FCC SAR TEST REPORT

FCC ID	:	**E2KBE200NG**
Equipment	:	**2x2 Wi-Fi and BT, M.2 2230 adapter card**
Brand Name	:	**DELL**
Model Name	:	**BE200NGW**
Applicant	:	**Dell Inc. One Dell Way Round Rock, Texas 78682 United States**
Manufacturer	:	**Dell Inc. One Dell Way Round Rock, Texas 78682 United States**
Standard	:	**FCC 47 CFR Part 2 (2.1093)**

The product was installed into Portable Computer (Brand Name: DELL, Model Name: P142F) during test.

The product was received on Dec. 12, 2024 and testing was started from Jan. 02, 2025 and completed on Jan. 07, 2025. 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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Table of Contents

1. Statement of Compliance **4**
2. Guidance Applied **4**
3. Equipment Under Test (EUT) Information **5**
3.1 General Information 5
4. Proximity Sensor Triggering Test **6**
5. RF Exposure Limits **17**
5.1 Uncontrolled Environment 17
5.2 Controlled Environment 17
5.3 RF Exposure limit for above 6GHz 18
6. Specific Absorption Rate (SAR) **19**
6.1 Introduction 19
6.2 SAR Definition 19
7. System Description and Setup **20**
7.1 Test Site Location 20
7.2 E-Field Probe 21
7.3 Data Acquisition Electronics (DAE) 21
7.4 Phantom 22
7.5 Device Holder 23
8. Measurement Procedures **24**
8.1 Spatial Peak SAR Evaluation 24
8.2 Power Reference Measurement 25
8.3 Area Scan 25
8.4 Zoom Scan 26
8.5 Volume Scan Procedures 26
8.6 Power Drift Monitoring 26
9. Test Equipment List **27**
10. System Verification **28**
10.1 Tissue Verification 28
10.2 System Performance Check Results 29
10.3 PD System Performance Check Results 30
11. WiFi/Bluetooth Output Power (Unit: dBm) **31**
12. Antenna Location **49**
13. SAR Test Results **51**
13.1 Body SAR 52
13.2 6GHz PD Test Result 55
14. Simultaneous Transmission Analysis **56**
14.1 Body Exposure Conditions 56
15. Uncertainty Assessment **57**
16. References **60**
Appendix A. Plots of SAR System Performance Check
Appendix B. Plots of PD System Performance Check
Appendix C. Plots of High SAR Measurement
Appendix D. Plots of High PD Measurement
Appendix E. DASY Calibration Certificate
Appendix F. Test Setup Photos

History of this test report

Report No.	Version	Description	Issued Date
FA4D0218-01	01	Initial issue of report	Feb. 07, 2025

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) for Dell Inc., 2x2 Wi-Fi and BT, M.2 2230 adapter card, BE200NGW, are as follows.

Equipment Class	Frequency Band	Highest SAR Summary	Highest Simultaneous Transmission 1g SAR (W/kg)
		Body 1g SAR (W/kg)	
DTS	2.4GHz WLAN	0.63	0.75
NII	5GHz WLAN	0.45	0.57
6CD	6GHz WLAN	0.21	0.57
DSS	Bluetooth	0.12	0.75
Equipment Class	Frequency Band	Reported APD (mW/cm^2)	Reported PD (mW/cm^2)
6CD	6GHz WLAN	0.18	0.57
Date of Testing:		2025/01/02 ~ 2025/01/07	

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), Human Exposure to RF Radiation Limits (1.0 mW/cm^2=10 W/m^2) specified in FCC 47 CFR part 1.1310 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
- IEC/IEEE 62209-1528:2020
- SPEAG DASY6 System Handbook
- SPEAG DASY6 Application Note (Interim Procedure for Device Operation at 6GHz-10GHz)

3. Equipment Under Test (EUT) Information

3.1 General Information

Product Feature & Specification	
Equipment Name	2x2 Wi-Fi and BT, M.2 2230 adapter card
Brand Name	DELL
Model Name	BE200NGW
FCC ID	E2KBE200NG
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 WLAN 6GHz Band: 5925 MHz ~ 6425 MHz, 6425 MHz ~ 6525 MHz, 6525 MHz ~ 6875 MHz, 6875 MHz ~ 7125 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz
Mode	WLAN: 802.11a/b/g/n/ac/ax/be HT20/HT40/VHT20/VHT40/VHT80/VHT160/HE20/HE40/HE80/HE160/EHT20/EHT40/EHT80/EHT160/EHT320 Bluetooth BR/EDR/LE

Remark:

1. There are two kinds of antenna vendor, RF exposure evaluation is selected WNC as the main test, Auden will spot check worst case found in WNC.

Host Information	
Equipment Name	Portable Computer
Brand Name	DELL
Model Name	P142F
EUT Stage	Identical Prototype

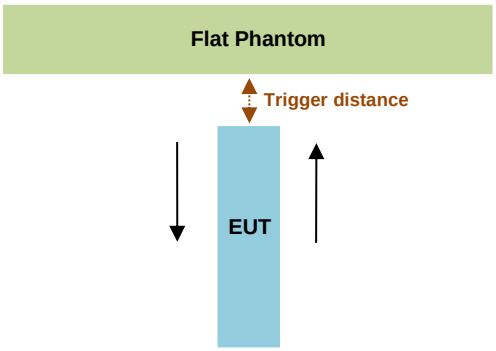
Antenna Information

1-WNC Wistron NeWeb Corp.	Ant. Type	Monopole	connector	MHF4L(IPEX),20565-001R-13	2-Auden Auden Techno Corp	Ant. Type	Monopole	connector	IPEX(20565-001R-13)
	Model No.	WNC PN: 81ELBE15.G21(DC33002YP1L)				Model No.	Auden PN: A23312-30 (DC33002YO1L)		
	Peak Gain (dBi)					Peak Gain (dBi)			
	2400~2483.5MHz	Main:-1.02 Aux:0.42	5850~5925MHz	Main:1.78 Aux:1.25		2400~2483.5MHz	Main:-1.09 Aux:0.39	5850~5925MHz	Main:1.62 Aux:1.15
	5150~5250MHz	Main:2.09 Aux:1.12	5925~6425MHz	Main:2.31 Aux:4.27		5150~5250MHz	Main:1.94 Aux:1.06	5925~6425MHz	Main:2.18 Aux:4.17
	5250~5350MHz	Main:2.09 Aux:2.01	6425~6525MHz	Main:0.29 Aux:4.22		5250~5350MHz	Main:1.94 Aux:1.88	6425~6525MHz	Main:0.24 Aux:4.10
	5470~5725MHz	Main:1.99 Aux:2.32	6525~6875MHz	Main:1.32 Aux:4.22		5470~5725MHz	Main:1.85 Aux:2.24	6525~6875MHz	Main:1.26 Aux:4.10
	5725~5850MHz	Main:2.12 Aux:2.32	6875~7125MHz	Main:1.55 Aux:2.25		5725~5850MHz	Main:2.08 Aux:2.24	6875~7125MHz	Main:1.48 Aux:2.17

4. Proximity Sensor Triggering Test

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

For the device is fully integrated, touch sensing capacitive sensor. It uses a charge transfer capacitive acquisition method that is capable of near range proximity detection. In this device offers a state of the art capacitive sensing engine with an embedded sampling capacitor and voltage regulator allowing the overall solution cost to be reduced and improving system immunity in noisy environments.
Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed. The details are illustrated as following, and the shortest triggering distances were reported and used for SAR assessment.
In the preliminary triggering distance testing, the tissue-equivalent medium for different frequency bands were used for verification; no other frequency bands tissue-equivalent medium was found to result in shortest triggering distance than that for 1900MHz, and the tissue-equivalent medium for 1900MHz was used for formal proximity sensor triggering testing.



<Main>

Proximity Sensor Trigger Distance (mm)		
Position	Bottom Side	
	moving toward	moving away
Minimum	28	28

<Aux>

Proximity Sensor Trigger Distance (mm)		
Position	Bottom Side	
	moving toward	moving away
Minimum	28	28

<MIMO>

Proximity Sensor Trigger Distance (mm)		
Position	Bottom Side	
	moving toward	moving away
Minimum	28	28

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

Since the antenna and sensor are collocated and all of the peak SAR location is overlapping with the sensor pad for this device, therefore, According to KDB 616217 section6.3, these procedures do not apply and are not required for this device. due to the antenna and sensor are collocated and the peak SAR location is overlapping with the sensor on this device.

Proximity sensor power reduction

	Mode	Channel	Frequency (MHz)	Bottom Side(1)		
				Main Ant Tune-Up Limit (dB)	Aux Ant Tune-Up Limit (dB)	Main+Aux Ant Tune-Up Limit (dB)
2.4GHz WLAN	802.11b 1Mbps	1	2412	2	4.5	
		6	2437	2	4.5	
		11	2462	2	4.5	
		12	2467	1	3.5	
		13	2472	0	0.5	
	802.11g 6Mbps	1	2412	1	3.5	
		6	2437	1	3.5	
		11	2462	1	3.5	
		12	2467	0	0	
		13	2472	0	0	
	802.11n-HT20 MCS0	1	2412	1	3.5	3.5
		6	2437	1	3.5	1
		11	2462	1	3.5	1
		12	2467	0	0	0
		13	2472	0	0	0
	802.11n-HT40 MCS0	3	2422	0	2.5	0
		6	2437	0	2.5	0
		9	2452	0	2.5	0
		10	2457	0	0	0
		11	2462	0	0	0
	802.11ax-HE20 MCS0	1	2412	1	3.5	1
		6	2437	1	3.5	1
		11	2462	1	3.5	1
		12	2467	0	0	0
		13	2472	0	0	0
	802.11ax-HE40 MCS0	3	2422	0	2.5	0
		6	2437	0	2.5	0
		9	2452	0	2.5	0
		10	2457	0	0	0
		11	2462	0	0	0
	802.11be-EHT20 MCS0	1	2412	1	3.5	1
		6	2437	1	3.5	1
		11	2462	1	3.5	1
		12	2467	0	0	0
		13	2472	0	0	0
	802.11be-EHT40 MCS0	3	2422	0	2.5	0
		6	2437	0	2.5	0
		9	2452	0	2.5	0
		10	2457	0	0	0
		11	2462	0	0	0

	Mode	Channel	Frequency (MHz)	Bottom Side[1]		
				Main Ant Tune-Up Limit (dB)	Aux Ant Tune-Up Limit (dB)	Main+Aux Ant Tune-Up Limit (dB)
5.2GHz WLAN	802.11a 6Mbps	36	5180	11.5	10.5	
		40	5200	11.5	10.5	
		44	5220	11.5	10.5	
		48	5240	11.5	10.5	
	802.11n-HT20 MCS0	36	5180	11.5	10.5	10.5
		40	5200	11.5	10.5	10.5
		44	5220	11.5	10.5	10.5
		48	5240	11.5	10.5	10.5
	802.11n-HT40 MCS0	38	5190	10.5	9.5	9.5
		46	5230	11.5	10.5	10.5
	802.11ac-VHT80 MCS0	42	5210	10.5	9.5	9.5
	802.11ax-HE20 MCS0	36	5180	11.5	10.5	10.5
		40	5200	11.5	10.5	10.5
		44	5220	11.5	10.5	10.5
		48	5240	11.5	10.5	10.5
	802.11ax-HE40 MCS0	38	5190	10.5	9.5	9.5
		46	5230	11.5	10.5	10.5
	802.11ax-HE80 MCS0	42	5210	10.5	9.5	9.5
	802.11be-EHT20 MCS0	36	5180	11.5	10.5	10.5
		40	5200	11.5	10.5	10.5
		44	5220	11.5	10.5	10.5
		48	5240	11.5	10.5	10.5
	802.11be-EHT40 MCS0	38	5190	10.5	9.5	9.5
		46	5230	11.5	10.5	10.5
	802.11be-EHT80 MCS0	42	5210	10.5	9.5	9.5

	Mode	Channel	Frequency (MHz)	Bottom Side[1]		
				Main Ant Tune-Up Limit (dB)	Aux Ant Tune-Up Limit (dB)	Main+Aux Ant Tune-Up Limit (dB)
5.3GHz WLAN	802.11a 6Mbps	52	5260	11.5	10.5	
		56	5280	11.5	10.5	
		60	5300	11.5	10.5	
		64	5320	11.5	10.5	
	802.11n-HT20 MCS0	52	5260	11.5	10.5	10.5
		56	5280	11.5	10.5	10.5
		60	5300	11.5	10.5	10.5
		64	5320	11.5	10.5	10.5
	802.11n-HT40 MCS0	54	5270	11.5	10.5	10.5
		62	5310	10.5	9.5	9.5
	802.11ac-VHT80 MCS0	58	5290	10.5	9.5	9.5
	802.11ac-VHT160 MCS0	50	5250	7.5	6.5	6.5
	802.11ax-HE20 MCS0	52	5260	11.5	10.5	10.5
		56	5280	11.5	10.5	10.5
		60	5300	11.5	10.5	10.5
		64	5320	11.5	10.5	10.5
	802.11ax-HE40 MCS0	54	5270	11.5	10.5	10.5
		62	5310	10.5	9.5	9.5
	802.11ax-HE80 MCS0	58	5290	10.5	9.5	9.5
	802.11ax-HE160 MCS0	50	5250	7.5	6.5	6.5
	802.11be-EHT20 MCS0	52	5260	11.5	10.5	10.5
		56	5280	11.5	10.5	10.5
		60	5300	11.5	10.5	10.5
		64	5320	11.5	10.5	10.5
	802.11be-EHT40 MCS0	54	5270	11.5	10	10.5
		62	5310	10.5	9	9.5
	802.11be-EHT80 MCS0	58	5290	10.5	9	9.5
	802.11be-EHT160 MCS0	50	5250	7.5	6	6.5

	Mode	Channel	Frequency (MHz)	Bottom Side(1)		
				Main Ant Tune-Up Limit (dB)	Aux Ant Tune-Up Limit (dB)	Main+Aux Ant Tune-Up Limit (dB)
5.5GHz WLAN	802.11a 6Mbps	100	5500	10.5	12.5	
		116	5580	10.5	12.5	
		124	5620	10.5	12.5	
		132	5660	10.5	12.5	
		140	5700	10.5	12.5	
		144	5720	10.5	12.5	
	802.11n-HT20 MCS0	100	5500	10.5	12.5	10.5
		116	5580	10.5	12.5	10.5
		124	5620	10.5	12.5	10.5
		132	5660	10.5	12.5	10.5
		140	5700	10.5	12.5	10.5
		144	5720	10.5	12.5	10.5
	802.11n-HT40 MCS0	102	5510	9.5	11.5	9.5
		110	5550	9.5	11.5	9.5
		126	5630	9.5	11.5	9.5
		134	5670	9.5	11.5	9.5
		142	5710	9.5	11.5	9.5
	802.11ac-VHT80 MCS0	106	5530	9.5	11.5	9.5
		122	5610	9.5	11.5	9.5
		138	5690	9.5	11.5	9.5
	802.11ac-VHT160 MCS0	114	5570	6.5	8.5	6.5
	802.11ax-HE20 MCS0	100	5500	10.5	12.5	10.5
		116	5580	10.5	12.5	10.5
		124	5620	10.5	12.5	10.5
		132	5660	10.5	12.5	10.5
		140	5700	10.5	12.5	10.5
		144	5720	10.5	12.5	10.5
	802.11ax-HE40 MCS0	102	5510	9.5	11.5	9.5
		110	5550	9.5	11.5	9.5
		126	5630	9.5	11.5	9.5
		134	5670	9.5	11.5	9.5
		142	5710	9.5	11.5	9.5
	802.11ax-HE80 MCS0	106	5530	9.5	11.5	9.5
		122	5610	9.5	11.5	9.5
		138	5690	9.5	11.5	9.5
	802.11ax-HE160 MCS0	114	5570	6.5	8.5	6.5
	802.11be-EHT20 MCS0	100	5500	10.5	12.5	10.5
		116	5580	10.5	12.5	10.5
		124	5620	10.5	12.5	10.5
		132	5660	10.5	12.5	10.5
		140	5700	10.5	12.5	10.5
		144	5720	10.5	12.5	10.5
	802.11be-EHT40 MCS0	102	5510	9.5	11.5	9.5
		110	5550	9.5	11.5	9.5
		126	5630	9.5	11.5	9.5
		134	5670	9.5	11.5	9.5
		142	5710	9.5	11.5	9.5
	802.11be-EHT80 MCS0	106	5530	9.5	11.5	9.5
		122	5610	9.5	11.5	9.5
		138	5690	9.5	11.5	9.5
	802.11be-EHT160 MCS0	114	5570	6.5	8.5	6.5

