

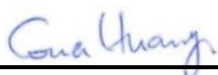
FCC SAR TEST REPORT

FCC ID : B94-RTL8852BER
Equipment : 11ax RTL8852BE Combo module
Brand Name : REALTEK
Model Name : RTL8852BE
Applicant : HP Inc.
3390 East Harmony Road, Fort Collins Colorado, USA 80528
Standard : FCC 47 CFR Part 2 (2.1093)

The product was installed into Notebook Computer (Brand Name: HP, Model Name: TPN-W169) during test.

The product was received on Nov. 22, 2024 and testing was started from Nov. 23, 2024 and completed on Nov. 25, 2024. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample provide by manufacturer and the test data has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been pass the FCC requirement.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Laboratory, the test report shall not be reproduced except in full.



Approved by: Cona Huang / Deputy Manager



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History of this test report

Report No.	Version	Description	Issued Date
FA4N0669	01	Initial issue of report	Jan. 17, 2025

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) for HP Inc., 11ax RTL8852BE Combo module, RTL8852BE, are as follows.

Equipment Class	Frequency Band		Highest SAR Summary	Highest Simultaneous Transmission 1g SAR (W/kg)
			Body (Separation 0mm)	
			1g SAR (W/kg)	
DTS	WLAN	2.4GHz WLAN	0.42	0.42
NII		5GHz WLAN	0.62	0.86
DSS	2.4GHz Band	Bluetooth	0.24	0.86
Date of Testing:			2024/11/23 ~ 2024/11/25	

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

Reviewed by: Jason Wang
Report Producer: Carlie Tsai

2. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards, the below KDB standard may not including in the TAF code without accreditation.

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

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	11ax RTL8852BE Combo module
Brand Name	REALTEK
Model Name	RTL8852BE
FCC ID	B94-RTL8852BER
Wireless Technology and Frequency Range	WLAN 2.4 GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2 GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3 GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.6 GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8 GHz Band: 5725 MHz ~ 5850 MHz WLAN 5.9 GHz Band: 5850 MHz ~ 5895 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz
Mode	WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/HE20/HE40/HE80 Bluetooth BR/EDR/LE
Remark: 1. There are four kinds of samples. Select sample 1 as the main test and sample 2, 3 and 4 will spot check found in sample 1. 2. This device is convertible type notebook PC, and there have Laptop and Tablet two usage way. When end user is used different mode, which the device will according current mode to limit different maximum power.	

Host Information	
Equipment Name	Notebook Computer
Brand Name	HP
Model Name	TPN-W169
EUT Stage	Production Unit

Sample List	
Sample 1	HTK_FF_C Plastic
Sample 2	HTK_FF+_C Metal
Sample 3	WNC_FF_C Plastic
Sample 4	WNC_FF+_C Metal



Antenna Information										
FF										
1 (Main/Tx2)	Ant. Type	PIFA	connector	High-Tek Electronics Co., Ltd	2 (Aux/Tx1)	Ant. Type	PIFA	connector	High-Tek Electronics Co., Ltd	
	Model No.	025.902IK.0001 (0ACAR024001N)				Model No.	025.902IL.0001 (0ACAR024002N)			
	Peak Gain (dBi)					Peak Gain (dBi)				
	2400~2483.5MHz	2.22	5470~5725MHz	0.69		2400~2483.5MHz	1.28	5470~5725MHz	0.57	
	5150~5250MHz	0.89	5725~5850MHz	1.07		5150~5250MHz	-0.01	5725~5850MHz	0.82	
	5250~5350MHz	0.79	5850~5925MHz	0.28		5250~5350MHz	0.43	5850~5925MHz	0.24	
3 (Main/Tx2)	Ant. Type	PIFA	connector	WNC	4 (Aux/Tx1)	Ant. Type	PIFA	connector	WNC	
	Model No.	025.902IM.0001 (81EAB615.G59)				Model No.	025.902IN.0001 (81EAB615.G58)			
	Peak Gain (dBi)					Peak Gain (dBi)				
	2400~2483.5MHz	2.12	5470~5725MHz	-0.45		2400~2483.5MHz	1.34	5470~5725MHz	0.53	
	5150~5250MHz	0.17	5725~5850MHz	0.35		5150~5250MHz	-0.14	5725~5850MHz	-0.23	
	5250~5350MHz	1.04	5850~5925MHz	0.24		5250~5350MHz	-0.54	5850~5925MHz	-1.33	
FF+										
5 (Main/Tx2)	Ant. Type	PIFA	connector	High-Tek Electronics Co., Ltd	6 (Aux/Tx1)	Ant. Type	PIFA	connector	High-Tek Electronics Co., Ltd	
	Model No.	025.902IK.0001 (0ACAR024001N)				Model No.	025.902IL.0001 (0ACAR024002N)			
	Peak Gain (dBi)					Peak Gain (dBi)				
	2400~2483.5MHz	1.14	5470~5725MHz	0.64		2400~2483.5MHz	0.7	5470~5725MHz	0.89	
	5150~5250MHz	1.61	5725~5850MHz	0.64		5150~5250MHz	0.81	5725~5850MHz	-0.33	
	5250~5350MHz	1.77	5850~5925MHz	-0.21		5250~5350MHz	1.21	5850~5925MHz	0.26	
7 (Main/Tx2)	Ant. Type	PIFA	connector	WNC	8 (Aux/Tx1)	Ant. Type	PIFA	connector	WNC	
	Model No.	025.902IM.0001 (81EAB615.G59)				Model No.	025.902IN.0001 (81EAB615.G58)			
	Peak Gain (dBi)					Peak Gain (dBi)				
	2400~2483.5MHz	1.9	5470~5725MHz	1.83		2400~2483.5MHz	1.41	5470~5725MHz	1.09	
	5150~5250MHz	-0.08	5725~5850MHz	2.1		5150~5250MHz	1.05	5725~5850MHz	1.37	
	5250~5350MHz	0.5	5850~5925MHz	2.17		5250~5350MHz	1.12	5850~5925MHz	-0.49	

3.2 Sensor Triggering angle and power verification

General Note:

1. The following guidance should be applied to laptops/tablets that use Hall Effect or gravity sensors to detect lid angle for the purpose of power reduction:

Step 1: With the lid is in closed mode (0 degrees), open the screen in 10 degree steps until laptop mode is obtained
Step 2: Lower the screen 5 degrees. Closed mode should be reobtained. If not keep lowering in 5 degree steps
Step 3: Open the screen in 1 degree steps until laptop mode is reobtained
Step 4: Continue opening the screen in 1 degree steps until at least 5 degrees past where laptop mode was obtained
Step 5: Then continue opening the screen in 10 degree steps until tablet mode is obtained
Step 6: Power measurements should be taken at each step
Step 7: Reverse this procedure going from tablet mode back down to closed mode

Screen Orientation = 0					
Use Cases	Antenna	Operation mode	Lid angle	Test Scale	802.11a 5.2G ch36
Lib Close	Ant 1+2(1)	Lid close	0	10	12.8
Lib Close		TB	10	10	12.8
Lib Close		TB	20	10	12.8
Laptop		NB	30	10	18.1
Lib Close		TB	25	5	12.8
Lib Close		TB	26	1	12.8
Lib Close		TB	27	1	12.8
Lib Close		TB	28	1	12.8
Lib Close		TB	29	1	12.8
Laptop		NB	30	1	18.1
Laptop		NB	40	10	18.1
Laptop		NB	50	10	18.1
Laptop		NB	60	10	18.1
Laptop		NB	70	10	18.1
Laptop		NB	80	10	18.1
Laptop		NB	90	10	18.1
Laptop		NB	100	10	18.1
Laptop		NB	110	10	18.1
Laptop		NB	120	10	18.1
Tablet		TB	130	10	12.8
Laptop		NB	125	5	18.1
Laptop		NB	126	1	18.1
Laptop		NB	127	1	18.1
Laptop		NB	128	1	18.1
Laptop		NB	129	1	18.1
Tablet		TB	130	1	12.8
Tablet		TB	140	10	12.8
Tablet		TB	150	10	12.8
Tablet		TB	160	10	12.8
Tablet		TB	170	10	12.8
Tablet		TB	180	10	12.8
Tablet		TB	190	10	12.8
Stand		NB	200	10	18.1
Tablet		TB	195	5	12.8
Tablet		TB	196	1	12.8
Tablet		TB	197	1	12.8
Tablet		TB	198	1	12.8
Tablet		TB	199	1	12.8
Stand		NB	200	s	18.1
Stand		NB	210	10	18.1
Stand		NB	220	10	18.1
Stand		NB	230	10	18.1



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Stand		NB	240	10	18.1
Stand		NB	250	10	18.1
Stand		NB	260	10	18.1
Stand		NB	270	10	18.1
Stand		NB	280	10	18.1
Stand		NB	290	10	18.1
Stand		NB	300	10	18.1
Stand		NB	310	10	18.1
Stand		NB	320	10	18.1
Stand		NB	330	10	18.1
Stand		NB	340	10	18.1
Tablet		TB	350	10	12.8
Tablet		TB	345	5	12.8
Stand		NB	340	1	18.1
Tablet		TB	341	1	12.8
Tablet		TB	342	1	12.8
Tablet		TB	343	1	12.8
Tablet		TB	344	1	12.8
Tablet		TB	345	1	12.8
Stand		NB	340	1	18.1
Stand		NB	339	1	18.1
Stand		NB	338	1	18.1
Stand		NB	337	1	18.1
Stand		NB	336	1	18.1
Stand		NB	335	1	18.1
Tablet		TB	350	10	12.8
Tablet		TB	360	10	12.8
Tablet		TB	350	10	12.8
Stand		NB	340	10	18.1
Tablet		TB	345	5	12.8
Tablet		TB	344	1	12.8
Tablet		TB	343	1	12.8
Tablet		TB	342	1	12.8
Tablet		TB	341	1	12.8
Stand		NB	340	1	18.1
Stand		NB	330	10	18.1
Stand		NB	320	10	18.1
Stand		NB	310	10	18.1
Stand		NB	300	10	18.1
Stand		NB	290	10	18.1
Stand		NB	280	10	18.1
Stand		NB	270	10	18.1
Stand		NB	260	10	18.1
Stand		NB	250	10	18.1
Stand		NB	240	10	18.1
Stand		NB	230	10	18.1
Stand		NB	220	10	18.1
Stand		NB	210	10	18.1
Stand		NB	200	10	18.1
Tablet		TB	190	10	12.8
Tablet		TB	195	5	12.8
Stand		NB	200	1	18.1
Tablet		TB	199	1	12.8
Tablet		TB	198	1	12.8
Tablet		TB	197	1	12.8
Tablet		TB	196	1	12.8



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Tablet	TB	195	1	12.8
Stand	NB	200	1	18.1
Stand	NB	201	1	18.1
Stand	NB	202	1	18.1
Stand	NB	203	1	18.1
Stand	NB	204	1	18.1
Stand	NB	205	1	18.1
Tablet	TB	190	10	12.8
Tablet	TB	180	10	12.8
Tablet	TB	170	10	12.8
Tablet	TB	160	10	12.8
Tablet	TB	150	10	12.8
Tablet	TB	140	10	12.8
Tablet	TB	130	10	12.8
Laptop	NB	120	10	18.1
Laptop	NB	125	5	18.1
Tablet	TB	130	1	12.8
Laptop	NB	129	1	18.1
Laptop	NB	128	1	18.1
Laptop	NB	127	1	18.1
Laptop	NB	126	1	18.1
Laptop	NB	125	1	18.1
Tablet	TB	130	1	12.8
Tablet	TB	131	1	12.8
Tablet	TB	132	1	12.8
Tablet	TB	133	1	12.8
Tablet	TB	134	1	12.8
Tablet	TB	135	1	12.8
Laptop	NB	120	10	18.1
Laptop	NB	110	10	18.1
Laptop	NB	100	10	18.1
Laptop	NB	90	10	18.1
Laptop	NB	80	10	18.1
Laptop	NB	70	10	18.1
Laptop	NB	60	10	18.1
Laptop	NB	50	10	18.1
Laptop	NB	40	10	18.1
Laptop	NB	30	10	18.1
Lib Close	TB	20	10	12.8
Lib Close	TB	25	5	12.8
Laptop	NB	30	1	18.1
Lib Close	TB	29	1	12.8
Lib Close	TB	28	1	12.8
Lib Close	TB	27	1	12.8
Lib Close	TB	26	1	12.8
Lib Close	TB	25	1	12.8
Laptop	NB	30	1	18.1
Laptop	NB	31	1	18.1
Laptop	NB	32	1	18.1
Laptop	NB	33	1	18.1
Laptop	NB	34	1	18.1
Laptop	NB	35	1	18.1
Lib Close	TB	20	10	12.8
Lib Close	TB	10	10	12.8
Lib Close	Lid close	0	10	12.8



