

8. RADIO FREQUENCY EXPOSURE

8.1. Limit

According to §1.1310 and §2.1091 RF exposure is calculated.

Table: Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Power Density (S) (mW/cm ²)
0.3–1.34	*(100)
1.34–30	*(180/f ²)
30–300	0.2
300–1500	f/1500
1500–100,000	1.0

F = frequency in MHz

* = Plane-wave equivalent power density

Maximum Permissible Exposure

The MPE was calculated at 20cm to show compliance with the power density limit.

$$S = PG/4\pi R^2$$

S = Power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna.

Note:

1. Manufacturer declared that the maximum antenna gain is **14.0dBi**(Max.) for 2412~2462MHz.
2. Manufacturer declared that the nearest distance between human and the EUT is 20cm.
3. Only record worst case data.

8.2 Test Results

Standalone MPE

2.4G wifi:

Test	Mode	Channel	ANT Max. Tune Up Power (dBm)	ANT Max. Tune Up Power (mW)	ANT MPE (mW/cm ²)	Limit (mW/cm ²)
IEEE 802.11b	Chain 0	1	9.0±1.0	10.0000	0.0500	1.0
		6	9.0±1.0	10.0000	0.0500	1.0
		11	9.0±1.0	10.0000	0.0500	1.0
	Chain 1	1	9.0±1.0	10.0000	0.0500	1.0
		6	9.0±1.0	10.0000	0.0500	1.0
		11	9.0±1.0	10.0000	0.0500	1.0
IEEE 802.11g	Chain 0	1	7.0±1.0	6.3096	0.0315	1.0
		6	7.0±1.0	6.3096	0.0315	1.0
		11	7.0±1.0	6.3096	0.0315	1.0
	Chain 1	1	7.0±1.0	6.3096	0.0315	1.0
		6	7.0±1.0	6.3096	0.0315	1.0
		11	7.0±1.0	6.3096	0.0315	1.0
IEEE 802.11n-HT20	Chain 0	1	7.0±1.0	6.3096	0.0315	1.0
		6	7.0±1.0	6.3096	0.0315	1.0
		11	7.0±1.0	6.3096	0.0315	1.0
	Chain 1	1	7.0±1.0	6.3096	0.0315	1.0
		6	7.0±1.0	6.3096	0.0315	1.0
		11	7.0±1.0	6.3096	0.0315	1.0
IEEE 802.11n-HT40	Chain 0	3	6.0±1.0	5.0119	0.0251	1.0
		6	6.0±1.0	5.0119	0.0251	1.0
		9	6.0±1.0	5.0119	0.0251	1.0
	Chain 1	3	6.0±1.0	5.0119	0.0251	1.0
		6	6.0±1.0	5.0119	0.0251	1.0
		9	6.0±1.0	5.0119	0.0251	1.0

Simultaneous transmission MPE

According to KDB447498 for Transmitters used in mobile exposure conditions for simultaneous transmission operations;

Σ of MPE ratios ≤ 1.0

Mode	Channel No.	Frequency (MHz)	Σ MPE ratios	Limit	Results
Chain 0+Chain 1					
IEEE 802.11b	1	2412	N/A	1.000	Pass
	6	2442	N/A	1.000	Pass
	11	2462	N/A	1.000	Pass
IEEE 802.11g	1	2412	N/A	1.000	Pass
	6	2442	N/A	1.000	Pass
	11	2462	N/A	1.000	Pass
IEEE 802.11n HT20	1	2412	0.0631	1.000	Pass
	6	2442	0.0631	1.000	Pass
	11	2462	0.0631	1.000	Pass
IEEE 802.11n HT40	3	2422	0.0501	1.000	Pass
	6	2442	0.0501	1.000	Pass
	9	2452	0.0501	1.000	Pass

Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.