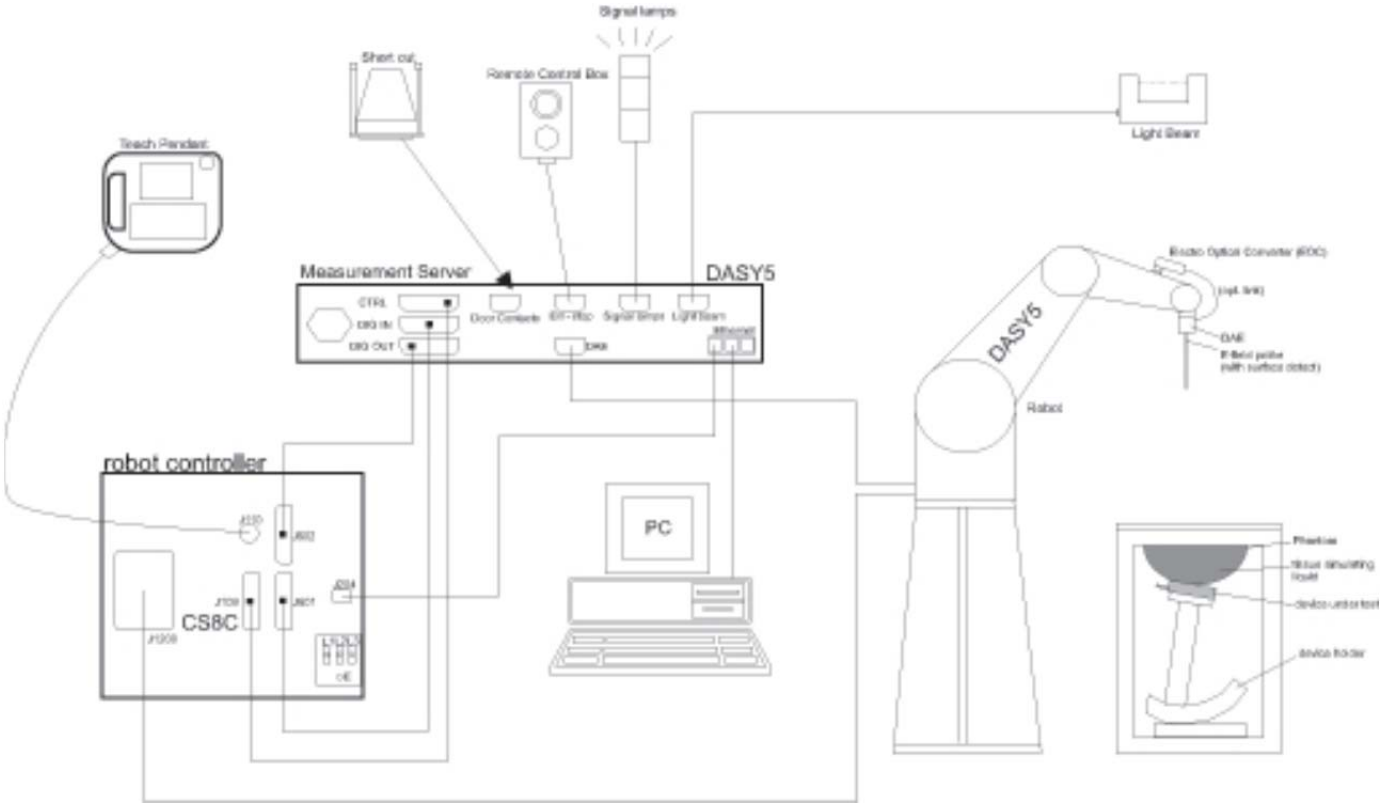
5. Measurement System Description and Setup

The DASY5 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 WinXP or Win7 and the DASY5 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.

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6. SAR Measurement Procedure

6.1. Normal SAR Measurement Procedure

Step 1: 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. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scan

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

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01

	≤ 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.	

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Step 3: Zoom Scan

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

Zoom Scan Parameters extracted from KDB 865664 D01 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	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
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.

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

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6.2. Volume Scan Procedures

Step 1: Repeat Step 1-4 in Section 6.1

Step 2: Volume Scan

Volume Scans are used to assess peak SAR and averaged SAR measurements in largely extended 3-dimensional volumes within any phantom. This measurement does not need any previous area scan. The grid can be anchored to a user specific point or to the current probe location.

Step 3: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

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7. Device Under Test

Wireless Network Adapter Module (Tested inside of Panasonic Tablet PC FZ-Y1) Model: WL14A	
Operating Configuration(s)	• Tablet Mode
Exposure Condition(s)	• The device is used in close proximity to the body. Specific details of the required test positions are provided in Section 8 “Exposure Conditions”
Accessory	• None

7.1. Band and Air Interfaces

Tx Frequency Bands	• 802.11a/b/g/n/ac: 2412 - 2462 MHz, b / g / HT20 / HT40 5150 - 5250 MHz, a / HT20 / HT40 / HT80 5250 - 5350 MHz, a / HT20 / HT40 / HT80 5500 - 5700 MHz, a / HT20 / HT40 / HT80 5725 - 5850 MHz, a / HT20 / HT40 / HT80 • Bluetooth: 2402 - 2480 MHz
Modulation	• 802.11a/b/g/n/ac : BPSK, QPSK, CCK, 16-QAM and 64-QAM and 256-QAM • Bluetooth 4.0+LE: GFSK, DQPSK, 8-DPSK
Duty Cycle	• WLAN: 100% • Bluetooth 89%

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7.2. Simultaneous Transmission

Main antenna WLAN 2.4GHz + Aux antenna Bluetooth

Main antenna WLAN 5GHz + Aux antenna Bluetooth

Main antenna WLAN2.4GHz + Aux antenna WLAN2.4GHz (MIMO)

Main antenna WLAN5GHz + Aux antenna 5GHz (MIMO)

Notes:

1. Bluetooth transmits using the WLAN Aux Antenna
2. Bluetooth can transmit simultaneously with the WLAN Main Antenna, in either of the WLAN bands.
3. Bluetooth cannot transmit simultaneously with the WLAN Aux Antenna, in either of the WLAN bands; this also precludes the transmission of Bluetooth when WLAN is in MIMO mode.

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8. Exposure Conditions

Refer to Section 17 “Antenna Dimensions and Separation Distances” and Section 18 “About Test positions “ for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

8.1. Test Configurations for the Main Antenna, SISO and MIMO Modes

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	7.7mm	Yes	
Front	-	No	SAR is not required as this is not a typical use scenario.
Edge 1	6.8mm	Yes	
Edge 2	115.0mm	No	Refer to section 13.1 for SAR exclusion justification.
Edge 3	326.8mm	No	Refer to section 13.1 for SAR exclusion justification.
Edge 4	358.0mm	No	Refer to section 13.1 for SAR exclusion justification.
Edge 1 tilt	3.6mm	Yes	
Edge 4 tilt	83.5mm	No	Refer to section 13.1 for SAR exclusion justification..

8.2. Test Configurations for the Auxiliary Antenna, SISO and MIMO Modes

Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	7.7mm	Yes	
Front	-	No	SAR is not required as this is not a typical use scenario.
Edge 1	133.0mm	No	Refer to section 13.1 for SAR exclusion justification.
Edge 2	465.7mm	No	Refer to section 13.1 for SAR exclusion justification.
Edge 3	199.0mm	No	Refer to section 13.1 for SAR exclusion justification.
Edge 4	7.3mm	Yes	
Edge 1 tilt	32.4mm	Yes	
Edge 4 tilt	3.7mm	Yes	

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8.3. Test Configurations for the Auxiliary Antenna, Bluetooth

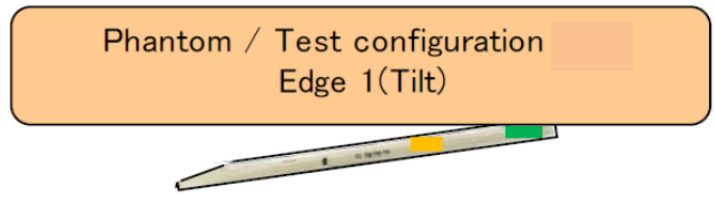
Test Configurations	Antenna-to-edge/surface	SAR Required	Note
Rear	7.7mm	No	Refer to section 13.1 for SAR exclusion justification.
Front	-	No	SAR is not required as this is not a typical use scenario.
Edge 1	133.0mm	No	Refer to section 13.1 for SAR exclusion justification.
Edge 2	465.7mm	No	Refer to section 13.1 for SAR exclusion justification.
Edge 3	199.0mm	No	Refer to section 13.1 for SAR exclusion justification.
Edge 4	7.3mm	No	Refer to section 13.1 for SAR exclusion justification.
Edge 1 tilt	32.4mm	Yes	Refer to section 13.2.
Edge 4 tilt	3.7mm	No	Refer to section 13.1 for SAR exclusion justification.

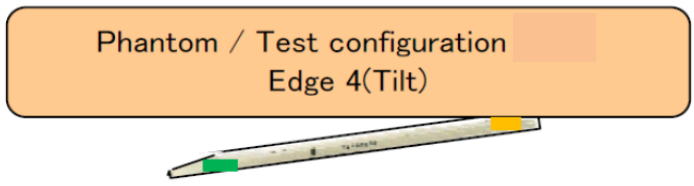
LEGEND:

- Rear = Bottom Face
- Edge 1 = Top Edge
- Edge 2 = Left Edge
- Edge 3 = Bottom Edge
- Edge 4 = Right Edge

8.4. Additional Test Scenarios

Due to the antenna location, a KDB enquiry was made to discuss additional test scenarios. Additional testing was performed with the DUT tilted against the flat phantom.





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9. Summary of Required Test Modes

9.1. Wi-Fi 2.4 GHz Band

Mode	Number of Transmitters	Ch. #	Freq. (MHz)	Maximum Target Power from Original Approval (dBm)		Maximum Target Power for Host Approval (dBm)		SAR Test (Yes/No)	Surfaces/Edges requiring SAR evaluation
				Main	Aux	Main	Aux		
802.11b	1 Tx	2	2417	17.5		14.5		Yes	Rear, Edge 1, Edge 1 tilt
		6	2437	17.5		14.5			
		10	2557	17.5		14.5			
		2	2417		17.5		14.5	Yes	Rear, Edge 4, Edge 4 tilt, Edge 1 tilt
		6	2437		17.5		14.5		
		10	2557		17.5		14.5		
802.11g	1 Tx	2	2417	17.5		14.5		No	N/A
		6	2437	17.5		14.5			
		10	2557	17.5		14.5			
		2	2417		17.5		14.5	No	N/A
		6	2437		17.5		14.5		
		10	2557		17.5		14.5		
802.11n HT20	1 Tx	2	2417	17.5		14.5		No	N/A
		6	2437	17.5		14.5			
		10	2557	17.5		14.5			
		2	2417		17.5		14.5	No	N/A
		6	2437		17.5		14.5		
		10	2557		17.5		14.5		
802.11n HT20	2 Tx	2	2417	17.5	17.5	12.0	12.0	Yes	Covered by testing in 802.11b/g/n 1Tx
		6	2437	17.5	17.5	12.0	12.0		
		10	2557	17.5	17.5	12.0	12.0		
802.11n HT40	1 Tx	3	2422	17.5		10.5		No	N/A
		6	2437	17.5		14.5			
		9	2452	17.5		10.5			
		3	2422		17.5		11.0	No	N/A
		6	2437		17.5		14.5		
		9	2452		17.5		9.5		
802.11n HT40	2 Tx	3	2422	17.5	17.5	7.0	7.0	No	N/A
		6	2437	17.5	17.5	12.0	12.0		
		9	2452	17.5	17.5	7.0	7.0		

Note(s):

- Per KDB 248227, SAR is not required for 802.HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a/b channels.

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9.2. Wi-Fi 5.2 GHz Band

Mode	Number of Transmitters	Ch. #	Freq. (MHz)	Maximum Target Power from Original Approval (dBm)		Maximum Target Power for Host Approval (dBm)		SAR Test (Yes/No)	Surfaces/Edges requiring SAR evaluation
				Main	Aux	Main	Aux		
802.11a	1 Tx	36	5180	16.0		13.5		Yes	Rear, Edge 1, Edge 1 tilt
		40	5200	16.0		13.5			
		44	5220	16.0		13.5			
		48	5240	16.0		13.5			
		36	5180		16.0		14.0	Yes	Rear, Edge 4, Edge 4 tilt, Edge 1 tilt
		40	5200		16.0		14.0		
		44	5220		16.0		14.0		
		48	5240		16.0		14.0		
802.11n HT20	1 Tx	36	5180	16.0		13.5		No	N/A
		40	5200	16.0		13.5			
		44	5220	16.0		13.5			
		48	5240	16.0		13.5			
		36	5180		16.0		14.0	No	N/A
		40	5200		16.0		14.0		
		44	5220		16.0		14.0		
		48	5240		16.0		14.0		
802.11n HT20	2 Tx	36	5180	16.0	16.0	9.0	9.0	Yes	Coverd by testing in 802.11a
		40	5200	16.0	16.0	11.5	11.5		
		44	5220	16.0	16.0	11.5	11.5		
		48	5240	16.0	16.0	11.5	11.5		
802.11n HT40	1 Tx	38	5190	16.5		13.5		No	N/A
		46	5230	16.5		13.5			
		38	5190		16.5		13.5	No	N/A
		46	5230		16.5		14.0		
802.11n HT40	2 Tx	38	5190	16.5	16.5	11.5	11.5	No	N/A
		46	5230	16.5	16.5	11.5	11.5		
802.11ac HT40	1 Tx	38	5190	16.5		13.5		No	N/A
		46	5230	16.5		13.5			
		38	5190		16.5		13.5	No	N/A
		46	5230		16.5		14.0		
802.11ac HT40	2 Tx	38	5190	16.5	16.5	11.5	11.5	No	N/A
802.11ac HT40	2 Tx	46	5230	16.5	16.5	11.5	11.5		
802.11ac HT80	1 Tx	42	5210	13.5		13.0		No	N/A
		42	5210		13.5		13.0	No	N/A
802.11ac HT80	2 Tx	42	5210	13.5	13.5	10.5	10.5	No	N/A

Note(s):

- Per KDB 248227, SAR is not required for 802.HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a/b channels.

