

# MPE REPORT

FCC ID: 2AKRB-MINI814

Date of issue: June 05, 2019

Report Number:	MTi190601E002
Sample Description:	MINI CAMERA
Model(s):	MINI 814, MINI 814 B
Applicant:	ShenZhen Nello Electronics Technology Co., Ltd.
Address:	6/F, Bldg A, HuaYuan Industrial Park, 1st Industrial area, FengHuang, FuYong Town, Bao'an Distict, ShenZhen, China
Date of Test:	May 28, 2019 to June 05, 2019

Shenzhen Microtest Co., Ltd.

<http://www.mtitest.com>

TEST RESULT CERTIFICATION	
Applicant's name:	ShenZhen Nello Electronics Technology Co., Ltd.
Address:	6/F, Bldg A, HuaYuan Industrial Park, 1st Industrial area, FengHuang, FuYong Town, Bao'an Distict, ShenZhen, China
Manufacture's Name:	ShenZhen Nello Electronics Technology Co., Ltd.
Address:	6/F, Bldg A, HuaYuan Industrial Park, 1st Industrial area, FengHuang, FuYong Town, Bao'an Distict, ShenZhen, China
Product name:	MINI CAMERA
Trademark:	N/A
Model and/or type reference ...:	MINI 814
Serial Model.....:	MINI 814 B
RF Exposure Procedures.....:	KDB 447498 D01 v06

*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.*

Tested by:

*Jone Lee*

Jone Lee

June 05, 2019

Reviewed by:

*Blue Zheng*

Blue Zheng

June 05, 2019

Approved by:

*Smith Chen*

Smith Chen

June 05, 2019

## 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)

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

Where

$P_d$  = Power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = 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)

$P_d$  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.

## Measurement Result

### WIFI:

Operation Frequency: WIFI 802.11b/g/n HT20: 2412-2462MHz,

802.11n HT40: 2422-2452MHz,

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

Antenna Type: Wifi Antenna: FPCB Mounted Embedded Antenna;

WIFI antenna gain: 3dBi

R=20cm

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

antenna gain Numeric= $10^{(dBi/10)}=10^{(3/10)}=2$

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/cm <sup>2</sup> )	(mW/cm <sup>2</sup> )
				(dBm)	(mW)	Numeric		
		Ant A	Ant A	Ant A	Ant A	Ant A	Ant A	
2412	802.11b	13.99	14±1	15	31.622777	2	0.01258	1
2437		14.77	14±1	15	31.622777	2	0.01258	1
2462		14.27	14±1	15	31.622777	2	0.01258	1
2412	802.11g	12.17	12±1	13	19.952623	2	0.00794	1
2437		12.77	12±1	13	19.952623	2	0.00794	1
2462		12.77	12±1	13	19.952623	2	0.00794	1
2412	802.11n H20	10.72	11±1	12	15.848932	2	0.00631	1
2437		10.27	11±1	12	15.848932	2	0.00631	1
2462		11.76	11±1	12	15.848932	2	0.00631	1
2422	802.11n H40	7.78	8±1	9	7.9432823	2	0.00316	1
2437		8.48	8±1	9	7.9432823	2	0.00316	1
2452		8.11	8±1	9	7.9432823	2	0.00316	1

### Conclusion:

For the max result:  $0.01258 \leq 1.0$  for 1g SAR, No SAR is required.

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