Screen Orientation = 0					
Use Cases	Antenna	Operation mode	Lid angle	Test Scale	802.11a 5.2G ch36
Lib Close	Ant 1+2(2)	Lid close	0	10	12.9
Lib Close		TB	10	10	12.9
Lib Close		TB	20	10	12.9
Laptop		NB	30	10	17.9
Lib Close		TB	25	5	12.9
Lib Close		TB	26	1	12.9
Lib Close		TB	27	1	12.9
Lib Close		TB	28	1	12.9
Lib Close		TB	29	1	12.9
Laptop		NB	30	1	17.9
Laptop		NB	40	10	17.9
Laptop		NB	50	10	17.9
Laptop		NB	60	10	17.9
Laptop		NB	70	10	17.9
Laptop		NB	80	10	17.9
Laptop		NB	90	10	17.9
Laptop		NB	100	10	17.9
Laptop		NB	110	10	17.9
Laptop		NB	120	10	17.9
Tablet		TB	130	10	12.9
Laptop		NB	125	5	17.9
Laptop		NB	126	1	17.9
Laptop		NB	127	1	17.9
Laptop		NB	128	1	17.9
Laptop		NB	129	1	17.9
Tablet		TB	130	1	12.9
Tablet		TB	140	10	12.9
Tablet		TB	150	10	12.9
Tablet		TB	160	10	12.9
Tablet		TB	170	10	12.9
Tablet		TB	180	10	12.9
Tablet		TB	190	10	12.9
Stand		NB	200	10	17.9
Tablet		TB	195	5	12.9
Tablet		TB	196	1	12.9
Tablet		TB	197	1	12.9
Tablet		TB	198	1	12.9
Tablet		TB	199	1	12.9
Stand		NB	200	1	17.9
Stand		NB	210	10	17.9
Stand		NB	220	10	17.9
Stand		NB	230	10	17.9
Stand		NB	240	10	17.9
Stand		NB	250	10	17.9
Stand		NB	260	10	17.9
Stand		NB	270	10	17.9
Stand		NB	280	10	17.9
Stand		NB	290	10	17.9
Stand		NB	300	10	17.9
Stand		NB	310	10	17.9
Stand		NB	320	10	17.9
Stand		NB	330	10	17.9
Stand		NB	340	10	17.9



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Tablet		TB	350	10	12.9
Tablet		TB	345	5	12.9
Stand		NB	340	1	17.9
Tablet		TB	341	1	12.9
Tablet		TB	342	1	12.9
Tablet		TB	343	1	12.9
Tablet		TB	344	1	12.9
Tablet		TB	345	1	12.9
Stand		NB	340	1	17.9
Stand		NB	339	1	17.9
Stand		NB	338	1	17.9
Stand		NB	337	1	17.9
Stand		NB	336	1	17.9
Stand		NB	335	1	17.9
Tablet		TB	350	10	12.9
Tablet		TB	360	10	12.9
Tablet		TB	350	10	12.9
Stand		NB	340	10	17.9
Tablet		TB	345	5	12.9
Tablet		TB	344	1	12.9
Tablet		TB	343	1	12.9
Tablet		TB	342	1	12.9
Tablet		TB	341	1	12.9
Stand		NB	340	1	17.9
Stand		NB	330	10	17.9
Stand		NB	320	10	17.9
Stand		NB	310	10	17.9
Stand		NB	300	10	17.9
Stand		NB	290	10	17.9
Stand		NB	280	10	17.9
Stand		NB	270	10	17.9
Stand		NB	260	10	17.9
Stand		NB	250	10	17.9
Stand		NB	240	10	17.9
Stand		NB	230	10	17.9
Stand		NB	220	10	17.9
Stand		NB	210	10	17.9
Stand		NB	200	10	17.9
Tablet		TB	190	10	12.9
Tablet		TB	195	5	12.9
Stand		NB	200	1	17.9
Tablet		TB	199	1	12.9
Tablet		TB	198	1	12.9
Tablet		TB	197	1	12.9
Tablet		TB	196	1	12.9
Tablet		TB	195	1	12.9
Stand		NB	200	1	17.9
Stand		NB	201	1	17.9
Stand		NB	202	1	17.9
Stand		NB	203	1	17.9
Stand		NB	204	1	17.9
Stand		NB	205	1	17.9
Tablet		TB	190	10	12.9
Tablet		TB	180	10	12.9
Tablet		TB	170	10	12.9
Tablet		TB	160	10	12.9



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Tablet		TB	150	10	12.9
Tablet		TB	140	10	12.9
Tablet		TB	130	10	12.9
Laptop		NB	120	10	17.9
Laptop		NB	125	5	17.9
Tablet		TB	130	1	12.9
Laptop		NB	129	1	17.9
Laptop		NB	128	1	17.9
Laptop		NB	127	1	17.9
Laptop		NB	126	1	17.9
Laptop		NB	125	1	17.9
Tablet		TB	130	1	12.9
Tablet		TB	131	1	12.9
Tablet		TB	132	1	12.9
Tablet		TB	133	1	12.9
Tablet		TB	134	1	12.9
Tablet		TB	135	1	12.9
Laptop		NB	120	10	17.9
Laptop		NB	110	10	17.9
Laptop		NB	100	10	17.9
Laptop		NB	90	10	17.9
Laptop		NB	80	10	17.9
Laptop		NB	70	10	17.9
Laptop		NB	60	10	17.9
Laptop		NB	50	10	17.9
Laptop		NB	40	10	17.9
Laptop		NB	30	10	17.9
Lib Close		TB	20	10	12.9
Lib Close		TB	25	5	12.9
Laptop		NB	30	1	17.9
Lib Close		TB	29	1	12.9
Lib Close		TB	28	1	12.9
Lib Close		TB	27	1	12.9
Lib Close		TB	26	1	12.9
Lib Close		TB	25	1	12.9
Laptop		NB	30	1	17.9
Laptop		NB	31	1	17.9
Laptop		NB	32	1	17.9
Laptop		NB	33	1	17.9
Laptop		NB	34	1	17.9
Laptop		NB	35	1	17.9
Lib Close		TB	20	10	12.9
Lib Close		TB	10	10	12.9
Lib Close		Lid close	0	10	12.9

Screen Orientation = 180					
Use Cases	Antenna	Operation mode	Lid angle	Test Scale	802.11a 5.2G ch36
Lib Close	Ant 1+2(1)	Lid close	0	10	12.8
Lib Close		TB	10	10	12.8
Lib Close		TB	20	10	12.8
Laptop		NB	30	10	18.1
Lib Close		TB	25	5	12.8
Lib Close		TB	26	1	12.8
Lib Close		TB	27	1	12.8
Lib Close		TB	28	1	12.8
Lib Close		TB	29	1	12.8
Lib Close		TB	29	1	12.8



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Laptop		NB	30	1	18.1
Laptop		NB	40	10	18.1
Laptop		NB	50	10	18.1
Laptop		NB	60	10	18.1
Laptop		NB	70	10	18.1
Laptop		NB	80	10	18.1
Laptop		NB	90	10	18.1
Laptop		NB	100	10	18.1
Laptop		NB	110	10	18.1
Laptop		NB	120	10	18.1
Tablet		TB	130	10	12.8
Laptop		NB	125	5	18.1
Laptop		NB	126	1	18.1
Laptop		NB	127	1	18.1
Laptop		NB	128	1	18.1
Laptop		NB	129	1	18.1
Tablet		TB	130	1	12.8
Tablet		TB	140	10	12.8
Tablet		TB	150	10	12.8
Tablet		TB	160	10	12.8
Tablet		TB	170	10	12.8
Tablet		TB	180	10	12.8
Tablet		TB	190	10	12.8
Tent		TB	200	10	12.8
Tent		TB	210	10	12.8
Tent		TB	220	10	12.8
Tent		TB	230	10	12.8
Tent		TB	240	10	12.8
Tent		TB	250	10	12.8
Tent		TB	260	10	12.8
Tent		TB	270	10	12.8
Tent		TB	280	10	12.8
Tent		TB	290	10	12.8
Tent		TB	300	10	12.8
Tent		TB	310	10	12.8
Tent		TB	320	10	12.8
Tent		TB	330	10	12.8
Tent		TB	340	10	12.8
Tablet		TB	350	10	12.8
Tablet		TB	360	10	12.8
Tablet		TB	350	10	12.8
Tent		TB	340	10	12.8
Tent		TB	330	10	12.8
Tent		TB	320	10	12.8
Tent		TB	310	10	12.8
Tent		TB	300	10	12.8
Tent		TB	290	10	12.8
Tent		TB	280	10	12.8
Tent		TB	270	10	12.8
Tent		TB	260	10	12.8
Tent		TB	250	10	12.8
Tent		TB	240	10	12.8
Tent		TB	230	10	12.8
Tent		TB	220	10	12.8
Tent		TB	210	10	12.8
Tent		TB	200	10	12.8



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Tablet		TB	190	10	12.8
Tablet		TB	180	10	12.8
Tablet		TB	170	10	12.8
Tablet		TB	160	10	12.8
Tablet		TB	150	10	12.8
Tablet		TB	140	10	12.8
Tablet		TB	130	10	12.8
Laptop		NB	120	10	18.1
Laptop		NB	125	5	18.1
Tablet		TB	130	1	12.8
Laptop		NB	129	1	18.1
Laptop		NB	128	1	18.1
Laptop		NB	127	1	18.1
Laptop		NB	126	1	18.1
Laptop		NB	125	1	18.1
Tablet		TB	130	1	12.8
Tablet		TB	131	1	12.8
Tablet		TB	132	1	12.8
Tablet		TB	133	1	12.8
Tablet		TB	134	1	12.8
Tablet		TB	135	1	12.8
Laptop		NB	120	10	18.1
Laptop		NB	110	10	18.1
Laptop		NB	100	10	18.1
Laptop		NB	90	10	18.1
Laptop		NB	80	10	18.1
Laptop		NB	70	10	18.1
Laptop		NB	60	10	18.1
Laptop		NB	50	10	18.1
Laptop		NB	40	10	18.1
Laptop		NB	30	10	18.1
Lib Close		TB	20	10	12.8
Lib Close		TB	25	5	12.8
Laptop		NB	30	1	18.1
Lib Close		TB	29	1	12.8
Lib Close		TB	28	1	12.8
Lib Close		TB	27	1	12.8
Lib Close		TB	26	1	12.8
Lib Close		TB	25	1	12.8
Laptop		NB	30	1	18.1
Laptop		NB	31	1	18.1
Laptop		NB	32	1	18.1
Laptop		NB	33	1	18.1
Laptop		NB	34	1	18.1
Laptop		NB	35	1	18.1
Lib Close		TB	20	10	12.8
Lib Close		TB	10	10	12.8
Lib Close		Lid close	0	10	12.8

Screen Orientation = 180					
Use Cases	Antenna	Operation mode	Lid angle	Test Scale	802.11a 5.2G ch36
Lib Close	Ant 1+2(2)	Lid close	0	10	12.9
Lib Close		TB	10	10	12.9
Lib Close		TB	20	10	12.9
Laptop		NB	30	10	17.9
Lib Close		TB	25	5	12.9



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Lib Close	TB	26	1	12.9
Lib Close	TB	27	1	12.9
Lib Close	TB	28	1	12.9
Lib Close	TB	29	1	12.9
Laptop	NB	30	1	17.9
Laptop	NB	40	10	17.9
Laptop	NB	50	10	17.9
Laptop	NB	60	10	17.9
Laptop	NB	70	10	17.9
Laptop	NB	80	10	17.9
Laptop	NB	90	10	17.9
Laptop	NB	100	10	17.9
Laptop	NB	110	10	17.9
Laptop	NB	120	10	17.9
Tablet	TB	130	10	12.9
Laptop	NB	125	5	17.9
Laptop	NB	126	1	17.9
Laptop	NB	127	1	17.9
Laptop	NB	128	1	17.9
Laptop	NB	129	1	17.9
Tablet	TB	130	1	12.9
Tablet	TB	140	10	12.9
Tablet	TB	150	10	12.9
Tablet	TB	160	10	12.9
Tablet	TB	170	10	12.9
Tablet	TB	180	10	12.9
Tablet	TB	190	10	12.9
Tent	TB	200	10	12.9
Tent	TB	210	10	12.9
Tent	TB	220	10	12.9
Tent	TB	230	10	12.9
Tent	TB	240	10	12.9
Tent	TB	250	10	12.9
Tent	TB	260	10	12.9
Tent	TB	270	10	12.9
Tent	TB	280	10	12.9
Tent	TB	290	10	12.9
Tent	TB	300	10	12.9
Tent	TB	310	10	12.9
Tent	TB	320	10	12.9
Tent	TB	330	10	12.9
Tent	TB	340	10	12.9
Tablet	TB	350	10	12.9
Tablet	TB	360	10	12.9
Tablet	TB	350	10	12.9
Tent	TB	340	10	12.9
Tent	TB	330	10	12.9
Tent	TB	320	10	12.9
Tent	TB	310	10	12.9
Tent	TB	300	10	12.9
Tent	TB	290	10	12.9
Tent	TB	280	10	12.9
Tent	TB	270	10	12.9
Tent	TB	260	10	12.9
Tent	TB	250	10	12.9
Tent	TB	240	10	12.9



