

10.4 Phablet/Extremity and APD (Absorbed Power Density) Results

Per FCC KDB Publication 648474 D04 Handset SAR, Phablet SAR tests were not required when Hotspot 1g SAR (scaled to maximum output power including tolerance) < 1.2 W/kg.

Table 11.4.1 UNII Phablet/Extremity SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	10g SAR [W/kg]	Scaling Factor	Scaling Factor (Duty Cycle)	10g Scaled SAR [W/kg]	Plots #
MHz	Ch														
5 270.0	54	802.11n (Ant.8)	14.50	14.46	-0.130	0 mm [Top]	FCC #2	0.048	MCS0	99.2	0.050	1.009	1.008	0.051	A49
5 270.0	54	802.11n (Ant.8)	14.50	14.46	-0.080	0 mm [Front]	FCC #2	0.148	MCS0	99.2	0.154	1.009	1.008	0.157	
5 270.0	54	802.11n (Ant.8)	14.50	14.46	0.060	0 mm [Rear]	FCC #2	0.246	MCS0	99.2	0.325	1.009	1.008	0.331	
5 270.0	54	802.11n (Ant.8)	14.50	14.46	0.180	0 mm [Right]	FCC #2	0.857	MCS0	99.2	0.932	1.009	1.008	0.948	
5 270.0	54	802.11n (Ant.8)	14.50	14.46	0.050	0 mm [Right]	FCC #2	0.743	MCS0	99.2	0.908	1.009	1.008	0.924	A50
5 270.0	54	802.11n (Ant.9)	14.50	14.43	-0.070	0 mm [Top]	FCC #2	0.015	MCS0	99.2	0.009	1.016	1.008	0.009	
5 270.0	54	802.11n (Ant.9)	14.50	14.43	0.000	0 mm [Front]	FCC #2	0.005	MCS0	99.2	0.008	1.016	1.008	0.008	
5 270.0	54	802.11n (Ant.9)	14.50	14.43	0.000	0 mm [Rear]	FCC #2	0.191	MCS0	99.2	0.219	1.016	1.008	0.224	
5 270.0	54	802.11n (Ant.9)	14.50	14.43	-0.010	0 mm [Left]	FCC #2	0.066	MCS0	99.2	0.046	1.016	1.008	0.047	A51
5 270.0	54	802.11n (Ant.9)	14.50	14.43	0.000	0 mm [Rear]	FCC #2	0.102	MCS0	99.2	0.120	1.016	1.008	0.123	
5 270.0	54	802.11n (MIMO)	17.51	17.46	-0.020	0 mm [Top]	FCC #2	0.049	MCS0	99.2	0.048	1.016	1.008	0.049	
5 270.0	54	802.11n (MIMO)	17.51	17.46	-0.060	0 mm [Front]	FCC #2	0.155	MCS0	99.2	0.157	1.016	1.008	0.161	
5 270.0	54	802.11n (MIMO)	17.51	17.46	-0.140	0 mm [Rear]	FCC #2	0.207	MCS0	99.2	0.156	1.016	1.008	0.160	A52
5 270.0	54	802.11a (MIMO)	17.51	17.46	-0.040	0 mm [Right]	FCC #2	0.766	MCS0	99.2	0.872	1.016	1.008	0.893	
5 270.0	54	802.11n (MIMO)	17.51	17.46	-0.130	0 mm [Left]	FCC #2	0.059	MCS0	99.2	0.071	1.016	1.008	0.073	
