



Maximum Permissible Exposure Evaluation

FCC ID: 2A56E-NB2**IC: 28519-NB2**

1. Client Information

Applicant	:	Nooie LLC
Address	:	1603 s main st, suite A, Milpitas, CA 95035
Manufacturer	:	Nooie LLC
Address	:	1603 s main st, suite A, Milpitas, CA 95035

2. General Description of EUT

EUT Name	:	nooie smart baby monitor
FCC Models No.	:	NB2, IPC100, IPC100C, NB2 Pro, NB2 Plus, NB3, NB3 Pro, NB3 Plus, NB4, NB4 Pro, NB4 Plus, NB5, NB5 Pro, NB5 Plus
IC Models No.	:	NB2
HVIN	:	NB2
Brand Name	:	Nooie
Model Different	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is appearance color.
Sample ID	:	HC-C-202401-0300-01-02-1#&HC-C-202401-0300-01-02-2#
Product Description	:	Operation Frequency: 802.11b/g/n(HT20): 2412MHz~2462MHz U-NII-1: 5180MHz~5240MHz
Power Rating	:	Adapter (Model: TPA-46B050100UU) Input: 100-240V~ 50/60Hz 0.2A Output: 5.0V $\overline{\text{---}}$ 1000mA
Software Version	:	4.4.36
Hardware Version	:	----
Remark	:	The antenna gain provided by the applicant, the verified for the RF conduction test and adapter provided by TOBY test lab.

Method of Measurement for FCC

1. Max. Antenna Gain:

2.4G WIFI Antenna: 4.02dBi

5G WIFI Antenna: 2.77dBi.

2. EUT Operation Condition:

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3. Exposure Evaluation:

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=(PG)/4\pi R^2$$

Where

S: power density

P: power input to the antenna

G: power gain of the antenna in the direction of interest relative to an isotropic radiator.

R: distance to the center of radiation of the antenna

Simultaneous transmission MPE Considerations

According to KDB447498: All transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1. Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0 .

This means that:

$$\sum \text{ of MPE ratios } \leq 1.0$$



4. Test Result:

2.4G WIFI MPE Result								
Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm ²) [S]
802.11b	1	2412	16.76	16±1	17	4.02	20	0.02516
		2437	16.79	16±1	17	4.02	20	0.02516
		2462	16.20	16±1	17	4.02	20	0.02516
802.11g	1	2412	15.40	15±1	16	4.02	20	0.01998
		2437	15.56	15±1	16	4.02	20	0.01998
		2462	15.98	15±1	16	4.02	20	0.01998
802.11n20	1	2412	15.45	15±1	16	4.02	20	0.01998
		2437	15.44	15±1	16	4.02	20	0.01998
		2462	15.62	15±1	16	4.02	20	0.01998

Note:

 N_{TX}= Number of Transmit Antennas

RF Output power specifies that Maximum Conducted Peak Output Power.

5.2G WIFI MPE Result								
Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm ²) [S]
802.11a	1	5180	11.44	11±1	12	2.77	20	0.00596
		5200	12.53	12±1	13	2.77	20	0.00751
		5240	12.11	12±1	13	2.77	20	0.00751
802.11n20	1	5180	12.78	12±1	13	2.77	20	0.00751
		5200	12.28	12±1	13	2.77	20	0.00751
		5240	12.32	12±1	13	2.77	20	0.00751

Note:

 N_{TX}= Number of Transmit Antennas

RF Output power specifies that Maximum Conducted average Output Power.



5. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/ cm ²)
300-1,500	F/1500
1,500-100,000	1.0

For: 2412MHz~2462MHz&5180MHz~5240MHz
MPE limit S: 1mW/ cm²

The MPE is calculated as $0.02516mW / cm^2 < limit 1mW / cm^2$.

So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b). The RF Exposure Information page from the manual is included here for reference.



Method of Measurement for IC

1. Applicable Standard

[Radio Standards Specification 102](#), Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands), sets out the requirements and measurement techniques used to evaluate radio frequency (RF) exposure compliance of radio communication apparatus designed to be used within the vicinity of the human body.