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Report No. : FA4N0669

Tent		TB	230	10	12.9
Tent		TB	220	10	12.9
Tent		TB	210	10	12.9
Tent		TB	200	10	12.9
Tablet		TB	190	10	12.9
Tablet		TB	180	10	12.9
Tablet		TB	170	10	12.9
Tablet		TB	160	10	12.9
Tablet		TB	150	10	12.9
Tablet		TB	140	10	12.9
Tablet		TB	130	10	12.9
Laptop		NB	120	10	17.9
Laptop		NB	125	5	17.9
Tablet		TB	130	1	12.9
Laptop		NB	129	1	17.9
Laptop		NB	128	1	17.9
Laptop		NB	127	1	17.9
Laptop		NB	126	1	17.9
Laptop		NB	125	1	17.9
Tablet		TB	130	1	12.9
Tablet		TB	131	1	12.9
Tablet		TB	132	1	12.9
Tablet		TB	133	1	12.9
Tablet		TB	134	1	12.9
Tablet		TB	135	1	12.9
Laptop		NB	120	10	17.9
Laptop		NB	110	10	17.9
Laptop		NB	100	10	17.9
Laptop		NB	90	10	17.9
Laptop		NB	80	10	17.9
Laptop		NB	70	10	17.9
Laptop		NB	60	10	17.9
Laptop		NB	50	10	17.9
Laptop		NB	40	10	17.9
Laptop		NB	30	10	17.9
Lib Close		TB	20	10	12.9
Lib Close		TB	25	5	12.9
Laptop		NB	30	1	17.9
Lib Close		TB	29	1	12.9
Lib Close		TB	28	1	12.9
Lib Close		TB	27	1	12.9
Lib Close		TB	26	1	12.9
Lib Close		TB	25	1	12.9
Laptop		NB	30	1	17.9
Laptop		NB	31	1	17.9
Laptop		NB	32	1	17.9
Laptop		NB	33	1	17.9
Laptop		NB	34	1	17.9
Laptop		NB	35	1	17.9
Lib Close		TB	20	10	12.9
Lib Close		TB	10	10	12.9
Lib Close		Lid close	0	10	12.9



Screen Orientation = 90 & 270					
Use Cases	Antenna	Operation mode	Lid angle	Test Scale	802.11a 5.2G ch36
Lib Close	Ant 1+2(1)	Lid close	0	10	12.8
Lib Close		TB	10	10	12.8
Lib Close		TB	20	10	12.8
Book		TB	30	10	12.8
Book		TB	40	10	12.8
Book		TB	50	10	12.8
Book		TB	60	10	12.8
Book		TB	70	10	12.8
Book		TB	80	10	12.8
Book		TB	90	10	12.8
Book		TB	100	10	12.8
Book		TB	110	10	12.8
Book		TB	120	10	12.8
Book		TB	130	10	12.8
Book		TB	140	10	12.8
Book		TB	150	10	12.8
Book		TB	160	10	12.8
Book		TB	170	10	12.8
Book		TB	180	10	12.8
Book		TB	190	10	12.8
Book		TB	200	10	12.8
Tablet		TB	210	10	12.8
Tablet		TB	220	10	12.8
Tablet		TB	230	10	12.8
Tablet		TB	240	10	12.8
Tablet		TB	250	10	12.8
Tablet		TB	260	10	12.8
Tablet		TB	270	10	12.8
Tablet		TB	280	10	12.8
Tablet		TB	290	10	12.8
Tablet		TB	300	10	12.8
Tablet		TB	310	10	12.8
Tablet		TB	320	10	12.8
Tablet		TB	330	10	12.8
Tablet		TB	340	10	12.8
Tablet		TB	350	10	12.8
Tablet		TB	360	10	12.8
Tablet		TB	350	10	12.8
Tablet		TB	340	10	12.8
Tablet		TB	330	10	12.8
Tablet		TB	320	10	12.8
Tablet		TB	310	10	12.8
Tablet		TB	300	10	12.8
Tablet		TB	290	10	12.8
Tablet		TB	280	10	12.8
Tablet		TB	270	10	12.8
Tablet		TB	260	10	12.8
Tablet		TB	250	10	12.8
Tablet		TB	240	10	12.8
Tablet		TB	230	10	12.8
Tablet		TB	220	10	12.8
Tablet		TB	210	10	12.8
Book		TB	200	10	12.8



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Book		TB	190	10	12.8
Book		TB	180	10	12.8
Book		TB	170	10	12.8
Book		TB	160	10	12.8
Book		TB	150	10	12.8
Book		TB	140	10	12.8
Book		TB	130	10	12.8
Book		TB	120	10	12.8
Book		TB	110	10	12.8
Book		TB	100	10	12.8
Book		TB	90	10	12.8
Book		TB	80	10	12.8
Book		TB	70	10	12.8
Book		TB	60	10	12.8
Book		TB	50	10	12.8
Book		TB	40	10	12.8
Book		TB	30	10	12.8
Lib Close		TB	20	10	12.8
Lib Close		TB	10	10	12.8
Lib Close		Lid close	0	10	12.8

Screen Orientation = 90 & 270					
Use Cases	Antenna	Operation mode	Lid angle	Test Scale	802.11a 5.2G ch36
Lib Close	Ant 1+2(2)	Lid close	0	10	12.9
Lib Close		TB	10	10	12.9
Lib Close		TB	20	10	12.9
Book		TB	30	10	12.9
Book		TB	40	10	12.9
Book		TB	50	10	12.9
Book		TB	60	10	12.9
Book		TB	70	10	12.9
Book		TB	80	10	12.9
Book		TB	90	10	12.9
Book		TB	100	10	12.9
Book		TB	110	10	12.9
Book		TB	120	10	12.9
Book		TB	130	10	12.9
Book		TB	140	10	12.9
Book		TB	150	10	12.9
Book		TB	160	10	12.9
Book		TB	170	10	12.9
Book		TB	180	10	12.9
Book		TB	190	10	12.9
Book		TB	200	10	12.9
Tablet		TB	210	10	12.9
Tablet		TB	220	10	12.9
Tablet		TB	230	10	12.9
Tablet		TB	240	10	12.9
Tablet		TB	250	10	12.9
Tablet		TB	260	10	12.9
Tablet		TB	270	10	12.9
Tablet		TB	280	10	12.9
Tablet		TB	290	10	12.9
Tablet		TB	300	10	12.9
Tablet		TB	310	10	12.9
Tablet		TB	320	10	12.9



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Tablet		TB	330	10	12.9
Tablet		TB	340	10	12.9
Tablet		TB	350	10	12.9
Tablet		TB	360	10	12.9
Tablet		TB	350	10	12.9
Tablet		TB	340	10	12.9
Tablet		TB	330	10	12.9
Tablet		TB	320	10	12.9
Tablet		TB	310	10	12.9
Tablet		TB	300	10	12.9
Tablet		TB	290	10	12.9
Tablet		TB	280	10	12.9
Tablet		TB	270	10	12.9
Tablet		TB	260	10	12.9
Tablet		TB	250	10	12.9
Tablet		TB	240	10	12.9
Tablet		TB	230	10	12.9
Tablet		TB	220	10	12.9
Tablet		TB	210	10	12.9
Book		TB	200	10	12.9
Book		TB	190	10	12.9
Book		TB	180	10	12.9
Book		TB	170	10	12.9
Book		TB	160	10	12.9
Book		TB	150	10	12.9
Book		TB	140	10	12.9
Book		TB	130	10	12.9
Book		TB	120	10	12.9
Book		TB	110	10	12.9
Book		TB	100	10	12.9
Book		TB	90	10	12.9
Book		TB	80	10	12.9
Book		TB	70	10	12.9
Book		TB	60	10	12.9
Book		TB	50	10	12.9
Book		TB	40	10	12.9
Book		TB	30	10	12.9
Lib Close		TB	20	10	12.9
Lib Close		TB	10	10	12.9
Lib Close		Lid close	0	10	12.9

4. RF Exposure Limits

4.1 Uncontrolled Environment

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

4.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

5. Specific Absorption Rate (SAR)

5.1 Introduction

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

5.2 SAR Definition

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

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

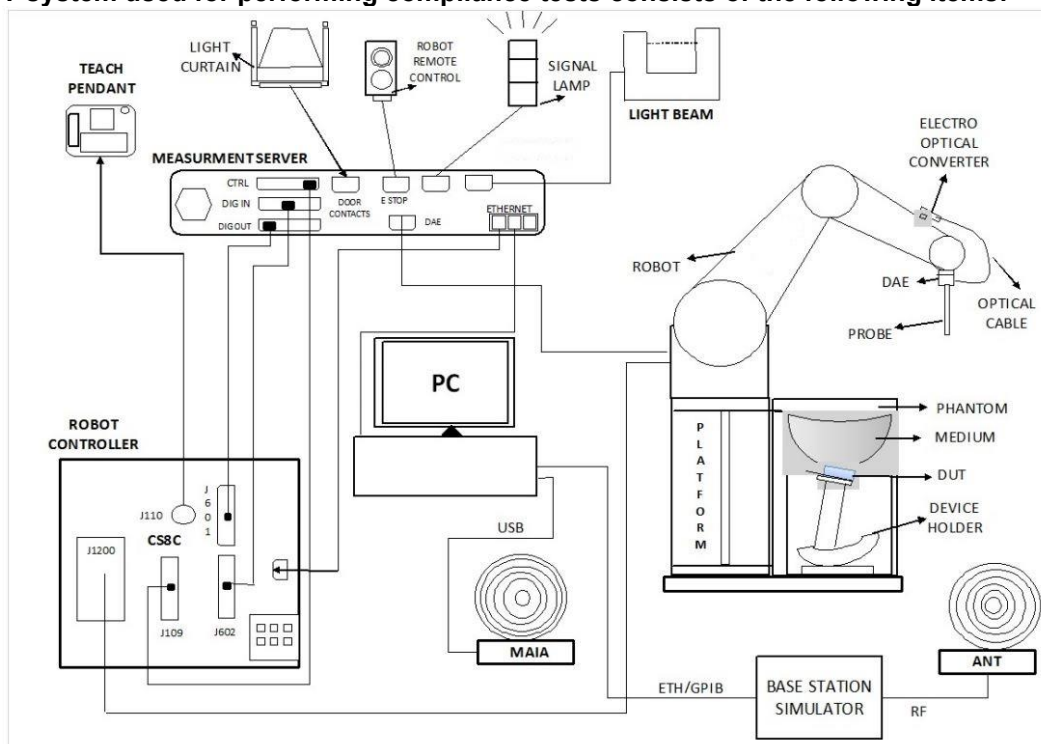
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

6. System Description and Setup

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



- The DASY system in SAR Configuration is shown above
- 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 windows software and the DASY 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.

6.1 Test Site Location

The SAR measurement facilities used to collect data are within both Sporton Lab list below test site location are accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190 and 3786) and the FCC designation No. TW1190 and TW3786 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.

Laboratory	EMC & Wireless Communications Laboratory		Wensan Laboratory				
Test Site Location	TW1190 No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan		TW3786 No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan				
Test Site No.	SAR01-HY	SAR03-HY	SAR08-HY	SAR09-HY	SAR15-HY	SAR18-HY	SAR21-HY
	SAR04-HY	SAR05-HY	SAR11-HY	SAR12-HY	SAR16-HY	SAR19-HY	SAR22-HY
	SAR06-HY	SAR10-HY	SAR13-HY	SAR14-HY	SAR17-HY	SAR20-HY	

6.2 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG). The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

<ES3DV3 Probe>

Construction	Symmetric design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	4 MHz – 4 GHz; Linearity: ± 0.2 dB (30 MHz – 4 GHz)	
Directivity	± 0.2 dB in TSL (rotation around probe axis) ± 0.3 dB in TSL (rotation normal to probe axis)	
Dynamic Range	5 μ W/g – >100 mW/g; Linearity: ± 0.2 dB	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 3.9 mm (body: 12 mm) Distance from probe tip to dipole centers: 3.0 mm	

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Frequency	4 MHz – >6 GHz Linearity: ± 0.2 dB (30 MHz – 6 GHz)	
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)	
Dynamic Range	10 μ W/g – >100 mW/g Linearity: ± 0.2 dB (noise: typically <1 μ W/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

6.3 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.



