

## 9. RADIO FREQUENCY EXPOSURE

### 9.1. 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 <sup>2</sup> )
0.3–1.34	*(100)
1.34–30	*(180/f <sup>2</sup> )
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 for Wi-Fi is 5dBi(Max.)
2. Manufacturer declared that the nearest distance between human and the EUT is 20cm.
3. Only record worst case data.

## Band 1:

Test Mode	Channel	Frequency (MHz)	Power (dBm, AV)	Power Tune Up (dBm)
802.11a	Low	5180	12.65	12.0±1.0
	Middle	5200	12.58	12.0±1.0
	High	5240	12.19	12.0±1.0
802.11n(HT20)	Low	5180	11.90	11.0±1.0
	Middle	5200	11.87	11.0±1.0
	High	5240	11.92	11.0±1.0
802.11n(HT40)	Low	5190	11.68	11.0±1.0
	High	5230	11.91	11.0±1.0
IEEE 802.11ac VHT20	Low	5180	11.84	11.0±1.0
	Middle	5200	11.77	11.0±1.0
	High	5240	11.92	11.0±1.0
IEEE 802.11ac VHT40	Low	5190	10.29	10.0±1.0
	High	5230	10.09	10.0±1.0
IEEE 802.11ac VHT80	Mid	5210	7.25	7.0±1.0

## Band 3:

Test Mode	Channel	Frequency (MHz)	Power (dBm, AV)	Power Tune Up (dBm)
802.11a	Low	5745	12.27	12.0±1.0
	Middle	5785	12.12	12.0±1.0
	High	5825	11.78	12.0±1.0
802.11n(HT20)	Low	5745	11.07	11.0±1.0
	Middle	5785	11.15	11.0±1.0
	High	5825	11.14	11.0±1.0
802.11n(HT40)	Low	5755	11.07	11.0±1.0
	High	5795	11.14	11.0±1.0
IEEE 802.11ac VHT20	Low	5745	11.08	11.0±1.0
	Middle	5785	11.06	11.0±1.0
	High	5825	11.19	11.0±1.0
IEEE 802.11ac VHT40	Low	5755	9.65	10.0±1.0
	High	5795	9.60	10.0±1.0
IEEE 802.11ac VHT80	Mid	5775	6.21	6.0±1.0

## 9.2 Test Results

Band 1:

Test Mode	Channel	Max. Tune Up Power (dBm, Average)	Max. Tune Up Power (mW)	Antenna gain(numeric)	MPE (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
802.11a	Low	13.0	19.95	3.16	0.0125	1.00
	Middle	13.0	19.95	3.16	0.0125	1.00
	High	13.0	19.95	3.16	0.0125	1.00
802.11n(HT20)	Low	12.0	15.85	3.16	0.0100	1.00
	Middle	12.0	15.85	3.16	0.0100	1.00
	High	12.0	15.85	3.16	0.0100	1.00
802.11n(HT40)	Low	12.0	15.85	3.16	0.0100	1.00
	High	12.0	15.85	3.16	0.0100	1.00
IEEE 802.11ac VHT20	Low	12.0	15.85	3.16	0.0100	1.00
	Middle	12.0	15.85	3.16	0.0100	1.00
	High	12.0	15.85	3.16	0.0100	1.00
IEEE 802.11ac VHT40	Low	11.0	12.59	3.16	0.0079	1.00
	High	11.0	12.59	3.16	0.0079	1.00
IEEE 802.11ac VHT80	Mid	8.0	6.31	3.16	0.0040	1.00

Band 3:

Test Mode	Channel	Max. Tune Up Power (dBm, Average)	Max. Tune Up Power (mW)	Antenna gain(numeric)	MPE (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
802.11a	Low	13.0	19.95	3.16	0.0125	1.00
	Middle	13.0	19.95	3.16	0.0125	1.00
	High	13.0	19.95	3.16	0.0125	1.00
802.11n(HT20)	Low	12.0	15.85	3.16	0.0100	1.00
	Middle	12.0	15.85	3.16	0.0100	1.00
	High	12.0	15.85	3.16	0.0100	1.00
802.11n(HT40)	Low	12.0	15.85	3.16	0.0100	1.00
	High	12.0	15.85	3.16	0.0100	1.00
IEEE 802.11ac VHT20	Low	12.0	15.85	3.16	0.0100	1.00
	Middle	12.0	15.85	3.16	0.0100	1.00
	High	12.0	15.85	3.16	0.0100	1.00
IEEE 802.11ac VHT40	Low	11.0	12.59	3.16	0.0079	1.00
	High	11.0	12.59	3.16	0.0079	1.00
IEEE 802.11ac VHT80	Mid	7.0	5.01	3.16	0.0032	1.00

Antenna Gain (typical): Wi-Fi: 5dBi, 3.16 (numeric)

Prediction distance:  $\geq 20$ cm

The power density level worst case at 20 cm is below the uncontrolled exposure limit.