REPORT No. : SZ100040S01

RF EXPOSURE EVALUATION REPORT

APPLICANT	:	Anker Technology Co., Limited
PRODUCT NAME	:	Nebula Capsule
MODEL NAME	:	D4111
BRAND NAME	:	N/A
FCC ID	:	2AB7K-D4111
STANDARD(S)	:	47CFR 2.1091 KDB 447498 D01 General RF Exposure Guidance v06
ISSUE DATE	:	2017-11-16

Tested by: Peng Fuwei (Test engineer)

Approved by: Peng Huarui (Supervisor)

MORLAB

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DIRECTORY

Change History		
Issue	**Date**	**Reason for change**
1.0	2017-11-16	First edition

1. Technical Information

Note: Provide by manufacturer.

1.1. Applicant and Manufacturer Information

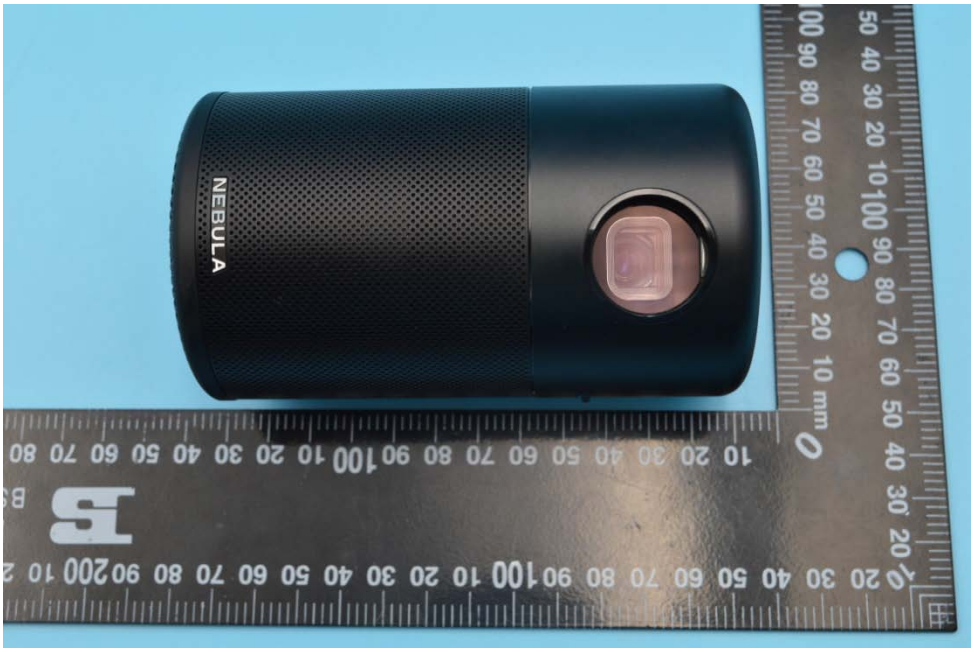
Applicant:	Anker Technology Co., Limited
Applicant Address:	Room 1318-19,Hollywood Plaza,610 Nathan Road,Mongkok,Kowloon,Hong Kong
Manufacturer:	Anker Technology Co., Limited
Manufacturer Address:	Room 1318-19,Hollywood Plaza,610 Nathan Road,Mongkok,Kowloon,Hong Kong

