# 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 is 0dBi(Max.).

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

3. Only record worst case data.

| Mode | Channel | Frequency (MHz) | Conducted Output Power (dBm) | Tolerance ±(dB) |
|---|---|---|---|---|
| GFSK | 00 | 2402 | -1.512 | -1.0 ± 1.0 |
| | 39 | 2441 | -0.314 | 0.0 ± 1.0 |
| | 78 | 2480 | -0.172 | 0.0 ± 1.0 |
| π/4DQPSK | 00 | 2402 | -1.350 | -1.0 ± 1.0 |
| | 39 | 2441 | -0.528 | 0.0 ± 1.0 |
| | 78 | 2480 | -1.234 | -1.0 ± 1.0 |
| 8-DPSK | 00 | 2402 | -1.209 | -1.0 ± 1.0 |
| | 39 | 2441 | -0.580 | 0.0 ± 1.0 |
| | 78 | 2480 | -0.688 | 0.0 ± 1.0 |

| Test Mode | Channel | Max. Tune Up Power (dBm, Peak) | Max. Tune Up Power (mW) | MPE ($mW/cm^2$) | Limit ($mW/cm^2$) |
|---|---|---|---|---|---|
| GFSK | 00 | 0.0 | 1.0000 | 0.0002 | 1.0 |
| | 39 | 1.0 | 1.2589 | 0.0003 | 1.0 |
| | 78 | 1.0 | 1.2589 | 0.0003 | 1.0 |
| π/4DQPSK | 00 | 0.0 | 1.0000 | 0.0002 | 1.0 |
| | 39 | 1.0 | 1.2589 | 0.0003 | 1.0 |
| | 78 | 0.0 | 1.0000 | 0.0002 | 1.0 |
| 8-DPSK | 00 | 0.0 | 1.0000 | 0.0002 | 1.0 |
| | 39 | 1.0 | 1.2589 | 0.0003 | 1.0 |
| | 78 | 1.0 | 1.2589 | 0.0003 | 1.0 |

Antenna Gain (typical): 0dBi, 1.0(numeric)

Prediction distance: >=20cm

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