

RF Exposure evaluation

FCC ID: 2AYN6-SH24GO10W

Exposure category: General population/uncontrolled environment

EUT Type: Production Unit

Device Type: Mobile 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 ²)	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 ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	0.300	6
1500-100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE) / Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/ m)	Power Density (mW/ cm ²)	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:
2.4G WIFI	/	External Antenna	2.13dBi for 2412-2462MHz;	

5 . Manufacturing Tolerance

WIFI (Peak)

IEEE 802.11b (PEAK)

Frequency (MHz)	Antenna 1					
	2412	2437	2462			
Target (dBm)	8	4	9			
Tolerance ± (dB)	1.0	1.0	1.0			

IEEE 802.11g (PEAK)

Frequency (MHz)	Antenna 1					
	2412	2437	2462			
Target (dBm)	10	6	10			
Tolerance ± (dB)	1.0	1.0	1.0			

IEEE 802.11n HT20 (PEAK)

Frequency (MHz)	Antenna 1					
	2412	2437	2462			
Target (dBm)	10	7	10			
Tolerance ± (dB)	1.0	1.0	1.0			

IEEE 802.11n HT40 (PEAK)

Frequency (MHz)	Antenna 1					
	2422	2437	2452			
Target (dBm)	9	7	10			
Tolerance ± (dB)	1.0	1.0	1.0			

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 is 2.13dBi, the RF power density can be obtained.

Modulation Type	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm ²)	MPE Limits (mW/cm ²)
	dBm	mW				
2.4GWIFI	9.80	9.55	2.13	1.633052	0.031027	1.0000

Remark:

- 1 . Output power (Peak) including turn-up tolerance:
- 2 . MPE evaluate distance is 20 cm 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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