

# RF Exposure Report

**FCC-ID: 2APVD-C520BU**

## RF Exposure Measurement

The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The gain of the antennas used in the product is extracted from the Antenna data sheets provided and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis Transmission formula is far field assumption, the calculated result of that is an over-prediction for near field power density. It is taken as worst case to specify the safety range.

## RF Exposure Limit

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

### 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> )
Limits for Occupational / controlled Exposures			
300 - 1500	--	--	F/300
1500 – 100000	--	--	5.0
Limits for General population / Uncontrolled Exposure			
300 - 1500	--	--	F/1500
1500 – 100000	--	--	1.0

F= Frequency in MHz

## **Friss Formula**

Friss Transmission Formula:  $P_d = (P_{out} * G) / (4\pi r^2)$

Where

$P_d$  = power density in  $\text{mW/cm}^2$

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

$G$  = gain of antenna in linear scale

$\pi = 3.1416$

$R$  = Distance between observation point and the center of radiator in cm

If we know the maximum gain of the antenna and the total output power to the antenna, through calculation, we will know MPE value at distance 20cm.

## **EUT Operation condition**

EUT was enabled to transmit and receive at lowest, middle and highest channels.

## **Classification**

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance from the antenna should be included in the User manual. So, this device is classified as Mobile device.

## **Turn up**

Mode	Detector	Turn up
802.11b	PEAK	$19 \pm 1 \text{ dBm}$
802.11g	PEAK	$17 \pm 1 \text{ dBm}$
802.11n(HT20)	PEAK	$18 \pm 1 \text{ dBm}$
802.11n(HT40)	PEAK	$18 \pm 1 \text{ dBm}$

**ANT Gain (G)****2402-2483.5MHz: 0dBi(gain of antenna in linear scale=1)**

Protocol	Output Power to Antenna (mW)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
802.11b	100	0.020	1	Pass
802.11g	63.10	0.013	1	Pass
802.11n(HT20)	79.43	0.016	1	Pass
802.11n(HT40)	79.43	0.016	1	Pass