

## 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: 2AOKB-D2121X

### EUT Specification

EUT	Nebula Vega Portable, Nebula Solar Portable
<b>Frequency band (Operating)</b>	<input checked="" type="checkbox"/> WLAN: 2.412GHz ~ 2.462GHz <input checked="" type="checkbox"/> WLAN: 5.18GHz ~ 5.24GHz <input checked="" type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input checked="" type="checkbox"/> Others: Bluetooth: 2402-2480MHz
<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 type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
<b>Antenna gain (Max)</b>	BDR+EDR: 1.99 dBi BLE: 1.99 dBi WiFi 2.4G ANT 1: 1.99 dBi WiFi 2.4G ANT 2: 1.98 dBi WiFi 5.2G ANT 1: 1.97 dBi WiFi 5.2G ANT 2: 1.95 dBi WiFi 5.3G ANT 1: 1.97 dBi WiFi 5.3G ANT 2: 1.95 dBi WiFi 5.6G ANT 1: 1.97 dBi WiFi 5.6G ANT 2: 1.95 dBi WiFi 5.8G ANT 1: 1.97 dBi WiFi 5.8G ANT 2: 1.95 dBi
<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	--	--	F/300	6
1500-100000	--	--	5	6
<b>(B) Limits for General Population/Uncontrol Exposures</b>				
300-1500	--	--	F/1500	6
1500-100000	--	--	1	30

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

Where

$P_d$ = Power density in mW/cm<sup>2</sup>

$P_{out}$ =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<sup>2</sup>. 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.

**Max Measurement Result**

Operating Mode	Measured Power	Tune up tolerance	Max. Tune up Power	Antenna Gain	Power density at 20cm	Power density Limits (mW/cm <sup>2</sup> )
	(dBm)	(dBm)	(dBm)	(dBi)	(mW/ cm <sup>2</sup> )	
BDR+EDR	6.59	6.59 ±1	7.59	1.99	0.0018	1
BLE	7.06	7.06 ±1	8.06	1.99	0.0020	1
2.4G WIFI ANT A	18.64	18.64 ±1	19.64	1.99	0.0290	1
5G WIFI	16.811	16.811 ±1	17.811	4.97	0.0377	1