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9.3. Wi-Fi 5.3 GHz Band

Mode	Number of Transmitters	Ch. #	Freq. (MHz)	Maximum Target Power from Original Approval (dBm)		Maximum Target Power for Host Approval (dBm)		SAR Test (Yes/No)	Surfaces/Edges requiring SAR evaluation
				Main	Aux	Main	Aux		
802.11a	1 Tx	52	5260	16.0		13.5		Yes	Rear, Edge 1, Edge 1 tilt
		56	5280	16.0		13.5			
		60	5300	16.0		13.5			
		64	5320	16.0		13.5			
		52	5260		16.0		14.0	Yes	Rear, Edge 4, Edge 4 tilt, Edge 1 tilt
		56	5280		16.0		14.0		
		60	5300		16.0		14.0		
		64	5320		16.0		13.5		
802.11n HT20	1 Tx	52	5260	16.0		13.5		No	N/A
		56	5280	16.0		13.5			
		60	5300	16.0		13.5			
		64	5320	16.0		13.5			
		52	5260		16.0		14.0	No	N/A
		56	5280		16.0		14.0		
		60	5300		16.0		14.0		
		64	5320		16.0		14.0		
802.11n HT20	2 Tx	52	5260	16.0	16.0	11.5	11.5	Yes	Covered by testing in 802.11a
		56	5280	16.0	16.0	11.5	11.5		
		60	5300	16.0	16.0	11.5	11.5		
		64	5320	16.0	16.0	10.5	10.5		
802.11n HT40	1 Tx	54	5270	16.5		13.5		No	N/A
		62	5310	16.5		13.5			
		54	5270		16.5		14.0	No	N/A
		62	5310		16.5		14.0		
802.11n HT40	2 Tx	54	5270	16.5	16.5	11.5	11.5	No	N/A
		62	5310	16.5	16.5	11.5	11.5		
802.11ac HT40	1 Tx	54	5270	16.5		13.5		No	N/A
		62	5310		16.5		13.5	No	N/A
802.11ac HT40	2 Tx	54	5270	16.5	16.5	11.5	11.5	No	N/A
802.11ac HT40	2 Tx	62	5310	16.5	16.5	11.5	11.5	No	N/A
802.11ac HT80	1 Tx	58	5290	13.5		13.0		No	N/A
		58	5290		13.5		13.0	No	N/A
802.11ac HT80	2 Tx	58	5290	13.5	13.5	10.5	10.5	No	N/A

Note(s):

- Per KDB 248227, SAR is not required for 802.HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a/b channels.

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9.4. Wi-Fi 5.5 GHz Band

Mode	Number of Transmitters	Ch. #	Freq. (MHz)	Maximum Target Power from Original Approval (dBm)		Maximum Target Power for Host Approval (dBm)		SAR Test (Yes/No)	Surfaces/Edges requiring SAR evaluation
				Main	Aux	Main	Aux		
802.11a	1 Tx	100	5500	16.0		13.5		Yes	Rear, Edge 1, Edge 1 tilt
		104	5520	16.0		13.5			
		108	5540	16.0		13.5			
		112	5560	16.0		13.5			
		116	5580	16.0		13.5			
		120	5600	16.0		13.5			
		124	5620	16.0		13.5			
		128	5640	16.0		13.5			
		132	5660	16.0		13.5			
		136	5680	16.0		13.5			
		140	5700	16.0		14.0			
		100	5500		16.0		14.0	Yes	Rear, Edge 4, Edge 4 tilt, Edge 1 tilt
		104	5520		16.0		14.0		
		108	5540		16.0		14.0		
		112	5560		16.0		14.0		
		116	5580		16.0		14.0		
		120	5600		16.0		14.0		
		124	5620		16.0		14.0		
		128	5640		16.0		14.0		
		132	5660		16.0		14.0		
		136	5680		16.0		14.0		
		140	5700		16.0		14.5		
802.11n HT20	1 Tx	100	5500	16.0		13.5		No	N/A
		104	5520	16.0		13.5			
		108	5540	16.0		13.5			
		112	5560	16.0		13.5			
		116	5580	16.0		13.5			
		120	5600	16.0		13.5			
		124	5620	16.0		13.5			
		128	5640	16.0		13.5			
		132	5660	16.0		13.5			
		136	5680	16.0		13.5			
		140	5700	16.0		14.0			
		100	5500		16.0		14.0	No	N/A
		104	5520		16.0		14.0		
		108	5540		16.0		14.0		
		112	5560		16.0		14.0		
		116	5580		16.0		14.0		
		120	5600		16.0		14.0		
		124	5620		16.0		14.0		
		128	5640		16.0		14.0		
		132	5660		16.0		14.0		
		136	5680		16.0		14.0		
		140	5700		16.0		14.5		

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Mode	Number of Transmitters	Ch. #	Freq. (MHz)	Maximum Target Power from Original Approval (dBm)		Maximum Target Power for Host Approval (dBm)		SAR Test (Yes/No)	Surfaces/Edges requiring SAR evaluation
				Main	Aux	Main	Aux		
802.11n HT20	2 Tx	100	5500	16.0	16.0	11.0	10.5	Yes	Covered by testing in 802.11a
		104	5520	16.0	16.0	12.0	12.0		
		108	5540	16.0	16.0	12.0	10.5		
		112	5560	16.0	16.0	12.0	10.5		
		116	5580	16.0	16.0	12.0	12.0		
		120	5600	16.0	16.0	12.0	12.0		
		124	5620	16.0	16.0	12.0	12.0		
		128	5640	16.0	16.0	12.0	12.0		
		132	5660	16.0	16.0	12.0	12.0		
		136	5680	16.0	16.0	12.0	12.0		
		140	5700	16.0	16.0	12.0	12.0		
802.11n HT40	1 Tx	102	5510	16.5		13.5		No	N/A
		110	5550	16.5		13.5			
		118	5590	16.5		13.5			
		126	5630	16.5		13.5			
		134	5670	16.5		13.5			
		102	5510		16.5		14.0	No	N/A
		110	5550		16.5		14.0		
		118	5590		16.5		14.0		
		126	5630		16.5		14.0		
		134	5670		16.5		14.0		
802.11n HT40	2 Tx	102	5510	16.5	16.5	12.0	12.0	No	N/A
		110	5550	16.5	16.5	12.0	12.0		
		118	5590	16.5	16.5	12.0	12.0		
		126	5630	16.5	16.5	12.0	12.0		
		134	5670	16.5	16.5	12.0	12.0		

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Mode	Number of Transmitters	Ch. #	Freq. (MHz)	Maximum Target Power from Original Approval (dBm)		Maximum Target Power for Host Approval (dBm)		SAR Test (Yes/No)	Surfaces/Edges requiring SAR evaluation
				Main	Aux	Main	Aux		
802.11ac HT20	1 Tx	144	5720	16.0		14.0		No	N/A
		144	5720		16.0		14.5	No	N/A
802.11ac HT20	2 Tx	144	5720	16.0	16.0	12.0	12.0	No	N/A
802.11ac HT40	1 Tx	102	5510	16.5		13.5		No	N/A
		110	5550	16.5		13.5			
		118	5590	16.5		13.5			
		126	5630	16.5		13.5			
		134	5670	16.5		13.5			
		142	5710	16.5		14.0			
		102	5510		16.5		14.0	No	N/A
		110	5550		16.5		14.0		
		118	5590		16.5		14.0		
		134	5670		16.5		14.0		
		142	5710		16.5		14.5		
802.11ac HT40	2 Tx	102	5510	16.5	16.5	12.0	12.0	No	N/A
		110	5550	16.5	16.5	12.0	12.0		
		118	5590	16.5	16.5	12.0	12.0		
		126	5630	16.5	16.5	12.0	12.0		
		134	5670	16.5	16.5	12.0	12.0		
		142	5710	16.5	16.5	12.5	12.5		
802.11ac HT80	1 Tx	106	5530	15.0		12.5		No	N/A
		138	5690	15.0		14.0			
		106	5530		15.0		12.5	No	N/A
		138	5690		15.0		14.5		
802.11ac HT80	2 Tx	106	5530	15.0	15.0	11.5	11.5	No	N/A
		138	5690	15.0	15.0	12.5	12.5	No	N/A

Note(s):

- Per KDB 248227, SAR is not required for 802.HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a/b channels.

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9.5. Wi-Fi 5.8 GHz Band

Mode	Number of Transmitters	Ch. #	Freq. (MHz)	Maximum Target Power from Original Approval (dBm)		Maximum Target Power for Host Approval (dBm)		SAR Test (Yes/No)	Surfaces/Edges requiring SAR evaluation
				Main	Aux	Main	Aux		
802.11a	1 Tx	149	5745	16.0		14.0		Yes	Rear, Edge 1, Edge 1 tilt
		153	5765	16.0		14.0			
		157	5785	16.0		14.0			
		161	5805	16.0		14.0			
		165	5825	16.0		14.0			
		149	5745		16.0		14.5	Yes	Rear, Edge 4, Edge 4 tilt, Edge 1 tilt
		153	5765		16.0		14.5		
		157	5785		16.0		14.5		
		161	5805		16.0		14.5		
		165	5825		16.0		14.5		
802.11n HT20	1 Tx	149	5745	16.0		14.0		No	N/A
		153	5765	16.0		14.0			
		157	5785	16.0		14.0			
		161	5805	16.0		14.0			
		165	5825	16.0		14.0			
		149	5745		16.0		14.5	No	N/A
		153	5765		16.0		14.5		
		157	5785		16.0		14.5		
		161	5805		16.0		14.5		
		165	5825		16.0		14.5		
802.11n HT20	2 Tx	149	5745	16.0	16.0	12.0	12.0	No	N/A
		157	5785	16.0	16.0	12.0	12.0		
		165	5825	16.0	16.0	12.0	12.0		
802.11n HT40	1 Tx	151	5755	16.5		14.0		No	N/A
		159	5795	16.5		14.0			
		151	5755		16.5		14.5	No	N/A
		159	5795		16.5		14.5		
802.11n HT40	2 Tx	151	5755	16.5	16.5	12.5	12.5	No	N/A
		159	5795	16.5	16.5	12.5	12.5		
802.11ac HT80	1 Tx	155	5775	15.0		14.0		No	N/A
		155	5775		15.0		14.5		
802.11ac HT80	2 Tx	155	5775	15.0	15.0	12.5	12.5	No	N/A

Note(s):

- Per KDB 248227, SAR is not required for 802.HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11a/b channels.

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9.6. Bluetooth Band

Mode	Number of Transmitters	Ch. #	Freq. (MHz)	Maximum Target Power from Original Approval (dBm)		Maximum Target Power for Host Approval (dBm)		SAR Test (Yes/No)	Surfaces/Edges requiring SAR evaluation
				Main	Aux	Main	Aux		
BDR	1 Tx	0	2402		7.0		7.0	Yes	Rear, Edge 4, Edge 4 tilt, Edge 1tilt
		39	2441		7.0		7.0		
		78	2480		7.0		7.0		
EDR2	1 Tx	0	2402		3.5		3.5	No	N/A
		39	2441		3.5		3.5		
		78	2480		3.5		3.5		
EDR3	1 Tx	0	2402		2.5		2.5	No	N/A
		39	2441		2.5		2.5		
		78	2480		2.5		2.5		
LE	1 Tx	0	2402		4.5		4.5	No	N/A
		38	2440		4.5		4.5		
		78	2480		4.5		4.5		

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10. RF Output Power Measurement

Required Test Channels per KDB 248227 D01

Mode		Band	**GHz**	Channel	"Default Test Channels"	
					802.11b	802.11g
802.11b/g		2.4 GHz	**2.412**	1#	√	∇
			2.437	6	√	∇
			2.462	11#	√	∇
Mode		Band	GHz	Channel	"Default Test Channels"	
					802.11a	
802.11a	UNII (15.407)	5.2 GHz	5.180	36	√	
			5.200	40		*
			5.220	44		*
			5.240	48	√	
		5.3 GHz	5.260	52	√	
			5.280	56		*
			5.300	60		*
			5.320	64	√	
		5.5 GHz	5.500	100		*
			5.520	104	√	
			5.540	108		*
			5.560	112		*
			5.580	116	√	
			5.600	120		*
			5.620	124	√	
			5.640	128		*
			5.660	132		*
			5.680	136	√	
			5.700	140		*
	DTS (15.247)	5.8 GHz	5.745	149	√	
			5.765	153		*
			5.785	157	√	
			5.805	161		*
			5.825	165	√	

√ = "default test channels"

* = possible 802.11a channels with maximum average output > the "default test channels"

∇ = possible 802.11g channels with maximum average output ¼ dB ≥ the "default test channels"

= when output power is reduced for channel 1 and /or 11 to meet restricted band requirements the highest output channels closest to each of these channels should be tested.

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10.1. Output Power

The target power is the absolute maximum.

Tune-up Tolerance

The Target power is the upper limit of tune-up tolerance.

