



APPENDIX L

: RF EXPOSURE EVALUATION



1. RF Exposure Evaluation

Test Result of RF Exposure Evaluation

According to the KDB-447498 D01 V06, FCC 47CFR § 2.1093 the following RF exposure evaluation shall to demonstrate RF exposure compliance

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] * [\sqrt{f(\text{GHz})}]$$

2.4 GHz Band (DTS)

802.11b

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
2412	7.4	8 ± 1	9	7.943	5	2.47
2437	7.5	8 ± 1	9	7.943	5	2.48
2462	7.8	8 ± 1	9	7.943	5	2.49

802.11g

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
2412	6.8	7 ± 1	8	6.310	5	1.96
2437	7.0	7 ± 1	8	6.310	5	1.97
2462	7.3	7 ± 1	8	6.310	5	1.98

802.11n(HT20)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
2412	6.5	7 ± 1	8	6.310	5	1.96
2437	6.7	7 ± 1	8	6.310	5	1.97
2462	7.0	7 ± 1	8	6.310	5	1.98



802.11n(HT40)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
2422	6.6	7 ± 1	8	6.310	5	1.96
2442	6.8	7 ± 1	8	6.310	5	1.97
2462	7.0	7 ± 1	8	6.310	5	1.98

Worst case for each channel

Frequency	Max Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
2412	7.4	8 ± 1	9	7.943	5	2.47
2437	7.5	8 ± 1	9	7.943	5	2.48
2462	7.8	8 ± 1	9	7.943	5	2.49

The Max RF exposure is 2.49

Threshold at which no SAR required is << 3 for 1-g SAR, Separation distance is 5 mm

**5 GHz Band (UNII 1)****802.11a**

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5180	4.6	5 ± 1	6	3.981	5	1.81
5200	4.2	5 ± 1	6	3.981	5	1.82
5240	6.2	6 ± 1	7	5.012	5	2.29

802.11n(HT20)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5180	4.8	5 ± 1	6	3.981	5	1.81
5200	4.0	5 ± 1	6	3.981	5	1.82
5240	5.7	5 ± 1	6	3.981	5	1.82

802.11n(HT40)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5190	4.1	5 ± 1	6	3.981	5	1.81
5230	5.1	5 ± 1	6	3.981	5	1.82

802.11ac(VHT20)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5180	4.4	5 ± 1	6	3.981	5	1.81
5200	3.8	4 ± 1	5	3.162	5	1.44
5240	5.6	5 ± 1	6	3.981	5	1.82

802.11ac(VHT40)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5190	4.0	5 ± 1	6	3.981	5	1.81
5230	5.1	5 ± 1	6	3.981	5	1.82



802.11ac(VHT80)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5210	4.8	5 ± 1	6	3.981	5	1.82

Worst case for each channel

Frequency	Max Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5180	4.8	5 ± 1	6	3.981	5	1.81
5190	4.1	5 ± 1	6	3.981	5	1.81
5200	4.2	5 ± 1	6	3.981	5	1.82
5210	4.8	5 ± 1	6	3.981	5	1.82
5230	5.1	5 ± 1	6	3.981	5	1.82
5240	6.2	6 ± 1	7	5.012	5	2.29

The Max RF exposure is 2.29

Threshold at which no SAR required is << 3 for 1-g SAR, Separation distance is 5 mm



5 GHz Band (UNII 2A)

802.11a

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5260	6.8	6 ± 1	7	5.012	5	2.30
5300	6.2	6 ± 1	7	5.012	5	2.31
5320	6.3	6 ± 1	7	5.012	5	2.31

802.11n(HT20)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5260	6.4	6 ± 1	7	5.012	5	2.30
5300	5.7	6 ± 1	7	5.012	5	2.31
5320	5.8	6 ± 1	7	5.012	5	2.31

802.11n(HT40)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5270	6.0	6 ± 1	7	5.012	5	2.30
5310	5.9	6 ± 1	7	5.012	5	2.31

802.11ac(VHT20)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5260	6.3	6 ± 1	7	5.012	5	2.30
5300	5.6	6 ± 1	7	5.012	5	2.31
5320	5.6	6 ± 1	7	5.012	5	2.31

802.11ac(VHT40)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5270	6.1	6 ± 1	7	5.012	5	2.30
5310	5.9	6 ± 1	7	5.012	5	2.31



802.11ac(VHT80)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5290	6.4	6 ± 1	7	5.012	5	2.31