5 270.0	54	802.11n (MIMO)	17.51	17.46	-0.030	0 mm [Right]	FCC #2	0.590	MCS0	99.2	0.845	1.016	1.008	0.865	
5 510.0	102	802.11n (Ant.8)	14.00	13.90	-0.020	0 mm [Top]	FCC #2	0.067	MCS0	99.2	0.061	1.023	1.019	0.064	A53
5 510.0	102	802.11n (Ant.8)	14.00	13.90	-0.040	0 mm [Front]	FCC #2	0.180	MCS0	99.2	0.186	1.023	1.019	0.194	
5 510.0	102	802.11n (Ant.8)	14.00	13.90	-0.050	0 mm [Rear]	FCC #2	0.237	MCS0	99.2	0.220	1.023	1.019	0.229	
5 510.0	102	802.11n (Ant.8)	14.00	13.90	-0.060	0 mm [Right]	FCC #2	0.645	MCS0	99.2	0.675	1.023	1.019	0.704	
5 510.0	102	802.11n (Ant.8)	14.00	13.90	0.190	0 mm [Right]	FCC #2	0.552	MCS0	99.2	0.637	1.023	1.019	0.664	A54
5 510.0	102	802.11n (Ant.9)	14.00	13.89	0.000	0 mm [Top]	FCC #2	0.013	MCS0	99.2	0.013	1.026	1.019	0.014	
5 510.0	102	802.11n (Ant.9)	14.00	13.89	0.150	0 mm [Front]	FCC #2	0.035	MCS0	99.2	0.041	1.026	1.019	0.043	
5 510.0	102	802.11n (Ant.9)	14.00	13.89	-0.190	0 mm [Rear]	FCC #2	0.165	MCS0	99.2	0.191	1.026	1.019	0.200	
5 510.0	102	802.11n (Ant.9)	14.00	13.89	-0.080	0 mm [Left]	FCC #2	0.064	MCS0	99.2	0.061	1.026	1.019	0.064	A55
5 510.0	102	802.11n (Ant.9)	14.00	13.89	0.190	0 mm [Rear]	FCC #2	0.082	MCS0	99.2	0.097	1.026	1.019	0.101	
5 510.0	102	802.11n (MIMO)	17.01	16.91	-0.050	0 mm [Top]	FCC #2	0.069	MCS0	99.2	0.052	1.026	1.019	0.054	
5 510.0	102	802.11n (MIMO)	17.01	16.91	0.030	0 mm [Front]	FCC #2	0.145	MCS0	99.2	0.150	1.026	1.019	0.157	
5 510.0	102	802.11n (MIMO)	17.01	16.91	-0.030	0 mm [Rear]	FCC #2	0.200	MCS0	99.2	0.242	1.026	1.019	0.253	A56
5 510.0	102	802.11n (MIMO)	17.01	16.91	-0.060	0 mm [Right]	FCC #2	0.666	MCS0	99.2	0.770	1.026	1.019	0.805	
5 510.0	102	802.11n (MIMO)	17.01	16.91	-0.040	0 mm [Left]	FCC #2	0.062	MCS0	99.2	0.091	1.026	1.019	0.095	
5 510.0	102	802.11n (MIMO)	17.01	16.91	-0.040	0 mm [Right]	FCC #2	0.631	MCS0	99.2	0.632	1.026	1.019	0.661	
ANSI / IEEE C95.1-1992- SAFETY LIMIT												Phablet/Extremity			
Spatial Peak												4.0 W/kg (mW/g)			
Uncontrolled Exposure/General Population Exposure												averaged over 10 gram			
Notes: Blue entries represent Extended Pathloss measurements.															