Band	Mode	Ant	Rate	Channel	Frequency (MHz)	Maximum Target Power (dBm)	Measured Power (dBm)	Measured Power (mW)	Antenna gain (dBi)	EIRP (dBm)	EIRP (mW)	Gain Control (SW Pwr Setting) (dB)
2400MHz	802.11b	Main	1Mbps	1	2412	13.5	13.46	22.18	0.62	14.08	25.58	12.5
				2	2417	14.5	14.28	26.77	0.62	14.90	30.88	13.5
				3	2422	14.5	14.40	27.53	0.62	15.02	31.75	13.5
				4	2427	14.5	14.31	26.95	0.62	14.93	31.09	13.5
				5	2432	14.5	14.42	27.65	0.62	15.04	31.90	13.5
				6	2437	14.5	14.28	26.82	0.62	14.90	30.93	13.5
				7	2442	14.5	14.43	27.73	0.62	15.05	31.98	13.5
				8	2447	14.5	14.49	28.10	0.62	15.11	32.42	13.5
				9	2452	14.5	14.48	28.07	0.62	15.10	32.38	13.5
				10	2457	14.5	14.49	28.09	0.62	15.11	32.40	13.5
				11	2462	14	13.90	24.53	0.62	14.52	28.29	13.0
	802.11g		6Mbps	1	2412	12	11.80	15.13	0.62	12.42	17.46	16.5
				2	2417	14.5	14.23	26.47	0.62	14.85	30.53	19.0
				3	2422	14.5	14.23	26.47	0.62	14.85	30.53	19.0
				4	2427	14.5	14.28	26.77	0.62	14.90	30.88	19.0
				5	2432	14.5	14.41	27.59	0.62	15.03	31.83	19.0
				6	2437	14.5	14.47	28.02	0.62	15.09	32.32	19.0
				7	2442	14.5	14.48	28.05	0.62	15.10	32.35	19.0
				8	2447	14.5	14.49	28.10	0.62	15.11	32.42	19.0
				9	2452	14.5	14.48	28.07	0.62	15.10	32.38	19.0
				10	2457	14.5	14.17	26.09	0.62	14.79	30.10	18.5
				11	2462	11	10.58	11.42	0.62	11.20	13.17	14.5
5200MHz	802.11a		6Mbps	36	5180	13.5	13.37	21.72	1.90	15.27	33.64	25.5
				40	5200	13.5	13.36	21.70	1.90	15.26	33.61	25.5
				44	5220	13.5	13.01	20.00	1.90	14.91	30.98	25.0
				48	5240	13.5	13.18	20.80	1.90	15.08	32.22	25.0
5300MHz				52	5260	13.5	13.47	22.24	1.90	15.37	34.44	25.0
				56	5280	13.5	13.27	21.23	1.90	15.17	32.88	24.5
				60	5300	13.5	13.41	21.92	1.90	15.31	33.96	24.5
				64	5320	13.5	13.44	22.08	1.90	15.34	34.20	24.5
5600MHz				100	5500	13.5	13.49	22.33	1.87	15.36	34.35	23.5
				104	5520	13.5	13.44	22.07	1.87	15.31	33.94	23.5
				108	5540	13.5	13.37	21.74	1.87	15.24	33.43	23.5
				112	5560	13.5	13.32	21.46	1.87	15.19	33.01	23.5
				116	5580	13.5	13.31	21.41	1.87	15.18	32.93	23.5
				120	5600	13.5	13.28	21.30	1.87	15.15	32.76	23.5
				124	5620	13.5	13.27	21.23	1.87	15.14	32.66	23.5
				128	5640	13.5	13.27	21.21	1.87	15.14	32.63	23.5
				132	5660	13.5	13.23	21.06	1.87	15.10	32.39	23.5
				136	5680	13.5	13.18	20.81	1.87	15.05	32.01	23.5
				140	5700	14	13.98	24.99	1.87	15.85	38.44	24.5
5800MHz				149	5745	14	13.85	24.25	2.53	16.38	43.43	24.5
				153	5765	14	13.78	23.86	2.53	16.31	42.73	24.5
				157	5785	14	13.67	23.29	2.53	16.20	41.71	24.5
				161	5805	14	13.97	24.93	2.53	16.50	44.64	25.0
				165	5825	14	13.86	24.30	2.53	16.39	43.52	25.0

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Band	Mode	Ant	Rate	Channel	Frequency (MHz)	Maximum Target Power (dBm)	Measured Power (dBm)	Measured Power (mW)	Antenna gain (dBi)	EIRP (dBm)	EIRP (mW)	Gain Control (SW Pwr Setting) (dB)
2400MHz	802.11b	Aux	1Mbps	1	2412	14	13.76	23.77	2.51	16.27	42.36	15.5
				2	2417	14.5	14.30	26.90	2.51	16.81	47.94	16.0
				3	2422	14.5	14.28	26.78	2.51	16.79	47.72	16.0
				4	2427	14.5	14.21	26.34	2.51	16.72	46.95	16.0
				5	2432	14.5	14.23	26.47	2.51	16.74	47.18	16.0
				6	2437	14.5	14.26	26.69	2.51	16.77	47.58	16.0
				7	2442	14.5	14.20	26.30	2.51	16.71	46.87	16.0
				8	2447	14.5	14.31	26.96	2.51	16.82	48.06	16.0
				9	2452	14.5	14.27	26.75	2.51	16.78	47.68	16.0
				10	2457	14.5	14.32	27.01	2.51	16.83	48.14	16.0
				11	2462	14	13.78	23.86	2.51	16.29	42.53	15.5
	802.11g		6Mbps	1	2412	12	11.98	15.77	2.51	14.49	28.12	19.0
				2	2417	14.5	14.13	25.86	2.51	16.64	46.10	21.5
				3	2422	14.5	14.20	26.29	2.51	16.71	46.85	21.5
				4	2427	14.5	14.26	26.65	2.51	16.77	47.49	21.5
				5	2432	14.5	14.27	26.72	2.51	16.78	47.62	21.5
				6	2437	14.5	14.29	26.88	2.51	16.80	47.91	21.5
				7	2442	14.5	14.30	26.91	2.51	16.81	47.97	21.5
				8	2447	14.5	14.35	27.21	2.51	16.86	48.50	21.5
				9	2452	14.5	14.39	27.50	2.51	16.90	49.01	21.5
				10	2457	14.5	14.37	27.32	2.51	16.88	48.70	21.5
				11	2462	10.5	10.46	11.11	2.51	12.97	19.80	17.0
5200MHz	802.11a		6Mbps	36	5180	14	13.79	23.92	1.06	14.85	30.54	24.5
				40	5200	14	13.80	24.01	1.06	14.86	30.65	24.5
				44	5220	14	13.87	24.38	1.06	14.93	31.12	24.5
				48	5240	14	13.90	24.55	1.06	14.96	31.34	24.5
5300MHz				52	5260	14	13.69	23.39	1.06	14.75	29.86	24.0
				56	5280	14	13.65	23.17	1.06	14.71	29.57	24.0
				60	5300	14	13.99	25.06	1.06	15.05	31.98	24.5
				64	5320	13.5	13.44	22.08	1.06	14.50	28.19	24.0
5600MHz				100	5500	14	13.70	23.44	0.22	13.92	24.65	25.0
				104	5520	14	13.61	22.95	0.22	13.83	24.14	25.0
				108	5540	14	13.99	25.07	0.22	14.21	26.38	25.5
				112	5560	14	13.93	24.70	0.22	14.15	25.98	25.5
				116	5580	14	13.90	24.52	0.22	14.12	25.80	25.5
				120	5600	14	13.83	24.18	0.22	14.05	25.43	25.5
				124	5620	14	13.78	23.88	0.22	14.00	25.12	25.5
				128	5640	14	13.71	23.47	0.22	13.93	24.69	25.5
				132	5660	14	13.61	22.98	0.22	13.83	24.18	25.5
				136	5680	14	13.91	24.62	0.22	14.13	25.90	26.0
				140	5700	14.5	14.49	28.10	0.22	14.71	29.56	27.0
5800MHz				149	5745	14.5	14.21	26.35	0.55	14.76	29.91	27.0
				153	5765	14.5	14.07	25.51	0.55	14.62	28.96	27.0
				157	5785	14.5	14.41	27.62	0.55	14.96	31.35	27.5
				161	5805	14.5	14.27	26.72	0.55	14.82	30.32	27.5
				165	5825	14.5	14.15	25.98	0.55	14.70	29.49	27.5

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Band	Mode	Ant	Rate	Channel	Frequency (MHz)	Maximum Target Power (dBm)	Measured Power (dBm)	Measured Power (mW)	Antenna gain (dBi)	EIRP (dBm)	EIRP (mW)	Gain Control (SW Pwr Setting) (dB)
2400MHz	802.11n 20MHz 1Tx	Main	HT0	1	2412	11.5	11.42	13.87	0.62	12.04	15.99	16.0
				2	2417	14.5	14.40	27.52	0.62	15.02	31.75	19.5
				6	2437	14.5	14.47	28.02	0.62	15.09	32.32	19.0
				10	2457	14.5	14.32	27.01	0.62	14.94	31.16	18.5
				11	2462	10.5	10.19	10.44	0.62	10.81	12.04	14.0
		Aux		1	2412	12	11.83	15.24	2.51	14.34	27.16	19.0
				2	2417	14.5	14.44	27.78	2.51	16.95	49.51	22.0
				6	2437	14.5	14.49	28.15	2.51	17.00	50.17	22.0
				10	2457	14.5	14.10	25.68	2.51	16.61	45.77	21.5
				11	2462	10	9.62	9.16	2.51	12.13	16.32	16.5
	802.11n 20MHz 2Tx	Main	HT8	1	2412	9	8.94	7.83	0.62	9.56	9.04	14.5
				2	2417	12	11.67	14.68	0.62	12.29	16.93	17.5
				6	2437	12	11.97	15.76	0.62	12.59	18.17	17.5
				10	2457	12	11.84	15.26	0.62	12.46	17.60	17.0
				11	2462	9.5	9.48	8.87	0.62	10.10	10.23	14.5
		Aux		1	2412	9	8.73	7.46	2.51	11.24	13.30	17.0
				2	2417	12	11.62	14.51	2.51	14.13	25.86	20.0
				6	2437	12	11.63	14.57	2.51	14.14	25.97	20.0
				10	2457	12	11.82	15.19	2.51	14.33	27.07	20.0
				11	2462	9.5	9.17	8.25	2.51	11.68	14.71	17.0
	802.11n 40MHz 1Tx	Main	HT0	3	2422	10.5	10.46	11.11	0.62	11.08	12.82	15.0
				4	2427	14.5	14.48	28.03	0.62	15.10	32.33	19.5
				6	2437	14.5	14.38	27.44	0.62	15.00	31.65	19.0
				8	2447	14.5	14.44	27.78	0.62	15.06	32.05	19.0
				9	2452	10.5	10.41	11.00	0.62	11.03	12.69	14.5
		Aux		3	2422	11	10.78	11.97	2.51	13.29	21.33	18.0
				4	2427	14.5	14.35	27.21	2.51	16.86	48.49	22.0
				6	2437	14.5	14.36	27.32	2.51	16.87	48.69	22.0
				8	2447	14.5	14.39	27.45	2.51	16.90	48.93	22.0
				9	2452	9.5	9.46	8.82	2.51	11.97	15.73	16.5
	802.11n 40MHz 2Tx	Main	HT8	3	2422	7	6.88	4.87	0.62	7.50	5.62	12.5
				4	2427	12	11.84	15.26	0.62	12.46	17.60	17.5
				6	2437	12	11.95	15.68	0.62	12.57	18.09	17.5
				8	2447	12	11.85	15.30	0.62	12.47	17.65	17.0
				9	2452	7	6.79	4.78	0.62	7.41	5.51	12.0
		Aux		3	2422	7	6.76	4.74	2.51	9.27	8.45	15.0
				4	2427	12	11.68	14.71	2.51	14.19	26.22	20.5
				6	2437	12	11.81	15.19	2.51	14.32	27.07	20.5
				8	2447	12	11.92	15.54	2.51	14.43	27.70	20.5
				9	2452	7	6.95	4.95	2.51	9.46	8.82	15.0

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Band	Mode	Ant	Rate	Channel	Frequency (MHz)	Maximum Target Power (dBm)	Measured Power (dBm)	Measured Power (mW)	Antenna gain (dBi)	EIRP (dBm)	EIRP (mW)	Gain Control (SW Pwr Setting) (dB)
5200MHz	802.11n 20MHz 1Tx	Main	HT0	36	5180	13.5	13.35	21.62	1.90	15.25	33.48	25.5
				40	5200	13.5	13.36	21.70	1.90	15.26	33.61	25.5
				44	5220	13.5	13.08	20.33	1.90	14.98	31.48	25.0
				48	5240	13.5	13.20	20.90	1.90	15.10	32.37	25.0
5300MHz				52	5260	13.5	13.33	21.53	1.90	15.23	33.35	25.0
				56	5280	13.5	13.47	22.23	1.90	15.37	34.43	25.0
				60	5300	13.5	13.13	20.55	1.90	15.03	31.84	24.5
				64	5320	13.5	13.22	20.99	1.90	15.12	32.51	24.5
5600MHz				100	5500	13.5	13.26	21.18	1.87	15.13	32.58	23.5
				104	5520	13.5	13.22	20.98	1.87	15.09	32.27	23.5
				108	5540	13.5	13.16	20.71	1.87	15.03	31.86	23.5
				112	5560	13.5	13.11	20.45	1.87	14.98	31.45	23.5
				116	5580	13.5	13.11	20.44	1.87	14.98	31.45	23.5
				120	5600	13.5	13.10	20.44	1.87	14.97	31.43	23.5
				124	5620	13.5	13.10	20.42	1.87	14.97	31.41	23.5
				128	5640	13.5	13.10	20.40	1.87	14.97	31.38	23.5
				132	5660	13.5	13.06	20.25	1.87	14.93	31.15	23.5
				136	5680	13.5	13.05	20.20	1.87	14.92	31.07	23.5
				140	5700	14	13.78	23.87	1.87	15.65	36.71	24.5
5800MHz				149	5745	14	13.63	23.05	2.53	16.16	41.28	24.5
				153	5765	14	13.55	22.63	2.53	16.08	40.53	24.5
				157	5785	14	13.90	24.56	2.53	16.43	43.98	25.0
				161	5805	14	13.79	23.92	2.53	16.32	42.83	25.0
				165	5825	14	13.66	23.21	2.53	16.19	41.56	25.0
5200MHz		Aux		36	5180	14	13.85	24.26	1.06	14.91	30.96	24.5
				40	5200	14	13.88	24.46	1.06	14.94	31.22	24.5
				44	5220	14	13.86	24.33	1.06	14.92	31.05	24.5
				48	5240	14	13.87	24.38	1.06	14.93	31.12	24.5
5300MHz				52	5260	14	13.91	24.61	1.06	14.97	31.41	24.5
				56	5280	14	13.90	24.54	1.06	14.96	31.32	24.5
				60	5300	14	13.81	24.04	1.06	14.87	30.68	24.5
				64	5320	14	13.69	23.39	1.06	14.75	29.86	24.5
5600MHz				100	5500	14	13.99	25.05	0.22	14.21	26.36	25.5
				104	5520	14	13.89	24.48	0.22	14.11	25.75	25.5
				108	5540	14	13.81	24.05	0.22	14.03	25.30	25.5
				112	5560	14	13.73	23.59	0.22	13.95	24.81	25.5
				116	5580	14	13.69	23.37	0.22	13.91	24.58	25.5
				120	5600	14	13.64	23.14	0.22	13.86	24.34	25.5
				124	5620	14	13.57	22.75	0.22	13.79	23.93	25.5
				128	5640	14	13.91	24.58	0.22	14.13	25.86	26.0
				132	5660	14	13.80	24.01	0.22	14.02	25.26	26.0
				136	5680	14	13.71	23.51	0.22	13.93	24.74	26.0
				140	5700	14.5	14.33	27.09	0.22	14.55	28.49	27.0
5800MHz				149	5745	14.5	14.39	27.46	0.55	14.94	31.17	27.5
				153	5765	14.5	14.35	27.21	0.55	14.90	30.88	27.5
				157	5785	14.5	14.19	26.26	0.55	14.74	29.80	27.5
				161	5805	14.5	14.40	27.53	0.55	14.95	31.24	28.0
				165	5825	14.5	14.36	27.27	0.55	14.91	30.95	28.0

