

RF Exposure Evaluation

LIMIT

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 Exposures				
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
300–1500	-	-	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/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500	-	-	f/1500	30
1500–100,000	-	-	1.0	30

Note: f = frequency in MHz

EVALUATION METHOD

Transmission formula: $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

Pd = power density in mW/cm², **Pout** = output power to antenna in mW, **G** = gain of antenna in linear scale;

Pi = 3.1416, **R** = distance between observation point and center of the radiator in cm

TEST RESULT

☒ **Passed**

☐ **Not Applicable**

Type	Maximum conducted output power(dBm)	Power Density (mW/cm2)	Limit (mW/cm2)	Result
2.4G WIFI				
802.11b	17.32	0.0248	1.0000	Pass
802.11g	22.77	0.0870	1.0000	Pass
802.11n(HT20)	25.42	0.1677	1.0000	Pass
Remark:	For 802.11b: the maximum conducted output power(dBm) is channel 11 at antenna 1. For 802.11g: the maximum conducted output power(dBm) is channel 11 at antenna 1. For 802.11n(HT20): the maximum conducted output power(dBm) is channel 11 at MIMO. 2.4G WIFI maximum antenna 0 gain: 1.01dBi. maximum antenna 1 gain: 3.64dBi			
5G WIFI				
Band I	21.71	0.1818	1.0000	Pass
Band II	21.07	0.1569	1.0000	Pass
Band III	17.27	0.0564	1.0000	Pass
Band IV	19.42	0.1073	1.0000	Pass
Remark:	For Band 1: the maximum conducted output power(dBm) is 802.11ac HT20 middle channel at MIMO.. For Band 2: the maximum conducted output power(dBm) is 802.11ac HT40 high channel at MIMO.. For Band 3: the maximum conducted output power(dBm) is 802.11ac HT40 Low channel at MIMO.. For Band 4: the maximum conducted output power(dBm) is 802.11ac HT40 high channel at MIMO.. 5G WIFI maximum antenna 0 gain: 5.08dBi, maximum antenna 1 gain: 4.69 dBi			
BT-EDR				
BT-EDR	7.15	0.0017	1.0000	Pass
BT-BLE	6.57	0.0015	1.0000	Pass
Remark:	For BT-EDR: the maximum conducted output power(dBm) is GFSK channel 39. For BT-BLE: the maximum conducted output power(dBm) is channel 19. BT-EDR antenna gain: 2.12dBi, BT-BLE antenna gain: 2.12dBin			

Note:

- 1) The exposure safety distance is less than 20cm.
- 2) Total Antenna gain = $10 * \log(10^{(ANT\ 0/10)} + 10^{(ANT\ 1/10)})$