	Mode	Channel	Frequency (MHz)	Bottom Side(1)		
				Main Ant Tune-Up Limit (dB)	Aux Ant Tune-Up Limit (dB)	Main+Aux Ant Tune-Up Limit (dB)
5.8GHz WLAN	802.11a 6Mbps	149	5745	10.5	11	
		157	5785	10.5	11	
		165	5825	10.5	11	
	802.11n-HT20 MCS0	149	5745	10.5	11	10.5
		157	5785	10.5	11	10.5
		165	5825	10.5	11	10.5
	802.11n-HT40 MCS0	151	5755	10.5	11	10.5
		159	5795	10.5	11	10.5
	802.11ac-VHT80 MCS0	155	5775	9.5	10	9.5
	802.11ax-HE20 MCS0	149	5745	10.5	11	10.5
		157	5785	10.5	11	10.5
		165	5825	10.5	11	10.5
	802.11ax-HE40 MCS0	151	5755	10.5	11	10.5
		159	5795	10.5	11	10.5
	802.11ax-HE80 MCS0	155	5775	9.5	10	9.5
	802.11be-EHT20 MCS0	149	5745	10.5	11	10.5
		157	5785	10.5	11	10.5
		165	5825	10.5	11	10.5
	802.11be-EHT40 MCS0	151	5755	10.5	11	10.5
		159	5795	10.5	11	10.5
	802.11be-EHT80 MCS0	155	5775	10.5	11	10.5

	Mode	Channel	Frequency (MHz)	Bottom Side(1)		
				Main Ant Tune-Up Limit (dB)	Aux Ant Tune-Up Limit (dB)	Main+Aux Ant Tune-Up Limit (dB)
5.9GHz WLAN	802.11a 6Mbps	169	5845	8.5	9	
		173	5865	8.5	9	
		177	5885	8.5	9	
	802.11n-HT20 MCS0	169	5845	8.5	9	8.5
		173	5865	8.5	9	8.5
		177	5885	8.5	9	8.5
	802.11n-HT40 MCS0	167	5835	10.5	11	10.5
		175	5875	10.5	11	10.5
	802.11ac-VHT80 MCS0	171	5855	10.5	11	10.5
	802.11ac-VHT160 MCS0	163	5815	8.5	9	8.5
	802.11ax-HE20 MCS0	169	5845	8.5	9	8.5
		173	5865	8.5	9	8.5
		177	5885	8.5	9	8.5
	802.11ax-HE40 MCS0	167	5835	10.5	11	10.5
		175	5875	10.5	11	10.5
	802.11ax-HE80 MCS0	171	5855	10.5	11	10.5
	802.11ax-HE160 MCS0	163	5815	8.5	9	8.5
	802.11be-EHT20 MCS0	169	5845	8.5	9	8.5
		173	5865	8.5	9	8.5
		177	5885	8.5	9	8.5
	802.11be-EHT40 MCS0	167	5835	10.5	11	10.5
		175	5875	10.5	11	10.5
	802.11be-EHT80 MCS0	171	5855	10.5	11	10.5
	802.11be-EHT160 MCS0	163	5815	8.5	9	8.5

	Mode	Channel	Frequency (MHz)	Bottom Side(1)		
				Main Ant Tune-Up Limit (dB)	Aux Ant Tune-Up Limit (dB)	Main+Aux Ant Tune-Up Limit (dB)
WLAN 6GHz (LPI)	802.11ax-HE20 MCS0	1	5955	0	0	0
		57	6235	0	0	0
		113	6515	0	0	0
		173	6815	0	0	0
		233	7115	0	0	0
	802.11ax-HE40 MCS0	3	5965	0	0	0
		59	6245	0	0	0
		107	6485	0	0	0
		171	6805	0	0	0
		227	7085	0	0	0
	802.11ax-HE80 MCS0	7	5985	0.5	1	0.5
		71	6305	0.5	1	0.5
		119	6545	0.5	1	0.5
		167	6785	0.5	1	0.5
		215	7025	0.5	1	0.5
	802.11ax-HE160 MCS0	15	6025	3.5	4	3.5
		47	6185	3.5	4	3.5
		111	6505	3.5	4	3.5
		143	6665	3.5	4	3.5
		207	6985	3.5	4	3.5
	802.11be-EHT20 MCS0	1	5955	0	0	0
		57	6235	0	0	0
		113	6515	0	0	0
		173	6815	0	0	0
		233	7115	0	0	0
	802.11be-EHT40 MCS0	3	5965	0	0	0
		59	6245	0	0	0
		107	6485	0	0	0
		171	6805	0	0	0
		227	7085	0	0	0
	802.11be-EHT80 MCS0	7	5985	0.5	1	0.5
		71	6305	0.5	1	0.5
		119	6545	0.5	1	0.5
		167	6785	0.5	1	0.5
		215	7025	0.5	1	0.5
	802.11be-EHT160 MCS0	15	6025	3.5	4	3.5
		47	6185	3.5	4	3.5
		111	6505	3.5	4	3.5
		143	6665	3.5	4	3.5
		207	6985	3.5	4	3.5
	802.11be-EHT320 MCS0	31	6105	6.5	7	6.5
		63	6265	6.5	7	6.5
		95	6425	6.5	7	6.5
		127	6585	6.5	7	6.5
		159	6745	6.5	7	6.5
		191	6905	6.5	7	6.5

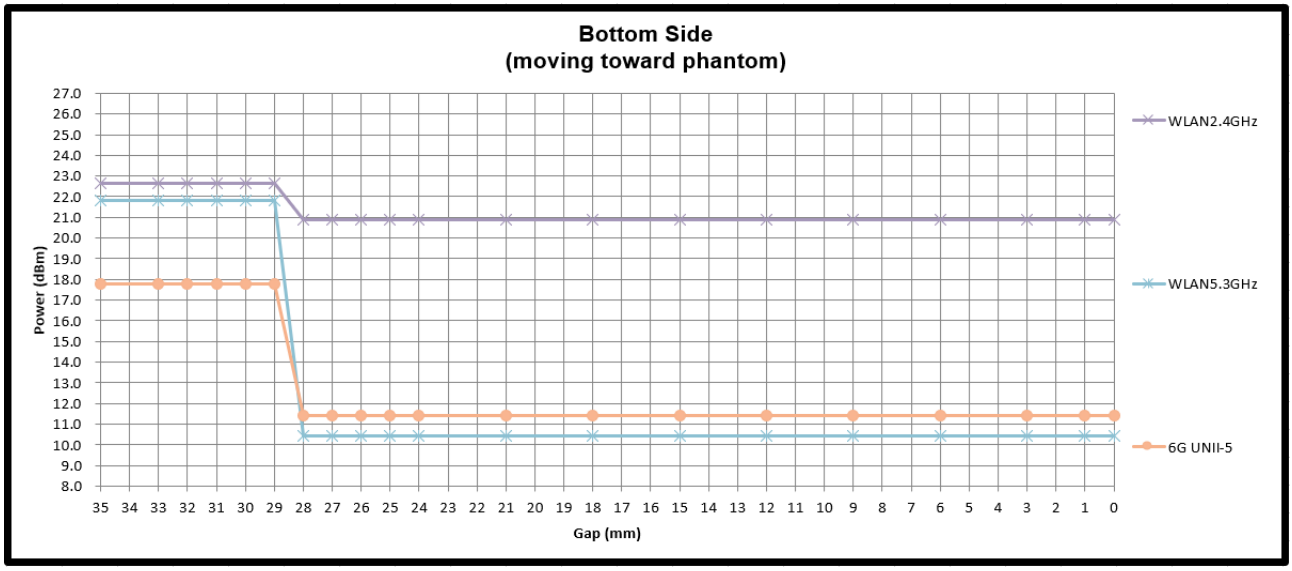
	Mode	Channel	Frequency (MHz)	Bottom Side[1]		
				Main Ant Tune-Up Limit (dB)	Aux Ant Tune-Up Limit (dB)	Main+Aux Ant Tune-Up Limit (dB)
WLAN 6GHz (SP)	802.11ax-HE20 MCS0	1	5955	11.5	12	11.5
		57	6235	11.5	12	11.5
		173	6815	11.5	12	11.5
	802.11ax-HE40 MCS0	3	5965	11.5	12	11.5
		59	6245	11.5	12	11.5
		171	6805	11.5	12	11.5
	802.11ax-HE80 MCS0	7	5985	11.5	12	11.5
		71	6305	11.5	12	11.5
		167	6785	11.5	12	11.5
	802.11ax-HE160 MCS0	15	6025	10.5	11	10.5
		47	6185	10.5	11	10.5
		143	6665	10.5	11	10.5
	802.11be-EHT20 MCS0	1	5955	11.5	12	11.5
		57	6235	11.5	12	11.5
		173	6815	11.5	12	11.5
	802.11be-EHT40 MCS0	3	5965	11.5	12	11.5
		59	6245	11.5	12	11.5
		171	6805	11.5	12	11.5
	802.11be-EHT80 MCS0	7	5985	11.5	12	11.5
		71	6305	11.5	12	11.5
		167	6785	11.5	12	11.5
	802.11be-EHT160 MCS0	15	6025	10.5	11	10.5
		47	6185	10.5	11	10.5
		143	6665	10.5	11	10.5
	802.11be-EHT320 MCS0	31	6105	7.5	8	7.5
		63	6265	7.5	8	7.5

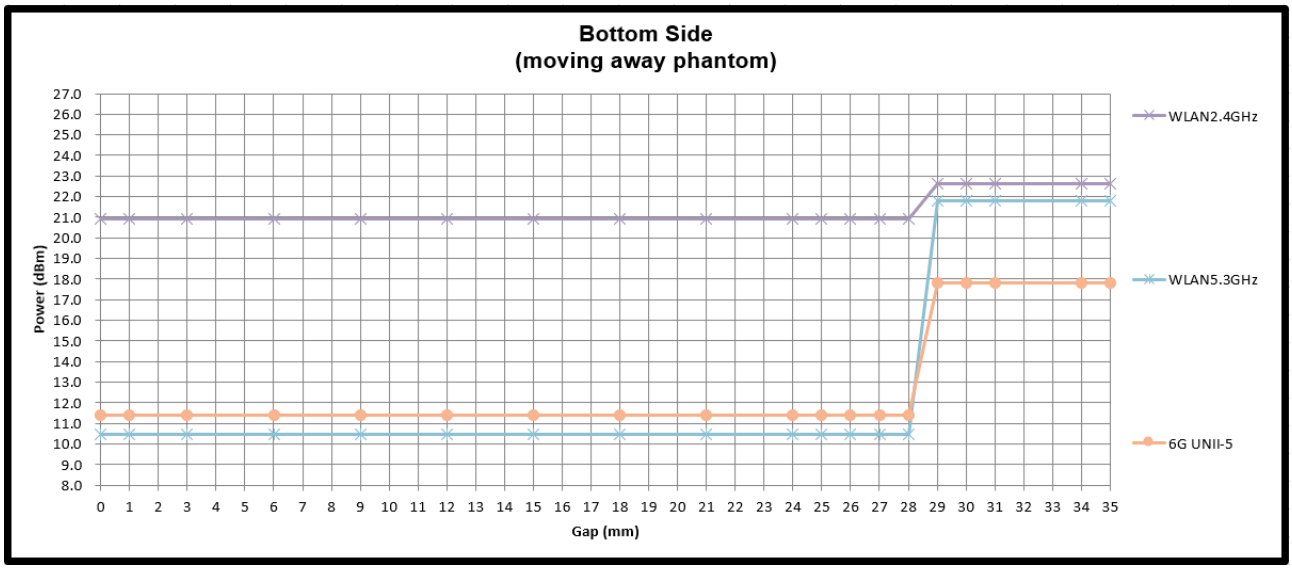
Remark:

1. [1]: Reduced maximum limit applied by activation of proximity sensor.
2. Tests were performed in accordance with KDB 616217 D04 section 6.1, 6.2, 6.3, 6.4 and 6.5 and compliant results are shown as below.
3. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance was performed trigger distance -1mm:
   - Bottom Side: 28 mm

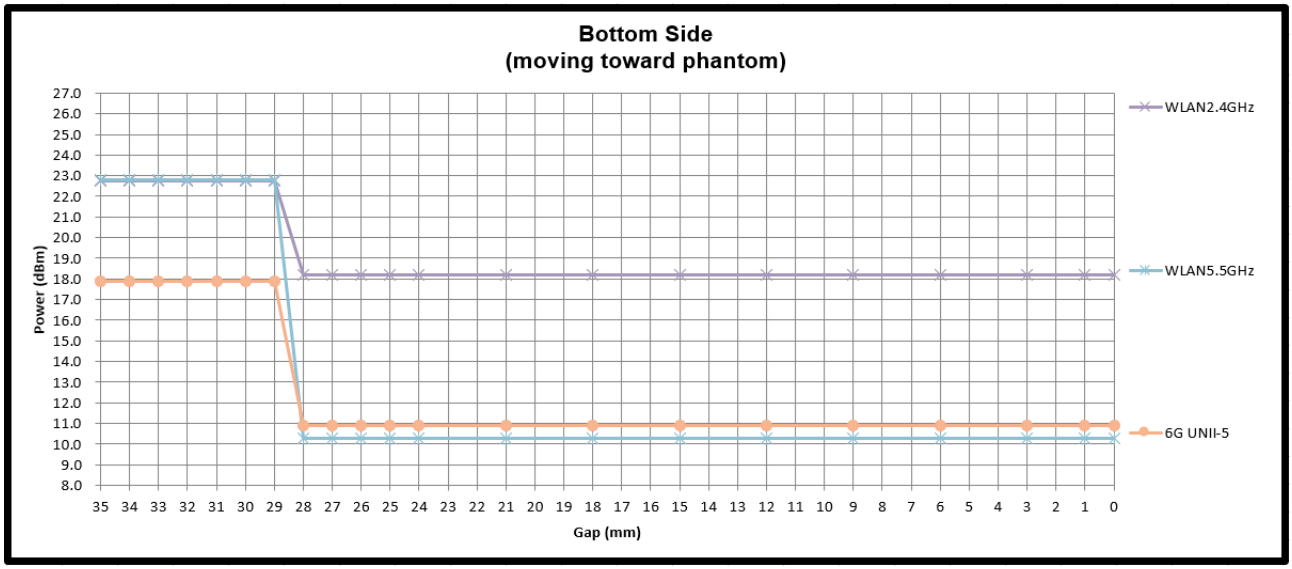
Power Measurement during Sensor Trigger distance testing

