

## RF EXPOSURE EVALUATION

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency(RF) Radiation as specified in §1.1307(b)

FCC ID: 2ANVP-W5X6X

### EUT Specification

EUT	WIFI Module
<b>Frequency band (Operating)</b>	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.24GHz <input checked="" type="checkbox"/> Others: 2.402GHz~2.480GHz (BT4.2)
<b>Device category</b>	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others ____
<b>Exposure classification</b>	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm <sup>2</sup> ) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )
<b>Antenna diversity</b>	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
<b>Max. output power</b>	BT4.2: -0.937dBm (0.0008W), 2.4GHz WiFi: 15.69dBm (0.0371W)
<b>Antenna gain (Max)</b>	BT4.0 & 2.4GHz WiFi: 2.3dBi
<b>Evaluation applied</b>	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

Limits for Maximum Permissible Exposure(MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm <sup>2</sup> )	Average Time
<b>(A) Limits for Occupational/Control Exposures</b>				
300-1500	--	--	<b>F/300</b>	<b>6</b>
1500-100000	--	--	<b>5</b>	<b>6</b>
<b>(B) Limits for General Population/Uncontrol Exposures</b>				
300-1500	--	--	<b>F/1500</b>	<b>6</b>
1500-100000	--	--	<b>1</b>	<b>30</b>

## Friis transmission formula: $P_d = \frac{P_{out} * G}{4 * \pi * R^2}$

Where

$P_d$  = Power density in  $mW/cm^2$

$P_{out}$  = output power to antenna in Mw

$G$  = gain of antenna in linear scale

$\pi$  = 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

Operating Mode	Channel Frequency	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits ( $mW/cm^2$ )
	(MHz)	(dBm)	(dBm)	(dBm)	(dBi)	( $mW/cm^2$ )	
802.11b	2412	15.68	15.68±1	16.68	2.3	0.0157	1
	2437	15.69	15.69±1	16.69	2.3	0.0158	1
	2462	15.31	15.31±1	16.31	2.3	0.0144	1
802.11g	2412	14.30	14.30±1	15.30	2.3	0.0114	1
	2437	13.96	13.96±1	14.96	2.3	0.0106	1
	2462	14.00	14.00±1	15.00	2.3	0.0107	1
802.11n (HT20)	2412	12.21	12.21±1	13.21	2.3	0.0071	1
	2437	12.42	12.42±1	13.42	2.3	0.0074	1
	2462	12.26	12.26±1	13.26	2.3	0.0072	1
802.11n (HT40)	2422	11.05	11.05±1	12.05	2.3	0.0054	1
	2437	10.89	10.89±1	11.89	2.3	0.0052	1
	2452	10.56	10.56±1	11.56	2.3	0.0048	1
BT4.2BLE	2402	-1.111	-1.111±1	-0.111	2.3	0.0003	1
	2441	-0.937	-0.937±1	0.063	2.3	0.0003	1
	2480	-1.238	-1.238±1	-0.238	2.3	0.0003	1