



REPORT No. : SZ18030225S01

RF EXPOSURE EVALUATION REPORT

APPLICANT : Fujian Newland Auto-ID Tech Co.,Ltd.

PRODUCT NAME : Information Terminal

MODEL NAME : NLS-NQuire1000

BRAND NAME : Newland

FCC ID : SL9NLS-NQUIRE1000

STANDARD(S) : 47CFR 2.1091
KDB 447498

ISSUE DATE : 2018-07-25

Tested by:

Gan Yueming(Test engineer)

Approved by:

Peng Huarui (Supervisor)

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MORLAB

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Change History		
Issue	Date	Reason for change
1.0	2018-07-25	First edition



1. Technical Information

Note: Provide by manufacturer.

1.1 Applicant and Manufacturer Information

Applicant:	Fujian Newland Auto-ID Tech Co.,Ltd.
Applicant Address:	Newland Science & Technology Park, No.1 Rujiang West Rd.,Mawei district,Fuzhou,Fujian,P.R.China
Manufacturer:	Shenzhen Chuangwei Electronic Appliance Tech Co., Ltd.
Manufacturer Address:	4F & 6F, Overseas plant south, Skyworth Industrial Park, Shiyan Street, Bao'an District, Shenzhen, P.R. China

1.2 Equipment Under Test (EUT) Description

EUT Type:	Information Terminal
Hardware Version:	NQ1000-MB-D6-V02
Software Version:	NQ1000-Android-7-1-V005
Frequency Bands:	WLAN 2.4GHz: 2412 MHz ~ 2462 MHz WLAN 5.2GHz: 5180 MHz ~ 5240 MHz WLAN 5.3GHz: 5260 MHz ~ 5320 MHz WLAN 5.5GHz: 5500 MHz ~ 5700 MHz WLAN 5.8GHz: 5745 MHz ~ 5825 MHz Bluetooth (BR+EDR+LE): 2402 MHz ~ 2480 MHz
Modulation Mode:	WLAN2.4GHz 802.11b:DSSS WLAN2.4GHz 802.11g/n HT20: OFDM WLAN5GHz 802.11a/n HT20/HT40: OFDM WLAN5GHz 802.11ac VHT20/VHT40/VHT80: OFDM Bluetooth: GFSK, $\pi/4$ -DQPSK, 8-DPSK
Antenna Type:	FPC Antenna
Antenna Gain:	2.4GHz Band: 3.98dBi WLAN5GHz: 4.77dBi

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#	NQ1000-MB-D6-V02	NQ1000-Android-7-1-V005

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 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 RF Output Power

<WLAN2.4GHz Mode>

WLAN 2.4GHz	Mode	Channel	Frequency (MHz)	Peak power (dBm)	Tune-Up Limit
	802.11b 1Mbps	CH 1	2412	12.52	13.00
		CH 6	2437	13.33	14.00
		CH 11	2462	13.86	14.00
	802.11g 6Mbps	CH 1	2412	19.37	20.00
		CH 6	2437	20.03	20.50
		CH 11	2462	20.43	21.00
	802.11n-HT20 MCS0	CH 1	2412	19.19	20.00
		CH 6	2437	19.85	20.00
		CH 11	2462	20.48	21.00

<WLAN5GHz Mode>

WLAN 5.2GHz	Mode	Channel	Frequency (MHz)	Peak power (dBm)	Tune-Up Limit
	802.11a 6Mbps	CH 36	5180	17.18	18.00
		CH 44	5220	17.54	18.00
		CH 48	5240	17.77	18.00
	802.11n-HT20 MCS0	CH 36	5180	16.50	17.00
		CH 44	5220	16.84	17.50
		CH 48	5240	17.28	17.50
	802.11n-HT40 MCS0	CH 38	5190	16.53	17.00
		CH 46	5230	17.06	17.50
	802.11ac-VHT20 MCS0	CH 36	5180	16.44	17.00
		CH 44	5220	16.83	17.50
		CH 48	5240	17.35	17.50
	802.11ac-VHT40 MCS0	CH 38	5190	16.65	17.00
		CH 46	5230	16.77	17.00
	802.11ac-VHT80 MCS0	CH 42	5210	16.21	17.00