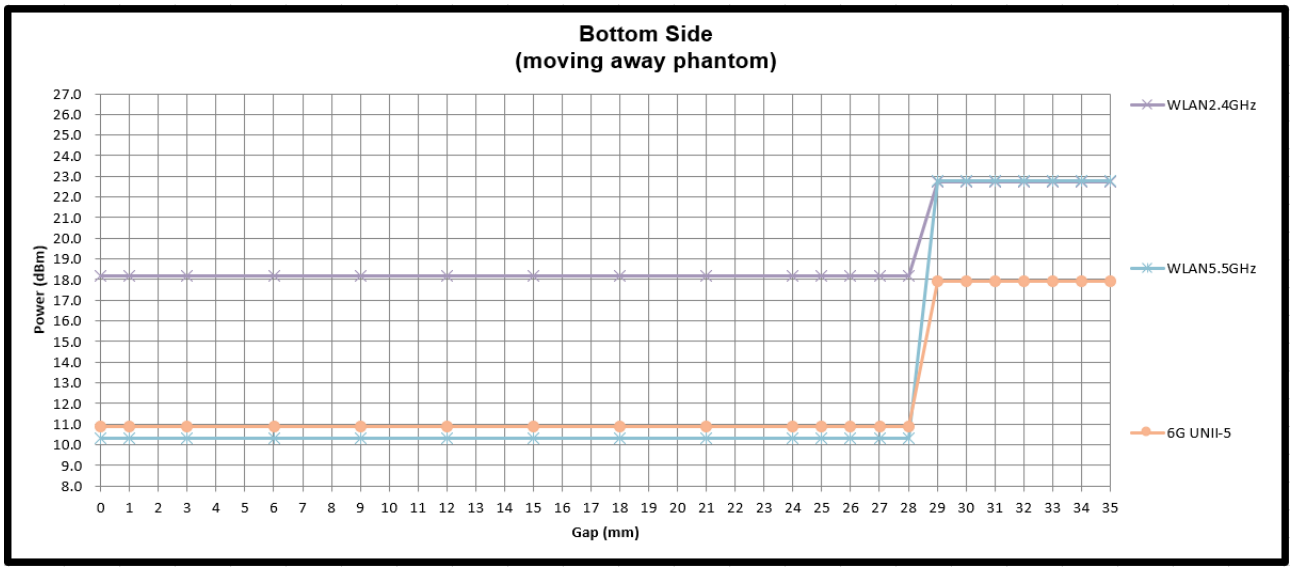
Main Ant



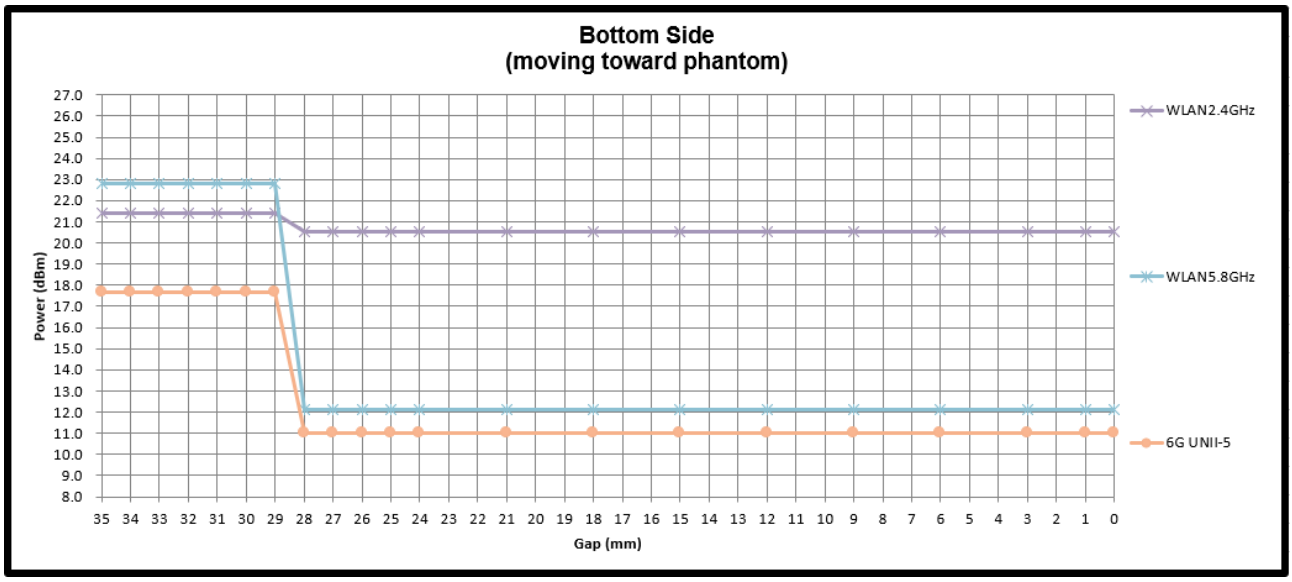


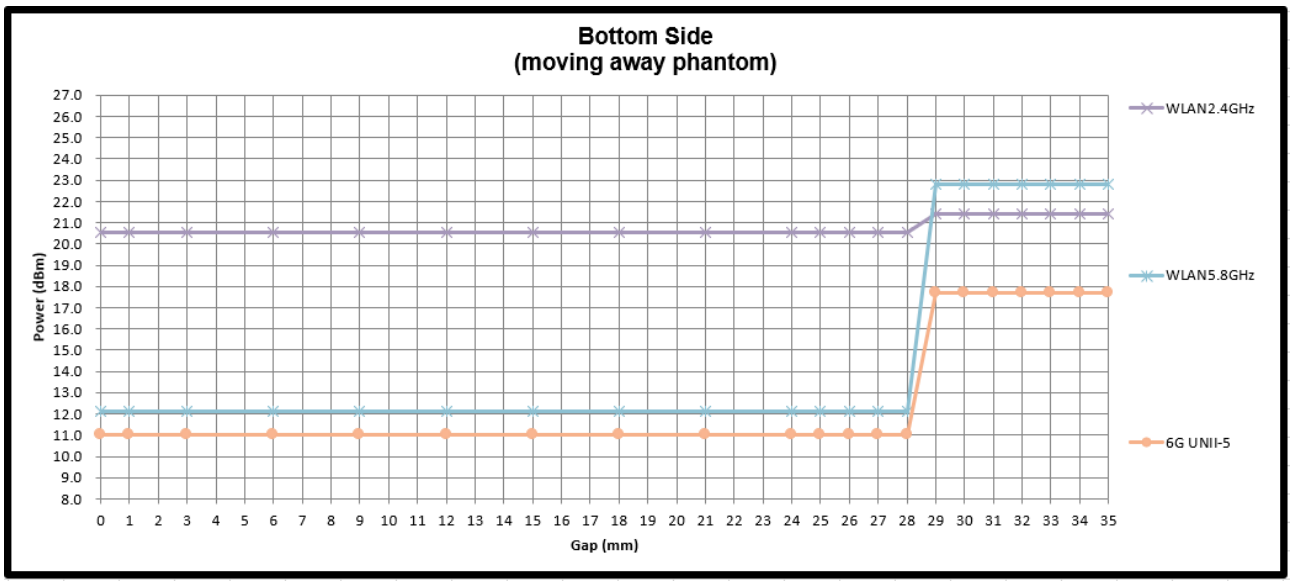
Aux Ant


Bottom Side
(moving toward phantom)
Power (dBm)
Gap (mm)
WLAN2.4GHz
WLAN5.5GHz
6G UNII-5


Bottom Side
(moving away phantom)
Power (dBm)
Gap (mm)
WLAN2.4GHz
WLAN5.5GHz
6G UNII-5

MIMO Ant


Bottom Side
(moving toward phantom)
Power (dBm)
Gap (mm)
WLAN2.4GHz
WLAN5.8GHz
6G UNII-5


Bottom Side
(moving away phantom)
Power (dBm)
Gap (mm)
WLAN2.4GHz
WLAN5.8GHz
6G UNII-5

5. RF Exposure Limits

5.1 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.

5.2 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.

5.3 RF Exposure limit for above 6GHz

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Peak Spatially Averaged Power Density was evaluated over a circular area of 4cm^2 per interim FCC Guidance for near-field power density evaluations per October 2018 TCB Workshop notes

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

6. Specific Absorption Rate (SAR)

6.1 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.

6.2 SAR Definition

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

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

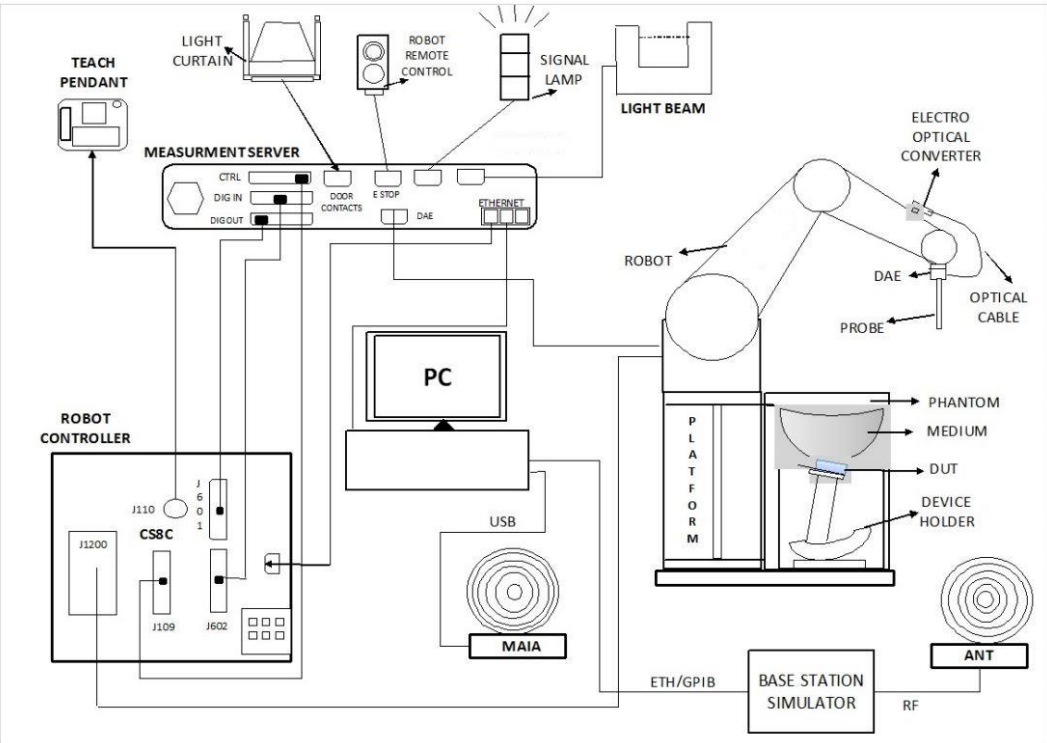
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. 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.

7.1 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	

7.2 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 µW/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 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)	
Dimensions	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

7.3 Data Acquisition Electronics (DAE)

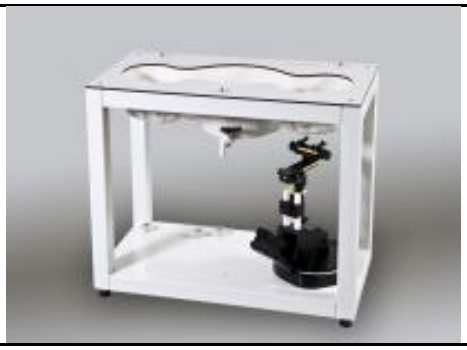
The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an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

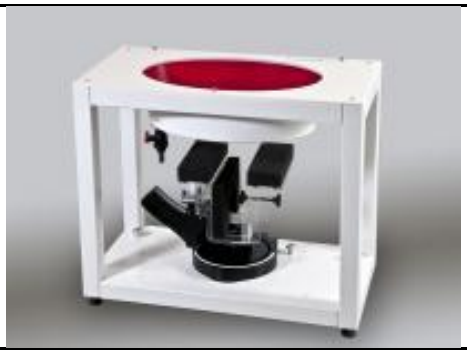
7.4 Phantom

<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.

7.5 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

8. 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

8.1 Spatial Peak SAR Evaluation

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

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

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

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

8.2 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.

8.3 Area Scan

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

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

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

8.4 Zoom Scan

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

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

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

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

8.5 Volume Scan Procedures

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

8.6 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.

9. 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	1006	Oct. 15, 2024	Oct. 14, 2025
SPEAG	6500MHz System Validation Kit	D6.5GHzV2	1003	Mar. 15, 2024	Mar. 14, 2025
SPEAG	5G Verification Source	10GHz	1052	Oct. 16, 2024	Oct. 15, 2025
SPEAG	EUmmWV Probe Tip Protection	EUmmWV3	9424	Mar. 12, 2024	Mar. 11, 2025
SPEAG	Data Acquisition Electronics	DAE4	854	Aug. 14, 2024	Aug. 13, 2025
SPEAG	Data Acquisition Electronics	DAE4	1326	Jul. 15, 2024	Jul. 14, 2025
SPEAG	Data Acquisition Electronics	DAE4ip	1823	Jul. 15, 2024	Jul. 14, 2025
SPEAG	Dosimetric E-Field Probe	EX3DV4	7306	Aug. 21, 2024	Aug. 20, 2025
SPEAG	Dosimetric E-Field Probe	EX3DV4	7822	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. System Verification

10.1 Tissue Verification

The tissue dielectric parameters of tissue-equivalent media used for SAR measurements must be characterized within a temperature range of 18℃ to 25℃, measured with calibrated instruments and apparatuses, such as network analyzers and temperature probes. The temperature of the tissue-equivalent medium during SAR measurement must also be within 18℃ to 25℃ and within ± 2℃ of the temperature when the tissue parameters are characterized. The tissue dielectric measurement system must be calibrated before use. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements.
The liquid tissue depth was at least 15cm in the phantom for all SAR testing

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
2450	22.5	1.796	39.724	1.80	39.20	-0.22	1.34	±5	2025/1/4
5250	22.2	4.605	34.874	4.71	35.95	-2.23	-2.99	±5	2025/1/2
5250	22.5	4.724	36.956	4.71	35.95	0.30	2.80	±5	2025/1/3
5600	22.2	4.960	34.330	5.07	35.50	-2.17	-3.30	±5	2025/1/2
5600	22.5	4.980	36.350	5.07	35.50	-1.78	2.39	±5	2025/1/3
5800	22.2	5.149	34.033	5.27	35.30	-2.30	-3.59	±5	2025/1/2
5800	22.5	5.302	35.981	5.27	35.30	0.61	1.93	±5	2025/1/3
6500	22.6	5.870	33.400	6.07	34.50	-3.29	-3.19	±5	2025/1/5

10.2 System Performance Check Results

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

Test Site	Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
SAR-05	2025/1/4	2450	50	D2450V2-736	EX3DV4 - SN7306	DAE4 Sn1326	2.390	51.400	47.8	-7.00
SAR-05	2025/1/2	5250	50	D5GHzV2-1006	EX3DV4 - SN7306	DAE4 Sn1326	4.000	80.600	80	-0.74
SAR-05	2025/1/3	5250	50	D5GHzV2-1006	EX3DV4 - SN7306	DAE4 Sn1326	4.110	80.600	82.2	1.99
SAR-05	2025/1/2	5600	100	D5GHzV2-1006	EX3DV4 - SN7306	DAE4 Sn1326	7.700	83.400	77	-7.67
SAR-05	2025/1/3	5600	100	D5GHzV2-1006	EX3DV4 - SN7306	DAE4 Sn1326	7.730	83.400	77.3	-7.31
SAR-05	2025/1/2	5800	100	D5GHzV2-1006	EX3DV4 - SN7306	DAE4 Sn1326	7.440	80.600	74.4	-7.69
SAR-05	2025/1/3	5800	100	D5GHzV2-1006	EX3DV4 - SN7306	DAE4 Sn1326	7.660	80.600	76.6	-4.96
SAR-04	2025/1/5	6500	100	D6.5GHzV2-1003	EX3DV4 - SN7822	DAE4ip Sn1823	28.200	293.000	282	-3.75

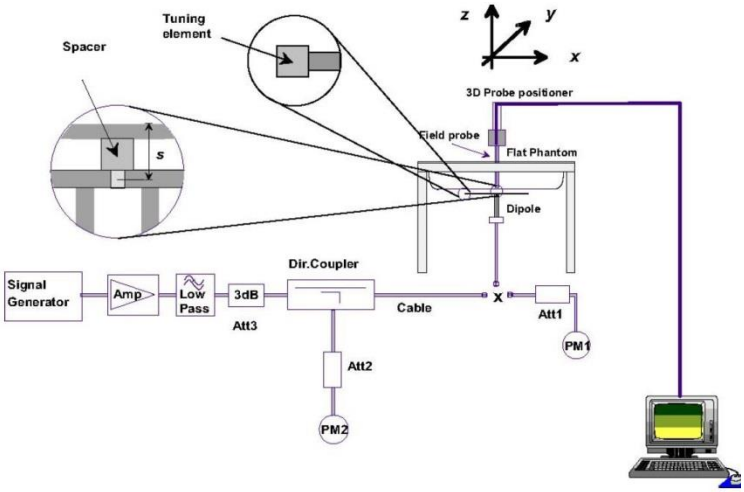


Fig 8.3.1 System Performance Check Setup

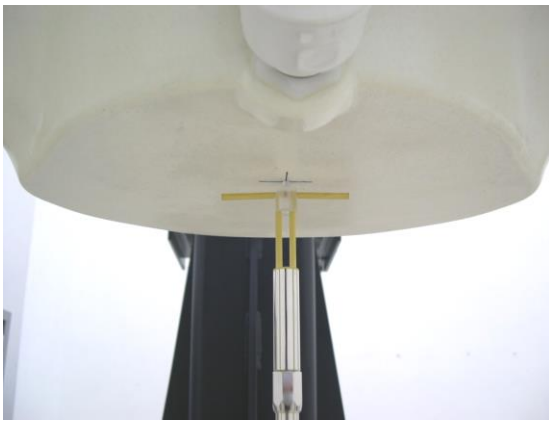


Fig 8.3.2 Setup Photo

10.3 PD System Performance Check Results

The system was verified to be within ±0.66 dB of the power density targets on the calibration certificate according to the test system specification in the user's manual and calibration facility recommendation. The 0.66 dB deviation threshold represents the expanded uncertainty for system performance checks using SPEAG's mmWave verification sources. The same spatial resolution and measurement region used in the source calibration was applied during the system check. The measured power density distribution of verification source was also confirmed through visual inspection to have no noticeable differences, both spatially (shape) and numerically (level) from the distribution provided by the manufacturer, per November 2017 TCBC Workshop Notes

Test Location	Frequency (GHz)	5G Verification Source	Probe S/N	DAE S/N	Distance (mm)	Measured 4 cm^2 (W/m^2)	Targeted 4 cm^2 (W/m^2)	Deviation (dB)	Date
SAR01-HY	10G	10GHz_1052	EUmmWV3-9424	DAE4-854	10	57.4	57.2	0.02	2025/1/7

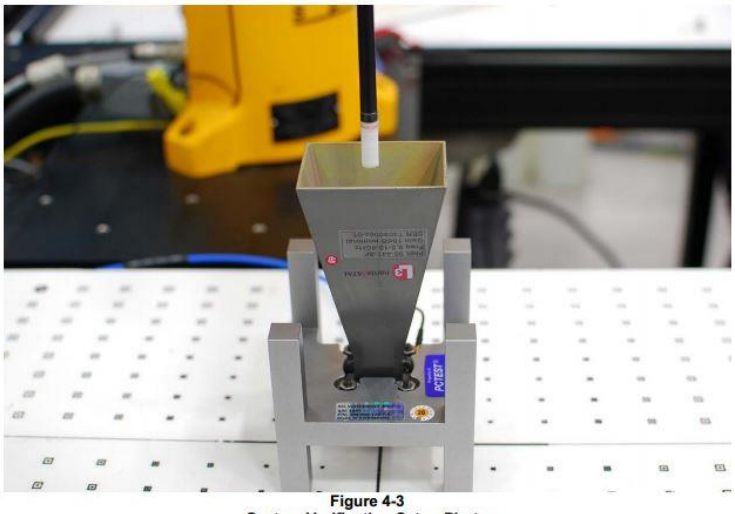


Figure 4-3
System Verification Setup Photo

System Performance Check Setup

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

General Note:

