FCC §2.1091&§1.1310 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
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; * = Plane-wave equivalent power density

According to §1.1310 and §2.1091 RF exposure is calculated for BT/BLE.

Furthermore, consistent with FCC's equipment authorization RF exposure guidance, any device (both portable and mobile) operating at frequencies below 100 kHz is considered compliant for the purpose of equipment authorization when the external (unperturbed) temporal peak field strengths do not exceed the following reference levels:

83 V/m for the electric field strength (E)

and

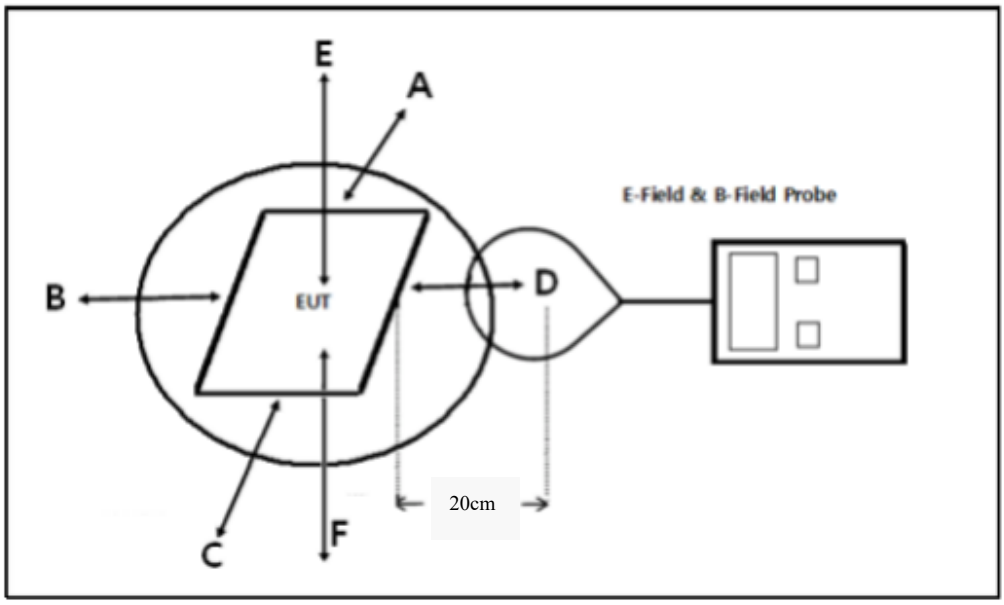
90 A/m for the magnetic field strength (H).

These data may be provided through measurements and/or numerical simulations, and for all the positions in space relevant for any possible body exposure.

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Block Diagram of Test Setup



Test Procedures

1) Perform H-field and E-field measurements for each all sides of the EUT at 20cm, along all the principal axes defined with respect to the orientation of the transmitting element (e.g., coil or antenna).
2) The highest emission level was recorded and compared with limit.

Test Data

Environmental Conditions

Temperature:	26.7 ℃
Relative Humidity:	52 %
ATM Pressure:	99.5 kPa

The testing was performed by Rainbow Zhu on 2025-07-14.

Test mode: Transmitting (Maximum output power mode)

9.925-41.375 kHz *(Measured)* **:**

H-Field Strength

Test Frequency (kHz)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	Position F (A/m)	Limit (A/m)
9.925-41.375	2.73	2.86	2.79	2.74	1.74	0.76	90

E-Field Strength

Test Frequency (kHz)	Position A (V/m)	Position B (V/m)	Position C (V/m)	Position D (V/m)	Position E (V/m)	Position F (V/m)	Limit (V/m)
9.925-41.375	1.69	1.47	1.34	1.39	1.51	2.49	83

Note: Test with 20cm distance from the center of the probe(s) to the edge of the device.

BT/BLE *(Calculated)***:**

Calculation formula:

Prediction of power density at the distance of the applicable MPE limit
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For worst case:

Mode	Frequency (MHz)	Antenna Gain#		Max Tune-up Power#		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
BT	2402-2480	2.00	1.58	0.266	1.06	20	0.00033	1.0
BLE	2402-2480	2.00	1.58	0.296	1.07	20	0.00034	1.0

Note: 1.The tune up power and antenna gain was declared by the applicant.
2. The device contains a certified BT module (model: FSC-BT986, FCC ID: 2AMWOFSC-BT986)

Simultaneous transmitting consideration (worst case):

The ratio= H-Field / H-Field $_{Limit}$ + MPE_{BLE} / MPE $_{Limit}$ = 2.86/90+0.00034/1.0 =0.032<1.0

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliant.