RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

Limits for Maximum Permissible Exposure (MPE)

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 Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			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	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

MPE Calculation Method

E (V/m) = $\frac{\sqrt{30 * P * G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

E = Electric field (V/m)

P = Average RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 * P * G}{377 * D^2}$

From the EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

Measurement Result

BT/BLE

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Antenna Gain (dBi)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density (mW/cm2)
2402	GFSK	4.54	5±1	6	3.981	3.00	2.00	0.0016	1
2441		4.19	5±1	6	3.981	3.00	2.00	0.0016	1
2480		5.48	5±1	6	3.981	3.00	2.00	0.0016	1
2402	π/4-DQPSK	2.63	2±1	3	1.995	3.00	2.00	0.0008	1
2441		3.47	2±1	3	1.995	3.00	2.00	0.0008	1
2480		2.07	2±1	3	1.995	3.00	2.00	0.0008	1
2402	8-DPSK	2.89	3±1	4	2.512	3.00	2.00	0.0010	1
2441		3.46	3±1	4	2.512	3.00	2.00	0.0010	1
2480		2.51	3±1	4	2.512	3.00	2.00	0.0010	1
2402	BLE	0.38	1±1	2	1.585	3.00	2.00	0.0006	1
2440		1.25	1±1	2	1.585	3.00	2.00	0.0006	1
2480		-0.6	0±1	1	1.259	3.00	2.00	0.0005	1

WIFI 2.4G:

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Antenna Gain (dBi)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density (mW/cm2)
2412	802.11b	12.67	12±1	13	19.953	3.00	2.00	0.0079	1
2437		12.36	12±1	13	19.953	3.00	2.00	0.0079	1
2462		13.65	12±1	13	19.953	3.00	2.00	0.0079	1
2412	802.11g	11.48	12±1	13	19.953	3.00	2.00	0.0079	1
2437		11.45	12±1	13	19.953	3.00	2.00	0.0079	1
2462		12.24	12±1	13	19.953	3.00	2.00	0.0079	1
2422	802.11n20	11.66	12±1	13	19.953	3.00	2.00	0.0079	1
2437		11.56	12±1	13	19.953	3.00	2.00	0.0079	1
2452		12.53	12±1	13	19.953	3.00	2.00	0.0079	1

WIFI 5.2G:

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Antenna Gain (dBi)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density (mW/cm2)
5180	802.11a	12.78	12±1	13	19.953	3.00	2.00	0.0079	1
5200		11.83	12±1	13	19.953	3.00	2.00	0.0079	1
5240		12.86	12±1	13	19.953	3.00	2.00	0.0079	1
5180	802.11nHT20	11.55	12±1	13	19.953	3.00	2.00	0.0079	1
5200		9.99	10±1	11	12.589	3.00	2.00	0.0050	1
5240		11.35	11±1	12	15.849	3.00	2.00	0.0063	1
5190	802.11nHT40	10.81	11±1	12	15.849	3.00	2.00	0.0063	1
5230		11.08	11±1	12	15.849	3.00	2.00	0.0063	1
5180	802.11acVHT20	11.58	11±1	12	15.849	3.00	2.00	0.0063	1
5200		10.25	11±1	12	15.849	3.00	2.00	0.0063	1
5240		11.37	11±1	12	15.849	3.00	2.00	0.0063	1
5190	802.11acVHT40	10.95	11±1	12	15.849	3.00	2.00	0.0063	1
5230		11.27	11±1	12	15.849	3.00	2.00	0.0063	1
5210	802.11acVHT80	10.04	11±1	12	15.849	3.00	2.00	0.0063	1

WIFI 5.8G:

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm2)	Power density (mW/cm2)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
5745	802.11a	12.04	12±1	13	19.953	3.00	2.00	0.0079	1
5785		11.89	12±1	13	19.953	3.00	2.00	0.0079	1
5825		12.28	12±1	13	19.953	3.00	2.00	0.0079	1
5745	802.11nHT20	10.7	10±1	11	12.589	3.00	2.00	0.0050	1
5785		9.38	10±1	11	12.589	3.00	2.00	0.0050	1
5825		10.59	10±1	11	12.589	3.00	2.00	0.0050	1
5755	802.11nHT40	10.46	10±1	11	12.589	3.00	2.00	0.0050	1
5795		10.21	10±1	11	12.589	3.00	2.00	0.0050	1
5745	802.11acVHT20	10.75	10±1	11	12.589	3.00	2.00	0.0050	1
5785		9.41	10±1	11	12.589	3.00	2.00	0.0050	1
5825		10.65	11±1	12	15.849	3.00	2.00	0.0063	1
5755	802.11acVHT40	10.49	11±1	12	15.849	3.00	2.00	0.0063	1
5795		10.15	11±1	12	15.849	3.00	2.00	0.0063	1
5775	802.11acVHT80	8.87	9±1	10	10.000	3.00	2.00	0.0040	1

This product does not support the requirements under multiple sources.

Conclusion:
For the max result : 0.0079≤1 for Max Power Density, compliance the RF Exposure.

Signature: **Date:** 2021/05/12

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