1. 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.
2. 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.
3. 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).
4. 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.
5. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
   a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
   b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
   c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
6. 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)
7. In applying the test guidance, the IEEE 802.11 mode with the maximum output power (out of all modes) should be considered for testing
8. 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
9. 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

<Sensor OFF>

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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 %
2.4GHz WLAN	802.11b 1Mbps	1	2412	21.58	23.00	97.66	22.55	23.00	97.62							
		6	2437	22.55	23.00		22.74	23.00								
		11	2462	22.64	23.00		22.40	23.00								
		12	2467	21.10	22.00		20.01	22.00								
		13	2472	18.80	19.00		18.70	19.00								
	802.11g 6Mbps	1	2412	Not Required	22.00	Not Required	Not Required	22.00	Not Required							
		6	2437		22.00			22.00								
		11	2462		22.00			22.00								
		12	2467		17.00			17.00								
		13	2472		14.50			14.50								
	802.11n-HT20 MCS0	1	2412		22.00			22.00		18.40	19.00	18.20	19.00	21.31	22.00	98.00
		6	2437		22.00			22.00		18.50	19.00	18.20	19.00	21.36	22.00	
		11	2462		22.00			22.00		18.50	19.00	18.30	19.00	21.41	22.00	
		12	2467		17.00			17.00		13.60	14.00	13.30	14.00	16.46	17.00	
		13	2472		14.50			14.50		11.20	11.50	11.00	11.50	14.11	14.50	
	802.11n-HT40 MCS0	3	2422		21.00			21.00		Not Required	18.00	Not Required	18.00	Not Required	21.00	Not Required
		6	2437		21.00			21.00			18.00		18.00		21.00	
		9	2452		21.00			21.00			18.00		18.00		21.00	
		10	2457		16.00			16.00			13.00		13.00		16.00	
		11	2462		13.00			13.00			10.00		10.00		13.00	
	802.11ax-HE20 MCS0	1	2412		22.00			22.00			19.00		19.00		22.00	
		6	2437		22.00			22.00			19.00		19.00		22.00	
		11	2462		22.00			22.00			19.00		19.00		22.00	
		12	2467		17.00			17.00			14.00		14.00		17.00	
		13	2472		14.50			14.50			11.50		11.50		14.50	
	802.11ax-HE40 MCS0	3	2422		21.00			21.00			18.00		18.00		21.00	
		6	2437		21.00			21.00			18.00		18.00		21.00	
		9	2452		21.00			21.00			18.00		18.00		21.00	
		10	2457		16.00			16.00			13.00		13.00		16.00	
		11	2462		13.00			13.00			10.00		10.00		13.00	
	802.11be-EHT20 MCS0	1	2412		22.00			22.00			19.00		19.00		22.00	
		6	2437		22.00			22.00			19.00		19.00		22.00	
		11	2462		22.00			22.00			19.00		19.00		22.00	
		12	2467		17.00			17.00			14.00		14.00		17.00	
		13	2472		14.50			14.50			11.50		11.50		14.50	
	802.11be-EHT40 MCS0	3	2422		21.00			21.00			18.00		18.00		21.00	
		6	2437		21.00			21.00			18.00		18.00		21.00	
		9	2452		21.00			21.00			18.00		18.00		21.00	
		10	2457		16.00			16.00			13.00		13.00		16.00	
		11	2462		13.00			13.00			10.00		10.00		13.00	

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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	22.00	Not Required	Not Required	22.00	Not Required							
		40	5200		22.00			22.00								
		44	5220		22.00			22.00								
		48	5240		22.00			22.00								
	802.11n-HT20 MCS0	36	5180		22.00			22.00		Not Required	19.00	Not Required	19.00	Not Required	22.00	Not Required
		40	5200		22.00			22.00			19.00		19.00		22.00	
		44	5220		22.00			22.00			19.00		19.00		22.00	
		48	5240		22.00			22.00			19.00		19.00		22.00	
	802.11n-HT40 MCS0	38	5190		21.00			21.00			18.00		18.00		21.00	
		46	5230		22.00			22.00			19.00		19.00		22.00	
	802.11ac-VHT80 MCS0	42	5210		21.00			21.00			18.00		18.00		21.00	
	802.11ax-HE20 MCS0	36	5180		22.00			22.00			19.00		19.00		22.00	
		40	5200		22.00			22.00			19.00		19.00		22.00	
		44	5220		22.00			22.00			19.00		19.00		22.00	
		48	5240		22.00			22.00			19.00		19.00		22.00	
	802.11ax-HE40 MCS0	38	5190		21.00			21.00			18.00		18.00		21.00	
		46	5230		22.00			22.00			19.00		19.00		22.00	
	802.11ax-HE80 MCS0	42	5210		21.00			21.00			18.00		18.00		21.00	
	802.11be-EHT20 MCS0	36	5180		22.00			22.00			19.00		19.00		22.00	
		40	5200		22.00			22.00			19.00		19.00		22.00	
		44	5220		22.00			22.00			19.00		19.00		22.00	
		48	5240		22.00			22.00			19.00		19.00		22.00	
	802.11be-EHT40 MCS0	38	5190		21.00			21.00			18.00		18.00		21.00	
		46	5230		22.00			22.00			19.00		19.00		22.00	
	802.11be-EHT80 MCS0	42	5210		21.00			21.00			18.00		18.00		21.00	

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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	21.80	22.00	97.62	21.50	22.00	97.62							
		56	5280	21.60	22.00		21.40	22.00								
		60	5300	21.60	22.00		21.30	22.00								
		64	5320	21.80	22.00		21.30	22.00								
	802.11n-HT20 MCS0	52	5260	Not Required	22.00	Not Required	Not Required	22.00	Not Required	18.50	19.00	18.60	19.00	21.56	22.00	98.50
		56	5280		22.00			22.00		18.40	19.00	18.40	19.00	21.41	22.00	
		60	5300		22.00			22.00		18.60	19.00	18.30	19.00	21.46	22.00	
		64	5320		22.00			22.00		18.70	19.00	18.30	19.00	21.51	22.00	
	802.11n-HT40 MCS0	54	5270	21.30	22.00	98.76	21.20	22.00	98.76	18.40	19.00	18.40	19.00	21.41	22.00	98.76
		62	5310	20.90	21.00		20.60	21.00		17.60	18.00	17.50	18.00	20.56	21.00	
	802.11ac-VHT80 MCS0	58	5290	Not Required	21.00	Not Required	Not Required	21.00	Not Required	Not Required	18.00	Not Required	18.00	Not Required	21.00	Not Required
	802.11ac-VHT160 MCS0	50	5250		18.00			18.00			15.00		15.00		18.00	
	802.11ax-HE20 MCS0	52	5260		22.00			22.00			19.00		19.00		22.00	
		56	5280		22.00			22.00			19.00		19.00		22.00	
		60	5300		22.00			22.00			19.00		19.00		22.00	
		64	5320		22.00			22.00			19.00		19.00		22.00	
	802.11ax-HE40 MCS0	54	5270		22.00			22.00			19.00		19.00		22.00	
		62	5310		21.00			21.00			18.00		18.00		21.00	
	802.11ax-HE80 MCS0	58	5290		21.00			21.00			18.00		18.00		21.00	
	802.11ax-HE160 MCS0	50	5250		18.00			18.00			15.00		15.00		18.00	
	802.11be-EHT20 MCS0	52	5260		22.00			22.00			19.00		19.00		22.00	
		56	5280		22.00			22.00			19.00		19.00		22.00	
		60	5300		22.00			22.00			19.00		19.00		22.00	
		64	5320		22.00			22.00			19.00		19.00		22.00	
	802.11be-EHT40 MCS0	54	5270		22.00			22.00			19.00		19.00		22.00	
		62	5310		21.00			21.00			18.00		18.00		21.00	
	802.11be-EHT80 MCS0	58	5290		21.00			21.00			18.00		18.00		21.00	
	802.11be-EHT160 MCS0	50	5250		18.00			18.00			15.00		15.00		18.00	

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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	22.90	23.00	97.62	22.60	23.00	97.62							
		116	5580	22.70	23.00		22.50	23.00								
		124	5620	23.00	23.00		22.70	23.00								
		132	5660	22.80	23.00		22.40	23.00								
		140	5700	22.70	23.00		22.70	23.00								
		144	5720	22.60	23.00		22.80	23.00								
	802.11n-HT20 MCS0	100	5500	Not Required	23.00	Not Required	Not Required	23.00	Not Required	19.50	20.00	19.40	20.00	22.46	23.00	98.50
		116	5580		23.00			23.00		19.60	20.00	19.40	20.00	22.51	23.00	
		124	5620		23.00			23.00		20.00	20.00	19.30	20.00	22.67	23.00	
		132	5660		23.00			23.00		19.90	20.00	19.50	20.00	22.71	23.00	
		140	5700		23.00			23.00		19.80	20.00	19.50	20.00	22.66	23.00	
		144	5720		23.00			23.00		19.80	20.00	19.60	20.00	22.71	23.00	
	802.11n-HT40 MCS0	102	5510		22.00			22.00		Not Required	19.00	Not Required	19.00	Not Required	22.00	Not Required
		110	5550		22.00			22.00			19.00		19.00		22.00	
		126	5630		22.00			22.00			19.00		19.00		22.00	
		134	5670		22.00			22.00			19.00		19.00		22.00	
		142	5710		22.00			22.00			19.00		19.00		22.00	
	802.11ac-VHT80 MCS0	106	5530		22.00			22.00			19.00		19.00		22.00	
		122	5610		22.00			22.00			19.00		19.00		22.00	
		138	5690		22.00			22.00			19.00		19.00		22.00	
	802.11ac-VHT160 MCS0	114	5570		19.00			19.00			16.00		16.00		19.00	
	802.11ax-HE20 MCS0	100	5500		23.00			23.00			20.00		20.00		23.00	
		116	5580		23.00			23.00			20.00		20.00		23.00	
		124	5620		23.00			23.00			20.00		20.00		23.00	
		132	5660		23.00			23.00			20.00		20.00		23.00	
		140	5700		23.00			23.00			20.00		20.00		23.00	
		144	5720		23.00			23.00			20.00		20.00		23.00	
	802.11ax-HE40 MCS0	102	5510		22.00			22.00			19.00		19.00		22.00	
		110	5550		22.00			22.00			19.00		19.00		22.00	
		126	5630		22.00			22.00			19.00		19.00		22.00	
		134	5670		22.00			22.00			19.00		19.00		22.00	
		142	5710		22.00			22.00			19.00		19.00		22.00	
	802.11ax-HE80 MCS0	106	5530		22.00			22.00			19.00		19.00		22.00	
		122	5610		22.00			22.00			19.00		19.00		22.00	
		138	5690		22.00			22.00			19.00		19.00		22.00	
	802.11ax-HE160 MCS0	114	5570		19.00			19.00			16.00		16.00		19.00	
	802.11be-EHT20 MCS0	100	5500		23.00			23.00			20.00		20.00		23.00	
		116	5580		23.00			23.00			20.00		20.00		23.00	
		124	5620		23.00			23.00			20.00		20.00		23.00	
		132	5660		23.00			23.00			20.00		20.00		23.00	
		140	5700		23.00			23.00			20.00		20.00		23.00	
		144	5720		23.00			23.00			20.00		20.00		23.00	
	802.11be-EHT40 MCS0	102	5510		22.00			22.00			19.00		19.00		22.00	
		110	5550		22.00			22.00			19.00		19.00		22.00	
		126	5630		22.00			22.00			19.00		19.00		22.00	
		134	5670		22.00			22.00			19.00		19.00		22.00	
		142	5710		22.00			22.00			19.00		19.00		22.00	
	802.11be-EHT80 MCS0	106	5530		22.00			22.00			19.00		19.00		22.00	
		122	5610		22.00			22.00			19.00		19.00		22.00	
		138	5690		22.00			22.00			19.00		19.00		22.00	
	802.11be-EHT160 MCS0	114	5570		19.00			19.00			16.00		16.00		19.00	

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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	23.00	Not Required	Not Required	23.00	Not Required							
		157	5785		23.00			23.00								
		165	5825		23.00			23.00								
	802.11n-HT20 MCS0	149	5745		23.00			23.00		Not Required	20.00	Not Required	20.00	Not Required	23.00	Not Required
		157	5785		23.00			23.00			20.00		20.00		23.00	
		165	5825		23.00			23.00			20.00		20.00		23.00	
	802.11n-HT40 MCS0	151	5755	22.80	23.00	98.76	22.80	23.00	98.76	19.80	20.00	19.70	20.00	22.76	23.00	98.76
		159	5795	22.90	23.00		22.90	23.00		19.80	20.00	19.80	20.00	22.81	23.00	
	802.11ac-VHT80 MCS0	155	5775	Not Required	22.00	Not Required	Not Required	22.00	Not Required	Not Required	19.00	Not Required	19.00	Not Required	22.00	Not Required
	802.11ax-HE20 MCS0	149	5745		23.00			23.00			20.00		20.00		23.00	
		157	5785		23.00			23.00			20.00		20.00		23.00	
		165	5825		23.00			23.00			20.00		20.00		23.00	
	802.11ax-HE40 MCS0	151	5755		23.00			23.00			20.00		20.00		23.00	
		159	5795		23.00			23.00			20.00		20.00		23.00	
	802.11ax-HE80 MCS0	155	5775		22.00			22.00			19.00		19.00		22.00	
	802.11be-EHT20 MCS0	149	5745		23.00			23.00			20.00		20.00		23.00	
		157	5785		23.00			23.00			20.00		20.00		23.00	
		165	5825		23.00			23.00			20.00		20.00		23.00	
	802.11be-EHT40 MCS0	151	5755		23.00			23.00			20.00		20.00		23.00	
		159	5795		23.00			23.00			20.00		20.00		23.00	
	802.11be-EHT80 MCS0	155	5775		23.00			23.00			20.00		20.00		23.00	

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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	21.00	Not Required	Not Required	21.00	Not Required							
		173	5865		21.00			21.00								
		177	5885		21.00			21.00								
	802.11n-HT20 MCS0	169	5845		21.00			21.00		Not Required	18.00	Not Required	18.00	Not Required	21.00	Not Required
		173	5865		21.00			21.00			18.00		18.00		21.00	
		177	5885		21.00			21.00			18.00		18.00		21.00	
	802.11n-HT40 MCS0	167	5835	22.43	23.00	98.76	22.80	23.00	98.76	19.30	20.00	19.70	20.00	22.51	23.00	98.76
		175	5875	22.53	23.00		22.90	23.00		19.40	20.00	19.60	20.00	22.51	23.00	
	802.11ac-VHT80 MCS0	171	5855	22.41	23.00	98.76	22.64	23.00	98.76	19.60	20.00	19.70	20.00	22.66	23.00	98.76
	802.11ac-VHT160 MCS0	163	5815	Not Required	21.00	Not Required	Not Required	21.00	Not Required	Not Required	18.00	Not Required	18.00	Not Required	21.00	Not Required
	802.11ax-HE20 MCS0	169	5845		21.00			21.00			18.00		18.00		21.00	
		173	5865		21.00			21.00			18.00		18.00		21.00	
		177	5885		21.00			21.00			18.00		18.00		21.00	
	802.11ax-HE40 MCS0	167	5835		23.00			23.00			20.00		20.00		23.00	
		175	5875		23.00			23.00			20.00		20.00		23.00	
	802.11ax-HE80 MCS0	171	5855		23.00			23.00			20.00		20.00		23.00	
	802.11ax-HE160 MCS0	163	5815		21.00			21.00			18.00		18.00		21.00	
	802.11be-EHT20 MCS0	169	5845		21.00			21.00			18.00		18.00		21.00	
		173	5865		21.00			21.00			18.00		18.00		21.00	
		177	5885		21.00			21.00			18.00		18.00		21.00	
	802.11be-EHT40 MCS0	167	5835		23.00			23.00			20.00		20.00		23.00	
		175	5875		23.00			23.00			20.00		20.00		23.00	
	802.11be-EHT80 MCS0	171	5855		23.00			23.00			20.00		20.00		23.00	
	802.11be-EHT160 MCS0	163	5815		21.00			21.00			18.00		18.00		21.00	