Note: Blue entries represent Extended Battery measurements.

Table 11.4.2 UNII Phablet/Extremity SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode (Antenna)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Peak SAR of Area Scan	Data Rate [Mbps]	Duty Cycle	10g SAR [W/kg]	Scaling Factor	Scaling Factor (Duty Cycle)	10g Scaled SAR [W/kg]	Plots #
MHz	Ch														
6 665.0	143	802.11ax (Ant.8)	10.00	9.62	0.180	0 mm [Top]	FCC #2	0.040	MCS0	99.1	0.035	1.091	1.009	0.039	A55
6 665.0	143	802.11ax (Ant.8)	10.00	9.62	-0.120	0 mm [Front]	FCC #2	0.042	MCS0	99.1	0.048	1.091	1.009	0.053	
6 665.0	143	802.11ax (Ant.8)	10.00	9.62	-0.040	0 mm [Rear]	FCC #2	0.064	MCS0	99.1	0.065	1.091	1.009	0.072	
6 025.0	15	802.11ax (Ant.8)	10.00	9.56	-0.000	0 mm [Right]	FCC #2	0.302	MCS0	99.1	0.333	1.107	1.009	0.372	
6 345.0	79	802.11ax (Ant.8)	9.00	8.95	-0.010	0 mm [Right]	FCC #2	0.287	MCS0	99.1	0.332	1.012	1.009	0.339	
6 505.0	111	802.11ax (Ant.8)	9.00	8.80	-0.070	0 mm [Right]	FCC #2	0.291	MCS0	99.1	0.314	1.047	1.009	0.332	
6 665.0	143	802.11ax (Ant.8)	10.00	9.62	0.010	0 mm [Right]	FCC #2	0.216	MCS0	99.1	0.252	1.091	1.009	0.277	
6 985.0	207	802.11ax (Ant.8)	10.00	9.27	-0.100	0 mm [Right]	FCC #2	0.158	MCS0	99.1	0.165	1.183	1.009	0.197	
6 025.0	15	802.11ax (Ant.8)	10.00	9.56	-0.020	0 mm [Right]	FCC #2	0.271	MCS0	99.1	0.316	1.107	1.009	0.353	
6 665.0	143	802.11ax (Ant.9)	10.00	9.98	-0.110	0 mm [Top]	FCC #2	0.006	MCS0	99.1	0.009	1.005	1.009	0.009	A56
6 665.0	143	802.11ax (Ant.9)	10.00	9.98	-0.019	0 mm [Front]	FCC #2	0.021	MCS0	99.1	0.028	1.005	1.009	0.028	
6 665.0	143	802.11ax (Ant.9)	10.00	9.98	-0.150	0 mm [Rear]	FCC #2	0.121	MCS0	99.1	0.131	1.005	1.009	0.133	
6 025.0	15	802.11ax (Ant.9)	10.00	8.98	-0.130	0 mm [Left]	FCC #2	0.091	MCS0	99.1	0.109	1.265	1.009	0.139	
6 345.0	79	802.11ax (Ant.9)	10.00	9.88	0.190	0 mm [Left]	FCC #2	0.043	MCS0	99.1	0.055	1.028	1.009	0.057	
6 505.0	111	802.11ax (Ant.9)	10.00	9.87	-0.010	0 mm [Left]	FCC #2	0.129	MCS0	99.1	0.147	1.030	1.009	0.153	
6 665.0	143	802.11ax (Ant.9)	10.00	9.98	0.060	0 mm [Left]	FCC #2	0.148	MCS0	99.1	0.166	1.005	1.009	0.168	
6 985.0	207	802.11ax (Ant.9)	10.00	9.86	0.030	0 mm [Left]	FCC #2	0.190	MCS0	99.1	0.208	1.033	1.009	0.217	
6 985.0	207	802.11ax (Ant.9)	10.00	9.86	-0.010	0 mm [Left]	FCC #2	0.187	MCS0	99.1	0.204	1.033	1.009	0.213	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	-0.040	0 mm [Top]	FCC #2	0.035	MCS0	98.1	0.035	1.047	1.019	0.037	A57
6 665.0	143	802.11ax (MIMO)	13.01	12.81	-0.110	0 mm [Front]	FCC #2	0.041	MCS0	98.1	0.044	1.047	1.019	0.047	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	-0.010	0 mm [Rear]	FCC #2	0.132	MCS0	98.1	0.141	1.047	1.019	0.150	
6 025.0	15	802.11ax (MIMO)	13.01	12.29	0.030	0 mm [Right]	FCC #2	0.295	MCS0	98.1	0.323	1.265	1.019	0.417	
6 345.0	79	802.11ax (MIMO)	12.54	12.45	0.000	0 mm [Right]	FCC #2	0.332	MCS0	98.1	0.390	1.028	1.019	0.409	
6 505.0	111	802.11ax (MIMO)	12.54	12.38	-0.040	0 mm [Right]	FCC #2	0.363	MCS0	98.1	0.386	1.047	1.019	0.412	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	0.020	0 mm [Right]	FCC #2	0.220	MCS0	98.1	0.232	1.091	1.019	0.258	
6 985.0	207	802.11ax (MIMO)	13.01	12.59	-0.180	0 mm [Right]	FCC #2	0.161	MCS0	98.1	0.163	1.183	1.019	0.197	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	-0.150	0 mm [Left]	FCC #2	0.147	MCS0	98.1	0.167	1.047	1.019	0.178	
6 025.0	15	802.11ax (MIMO)	13.01	12.29	-0.090	0 mm [Right]	FCC #2	0.281	MCS0	98.1	0.311	1.265	1.019	0.401	
ANSI / IEEE C95.1-1992- SAFETY LIMIT												Phablet/Extremity			
Spatial Peak												4.0 W/kg (mW/g)			
Uncontrolled Exposure/General Population Exposure												averaged over 10 gram			

Note: Blue entries represent Extended Battery measurements.

