



REPORT No. : SZ18020099S01

# RF EXPOSURE

# EVALUATION REPORT

**APPLICANT** : Chengdu Diting Technology Co. ,Ltd

**PRODUCT NAME** : newifi 3

**MODEL NAME** : newifi D2

**BRAND NAME** : newifi

**FCC ID** : 2AO49-NEWIFID2

**STANDARD(S)** : 47CFR 2.1091  
KDB 447498

**ISSUE DATE** : 2018-04-02

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Change History		
Issue	Date	Reason for change
1.0	2018-04-02	First edition



# 1. Technical Information

**Note:** Provide by manufacturer.

## 1.1 Applicant and Manufacturer Information

<b>Applicant:</b>	Chengdu Diting Technology Co. ,Ltd
<b>Applicant Address:</b>	C11 Building 2001, No.219, 2nd Tianhua Road, Hi-tech Zone, Chengdu
<b>Manufacturer:</b>	Chengdu Diting Technology Co. ,Ltd
<b>Manufacturer Address:</b>	C11 Building 2001, No.219, 2nd Tianhua Road, Hi-tech Zone, Chengdu

## 1.2 Equipment Under Test (EUT) Description

<b>EUT Type:</b>	newifi 3
<b>Hardware Version:</b>	N/A
<b>Software Version:</b>	v3.2.1.17400
<b>Frequency Bands:</b>	WLAN 2.4GHz: 802.11b/g/n-20MHz: 2.412GHz - 2.462GHz 802.11n-40MHz: 2.422GHz - 2.452GHz WLAN 5.2GHz : 5.150GHz - 5.250GHz; WLAN5.8GHz : 5.725GHz- 5.850GHz;
<b>Modulation Mode:</b>	WLAN 2.4GHz:802.11b/g/n HT-20/HT-40 ; WLAN 5.2GHz:802.11a/n HT-20/n HT-40/ac VHT-20/ac VHT-40/ac VHT-80 ; WLAN5.8GHz : 802.11a/n HT-20/n HT-40/ac VHT-20/ac VHT-40/ac VHT-80 ;
<b>Antenna type:</b>	External Antenna
<b>Antenna Gain:</b>	2.4G: Ant0: 5 dBi; Ant1: 5 dBi 5G: Ant0: 6.5 dBi; Ant1: 6.5 dBi

## 1.3 Photographs of the EUT

### 1. EUT front view



### 2. EUT rear view





### 1.3.1 Identification of all used EUT

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

EUT Identity	Hardware Version	Software Version
1#	N/A	v3.2.1.17400

## 1.4 Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	47 CFR§2.1091	Radio frequency Radiation Exposure Evaluation: mobile devices
2	KDB 447498 D01v06	General RF Exposure Guidance



## 2. Device Category And RF Exposure Limit

Per user manual, Based on 47CFR 2.1091, this device belongs to mobile device category with General Population/Uncontrolled exposure.

### Mobile Devices:

#### 47CFR 2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. In this context, the term "fixed location" means that the device is physically secured at one location and is not able to be easily moved to another location. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

### GENERAL POPULATION / UNCONTROLLED EXPOSURE

The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity. Warning labels placed on low-power consumer devices such as cellular telephones are not considered sufficient to allow the device to be considered under the occupational/controlled category, and the general population/uncontrolled exposure limits apply to these devices.

TABLE 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>(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
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz

\* = Plane-wave equivalent power density



### 3. Measurement Of conducted Peak Output Power

#### 1. 2.4G Wifi Peak output power

Band	Channel	Frequency (MHz)	ANT0 Output Power(dBm)		
			802.11b	802.11g	802.11n20
Wifi2.4G	1	2412	13.38	19.25	19.42
	6	2437	12.96	19.17	19.67
	11	2462	12.20	18.28	18.48

Band	Channel	Frequency (MHz)	ANT1 Output Power(dBm)		
			802.11b	802.11g	802.11n20
Wifi2.4G	1	2412	18.23	24.93	25.18
	6	2437	17.75	24.68	24.74
	11	2462	18.18	24.67	24.91

Band	Channel	Frequency (MHz)	ANT0+ANT1 Total Peak Power (dBm)	
			802.11n20	
Wifi2.4G	1	2412	26.20	
	6	2437	25.92	
	11	2462	25.80	



Band	Channel	Frequency (MHz)	ANT0
			Output Power(dBm)
Wifi2.4G	3	2422	17.29
	6	2437	17.64
	9	2452	16.80

Band	Channel	Frequency (MHz)	ANT1
			Output Power(dBm)
Wifi2.4G	3	2422	23.61
	6	2437	23.31
	9	2452	22.53

Band	Channel	Frequency (MHz)	ANT0+ANT1
			Total Peak Power (dBm)
Wifi2.4G	3	2422	24.52
	6	2437	24.35
	9	2452	23.56



## 2. 5G Wifi Peak output power

Band	Channel	Frequency (MHz)	802.11a	
			ANT0 Measured Peak Power (dBm)	ANT1 Measured Peak Power (dBm)
Wifi 5.2G	36	5180	14.22	14.50
	44	5220	13.54	13.76
	48	5240	13.86	13.66
Wifi 5.8G	149	5745	15.15	16.14
	157	5785	14.76	15.47
	165	5825	15.15	14.63