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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 %
WLAN 6GHz (LPI)	802.11ax-HE20 MCS0	1	5955	Not Required	6.00	Not Required	Not Required	6.00	Not Required	Not Required	3.00	Not Required	3.00	Not Required	6.00	Not Required
		57	6235		6.00			6.00			3.00		3.00		6.00	
		113	6515		6.00			6.00			3.00		3.00		6.00	
		173	6815		6.00			6.00			3.00		3.00		6.00	
		233	7115		2.00			2.00			-1.00		-1.00		2.00	
	802.11ax-HE40 MCS0	3	5965		9.00			9.00			6.00		6.00		9.00	
		59	6245		9.00			9.00			6.00		6.00		9.00	
		107	6485		9.00			9.00			6.00		6.00		9.00	
		171	6805		9.00			9.00			6.00		6.00		9.00	
		227	7085		9.00			9.00			6.00		6.00		9.00	
	802.11ax-HE80 MCS0	7	5985		12.00			12.00			9.00		9.00		12.00	
		71	6305		12.00			12.00			9.00		9.00		12.00	
		119	6545		12.00			12.00			9.00		9.00		12.00	
		167	6785		12.00			12.00			9.00		9.00		12.00	
		215	7025		12.00			12.00			9.00		9.00		12.00	
	802.11ax-HE160 MCS0	15	6025		15.00			15.00			12.00		12.00		15.00	
		47	6185		15.00			15.00			12.00		12.00		15.00	
		111	6505		15.00			15.00			12.00		12.00		15.00	
		143	6665		15.00			15.00			12.00		12.00		15.00	
		207	6985		15.00			15.00			12.00		12.00		15.00	
	802.11be-EHT20 MCS0	1	5955		6.00			6.00			3.00		3.00		6.00	
		57	6235		6.00			6.00			3.00		3.00		6.00	
		113	6515		6.00			6.00			3.00		3.00		6.00	
		173	6815		6.00			6.00			3.00		3.00		6.00	
		233	7115		2.00			2.00			-1.00		-1.00		2.00	
	802.11be-EHT40 MCS0	3	5965		9.00			9.00			6.00		6.00		9.00	
		59	6245		9.00			9.00			6.00		6.00		9.00	
		107	6485		9.00			9.00			6.00		6.00		9.00	
		171	6805		9.00			9.00			6.00		6.00		9.00	
		227	7085		9.00			9.00			6.00		6.00		9.00	
	802.11be-EHT80 MCS0	7	5985		12.00			12.00			9.00		9.00		12.00	
		71	6305		12.00			12.00			9.00		9.00		12.00	
		119	6545		12.00			12.00			9.00		9.00		12.00	
		167	6785		12.00			12.00			9.00		9.00		12.00	
		215	7025		12.00			12.00			9.00		9.00		12.00	
	802.11be-EHT160 MCS0	15	6025		15.00			15.00			12.00		12.00		15.00	
		47	6185		15.00			15.00			12.00		12.00		15.00	
		111	6505		15.00			15.00			12.00		12.00		15.00	
		143	6665		15.00			15.00			12.00		12.00		15.00	
		207	6985		15.00			15.00			12.00		12.00		15.00	
	802.11be-EHT320 MCS0	31	6105	17.80	18.00	98.84	17.90	18.00	98.76	14.40	15.00	14.90	15.00	17.67	18.00	98.84
		63	6265	17.10	18.00		17.90	18.00		14.30	15.00	14.60	15.00	17.46	18.00	
		95	6425	17.60	18.00		17.50	18.00		14.30	15.00	14.50	15.00	17.41	18.00	
		127	6585	17.50	18.00		17.40	18.00		14.40	15.00	14.20	15.00	17.31	18.00	
		159	6745	17.90	18.00		17.70	18.00		14.80	15.00	14.70	15.00	17.76	18.00	
		191	6905	17.00	18.00		16.80	18.00		14.60	15.00	14.80	15.00	17.71	18.00	

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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 %
WLAN 6GHz (SP)	802.11ax-HE20 MCS0	1	5955	Not Required	23.00	Not Required	Not Required	23.00	Not Required	Not Required	20.00	Not Required	20.00	Not Required	23.00	Not Required
		57	6235		23.00			23.00			20.00		20.00		23.00	
		173	6815		23.00			23.00			20.00		20.00		23.00	
	802.11ax-HE40 MCS0	3	5965		23.00			23.00			20.00		20.00		23.00	
		59	6245		23.00			23.00			20.00		20.00		23.00	
		171	6805		23.00			23.00			20.00		20.00		23.00	
	802.11ax-HE80 MCS0	7	5985	22.70	23.00	98.76	22.90	23.00	98.76	19.60	20.00	19.80	20.00	22.71	23.00	98.76
		71	6305	22.10	23.00		22.50	23.00		19.30	20.00	19.50	20.00	22.41	23.00	
		119	6545	22.40	23.00		22.39	23.00		19.31	20.00	19.35	20.00	22.34	23.00	
		167	6785	22.30	23.00		22.40	23.00		19.40	20.00	19.80	20.00	22.61	23.00	
	802.11ax-HE160 MCS0	15	6025	Not Required	22.00	Not Required	Not Required	22.00	Not Required	Not Required	19.00	Not Required	19.00	Not Required	22.00	Not Required
		47	6185		22.00			22.00			19.00		19.00		22.00	
		143	6665		22.00			22.00			19.00		19.00		22.00	
	802.11be-EHT20 MCS0	1	5955		23.00			23.00			20.00		20.00		23.00	
		57	6235		23.00			23.00			20.00		20.00		23.00	
		173	6815		23.00			23.00			20.00		20.00		23.00	
	802.11be-EHT40 MCS0	3	5965		23.00			23.00			20.00		20.00		23.00	
		59	6245		23.00			23.00			20.00		20.00		23.00	
		171	6805		23.00			23.00			20.00		20.00		23.00	
	802.11be-EHT80 MCS0	7	5985		23.00			23.00			20.00		20.00		23.00	
		71	6305		23.00			23.00			20.00		20.00		23.00	
		167	6785		23.00			23.00			20.00		20.00		23.00	
	802.11be-EHT160 MCS0	15	6025		22.00			22.00			19.00		19.00		22.00	
		47	6185		22.00			22.00			19.00		19.00		22.00	
		143	6665		22.00			22.00			19.00		19.00		22.00	
	802.11be-EHT320 MCS0	31	6105		19.00			19.00			16.00		16.00		19.00	
		63	6265		19.00			19.00			16.00		16.00		19.00	

<Sensor ON>

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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 %
2.4GHz WLAN	802.11b 1Mbps	1	2412	20.70	21.00	97.66	18.00	18.50	97.62							
		6	2437	20.60	21.00		18.00	18.50								
		11	2462	20.90	21.00		18.20	18.50								
		12	2467	20.80	21.00		18.10	18.50								
		13	2472	18.80	19.00		18.10	18.50								
	802.11g 6Mbps	1	2412	Not Required	21.00	Not Required	Not Required	18.50	Not Required							
		6	2437		21.00			18.50								
		11	2462		21.00			18.50								
		12	2467		17.00			17.00								
		13	2472		14.50			14.50								
	802.11n-HT20 MCS0	1	2412		21.00			18.50		Not Required	15.50	Not Required	15.50	Not Required	18.50	98.00
		6	2437		21.00			18.50			18.00		18.00		21.00	
		11	2462		21.00			18.50			18.00		18.00		21.00	
		12	2467		17.00			17.00			14.00		14.00		17.00	
		13	2472		14.50			14.50			11.50		11.50		14.50	
	802.11n-HT40 MCS0	3	2422		21.00			18.50		17.60	18.00	17.50	18.00	20.56	21.00	98.00
		6	2437		21.00			18.50		17.70	18.00	17.70	18.00	20.71	21.00	
		9	2452		21.00			18.50		17.60	18.00	17.50	18.00	20.56	21.00	
		10	2457		16.00			16.00		12.80	13.00	12.60	13.00	15.71	16.00	
		11	2462		13.00			13.00		9.90	10.00	9.70	10.00	12.81	13.00	
	802.11ax-HE20 MCS0	1	2412		21.00			18.50		Not Required	18.00	Not Required	18.00	Not Required	21.00	Not Required
		6	2437		21.00			18.50			18.00		18.00		21.00	
		11	2462		21.00			18.50			18.00		18.00		21.00	
		12	2467		17.00			17.00			14.00		14.00		17.00	
		13	2472		14.50			14.50			11.50		11.50		14.50	
	802.11ax-HE40 MCS0	3	2422		21.00			18.50			18.00		18.00		21.00	
		6	2437		21.00			18.50			18.00		18.00		21.00	
		9	2452		21.00			18.50			18.00		18.00		21.00	
		10	2457		16.00			16.00			13.00		13.00		16.00	
		11	2462		13.00			13.00			10.00		10.00		13.00	
	802.11be-EHT20 MCS0	1	2412		21.00			18.50			18.00		18.00		21.00	
		6	2437		21.00			18.50			18.00		18.00		21.00	
		11	2462		21.00			18.50			18.00		18.00		21.00	
		12	2467		17.00			17.00			14.00		14.00		17.00	
		13	2472		14.50			14.50			11.50		11.50		14.50	
	802.11be-EHT40 MCS0	3	2422		21.00			18.50			18.00		18.00		21.00	
		6	2437		21.00			18.50			18.00		18.00		21.00	
		9	2452		21.00			18.50			18.00		18.00		21.00	
		10	2457		16.00			16.00			13.00		13.00		16.00	
		11	2462		13.00			13.00			10.00		10.00		13.00	

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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	10.50	Not Required	Not Required	11.50	Not Required							
		40	5200		10.50			11.50								
		44	5220		10.50			11.50								
		48	5240		10.50			11.50								
	802.11n-HT20 MCS0	36	5180		10.50			11.50		Not Required	8.50	Not Required	8.50	Not Required	11.50	Not Required
		40	5200		10.50			11.50			8.50		8.50		11.50	
		44	5220		10.50			11.50			8.50		8.50		11.50	
		48	5240		10.50			11.50			8.50		8.50		11.50	
	802.11n-HT40 MCS0	38	5190		10.50			11.50			8.50		8.50		11.50	
		46	5230		10.50			11.50			8.50		8.50		11.50	
	802.11ac-VHT80 MCS0	42	5210		10.50			11.50			8.50		8.50		11.50	
	802.11ax-HE20 MCS0	36	5180		10.50			11.50			8.50		8.50		11.50	
		40	5200		10.50			11.50			8.50		8.50		11.50	
		44	5220		10.50			11.50			8.50		8.50		11.50	
		48	5240		10.50			11.50			8.50		8.50		11.50	
	802.11ax-HE40 MCS0	38	5190		10.50			11.50			8.50		8.50		11.50	
		46	5230		10.50			11.50			8.50		8.50		11.50	
	802.11ax-HE80 MCS0	42	5210		10.50			11.50			8.50		8.50		11.50	
	802.11be-EHT20 MCS0	36	5180		10.50			11.50			8.50		8.50		11.50	
		40	5200		10.50			11.50			8.50		8.50		11.50	
		44	5220		10.50			11.50			8.50		8.50		11.50	
		48	5240		10.50			11.50			8.50		8.50		11.50	
	802.11be-EHT40 MCS0	38	5190		10.50			11.50			8.50		8.50		11.50	
		46	5230		10.50			11.50			8.50		8.50		11.50	
	802.11be-EHT80 MCS0	42	5210		10.50			11.50			8.50		8.50		11.50	

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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	10.50	Not Required	Not Required	11.50	Not Required							
		56	5280		10.50			11.50								
		60	5300		10.50			11.50								
		64	5320		10.50			11.50								
	802.11n-HT20 MCS0	52	5260		10.50			11.50		Not Required	8.50	Not Required	8.50	Not Required	11.50	Not Required
		56	5280		10.50			11.50			8.50		8.50		11.50	
		60	5300		10.50			11.50			8.50		8.50		11.50	
		64	5320		10.50			11.50			8.50		8.50		11.50	
	802.11n-HT40 MCS0	54	5270		10.50			11.50			8.50		8.50		11.50	
		62	5310		10.50			11.50			8.50		8.50		11.50	
	802.11ac-VHT80 MCS0	58	5290	10.35	10.50	98.76	11.30	11.50	98.76	8.10	8.50	8.20	8.50	11.16	11.50	98.76
	802.11ac-VHT160 MCS0	50	5250	10.45	10.50	98.75	11.40	11.50	98.68	8.20	8.50	8.25	8.50	11.21	11.50	98.75
	802.11ax-HE20 MCS0	52	5260	Not Required	10.50	Not Required	Not Required	11.50	Not Required	Not Required	8.50	Not Required	8.50	Not Required	11.50	Not Required
		56	5280		10.50			11.50			8.50		8.50		11.50	
		60	5300		10.50			11.50			8.50		8.50		11.50	
		64	5320		10.50			11.50			8.50		8.50		11.50	
	802.11ax-HE40 MCS0	54	5270		10.50			11.50			8.50		8.50		11.50	
		62	5310		10.50			11.50			8.50		8.50		11.50	
	802.11ax-HE80 MCS0	58	5290		10.50			11.50			8.50		8.50		11.50	
	802.11ax-HE160 MCS0	50	5250		10.50			11.50			8.50		8.50		11.50	
	802.11be-EHT20 MCS0	52	5260		10.50			11.50			8.50		8.50		11.50	
		56	5280		10.50			11.50			8.50		8.50		11.50	
		60	5300		10.50			11.50			8.50		8.50		11.50	
		64	5320		10.50			11.50			8.50		8.50		11.50	
	802.11be-EHT40 MCS0	54	5270		10.50			12.00			8.50		8.50		11.50	
		62	5310		10.50			12.00			8.50		8.50		11.50	
	802.11be-EHT80 MCS0	58	5290		10.50			12.00			8.50		8.50		11.50	
	802.11be-EHT160 MCS0	50	5250		10.50			12.00			8.50		8.50		11.50	

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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	12.50	Not Required	Not Required	10.50	Not Required							
		116	5580		12.50			10.50								
		124	5620		12.50			10.50								
		132	5660		12.50			10.50								
		140	5700		12.50			10.50								
		144	5720		12.50			10.50								
	802.11n-HT20 MCS0	100	5500		12.50			10.50		Not Required	9.50	Not Required	9.50	Not Required	12.50	Not Required
		116	5580		12.50			10.50			9.50		9.50		12.50	
		124	5620		12.50			10.50			9.50		9.50		12.50	
		132	5660		12.50			10.50			9.50		9.50		12.50	
		140	5700		12.50			10.50			9.50		9.50		12.50	
		144	5720		12.50			10.50			9.50		9.50		12.50	
	802.11n-HT40 MCS0	102	5510		12.50			10.50			9.50		9.50		12.50	
		110	5550		12.50			10.50			9.50		9.50		12.50	
		126	5630		12.50			10.50			9.50		9.50		12.50	
		134	5670		12.50			10.50			9.50		9.50		12.50	
		142	5710		12.50			10.50			9.50		9.50		12.50	
	802.11ac-VHT80 MCS0	106	5530	12.20	12.50	98.76	10.10	10.50	98.83	9.40	9.50	9.50	9.50	12.46	12.50	98.83
		122	5610	12.30	12.50		10.20	10.50		9.30	9.50	9.50	9.50	12.41	12.50	
		138	5690	12.30	12.50		10.30	10.50		9.30	9.50	9.50	9.50	12.41	12.50	
	802.11ac-VHT160 MCS0	114	5570	12.20	12.50	98.75	10.20	10.50	98.68	9.40	9.50	9.50	9.50	12.46	12.50	98.68
	802.11ax-HE20 MCS0	100	5500	Not Required	12.50	Not Required	Not Required	10.50	Not Required	Not Required	9.50	Not Required	9.50	Not Required	12.50	Not Required
		116	5580		12.50			10.50			9.50		9.50		12.50	
		124	5620		12.50			10.50			9.50		9.50		12.50	
		132	5660		12.50			10.50			9.50		9.50		12.50	
		140	5700		12.50			10.50			9.50		9.50		12.50	
		144	5720		12.50			10.50			9.50		9.50		12.50	
	802.11ax-HE40 MCS0	102	5510		12.50			10.50			9.50		9.50		12.50	
		110	5550		12.50			10.50			9.50		9.50		12.50	
		126	5630		12.50			10.50			9.50		9.50		12.50	
		134	5670		12.50			10.50			9.50		9.50		12.50	
		142	5710		12.50			10.50			9.50		9.50		12.50	
	802.11ax-HE80 MCS0	106	5530		12.50			10.50			9.50		9.50		12.50	
		122	5610		12.50			10.50			9.50		9.50		12.50	
		138	5690		12.50			10.50			9.50		9.50		12.50	
	802.11ax-HE160 MCS0	114	5570		12.50			10.50			9.50		9.50		12.50	
	802.11be-EHT20 MCS0	100	5500		12.50			10.50			9.50		9.50		12.50	
		116	5580		12.50			10.50			9.50		9.50		12.50	
		124	5620		12.50			10.50			9.50		9.50		12.50	
		132	5660		12.50			10.50			9.50		9.50		12.50	
		140	5700		12.50			10.50			9.50		9.50		12.50	
		144	5720		12.50			10.50			9.50		9.50		12.50	
	802.11be-EHT40 MCS0	102	5510		12.50			10.50			9.50		9.50		12.50	
		110	5550		12.50			10.50			9.50		9.50		12.50	
		126	5630		12.50			10.50			9.50		9.50		12.50	
		134	5670		12.50			10.50			9.50		9.50		12.50	
		142	5710		12.50			10.50			9.50		9.50		12.50	
	802.11be-EHT80 MCS0	106	5530		12.50			10.50			9.50		9.50		12.50	
		122	5610		12.50			10.50			9.50		9.50		12.50	
		138	5690		12.50			10.50			9.50		9.50		12.50	
	802.11be-EHT160 MCS0	114	5570		12.50			10.50			9.50		9.50		12.50	

