

## 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 <sup>2</sup> )	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 <sup>2</sup> )	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 <sup>2</sup> )	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:  $Pd = (Pout * G) / (4 * \pi * r^2)$

Where

**Pd** = power density in mW/cm<sup>2</sup>, **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**

RF specification	Type	Maximum conducted output power(dBm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
2.4G WiFi	802.11n(HT20)	19.96	0.01971	1.0000	Pass
5G WiFi	802.11ac(HT20)	18.61	0.01445	1.0000	Pass
5.8G SRD	802.11ac(HT20)	18.51	0.01412	1.0000	Pass
Bluetooth	BLE	12.79	0.00378	1.0000	Pass

RF specification	Field strength of fundamental(dB $\mu$ V/m)	Maximum ERIP(dBm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
Z-wave	93.01	-2.22	0.00012	0.6056	Pass

Note:

- 1) The maximum antenna gain for WiFi and Bluetooth are 2.00dBi. The maximum antenna gain for Z-wave is 3.00dBi.
- 2)  $EIRP[dBm] = E[dB \mu V/m] + 20 \log(d[m]) - 104.77$ ,  $d=3$ .
- 3) The exposure safety distance is less than 20cm.