



## Maximum Permissible Exposure

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**FCC ID:** XBG-UBA100  
**APPLICANT:** AVALUE TECHNOLOGY INCORPORATION  
**Application Type:** Certification  
**Product:** UWB Anchor  
**Model No.:** UB-A100  
**Trademark:**   
**FCC Rule Part(s):** Part 2.1091 (Mobile)  
**Received Date:** September 5, 2019  
**Test Date:** February 6 ~ 11, 2020

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( Fran Chen )  
**Reviewed By** : *Paddy Chen*  
( Paddy Chen )  
**Approved By** : *Chenz Ker*  
( Chenz Ker )



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Taiwan) Co., Ltd.


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## Revision History

Report No.	Version	Description	Issue Date
1909TW3101-U3	1.0	Original Report	2020-03-19

## 1. PRODUCT INFORMATION

### 1.1. Equipment Description

Product Name	UWB Anchor
Model No.	UB-A100
Trademark	
Supports Radios Spec.	<b>WLAN:</b> 2.4G: 802.11b/g/HT-20/HT-40 <b>UWB:</b> 4.5GHz
Operating Frequency	<b>WiFi 2.4G:</b> For 802.11b/g/n-HT20: 2412 ~ 2462 MHz For 802.11n-HT40: 2422 ~ 2452 MHz <b>UWB:</b> 4.5GHz
Modulation	<b>WiFi 2.4GHz:</b> 802.11b: DSSS, DBPSK, DQPSK, CCK 802.11g/n-20M/n-40M: OFDM (BPSK, QPSK, 16QAM, 64QAM) <b>UWB:</b> BPM-BPSK

## 1.2. Antenna Description

WiFi 2.4GHz	
Antenna Type	Dipole
Antenna M/N	AFMQ1B-C0003
Antenna Gain	3dBi
UWB 4.5GHz	
Antenna Type	Dipole
Antenna M/N	AEQQ2S-B0003
Antenna Gain	4.2dBi

## 2. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

### 2.1. Limits

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)

#### 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 (Minutes)
(A) Limits for Occupational/ Control Exposures				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f <sup>2</sup>	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
0.3-1.4	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f <sup>2</sup>	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

Note : (1) f= Frequency in MHz , (2) \* = Plane-wave equivalent power density

Calculation Formula:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

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

Under normal use condition, is at least 20cm away from the body of the user.

So, this device is classified as **Mobile Device**.

## 2.2. Test Result

Mode	Frequency (MHz)	Output Power to Antenna (dBm)	Output Power to Antenna (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
802.11b	2412-2462	18.16	65.46	3	20	0.0260	1
802.11g	2412-2462	21.61	144.88	3	20	0.0575	1
802.11n-HT20	2412-2462	21.20	131.83	3	20	0.0523	1
802.11n-HT40	2422-2452	19.84	96.38	3	20	0.0383	1
UWB	4500	-5.00	0.32	4.2	20	0.0002	1

### Conclusion :

$$CPD1/LPD1 + CPD2/LPD2 + \dots + CPDN/LPDN \leq 1$$

CPD : Calculation Power Density

LPD : Limit of Power Density

Mode	Power Density	Limit	Conclusion	Result ( $\leq 1$ )
WiFi	0.0575	1	0.0577	Pass
UWB	0.0002	1		

So, the device can comply with FCC radiation exposure requirement specified in the FCC Rule 2.1091.

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