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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	12.50	Not Required	Not Required	12.00	Not Required							
		157	5785		12.50			12.00								
		165	5825		12.50			12.00								
	802.11n-HT20 MCS0	149	5745		12.50			12.00		Not Required	9.50	Not Required	9.50	Not Required	12.50	Not Required
		157	5785		12.50			12.00			9.50		9.50		12.50	
		165	5825		12.50			12.00			9.50		9.50		12.50	
	802.11n-HT40 MCS0	151	5755	12.30	12.50	98.76	11.60	12.00	98.76	9.20	9.50	9.10	9.50	12.16	12.50	98.76
		159	5795	12.40	12.50		11.70	12.00		9.00	9.50	8.80	9.50	11.91	12.50	
	802.11ac-VHT80 MCS0	155	5775	12.40	12.50	98.76	11.80	12.00	98.83	9.20	9.50	9.20	9.50	12.21	12.50	98.83
	802.11ax-HE20 MCS0	149	5745	Not Required	12.50	Not Required	Not Required	12.00	Not Required	Not Required	9.50	Not Required	9.50	Not Required	12.50	Not Required
		157	5785		12.50			12.00			9.50		9.50		12.50	
		165	5825		12.50			12.00			9.50		9.50		12.50	
	802.11ax-HE40 MCS0	151	5755		12.50			12.00			9.50		9.50		12.50	
		159	5795		12.50			12.00			9.50		9.50		12.50	
	802.11ax-HE80 MCS0	155	5775		12.50			12.00			9.50		9.50		12.50	
	802.11be-EHT20 MCS0	149	5745		12.50			12.00			9.50		9.50		12.50	
		157	5785		12.50			12.00			9.50		9.50		12.50	
		165	5825		12.50			12.00			9.50		9.50		12.50	
	802.11be-EHT40 MCS0	151	5755		12.50			12.00			9.50		9.50		12.50	
		159	5795		12.50			12.00			9.50		9.50		12.50	
	802.11be-EHT80 MCS0	155	5775		12.50			12.00			9.50		9.50		12.50	

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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	12.50	Not Required	Not Required	12.00	Not Required							
		173	5865		12.50			12.00								
		177	5885		12.50			12.00								
	802.11n-HT20 MCS0	169	5845		12.50			12.00		Not Required	9.50	Not Required	9.50	Not Required	12.50	Not Required
		173	5865		12.50			12.00			9.50		9.50		12.50	
		177	5885		12.50			12.00			9.50		9.50		12.50	
	802.11n-HT40 MCS0	167	5835		12.50			12.00			9.50		9.50		12.50	
		175	5875		12.50			12.00			9.50		9.50		12.50	
	802.11ac-VHT80 MCS0	171	5855	12.30	12.50	98.76	11.80	12.00	98.83	8.80	9.50	9.20	9.50	12.01	12.50	98.83
	802.11ac-VHT160 MCS0	163	5815	12.40	12.50	98.75	11.70	12.00	98.68	8.90	9.50	9.30	9.50	12.11	12.50	98.68
	802.11ax-HE20 MCS0	169	5845	Not Required	12.50	Not Required	Not Required	12.00	Not Required	Not Required	9.50	Not Required	9.50	Not Required	12.50	Not Required
		173	5865		12.50			12.00			9.50		9.50		12.50	
		177	5885		12.50			12.00			9.50		9.50		12.50	
	802.11ax-HE40 MCS0	167	5835		12.50			12.00			9.50		9.50		12.50	
		175	5875		12.50			12.00			9.50		9.50		12.50	
	802.11ax-HE80 MCS0	171	5855		12.50			12.00			9.50		9.50		12.50	
	802.11ax-HE160 MCS0	163	5815		12.50			12.00			9.50		9.50		12.50	
	802.11be-EHT20 MCS0	169	5845		12.50			12.00			9.50		9.50		12.50	
		173	5865		12.50			12.00			9.50		9.50		12.50	
		177	5885		12.50			12.00			9.50		9.50		12.50	
	802.11be-EHT40 MCS0	167	5835		12.50			12.00			9.50		9.50		12.50	
		175	5875		12.50			12.00			9.50		9.50		12.50	
	802.11be-EHT80 MCS0	171	5855		12.50			12.00			9.50		9.50		12.50	
	802.11be-EHT160 MCS0	163	5815		12.50			12.00			9.50		9.50		12.50	

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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 %
WLAN 6GHz (LPI)	802.11ax-HE20 MCS0	1	5955	Not Required	6.00	Not Required	Not Required	6.00	Not Required	Not Required	3.00	Not Required	3.00	Not Required	6.00	Not Required
		57	6235		6.00			6.00			3.00		3.00		6.00	
		113	6515		6.00			6.00			3.00		3.00		6.00	
		173	6815		6.00			6.00			3.00		3.00		6.00	
		233	7115		2.00			2.00			-1.00		-1.00		2.00	
	802.11ax-HE40 MCS0	3	5965		9.00			9.00			6.00		6.00		9.00	
		59	6245		9.00			9.00			6.00		6.00		9.00	
		107	6485		9.00			9.00			6.00		6.00		9.00	
		171	6805		9.00			9.00			6.00		6.00		9.00	
		227	7085		9.00			9.00			6.00		6.00		9.00	
	802.11ax-HE80 MCS0	7	5985		11.50			11.00			8.50		8.50		11.50	
		71	6305		11.50			11.00			8.50		8.50		11.50	
		119	6545		11.50			11.00			8.50		8.50		11.50	
		167	6785		11.50			11.00			8.50		8.50		11.50	
		215	7025		11.50			11.00			8.50		8.50		11.50	
	802.11ax-HE160 MCS0	15	6025		11.50			11.00			8.50		8.50		11.50	
		47	6185		11.50			11.00			8.50		8.50		11.50	
		111	6505		11.50			11.00			8.50		8.50		11.50	
		143	6665		11.50			11.00			8.50		8.50		11.50	
		207	6985		11.50			11.00			8.50		8.50		11.50	
	802.11be-EHT20 MCS0	1	5955		6.00			6.00			3.00		3.00		6.00	
		57	6235		6.00			6.00			3.00		3.00		6.00	
		113	6515		6.00			6.00			3.00		3.00		6.00	
		173	6815		6.00			6.00			3.00		3.00		6.00	
		233	7115		2.00			2.00			-1.00		-1.00		2.00	
	802.11be-EHT40 MCS0	3	5965		9.00			9.00			6.00		6.00		9.00	
		59	6245		9.00			9.00			6.00		6.00		9.00	
		107	6485		9.00			9.00			6.00		6.00		9.00	
		171	6805		9.00			9.00			6.00		6.00		9.00	
		227	7085		9.00			9.00			6.00		6.00		9.00	
	802.11be-EHT80 MCS0	7	5985		11.50			11.00			8.50		8.50		11.50	
		71	6305		11.50			11.00			8.50		8.50		11.50	
		119	6545		11.50			11.00			8.50		8.50		11.50	
		167	6785		11.50			11.00			8.50		8.50		11.50	
		215	7025		11.50			11.00			8.50		8.50		11.50	
	802.11be-EHT160 MCS0	15	6025		11.50			11.00			8.50		8.50		11.50	
		47	6185		11.50			11.00			8.50		8.50		11.50	
		111	6505		11.50			11.00			8.50		8.50		11.50	
		143	6665		11.50			11.00			8.50		8.50		11.50	
		207	6985		11.50			11.00			8.50		8.50		11.50	
	802.11be-EHT320 MCS0	31	6105	11.40	11.50	98.84	10.90	11.00	98.76	7.60	8.50	8.40	8.50	11.03	11.50	98.84
		63	6265	11.20	11.50		10.80	11.00		7.40	8.50	8.20	8.50	10.83	11.50	
		95	6425	11.30	11.50		10.70	11.00		7.50	8.50	8.00	8.50	10.77	11.50	
		127	6585	11.40	11.50		10.80	11.00		7.70	8.50	7.70	8.50	10.71	11.50	
		159	6745	11.30	11.50		10.90	11.00		8.00	8.50	8.10	8.50	11.06	11.50	
		191	6905	11.20	11.50		10.90	11.00		8.00	8.50	8.20	8.50	11.11	11.50	

				Main Ant			Aux Ant			MIMO-Main		MIMO-Aux		MIMO		
	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 %
WLAN 6GHz (SP)	802.11ax-HE20 MCS0	1	5955	Not Required	11.50	Not Required	Not Required	11.00	Not Required	Not Required	8.50	Not Required	8.50	Not Required	11.50	Not Required
		57	6235		11.50			11.00			8.50		8.50		11.50	
		173	6815		11.50			11.00			8.50		8.50		11.50	
	802.11ax-HE40 MCS0	3	5965		11.50			11.00			8.50		8.50		11.50	
		59	6245		11.50			11.00			8.50		8.50		11.50	
		171	6805		11.50			11.00			8.50		8.50		11.50	
	802.11ax-HE80 MCS0	7	5985		11.50			11.00			8.50		8.50		11.50	
		71	6305		11.50			11.00			8.50		8.50		11.50	
		167	6785		11.50			11.00			8.50		8.50		11.50	
	802.11ax-HE160 MCS0	15	6025		11.50			11.00			8.50		8.50		11.50	
		47	6185		11.50			11.00			8.50		8.50		11.50	
		143	6665		11.50			11.00			8.50		8.50		11.50	
	802.11be-EHT20 MCS0	1	5955		11.50			11.00			8.50		8.50		11.50	
		57	6235		11.50			11.00			8.50		8.50		11.50	
		173	6815		11.50			11.00			8.50		8.50		11.50	
	802.11be-EHT40 MCS0	3	5965		11.50			11.00			8.50		8.50		11.50	
		59	6245		11.50			11.00			8.50		8.50		11.50	
		171	6805		11.50			11.00			8.50		8.50		11.50	
	802.11be-EHT80 MCS0	7	5985		11.50			11.00			8.50		8.50		11.50	
		71	6305		11.50			11.00			8.50		8.50		11.50	
		167	6785		11.50			11.00			8.50		8.50		11.50	
	802.11be-EHT160 MCS0	15	6025		11.50			11.00			8.50		8.50		11.50	
		47	6185		11.50			11.00			8.50		8.50		11.50	
		143	6665		11.50			11.00			8.50		8.50		11.50	
	802.11be-EHT320 MCS0	31	6105	11.40	11.50	98.84	10.90	11.00	98.76	7.60	8.50	8.40	8.50	11.03	11.50	98.84
		63	6265	11.20	11.50		10.80	11.00		7.40	8.50	8.20	8.50	10.83	11.50	
		127	6585	11.40	11.50		10.80	11.00		7.70	8.50	7.70	8.50	10.71	11.50	
		159	6745	11.30	11.50		10.90	11.00		8.00	8.50	8.10	8.50	11.06	11.50	

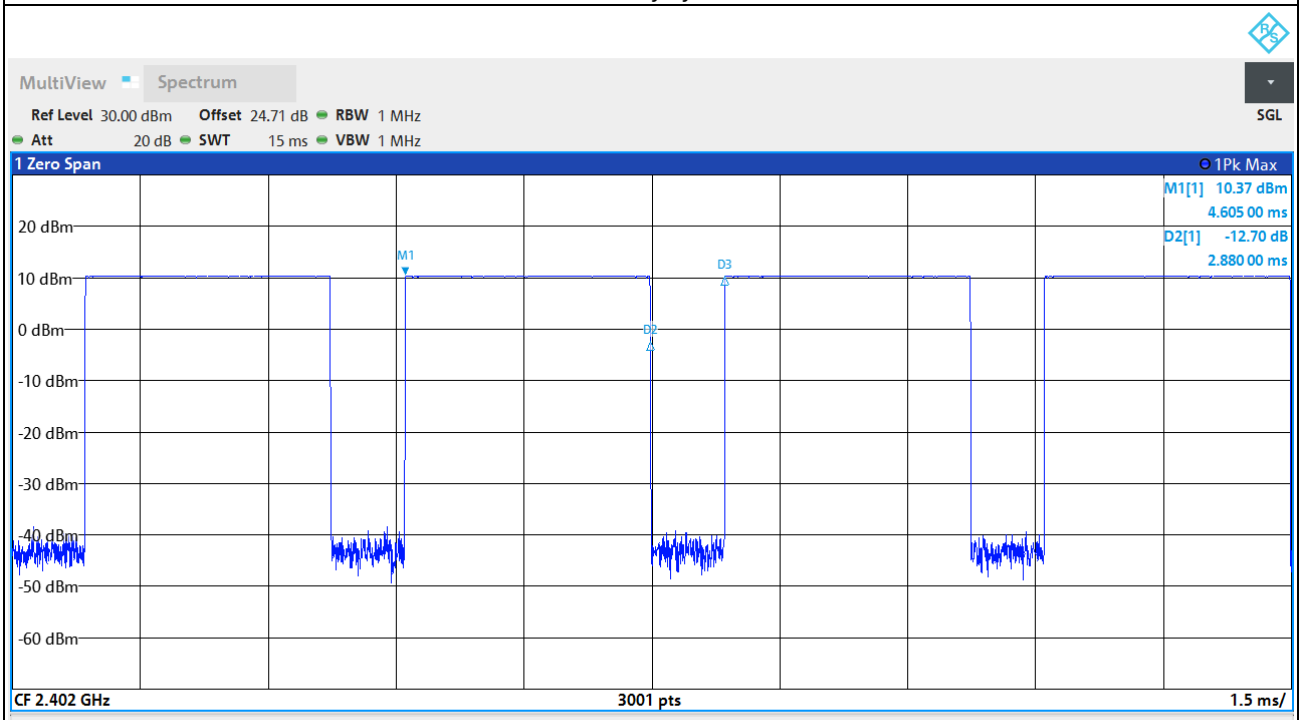
<2.4GHz Bluetooth>

				Aux Ant		
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
Bluetooth	BR / EDR 1Mbps	0	2402	14.80	15.00	76.80
		39	2441	14.60	15.00	
		78	2480	14.50	15.00	
	BR / EDR 2Mbps	0	2402	Not Required	15.00	Not Required
		39	2441		15.00	
		78	2480		15.00	
	BR / EDR 3Mbps	0	2402		15.00	
		39	2441		15.00	
		78	2480		15.00	
	LE 1Mbps	0	2402		15.00	
		19	2440		15.00	
		39	2480		15.00	
	LE 2Mbps	0	2402		15.00	
		19	2440		15.00	
		39	2480		15.00	

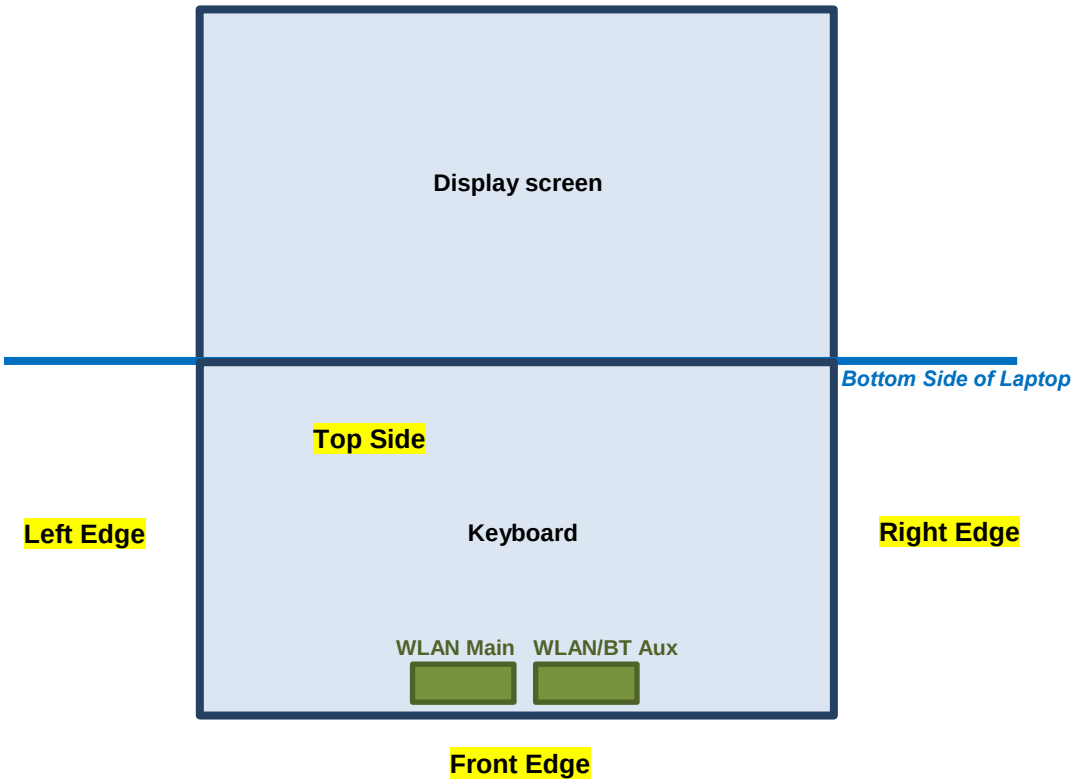
General Note:

1. For 2.4GHz Bluetooth SAR testing was selected 1Mbps due to its highest average power and duty cycle is 76.80% considered in SAR testing, and the duty cycle would be scaled to theoretical 83.3% in reported SAR calculation.

