

# RF Exposure evaluation

FCC ID: 2BF7Y-VBM002T

Exposure category: General population/uncontrolled environment

EUT Type: Production Unit

Device Type: Fixed Device

## 1. Reference

According to § 1. 130(b)(1), 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.

According to § 1. 1310 and §2. 1091 RF exposure is calculated.

KDB447498 DOI: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

## 2. Limit

Limits for Maximum Permissible Exposure (MPE) /Controlled Exposure

Frequency Range(MHz)	Electric Field Strength (V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
Limits for Occupational/ Controlled Exposure				
0.3-3.0	614	1.63	( 100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300- 1500	/	/	0300	6
1500- 100,000	/	/	5	6

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Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength( A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
Limits for Occupational/ Controlled Exposure				
0.3-3.0	614	1.63	( 100)*	30
3.0-30	824/f	2. 19/f	( 180/F)*	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

## 3. MPE Calculation Method

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG/4 \pi R^2$$

Where: 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

#### 4. Antenna Information

Only use antennas certificated as follows provided by manufacturer,

Antenna No.	Model No. of antenna:	Type of antenna:	Gain of the antenna (Max.)	Frequency range:
/	/	External Antenna	0.7 dBi for 902-928MHz;	

#### 5. Standalone MPE Result

As declared by the Applicant, the EUT is a wireless device used in a fix application, at least 20 cm from any body part of the user or nearby persons; from the maximum EUT RF output power, the minimum separation distance,  $r = 20\text{cm}$ , as well as the gain of the used antenna above article 4(antenna information), the RF power density can be obtained.

Modulation Type	Max conducted power (dBm)		Antenna Gain (dBi)	MPE (mW/cm <sup>2</sup> )	MPE Limits (mW/cm <sup>2</sup> )
	dBm	mw			
802.11ah	26.29	425.6	0.7	0.0995	1.0000

Conclusion: Sum= 0.0995 < 1, therefore the result is PASS.

Remark:

1. Output power including turn-up tolerance:
2. MPE evaluate distance is 20cm from user manual provide by manufacturer.

#### 6. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

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