7. RADIO FREQUENCY EXPOSURE

7.1. 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/cm2)
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 for BLE, Wi-Fi & Zigbee is 1.7dBi(Max.).

2. Manufacturer declared that the nearest distance between human and the EUT is 20cm.

3. Only record worst case data.

Test Mode	Channel	Frequency (MHz)	Power (dBm, Peak)	Power Tune Up (dBm)
802.11b	Low	2402	10.35	10±1.0
	Middle	2440	10.74	10±1.0
	High	2480	10.03	10±1.0
802.11g	Low	2412	9.77	10±1.0
	Middle	2437	10.21	10±1.0
	High	2462	9.93	10±1.0
802.11n HT20	Low	2412	9.71	10±1.0
	Middle	2437	9.78	10±1.0
	High	2462	9.55	10±1.0
802.11n HT40	Low	2412	9.99	10±1.0
	Middle	2437	9.79	10±1.0
	High	2462	9.59	10±1.0
BT-LE	Low	2422	-5.462	-5.0±1.0
	Middle	2437	-5.775	-5.0±1.0
	High	2452	-5.669	-5.0±1.0
Zigbee	Low	2405	-5.318	-5.0±1.0
	Middle	2440	-5.646	-5.0±1.0
	High	2480	-5.536	-5.0±1.0

7.2 Test Results

Test Mode	Channel	Max. Tune Up Power (dBm, Peak)	Max. Tune Up Power (mW)	MPE (mW/cm^2)	Limit (mW/cm^2)
802.11b	Low	11.0	12.59	0.0037	1.0
	Middle	11.0	12.59	0.0037	1.0
	High	11.0	12.59	0.0037	1.0
802.11g	Low	11.0	12.59	0.0037	1.0
	Middle	11.0	12.59	0.0037	1.0
	High	11.0	12.59	0.0037	1.0
802.11n HT20	Low	11.0	12.59	0.0037	1.0
	Middle	11.0	12.59	0.0037	1.0
	High	11.0	12.59	0.0037	1.0
802.11n HT40	Low	11.0	12.59	0.0037	1.0
	Middle	11.0	12.59	0.0037	1.0
	High	11.0	12.59	0.0037	1.0
BT-LE	Low	-4.0	0.40	0.0001	1.0
	Middle	-4.0	0.40	0.0001	1.0
	High	-4.0	0.40	0.0001	1.0
Zigbee	Low	-4.0	0.40	0.0001	1.0
	Middle	-4.0	0.40	0.0001	1.0
	High	-4.0	0.40	0.0001	1.0

Antenna Gain (typical): BLE, Wi-Fi& Zigbee: 1.7dBi, 1.48 (numeric)

Prediction distance: >=20cm

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