BT Duty cycle



12. Antenna Location



The separation distance for antenna to edge :

Antenna	To Bottom Side (mm)
WLAN/Main	10
WLAN/BT Aux	10

<SAR test exclusion table>

General Note:

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

Exposure Position	Wireless Interface	BT Aux	2.4GHz WLAN Main	2.4GHz WLAN Aux	2.4GHz WLAN Main+Aux	5/6GHz WLAN Main	5/6GHz WLAN Aux	5/6GHz WLAN Main+Aux
	Calculated Frequency (MHz)	2480	2472	2472	2472	7115	7115	7115
	Maximum power (dBm)	15.0	23.0	23.0	19.0	23.0	23.0	23.0
	Maximum rated power(mW)	31.62	199.53	199.53	79.43	199.53	199.53	199.53
Bottom Side	Separation distance(mm)	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	exclusion threshold	5.0	31.4	31.4	12.5	53.2	53.2	53.2
	Testing required?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

13. SAR Test Results

General Note:

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

WLAN Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. 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.
3. 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.
4. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
5. 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
6. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

WLAN PD Note:

1. The WiFi 6E PD was performed according 2020 TCB workshop RF Exposure 5G RFX Policies Interim Procedures.
2. First, evaluate SAR using 6-7 GHz parameters per IEC/IEEE 62209-1528:2020 and evaluate incident PD using the mmw near-field probe and total-field/power-density reconstruction method.
3. Per Interim Procedures. The power density results were scaled according to IEC 62479:2010 for the portion of the measurement uncertainty > 30%. Total expanded uncertainty of 2.68 dB (85.4%) was used to determine the psPD measurement scaling factor
4. The manufacturer has confirmed that the devices tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
5. The WiFi 6E RF Exposure results are used for simultaneous transmission analysis with the other transmitters and total exposure ratio, the analysis can be found in this report section 14.
6. Absorbed power density (APD) using a 4cm2 averaging area is reported based on SAR measurements.
7. Power density was calculated by repeated E-field measurements on two measurement planes separated by λ/4.
8. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools.
9. The measurement procedure consists of measuring the PDinc at two different distances: 2 mm (compliance distance) and λ/5. The grid extents should be large enough to fully capture the transmitted energy. The grid step should be fine enough to demonstrate that the integrated Power Density iPDn fulfill the criterion described below. Since iPD ratio between the two distances is ≥ -1dB, the grid step (0.0625) was sufficient for determining compliance at d=2mm.

$$10 \cdot log_{10} \frac{iPD_n(2mm)}{iPD_n(\lambda/5)} \geq -1$$

13.1 Body SAR

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Antenna Vendor	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Bottom Side	28mm	Main	OFF	11	2462	WNC	22.64	23.00	1.086	97.66	1.024	0.02	0.048	0.053
01	WLAN2.4GHz	802.11b 1Mbps	Bottom Side	0mm	Main	ON	11	2462	WNC	20.90	21.00	1.023	97.66	1.024	-0.03	0.599	0.628
	WLAN2.4GHz	802.11b 1Mbps	Bottom Side	0mm	Main	ON	1	2412	WNC	20.70	21.00	1.072	97.66	1.024	0.05	0.562	0.617
	WLAN2.4GHz	802.11b 1Mbps	Bottom Side	0mm	Main	ON	6	2437	WNC	20.60	21.00	1.096	97.66	1.024	0.011	0.550	0.618
	WLAN2.4GHz	802.11b 1Mbps	Bottom Side	0mm	Main	ON	12	2467	WNC	20.80	21.00	1.047	97.66	1.024	0.05	0.576	0.618
	WLAN2.4GHz	802.11b 1Mbps	Bottom Side	0mm	Main	ON	13	2472	WNC	18.80	19.00	1.047	97.66	1.024	0.13	0.398	0.427
	WLAN2.4GHz	802.11b 1Mbps	Bottom Side	0mm	Main	ON	11	2462	Auden	20.90	21.00	1.023	97.66	1.024	0.18	0.298	0.312
	WLAN2.4GHz	802.11b 1Mbps	Bottom Side	28mm	Aux	OFF	6	2437	WNC	22.74	23.00	1.062	97.62	1.024	0.1	0.051	0.055
	WLAN2.4GHz	802.11b 1Mbps	Bottom Side	0mm	Aux	ON	11	2462	WNC	18.20	18.50	1.072	97.62	1.024	-0.02	0.539	0.591
	WLAN2.4GHz	802.11b 1Mbps	Bottom Side	0mm	Aux	ON	11	2462	Auden	18.20	18.50	1.072	97.62	1.024	-0.13	0.388	0.426
	WLAN2.4GHz	802.11n-HT20 MCS0	Bottom Side	28mm	Main+Aux (Main)	OFF	11	2462	WNC	18.50	19.00	1.122	98	1.020	0.02	0.001	0.001
	WLAN2.4GHz	802.11n-HT20 MCS0	Bottom Side	28mm	Main+Aux (Aux)	OFF	11	2462	WNC	18.30	19.00	1.175	98	1.020	0.02	0.001	0.001
	WLAN2.4GHz	802.11n-HT40 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	6	2437	WNC	17.70	18.00	1.072	98	1.020	0.07	0.361	0.395
	WLAN2.4GHz	802.11n-HT40 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	6	2437	WNC	17.70	18.00	1.072	98	1.020	0.07	0.391	0.427
	WLAN2.4GHz	802.11n-HT40 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	6	2437	Auden	17.70	18.00	1.072	98	1.020	0.13	0.285	0.311
	WLAN2.4GHz	802.11n-HT40 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	6	2437	Auden	17.70	18.00	1.072	98	1.020	0.13	0.339	0.371

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Antenna Vendor	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)
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Side	28mm	Main	OFF	54	5270	WNC	21.30	22.00	1.175	98.76	1.013	0.01	0.189	0.225
02	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main	ON	50	5250	WNC	10.45	10.50	1.012	98.75	1.013	0.02	0.416	0.426
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main	ON	50	5250	Auden	10.45	10.50	1.012	98.75	1.013	0.15	0.225	0.231
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Side	28mm	Aux	OFF	54	5270	WNC	21.20	22.00	1.202	98.76	1.013	0.13	0.066	0.080
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Aux	ON	50	5250	WNC	11.40	11.50	1.023	98.68	1.013	-0.17	0.114	0.118
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Aux	ON	50	5250	Auden	11.40	11.50	1.023	98.68	1.013	0.15	0.084	0.087
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Side	28mm	Main+Aux (Main)	OFF	54	5270	WNC	18.40	19.00	1.148	98.76	1.013	0.11	0.150	0.174
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Side	28mm	Main+Aux (Aux)	OFF	54	5270	WNC	18.40	19.00	1.148	98.76	1.013	0.11	0.103	0.120
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	50	5250	WNC	8.20	8.50	1.072	98.75	1.013	0.02	0.168	0.182
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	50	5250	WNC	8.25	8.50	1.059	98.75	1.013	0.02	0.105	0.113
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	50	5250	Auden	8.20	8.50	1.072	98.75	1.013	0.13	0.140	0.152
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	50	5250	Auden	8.25	8.50	1.059	98.75	1.013	0.13	0.088	0.094
	WLAN5GHz	802.11a 6Mbps	Bottom Side	28mm	Main	OFF	124	5620	WNC	23.00	23.00	1.000	97.62	1.024	0.06	0.279	0.286
03	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main	ON	114	5570	WNC	12.20	12.50	1.072	98.75	1.013	-0.03	0.414	0.449
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main	ON	114	5570	Auden	12.20	12.50	1.072	98.75	1.013	-0.19	0.275	0.298
	WLAN5GHz	802.11a 6Mbps	Bottom Side	28mm	Aux	OFF	144	5720	WNC	22.80	23.00	1.047	97.62	1.024	-0.19	0.148	0.159
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Aux	ON	114	5570	WNC	10.20	10.50	1.072	98.68	1.013	-0.04	0.152	0.165
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Aux	ON	114	5570	Auden	10.20	10.50	1.072	98.68	1.013	-0.14	0.125	0.136
	WLAN5GHz	802.11n-HT20 MCS0	Bottom Side	28mm	Main+Aux (Main)	OFF	132	5660	WNC	19.90	20.00	1.023	98.5	1.015	0.08	0.128	0.133
	WLAN5GHz	802.11n-HT20 MCS0	Bottom Side	28mm	Main+Aux (Aux)	OFF	132	5660	WNC	19.50	20.00	1.122	98.5	1.015	0.08	0.073	0.083
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	114	5570	WNC	9.40	9.50	1.023	98.68	1.013	-0.08	0.143	0.148
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	114	5570	WNC	9.50	9.50	1.000	98.68	1.013	-0.08	0.088	0.089
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	114	5570	Auden	9.40	9.50	1.023	98.68	1.013	-0.07	0.130	0.135
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	114	5570	Auden	9.50	9.50	1.000	98.68	1.013	-0.07	0.081	0.082
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Side	28mm	Main	OFF	159	5795	WNC	22.90	23.00	1.023	98.76	1.013	-0.05	0.262	0.272
04	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom Side	0mm	Main	ON	155	5775	WNC	12.40	12.50	1.023	98.76	1.013	-0.02	0.293	0.304
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom Side	0mm	Main	ON	155	5775	Auden	12.40	12.50	1.023	98.76	1.013	0.04	0.266	0.276
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Side	28mm	Aux	OFF	159	5795	WNC	22.90	23.00	1.023	98.76	1.013	-0.1	0.129	0.134
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom Side	0mm	Aux	ON	155	5775	WNC	11.80	12.00	1.047	98.83	1.012	-0.05	0.142	0.150
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom Side	0mm	Aux	ON	155	5775	Auden	11.80	12.00	1.047	98.83	1.012	0.03	0.128	0.136
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Side	28mm	Main+Aux (Main)	OFF	159	5795	WNC	19.80	20.00	1.047	98.76	1.013	0.08	0.122	0.129
	WLAN5GHz	802.11n-HT40 MCS0	Bottom Side	28mm	Main+Aux (Aux)	OFF	159	5795	WNC	19.80	20.00	1.047	98.76	1.013	0.08	0.070	0.074
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	155	5775	WNC	9.20	9.50	1.072	98.83	1.012	0.11	0.138	0.150
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	155	5775	WNC	9.20	9.50	1.072	98.83	1.012	0.11	0.080	0.087
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	155	5775	Auden	9.20	9.50	1.072	98.83	1.012	0.18	0.129	0.140
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	155	5775	Auden	9.20	9.50	1.072	98.83	1.012	0.18	0.078	0.085
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom Side	28mm	Main	OFF	171	5855	WNC	22.41	23.00	1.146	98.76	1.013	-0.07	0.222	0.258
05	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main	ON	163	5815	WNC	12.40	12.50	1.023	98.75	1.013	-0.01	0.347	0.360
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main	ON	163	5815	Auden	12.40	12.50	1.023	98.75	1.013	-0.13	0.254	0.263
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom Side	28mm	Aux	OFF	171	5855	WNC	22.64	23.00	1.086	98.76	1.013	-0.19	0.152	0.167
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Aux	ON	163	5815	WNC	11.70	12.00	1.072	98.68	1.013	0.03	0.178	0.193
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Aux	ON	163	5815	Auden	11.70	12.00	1.072	98.68	1.013	-0.03	0.165	0.179
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom Side	28mm	Main+Aux (Main)	OFF	171	5855	WNC	19.60	20.00	1.096	98.76	1.013	0.01	0.100	0.111
	WLAN5GHz	802.11ac-VHT80 MCS0	Bottom Side	28mm	Main+Aux (Aux)	OFF	171	5855	WNC	19.70	20.00	1.072	98.76	1.013	0.01	0.059	0.064
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	163	5815	WNC	8.90	9.50	1.148	98.68	1.013	-0.01	0.122	0.142
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	163	5815	WNC	9.30	9.50	1.047	98.68	1.013	-0.01	0.078	0.083
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	163	5815	Auden	8.90	9.50	1.148	98.68	1.013	0.05	0.119	0.138
	WLAN5GHz	802.11ac-VHT160 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	163	5815	Auden	9.30	9.50	1.047	98.68	1.013	0.05	0.075	0.080

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Antenna Vendor	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)	Measured APD (W/m^2)	Reported APD (W/m^2)
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main	OFF	7	5985	WNC	22.70	23.00	1.072	98.76	1.013	0.1	0.161	0.175	1.03	1.118
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main	OFF	71	6305	WNC	22.10	23.00	1.230	98.76	1.013	0.08	0.132	0.165	0.844	1.052
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main	OFF	119	6545	WNC	22.40	23.00	1.148	98.76	1.013	0.01	0.142	0.165	0.908	1.056
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main	OFF	167	6785	WNC	22.30	23.00	1.175	98.76	1.013	0.03	0.145	0.173	0.927	1.103
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	28mm	Main	OFF	191	6905	WNC	17.00	18.00	1.259	98.84	1.012	-0.08	0.028	0.036	0.179	0.228
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main	ON	63	6265	WNC	11.20	11.50	1.072	98.84	1.012	-0.17	0.171	0.185	1.3	1.410
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main	ON	31	6105	WNC	11.40	11.50	1.023	98.84	1.012	-0.13	0.175	0.181	1.02	1.056
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main	ON	95	6425	WNC	11.30	11.50	1.047	98.84	1.012	0	0.115	0.122	0.89	0.943
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main	ON	127	6585	WNC	11.40	11.50	1.023	98.84	1.012	0.13	0.112	0.116	0.9	0.932
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main	ON	159	6745	WNC	11.30	11.50	1.047	98.84	1.012	-0.13	0.132	0.140	1.05	1.113
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main	ON	191	6905	WNC	11.20	11.50	1.072	98.84	1.012	-0.15	0.078	0.085	0.58	0.629
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main	ON	63	6265	Auden	11.20	11.50	1.072	98.84	1.012	0.02	0.169	0.183	1.25	1.355
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Aux	OFF	7	5985	WNC	22.90	23.00	1.023	98.76	1.013	0.08	0.100	0.104	1.05	1.088
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Aux	OFF	71	6305	WNC	22.50	23.00	1.122	98.76	1.013	0.1	0.092	0.105	0.966	1.098
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Aux	OFF	119	6545	WNC	22.39	23.00	1.151	98.76	1.013	-0.18	0.088	0.103	0.924	1.077
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Aux	OFF	167	6785	WNC	22.40	23.00	1.148	98.76	1.013	0.1	0.079	0.092	0.829	0.964
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	28mm	Aux	OFF	191	6905	WNC	16.80	18.00	1.318	98.76	1.013	0.12	0.009	0.012	0.092	0.123
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Aux	ON	31	6105	WNC	10.90	11.00	1.023	98.76	1.013	-0.1	0.136	0.141	1.26	1.306
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Aux	ON	63	6265	WNC	10.80	11.00	1.047	98.76	1.013	-0.15	0.125	0.133	1.11	1.177
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Aux	ON	95	6425	WNC	10.70	11.00	1.072	98.76	1.013	0.08	0.154	0.167	1.36	1.476
06	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Aux	ON	127	6585	WNC	10.80	11.00	1.047	98.76	1.013	0.03	0.195	0.207	1.72	1.824
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Aux	ON	159	6745	WNC	10.90	11.00	1.023	98.76	1.013	0.17	0.153	0.159	1.32	1.368
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Aux	ON	191	6905	WNC	10.90	11.00	1.023	98.76	1.013	0.19	0.148	0.153	1.3	1.348
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Aux	ON	127	6585	Auden	10.80	11.00	1.047	98.76	1.013	-0.17	0.132	0.140	1.11	1.177
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Main)	OFF	7	5985	WNC	19.60	20.00	1.096	98.76	1.013	0.08	0.052	0.058	0.587	0.652
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Aux)	OFF	7	5985	WNC	19.80	20.00	1.047	98.76	1.013	0.08	0.036	0.038	0.493	0.523
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Main)	OFF	71	6305	WNC	19.30	20.00	1.175	98.76	1.013	-0.17	0.041	0.049	0.462	0.550
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Aux)	OFF	71	6305	WNC	19.50	20.00	1.122	98.76	1.013	-0.17	0.028	0.032	0.316	0.359
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Main)	OFF	119	6545	WNC	19.31	20.00	1.172	98.76	1.013	0.14	0.043	0.051	0.485	0.576
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Aux)	OFF	119	6545	WNC	19.35	20.00	1.161	98.76	1.013	0.14	0.030	0.035	0.338	0.398
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Main)	OFF	167	6785	WNC	19.40	20.00	1.148	98.76	1.013	0.11	0.042	0.049	0.474	0.551
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Aux)	OFF	167	6785	WNC	19.80	20.00	1.047	98.76	1.013	0.11	0.026	0.028	0.2935	0.311
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	28mm	Main+Aux (Main)	OFF	191	6905	WNC	14.60	15.00	1.096	98.84	1.012	-0.17	0.001	0.001	<0.001	<0.001
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	28mm	Main+Aux (Aux)	OFF	191	6905	WNC	14.80	15.00	1.047	98.84	1.012	-0.17	0.001	0.001	<0.001	<0.001
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	191	6905	WNC	8.00	8.50	1.122	98.84	1.012	0.11	0.135	0.153	1.19	1.351
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	191	6905	WNC	8.20	8.50	1.072	98.84	1.012	0.11	0.126	0.137	1.08	1.171
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	31	6105	WNC	7.60	8.50	1.230	98.84	1.012	0.05	0.142	0.177	1.15	1.432
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	31	6105	WNC	8.40	8.50	1.023	98.84	1.012	0.05	0.125	0.129	1.31	1.357
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	63	6265	WNC	7.40	8.50	1.288	98.84	1.012	0.13	0.130	0.169	0.869	1.133
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	63	6265	WNC	8.20	8.50	1.072	98.84	1.012	0.13	0.117	0.127	1.24	1.345
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	95	6425	WNC	7.50	8.50	1.259	98.84	1.012	0	0.145	0.185	0.94	1.198
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	95	6425	WNC	8.00	8.50	1.122	98.84	1.012	0	0.125	0.142	0.517	0.587
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	127	6585	WNC	7.70	8.50	1.202	98.84	1.012	-0.01	0.155	0.189	1.2	1.460
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	127	6585	WNC	7.70	8.50	1.202	98.84	1.012	-0.01	0.147	0.179	0.96	1.168
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	159	6745	WNC	8.00	8.50	1.122	98.84	1.012	0.02	0.131	0.149	1.1	1.249
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	159	6745	WNC	8.10	8.50	1.096	98.84	1.012	0.02	0.113	0.125	0.987	1.095
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main+Aux (Main)	ON	127	6585	Auden	7.70	8.50	1.202	98.84	1.012	-0.05	0.140	0.170	1.15	1.399
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	0mm	Main+Aux (Aux)	ON	127	6585	Auden	7.70	8.50	1.202	98.84	1.012	-0.05	0.130	0.158	0.752	0.915