Band	Channel	Frequency (MHz)	802.11n20	
			ANT0 Measured Peak Power (dBm)	ANT1 Measured Peak Power (dBm)
Wifi 5.2G	36	5180	14.66	14.08
	44	5220	15.62	14.17
	48	5240	14.77	14.17
Wifi 5.8G	149	5745	15.20	16.33
	157	5785	15.82	15.84
	165	5825	15.20	15.49

Band	Channel	Frequency (MHz)	802.11n20
			ANT0+ANT1 Total Peak Power (dBm)
Wifi 5.2G	36	5180	17.39
	44	5220	17.97
	48	5240	17.49
Wifi 5.8G	149	5745	18.81
	157	5785	18.84
	165	5825	18.36



Band	Channel	Frequency (MHz)	802.11n40	
			ANT0 Measured Peak Power (dBm)	ANT1 Measured Peak Power (dBm)
Wifi 5.2G	38	5190	11.90	11.45
	46	5230	11.95	11.80
Wifi 5.8G	151	5755	13.80	14.03
	159	5795	13.29	13.58

Band	Channel	Frequency (MHz)	802.11n40
			ANT0+ANT1 Total Peak Power (dBm)
Wifi 5.2G	38	5190	14.69
	46	5230	14.89
Wifi 5.8G	151	5755	16.93
	159	5795	16.45

Band	Channel	Frequency (MHz)	802.11 ac (VHT40)	
			ANT0 Measured Peak Power (dBm)	ANT1 Measured Peak Power (dBm)
Wifi 5.2G	38	5190	12.02	12.09
	46	5230	11.96	11.41
Wifi 5.8G	151	5755	12.65	14.24
	159	5795	13.17	13.77

Band	Channel	Frequency (MHz)	802.11 ac (VHT40)
			ANT0+ANT1 Total Peak Power (dBm)
Wifi 5.2G	38	5190	15.07
	46	5230	14.70
Wifi 5.8G	151	5755	16.53
	159	5795	16.49



Band	Channel	Frequency (MHz)	802.11 ac (VHT20)	
			ANT0 Measured Peak Power (dBm)	ANT1 Measured Peak Power (dBm)
Wifi 5.2G	36	5180	14.39	13.18
	44	5220	13.64	12.91
	48	5240	13.54	12.98
Wifi 5.8G	149	5745	15.06	15.48
	157	5785	14.65	14.91
	165	5825	13.73	14.71

Band	Channel	Frequency (MHz)	802.11 ac (VHT20)
			ANT0+ANT1 Total Peak Power (dBm)
Wifi 5.2G	36	5180	16.84
	44	5220	16.30
	48	5240	16.28
Wifi 5.8G	149	5745	18.29
	157	5785	17.79
	165	5825	17.26

Band	Channel	Frequency (MHz)	802.11 ac (VHT80)	
			ANT0 Measured Peak Power (dBm)	ANT1 Measured Peak Power (dBm)
Wifi 5.2G	42	5210	12.98	13.10
Wifi 5.8G	155	5775	13.06	15.75

Band	Channel	Frequency (MHz)	802.11 ac (VHT80)
			ANT0+ANT1 Total Peak Power (dBm)
Wifi 5.2G	42	5210	16.05
Wifi 5.8G	155	5775	17.62



## 4. RF Exposure Evaluation

### Standalone transmission MPE evaluation

Bands	Frequency (MHz)	Antenna Gain (dBi)	Conducted Peak Power (dBm)	EIRP (mW)	Power density (mW/cm <sup>2</sup> )	Limit for MPE (mW/cm <sup>2</sup> )
2.4GHz ANT0	2437	5	19.67	293.09	0.058	1.0
2.4GHz ANT1	2412	5	25.18	1042.32	0.207	1.0
2.4GHz ANT0+ ANT1	2412	5	26.20	1318.26	0.262	1.0
5.2GHz ANT0	5220	6.5	15.62	162.93	0.032	1.0
5.2GHz ANT1	5180	6.5	14.50	125.89	0.025	1.0
5.8GHz ANT0	5785	6.5	15.82	170.61	0.034	1.0
5.8GHz ANT1	5745	6.5	16.33	191.87	0.038	1.0
5.2GHz ANT0+ANT1	5220	6.5	17.97	279.90	0.056	1.0
5.8GHz ANT0+ANT1	5785	6.5	18.84	341.98	0.068	1.0

#### 1. MPE calculation method

$$\text{Power Density} = \text{EIRP}/4\pi R^2$$

Where: EIRP = P·G

P = Peak output power

G = Antenna gain

R = Separation distance (20cm)

### Simultaneous transmission MPE evaluation

For multiple collocated transmitters operating simultaneously in frequency bands where different limits apply

The Power Density at the specified separation distance is calculated for each transmitter.

According to KDB 447498 D01, the fraction of the exposure limit is calculated for each transmitter as  $(\text{Power Density of transmitter}) / (\text{Limit applicable to that transmitter}) \leq 1$

The fractions are summed. The summed value is  $0.742 \leq 1$ .



## Annex A General Information

### 1. Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Responsible Test Lab Manager:	Mr. Su Feng
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### 2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

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