RF Exposure

FCC ID: 2AWIV-20A061

1.0 INTRODUCTION

These calculations are based on the highest average power from the EUT.

The 915 MHz transmitter operates for 6.4 mSec every 528 mS for a duty cycle of 1.21%.

The Wi-Fi Module will only be operated at a duty cycle of much less than 10% over any six-minute period. Therefore, 10 % was used in the calculations. For the d

For all calculations 1 dB was added to the power for tune up tolerance.

2.0 FCC SAR TESTING EXCLUSION:

In accordance with FCC KDB Publication 447498 D01 V05R02 Clause 4.3.1(a),

For 100 MHz to 6 GHz and *test separation distances* ≤ 50 mm, the 1-g and 10-g *SAR test exclusion thresholds* are determined by the following:
[(*max. power of channel, including tune-up tolerance, mW*) / (*min. test separation distance, mm*)]x[$\sqrt{f_{(GHz)}}$] ≤ 3.0 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR,[30] where

- $f_{(GHz)}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation[31]
- The result is rounded to one decimal place for comparison
- The values 3.0 and 7.5 are referred to as *numeric thresholds*

The test exclusions are applicable only when the minimum *test separation distance* is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

This table is for devices with a separation less than 50 mm.

	Freq. (MHz)	Max Power (dBm)	Duty Cycle %	Average Power per channel (mW)	Min Sep (mm)	SAR Calculation as per 4.3.1 a)	SAR Exemption limit 4.3.2 a)	Result
2G Wifi	2462	3.0	10.0	0.20	5	0.063	3.0	
915	915	-11.5	1.2	8.57E-04	5	1.64E-04	3.0	
					Total	0.063	3.0	Exempt

Judgement: The product is exempt from SAR testing

2.1 Calculations for Simultaneous Transmission.

In accordance with FCC KDB Publication 447498 D01 V05R02 Clause 7.2 (a)

From Clause 4.3.2 (b) For distances</= 50mm
[(max. power of Channel, mW) / (min. separation distance, mm)] x [(√Freq(GHz)/7.5)] W/kg
Where 7.5 is used for 1-g SAR limit

	Freq. (MHz)	Max Power (dBm)	Duty Cycle %	Average Power per channel (mW)	Min Sep (mm)	SAR Calculation as per 4.3.2 b)1	Limit	Result
2G Wifi	2462	3.0	10.0	0.20	5	0.0083	0.4	
915	915	-11.5	1.2	8.57E-04	5	2.19E-05	0.4	
					Total	0.0084	0.4	Exempt

3.0 MPE CALCULATION FROM FCC 1.1310 FOR MOBILE DEVICES

Band	Freq. (MHz)	Max Power (dBm)	Max Power (mW)	Max Ant Gain (dBi)	Max Ant Gain Above Isotropic (numeric)	Duty Cycle %	Max EIRP (mW)	Power Density at 20 cm (mW/cm^2)	(S) GP Limit (mW/cm^2)	MPE Ratio
2G Wifi	2412	3.0	2.00	3.7	2.34	10.0	0.47	0.0015	1.000	0.0015
915	915	-11.5	0.07	0	1.00	1.21	0.00086	1.70E-07	0.610	2.79E-07
									Total	0.0015

Notes on the above table:
In accordance with OET 65, 97-01, Power Density is calculated by:
$S = P*G/(4*\pi*R^2)$
Where
S = power density (mW/cm2)
P = power input to the antenna (mW)
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 (cm)

MPE Ratio = Product Power Density / Power Density limit
Since the calculated power density is less than the limit, this product fully meets the OET 65 requirements for the general population.