

SAR Evaluation

1. RF Exposure Compliance Requirement:

Standard Requirement

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm ²) | Averaging time (minutes) |
|--|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| (A) Limits for Occupational/Controlled Exposures | | | | |
| 0.3–3.0 | 614 | 1.63 | *(100) | 6 |
| 3.0–30 | 1842/f | 4.89/f | *(900/f ²) | 6 |
| 30–300 | 61.4 | 0.163 | 1.0 | 6 |
| 300–1500 | | | f/300 | 6 |
| 1500–100,000 | | | 5 | 6 |
| (B) Limits for General Population/Uncontrolled Exposure | | | | |
| 0.3–1.34 | 614 | 1.63 | *(100) | 30 |
| 1.34–30 | 824/f | 2.19/f | *(180/f ²) | 30 |
| 30–300 | 27.5 | 0.073 | 0.2 | 30 |
| 300–1500 | | | f/1500 | 30 |
| 1500–100,000 | | | 1.0 | 30 |

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2. EUT RF Exposure

Antenna Gain: 2dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Worst case: 802.11b mode Lowest(2412MHz)

(Using the maximum value of the test report)

| Maximum tune-up Power (mW) | Antenna Gain (dBi) | Power Density at R = 20 cm (mW/cm ²) | Limit | Result |
|-------------------------------|-----------------------|--|-------|--------|
| 18.49 | 2.0 | 0.00583 | 1 | PASS |

Remark: The Max Conducted Peak Output Power data refer to report Report No.: UNIA19092318FR-01

value.:

$$2) P_d = (P_{out} * G) / (4 * \pi * R^2) = (18.49 * 1.585) / (4 * 3.1416 * 20^2) = 0.00583$$