WLAN 5.3GHz	Mode	Channel	Frequency (MHz)	Peak power (dBm)	Tune-Up Limit
	802.11a 6Mbps	CH 52	5260	18.16	19.00
		CH 60	5300	18.45	19.00
		CH 64	5320	18.78	19.00
	802.11n-HT20 MCS0	CH 52	5260	17.82	18.50
		CH 60	5300	18.15	18.50
		CH 64	5320	18.69	19.00
	802.11n-HT40 MCS0	CH 54	5270	17.79	18.00
		CH 62	5310	18.35	18.50
	802.11ac-VHT20 MCS0	CH 52	5260	17.87	18.00
		CH 60	5300	18.06	18.50
		CH 64	5320	18.57	19.00
	802.11ac-VHT40 MCS0	CH 54	5270	17.87	18.00
		CH 62	5310	18.47	19.00
	802.11ac-VHT80 MCS0	CH 58	5290	17.90	18.50

WLAN 5.5GHz	Mode	Channel	Frequency (MHz)	Peak power (dBm)	Tune-Up Limit
	802.11a 6Mbps	CH 100	5500	19.78	20.00
		CH 120	5600	19.19	20.00
		CH 140	5700	18.50	19.00
	802.11n-HT20 MCS0	CH 100	5500	19.60	20.00
		CH 120	5600	19.13	20.00
		CH 140	5700	18.51	19.00
	802.11n-HT40 MCS0	CH 102	5510	19.47	20.00
		CH 126	5630	18.81	19.00
		CH 142	5710	18.23	19.00
	802.11ac-VHT20 MCS0	CH 100	5500	19.60	20.00
		CH 120	5600	19.06	19.50
		CH 140	5700	18.47	19.00
	802.11ac-VHT40 MCS0	CH 102	5510	19.46	20.00
		CH 126	5630	18.78	19.00
		CH 142	5710	18.23	19.00



	802.11ac-VHT80 MCS0	CH 106	5530	18.97	19.50
		CH 122	5610	18.72	19.50
		CH 138	5690	18.17	19.00

WLAN 5.8GHz	Mode	Channel	Frequency (MHz)	Peak power (dBm)	Tune-Up Limit
	802.11a MCS0	CH 149	5745	18.30	19.00
		CH 157	5785	17.79	18.50
		CH 165	5825	17.46	18.00
	802.11n-HT20 MCS0	CH 149	5745	18.22	19.00
		CH 157	5785	17.61	18.00
		CH 165	5825	17.43	18.00
	802.11n-HT40 MCS0	CH 151	5755	18.10	18.50
		CH 159	5795	17.62	18.00
	802.11ac-VHT20 MCS0	CH 149	5745	18.41	19.00
		CH 157	5785	17.62	18.00
		CH 165	5825	17.44	18.00
	802.11ac-VHT40 MCS0	CH 151	5755	18.07	18.50
		CH 159	5795	17.76	18.00
	802.11ac-VHT80 MCS0	CH 155	5775	17.76	18.00

<Bluetooth Mode>

Mode	Channel	Frequency (MHz)	Peak power (dBm)		
			1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	5.62	1.94	2.39
	CH 39	2441	7.62	3.68	4.04
	CH 78	2480	6.90	3.62	3.87
Tune-up Limit			8	4	4.5

Mode	Channel	Frequency (MHz)	Peak power (dBm)
			GFSK
LE	CH 00	2402	7.52
	CH 19	2440	9.81
	CH 39	2480	8.97
Tune-up Limit			10.5

4. RF Exposure Evaluation

Standalone transmission MPE evaluation

Bands	Frequency (MHz)	Maximum Tune-up Limit (dBm)	Antenna Gain (dBi)	EIRP (mW)	Power density (mW/cm ²)	Limit for MPE (mW/cm ²)
WLAN2.4G	2462	21.0	3.98	314.7	0.063	1.0
WLAN5.2G	5240	18.0	4.77	189.3	0.038	1.0
WLAN5.3G	5320	19.0	4.77	237.9	0.047	1.0
WLAN5.5G	5500	20.0	4.77	300.0	0.06	1.0
WLAN5.8G	5745	19.0	4.77	237.9	0.047	1.0
Bluetooth	2440	10.5	3.98	28	0.006	1.0

1. MPE calculation method

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

Where: $\text{EIRP} = P \cdot G$

P = Peak output power

G = Antenna gain

R = Separation distance (20cm)

Simultaneous transmission MPE evaluation

According to the Characteristics of the device, it cannot operate at the same time with one common antenna, so simultaneous transmission MPE evaluation is unnecessary.



Annex A General Information

1. Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
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Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
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