

RF EXPOSURE EVALUATION

EUT Specification

EUT	WIFI Module
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5.825GHz ☐ Others(Bluetooth: 2.402GHz ~ 2.480GHz)
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others ____
Antenna diversity	☒ Single antenna ☐ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	18.44dBm(69.82mW)
Antenna gain	2dBi or 0dBi
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation

Antenna Information

Ant.	Brand	Model name	Antenna Type	Connector	Gain (dBi)
1	XK	XKFPC-2D4-5D8-150	PIFA	I-PEX	0.0
2	XK	XK-QX2400-PCB-140	PIFA	I-PEX	2.0

- Note: 1. This module has only one antenna port
2. Antenna 1 and antenna 2 are used for different customers.
3. Both antennas were tested and only the worst antennas (Antenna 2) were reported.

Limits for Maximum Permissible Exposure (MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)
300-1500	--	--	F/1500
1500-100000	--	--	1

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

Where

P_d = Power density in mW/cm^2

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 the limit of MPE, $1mW/cm^2$. If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

Channel	Channel Frequency (MHz)	Max Output power (dBm)	Antenna Gain (dBi)	Tolerance	Max Tune-UP power (mW)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
Test mode: 802.11b							
Low	2412	18.16	2	± 0.1	66.99	0.0211	1
Middle	2437	18.35	2	± 0.1	69.98	0.0221	1
High	2462	18.44	2	± 0.1	71.45	0.0225	1
Test mode: 802.11g							
Low	2412	15.57	2	± 0.1	36.90	0.0116	1
Middle	2437	16.34	2	± 0.1	44.06	0.0139	1
High	2462	15.84	2	± 0.1	39.26	0.0124	1
Test mode: 802.11n(HT20)							
Low	2412	14.88	2	± 0.1	31.48	0.0099	1
Middle	2437	15.19	2	± 0.1	33.81	0.0107	1
High	2462	15.15	2	± 0.1	33.50	0.0106	1
Test mode: 802.11n(HT40)							
Low	2422	14.08	2	± 0.1	26.18	0.0083	1
Middle	2437	14.29	2	± 0.1	27.48	0.0087	1
High	2452	13.90	2	± 0.1	25.12	0.0079	1