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Band	Mode	Ant	Rate	Channel	Frequency (MHz)	Maximum Target Power (dBm)	Measured Power (dBm)	Measured Power (mW)	Antenna gain (dBi)	EIRP (dBm)	EIRP (mW)	Gain Control (SW Pwr Setting) (dB)
5200MHz	802.11n 20MHz 2Tx	Main	HT8	36	5180	9	8.91	7.78	1.90	10.81	12.05	22.5
				40	5200	11.5	11.47	14.04	1.90	13.37	21.75	25.5
				44	5220	11.5	11.49	14.10	1.90	13.39	21.83	25.5
				48	5240	11.5	11.46	14.00	1.90	13.36	21.68	25.0
5300MHz				52	5260	11.5	11.48	14.06	1.90	13.38	21.78	25.0
				56	5280	11.5	11.47	14.02	1.90	13.37	21.72	25.0
				60	5300	11.5	11.36	13.67	1.90	13.26	21.18	24.5
				64	5320	10.5	10.41	10.99	1.90	12.31	17.02	23.5
5600MHz				100	5500	11	10.99	12.56	1.87	12.86	19.31	23.0
				104	5520	12	11.87	15.37	1.87	13.74	23.65	24.0
				108	5540	12	11.81	15.18	1.87	13.68	23.34	24.0
				112	5560	12	11.77	15.02	1.87	13.64	23.10	24.0
				116	5580	12	11.78	15.05	1.87	13.65	23.15	24.0
				120	5600	12	11.76	15.01	1.87	13.63	23.09	24.0
				124	5620	12	11.64	14.59	1.87	13.51	22.44	24.0
				128	5640	12	11.58	14.37	1.87	13.45	22.11	24.0
				132	5660	12	11.91	15.54	1.87	13.78	23.90	24.5
				136	5680	12	11.87	15.39	1.87	13.74	23.68	24.5
				140	5700	12	11.85	15.30	1.87	13.72	23.54	24.5
5800MHz				149	5745	12	11.66	14.65	2.53	14.19	26.23	24.5
				153	5765	12	11.60	14.45	2.53	14.13	25.87	24.5
				157	5785	12	11.95	15.68	2.53	14.48	28.07	25.0
				161	5805	12	11.71	14.82	2.53	14.24	26.53	25.0
				165	5825	12	11.69	14.74	2.53	14.22	26.40	25.0
5200MHz		Aux		36	5180	9	8.88	7.72	1.06	9.94	9.86	21.0
				40	5200	11.5	11.20	13.20	1.06	12.26	16.84	23.5
				44	5220	11.5	11.23	13.28	1.06	12.29	16.95	23.5
				48	5240	11.5	11.31	13.52	1.06	12.37	17.26	23.5
5300MHz				52	5260	11.5	11.32	13.55	1.06	12.38	17.30	23.5
				56	5280	11.5	11.32	13.55	1.06	12.38	17.29	23.5
				60	5300	11.5	11.28	13.42	1.06	12.34	17.14	23.5
				64	5320	10.5	10.31	10.74	1.06	11.37	13.71	22.5
5600MHz				100	5500	10.5	10.42	11.01	0.22	10.64	11.58	23.5
				104	5520	12	11.77	15.02	0.22	11.99	15.80	25.0
				108	5540	12	11.71	14.83	0.22	11.93	15.60	25.0
				112	5560	12	11.66	14.64	0.22	11.88	15.40	25.0
				116	5580	12	11.64	14.57	0.22	11.86	15.33	25.0
				120	5600	12	11.95	15.68	0.22	12.17	16.50	25.5
				124	5620	12	11.83	15.24	0.22	12.05	16.03	25.5
				128	5640	12	11.77	15.02	0.22	11.99	15.80	25.5
				132	5660	12	11.65	14.64	0.22	11.87	15.40	25.5
				136	5680	12	11.52	14.20	0.22	11.74	14.94	25.5
				140	5700	12	11.61	14.48	0.22	11.83	15.23	26.0
5800MHz				149	5745	12	11.76	14.99	0.55	12.31	17.01	26.5
				153	5765	12	11.64	14.58	0.55	12.19	16.55	26.5
				157	5785	12	11.97	15.75	0.55	12.52	17.87	27.0
				161	5805	12	11.75	14.95	0.55	12.30	16.97	27.0
				165	5825	12	11.77	15.02	0.55	12.32	17.05	27.0

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Band	Mode	Ant	Rate	Channel	Frequency (MHz)	Maximum Target Power (dBm)	Measured Power (dBm)	Measured Power (mW)	Antenna gain (dBi)	EIRP (dBm)	EIRP (mW)	Gain Control (SW Pwr Setting) (dB)
5200MHz	802.11n 40MHz 1Tx	Main	HT0	38	5190	13.5	13.19	20.84	1.90	15.09	32.28	26.0
				46	5230	13.5	13.36	21.69	1.90	15.26	33.60	26.0
5300MHz				54	5270	13.5	13.34	21.60	1.90	15.24	33.46	25.5
				62	5310	13.5	13.12	20.49	1.90	15.02	31.73	25.0
5600MHz				102	5510	13.5	13.12	20.50	1.87	14.99	31.53	25.0
				110	5550	13.5	13.06	20.22	1.87	14.93	31.09	25.0
				118	5590	13.5	13.47	22.22	1.87	15.34	34.18	24.5
				126	5630	13.5	13.42	21.98	1.87	15.29	33.81	24.5
				134	5670	13.5	13.37	21.71	1.87	15.24	33.39	24.5
5800MHz				151	5755	14	13.56	22.68	2.53	16.09	40.60	25.0
				159	5795	14	13.83	24.17	2.53	16.36	43.29	25.5
5200MHz		Aux		38	5190	13.5	13.44	22.08	1.06	14.50	28.18	24.5
				46	5230	14	13.88	24.45	1.06	14.94	31.21	25.0
5300MHz				54	5270	14	13.89	24.52	1.06	14.95	31.30	25.0
				62	5310	14	13.92	24.63	1.06	14.98	31.44	25.0
5500MHz				102	5510	14	13.91	24.59	0.22	14.13	25.87	26.0
				110	5550	14	13.75	23.70	0.22	13.97	24.93	26.0
				118	5590	14	13.61	22.95	0.22	13.83	24.14	26.0
				126	5630	14	13.52	22.49	0.22	13.74	23.66	26.0
				134	5670	14	13.79	23.91	0.22	14.01	25.16	26.5
5800MHz				151	5755	14.5	14.40	27.51	0.55	14.95	31.23	28.0
				159	5795	14.5	14.13	25.90	0.55	14.68	29.40	28.0
5200MHz	802.11n 40MHz 2Tx	Main	HT8	38	5190	11.5	11.36	13.68	1.90	13.26	21.18	25.5
				46	5230	11.5	11.49	14.10	1.90	13.39	21.84	25.5
5300MHz				54	5270	11.5	11.45	13.98	1.90	13.35	21.65	25.0
				62	5310	11.5	11.38	13.72	1.90	13.28	21.26	24.5
5600MHz				102	5510	12	11.71	14.82	1.87	13.58	22.79	24.0
				110	5550	12	11.61	14.48	1.87	13.48	22.27	24.0
				118	5590	12	11.96	15.69	1.87	13.83	24.14	24.5
				126	5630	12	11.94	15.63	1.87	13.81	24.04	24.5
				134	5670	12	11.98	15.76	1.87	13.85	24.25	24.5
5800MHz				151	5755	12.5	12.39	17.32	2.53	14.92	31.01	25.5
				159	5795	12.5	12.25	16.80	2.53	14.78	30.08	25.5
5200MHz		Aux		38	5190	11.5	11.34	13.61	1.06	12.40	17.38	24.0
				46	5230	11.5	11.41	13.85	1.06	12.47	17.67	24.0
5300MHz				54	5270	11.5	11.48	14.08	1.06	12.54	17.97	24.0
				62	5310	11.5	11.44	13.92	1.06	12.50	17.76	24.0
5600MHz				102	5510	12	11.60	14.45	0.22	11.82	15.20	25.0
				110	5550	12	11.94	15.62	0.22	12.16	16.43	25.5
				118	5590	12	11.73	14.89	0.22	11.95	15.66	25.5
				126	5630	12	11.62	14.52	0.22	11.84	15.28	25.5
				134	5670	12	11.88	15.41	0.22	12.10	16.21	26.0
5800MHz				151	5755	12.5	12.02	15.91	0.55	12.57	18.05	27.0
				159	5795	12.5	12.20	16.61	0.55	12.75	18.85	27.5

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Band	Mode	Ant	Rate	Channel	Frequency (MHz)	Maximum Target Power (dBm)	Measured Power (dBm)	Measured Power (mW)	Antenna gain (dBi)	EIRP (dBm)	EIRP (mW)	Gain Control (SW Pwr Setting) (dB)
5720MHz	802.11ac 20MHz 1Tx	Main	VHT0	144	5720	14	13.78	23.86	2.53	16.31	42.72	25.0
5720MHz		Aux		144	5720	14.5	14.20	26.28	0.55	14.75	29.83	27.5
5720MHz	802.11ac 20MHz 2Tx	Main		144	5720	12	11.54	14.24	2.53	14.07	25.50	24.0
5720MHz		Aux		144	5720	12	11.70	14.78	0.55	12.25	16.77	26.0
5200MHz	802.11ac 40MHz 1Tx	Main	VHT0	38	5190	13.5	13.34	21.58	1.90	15.24	33.42	26.0
				46	5230	13.5	13.16	20.72	1.90	15.06	32.09	25.5
5300MHz				54	5270	13.5	13.39	21.85	1.90	15.29	33.85	25.5
				62	5310	13.5	13.16	20.68	1.90	15.06	32.03	25.0
5600MHz				102	5510	13.5	13.14	20.59	1.87	15.01	31.68	24.0
				110	5550	13.5	13.06	20.22	1.87	14.93	31.09	24.0
				118	5590	13.5	13.48	22.27	1.87	15.35	34.26	24.5
				126	5630	13.5	13.42	21.98	1.87	15.29	33.81	24.5
				134	5670	13.5	13.37	21.71	1.87	15.24	33.39	24.5
				142	5710	14	13.73	23.59	2.53	16.26	42.24	25.0
5800MHz				151	5755	14	13.94	24.75	2.53	16.47	44.32	25.5
				159	5795	14	13.83	24.17	2.53	16.36	43.29	25.5
5200MHz		Aux		38	5190	13.5	13.45	22.13	1.06	14.51	28.25	24.5
				46	5230	14	13.88	24.45	1.06	14.94	31.21	25.0
5300MHz				54	5270	14	13.93	24.75	1.06	14.99	31.59	25.0
				62	5310	14	13.81	24.02	1.06	14.87	30.66	25.0
5600MHz				102	5510	14	13.95	24.82	0.22	14.17	26.11	26.0
				110	5550	14	13.78	23.86	0.22	14.00	25.10	26.0
				118	5590	14	13.66	23.21	0.22	13.88	24.42	26.0
				126	5630	14	13.54	22.60	0.22	13.76	23.77	26.0
				134	5670	14	13.84	24.19	0.22	14.06	25.45	26.5
				142	5710	14.5	14.32	27.02	0.55	14.87	30.67	27.5
5800MHz				151	5755	14.5	14.39	27.45	0.55	14.94	31.16	28.0
				159	5795	14.5	14.15	26.02	0.55	14.70	29.54	28.0
5200MHz	802.11ac 40MHz 2Tx	Main		38	5190	11.5	11.40	13.80	1.90	13.30	21.38	25.5
				46	5230	11.5	11.50	14.14	1.90	13.40	21.89	25.5
5300MHz				54	5270	11.5	11.43	13.92	1.90	13.33	21.55	25.0
				62	5310	11.5	11.30	13.47	1.90	13.20	20.87	24.5
5600MHz				102	5510	12	11.68	14.71	1.87	13.55	22.63	24.0
				110	5550	12	11.58	14.38	1.87	13.45	22.11	24.0
				118	5590	12	11.96	15.69	1.87	13.83	24.14	24.5
				126	5630	12	11.92	15.56	1.87	13.79	23.93	24.5
				134	5670	12	11.83	15.23	1.87	13.70	23.42	24.5
				142	5710	12.5	12.25	16.78	2.53	14.78	30.04	25.0
5800MHz				151	5755	12.5	12.43	17.48	2.53	14.96	31.30	25.5
				159	5795	12.5	12.18	16.53	2.53	14.71	29.60	25.5
5200MHz		Aux		38	5190	11.5	11.43	13.90	1.06	12.49	17.74	24.0
				46	5230	11.5	11.48	14.07	1.06	12.54	17.96	24.0
5300MHz				54	5270	11.5	11.48	14.08	1.06	12.54	17.97	24.0
				62	5310	11.5	11.41	13.82	1.06	12.47	17.64	24.0
5600MHz				102	5510	12	11.96	15.69	0.22	12.18	16.51	25.5
				110	5550	12	11.90	15.48	0.22	12.12	16.28	25.5
				118	5590	12	11.73	14.89	0.22	11.95	15.66	25.5
				126	5630	12	11.92	15.56	0.22	12.14	16.37	26.0
				134	5670	12	11.84	15.26	0.22	12.06	16.06	26.0
				142	5710	12.5	12.41	17.41	0.55	12.96	19.76	27.0
5800MHz				151	5755	12.5	12.06	16.05	0.55	12.61	18.22	27.0
				159	5795	12.5	12.18	16.53	0.55	12.73	18.76	27.5