Fig 5.1 Photo of DAE

6.4 Phantom

<SAM Twin Phantom>

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

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

<ELI Phantom>

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

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

6.5 Device Holder

<Mounting Device for Hand-Held Transmitter>

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



Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

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

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



Mounting Device for Laptops

7. Measurement Procedures

The measurement procedures are as follows:

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

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

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

7.1 Spatial Peak SAR Evaluation

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

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

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

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

7.2 Power Reference Measurement

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

7.3 Area Scan

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

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

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	$30^\circ \pm 1^\circ$	$20^\circ \pm 1^\circ$
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 $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

7.4 Zoom Scan

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

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

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$			≤ 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: $\Delta z_{\text{Zoom}}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{\text{Zoom}}(1)$: between 1 st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{\text{Zoom}}(n>1)$: between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$	
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 <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> 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.				

7.5 Volume Scan Procedures

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

7.6 Power Drift Monitoring

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

8. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	2450MHz System Validation Kit	D2450V2	736	Aug. 15, 2024	Aug. 14, 2025
SPEAG	5GHz System Validation Kit	D5GHzV2	1171	Apr. 19, 2024	Apr. 18, 2025
SPEAG	Data Acquisition Electronics	DAE4	1311	Sep. 16, 2024	Sep. 15, 2025
SPEAG	Dosimetric E-Field Probe	EX3DV4	7692	Sep. 03, 2024	Sep. 02, 2025
Testo	Hygro meter	608-H1	45196600	Oct. 28, 2024	Oct. 27, 2025
R&S	BT Base Station	CBT	101136	Oct. 20, 2024	Oct. 19, 2025
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Sep. 24, 2024	Sep. 23, 2025
Keysight	ENA Network Analyzer	E5071C	MY46104758	Oct. 20, 2024	Oct. 19, 2025
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 17, 2024	Sep. 16, 2025
LINE SEIKI	Digital Thermometer	DTM3000-spezial	3690	Aug. 07, 2024	Aug. 06, 2025
Anritsu	Power Meter	ML2495A	1419002	Aug. 13, 2024	Aug. 12, 2025
Anritsu	Power Sensor	MA2411B	1911176	Aug. 13, 2024	Aug. 12, 2025
Anritsu	Spectrum Analyzer	MS2830A	6201396378	Jul. 09, 2024	Jul. 08, 2025
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 23, 2024	Oct. 22, 2025
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Warison	Directional Coupler	WCOU-10-50S-10	WR889BMC4B1	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

General Note:

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.



10. RF Exposure Positions

10.1 SAR Testing for Tablet

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



11. WiFi/Bluetooth Output Power (Unit: dBm)

General Note:

1. For each antenna, transmit power in SISO operation is larger than (or equal to) the power in MIMO operation, RF exposure compliance of MIMO mode can be deduced from the compliance simultaneous transmission of antennas operating in SISO mode.
2. Per KDB 248227 D01v02r02, the simultaneous SAR provisions in KDB publication 447498 should be applied to determine simultaneous transmission SAR test exclusion for WiFi MIMO. If the sum of 1g single transmission chain SAR measurements is $< 1.6\text{W/kg}$ and SAR peak to location ratio ≤ 0.04 , no additional SAR measurements for MIMO.
3. The maximum output power specified for production units are determined for all applicable 802.11 transmission modes in each standalone and aggregated frequency band. Maximum output power is measured for the highest maximum output power configuration(s) in each frequency band according to the default power measurement procedures. For "Not required", SAR Test reduction was applied from KDB 248227 guidance, Sec. 2.1, b), 1) when the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, additional output power measurements were not necessary.
4. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
5. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
6. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
7. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures. 18 The initial test position procedure is described in the following:
 - a. When the reported SAR of the initial test position is $\leq 0.4\text{ W/kg}$, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
 - b. When the reported SAR of the test position is $> 0.4\text{ W/kg}$, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is $\leq 0.8\text{ W/kg}$ or all required test position are tested.
 - c. For all positions/configurations, when the reported SAR is $> 0.8\text{ W/kg}$, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is $\leq 1.2\text{ W/kg}$ or all required channels are tested.
8. Per 201904 TCBC workshops, General principles of FCC KDB Publication 248227 D01 can be applied to determine the SAR Initial Test Configurations and test reduction for 802.11ax SAR testing. For the table below the 802.11ax maximum power is SU (non-OFDMA), and the SU maximum power also higher than RU (OFDMA)
9. In applying the test guidance, the IEEE 802.11 mode with the maximum output power (out of all modes) should be considered for testing
10. For modes with the same maximum output power, the guidance from section 5.3.2 a) of FCC KDB Publication 248227 D01 should be applied, with 802.11ax being considered as the highest 802.11 mode for the appropriate frequency bands
11. When SAR testing for 802.11ax is required
 - a. If the maximum output power is highest for OFDMA scenarios, choose the tone size with the maximum number of tones and the highest maximum output power
 - b. Otherwise, consider the fully allocated channel for SAR testing
 - c. When SAR testing is required on RU sizes less than the fully allocated channel, use the RU number closest to the middle of the channel, choosing the higher RU number when two RUs are equidistant to the middle of the channel

<Laptop Mode>

	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
				Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	Not required	20.00	Not required	Not required	20.00	Not required	19.70	20.00	20.00	20.00	22.86	23.00	98.30
		6	2437		20.00			20.00		19.70	20.00	20.00	20.00	22.86	23.00	
		11	2462		20.00			20.00		19.70	20.00	20.00	20.00	22.86	23.00	
		12	2467		15.00			15.00		14.70	15.00	14.90	15.00	17.81	18.00	
		13	2472		12.00			12.00		11.60	12.00	12.00	12.00	14.81	15.00	
	802.11g 6Mbps	1	2412		17.00			17.00		Not required	17.00	Not required	17.00	Not required	20.00	Not required
		6	2437		21.00			21.00			21.00		21.00		24.00	
		11	2462		17.00			17.00			17.00		17.00		20.00	
		12	2467		13.00			13.00			13.00		13.00		16.00	
		13	2472		12.00			12.00			12.00		12.00		15.00	
	802.11n-HT20 MCS0	1	2412		16.00			16.00			16.00		16.00		19.00	
		6	2437		21.00			21.00			21.00		21.00		24.00	
		11	2462		16.00			16.00			16.00		16.00		19.00	
		12	2467		13.00			13.00			13.00		13.00		16.00	
		13	2472		12.00			12.00			12.00		12.00		15.00	
	802.11n-HT40 MCS0	3	2422		15.00			15.00			15.00		15.00		18.00	
		6	2437		18.00			18.00			18.00		18.00		21.00	
		9	2452		15.00			15.00			15.00		15.00		18.00	
		10	2457		12.00			12.00			12.00		12.00		15.00	
		11	2462		11.00			11.00			11.00		11.00		14.00	
	802.11ac-VHT20 MCS0	1	2412		16.00			16.00			16.00		16.00		19.00	
		6	2437		21.00			21.00			21.00		21.00		24.00	
		11	2462		16.00			16.00		Not required	16.00	Not required	16.00	Not required	19.00	Not required
		12	2467		13.00			13.00			13.00		13.00		16.00	
		13	2472		12.00			12.00			12.00		12.00		15.00	
	802.11ac-VHT40 MCS0	3	2422		15.00			15.00			15.00		15.00		18.00	
		6	2437		18.00			18.00			18.00		18.00		21.00	
		9	2452		15.00			15.00			15.00		15.00		18.00	
		10	2457		12.00			12.00			12.00		12.00		15.00	
		11	2462		11.00			11.00			11.00		11.00		14.00	
	802.11ax-HE20 MCS0	1	2412		16.00			16.00			16.00		16.00		19.00	
		6	2437		21.00			21.00			21.00		21.00		24.00	
		11	2462		16.00			16.00			16.00		16.00		19.00	
		12	2467		13.00			13.00			13.00		13.00		16.00	
		13	2472		12.00			12.00			12.00		12.00		15.00	
	802.11ax-HE40 MCS0	3	2422		15.00			15.00			15.00		15.00		18.00	
		6	2437		18.00			18.00			18.00		18.00		21.00	
		9	2452		15.00			15.00			15.00		15.00		18.00	
		10	2457		12.00			12.00			12.00		12.00		15.00	
		11	2462		11.00			11.00			11.00		11.00		14.00	

				Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	Not required	18.50	Not required	Not required	18.50	Not required	Not required	18.50	Not required	18.50	Not required	21.50	Not required
		40	5200		18.50			18.50			18.50		18.50		21.50	
		44	5220		18.50			18.50			18.50		18.50		21.50	
		48	5240		18.50			18.50			18.50		18.50		21.50	
	802.11n-HT20 MCS0	36	5180		19.00			19.00			19.00		19.00		22.00	
		40	5200		19.00			19.00			19.00		19.00		22.00	
		44	5220		19.00			19.00			19.00		19.00		22.00	
		48	5240		19.00			19.00			19.00		19.00		22.00	
	802.11n-HT40 MCS0	38	5190		17.00			17.00			17.00		17.00		20.00	
		46	5230		20.50			20.50			20.50		20.50		23.50	
	802.11ac-VHT20 MCS0	36	5180		19.00			19.00			19.00		19.00		22.00	
		40	5200		19.00			19.00			19.00		19.00		22.00	
		44	5220		19.00			19.00			19.00		19.00		22.00	
	802.11ac-VHT40 MCS0	38	5190		17.00			17.00			17.00		17.00		20.00	
		46	5230		20.50			20.50			20.50		20.50		23.50	
	802.11ac-VHT80 MCS0	42	5210		15.50			15.50			15.50		15.50		18.50	
		36	5180		19.00			19.00			19.00		19.00		22.00	
	802.11ax-HE20 MCS0	40	5200		19.00			19.00			19.00		19.00		22.00	
		44	5220		19.00			19.00			19.00		19.00		22.00	
		48	5240		19.00			19.00			19.00		19.00		22.00	
		38	5190		17.00			17.00			17.00		17.00		20.00	
	802.11ax-HE40 MCS0	46	5230		20.50			20.50			20.50		20.50		23.50	
		42	5210		15.50			15.50			15.50		15.50		18.50	

				Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	Not required	18.50	Not required	Not required	18.50	Not required	Not required	18.50	Not required	18.50	Not required	21.50	Not required
		56	5280		18.50			18.50			18.50		18.50		21.50	
		60	5300		18.50			18.50			18.50		18.50		21.50	
		64	5320		18.50			18.50			18.50		18.50		21.50	
	802.11n-HT20 MCS0	52	5260		19.00			19.00		Not required	19.00	Not required	19.00	Not required	22.00	Not required
		56	5280		19.00			19.00			19.00		19.00		22.00	
		60	5300		19.00			19.00			19.00		19.00		22.00	
		64	5320		19.00			19.00			19.00		19.00		22.00	
	802.11n-HT40 MCS0	54	5270		20.50			20.50		20.20	20.50	20.50	20.50	23.36	23.50	92.10
		62	5310		17.00			17.00		16.50	17.00	17.00	17.00	19.77	20.00	
	802.11ac-VHT20 MCS0	52	5260		19.00		Not required	19.00	Not required	Not required	19.00	Not required	19.00	Not required	22.00	Not required
		56	5280		19.00			19.00			19.00		19.00		22.00	
		60	5300		19.00			19.00			19.00		19.00		22.00	
		64	5320		19.00			19.00			19.00		19.00		22.00	
	802.11ac-VHT40 MCS0	54	5270		20.50			20.50			20.50	Not required	20.50	Not required	23.50	Not required
		62	5310		17.00			17.00			17.00		17.00		20.00	
	802.11ac-VHT80 MCS0	58	5290		17.00			17.00			17.00		17.00		20.00	
	802.11ax-HE20 MCS0	52	5260		19.00			19.00		Not required	19.00	Not required	19.00	Not required	22.00	Not required
		56	5280		19.00			19.00			19.00		19.00		22.00	
		60	5300		19.00			19.00			19.00		19.00		22.00	
		64	5320		19.00			19.00			19.00		19.00		22.00	
	802.11ax-HE40 MCS0	54	5270		20.50			20.50			20.50		20.50		23.50	
		62	5310		17.00			17.00			17.00		17.00		20.00	
	802.11ax-HE80 MCS0	58	5290		17.00			17.00			17.00		17.00		20.00	