[ANSI C95.1–1999](#): IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

[FCC KDB publication 447498 D01 General RF Exposure Guidance v06](#): Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

2. Evaluation Method and Limit

According to RSS-102 §4 Table 4, RF Filed Strength Limits for Devices Used by the General Public (Uncontrolled Environment)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003-10 ²¹	83	90	-	Instantaneous*
0.1-10	-	0.73/ <i>f</i>	-	6**
1.1-10	87/ <i>f</i> ^{0.5}	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ <i>f</i> ^{0.25}	0.1540/ <i>f</i> ^{0.25}	8.944/ <i>f</i> ^{0.5}	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 <i>f</i> ^{0.3417}	0.008335 <i>f</i> ^{0.3417}	0.02619 <i>f</i> ^{0.6834}	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ <i>f</i> ^{1.2}
150000-300000	0.158 <i>f</i> ^{0.5}	4.21 x 10 ⁻⁴ <i>f</i> ^{0.5}	6.67 x 10 ⁻⁵ <i>f</i>	616000/ <i>f</i> ^{1.2}

Note: *f* is frequency in MHz.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

Frequency Band	<i>f</i> (MHz)	Limit of Power Density (W/m ²)
2.4G WLAN	2412	5.37
5G WLAN	5180	9.05

Note: Limit=0.02619 *f*^{0.6834} (where *f* is in MHz).
The *f* in the limit is the frequency of the lowest Channel.



4.1 Calculation Formula

Prediction of power density at the distance of the applicable MPE limit:

$S = PG/4\pi R^2$ =Power density(in appropriate units, e.g W/m²)

P=power input to antenna (in appropriate units, e.g W)

G=power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.

R=distance to the center of radiation of the antenna(in appropriate units, e.g m)

Simultaneous transmission MPE Considerations

According to KDB447498: All transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1. Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0 .

This means that:

\sum of MPE ratios ≤ 1.0



5. Evaluation Results

Standalone MPE Evaluation:

2.4G WIFI MPE Result									
Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (m) [R]	Power Density (W/ m ²) [S]	Limit of Power Density (W/m ²) [S]
802.11b	1	2412	16.76	16±1	17	4.02	0.2	0.2516	5.37
		2437	16.79	16±1	17	4.02	0.2	0.2516	5.37
		2462	16.20	16±1	17	4.02	0.2	0.2516	5.37
802.11g	1	2412	15.40	15±1	16	4.02	0.2	0.1998	5.37
		2437	15.56	15±1	16	4.02	0.2	0.1998	5.37
		2462	15.98	15±1	16	4.02	0.2	0.1998	5.37
802.11n20	1	2412	15.45	15±1	16	4.02	0.2	0.1998	5.37
		2437	15.44	15±1	16	4.02	0.2	0.1998	5.37
		2462	15.62	15±1	16	4.02	0.2	0.1998	5.37

Note:

N_{TX}= Number of Transmit Antennas

RF Output power specifies that Maximum Conducted Peak Output Power.



5.2G WIFI MPE Result									
Mode	N _{TX}	Freq. (MHz)	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (m) [R]	Power Density (W/ m ²) [S]	Limit of Power Density (W/m ²) [S]
802.11a	1	5180	11.44	11±1	12	2.77	0.2	0.0596	9.05
		5200	12.53	12±1	13	2.77	0.2	0.0751	9.05
		5240	12.11	12±1	13	2.77	0.2	0.0751	9.05
802.11n20	1	5180	12.78	12±1	13	2.77	0.2	0.0751	9.05
		5200	12.28	12±1	13	2.77	0.2	0.0751	9.05
		5240	12.32	12±1	13	2.77	0.2	0.0751	9.05

Note:

N_{TX}= Number of Transmit Antennas

RF Output power specifies that Maximum Conducted average Output Power.

For: 2412~2462MHz&5180~5240MHz

The worst MPE is calculated as **0.2516W/m²**. So, RF exposure limit warning or SAR test are not required. The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b).

The RF Exposure Information page from the manual is included here for reference.

For a more detailed features description, please refer to the RF Test Report.

-----END OF THE REPORT-----

