



# MPE Test Report

**Report No.:** MTi210730012-02E4

**Date of issue:** Aug. 19, 2021

**Applicant:** WIRELESS-TAG TECHNOLOGY  
CO., LIMITED.

**Product name:** WiFi Module

**Model(s):** WT32-ETH01

**FCC ID:** 2AFOS-WT32-ETH01

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>



## Instructions

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<b>TEST RESULT CERTIFICATION</b>	
Applicant's name.....	WIRELESS-TAG TECHNOLOGY CO., LIMITED.
Address.....	Room 115-118, Building A, ChengshishanhaiCenter, No.11, Zhongxing Road, Bantian Sub-district, Longgang District, Shenzhen, 518000 China
Manufacturer's Name ...	WIRELESS-TAG TECHNOLOGY CO., LIMITED.
Address.....	Room 115-118, Building A, ChengshishanhaiCenter, No.11, Zhongxing Road, Bantian Sub-district, Longgang District, Shenzhen, 518000 China
<b>Product description</b>	
Product name.....	WiFi Module
Trademark .....	Wireless-tag
Model Name .....	WT32-ETH01
Serial Model.....	N/A
Standards.....	N/A
Test procedure	KDB 447498 D01 v06
<b>Date of Test</b>	
Date (s) of performance of tests... :	Aug. 11, 2021 ~Aug. 19, 2021
Test Result.....:	Pass
This device described above has been tested by Shenzhen Microtest Co., Ltd. and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.	

**Testing Engineer** :

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**Authorized Signatory** :

*Tom Xue*

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(Tom Xue)



# 1 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)

## 1.1 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> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposure</b>				
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
300-1,500			f/300	6
1,500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	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
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz \* = Plane-wave equivalent power density

### MPE Calculation Method

Friis transmission formula:  $Pd = (Pout * G) / (4 * \pi * R^2)$

Where

Pd= Power density in mW/cm<sup>2</sup>

Pout=output power to antenna in mW

G= Numeric gain of the antenna relative to isotropic antenna

Pi=3.1415926

R= distance between observation point and center of the radiator in cm(20cm)

Pd 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.



## 1.2 Measurement Result

**BLE:** Operation Frequency: BT GFSK: 2402-2480MHz

**BT:** Operation Frequency: BT GFSK,  $\pi/4$ -DQPSK, 8DPSK: 2402-2480MHz

**WIFI:** Operation Frequency: 802.11b/g/n20:2412~2462 MHz, 802.11n40:2422~2452 MHz

Power density limited: 1mW/ cm<sup>2</sup>

Antenna Type: PCB Antenna; antenna gain: 1dBi

R=20cm

$mW=10^{(dBm/10)}$

antenna gain Numeric= $10^{(dBi/10)}=10^{(1/10)}=1.26$

### BLE:

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK	3.797	3±1	4	2.512	1	1.26	0.0006	1
2440		3.21	3±1	4	2.512	1	1.26	0.0006	1
2480		3.396	3±1	4	2.512	1	1.26	0.0006	1

### BT:

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2402	GFSK	3.82	3±1	4	2.512	1	1.26	0.0006	1
2441		3.187	3±1	4	2.512	1	1.26	0.0006	1
2480		3.527	3±1	4	2.512	1	1.26	0.0006	1
2402	$\pi/4$ -DQPSK	5.849	6±1	7	5.012	1	1.26	0.0013	1
2441		5.46	6±1	7	5.012	1	1.26	0.0013	1
2480		5.728	6±1	7	5.012	1	1.26	0.0013	1
2402	8DPSK	6.193	6±1	7	5.012	1	1.26	0.0013	1
2441		5.852	6±1	7	5.012	1	1.26	0.0013	1
2480		6.092	6±1	7	5.012	1	1.26	0.0013	1



**WIFI:**

Channel Freq. (MHz)	modulation	conducted power	Tune-up power	Max		Antenna	Evaluation result at 20cm	Power density Limits
		(dBm)	(dBm)	tune-up power		Gain	Power density(mW/cm2 )	(mW/cm2)
		Ant A	Ant A	(dBm)	(mW)	Numeric		
2412	802.11b	16.59	16±1	17	50.118723	1.26	0.01256	1
2437		15.45	16±1	17	50.118723	1.26	0.01256	1
2462		15.75	16±1	17	50.118723	1.26	0.01256	1
2412	802.11g	14.44	14±1	15	31.622777	1.26	0.00793	1
2437		13.71	14±1	15	31.622777	1.26	0.00793	1
2462		13.94	14±1	15	31.622777	1.26	0.00793	1
2412	802.11n H20	14.2	14±1	15	31.622777	1.26	0.00793	1
2437		13.45	14±1	15	31.622777	1.26	0.00793	1
2462		13.68	14±1	15	31.622777	1.26	0.00793	1
2422	802.11n H40	13.62	13±1	14	25.118864	1.26	0.00630	1
2437		13.13	13±1	14	25.118864	1.26	0.00630	1
2452		12.77	13±1	14	25.118864	1.26	0.00630	1

Simultaneous transmit  
BT+2.4GWiFi=0.0013+0.01256=0.01440

**Conclusion:**

For the max result:  $0.01440 \leq 1.0$  for 1g SAR, No SAR is required.

**----END OF REPORT----**