Table 11.4.3 UNII Phablet/Extremity APD

MEASUREMENT RESULTS														
FREQUENCY		Mode (Antenna)	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Data Rate [Mbps]	Duty Cycle	APD [W/m² (4cm²)]	Scaling Factor	Scaling Factor (Duty Cycle)	Scaled APD [W/m² (4cm²)]	Plots #
MHz	Ch													
6 665.0	143	802.11ax (Ant.8)	10.00	9.62	0.180	0 mm [Top]	FCC #2	MCS0	99.1	0.788	1.091	1.009	0.868	
6 665.0	143	802.11ax (Ant.8)	10.00	9.62	-0.120	0 mm [Front]	FCC #2	MCS0	99.1	1.080	1.091	1.009	1.189	
6 665.0	143	802.11ax (Ant.8)	10.00	9.62	-0.040	0 mm [Rear]	FCC #2	MCS0	99.1	1.490	1.091	1.009	1.640	
6 025.0	15	802.11ax (Ant.8)	10.00	9.56	-0.000	0 mm [Right]	FCC #2	MCS0	99.1	7.790	1.107	1.009	8.702	A55
6 345.0	79	802.11ax (Ant.8)	9.00	8.95	-0.010	0 mm [Right]	FCC #2	MCS0	99.1	7.820	1.012	1.009	7.986	
6 505.0	111	802.11ax (Ant.8)	9.00	8.80	0.040	0 mm [Right]	FCC #2	MCS0	99.1	7.360	1.047	1.009	7.776	
6 665.0	143	802.11ax (Ant.8)	10.00	9.62	0.010	0 mm [Right]	FCC #2	MCS0	99.1	5.870	1.091	1.009	6.462	
6 985.0	207	802.11ax (Ant.8)	10.00	9.27	-0.100	0 mm [Right]	FCC #2	MCS0	99.1	3.900	1.183	1.009	4.656	
6 345.0	79	802.11ax (Ant.8)	10.00	8.95	-0.020	0 mm [Right]	FCC #2	MCS0	99.1	7.450	1.274	1.009	9.577	
6 665.0	143	802.11ax (Ant.9)	10.00	9.98	-0.110	0 mm [Top]	FCC #2	MCS0	99.1	0.219	1.005	1.009	0.222	
6 665.0	143	802.11ax (Ant.9)	10.00	9.98	-0.190	0 mm [Front]	FCC #2	MCS0	99.1	0.633	1.005	1.009	0.642	
6 665.0	143	802.11ax (Ant.9)	10.00	9.98	-0.150	0 mm [Rear]	FCC #2	MCS0	99.1	2.870	1.005	1.009	2.911	
6 025.0	15	802.11ax (Ant.9)	10.00	8.98	-0.130	0 mm [Left]	FCC #2	MCS0	99.1	2.540	1.265	1.009	3.242	
6 345.0	79	802.11ax (Ant.9)	10.00	9.88	0.190	0 mm [Left]	FCC #2	MCS0	99.1	1.290	1.028	1.009	1.338	
6 505.0	111	802.11ax (Ant.9)	10.00	9.87	-0.010	0 mm [Left]	FCC #2	MCS0	99.1	3.390	1.030	1.009	3.523	
6 665.0	143	802.11ax (Ant.9)	10.00	9.98	0.060	0 mm [Left]	FCC #2	MCS0	99.1	3.830	1.005	1.009	3.884	
6 985.0	207	802.11ax (Ant.9)	10.00	9.86	0.030	0 mm [Left]	FCC #2	MCS0	99.1	4.840	1.033	1.009	5.045	A56
6 985.0	207	802.11ax (Ant.9)	10.00	9.86	-0.010	0 mm [Left]	FCC #2	MCS0	99.1	4.740	1.033	1.009	4.941	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	-0.040	0 mm [Top]	FCC #2	MCS0	98.1	0.800	1.091	1.019	0.890	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	-0.110	0 mm [Front]	FCC #2	MCS0	98.1	1.000	1.091	1.019	1.112	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	-0.010	0 mm [Rear]	FCC #2	MCS0	98.1	3.080	1.091	1.019	3.425	
6 025.0	15	802.11ax (MIMO)	13.01	12.29	0.030	0 mm [Right]	FCC #2	MCS0	98.1	7.570	1.265	1.019	9.762	A57
6 345.0	79	802.11ax (MIMO)	12.54	12.45	0.000	0 mm [Right]	FCC #2	MCS0	98.1	9.170	1.028	1.019	9.609	
6 505.0	111	802.11ax (MIMO)	12.54	12.38	-0.040	0 mm [Right]	FCC #2	MCS0	98.1	9.030	1.047	1.019	9.638	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	0.020	0 mm [Right]	FCC #2	MCS0	98.1	5.320	1.091	1.019	5.917	
6 985.0	207	802.11ax (MIMO)	13.01	12.59	-0.180	0 mm [Right]	FCC #2	MCS0	98.1	3.850	1.183	1.019	4.643	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	-0.150	0 mm [Left]	FCC #2	MCS0	98.1	3.870	1.091	1.019	4.304	
6 025.0	15	802.11ax (MIMO)	13.01	12.29	-0.090	0 mm [Right]	FCC #2	MCS0	98.1	7.480	1.180	1.019	8.997	