1.2. Equipment Under Test (EUT) Description

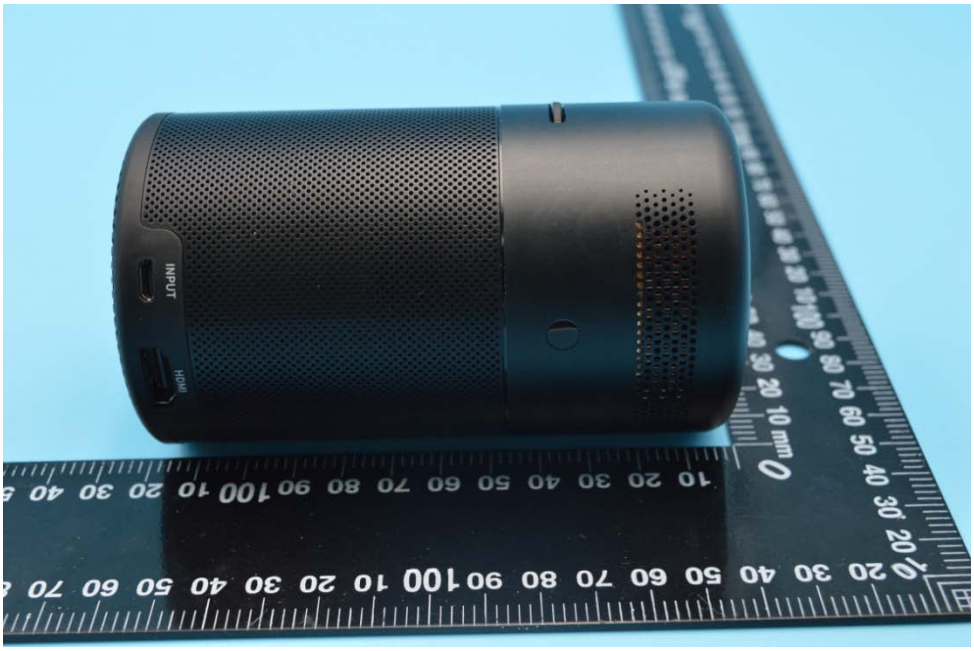
EUT Type:	Nebula Capsule
Hardware Version:	V0.4
Software Version:	V1.0.6
Frequency Bands:	802.11b/g/n-20: 2412MHz – 2462MHz; 802.11 n-40MHz:2422MHz– 2452MHz 802.11a/n:5150MHz-5250;5725 MHz -5850MHz Bluetooth 4.0 LE:2402-2480MHz; Bluetooth 2.1+EDR:2402-2480MHz;
Modulation Mode:	802.11b :DSSS; 802.11a/g/n:OFDM; Bluetooth 2.1+EDR:(FHSS); Bluetooth 4.0: GFSK;
Antenna type:	Monopole Antenna

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#	V0.4	V1.0.6

1.4. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	**47 CFR§2.1091**	Radiofrequency 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^2)	Averaging time (minutes)
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	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. Bluetooth Average output power

Band	Channel	Output Power(dBm)		
		GFSK	π/4-DQPSK	8-DPSK
BT 2.1+EDR	0	5.81	5.72	5.88
	39	6.77	6.70	6.90
	78	8.26	7.95	8.16

Band	Channel	Frequency (MHz)	Output Power(dBm)
			GFSK
BLE	0	2402	-4.87
	19	2440	-4.10
	39	2480	-3.24

2. 2.4G Wifi Average output power

Band	Channel	Frequency (MHz)	Output Power(dBm)		
			802.11b	802.11g	802.11n20
Wifi	1	2412	15.77	17.32	17.48
	6	2437	16.38	17.74	17.57
	11	2462	16.50	17.54	17.77

Band	Channel	Frequency (MHz)	Output Power(dBm)
			802.11n40
Wifi	3	2422	17.67
	6	2437	17.57
	9	2452	17.70

3. 5G Wifi Average output power

Band	Channel	Frequency (MHz)	Output Power(dBm)	
			802.11a (DSSS)	802.11n20 (OFDM)
5.2G Wi-Fi	36	5180	6.59	6.52
	44	5220	8.78	8.94
	48	5240	9.97	10.08

Band	Channel	Frequency (MHz)	Output Power(dBm)
			802.11n40 (GFSK)
5.2GWi-Fi	38	5190	7.48
	46	5230	9.81

Band	Channel	Frequency (MHz)	Output Power(dBm)	
			802.11a (DSSS)	802.11n20 (OFDM)
5.8G Wi-Fi	149	5745	0.09	0.25
	157	5785	0.84	1.02
	165	5825	2.07	2.29

Band	Channel	Frequency (MHz)	Output Power(dBm)
			802.11n40 (GFSK)
5.8G Wi-Fi	151	5755	0.56
	159	5795	1.17

4. RF EXPOSURE EVALUATION

Standalone transmission MPE evaluation

Bands	Frequency (MHz)	Antenna Gain (dBi)	Conducted Average Power (dBm)	Time-averaging EIRP (mW)	Power density (mW/cm²)	Limit for MPE (mW/cm²)
BT2.1+EDR	2402	0	8.5	7.08	0.0014	1.0
BLE	2480	0	-3.0	0.50	0.0001	1.0
2.4GHz	2462	0	18	63.10	0.0126	1.0
5GHz	5240	0	10.5	11.22	0.0022	1.0

1. MPE calculation method

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

Where: $EIRP = P \cdot G$

P = Peak out power

G = Antenna gain

R = Separation distance (20cm)

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
Telephone:	+86 755 36698555
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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

END OF REPORT