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Band	Mode	Ant	Rate	Channel	Frequency (MHz)	Maximum Target Power (dBm)	Measured Power (dBm)	Measured Power (mW)	Antenna gain (dBi)	EIRP (dBm)	EIRP (mW)	Gain Control (SW Pwr Setting) (dB)
5200MHz	802.11ac 80MHz 1Tx	Main	VHT0	42	5210	13	12.53	17.90	1.90	14.43	27.73	21.0
5300MHz				58	5290	13	12.72	18.72	1.90	14.62	28.99	24.5
5600MHz				106	5530	12.5	12.50	17.80	1.87	14.37	27.38	20.5
				122	5610	13.5	13.16	20.70	1.87	15.03	31.85	24.0
				138	5690	14	13.96	24.90	1.87	15.83	38.30	25.0
5800MHz				155	5775	14	13.65	23.18	2.53	16.18	41.50	22.5
5200MHz		Aux		42	5210	13	12.81	19.10	1.06	13.87	24.38	20.5
5300MHz				58	5290	13	12.66	18.46	1.06	13.72	23.57	23.5
5600MHz				106	5530	12.5	12.50	17.80	0.22	12.72	18.73	21.5
				122	5610	13.5	13.33	21.53	0.22	13.55	22.65	25.5
				138	5690	14.5	14.39	27.49	0.22	14.61	28.92	27.0
5800MHz				155	5775	14.5	14.49	28.12	0.55	15.04	31.92	25.5
5200MHz	802.11ac 80MHz 2Tx	Main		42	5210	10.5	10.09	10.21	1.90	11.99	15.81	20.5
5300MHz				58	5290	10.5	10.39	10.95	1.90	12.29	16.95	23.5
5600MHz				106	5530	11.5	11.32	13.57	1.87	13.19	20.87	21.0
				122	5610	12	11.63	14.56	1.87	13.50	22.39	24.0
				138	5690	12.5	12.50	17.79	1.87	14.37	27.37	24.5
5800MHz				155	5775	12.5	12.20	16.60	2.53	14.73	29.72	23.0
5200MHz		Aux		42	5210	10.5	10.45	11.09	1.06	11.51	14.16	20.0
5300MHz				58	5290	10.5	10.29	10.70	1.06	11.35	13.65	22.5
5600MHz				106	5530	11.5	11.30	13.50	0.22	11.52	14.21	22.0
				122	5610	12	11.87	15.38	0.22	12.09	16.18	25.5
				138	5690	12.5	12.49	17.75	0.22	12.71	18.67	26.0
5800MHz				155	5775	12.5	12.20	16.60	0.55	12.75	18.84	24.5

Band	Mode	Antenna	Channel	Frequency (MHz)	Maximum Target Power (dBm)	Measured Power (dBm)	Measured Power (mW)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	SW Pwr Setting (dBm)
2400MHz	Bluetooth BDR DH5	Aux	0	2402	7.0	5.20	3.31	2.51	7.71	5.90	5.00
			39	2441	7.0	5.74	3.75	2.51	8.25	6.68	5.00
			78	2480	7.0	6.10	4.07	2.51	8.61	7.26	5.00

Band	Mode	Antenna	Channel	Frequency (MHz)	Maximum Target Power (dBm)	Measured Power (dBm)	Measured Power (mW)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	SW Pwr Setting (dBm)
2400MHz	Bluetooth EDR 2DH5	Aux	0	2402	3.5	2.43	1.75	2.51	4.94	3.12	2.00
			39	2441	3.5	2.92	1.96	2.51	5.43	3.49	2.00
			78	2480	3.5	3.34	2.16	2.51	5.85	3.84	2.00

Band	Mode	Antenna	Channel	Frequency (MHz)	Maximum Target Power (dBm)	Measured Power (dBm)	Measured Power (mW)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	SW Pwr Setting (dBm)
2400MHz	Bluetooth EDR 3DH5	Aux	0	2402	2.5	1.26	1.34	2.51	3.77	2.38	1.00
			39	2441	2.5	1.71	1.48	2.51	4.22	2.64	1.00
			78	2480	2.5	2.15	1.64	2.51	4.66	2.92	1.00

Band	Mode	Antenna	Channel	Frequency (MHz)	Maximum Target Power (dBm)	Measured Power (dBm)	Measured Power (mW)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	SW Pwr Setting (dBm)
2400MHz	Bluetooth LE	Aux	0	2402	4.5	3.43	2.20	2.51	5.94	3.93	Default
			38	2440	4.5	3.42	2.20	2.51	5.93	3.92	Default
			78	2480	4.5	3.46	2.22	2.51	5.97	3.95	Default

EIRP(dBm)=Measured power(dBm)+Antenna gain(dBi)

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11. Tissue Dielectric Properties

IEEE Std 1528-2003 Table 2

Target Frequency (MHz)	Head	
	ε_r	σ (S/m)
300	45.3	0.87
450	43.5	0.87
835	41.5	0.90
900	41.5	0.97
1450	40.5	1.20
1800 – 2000	40.0	1.40
2450	39.2	1.80
2600	39.0	1.96
3000	38.5	2.40

KDB865664 D01 SAR Measurement 100 MHz to 6 GHz v01r01

Target Frequency (MHz)	Head		Body	
	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5000	36.2	4.45	49.3	5.07
5100	36.1	4.55	49.1	5.18
5200	36.0	4.66	49.0	5.30
5300	35.9	4.76	48.9	5.42
5400	35.8	4.86	48.7	5.53
5500	35.6	4.96	48.6	5.65
5600	35.5	5.07	48.5	5.77
5700	35.4	5.17	48.3	5.88
5800	35.3	5.27	48.2	6.00

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11.1. Composition of Ingredients for the Tissue Material Used in the SAR Tests

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.

Ingredients (% by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7
Dielectric Constant	43.42	58.0	42.54	56.1	42.0	56.8	39.9	54.0	39.8	52.5
Conductivity (S/m)	0.85	0.83	0.91	0.95	1.0	1.07	1.42	1.45	1.88	1.78

Salt: 99+% Pure Sodium Chloride Sugar: 98+% Pure Sucrose

Water: De-ionized, 16 MΩ+ resistivity HEC: Hydroxyethyl Cellulose

DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]

Triton X-100 (ultra pure): Polyethylene glycol mono [4-(1,1, 3, 3-tetramethylbutyl)phenyl]ether

Simulating Liquids for 5 GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	78
Mineral oil	11
Emulsifiers	9
Additives and Salt	2

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11.2. Tissue Dielectric Parameter Check Results

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized.
The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.
Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

Date	Freq. (MHz)	Liquid Parameters	Measured	Target	Delta (%)	Limit ±(%)
2015/3/18	Body 2400	Relative Permittivity (ε_r):	51.87	52.77	-1.71	5
		Conductivity (σ):	1.86	1.90	-2.21	5
	Body 2450	Relative Permittivity (ε_r):	51.59	52.70	-2.11	5
		Conductivity (σ):	1.93	1.95	-1.28	5
	Body 2480	Relative Permittivity (ε_r):	51.55	52.66	-2.11	5
		Conductivity (σ):	1.96	1.99	-1.61	5
2015/3/25	Body 2400	Relative Permittivity (ε_r):	51.96	52.77	-1.54	5
		Conductivity (σ):	1.85	1.90	-2.48	5
	Body 2450	Relative Permittivity (ε_r):	51.67	52.70	-1.95	5
		Conductivity (σ):	1.92	1.95	-1.54	5
	Body 2480	Relative Permittivity (ε_r):	51.64	52.66	-1.94	5
		Conductivity (σ):	1.96	1.99	-1.87	5
2015/3/19	Body 5180	Relative Permittivity (ε_r):	48.13	49.05	-1.87	10
		Conductivity (σ):	5.17	5.27	-2.00	5
	Body 5200	Relative Permittivity (ε_r):	48.04	49.02	-1.99	10
		Conductivity (σ):	5.19	5.29	-1.94	5
	Body 5300	Relative Permittivity (ε_r):	47.79	48.88	-2.24	10
		Conductivity (σ):	5.31	5.41	-1.93	5
	Body 5825	Relative Permittivity (ε_r):	47.20	48.20	-2.07	10
		Conductivity (σ):	6.00	6.00	-0.05	5
2015/3/20	Body 5180	Relative Permittivity (ε_r):	48.19	49.05	-1.75	10
		Conductivity (σ):	5.15	5.27	-2.26	5
	Body 5600	Relative Permittivity (ε_r):	47.55	48.48	-1.91	10
		Conductivity (σ):	5.67	5.65	0.42	5
	Body 5825	Relative Permittivity (ε_r):	47.22	48.20	-2.03	10
		Conductivity (σ):	5.97	6.00	-0.52	5
2015/3/23	Body 5180	Relative Permittivity (ε_r):	48.13	49.05	-1.87	10
		Conductivity (σ):	5.12	5.27	-2.80	5
	Body 5800	Relative Permittivity (ε_r):	47.19	48.20	-2.10	10
		Conductivity (σ):	5.91	6.00	-1.48	5
	Body 5825	Relative Permittivity (ε_r):	47.16	48.20	-2.16	10
		Conductivity (σ):	5.94	6.00	-0.97	5

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12. System Performance Check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are remeasured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

12.1. System Performance Check Measurement Conditions

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ±0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm ± 0.5 cm for SAR measurements.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 12 mm (1GHz to 3GHz) and15 mm (below 1GHz) was aligned with the dipole.
  For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 (below 3 GHz) and/or 8x8x7 (above 3 GHz) fine cube was chosen for the cube.
- Distance between probe sensors and phantom surface was set to 2 mm.
  For 5 GHz band - Distance between probe sensors and phantom surface was set to 1.4 mm
- The dipole input power (forward power) was 100 mW(For 5GHz band) or 250 mW(For 2.4GHz band).
- The results are normalized to 1 W input power.

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12.2. Reference SAR Values for System Performance Check

The reference SAR values can be obtained from the calibration certificate of system validation dipoles

System Dipole	Serial No.	Cal. Date	Freq. (MHz)	Target SAR Values (mW/g)		
				1g/10g	Head	Body
D2450V2	713	9/10/2013	2450	1g	52.0	50.4
				10g	24.2	23.6
D5GHV2	1020	1/13/2015	5.2GHz	1g	78.2	74.1
				10g	22.3	20.7
			5.3GHz	1g	82.8	74.2
				10g	23.7	20.8
			5.5GHz	1g	82.2	78.7
				10g	23.3	21.8
			5.6GHz	1g	81.4	77.2
				10g	23.1	21.4
			5.8GHz	1g	78.8	74.9
				10g	22.3	20.7

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12.3. System Performance Check Results

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within 10% of the manufacturer calibrated dipole SAR target.

Date Tested	System Dipole		T.S. Liquid		Measured Results		Target (Ref. Value)	Delta ±10 %
	Type	Serial #			Zoom Scan	Normalize to 1 W		
3/15/2015	D2450V2	713	Body	1g	13.70	54.8	50.4	8.73
				10g	6.45	25.8	23.6	9.32
3/25/2015	D2450V2	713	Body	1g	13.50	54.0	50.4	7.14
				10g	6.19	24.8	23.6	4.92
3/19/2015	D5GHzV2 5.2 GHz	1020	Body	1g	7.86	78.6	74.1	6.07
				10g	2.27	22.7	20.7	9.66
3/19/2015	D5GHzV2 5.3 GHz	1020	Body	1g	7.55	75.5	74.2	1.75
				10g	2.11	21.1	20.8	1.44
3/20/2015	D5GHzV2 5.6 GHz	1020	Body	1g	7.93	79.3	77.2	2.72
				10g	2.21	22.1	21.4	3.27
3/23/2015	D5GHzV2 5.8 GHz	1020	Body	1g	7.89	78.9	74.9	5.34
				10g	2.16	21.6	20.7	4.35

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13. SAR Test Results

13.1. Standalone SAR Test Exclusion Considerations

Standalone SAR test exclusion was based upon the following criteria:

1. According to KDB 447498 § 4.1.5 if the antenna is at close proximity to user then the outer surface of the DUT should be treated as the radiating surface. The test separation distance is then determined by the smallest distance between the outer surface of the device and the user. For the purposes of this report close proximity has been defined as closer than 50 mm. For antennas <50 mm from the rear or edge the separation distance used for the SAR exclusion calculations is 0mm.
2. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.
3. If the antenna to DUT adjacent rear or edge separation distance is >50mm the actual antenna to user separation distance is used to determine SAR exclusion and estimated SAR value
4. As the SISO (1 Tx) mode powers are higher than the MIMO (2Tx) powers separate testing of the MIMO (2 Tx) SAR was considered unnecessary. The reported stand-alone values for 1Tx mode are used to cover simultaneous conditions.

13.1.1. SAR exclusion calculations for Wi-Fi SISO (1 Tx) and Bluetooth for antenna <50mm from the user

Antenna	Tx	Frequency	Output power		Separation distances(mm)								Calcurated Threshold Value							
		(MHz)	dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Edge1 tilt	Edge4 tilt	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Edge1 tilt	Edge4 tilt	Front
WiFi - Main Antenna																				
WLAN Main	WiFi	2462	14.50	28	0.00	0.00	115.00	326.80	358.00	0.00	83.50		8.8	8.8	>50mm	>50mm	>50mm	8.8	>50mm	N/A
WLAN Main	WiFi	5240	13.50	22	0.00	0.00	115.00	326.80	358.00	0.00	83.50		10.1	10.1	>50mm	>50mm	>50mm	10.1	>50mm	N/A
WLAN Main	WiFi	5320	13.50	22	0.00	0.00	115.00	326.80	358.00	0.00	83.50		10.1	10.1	>50mm	>50mm	>50mm	10.1	>50mm	N/A
WLAN Main	WiFi	5700	14.00	25	0.00	0.00	115.00	326.80	358.00	0.00	83.50		11.9	11.9	>50mm	>50mm	>50mm	11.9	>50mm	N/A
WLAN Main	WiFi	5825	14.00	25	0.00	0.00	115.00	326.80	358.00	0.00	83.50		12.1	12.1	>50mm	>50mm	>50mm	12.1	>50mm	N/A
Bluetooth / WiFi - Aux Antenna																				
WLAN Aux	WiFi	2462	14.50	28	0.00	133.00	465.70	199.00	0.00	0.00	0.00		8.8	>50mm	>50mm	>50mm	8.8	8.8	8.8	N/A
WLAN Aux	WiFi	5240	14.00	25	0.00	133.00	465.70	199.00	0.00	0.00	0.00		11.4	>50mm	>50mm	>50mm	11.4	11.4	11.4	N/A
WLAN Aux	WiFi	5320	14.00	25	0.00	133.00	465.70	199.00	0.00	0.00	0.00		11.5	>50mm	>50mm	>50mm	11.5	11.5	11.5	N/A
WLAN Aux	WiFi	5700	14.50	28	0.00	133.00	465.70	199.00	0.00	0.00	0.00		13.4	>50mm	>50mm	>50mm	13.4	13.4	13.4	N/A
WLAN Aux	WiFi	5825	14.50	28	0.00	133.00	465.70	199.00	0.00	0.00	0.00		13.5	>50mm	>50mm	>50mm	13.5	13.5	13.5	N/A
WLAN Aux	Bluetooth	2480	7.00	5	0.00	133.00	465.70	199.00	0.00	0.00	0.00		1.6	>50mm	>50mm	>50mm	1.6	1.6	1.6	N/A

Note(s):

1. According to KDB 447498, if the calculated threshold value is >3 then SAR testing is required.
2. SAR exclusion was not assessed for 2 Tx (MIMO) as the higher 1 Tx (SISO) SAR values were used for simultaneous transmission analysis.