Note(s):

1. APD (Absorbed Power Density) over 4 cm² averaging area is reported based on SAR measurements.

2. 10 W/m²= 1.0 mW/cm²

3. Blue entries represent Extended Battery measurements.

Table 10.4.4 NFC Phablet/Extremity SAR

MEASUREMENT RESULTS									
FREQUENCY		Mode	Drift Power [dB]	Phantom Position	Device Serial Number	Duty Cycle [%]	10 g SAR (W/kg)	Plots #	
MHz	Ch								
13.6	13600	NFC	0.040	0 mm [Top]	FCC #1	100	0.001		
13.6	13600	NFC	0.030	0 mm [Bottom]	FCC #1	100	0.001		
13.6	13600	NFC	-0.070	0 mm [Front]	FCC #1	100	0.023	A58	
13.6	13600	NFC	0.000	0 mm [Rear]	FCC #1	100	0.003		
13.6	13600	NFC	0.010	0 mm [Right]	FCC #1	100	0.001		
13.6	13600	NFC	0.070	0 mm [Left]	FCC #1	100	0.001		
13.6	13600	NFC	0.150	0 mm [Front]	FCC #1	100	0.018		
ANSI / IEEE C95.1-1992- SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population Exposure						Phablet/Extremity 4.0 W/kg (mW/g) averaged over 10 gram			

Note: Blue entries represent Extended Battery measurements.

10.5 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements. A standard battery was used for all SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was not > 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were performed.
8. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated.
9. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the 1g thresholds for equivalent test cases.
10. SAR measurements were performed using the DASY5 automated system. The procedure for spatial peak SAR evaluation has been implemented according to the IEEE 1528 standard. During a maximum search, global and local maxima searches are automatically performed in 2-D after each area scan measurement. The algorithm will find the global maximum and all local maxima within 2 dB of the global maxima for all SAR distributions. All local maxima within 2 dB of the global maximum were searched and passed for the Zoom Scan measurement.
11. Per October 2020 TCB Workshop notes, absorbed power density (APD) using 4cm^2 averaging area is reported based on SAR measurements.

WLAN Notes:

1. The initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output and the adjusted SAR is ≤ 1.2 W/kg.
3. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg.
4. When the maximum reported 1g averaged SAR ≤ 0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg for 1g evaluations or all test channels were measured.
5. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor to determine compliance.
6. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D01v06 by making a SAR measurement with both antennas transmitting simultaneously.
7. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.
8. Per FCC guidance, SAR was performed using 6.5 GHz SAR probe calibration factor for WIFI 6E. Per October 2020 TCB Workshop notes, 5 channels were tested for WIFI 6E.

Bluetooth Notes:

1. Bluetooth SAR was measured with the device connected to a call with hopping disabled with DH5 operation.
Per October 2016 TCB Workshop Notes, the reported SAR was scaled to the 100% transmission duty factor to determine compliance. Refer to section 8.3 for the time-domain plot and calculation for the duty factor of the device.
2. Head and Hotspot Bluetooth SAR were evaluated for BT BDR tethering applications.
3. The highest frame average power configurations for both Bluetooth and Bluetooth LE were evaluated for SAR. The worst case configuration was used for the remaining test positions as the most conservative scenario.