Worst case for each channel

Frequency	Max Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5260	6.8	6 ± 1	7	5.012	5	2.30
5270	6.1	6 ± 1	7	5.012	5	2.30
5290	6.4	6 ± 1	7	5.012	5	2.31
5300	6.2	6 ± 1	7	5.012	5	2.31
5310	5.9	6 ± 1	7	5.012	5	2.31
5320	6.3	6 ± 1	7	5.012	5	2.31

The Max RF exposure is 2.31

Threshold at which no SAR required is << 3 for 1-g SAR, Separation distance is 5 mm

**5 GHz Band (UNII 2C)****802.11a**

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5500	6.4	6 ± 1	7	5.012	5	2.35
5580	5.5	6 ± 1	7	5.012	5	2.37
5720	5.3	6 ± 1	7	5.012	5	2.40

802.11n(HT20)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5500	5.8	6 ± 1	7	5.012	5	2.35
5580	5.3	6 ± 1	7	5.012	5	2.37
5720	4.8	5 ± 1	6	3.981	5	1.90

802.11n(HT40)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5510	5.6	5 ± 1	6	3.981	5	1.87
5590	4.3	5 ± 1	6	3.981	5	1.88
5710	4.7	5 ± 1	6	3.981	5	1.90

802.11ac(VHT20)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5500	5.7	6 ± 1	7	5.012	5	2.35
5580	4.8	5 ± 1	6	3.981	5	1.88
5720	4.9	5 ± 1	6	3.981	5	1.90



802.11ac(VHT40)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5510	5.5	5 ± 1	6	3.981	5	1.87
5590	4.4	5 ± 1	6	3.981	5	1.88
5710	4.7	5 ± 1	6	3.981	5	1.90

802.11ac(VHT80)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5530	5.4	5 ± 1	6	3.981	5	1.87
5610	4.6	5 ± 1	6	3.981	5	1.89
5690	5.2	5 ± 1	6	3.981	5	1.90

Worst case for each channel

Frequency	Max Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5500	6.4	6 ± 1	7	5.012	5	2.35
5510	5.6	5 ± 1	6	3.981	5	1.87
5530	5.4	5 ± 1	6	3.981	5	1.87
5580	5.5	6 ± 1	7	5.012	5	2.37
5590	4.4	5 ± 1	6	3.981	5	1.88
5610	4.6	5 ± 1	6	3.981	5	1.89
5690	5.2	5 ± 1	6	3.981	5	1.90
5710	4.7	5 ± 1	6	3.981	5	1.90
5720	5.3	6 ± 1	7	5.012	5	2.40

The Max RF exposure is 2.40

Threshold at which no SAR required is << 3 for 1-g SAR, Separation distance is 5 mm



5 GHz Band (UNII 3)

802.11a

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5745	6.3	6 ± 1	7	5.012	5	2.40
5785	3.7	4 ± 1	5	3.162	5	1.52
5825	4.5	4 ± 1	5	3.162	5	1.53

802.11n(HT20)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5745	6.2	6 ± 1	7	5.012	5	2.40
5785	2.8	3 ± 1	4	2.512	5	1.21
5825	3.9	3 ± 1	4	2.512	5	1.21

802.11n(HT40)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5755	5.7	6 ± 1	7	5.012	5	2.40
5795	2.8	3 ± 1	4	2.512	5	1.21

802.11ac(VHT20)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5745	6.3	6 ± 1	7	5.012	5	2.40
5785	3.2	3 ± 1	4	2.512	5	1.21
5825	4.0	3 ± 1	4	2.512	5	1.21

802.11ac(VHT40)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5755	5.6	6 ± 1	7	5.012	5	2.40
5795	3.0	3 ± 1	4	2.512	5	1.21



802.11ac(VHT80)

Frequency	Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5775	4.3	4 ± 1	5	3.162	5	1.52

Worst case for each channel

Frequency	Max Average Conducted Output Power(dBm)	Target Power /tolerance (dBm)	Max tune up power Tolerance (dBm)	Maximum Average Output Power(mW)	Separation Distance (mm)	RF Exposure
5745	6.3	6 ± 1	7	5.012	5	2.40
5755	5.7	6 ± 1	7	5.012	5	2.40
5775	4.3	4 ± 1	5	3.162	5	1.52
5785	3.7	4 ± 1	5	3.162	5	1.52
5795	3.0	3 ± 1	4	2.512	5	1.21
5825	4.5	4 ± 1	5	3.162	5	1.53

The Max RF exposure is 2.40

Threshold at which no SAR required is << 3 for 1-g SAR, Separation distance is 5 mm

Conclusion:

So no SAR is required.

※ This device does not operate in simultaneous mode.