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13.1.2. SAR exclusion calculations for Wi-Fi SISO (1 Tx) and Bluetooth for antenna >50mm from the user

Antenna	Tx	Frequency	Output power		Separation distances(mm)								Power Threshold (mW)							
		(MHz)	dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Edge1 tilt	Edge4 tilt	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Edge1 tilt	Edge4 tilt	Front
WiFi - Main Antenna																				
WLAN Main	WiFi	2462	14.50	28	0.00	0.00	115.00	326.80	358.00	0.00	83.50		<50mm	<50mm	745.6	2863.6	3175.6	<50mm	430.6	N/A
WLAN Main	WiFi	5240	13.50	22	0.00	0.00	115.00	326.80	358.00	0.00	83.50		<50mm	<50mm	715.5	2833.5	3145.5	<50mm	400.5	N/A
WLAN Main	WiFi	5320	13.50	22	0.00	0.00	115.00	326.80	358.00	0.00	83.50		<50mm	<50mm	715.0	2833.0	3145.0	<50mm	400.0	N/A
WLAN Main	WiFi	5700	14.00	25	0.00	0.00	115.00	326.80	358.00	0.00	83.50		<50mm	<50mm	712.8	2830.8	3142.8	<50mm	397.8	N/A
WLAN Main	WiFi	5825	14.00	25	0.00	0.00	115.00	326.80	358.00	0.00	83.50		<50mm	<50mm	712.2	2830.2	3142.2	<50mm	397.2	N/A
Bluetooth / WiFi - Aux Antenna																				
WLAN Aux	WiFi	2462	14.50	28	0.00	133.00	465.70	199.00	0.00	0.00	0.00		<50mm	925.6	4252.6	1585.6	<50mm	<50mm	<50mm	N/A
WLAN Aux	WiFi	5240	14.00	25	0.00	133.00	465.70	199.00	0.00	0.00	0.00		<50mm	895.5	4222.5	1555.5	<50mm	<50mm	<50mm	N/A
WLAN Aux	WiFi	5320	14.00	25	0.00	133.00	465.70	199.00	0.00	0.00	0.00		<50mm	895.0	4222.0	1555.0	<50mm	<50mm	<50mm	N/A
WLAN Aux	WiFi	5700	14.50	28	0.00	133.00	465.70	199.00	0.00	0.00	0.00		<50mm	892.8	4219.8	1552.8	<50mm	<50mm	<50mm	N/A
WLAN Aux	WiFi	5825	14.50	28	0.00	133.00	465.70	199.00	0.00	0.00	0.00		<50mm	892.2	4219.2	1552.2	<50mm	<50mm	<50mm	N/A
WLAN Aux	Bluetooth	2480	7.00	5	0.00	133.00	465.70	199.00	0.00	0.00	0.00		<50mm	925.3	4252.3	1585.3	<50mm	<50mm	<50mm	N/A

Note(s):

1. According to KDB 447498, if the calculated Power threshold is less than the output power then SAR testing is required.
2. SAR exclusion was not assessed for 2 Tx (MIMO) as the higher 1 Tx (SISO) SAR values were used for simultaneous transmission analysis

Conclusion:

- As the calculated Power Threshold is greater than the DUT output power for Edge2, 3, 4 and Edge 4 tilt of WIFI Main antenna and Edge1 ,2, 3 of Bluetooth/ WIFI Aux antenna, SAR testing is not required for these configurations

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13.2. Estimated SAR for Simultaneous Transmission SAR Analysis

Considerations for using estimated SAR values:

1. According to KDB 447498 § 4.1.5 if the antenna is at close proximity to user then the outer surface of the DUT should be treated as the radiating surface. The test separation distance is then determined by the smallest distance between the outer surface of the device and the user. For the purposes of this report close proximity has been defined as closer than 50 mm. For antennas <50 mm from the rear or edge the separation distance used for the estimated SAR calculations is 0mm.
2. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.
3. Output power is the maximum rated power (including tune-up or manufacturing tolerances) and includes source-based averaging.
4. If the antenna separation distance is > 50mm then the estimated SAR value is 0.4 W/Kg.
5. Formulas round separation distance to nearest mm and power to nearest mW before calculating estimated SAR

13.2.1. Estimated SAR for Wi-Fi 1 Tx (SISO) and Bluetooth

Antenna	Tx	Frequency	Output power		Separation distances(mm)								Estimated SAR Value							
		(MHz)	dBm	mW	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Edge1 tilt	Edge4 tilt	Front	Rear	Edge 1	Edge 2	Edge 3	Edge 4	Edge1 tilt	Edge4 tilt	Front
WiFi - Main Antenna																				
WLAN Main	WiFi	2462	14.50	28	0.00	0.00	115.00	326.80	358.00	0.00	83.50		Measure	Measure	0.400	>200 mm	>200 mm	>200 mm	0.400	N/A
WLAN Main	WiFi	5240	13.50	22	0.00	0.00	115.00	326.80	358.00	0.00	83.50		Measure	Measure	0.400	>200 mm	>200 mm	>200 mm	0.400	N/A
WLAN Main	WiFi	5320	13.50	22	0.00	0.00	115.00	326.80	358.00	0.00	83.50		Measure	Measure	0.400	>200 mm	>200 mm	>200 mm	0.400	N/A
WLAN Main	WiFi	5700	14.00	25	0.00	0.00	115.00	326.80	358.00	0.00	83.50		Measure	Measure	0.400	>200 mm	>200 mm	>200 mm	0.400	N/A
WLAN Main	WiFi	5825	14.00	25	0.00	0.00	115.00	326.80	358.00	0.00	83.50		Measure	Measure	0.400	>200 mm	>200 mm	>200 mm	0.400	N/A
Bluetooth / WiFi - Aux Antenna																				
WLAN Aux	WiFi	2462	14.50	28	0.00	133.00	465.70	199.00	0.00	0.00	0.00		Measure	0.400	>200 mm	0.400	Measure	Measure	Measure	N/A
WLAN Aux	WiFi	5240	14.00	25	0.00	133.00	465.70	199.00	0.00	0.00	0.00		Measure	0.400	>200 mm	0.400	Measure	Measure	Measure	N/A
WLAN Aux	WiFi	5320	14.00	25	0.00	133.00	465.70	199.00	0.00	0.00	0.00		Measure	0.400	>200 mm	0.400	Measure	Measure	Measure	N/A
WLAN Aux	WiFi	5700	14.50	28	0.00	133.00	465.70	199.00	0.00	0.00	0.00		Measure	0.400	>200 mm	0.400	Measure	Measure	Measure	N/A
WLAN Aux	WiFi	5825	14.50	28	0.00	133.00	465.70	199.00	0.00	0.00	0.00		Measure	0.400	>200 mm	0.400	Measure	Measure	Measure	N/A
WLAN Aux	Bluetooth	2480	7.00	5	0.00	133.00	465.70	199.00	0.00	0.00	0.00		0.400	0.400	>200 mm	0.400	0.400	Measure	0.400	N/A

Notes:

1. Estimated SAR for 2 Tx (MIMO) was not assessed as the higher 1 Tx (SISO) SAR values were used for simultaneous transmission analysis.
2. As Simultaneous Transmission SAR of the DUT was compliant under the higher power conditions of Wi-Fi 1 Tx, it was judged that such analyses would be unnecessary for Wi-Fi 2 Tx (MIMO), given the substantially lower MIMO power levels and considerable separation distance between WLAN Main and the WLAN Auxiliary antennas.
3. Wherever appropriate, Wi-Fi 1 Tx (SISO) SAR values were used to represent those of Wi-Fi 2 Tx (MIMO); if compliance can be shown with the more conservative Wi-Fi 1 Tx values, then there is no need to perform separate assessment for Wi-Fi 2 Tx.
4. Though SAR for Bluetooth/WiFi Aux antenna in edge 1 tilt was not required for standalone SAR, test was performed. The reason is as follows.

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When considering simultaneous transmitting exclusion of Edge1 tilt, 0.4W/kg had very large estimated SAR of Edge1 tilt of WLAN Aux/BT, and since the sum of SAR value exceeded 1.6W/kg, estimated SAR was not used in this report.

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13.3. Wi-Fi 2.4 GHz Band

Main Antenna

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note	SW Pwr Setting
					Tune-up limit	Meas.	Meas.	Scaled			
Rear	802.11b	0	2	2417	14.50	14.28				1	13.5
			6	2437	14.50	14.28				1	13.5
			10	2457	14.50	14.49	0.544	0.545	1		13.5
Edge 1	802.11b	0	2	2417	14.50	14.28				1	13.5
			6	2437	14.50	14.28				1	13.5
			10	2457	14.50	14.49	0.509	0.510	2		13.5
Edge1 tilt	802.11b	0	2	2417	14.50	14.28	0.908	0.955	3		13.5
			6	2437	14.50	14.28	1.280	1.347	4		13.5
			10	2457	14.50	14.49	1.200	1.203	5		13.5

Auxiliary Antenna

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note	SW Pwr Setting
					Tune-up limit	Meas.	Meas.	Scaled			
Rear	802.11b	0	2	2417	14.5	14.30				1	16.0
			6	2437	14.5	14.26				1	16.0
			10	2457	14.5	14.32	0.424	0.442	6		16.0
Edge 4	802.11b	0	2	2417	14.5	14.30				1	16.0
			6	2437	14.5	14.26				1	16.0
			10	2457	14.5	14.32	0.427	0.445	7		16.0
Edge 4 tilt	802.11b	0	2	2417	14.5	14.30	0.800	0.838	8		16.0
			6	2437	14.5	14.26	0.643	0.680	9		16.0
			10	2457	14.5	14.32	0.832	0.867	10		16.0
Edge 1 tilt	802.11b	0	2	2417	14.5	14.30				1	16.0
			6	2437	14.5	14.26				1	16.0
			10	2457	14.5	14.32	0.090	0.094	11		16.0

Note(s):

1. According to KDB 447498 D01 General RF Exposure Guidance v05, 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

   1. ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   2. ≤ 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
   3. ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

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13.4. Wi-Fi 5.2 GHz Band

Main Antenna

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note	SW Pwr Setting
					Tune-up limit	Meas.	Meas.	Scaled			
Rear	802.11a	0	36	5180	13.50	13.37	0.210	0.216	1		25.5
			48	5240	13.50	13.18				1	25.0
Edge1	802.11a	0	36	5180	13.50	13.37	0.442	0.455	2		25.5
			48	5240	13.50	13.18				1	25.0
Edge1 tilt	802.11a	0	36	5180	13.50	13.37	0.535	0.551	3		25.5
			48	5240	13.50	13.18				1	25.0

Auxiliary Antenna

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note	SW Pwr Setting
					Tune-up limit	Meas.	Meas.	Scaled			
Rear	802.11a	0	40	5200	14.00	13.80				1	24.5
			48	5240	14.00	13.90	0.156	0.160	4		24.5
Edge4	802.11a	0	40	5200	14.00	13.80				1	24.5
			48	5240	14.00	13.90	0.274	0.280	5		24.5
Edge4 tilt	802.11a	0	40	5200	14.00	13.80				1	24.5
			48	5240	14.00	13.90	0.485	0.496	6		24.5
Edge1 tilt	802.11a	0	40	5200	14.00	13.80				1	24.5
			48	5240	14.00	13.90	0.021	0.021	7		24.5

Note(s):

According to KDB 447498 D01 General RF Exposure Guidance v05, 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

1. ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
2. ≤ 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
3. ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

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13.5. Wi-Fi 5.3 GHz Band

Main Antenna

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note	SW Pwr Setting
					Tune-up limit	Meas.	Meas.	Scaled			
Rear	802.11a	0	52	5260	13.50	13.47	0.164	0.165	1		25.0
			64	5320	13.50	13.44				1	24.5
Edge1	802.11a	0	52	5260	13.50	13.47	0.427	0.430	2		25.0
			64	5320	13.50	13.44				1	24.5
Edge1 tilt	802.11a	0	52	5260	13.50	13.47	0.431	0.434	3		25.0
			64	5320	13.50	13.44				1	24.5

Auxiliary Antenna

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note	SW Pwr Setting
					Tune-up limit	Meas.	Meas.	Scaled			
Rear	802.11a	0	52	5260	14.00	13.69				1	24.0
			60	5300	14.00	13.99	0.143	0.143	4		24.5
Edge4	802.11a	0	52	5260	14.00	13.69				1	24.0
			60	5300	14.00	13.99	0.315	0.316	5		24.5
Edge4 tilt	802.11a	0	52	5260	14.00	13.69				1	24.0
			60	5300	14.00	13.99	0.564	0.565	6		24.5
Edge1 tilt	802.11a	0	52	5260	14.00	13.69				1	24.0
			60	5300	14.00	13.99	0.022	0.022	7		24.5

Note(s):

According to KDB 447498 D01 General RF Exposure Guidance v05, 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

1. ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
2. ≤ 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
3. ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

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13.6. Wi-Fi 5.6 GHz Band

Main Antenna

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note	SW Pwr Setting
					Tune-up limit	Meas.	Meas.	Scaled			
Rear	802.11a	0	100	5500	13.50	13.49				3	23.5
			112	5560	13.50	13.32				3	23.5
			120	5600	13.50	13.28				3	23.5
			140	5700	14.00	13.98	0.179	0.180	1		24.5
Edge1	802.11a	0	100	5500	13.50	13.49				3	23.5
			112	5560	13.50	13.32				3	23.5
			120	5600	13.50	13.28				3	23.5
			140	5700	14.00	13.98	0.392	0.394	2		24.5
Edge1 tilt	802.11a	0	100	5500	13.50	13.49	0.398	0.399	3		23.5
			112	5560	13.50	13.32	0.454	0.473	4		23.5
			120	5600	13.50	13.28	0.506	0.532	5		23.5
			140	5700	14.00	13.98	0.474	0.476	6		24.5

Auxiliary Antenna

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note	SW Pwr Setting
					Tune-up limit	Meas.	Meas.	Scaled			
Rear	802.11a	0	108	5540	14.00	13.99				3	25.5
			112	5560	14.00	13.93				3	25.5
			120	5600	14.00	13.83				3	25.5
			140	5700	14.50	14.49	0.126	0.126	7		27.0
Edge4	802.11a	0	108	5540	14.00	13.99				3	25.5
			112	5560	14.00	13.93				3	25.5
			120	5600	14.00	13.83				3	25.5
			140	5700	14.50	14.49	0.386	0.387	8		27.0
Edge4 tilt	802.11a	0	108	5540	14.00	13.99				3	25.5
			112	5560	14.00	13.93				3	25.5
			120	5600	14.00	13.83				3	25.5
			140	5700	14.50	14.49	0.330	0.331	9		27.0
Edge1 tilt	802.11a	0	108	5540	14.00	13.99				3	25.5
			112	5560	14.00	13.93				3	25.5
			120	5600	14.00	13.83				3	25.5
			140	5700	14.50	14.49	0.176	0.176	10		27.0