10.6 IPD (Incident Power Density) Results

Table 11.6.1 UNII IPD

FREQUENCY		Mode	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Drift Power [dB]	Phantom Position	Device Serial Number	Grid Step (A)	Data Rate [Mbps]	Duty Cycle (%)	Scaling Factor for Measurement Uncertainty per IEC 62479	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Normal psPD (W/m ²)	Scaled Normal psPD (W/m ²)	Total psPD (W/m ²)	Scaled Total psPD (W/m ²)	Plots #
MHz	Ch																	
6 665.0	143	802.11ax (Ant.8)	10.00	9.62	-0.110	2 mm [Top]	FCC #2	0.050	MCS0	99.1	1.116	1.091	1.009	0.621	0.763	1.170	1.437	
6 665.0	143	802.11ax (Ant.8)	10.00	9.62	-0.070	2 mm [Front]	FCC #2	0.050	MCS0	99.1	1.116	1.091	1.009	0.428	0.526	0.836	1.027	
6 665.0	143	802.11ax (Ant.8)	10.00	9.62	-0.090	2 mm [Rear]	FCC #2	0.050	MCS0	99.1	1.116	1.091	1.009	0.253	0.311	0.619	0.761	
6 025.0	15	802.11ax (Ant.9)	10.00	9.56	-0.190	2 mm [Right]	FCC #2	0.050	MCS0	99.1	1.116	1.107	1.009	1.940	2.418	3.090	3.852	A59
6 345.0	79	802.11ax (Ant.8)	9.00	8.95	0.170	2 mm [Right]	FCC #2	0.050	MCS0	99.1	1.116	1.012	1.009	1.870	2.131	2.880	3.282	
6 505.0	111	802.11ax (Ant.8)	9.00	8.80	-0.130	2 mm [Right]	FCC #2	0.050	MCS0	99.1	1.116	1.047	1.009	1.800	2.122	2.630	3.101	
6 665.0	143	802.11ax (Ant.8)	10.00	9.62	0.060	2 mm [Right]	FCC #2	0.050	MCS0	99.1	1.116	1.091	1.009	0.990	1.216	1.670	2.052	
6 985.0	207	802.11ax (Ant.8)	10.00	9.27	-0.030	2 mm [Right]	FCC #2	0.050	MCS0	99.1	1.116	1.183	1.009	0.754	1.004	1.770	2.358	
6 025.0	15	802.11ax (Ant.9)	10.00	9.56	-0.130	2 mm [Right]	FCC #2	0.050	MCS0	99.1	1.116	1.107	1.009	1.800	2.244	2.760	3.441	
6 665.0	143	802.11ax (Ant.9)	10.00	9.98	-0.080	2 mm [Top]	FCC #2	0.050	MCS0	99.1	1.116	1.005	1.009	0.238	0.269	0.352	0.398	
6 665.0	143	802.11ax (Ant.9)	10.00	9.98	0.060	2 mm [Front]	FCC #2	0.050	MCS0	99.1	1.116	1.005	1.009	0.278	0.315	0.659	0.746	
6 665.0	143	802.11ax (Ant.9)	10.00	9.98	-0.040	2 mm [Rear]	FCC #2	0.050	MCS0	99.1	1.116	1.005	1.009	1.070	1.211	1.810	2.048	
6 025.0	15	802.11ax (Ant.9)	10.00	8.98	-0.060	2 mm [Left]	FCC #2	0.050	MCS0	99.1	1.116	1.265	1.009	1.100	1.567	1.670	2.379	
6 345.0	79	802.11ax (Ant.9)	10.00	9.88	-0.070	2 mm [Left]	FCC #2	0.050	MCS0	99.1	1.116	1.028	1.009	0.956	1.107	1.480	1.713	
6 505.0	111	802.11ax (Ant.9)	10.00	9.87	-0.050	2 mm [Left]	FCC #2	0.050	MCS0	99.1	1.116	1.030	1.009	1.300	1.508	1.940	2.250	
6 665.0	143	802.11ax (Ant.9)	10.00	9.98	-0.010	2 mm [Left]	FCC #2	0.050	MCS0	99.1	1.116	1.005	1.009	1.820	2.060	2.590	2.931	
6 985.0	207	802.11ax (Ant.9)	10.00	9.86	-0.030	2 mm [Left]	FCC #2	0.050	MCS0	99.1	1.116	1.033	1.009	1.860	2.164	3.050	3.548	A60
6 985.0	207	802.11ax (Ant.9)	10.00	9.86	-0.060	2 mm [Left]	FCC #2	0.050	MCS0	99.1	1.116	1.033	1.009	1.770	2.059	2.740	3.187	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	-0.040	2 mm [Top]	FCC #2	0.050	MCS0	98.1	1.116	1.091	1.019	0.483	0.599	0.749	0.930	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	0.050	2 mm [Front]	FCC #2	0.050	MCS0	98.1	1.116	1.091	1.019	0.525	0.652	0.923	1.146	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	-0.190	2 mm [Rear]	FCC #2	0.050	MCS0	98.1	1.116	1.091	1.019	1.360	1.688	2.040	2.532	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	0.080	2 mm [Right]	FCC #2	0.050	MCS0	98.1	1.116	1.091	1.019	1.380	1.713	2.010	2.495	
6 025.0	15	802.11ax (MIMO)	13.01	12.29	-0.170	2 mm [Left]	FCC #2	0.050	MCS0	98.1	1.116	1.265	1.019	0.904	1.301	1.590	2.288	
6 345.0	79	802.11ax (MIMO)	12.54	12.45	0.020	2 mm [Left]	FCC #2	0.050	MCS0	98.1	1.116	1.028	1.019	0.753	0.881	1.290	1.509	
6 505.0	111	802.11ax (MIMO)	12.54	12.38	-0.130	2 mm [Left]	FCC #2	0.050	MCS0	98.1	1.116	1.047	1.019	1.050	1.251	1.610	1.918	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	-0.160	2 mm [Left]	FCC #2	0.050	MCS0	98.1	1.116	1.091	1.019	1.740	2.160	2.560	3.177	A61
6 985.0	207	802.11ax (MIMO)	13.01	12.59	0.060	2 mm [Left]	FCC #2	0.050	MCS0	98.1	1.116	1.183	1.019	1.320	1.776	1.910	2.570	
6 665.0	143	802.11ax (MIMO)	13.01	12.81	-0.130	2 mm [Left]	FCC #2	0.050	MCS0	98.1	1.116	1.091	1.019	1.710	2.122	2.440	3.028	