	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
				Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	Not required	18.50	Not required	Not required	18.50	Not required	Not required	18.50	Not required	18.50	Not required	21.50	Not required
		116	5580		18.50			18.50			18.50		18.50		21.50	
		124	5620		18.50			18.50			18.50		18.50		21.50	
		132	5660		18.50			18.50			18.50		18.50		21.50	
		144	5720		18.50			18.50			18.50		18.50		21.50	
	802.11n-HT20 MCS0	100	5500		18.50			18.50			18.50		18.50		21.50	
		116	5580		19.00			19.00			19.00		19.00		22.00	
		124	5620		19.00			19.00			19.00		19.00		22.00	
		132	5660		19.00			19.00			19.00		19.00		22.00	
		144	5720		19.00			19.00			19.00		19.00		22.00	
	802.11n-HT40 MCS0	102	5510		15.50			15.50			15.20	15.50	15.50	15.50	18.36	92.10
		110	5550		20.50			20.50			20.00	20.50	20.50	20.50	23.27	
		126	5630		20.50			20.50			20.00	20.50	20.50	20.50	23.27	
		134	5670		18.50			18.50			18.00	18.50	18.50	18.50	21.27	
		142	5710		20.50			20.50			20.00	20.50	20.50	20.50	23.27	
	802.11ac-VHT20 MCS0	100	5500		18.50			18.50		Not required	18.50	Not required	18.50	Not required	21.50	Not required
		116	5580		19.00			19.00			19.00		19.00		22.00	
		124	5620		19.00			19.00			19.00		19.00		22.00	
		132	5660		19.00			19.00			19.00		19.00		22.00	
		144	5720		19.00			19.00			19.00		19.00		22.00	
	802.11ac-VHT40 MCS0	102	5510		15.50			15.50			15.50		15.50		18.50	
		110	5550		20.50			20.50			20.50		20.50		23.50	
		126	5630		20.50			20.50			20.50		20.50		23.50	
		134	5670		18.50			18.50			18.50		18.50		21.50	
		142	5710		20.50			20.50			20.50		20.50		23.50	
	802.11ac-VHT80 MCS0	106	5530		15.50			15.50			15.50		15.50		18.50	
		122	5610		19.00			19.00			19.00		19.00		22.00	
		138	5690		20.00			20.00		Not required	20.00	Not required	20.00	Not required	23.00	Not required
	802.11ax-HE20 MCS0	100	5500		18.50			18.50			18.50		18.50		21.50	
		116	5580		19.00			19.00			19.00		19.00		22.00	
		124	5620		19.00			19.00			19.00		19.00		22.00	
		132	5660		19.00			19.00			19.00		19.00		22.00	
		144	5720		19.00			19.00			19.00		19.00		22.00	
	802.11ax-HE40 MCS0	102	5510		15.50			15.50			15.50		15.50		18.50	
		110	5550		20.50			20.50			20.50		20.50		23.50	
		126	5630		20.50			20.50			20.50		20.50		23.50	
		134	5670		18.50			18.50			18.50		18.50		21.50	
		142	5710		20.50			20.50			20.50		20.50		23.50	
	802.11ax-HE80 MCS0	106	5530		15.50			15.50			15.50		15.50		18.50	
		122	5610		19.00			19.00			19.00		19.00		22.00	
		138	5690		20.00			20.00			20.00		20.00		23.00	

				Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	Not required	21.00	Not required	Not required	21.00	Not required	Not required	21.00	Not required	21.00	Not required	24.00	Not required
		157	5785		21.00			21.00			21.00		21.00		24.00	
		165	5825		21.00			21.00			21.00		21.00		24.00	
	802.11n-HT20 MCS0	149	5745		21.00			21.00			21.00		21.00		24.00	
		157	5785		21.00			21.00			21.00		21.00		24.00	
		165	5825		21.00			21.00			21.00		21.00		24.00	
	802.11n-HT40 MCS0	151	5755		21.00			21.00		20.60	21.00	21.00	21.00	23.81	24.00	92.10
		159	5795		21.00			21.00		20.70	21.00	20.80	21.00	23.76	24.00	
	802.11ac-VHT20 MCS0	149	5745		21.00			21.00		Not required	21.00	Not required	21.00	Not required	24.00	Not required
		157	5785		21.00			21.00			21.00		21.00		24.00	
		165	5825		21.00			21.00			21.00		21.00		24.00	
	802.11ac-VHT40 MCS0	151	5755		21.00			21.00			21.00		21.00		24.00	
		159	5795		21.00			21.00			21.00		21.00		24.00	
	802.11ac-VHT80 MCS0	155	5775		20.00			20.00			20.00		20.00		23.00	Not required
	802.11ax-HE20 MCS0	149	5745		21.00			21.00			21.00		21.00		24.00	
		157	5785		21.00			21.00			21.00		21.00		24.00	
		165	5825		21.00			21.00			21.00		21.00		24.00	
	802.11ax-HE40 MCS0	151	5755		21.00			21.00			21.00		21.00		24.00	
		159	5795		21.00			21.00			21.00		21.00		24.00	
	802.11ax-HE80 MCS0	155	5775		20.00			20.00			20.00		20.00		23.00	

				Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.9GHz WLAN	802.11a 6Mbps	169	5845	Not required	15.50	Not required	Not required	15.50	Not required	Not required	15.50	Not required	15.50	Not required	18.50	Not required
		173	5865		15.50			15.50			15.50		15.50		18.50	
		177	5885		15.50			15.50			15.50		15.50		18.50	
	802.11n-HT20 MCS0	169	5845		16.00			16.00			16.00		16.00		19.00	Not required
		173	5865		16.00			16.00			16.00		16.00		19.00	
		177	5885		16.00			16.00			16.00		16.00		19.00	
	802.11n-HT40 MCS0	167	5835		18.50			18.50		18.10	18.50	18.50	18.50	21.31	21.50	92.10
		175	5875		18.00			18.00		17.80	18.00	17.90	18.00	20.86	21.00	
	802.11ac-VHT20 MCS0	169	5845		16.00			16.00		Not required	16.00	Not required	16.00	Not required	19.00	Not required
		173	5865		16.00			16.00			16.00		16.00		19.00	
		177	5885		16.00			16.00			16.00		16.00		19.00	
	802.11ac-VHT40 MCS0	167	5835		18.50			18.50			18.50		18.50		21.50	
		175	5875		18.00			18.00			18.00		18.00		21.00	
	802.11ac-VHT80 MCS0	171	5855		16.00			16.00			16.00		16.00		19.00	Not required
	802.11ax-HE20 MCS0	169	5845		16.00			16.00			16.00		16.00		19.00	
		173	5865		16.00			16.00			16.00		16.00		19.00	
		177	5885		16.00			16.00			16.00		16.00		19.00	
	802.11ax-HE40 MCS0	167	5835		18.50			18.50			18.50		18.50		21.50	
		175	5875		18.00			18.00			18.00		18.00		21.00	
	802.11ax-HE80 MCS0	171	5855		16.00			16.00			16.00		16.00		19.00	



<Tablet Mode>

	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
				Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	Not required	14.00	Not required	Not required	14.00	Not required	13.54	14.00	13.73	14.00	16.65	17.00	99.36
		6	2437		14.00			14.00		13.99	14.00	13.76	14.00	16.89	17.00	
		11	2462		14.00			14.00		13.96	14.00	13.81	14.00	16.90	17.00	
		12	2467		14.00			14.00		13.89	14.00	13.74	14.00	16.83	17.00	
		13	2472		12.00			12.00		11.67	12.00	11.52	12.00	14.61	15.00	
		1	2412		14.00			14.00		Not required	14.00	Not required	14.00	Not required	17.00	Not required
	802.11g 6Mbps	6	2437		14.00			14.00			14.00		14.00		17.00	
		11	2462		14.00			14.00			14.00		14.00		17.00	
		12	2467		13.00			13.00			13.00		13.00		16.00	
		13	2472		12.00			12.00			12.00		12.00		15.00	
	802.11n-HT20 MCS0	1	2412		14.00			14.00			14.00		14.00		17.00	
		6	2437		14.00			14.00			14.00		14.00		17.00	
		11	2462		14.00			14.00			14.00		14.00		17.00	
		12	2467		13.00			13.00			13.00		13.00		16.00	
		13	2472		12.00			12.00			12.00		12.00		15.00	
	802.11n-HT40 MCS0	3	2422		14.00			14.00			14.00		14.00		17.00	
		6	2437		14.00			14.00			14.00		14.00		17.00	
		9	2452		14.00			14.00			14.00		14.00		17.00	
		10	2457		12.00			12.00			12.00		12.00		15.00	
		11	2462		11.00			11.00			11.00		11.00		14.00	
	802.11ac-VHT20 MCS0	1	2412		14.00			14.00			14.00		14.00		17.00	
		6	2437		14.00			14.00			14.00		14.00		17.00	
		11	2462		14.00			14.00		Not required	14.00	Not required	14.00	Not required	17.00	Not required
		12	2467		13.00			13.00			13.00		13.00		16.00	
		13	2472		12.00			12.00			12.00		12.00		15.00	
	802.11ac-VHT40 MCS0	3	2422		14.00			14.00			14.00		14.00		17.00	
		6	2437		14.00			14.00			14.00		14.00		17.00	
		9	2452		14.00			14.00			14.00		14.00		17.00	
		10	2457		12.00			12.00			12.00		12.00		15.00	
		11	2462		11.00			11.00			11.00		11.00		14.00	
	802.11ax-HE20 MCS0	1	2412		14.00			14.00			14.00		14.00		17.00	
		6	2437		14.00			14.00			14.00		14.00		17.00	
		11	2462		14.00			14.00			14.00		14.00		17.00	
		12	2467		13.00			13.00			13.00		13.00		16.00	
		13	2472		12.00			12.00			12.00		12.00		15.00	
	802.11ax-HE40 MCS0	3	2422		14.00			14.00			14.00		14.00		17.00	
		6	2437		14.00			14.00			14.00		14.00		17.00	
		9	2452		14.00			14.00			14.00		14.00		17.00	
		10	2457		12.00			12.00			12.00		12.00		15.00	
		11	2462		11.00			11.00			11.00		11.00		14.00	

				Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	Not required	13.50	Not required	Not required	13.50	Not required	Not required	13.50	Not required	13.50	Not required	16.50	Not required
		40	5200		13.50			13.50			13.50		13.50		16.50	
		44	5220		13.50			13.50			13.50		13.50		16.50	
		48	5240		13.50			13.50			13.50		13.50		16.50	
	802.11n-HT20 MCS0	36	5180		13.50			13.50		Not required	13.50	Not required	13.50	Not required	16.50	Not required
		40	5200		13.50			13.50			13.50		13.50		16.50	
		44	5220		13.50			13.50			13.50		13.50		16.50	
		48	5240		13.50			13.50			13.50		13.50		16.50	
	802.11n-HT40 MCS0	38	5190		13.50			13.50		13.49	13.50	13.02	13.50	16.43	16.50	91.58
		46	5230		13.50			13.50		13.34	13.50	13.10	13.50	16.39	16.50	
	802.11ac-VHT20 MCS0	36	5180		13.50			13.50		Not required	13.50	Not required	13.50	Not required	16.50	Not required
		40	5200		13.50			13.50			13.50		13.50		16.50	
		44	5220		13.50			13.50			13.50		13.50		16.50	
		48	5240		13.50			13.50			13.50		13.50		16.50	
	802.11ac-VHT40 MCS0	38	5190		13.50			13.50		Not required	13.50	Not required	13.50	Not required	16.50	Not required
		46	5230		13.50			13.50			13.50		13.50		16.50	
	802.11ac-VHT80 MCS0	42	5210		13.50			13.50			13.49		13.29		16.40	
	802.11ax-HE20 MCS0	36	5180		13.50			13.50		Not required	13.50	Not required	13.50	Not required	16.50	Not required
		40	5200		13.50			13.50			13.50		13.50		16.50	
		44	5220		13.50			13.50			13.50		13.50		16.50	
		48	5240		13.50			13.50			13.50		13.50		16.50	
	802.11ax-HE40 MCS0	38	5190		13.50			13.50		Not required	13.50	Not required	13.50	Not required	16.50	Not required
		46	5230		13.50			13.50			13.50		13.50		16.50	
	802.11ax-HE80 MCS0	42	5210		13.50			13.50			13.50		13.50		16.50	

				Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	Not required	12.50	Not required	Not required	12.50	Not required	Not required	12.50	Not required	12.50	Not required	15.50	Not required
		56	5280		12.50			12.50			12.50		12.50		15.50	
		60	5300		12.50			12.50			12.50		12.50		15.50	
		64	5320		12.50			12.50			12.50		12.50		15.50	
	802.11n-HT20 MCS0	52	5260		12.50			12.50			12.50		12.50		15.50	
		56	5280		12.50			12.50			12.50		12.50		15.50	
		60	5300		12.50			12.50			12.50		12.50		15.50	
		64	5320		12.50			12.50			12.50		12.50		15.50	
	802.11n-HT40 MCS0	54	5270		12.50			12.50			12.50		12.50		15.50	
		62	5310		12.50			12.50			12.50		12.50		15.50	
	802.11ac-VHT20 MCS0	52	5260		12.50			12.50			12.50		12.50		15.50	
		56	5280		12.50			12.50			12.50		12.50		15.50	
		60	5300		12.50			12.50			12.50		12.50		15.50	
		64	5320		12.50			12.50			12.50		12.50		15.50	
	802.11ac-VHT40 MCS0	54	5270		12.50			12.50			12.50		12.50		15.50	
		62	5310		12.50			12.50			12.50		12.50		15.50	
	802.11ac-VHT80 MCS0	58	5290		12.50			12.50		12.38	12.50	12.18	12.50	15.29	15.50	85.09
	802.11ax-HE20 MCS0	52	5260		12.50			12.50		Not required	12.50	Not required	12.50	Not required	15.50	Not required
		56	5280		12.50			12.50			12.50		12.50		15.50	
		60	5300		12.50			12.50			12.50		12.50		15.50	
		64	5320		12.50			12.50			12.50		12.50		15.50	
	802.11ax-HE40 MCS0	54	5270		12.50			12.50			12.50		12.50		15.50	
		62	5310		12.50			12.50			12.50		12.50		15.50	
	802.11ax-HE80 MCS0	58	5290		12.50			12.50			12.50		12.50		15.50	

				Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2						
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %				
5.5GHz WLAN	802.11a 6Mbps	100	5500	Not required	13.00	Not required	Not required	13.00	Not required	Not required	13.00	Not required	13.00	Not required	16.00	Not required				
		116	5580		13.00			13.00			13.00		16.00							
		124	5620		13.00			13.00			13.00		16.00							
		132	5660		13.00			13.00			13.00		16.00							
		144	5720		13.00			13.00			13.00		16.00							
	802.11n-HT20 MCS0	100	5500		13.00			13.00			13.00		13.00		16.00					
		116	5580		13.00			13.00			13.00		13.00		16.00					
		124	5620		13.00			13.00			13.00		13.00		16.00					
		132	5660		13.00			13.00			13.00		13.00		16.00					
		144	5720		13.00			13.00			13.00		13.00		16.00					
	802.11n-HT40 MCS0	102	5510		13.00			13.00			13.00		13.00		16.00					
		110	5550		13.00			13.00			13.00		13.00		16.00					
		126	5630		13.00			13.00			13.00		13.00		16.00					
		134	5670		13.00			13.00			13.00		13.00		16.00					
		142	5710		13.00			13.00			13.00		13.00		16.00					
	802.11ac-VHT20 MCS0	100	5500		13.00			13.00			13.00		13.00		16.00					
		116	5580		13.00			13.00			13.00		13.00		16.00					
		124	5620		13.00			13.00			13.00		13.00		16.00					
		132	5660		13.00			13.00			13.00		13.00		16.00					
		144	5720		13.00			13.00			13.00		13.00		16.00					
	802.11ac-VHT40 MCS0	102	5510		13.00			13.00			13.00		13.00		16.00					
		110	5550		13.00			13.00			13.00		13.00		16.00					
		126	5630		13.00			13.00			13.00		13.00		16.00					
		134	5670		13.00			13.00			13.00		13.00		16.00					
		142	5710		13.00			13.00			13.00		13.00		16.00					
	802.11ac-VHT80 MCS0	106	5530		13.00			13.00			13.00		12.88		13.00		15.95	16.00	85.09	
		122	5610		13.00			13.00			12.98		13.00		12.73		13.00	15.87		16.00
		138	5690		13.00			13.00			12.99		13.00		12.51		13.00	15.77		16.00
	802.11ax-HE20 MCS0	100	5500		13.00			13.00			Not required		Not required		13.00		16.00	Not required		
		116	5580		13.00			13.00							13.00		16.00			
		124	5620		13.00			13.00							13.00		16.00			
		132	5660		13.00			13.00							13.00		16.00			
		144	5720		13.00			13.00							13.00		16.00			
	802.11ax-HE40 MCS0	102	5510		13.00			13.00							13.00		16.00			
		110	5550		13.00			13.00							13.00		16.00			
		126	5630		13.00			13.00							13.00		16.00			
134		5670	13.00	13.00	13.00	16.00														
142		5710	13.00	13.00	13.00	16.00														
802.11ax-HE80 MCS0	106	5530	13.00	13.00	13.00	16.00														
	122	5610	13.00	13.00	13.00	16.00														
	138	5690	13.00	13.00	13.00	16.00														

	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
				Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	Not required	13.00	Not required	Not required	13.00	Not required	Not required	13.00	Not required	13.00	Not required	16.00	Not required
		157	5785		13.00			13.00			13.00		13.00		16.00	
		165	5825		13.00			13.00			13.00		13.00		16.00	
	802.11n-HT20 MCS0	149	5745		13.00			13.00			13.00		13.00		16.00	
		157	5785		13.00			13.00			13.00		13.00		16.00	
		165	5825		13.00			13.00			13.00		13.00		16.00	
	802.11n-HT40 MCS0	151	5755		13.00			13.00			13.00		13.00		16.00	
		159	5795		13.00			13.00			13.00		13.00		16.00	
		149	5745		13.00			13.00			13.00		13.00		16.00	
	802.11ac-VHT20 MCS0	157	5785		13.00			13.00			13.00		13.00		16.00	
		165	5825		13.00			13.00			13.00		13.00		16.00	
		151	5755		13.00			13.00			13.00		13.00		16.00	
	802.11ac-VHT40 MCS0	159	5795		13.00			13.00			13.00		13.00		16.00	
		155	5775		13.00			13.00		12.97	13.00	12.50	13.00	15.75	16.00	85.09
		149	5745		13.00			13.00		Not required	13.00	Not required	13.00	Not required	16.00	Not required
	802.11ax-HE20 MCS0	157	5785		13.00			13.00			13.00		13.00		16.00	
		165	5825		13.00			13.00			13.00		13.00		16.00	
		151	5755		13.00			13.00			13.00		13.00		16.00	
	802.11ax-HE40 MCS0	159	5795		13.00			13.00			13.00		13.00		16.00	
		155	5775		13.00			13.00			13.00		13.00		16.00	

	Mode	Channel	Frequency (MHz)	Ant 1			Ant 2			Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		
				Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Duty Cycle %	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.9GHz WLAN	802.11a 6Mbps	169	5845	Not required	13.00	Not required	Not required	13.00	Not required	Not required	13.00	Not required	13.00	Not required	16.00	Not required
		173	5865		13.00			13.00			13.00		13.00		16.00	
		177	5885		13.00			13.00			13.00		13.00		16.00	
	802.11n-HT20 MCS0	169	5845		13.00			13.00			13.00		13.00		16.00	
		173	5865		13.00			13.00			13.00		13.00		16.00	
		177	5885		13.00			13.00			13.00		13.00		16.00	
	802.11n-HT40 MCS0	167	5835		13.00			13.00			13.00		13.00		16.00	
		175	5875		13.00			13.00			13.00		13.00		16.00	
		169	5845		13.00			13.00			13.00		13.00		16.00	
	802.11ac-VHT20 MCS0	173	5865		13.00			13.00			13.00		13.00		16.00	
		177	5885		13.00			13.00			13.00		13.00		16.00	
		167	5835		13.00			13.00			13.00		13.00		16.00	
	802.11ac-VHT40 MCS0	175	5875		13.00			13.00			13.00		13.00		16.00	
		171	5855		13.00			13.00		12.96	13.00	12.53	13.00	15.76	16.00	85.09
		169	5845		13.00			13.00		Not required	13.00	Not required	13.00	Not required	16.00	Not required
	802.11ax-HE20 MCS0	173	5865		13.00			13.00			13.00		13.00		16.00	
		177	5885		13.00			13.00			13.00		13.00		16.00	
		167	5835		13.00			13.00			13.00		13.00		16.00	
	802.11ax-HE40 MCS0	175	5875		13.00			13.00			13.00		13.00		16.00	
		171	5855		13.00			13.00			13.00		13.00		16.00	

<2.4GHz Bluetooth>
<Laptop Mode>

				Ant 2		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
Bluetooth	BR / EDR 1Mbps	0	2402	11.99	12.00	100.00
		39	2441	11.99	12.00	
		78	2480	11.97	12.00	
	BR / EDR 2Mbps	0	2402	Not required	9.00	Not required
		39	2441		9.00	
		78	2480		9.00	
	BR / EDR 3Mbps	0	2402		9.00	
		39	2441		9.00	
		78	2480		9.00	
	LE 1Mbps	0	2402		12.00	
		19	2440		12.00	
		39	2480		12.00	
	LE 2Mbps	0	2402		12.00	
		19	2440		12.00	
		39	2480		12.00	

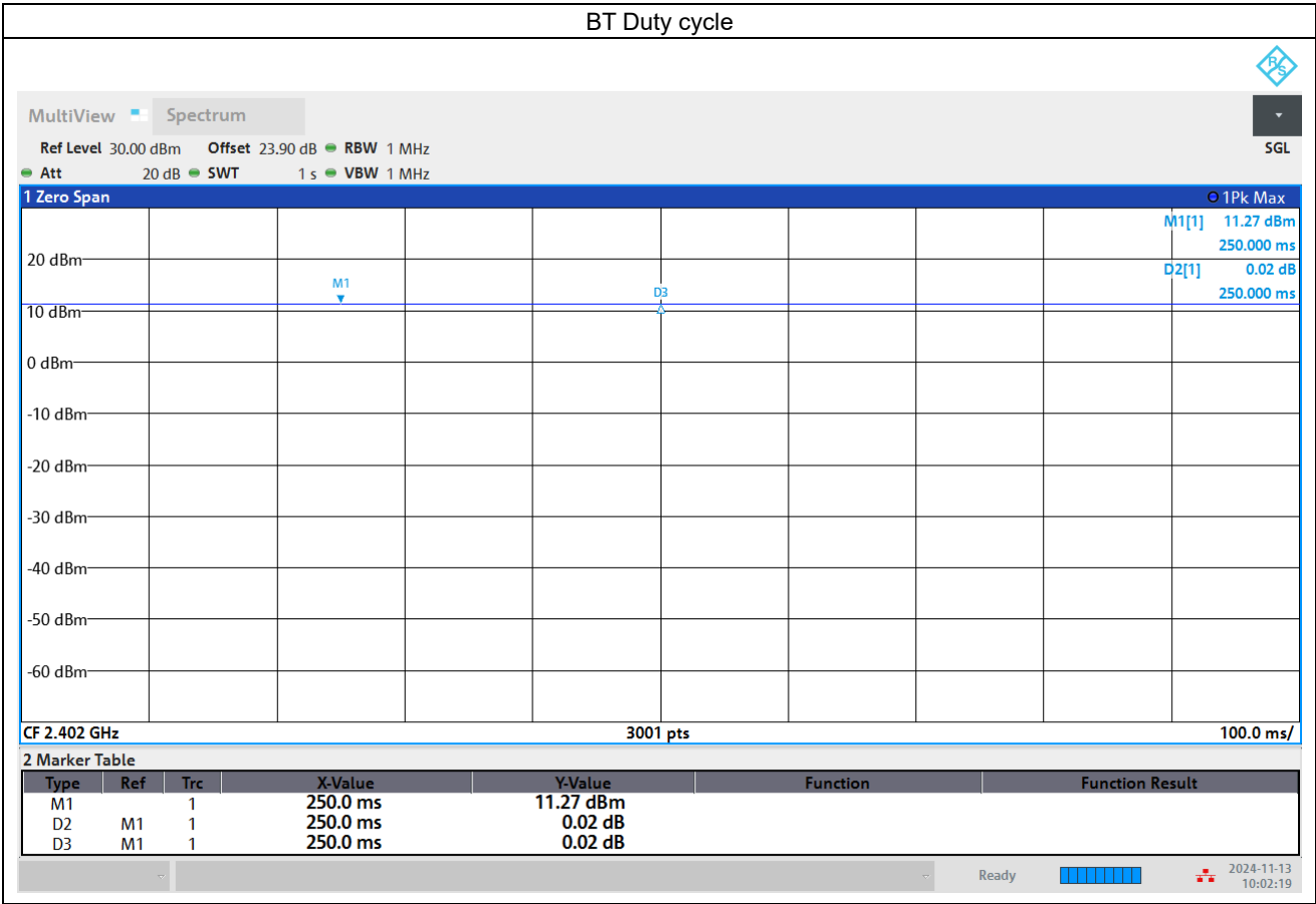
<Tablet Mode>

				Ant 2		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
Bluetooth	BR / EDR 1Mbps	0	2402	11.99	12.00	100.00
		39	2441	11.99	12.00	
		78	2480	11.97	12.00	
	BR / EDR 2Mbps	0	2402	Not required	9.00	Not required
		39	2441		9.00	
		78	2480		9.00	
	BR / EDR 3Mbps	0	2402		9.00	
		39	2441		9.00	
		78	2480		9.00	
	LE 1Mbps	0	2402		12.00	
		19	2440		12.00	
		39	2480		12.00	
	LE 2Mbps	0	2402		12.00	
		19	2440		12.00	
		39	2480		12.00	