Note(s):

According to KDB 447498 D01 General RF Exposure Guidance v05, 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

1. ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
2. ≤ 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
3. ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

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13.7. Wi-Fi 5.8 GHz Band

Main Antenna

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note	SW Pwr Setting
					Tune-up limit	Meas.	Meas.	Scaled			
Rear	802.11a	0	149	5745	14.00	13.85				1	24.5
			161	5805	14.00	13.97	0.166	0.167	1		25.0
			165	5825	14.00	13.86				1	25.0
Edge1	802.11a	0	149	5745	14.00	13.85				1	24.5
			161	5805	14.00	13.97	0.491	0.494	2		25.0
			165	5825	14.00	13.86				1	25.0
Edge1 tilt	802.11a	0	149	5745	14.00	13.85				1	24.5
			161	5805	14.00	13.97	0.549	0.553	3		25.0
			165	5825	14.00	13.86				1	25.0

Auxiliary Antenna

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note	SW Pwr Setting
					Tune-up limit	Meas.	Meas.	Scaled			
Rear	802.11a	0	149	5745	14.50	14.21				1	27.0
			157	5785	14.50	14.41	0.129	0.132	4		27.5
			161	5805	14.50	14.27				1	27.5
Edge4	802.11a	0	149	5745	14.50	14.21				1	27.0
			157	5785	14.50	14.41	0.503	0.514	5		27.5
			161	5805	14.50	14.27				1	27.5
Edge4 tilt	802.11a	0	149	5745	14.50	14.21				1	27.0
			157	5785	14.50	14.41	0.405	0.413	6		27.5
			161	5805	14.50	14.27				1	27.5
Edge1 tilt	802.11a	0	149	5745	14.50	14.21				1	27.0
			157	5785	14.50	14.41	0.202	0.206	7		27.5
			161	5805	14.50	14.27				1	27.5

Note(s):

According to KDB 447498 D01 General RF Exposure Guidance v05, 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

1. ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
2. ≤ 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
3. ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

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13.8. Bluetooth

Auxiliary Antenna

Test Position	Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.	Note	SW Pwr Setting
					Tune-up limit	Meas.	Meas.	Scaled			
Edge 1 tilt	DH5	0	0	2402	7.00	5.20				1	5.0
			39	2441	7.00	5.74				1	5.0
			78	2480	7.00	6.10	0.00582	0.007	1		5.0

Note(s):

According to KDB 447498 D01 General RF Exposure Guidance v05, 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

1. ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
2. ≤ 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
3. ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

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13.9. Summary of Highest SAR Values

Results for the highest measured SAR values in each frequency band and mode

Technology/ Band	Test configuration			Mode	Dist. (mm)	Freq. (Mhz)	Power (dBm)	1g SAR (W/kg)
	Transmit Antenna	Exposure	Position					
Wi-Fi 2.4 GHz	Main	Body	Edge 1 tilt	802.11b	0	2437	14.28	1.280
Wi-Fi 5.2 GHz	Main	Body	Edge 1 tilt	802.11a	0	5180	13.37	0.535
Wi-Fi 5.3 GHz	Auxiliary	Body	Edge 4 tilt	802.11a	0	5300	13.99	0.564
Wi-Fi 5.6 GHz	Main	Body	Edge 1 tilt	802.11a	0	5600	13.28	0.506
Wi-Fi 5.8 GHz	Main	Body	Edge 1 tilt	802.11a	0	5805	13.97	0.549
Bluetooth	Auxiliary	Body	Edge 1 tilt	DH5	0	2480	6.10	0.00582

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13.10. SAR Measurement Variability and Uncertainty

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Repeated measurement was not performed since the original highest measured SAR is < 0.80 W/kg

Wireless Technologies	Test Configuration			Mode	Dist. (mm)	Ch #.	Freq. (MHz)	Meas. SAR (W/kg)		Largest to Smallest SAR Ratio	Plot No.
	Transmit Antenna	Exposure	Position					Original	Repeated		
Wi-Fi 2.4 GHz	Main	Body	Edge 1 tilt	802.11b	0	6	2437	1.280	1.150	1.113	1
Wi-Fi 5.2 GHz	Main	Body	Edge 1 tilt	802.11a 6 Mbps	0	36	5180	0.535	N/A	N/A	-
Wi-Fi 5.3 GHz	Auxiliary	Body	Edge 4 tilt	802.11a 6 Mbps	0	60	5300	0.564	N/A	N/A	-
Wi-Fi 5.6 GHz	Main	Body	Edge 1 tilt	802.11a 6 Mbps	0	120	5600	0.506	N/A	N/A	-
Wi-Fi 5.8 GHz	Main	Body	Edge 1 tilt	802.11a 6 Mbps	0	161	5805	0.549	N/A	N/A	-
Bluetooth	Auxiliary	Body	Edge 1 tilt	DH5	0	78	2480	0.00582	N/A	N/A	-

Note(s):

Repeated Measurement is not required since the original highest measured SAR for all band is < 0.80 W/kg.

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13.11. SAR Plots (from Summary of Highest Measured SAR Values)

WLAN 11b 1Mbps Main Ant Edge1 tilt 2437MHz

Communication System: UID 0, WLAN 11a/b/g/n (0); Communication System Band: 11b/g/n (2.4G); Frequency: 2437 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.906 S/m; ε_r = 51.628; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

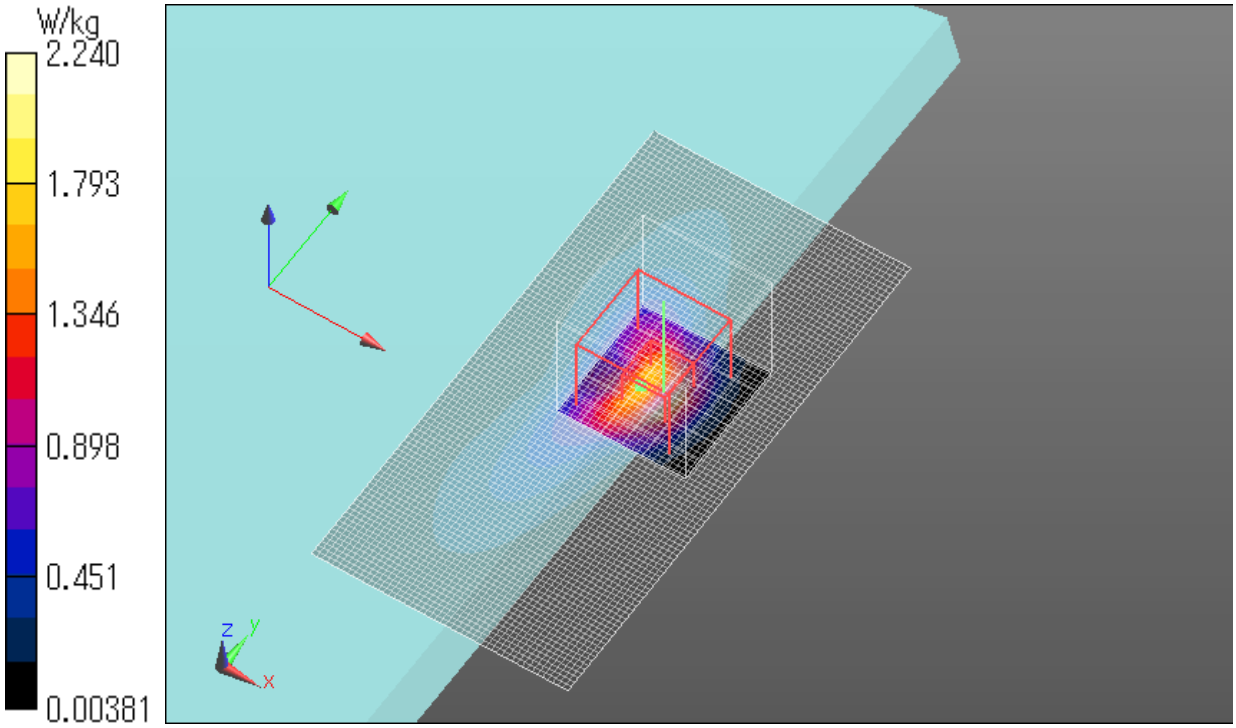
Probe: EX3DV4 - SN3825; ConvF(7.21, 7.21, 7.21); Calibrated: 2014/12/16;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn509; Calibrated: 2014/07/28
Phantom: ELI v4.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1045
DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Area Scan 2 (51x101x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.68 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 34.54 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 3.58 W/kg
SAR(1 g) = 1.28 W/kg; SAR(10 g) = 0.499 W/kg

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 2.24 W/kg



WLAN 11a 6Mbps Main Ant Edge1 tilt 5180MHz

Communication System: UID 0, WLAN 5GHz (0); Communication System Band: WLAN 5GHz Low; Frequency: 5180 MHz; Duty Cycle: 1:1

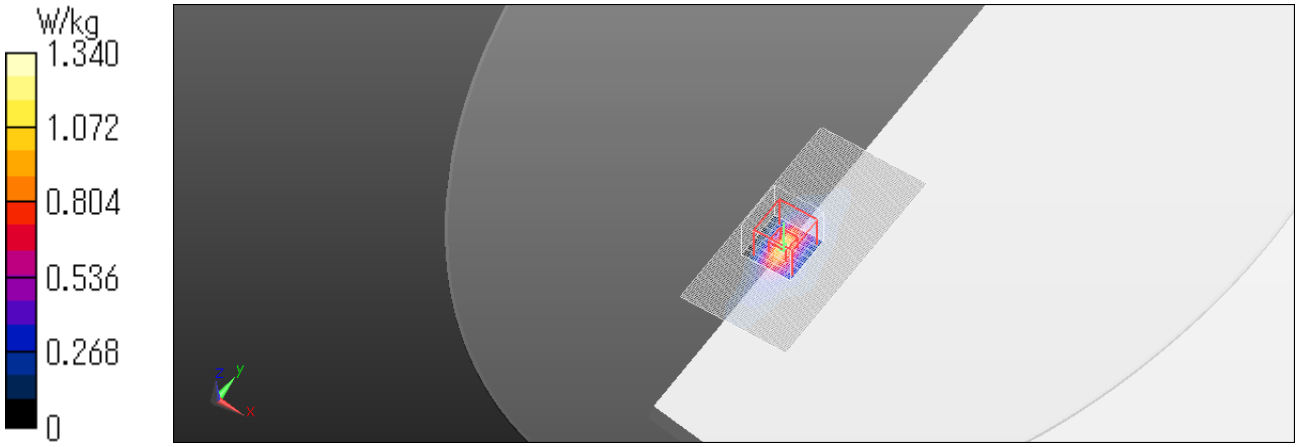
Medium parameters used: f = 5180 MHz; σ = 5.172 S/m; ε_r = 48.092; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3540; ConvF(3.98, 3.98, 3.98); Calibrated: 2014/05/09;
Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1369; Calibrated: 2014/05/14
Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002AA; Serial: TP:1203
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.916 W/kg

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 16.28 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 2.30 W/kg
SAR(1 g) = 0.535 W/kg; SAR(10 g) = 0.161 W/kg
Maximum value of SAR (measured) = 1.34 W/kg



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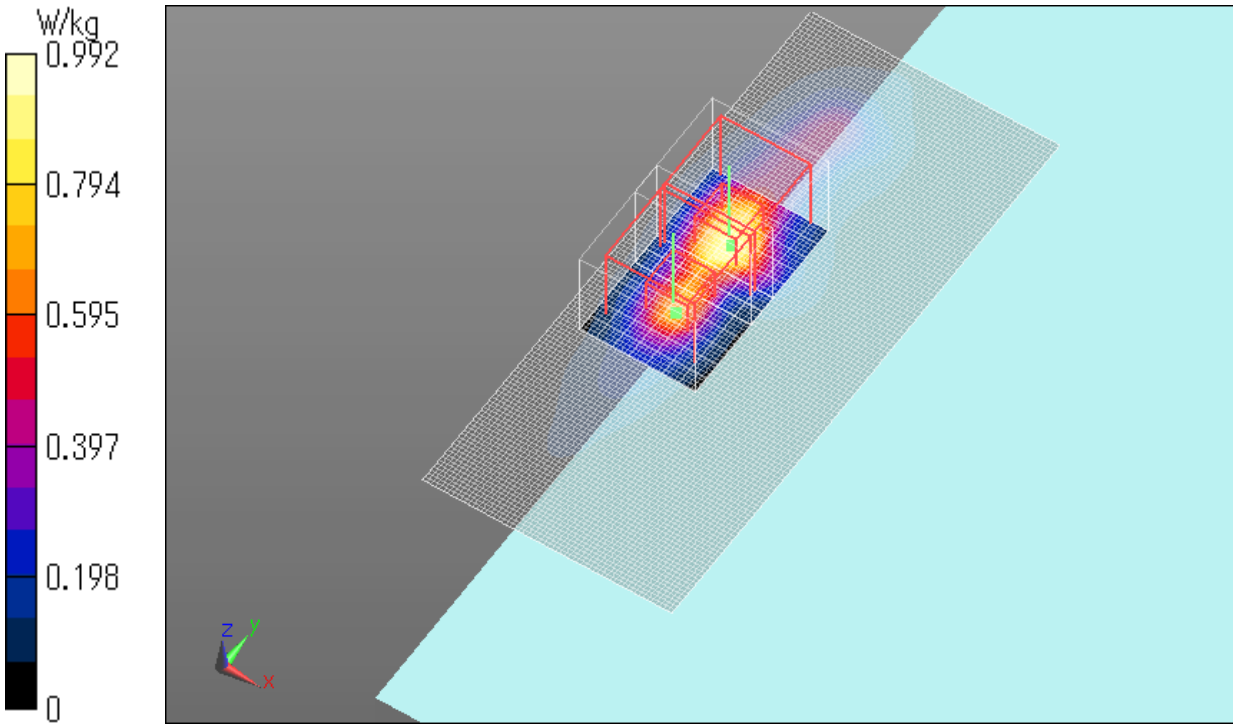
WLAN 11a 6Mbps Aux Ant Edge4 tilt 5300MHz

Communication System: UID 0, WLAN 11a/b/g/n (0); Communication System Band: 11a/n (W52 53); Frequency: 5300 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5300 MHz; σ = 5.307 S/m; ε_r = 47.789; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