Note(s):

1. 10 W/m² = 1.0 mW/cm²

2. Per TCBC workshop guide, Incident power density results were scaled according to IEC62479:2010 for the portion of the measurement uncertainty >3.0%. Total expanded uncertainty of 1.51 dB (41.6%) was used to determine the psPD measurement scaling factor.

3. Per manufacturer guide, Grid Step setting were using the automatic grid step function of measurement system tool.

4. Per manufacturer guide, Incident power density was measured at d=2mm.

5. ESR Algorithm was used during psPD measurement and calculations.

6. SISO Ant mode was evaluated in the worst case configuration of SAR test results.

7. MIMO Ant mode was evaluated for the entire measurement position in the worst case configuration of SAR test results.

8. Blue entries represent Extended Battery measurements.

10.7 Power Density General Notes

1. 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.
2. Batteries are fully charged at the beginning of the measurements. The DUT was connected to a wall charger for some measurements due to the test duration. It was confirmed that the charger plugged into this DUT did not impact the near-field PD test results.
3. Power density was calculated by repeated E-field measurements on two measurement planes separated by $\lambda/4$.
4. 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.
5. Per FCC guidance and equipment manufacturer guidance, power density results were scaled according to IEC 62479:2010 for the portion of the measurement uncertainty > 30%. Total expanded uncertainty of 1.51 dB (41.6%) was used to determine the psPD measurement scaling factor.
6. Per equipment manufacturer guidance, power density was measured at $d=2\text{mm}$ and $d=\lambda/5\text{mm}$ using the same grid size and grid step size for some frequencies and surfaces. The integrated Power Density (iPD) was calculated based on these measurements. Since iPD ratio between the two distances is $\geq -1\text{dB}$, the grid step was sufficient for determining compliance at $d=2\text{mm}$.
7. psPD for MIMO was evaluated by making a measurement with both antennas transmitting simultaneously.
8. PTP-PR algorithm was used during psPD measurement and calculations.
9. PD results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D04.

11. FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

11.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v06 are applicable to handsets with built-in unlicensed transmitters such as 802.11 and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

11.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore simultaneous transmission analysis is required. Per FCC KDB 447498 D01v06 4.3.2 and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the sum 1g SAR for all the simultaneous transmitting antennas in a specific physical test configuration is ≤ 1.6 W/kg. The different test position in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1g or 10g SAR.

For this model, non-Smart Transmit Radios include WLAN/BT/NFC.

For all combinations where the TER sum is not greater than 1, there's no further analysis required for compliance demonstration.