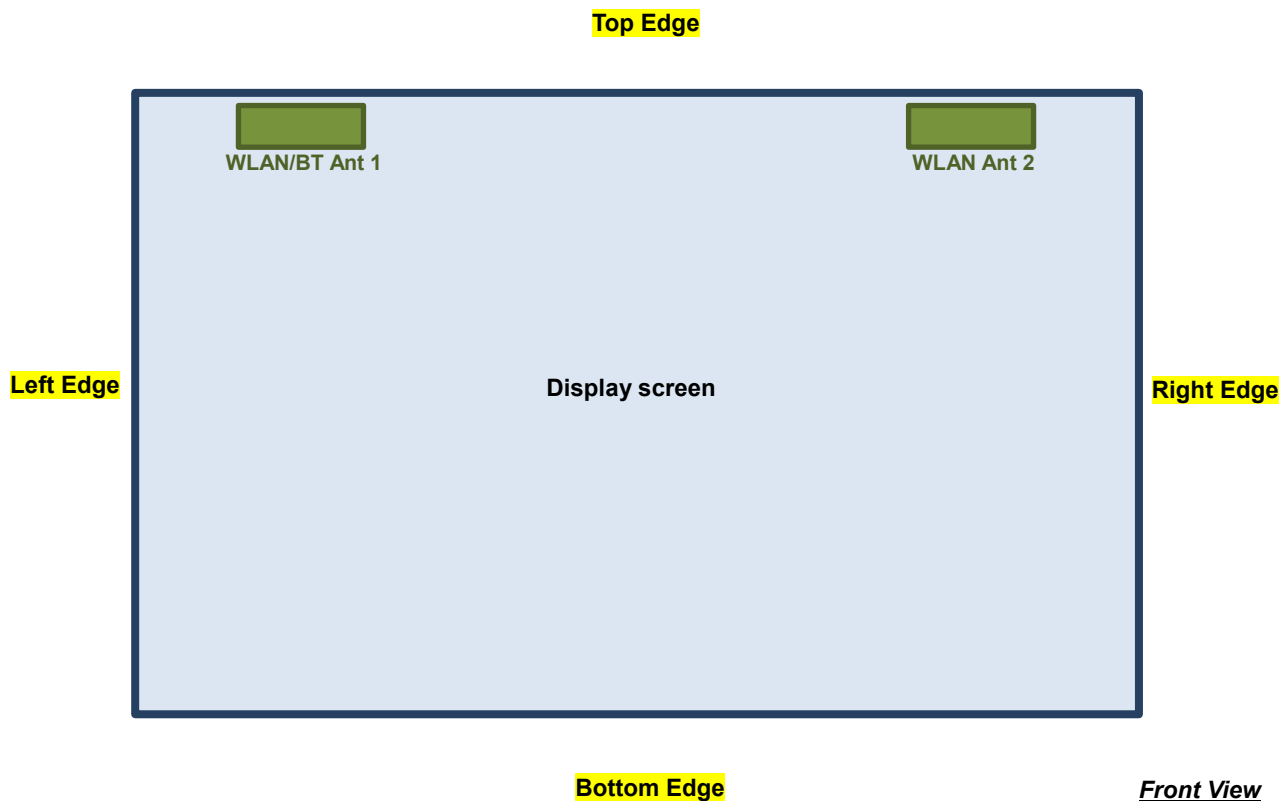
General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps due to its highest average power and duty cycle is 100% considered in SAR testing.



12. Antenna Location

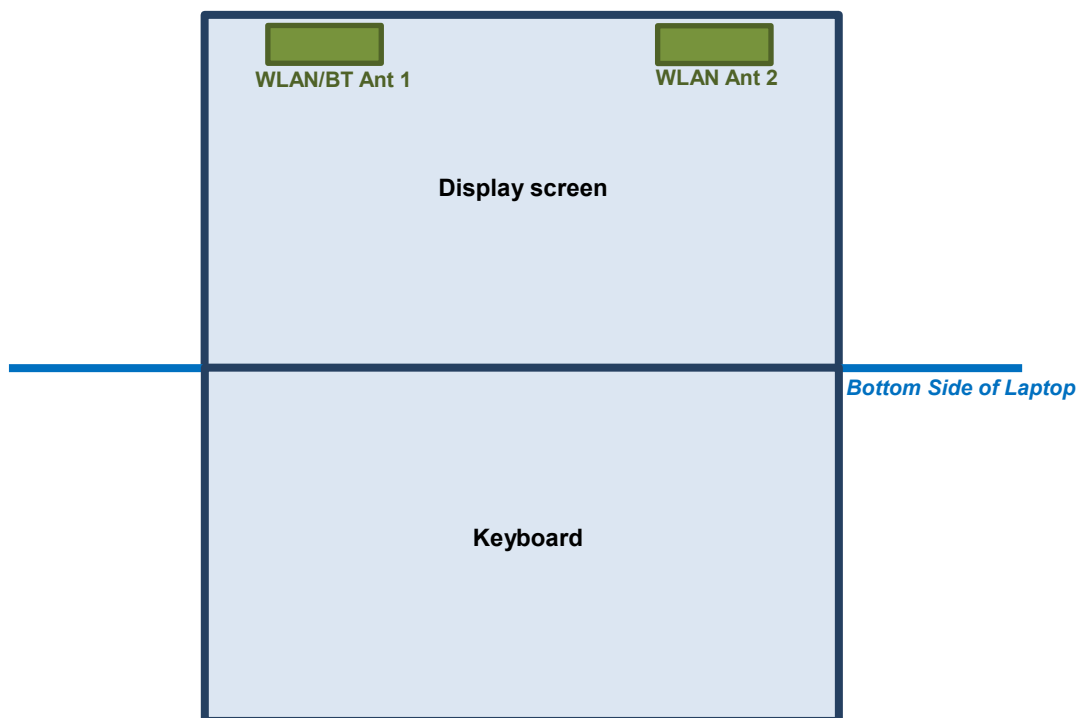
<Tablet Mode>



The separation distance for antenna to edge :

Antenna	To Top Edge (mm)	To Right Edge (mm)	To Bottom Edge (mm)	To Left Edge (mm)
WLAN/BT Antenna 1	< 5	193.9	212.9	28.9
WLAN Antenna 2	< 5	28.9	212.9	193.9

<Laptop Mode>



The separation distance for antenna to edge :

Antenna	To Bottom Side (mm)
WLAN/BT Antenna 1	212.9
WLAN Antenna 2	212.9

<SAR test exclusion table>
General Note:

1. The below table, when the distance is < 50 mm exclusion threshold is "Ratio", when the distance is > 50 mm exclusion threshold is "mW"
2. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
3. Per KDB 447498 D01v06, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
4. Per KDB 447498 D01v06, standalone SAR test exclusion threshold is applied; If the test separation distance is < 5mm, 5mm is used to determine SAR exclusion threshold.
5. Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR}$$
 - f(GHz) is the RF channel transmit frequency in GHz
 - Power and distance are rounded to the nearest mW and mm before calculation
 - The result is rounded to one decimal place for comparison
6. Per KDB 447498 D01v06, at 100 MHz to 6 GHz and for *test separation distances* > 50 mm, the SAR test exclusion threshold is determined according to the following
 - a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm) · (f(MHz)/150)] mW, at 100 MHz to 1500 MHz
 - b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm) · 10] mW at > 1500 MHz and ≤ 6 GHz

<Tablet Mode>

Exposure Position	Wireless Interface	BT ANT 1	2.4GHz WLAN ANT 1+2	5GHz WLAN ANT 1+2
	Calculated Frequency (MHz)	2480	2472	5885
	Maximum power (dBm)	12.0	17.0	16.5
	Maximum rated power(mW)	15.85	50.12	44.67
Back	Separation distance(mm)	5.0	5.0	5.0
	exclusion threshold	5.0	15.8	21.7
	Testing required?	Yes	Yes	Yes
Top Edge	Separation distance(mm)	5.0	5.0	5.0
	exclusion threshold	5.0	15.8	21.7
	Testing required?	Yes	Yes	Yes
Right Edge	Separation distance(mm)	193.9	28.9	28.9
	exclusion threshold	1534.0	2.7	3.8
	Testing required?	No	No	Yes
Bottom Edge	Separation distance(mm)	212.9	212.9	212.9
	exclusion threshold	1724.0	1724.0	1691.0
	Testing required?	No	No	No
Left Edge	Separation distance(mm)	28.9	28.9	28.9
	exclusion threshold	0.9	2.7	3.8
	Testing required?	No	No	Yes

<Laptop Mode>

Exposure Position	Wireless Interface	BT ANT 1	2.4GHz WLAN ANT 1+2	5GHz WLAN ANT 1+2
	Calculated Frequency (MHz)	2480	2472	5885
	Maximum power (dBm)	12.0	24.0	24.0
	Maximum rated power(mW)	15.85	251.19	251.19
Bottom Side	Separation distance(mm)	212.9	212.9	212.9
	exclusion threshold	1724.0	1724.0	1691.0
	Testing required?	No	No	No

13. SAR Test Results

General Note:

- Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
 - Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
 - For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
 - For WLAN/Bluetooth: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
- Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
 - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
 - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
 - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
- Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.

WLAN Note:

- Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
- Per KDB 248227 D01v02r02, WLAN5.2GHz SAR testing is not required when the WLAN5.3GHz band highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for WLAN5.2GHz band.
- When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
- For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
- For determination of the scaling factor for report SAR of MIMO mode, if the hot spots are separated the scaling factors are individually determined from each transmit chain. If the hot spots are not spatially separated, the scaling factor is determined from the worst number of each transmit chain
- During SAR testing the WLAN transmission was verified using a spectrum analyzer.

13.1 Body SAR

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	User Scenario	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
01	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Ant 1+2(1)	Tablet	11	2462	Sample 1	13.96	14.00	1.009	99.36	1.006	-0.09	0.047	0.048
	WLAN2.4GHz	802.11b 1Mbps	Back	0mm	Ant 1+2(2)	Tablet	11	2462	Sample 1	13.81	14.00	1.045	99.36	1.006	0.03	0.067	0.070
	WLAN2.4GHz	802.11b 1Mbps	Top Edge	0mm	Ant 1+2(1)	Tablet	11	2462	Sample 1	13.96	14.00	1.009	99.36	1.006	-0.04	0.341	0.346
	WLAN2.4GHz	802.11b 1Mbps	Top Edge	0mm	Ant 1+2(2)	Tablet	11	2462	Sample 1	13.81	14.00	1.045	99.36	1.006	0	0.402	0.422
	WLAN2.4GHz	802.11b 1Mbps	Top Edge	0mm	Ant 1+2(1)	Tablet	11	2462	Sample 2	13.96	14.00	1.009	99.36	1.006	-0.07	0.259	0.263
	WLAN2.4GHz	802.11b 1Mbps	Top Edge	0mm	Ant 1+2(2)	Tablet	11	2462	Sample 2	13.81	14.00	1.045	99.36	1.006	0.02	0.279	0.293
	WLAN2.4GHz	802.11b 1Mbps	Top Edge	0mm	Ant 1+2(1)	Tablet	11	2462	Sample 3	13.96	14.00	1.009	99.36	1.006	-0.04	0.368	0.374
	WLAN2.4GHz	802.11b 1Mbps	Top Edge	0mm	Ant 1+2(2)	Tablet	11	2462	Sample 3	13.81	14.00	1.045	99.36	1.006	0.05	0.396	0.416
	WLAN2.4GHz	802.11b 1Mbps	Top Edge	0mm	Ant 1+2(1)	Tablet	11	2462	Sample 4	13.96	14.00	1.009	99.36	1.006	-0.03	0.353	0.358
	WLAN2.4GHz	802.11b 1Mbps	Top Edge	0mm	Ant 1+2(2)	Tablet	11	2462	Sample 4	13.81	14.00	1.045	99.36	1.006	0.04	0.400	0.420