Probe: EX3DV4 - SN3540; ConvF(3.81, 3.81, 3.81); Calibrated: 2014/05/09;
Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1369; Calibrated: 2014/05/14
Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002AA; Serial: TP:1203
DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Rear 2 2/Area Scan (61x141x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.915 W/kg
Rear 2 2/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 16.71 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 2.72 W/kg
SAR(1 g) = 0.564 W/kg; SAR(10 g) = 0.149 W/kg
Maximum value of SAR (measured) = 1.60 W/kg
Rear 2 2/Zoom Scan 2 (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 16.71 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 0.385 W/kg; SAR(10 g) = 0.103 W/kg
Maximum value of SAR (measured) = 0.992 W/kg



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WLAN 11a 6Mbps Main Ant Edge1 tilt 5600MHz

Communication System: UID 0, WLAN 11a/b/g/n (0); Communication System Band: 11a/n (W56); Frequency: 5600 MHz; Duty Cycle: 1:1

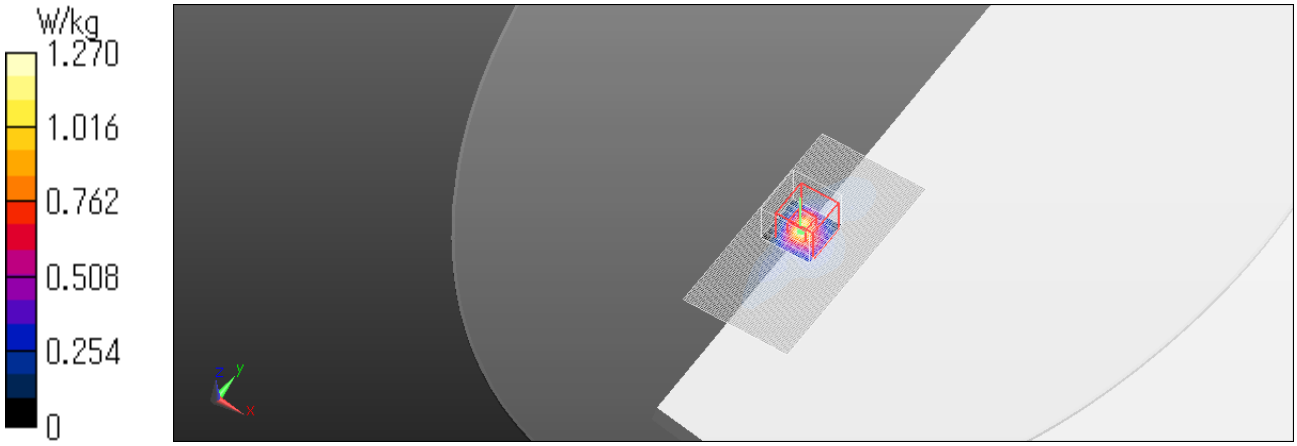
Medium parameters used: f = 5600 MHz; σ = 5.674 S/m; ε_r = 47.553; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3540; ConvF(3.5, 3.5, 3.5); Calibrated: 2014/05/09;
Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1369; Calibrated: 2014/05/14
Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002AA; Serial: TP:1203
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.01 W/kg

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 14.65 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 2.44 W/kg
SAR(1 g) = 0.506 W/kg; SAR(10 g) = 0.155 W/kg
Maximum value of SAR (measured) = 1.27 W/kg



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WLAN 11a 6Mbps Main Ant Edge1 tilt 5805MHz

Communication System: UID 0, WLAN 11a/b/g/n (0); Communication System Band: 11a/n (W58); Frequency: 5805 MHz; Duty Cycle: 1:1

Medium parameters used: f = 5805 MHz; σ = 5.91 S/m; ε_r = 47.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

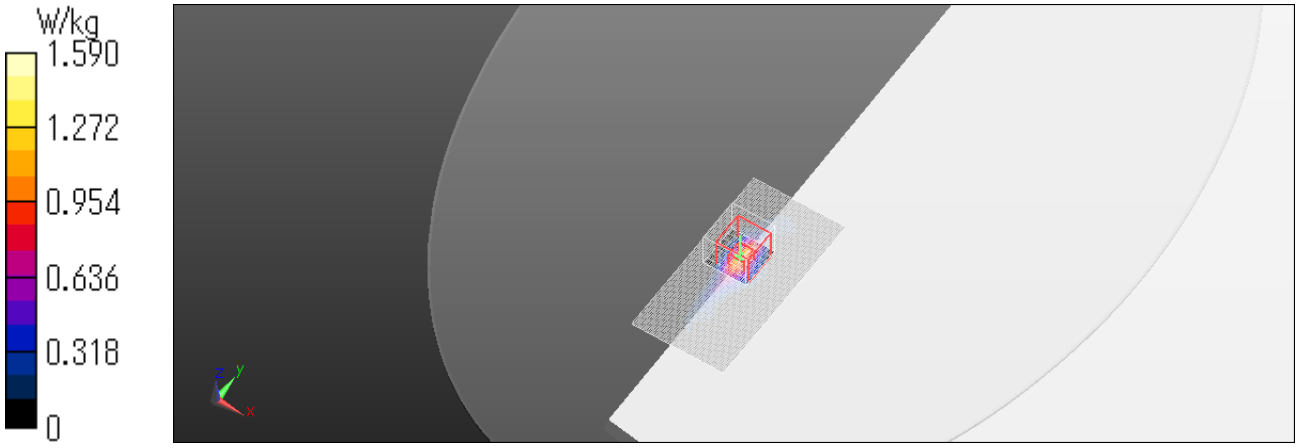
DASY5 Configuration

Probe: EX3DV4 - SN3540; ConvF(3.59, 3.59, 3.59); Calibrated: 2014/05/09;
Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1369; Calibrated: 2014/05/14
Phantom: ELI v5.0 (30deg probe tilt); Type: QDOVA002AA; Serial: TP:1203
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Area Scan (61x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.05 W/kg

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 15.77 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 2.91 W/kg
SAR(1 g) = 0.549 W/kg; SAR(10 g) = 0.154 W/kg

Maximum value of SAR (measured) = 1.59 W/kg



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BT DH5 Aux Ant Edge1 tilt 2480MHz

Communication System: UID 0, Bluetooth (0); Communication System Band: Bluetooth; Frequency: 2480 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2480 MHz; σ = 1.955 S/m; ε_r = 51.637; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY Configuration:

Probe: EX3DV4 - SN3825; ConvF(7.21, 7.21, 7.21); Calibrated: 2014/12/16;

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2014/07/28

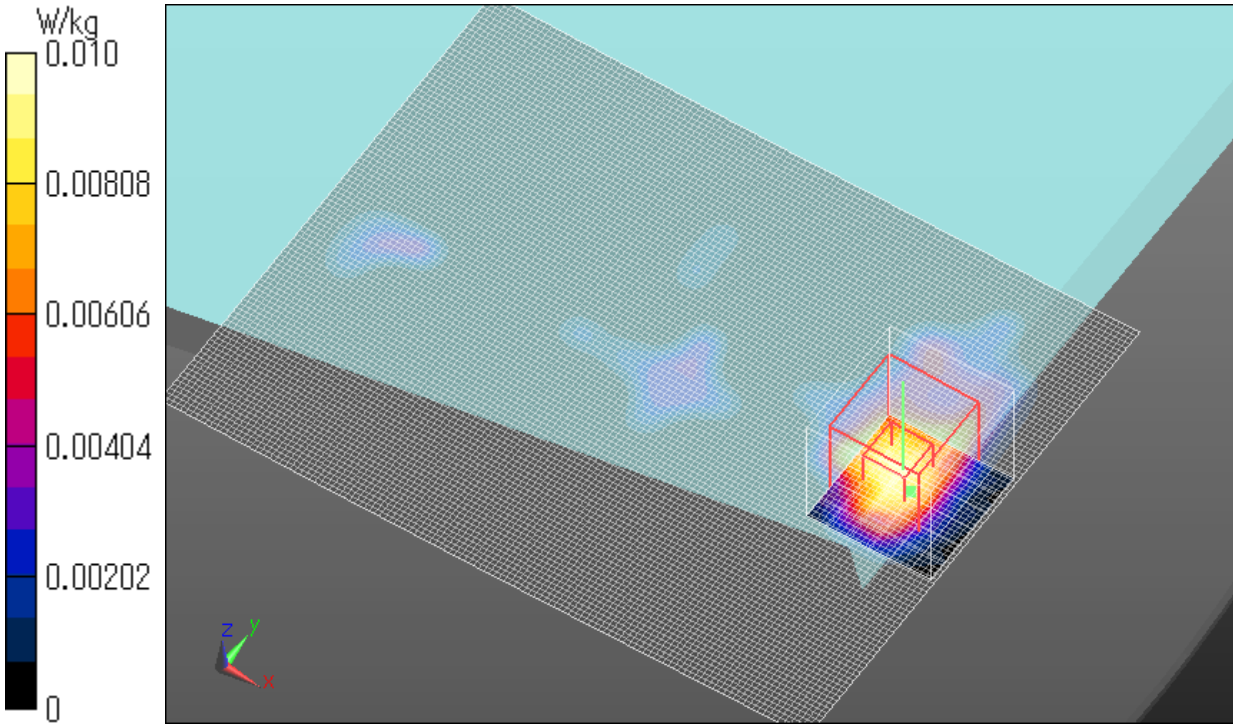
Phantom: ELI v4.0 (20deg probe tilt); Type: QDOVA001BB; Serial: TP:1045

DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Area Scan (131x101x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.0151 W/kg

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.055 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.0150 W/kg
SAR(1 g) = 0.00582 W/kg; SAR(10 g) = 0.00191 W/kg

Maximum value of SAR (measured) = 0.0101 W/kg



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14. Simultaneous Transmission SAR Analysis

14.1. Simultaneous Transmission SAR Analysis of Rear

Test Position	WiFi Main	WiFi Aux	Bluetooth	∑ 1-g SAR (mW/g)
Rear, 2.4 GHz	0.545	0.442		0.987
	0.545		0.400	0.945
Rear, 5.2 GHz	0.216	0.160		0.376
	0.216		0.400	0.616
Rear, 5.3 GHz	0.165	0.143		0.308
	0.165		0.400	0.565
Rear, 5.6 GHz	0.180	0.126		0.306
	0.180		0.400	0.580
Rear, 5.8 GHz	0.167	0.132		0.299
	0.167		0.400	0.567

Note(s):

1. Bluetooth and Wi-Fi Aux cannot simultaneously transmit
2. Values shaded green are estimated SAR

14.2. Simultaneous Transmission SAR Analysis of Edge1

Test Position	WiFi Main	WiFi Aux	Bluetooth	∑ 1-g SAR (mW/g)
Edge1, 2.4 GHz	0.510	0.400		0.910
	0.510		0.400	0.910
Edge1, 5.2 GHz	0.455	0.400		0.855
	0.455		0.400	0.855
Edge1, 5.3 GHz	0.430	0.400		0.830
	0.430		0.400	0.830
Edge1, 5.6 GHz	0.394	0.400		0.794
	0.394		0.400	0.794
Edge1, 5.8 GHz	0.494	0.400		0.894
	0.494		0.400	0.894

Note(s):

1. Bluetooth and Wi-Fi Aux cannot simultaneously transmit
2. Values shaded green are estimated SAR

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14.3. Simultaneous Transmission SAR Analysis of Edge1 tilt

Test Position	WiFi Main	WiFi Aux	Bluetooth	∑ 1-g SAR (mW/g)
Edge1 tilt, 2.4 GHz	1.347	0.094		1.441
	1.347		0.007	1.354
Edge1 tilt, 5.2 GHz	0.551	0.021		0.572
	0.551		0.007	0.558
Edge1 tilt, 5.3 GHz	0.434	0.022		0.456
	0.434		0.007	0.441
Edge1 tilt, 5.6 GHz	0.532	0.176		0.708
	0.532		0.007	0.539
Edge1 tilt, 5.8 GHz	0.553	0.206		0.759
	0.553		0.007	0.560

Note(s):

Bluetooth and Wi-Fi Aux cannot simultaneously transmit

14.4. Simultaneous Transmission SAR Analysis of Edge2

Stand-alone SAR test of Edge2 in Main antenna Tx is excluded. Aux antenna is more than 20 cm away from Edge2. (Refer to section 13.1) Therefore the Simultaneous Transmission SAR Analysis isn't considered.

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14.5. Simultaneous Transmission SAR Analysis of Edge3

Stand-alone SAR test of Edge3 in Aux antenna Tx is excluded. Main antenna is more than 20 cm away from Edge3. (Refer to section 13.1) Therefore the Simultaneous Transmission SAR Analysis isn't considered.

14.6. Simultaneous Transmission SAR Analysis of Edge4

Main antenna is more than 20 cm away from Edge4. (Refer to section 13.1) Therefore the Simultaneous Transmission isn't considered.

14.7. Simultaneous Transmission SAR Analysis of Edge4 tilt

Test Position	WiFi Main	WiFi Aux	Bluetooth	∑ 1-g SAR (mW/g)
Edge4 tilt, 2.4 GHz	0.400	0.867		1.267
	0.400		0.400	0.800
Edge4 tilt, 5.2 GHz	0.400	0.496		0.896
	0.400		0.400	0.800
Edge4 tilt, 5.3 GHz	0.400	0.565		0.965
	0.400		0.400	0.800
Edge4 tilt, 5.6 GHz	0.400	0.331		0.731
	0.400		0.400	0.800
Edge4 tilt, 5.8 GHz	0.400	0.413		0.813
	0.400		0.400	0.800

Note(s):

1. Bluetooth and Wi-Fi Aux cannot simultaneously transmit
2. Values shaded green are estimated SAR

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15. Appendixes

Refer to separated files for the following appendixes.

15.1.	**System Performance Check Plots**
15.2.	**SAR Test Plots for Wi-Fi 2.4 GHz Band**
15.3.	**SAR Test Plots for Wi-Fi 5.2 GHz Band**
15.4.	**SAR Test Plots for Wi-Fi 5.3 GHz Bands**
15.5.	**SAR Test Plots for Wi-Fi 5.6 GHz Bands**
15.6.	**SAR Test Plots for Wi-Fi 5.8 GHz Bands**
15.7.	**SAR Test Plots for Bluetooth**
15.8.	**SAR Test Plots for Repeat Measurement**
15.9.	**Calibration Certificate for E-Field Probe EX3DV4 - SN 3825**
15.10.	**Calibration Certificate for E-Field Probe EX3DV4 - SN 3540**
15.11.	**Calibration Certificate for D2450V2 - SN 713**
15.12.	**Calibration Certificate for D5GHzV2 - SN 1020**

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