11.3 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v06.

[illegible]

Table 11.3.2 Simultaneous SAR Cases (Phablet)

No.	Capable Transmit Configuration	Phablet	Note
1	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.8 + Bluetooth 2.4 GHz Ant.8	Yes	
2	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.9 + Bluetooth 2.4 GHz Ant.8		
3	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
4	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
5	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 5 GHz Ant.8 + Bluetooth 2.4 GHz Ant.8		
6	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 5 GHz Ant.9 + Bluetooth 2.4 GHz Ant.8		
7	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 5 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
8	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 5 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
9	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 6 GHz Ant.8 + Bluetooth 2.4 GHz Ant.8		
10	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 6 GHz Ant.9 + Bluetooth 2.4 GHz Ant.8		
11	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 6 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
12	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 6 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
13	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz MIMO (Ant.8 + Ant.9) + Wi-Fi 5 GHz MIMO (Ant.8 + Ant.9)		
14	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz MIMO (Ant.8 + Ant.9) + Wi-Fi 6 GHz MIMO (Ant.8 + Ant.9)		
15	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz MIMO (Ant.8 + Ant.9) + Wi-Fi 5 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
16	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz MIMO (Ant.8 + Ant.9) + Wi-Fi 6 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
17	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.8 + Wi-Fi 5 GHz Ant.9		
18	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.8 + Wi-Fi 5 GHz Ant.9 + Bluetooth 2.4 GHz Ant.8	Yes	
19	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.8 + Wi-Fi 6 GHz Ant.9		
20	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.8 + Wi-Fi 5 GHz Ant.8 + Bluetooth 2.4 GHz Ant.8		
21	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.9 + Wi-Fi 5 GHz Ant.8		
22	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.9 + Wi-Fi 5 GHz Ant.8 + Bluetooth 2.4 GHz Ant.8		
23	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.9 + Wi-Fi 5 GHz Ant.9		
24	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.9 + Wi-Fi 5 GHz Ant.9 + Bluetooth 2.4 GHz Ant.8		
25	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.8 + Wi-Fi 6 GHz Ant.9		
26	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.8 + Wi-Fi 6 GHz Ant.9 + Bluetooth 2.4 GHz Ant.8		
27	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.8 + Wi-Fi 6 GHz Ant.8		
28	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.8 + Wi-Fi 6 GHz Ant.8 + Bluetooth 2.4 GHz Ant.8		
29	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.9 + Wi-Fi 6 GHz Ant.8		
30	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.9 + Wi-Fi 6 GHz Ant.8 + Bluetooth 2.4 GHz Ant.8		
31	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.9 + Wi-Fi 6 GHz Ant.9		
32	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.9 + Wi-Fi 6 GHz Ant.9 + Bluetooth 2.4 GHz Ant.8		
33	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.8 + Wi-Fi 5 GHz MIMO (Ant.8 + Ant.9)		
34	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.8 + Wi-Fi 5 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
35	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.9 + Wi-Fi 5 GHz MIMO (Ant.8 + Ant.9)		
36	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.9 + Wi-Fi 5 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
37	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.8 + Wi-Fi 6 GHz MIMO (Ant.8 + Ant.9)		
38	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.8 + Wi-Fi 6 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
39	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.9 + Wi-Fi 6 GHz MIMO (Ant.8 + Ant.9)		
40	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 2.4 GHz Ant.9 + Wi-Fi 6 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
41	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 5 GHz Ant.8 + Wi-Fi 2.4 GHz MIMO (Ant.8 + Ant.9)		
42	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 5 GHz Ant.8 + Wi-Fi 2.4 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
43	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 5 GHz Ant.9 + Wi-Fi 2.4 GHz MIMO (Ant.8 + Ant.9)		
44	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 5 GHz Ant.9 + Wi-Fi 2.4 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
45	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 6 GHz Ant.8 + Wi-Fi 2.4 GHz MIMO (Ant.8 + Ant.9)		
46	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 6 GHz Ant.8 + Wi-Fi 2.4 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		
47	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 6 GHz Ant.9 + Wi-Fi 2.4 GHz MIMO (Ant.8 + Ant.9)		
48	NFC + WWAN + BLE 2.4 GHz Ant.12 + Wi-Fi 6 GHz Ant.9 + Wi-Fi 2.4 GHz MIMO (Ant.8 + Ant.9) + Bluetooth 2.4 GHz Ant.8		