# 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/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 is 5.0dBi for TX.

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

3. Only record worst case data.

802.11b

| | | |
|---|---|---|
| Conducted Peak output Power in dBm | 16.00 | dBm |
| Tune up power tolerance | 15.5±0.5 | dBm |
| Max. Conducted Peak output Power in mW | 39.8107 | mW |
| Prediction distance | 20 | cm |
| Prediction frequency | 2462 | MHz |
| Antenna Gain(typical) | 5.0 | dBi |
| Antenna Gain(numeric) | 3.16 | |
| Power density at prediction frequency( S) | 0.02504 | $mW/cm^2$ |
| MPE limit for uncontrolled exposure at prediction frequency | 1 | $mW/cm^2$ |

802.11g

| | | |
|---|---|---|
| Conducted Peak output Power in dBm | 12.80 | dBm |
| Tune up power tolerance | 12.3±0.5 | dBm |
| Max. Conducted Peak output Power in mW | 19.0546 | mW |
| Prediction distance | 20 | cm |
| Prediction frequency | 2462 | MHz |
| Antenna Gain(typical) | 5.0 | dBi |
| Antenna Gain(numeric) | 3.16 | |
| Power density at prediction frequency( S) | 0.01198 | $mW/cm^2$ |
| MPE limit for uncontrolled exposure at prediction frequency | 1 | $mW/cm^2$ |

802.11n-HT20

| | | |
|---|---|---|
| Conducted Peak output Power in dBm | 12.50 | dBm |
| Tune up power tolerance | 12.0±0.5 | dBm |
| Max. Conducted Peak output Power in mW | 17.7828 | mW |
| Prediction distance | 20 | cm |
| Prediction frequency | 2462 | MHz |
| Antenna Gain(typical) | 5.0 | dBi |
| Antenna Gain(numeric) | 3.16 | |
| Power density at prediction frequency( S) | 0.01118 | $mW/cm^2$ |
| MPE limit for uncontrolled exposure at prediction frequency | 1 | $mW/cm^2$ |

802.11n-HT40

| | | |
|---|---|---|
| Conducted Peak output Power in dBm | 10.00 | dBm |
| Tune up power tolerance | 9.5±0.5 | dBm |
| Max. Conducted Peak output Power in mW | 10.0000 | mW |
| Prediction distance | 20 | cm |
| Prediction frequency | 2452 | MHz |
| Antenna Gain(typical) | 5.0 | dBi |
| Antenna Gain(numeric) | 3.16 | |
| Power density at prediction frequency( S) | 0.00628 | $mW/cm^2$ |
| MPE limit for uncontrolled exposure at prediction frequency | 1 | $mW/cm^2$ |

GFSK(BT V3.0)

| | | |
|---|---|---|
| Conducted Peak output Power in dBm | 4.7 | dBm |
| Tune up power tolerance | 4.2±0.5 | dBm |
| Max. Conducted Peak output Power in mW | 2.9512 | mW |
| Prediction distance | 20 | cm |
| Prediction frequency | 2480 | MHz |
| Antenna Gain(typical) | 5.0 | dBi |
| Antenna Gain(numeric) | 3.16 | |
| Power density at prediction frequency( S) | 0.0019 | $mW/cm^2$ |
| MPE limit for uncontrolled exposure at prediction frequency | 1 | $mW/cm^2$ |

GFSK (BT V4.0)

| | | |
|---|---|---|
| Conducted Peak output Power in dBm | 2.5 | dBm |
| Tune up power tolerance | 2.0±0.5 | dBm |
| Max. Conducted Peak output Power in mW | 1.7783 | mW |
| Prediction distance | 20 | cm |
| Prediction frequency | 2480 | MHz |
| Antenna Gain(typical) | 5.0 | dBi |
| Antenna Gain(numeric) | 3.16 | |
| Power density at prediction frequency( S) | 0.0011 | $mW/cm^2$ |
| MPE limit for uncontrolled exposure at prediction frequency | 1 | $mW/cm^2$ |

## 8.2 Test Results

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