<Bluetooth SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Power Reduction	Ch.	Freq. (MHz)	Antenna Vendor	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)
07	Bluetooth	1Mbps	Bottom Side	0mm	Aux	OFF	0	2402	WNC	14.80	15.00	1.047	76.8	1.085	-0.07	0.106	0.120
	Bluetooth	1Mbps	Bottom Side	0mm	Aux	OFF	0	2402	Auden	14.80	15.00	1.047	76.8	1.085	-0.06	0.101	0.115

13.2 6GHz PD Test Result

Band	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Antenna Vendor	Grid Step (λ)	iPDn	iPD ratio (≥ -1)	Normal psPD (W/m^2)	Total psPD (W/m^2)
WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main	31	6105	WNC	0.0625	3.2	0.533635428	2.92	3.51
WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	9.82mm	Main	31	6105	WNC	0.25	2.83		1.4	1.69
WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main	191	6905	WNC	0.0625	1.98	-0.97786491	1.13	1.25
WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	8.69mm	Main	191	6905	WNC	0.25	2.48		0.825	0.904

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Antenna Vendor	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Grid Step (λ)	Scaling Factor for Measurement Uncertainty	Power Drift (dB)	Normal psPD (W/m^2)	Scaled Normal psPD (W/m^2)	Total psPD (W/m^2)	Scaled Total psPD (W/m^2)
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main	WNC	7	5985	22.70	23.00	1.072	98.76	1.013	0.0625	1.5535	-0.03	2.5	4.22	3.01	5.08
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main	WNC	71	6305	22.10	23.00	1.230	98.76	1.013	0.0625	1.5535	0.08	1.8	3.48	2.22	4.30
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main	WNC	119	6545	22.40	23.00	1.148	98.76	1.013	0.0625	1.5535	-0.07	1.81	3.27	2.21	3.99
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main	WNC	167	6785	22.30	23.00	1.175	98.76	1.013	0.0625	1.5535	0.05	1.92	3.55	2.38	4.40
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	28mm	Main	WNC	191	6905	17.00	18.00	1.259	98.84	1.012	0.0625	1.5535	-0.11	0.54	1.07	0.653	1.29
01	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main	WNC	31	6105	11.40	11.50	1.023	98.84	1.012	0.0625	1.5535	-0.01	2.92	4.70	3.51	5.65
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main	WNC	63	6265	11.20	11.50	1.072	98.84	1.012	0.0625	1.5535	0.02	2.11	3.55	2.8	4.72
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main	WNC	95	6425	11.30	11.50	1.047	98.84	1.012	0.0625	1.5535	-0.08	1.57	2.58	1.72	2.83
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main	WNC	127	6585	11.40	11.50	1.023	98.84	1.012	0.0625	1.5535	-0.1	1.91	3.07	2.56	4.12
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main	WNC	159	6745	11.30	11.50	1.047	98.84	1.012	0.0625	1.5535	0.18	1.57	2.58	2.08	3.42
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main	WNC	191	6905	11.20	11.50	1.072	98.84	1.012	0.0625	1.5535	-0.06	1.13	1.90	1.25	2.11
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main	Auden	31	6105	11.40	11.50	1.023	98.84	1.012	0.0625	1.5535	0.03	1.27	2.04	1.4	2.25
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Aux	WNC	7	5985	22.90	23.00	1.023	98.76	1.013	0.0625	1.5535	0.03	1.45	2.34	1.58	2.54
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Aux	WNC	71	6305	22.50	23.00	1.122	98.76	1.013	0.0625	1.5535	-0.16	1.02	1.80	1.12	1.98
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Aux	WNC	119	6545	22.39	23.00	1.151	98.76	1.013	0.0625	1.5535	-0.02	1.22	2.21	1.33	2.41
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Aux	WNC	167	6785	22.40	23.00	1.148	98.76	1.013	0.0625	1.5535	0.15	1.05	1.90	1.2	2.17
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	28mm	Aux	WNC	191	6905	16.80	18.00	1.318	98.76	1.013	0.0625	1.5535	-0.09	0.3	0.62	0.325	0.67
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Aux	WNC	31	6105	10.90	11.00	1.023	98.76	1.013	0.0625	1.5535	-0.02	2.06	3.32	2.2	3.54
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Aux	WNC	63	6265	10.80	11.00	1.047	98.76	1.013	0.0625	1.5535	0.04	2.13	3.51	2.44	4.02
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Aux	WNC	95	6425	10.70	11.00	1.072	98.76	1.013	0.0625	1.5535	-0.05	1.97	3.32	2.11	3.56
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Aux	WNC	127	6585	10.80	11.00	1.047	98.76	1.013	0.0625	1.5535	-0.04	2.33	3.84	2.58	4.25
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Aux	WNC	159	6745	10.90	11.00	1.023	98.76	1.013	0.0625	1.5535	0.06	1.62	2.61	1.77	2.85
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Aux	WNC	191	6905	10.90	11.00	1.023	98.76	1.013	0.0625	1.5535	0.09	2.23	3.59	2.42	3.90
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Aux	Auden	127	6585	10.80	11.00	1.047	98.76	1.013	0.0625	1.5535	-0.06	1.74	2.87	1.9	3.13
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Main)	WNC	7	5985	19.60	20.00	1.096	98.76	1.013	0.0625	1.5535	-0.05	1.43	2.47	1.62	2.80
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Aux)	WNC	7	5985	19.80	20.00	1.047	98.76	1.013	0.0625	1.5535	-0.05	0.925	1.52	1.01	1.66
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Main)	WNC	71	6305	19.30	20.00	1.175	98.76	1.013	0.0625	1.5535	0.16	1.11	2.05	1.23	2.27
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Aux)	WNC	71	6305	19.50	20.00	1.122	98.76	1.013	0.0625	1.5535	0.16	0.693	1.22	0.752	1.33
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Main)	WNC	119	6545	19.31	20.00	1.172	98.76	1.013	0.0625	1.5535	0.05	0.999	1.84	1.09	2.01
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Aux)	WNC	119	6545	19.35	20.00	1.161	98.76	1.013	0.0625	1.5535	0.05	0.785	1.43	0.87	1.59
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Main)	WNC	167	6785	19.40	20.00	1.148	98.76	1.013	0.0625	1.5535	-0.15	0.963	1.74	1.03	1.86
	WLAN6GHz	802.11ax-HE80 MCS0	Bottom Side	28mm	Main+Aux (Aux)	WNC	167	6785	19.80	20.00	1.047	98.76	1.013	0.0625	1.5535	-0.15	0.638	1.05	0.693	1.14
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	28mm	Main+Aux (Main)	WNC	191	6905	14.60	15.00	1.096	98.84	1.012	0.0625	1.5535	0.07	0.475	0.82	0.523	0.90
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	28mm	Main+Aux (Aux)	WNC	191	6905	14.80	15.00	1.047	98.84	1.012	0.0625	1.5535	0.07	0.115	0.19	0.13	0.21
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main+Aux (Main)	WNC	191	6905	8.00	8.50	1.122	98.84	1.012	0.0625	1.5535	0.13	0.852	1.50	0.932	1.64

	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main+Aux (Aux)	WNC	191	6905	8.20	8.50	1.072	98.84	1.012	0.0625	1.5535	0.13	0.48	0.81	0.523	0.88
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main+Aux (Main)	WNC	31	6105	7.60	8.50	1.230	98.84	1.012	0.0625	1.5535	0.02	0.811	1.57	0.893	1.73
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main+Aux (Aux)	WNC	31	6105	8.40	8.50	1.023	98.84	1.012	0.0625	1.5535	0.02	0.293	0.47	0.321	0.52
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main+Aux (Main)	WNC	63	6265	7.40	8.50	1.288	98.84	1.012	0.0625	1.5535	-0.03	0.622	1.26	0.678	1.37
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main+Aux (Aux)	WNC	63	6265	8.20	8.50	1.072	98.84	1.012	0.0625	1.5535	-0.03	0.114	0.19	0.125	0.21
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main+Aux (Main)	WNC	95	6425	7.50	8.50	1.259	98.84	1.012	0.0625	1.5535	0	0.696	1.38	0.752	1.49
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main+Aux (Aux)	WNC	95	6425	8.00	8.50	1.122	98.84	1.012	0.0625	1.5535	0	0.112	0.20	0.133	0.23
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main+Aux (Main)	WNC	127	6585	7.70	8.50	1.202	98.84	1.012	0.0625	1.5535	-0.01	0.711	1.34	0.763	1.44
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main+Aux (Aux)	WNC	127	6585	7.70	8.50	1.202	98.84	1.012	0.0625	1.5535	-0.01	0.135	0.26	0.183	0.35
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main+Aux (Main)	WNC	159	6745	8.00	8.50	1.122	98.84	1.012	0.0625	1.5535	-0.04	0.825	1.46	0.896	1.58
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main+Aux (Aux)	WNC	159	6745	8.10	8.50	1.096	98.84	1.012	0.0625	1.5535	-0.04	0.283	0.49	0.315	0.54
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main+Aux (Main)	Auden	127	6585	7.70	8.50	1.202	98.84	1.012	0.0625	1.5535	-0.17	0.725	1.37	0.812	1.53
	WLAN6GHz	802.11be-EHT320 MCS0	Bottom Side	2mm	Main+Aux (Aux)	Auden	127	6585	7.70	8.50	1.202	98.84	1.012	0.0625	1.5535	-0.17	0.269	0.51	0.293	0.55

14. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Body
1.	WLAN2.4GHz Main + Bluetooth Aux	Yes
2.	WLAN5/6GHz Main + Bluetooth Aux	Yes
3.	WLAN5/6GHz Aux + Bluetooth Aux	Yes
4.	WLAN5/6GHz Main+Aux + Bluetooth Aux	Yes
5.	WLAN2.4GHz Main+Aux	Yes

General Note:

1. 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.
2. The Scaled SAR summation is calculated based on the same configuration and test position.
3. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/kg.
   ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$, where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
   iii) If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.

14.1 Body Exposure Conditions

Exposure Position	1	2	3	4	7	6	5	1+7 Summed 1g SAR (W/kg)	6 Summed 1g SAR (W/kg)	5+7 Summed 1g SAR (W/kg)	3+7 Summed 1g SAR (W/kg)	4+7 Summed 1g SAR (W/kg)
	WLAN2.4GHz Main	WLAN2.4GHz Aux	WLAN5/6GHz Main	WLAN5/6GHz Aux	Bluetooth Aux	WLAN2.4GHz Main+Aux	WLAN5/6GHz Main+Aux					
	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)					
Bottom Side at 0mm	0.628	0.591	0.449	0.207	0.120	0.427	0.189	**0.748**	**0.427**	**0.309**	**0.569**	**0.327**

Test Engineer： Jimmy Lu, Dennis Hsieh and Elio Wei

15. Uncertainty Assessment

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.

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in table below.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[(a)]	1/k[(b)]	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

The judgment of conformity in the report is based on the measurement results excluding the measurement uncertainty.

Applicable for SAR Measurements:

Uncertainty Budget (4 MHz - 10 GHz range)							
Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	18.60	N	2	1	1	9.3	9.3
Axial Isotropy	4.70	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.60	R	1.732	0.7	0.7	3.9	3.9
Linearity	4.70	R	1.732	1	1	2.7	2.7
Modulation Response	4.68	R	1.732	1	1	2.7	2.7
System Detection Limits	1.00	R	1.732	1	1	0.6	0.6
Boundary Effects	2.00	R	1.732	1	1	1.2	1.2
Readout Electronics	0.30	N	1	1	1	0.3	0.3
Response Time	0.00	R	1.732	1	1	0.0	0.0
Integration Time	2.60	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.00	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.00	R	1.732	1	1	1.7	1.7
Probe Positioner	0.40	R	1.732	1	1	0.2	0.2
Probe Positioning	6.70	R	1.732	1	1	3.9	3.9
Post-processing	4.00	R	1.732	1	1	2.3	2.3
Test Sample Related							
Device Holder	3.60	N	1	1	1	3.6	3.6
Test sample Positioning	3.03	N	1	1	1	3.0	3.0
Power Scaling	0.00	R	1.732	1	1	0.0	0.0
Power Drift	5.00	R	1.732	1	1	2.9	2.9
Phantom and Setup							
Phantom Uncertainty	7.60	R	1.732	1	1	4.4	4.4
SAR correction	0.00	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.03	N	1	0.78	0.77	0.0	0.0
Liquid Conductivity (target)	5.00	R	1.732	0.78	0.77	2.3	2.2
Liquid Conductivity (mea.)	2.50	R	1.732	0.78	0.77	1.1	1.1
Temp. unc. - Conductivity	3.68	R	1.732	0.78	0.77	1.7	1.6
Liquid Permittivity Repeatability	0.02	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.00	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.50	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.84	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						14.5%	14.2%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						29.0%	28.4%

Applicable for Power Density Measurements:

Error Description	Uncertainty Value (±dB)	Probability	Divisor	(Ci)	Standard Uncertainty (±dB)
Probe Calibration	0.49	N	1	1	0.49
Probe correction	0.00	R	1.732	1	0.00
Frequency response (BW ≤ 1 GHz)	0.20	R	1.732	1	0.12
Sensor cross coupling	0.00	R	1.732	1	0.00
Isotropy	0.50	R	1.732	1	0.29
Linearity	0.20	R	1.732	1	0.12
Probe scattering	0.00	R	1.732	1	0.00
Probe positioning offset	0.30	R	1.732	1	0.17
Probe positioning repeatability	0.04	R	1.732	1	0.02
Sensor mechanical offset	0.00	R	1.732	1	0.00
Probe spatial resolution	0.00	R	1.732	1	0.00
Field impedance dependance	0.00	R	1.732	1	0.00
Amplitude and phase drift	0.00	R	1.732	1	0.00
Amplitude and phase noise	0.04	R	1.732	1	0.02
Measurement area truncation	0.00	R	1.732	1	0.00
Data acquisition	0.03	N	1	1	0.03
Sampling	0.00	R	1.732	1	0.00
Field reconstruction	2.00	R	1.732	1	1.15
Forward transformation	0.00	R	1.732	1	0.00
Power density scaling	0.00	R	1.732	1	0.00
Spatial averaging	0.10	R	1.732	1	0.06
System detection limit	0.04	R	1.732	1	0.02
Uncertainty terms dep endent on the DUT and environmental factors					
Probe coupling with DUT	0.00	R	1.732	1	0.0
Modulation response	0.40	R	1.732	1	0.2
Integration time	0.00	R	1.732	1	0.0
Response time	0.00	R	1.732	1	0.0
Device holder influence	0.10	R	1.732	1	0.1
DUT alignment	0.00	R	1.732	1	0.0
RF ambient conditions	0.04	R	1.732	1	0.0
Ambient reflections	0.04	R	1.732	1	0.0
Immunity / secondary reception	0.00	R	1.732	1	0.0
Drift of the DUT		R	1.732	1	
Combined Std. Uncertainty					1.34
Expanded STD Uncertainty (95%)					**2.68**

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

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

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

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

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

[9] IEC/IEEE 62209-1528:2020, “Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Part 1528: Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 GHz)”, Oct. 2020

[10] SPEAG DASY6 System Handbook

[11] SPEAG DASY6 Application Note (Interim Procedure for Device Operation at 6GHz-10GHz)