FCC SAR TEST REPORT

Report No. : FA4N0669

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	User Scenario	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
02	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 1+2(1)	Tablet	42	5210	Sample 1	13.49	13.50	1.002	85.09	1.175	-0.06	0.074	0.087
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 1+2(2)	Tablet	42	5210	Sample 1	13.29	13.50	1.050	85.09	1.175	0.09	0.048	0.059
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Edge	0mm	Ant 1+2(1)	Tablet	42	5210	Sample 1	13.49	13.50	1.002	85.09	1.175	-0.04	0.068	0.080
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Edge	0mm	Ant 1+2(2)	Tablet	42	5210	Sample 1	13.29	13.50	1.050	85.09	1.175	0.02	0.057	0.070
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	42	5210	Sample 1	13.49	13.50	1.002	85.09	1.175	0.01	0.442	0.521
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	42	5210	Sample 1	13.29	13.50	1.050	85.09	1.175	0.02	0.383	0.472
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	42	5210	Sample 2	13.49	13.50	1.002	85.09	1.175	0.05	0.454	0.535
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	42	5210	Sample 2	13.29	13.50	1.050	85.09	1.175	0.04	0.411	0.507
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	42	5210	Sample 3	13.49	13.50	1.002	85.09	1.175	0.02	0.337	0.397
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	42	5210	Sample 3	13.29	13.50	1.050	85.09	1.175	-0.03	0.284	0.350
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	42	5210	Sample 4	13.49	13.50	1.002	85.09	1.175	0.1	0.528	0.622
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	42	5210	Sample 4	13.29	13.50	1.050	85.09	1.175	0.02	0.338	0.417
	WLAN5GHz	802.11n-HT40 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	38	5190	Sample 4	13.49	13.50	1.002	91.58	1.092	0.03	0.292	0.320
	WLAN5GHz	802.11n-HT40 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	38	5190	Sample 4	13.02	13.50	1.117	91.58	1.092	0.1	0.284	0.346
	WLAN5GHz	802.11n-HT40 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	46	5230	Sample 4	13.34	13.50	1.038	91.58	1.092	0.02	0.440	0.499
	WLAN5GHz	802.11n-HT40 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	46	5230	Sample 4	13.10	13.50	1.096	91.58	1.092	0.05	0.317	0.380
03	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 1+2(1)	Tablet	58	5290	Sample 1	12.38	12.50	1.028	85.09	1.175	-0.05	0.059	0.071
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 1+2(2)	Tablet	58	5290	Sample 1	12.18	12.50	1.076	85.09	1.175	0	0.062	0.078
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Edge	0mm	Ant 1+2(1)	Tablet	58	5290	Sample 1	12.38	12.50	1.028	85.09	1.175	0.05	0.051	0.062
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Edge	0mm	Ant 1+2(2)	Tablet	58	5290	Sample 1	12.18	12.50	1.076	85.09	1.175	0.05	0.054	0.068
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	58	5290	Sample 1	12.38	12.50	1.028	85.09	1.175	-0.05	0.288	0.348
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	58	5290	Sample 1	12.18	12.50	1.076	85.09	1.175	-0.01	0.270	0.342
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	58	5290	Sample 2	12.38	12.50	1.028	85.09	1.175	-0.03	0.269	0.325
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	58	5290	Sample 2	12.18	12.50	1.076	85.09	1.175	-0.09	0.288	0.364
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	58	5290	Sample 3	12.38	12.50	1.028	85.09	1.175	0.02	0.221	0.267
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	58	5290	Sample 3	12.18	12.50	1.076	85.09	1.175	0.06	0.279	0.353
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	58	5290	Sample 4	12.38	12.50	1.028	85.09	1.175	0.07	0.406	0.490
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	58	5290	Sample 4	12.18	12.50	1.076	85.09	1.175	0.02	0.284	0.359
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 1+2(1)	Tablet	106	5530	Sample 1	13.00	13.00	1.000	85.09	1.175	-0.02	0.110	0.129
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 1+2(2)	Tablet	106	5530	Sample 1	12.88	13.00	1.028	85.09	1.175	-0.04	0.066	0.080
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Edge	0mm	Ant 1+2(1)	Tablet	106	5530	Sample 1	13.00	13.00	1.000	85.09	1.175	-0.05	0.077	0.090
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Edge	0mm	Ant 1+2(2)	Tablet	106	5530	Sample 1	12.88	13.00	1.028	85.09	1.175	-0.02	0.085	0.103
04	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	106	5530	Sample 1	13.00	13.00	1.000	85.09	1.175	0.03	0.371	0.436
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	106	5530	Sample 1	12.88	13.00	1.028	85.09	1.175	-0.06	0.372	0.449
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	106	5530	Sample 2	13.00	13.00	1.000	85.09	1.175	0.08	0.415	0.488
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	106	5530	Sample 2	12.88	13.00	1.028	85.09	1.175	0.09	0.487	0.588
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	106	5530	Sample 3	13.00	13.00	1.000	85.09	1.175	0.04	0.370	0.435
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	106	5530	Sample 3	12.88	13.00	1.028	85.09	1.175	0.02	0.285	0.344
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	106	5530	Sample 4	13.00	13.00	1.000	85.09	1.175	-0.01	0.388	0.456
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	106	5530	Sample 4	12.88	13.00	1.028	85.09	1.175	0.03	0.430	0.519
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 1+2(1)	Tablet	155	5775	Sample 1	12.97	13.00	1.007	85.09	1.175	-0.06	0.126	0.149
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 1+2(2)	Tablet	155	5775	Sample 1	12.50	13.00	1.122	85.09	1.175	0.03	0.109	0.144
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Edge	0mm	Ant 1+2(1)	Tablet	155	5775	Sample 1	12.97	13.00	1.007	85.09	1.175	-0.04	0.107	0.127
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Edge	0mm	Ant 1+2(2)	Tablet	155	5775	Sample 1	12.50	13.00	1.122	85.09	1.175	-0.08	0.130	0.171
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	155	5775	Sample 1	12.97	13.00	1.007	85.09	1.175	0.04	0.399	0.472
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	155	5775	Sample 1	12.50	13.00	1.122	85.09	1.175	0.05	0.394	0.519
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	155	5775	Sample 2	12.97	13.00	1.007	85.09	1.175	-0.03	0.386	0.457
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	155	5775	Sample 2	12.50	13.00	1.122	85.09	1.175	0.11	0.428	0.564
05	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	155	5775	Sample 3	12.97	13.00	1.007	85.09	1.175	0.03	0.342	0.405
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	155	5775	Sample 3	12.50	13.00	1.122	85.09	1.175	0.09	0.317	0.418
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	155	5775	Sample 4	12.97	13.00	1.007	85.09	1.175	-0.05	0.386	0.457
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	155	5775	Sample 4	12.50	13.00	1.122	85.09	1.175	0.09	0.307	0.405
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	155	5775	Sample 1	12.97	13.00	1.007	85.09	1.175	-0.06	0.126	0.149
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	155	5775	Sample 1	12.50	13.00	1.122	85.09	1.175	0.03	0.109	0.144
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	155	5775	Sample 2	12.97	13.00	1.007	85.09	1.175	-0.03	0.386	0.457
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	155	5775	Sample 2	12.50	13.00	1.122	85.09	1.175	0.09	0.317	0.418

	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 1+2(1)	Tablet	171	5855	Sample 1	12.96	13.00	1.009	85.09	1.175	-0.01	0.092	0.109
	WLAN5GHz	802.11ac-VHT80 MCS0	Back	0mm	Ant 1+2(2)	Tablet	171	5855	Sample 1	12.53	13.00	1.114	85.09	1.175	0.01	0.080	0.105
	WLAN5GHz	802.11ac-VHT80 MCS0	Left Edge	0mm	Ant 1+2(1)	Tablet	171	5855	Sample 1	12.96	13.00	1.009	85.09	1.175	-0.07	0.055	0.065
	WLAN5GHz	802.11ac-VHT80 MCS0	Right Edge	0mm	Ant 1+2(2)	Tablet	171	5855	Sample 1	12.53	13.00	1.114	85.09	1.175	0.09	0.107	0.140
06	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	171	5855	Sample 1	12.96	13.00	1.009	85.09	1.175	0.04	0.324	0.384
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	171	5855	Sample 1	12.53	13.00	1.114	85.09	1.175	-0.02	0.374	0.490
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	171	5855	Sample 2	12.96	13.00	1.009	85.09	1.175	0.09	0.332	0.394
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	171	5855	Sample 2	12.53	13.00	1.114	85.09	1.175	-0.03	0.348	0.456
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	171	5855	Sample 3	12.96	13.00	1.009	85.09	1.175	0.01	0.275	0.326
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	171	5855	Sample 3	12.53	13.00	1.114	85.09	1.175	0	0.332	0.435
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(1)	Tablet	171	5855	Sample 4	12.96	13.00	1.009	85.09	1.175	-0.02	0.385	0.457
	WLAN5GHz	802.11ac-VHT80 MCS0	Top Edge	0mm	Ant 1+2(2)	Tablet	171	5855	Sample 4	12.53	13.00	1.114	85.09	1.175	-0.06	0.318	0.416

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	User Scenario	Ch.	Freq. (MHz)	Sample	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	Bluetooth	1Mbps	Back	0mm	Ant 1	Tablet	0	2402	Sample 1	11.99	12.00	1.002	100	1.000	0.02	0.001	0.001
	Bluetooth	1Mbps	Top Edge	0mm	Ant 1	Tablet	0	2402	Sample 1	11.99	12.00	1.002	100	1.000	-0.06	0.186	0.186
	Bluetooth	1Mbps	Top Edge	0mm	Ant 1	Tablet	0	2402	Sample 2	11.99	12.00	1.002	100	1.000	0.06	0.203	0.203
	Bluetooth	1Mbps	Top Edge	0mm	Ant 1	Tablet	0	2402	Sample 3	11.99	12.00	1.002	100	1.000	0.03	0.181	0.181
07	Bluetooth	1Mbps	Top Edge	0mm	Ant 1	Tablet	0	2402	Sample 4	11.99	12.00	1.002	100	1.000	0.1	0.241	0.242

14. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Body
1.	WLAN5GHz Ant 1+2 + Bluetooth Ant 1	Yes

General Note:

- The worst case WLAN reported SAR for each configuration was used for SAR summation. Therefore, the following summations represent the absolute worst cases for simultaneous transmission with WLAN.
- The Scaled SAR summation is calculated based on the same configuration and test position.
- Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
 - Scalar SAR summation $< 1.6\text{W/kg}$.
 - $\text{SPLSR} = (\text{SAR1} + \text{SAR2})^{1.5} / (\text{min. separation distance, mm})$, and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where $(x1, y1, z1)$ and $(x2, y2, z2)$ are the coordinates of the extrapolated peak SAR locations in the zoom scan.
 - If $\text{SPLSR} \leq 0.04$, simultaneously transmission SAR measurement is not necessary.
 - Simultaneously transmission SAR measurement, and the reported multi-band SAR $< 1.6\text{W/kg}$.

14.1 Body Exposure Conditions

Exposure Position	1	2	3	2+3 Summed 1g SAR (W/kg)
	WLAN2.4GHz Ant 1+2	WLAN5GHz Ant 1+2	Bluetooth Ant 1	
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	
Back at 0mm	0.070	0.149	0.001	0.150
Left Edge at 0mm		0.127		0.127
Right Edge at 0mm		0.171		0.171
Top Edge at 0mm	0.422	0.622	0.242	0.864

Test Engineer : Jacky Chen

15. Uncertainty Assessment

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

Declaration of Conformity:

The test results with all measurement uncertainty excluded is presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

16. References

- [1] FCC 47 CFR Part 2 "Frequency Allocations and Radio Treaty Matters; General Rules and Regulations"
- [2] ANSI/IEEE Std. C95.1-1992, "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz", September 1992
- [3] IEEE Std. 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", Sep 2013
- [4] SPEAG DASY System Handbook
- [5] FCC KDB 248227 D01 v02r02, "SAR Guidance for IEEE 802.11 (WiFi) Transmitters", Oct 2015.
- [6] FCC KDB 447498 D01 v06, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", Oct 2015
- [7] FCC KDB 616217 D04 v01r02, "SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers", Oct 2015
- [8] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [9] FCC KDB 865664 D02 v01r02, "RF Exposure Compliance Reporting and Documentation Considerations" Oct 2015.