Radio Frequency Exposure Report

On Behalf of

NetReach Technologies (Hangzhou), Inc.

FCC ID:	**2AA2E-NR1107**
Product Description:	**Mini PC**
Model No.:	**NR1107**
Supplementary Model:	**N/A**

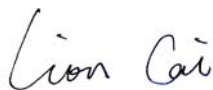|	
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TABLE OF CONTENTS

1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	**NetReach Technologies (Hangzhou), Inc.**
Address of Applicant:	Room 205-207, Building 3, No.452, 6th Avenue, Baiyang Subdistrict, Economic & Technical Development Zone, Hangzhou City, Zhejiang Province, China
Manufacturer :	**NetReach Technologies (Hangzhou), Inc.**
Address of Manufacturer:	Room 205-207, Building 3, No.452, 6th Avenue, Baiyang Subdistrict, Economic & Technical Development Zone, Hangzhou City, Zhejiang Province, China

General Description of E.U.T

Items	Description
EUT Description:	Mini PC
Trade Name:	NetReach
Model No.:	NR1107
Supplementary Model:	N/A
Frequency Band:	IEEE 802.11b/g, IEEE 802.11n HT20 (ISM Band) : 2412MHz～2462MHz, IEEE 802.11n HT40 (ISM Band) : 2422MHz～2452MHz
Channel Spacing:	IEEE 802.11b/g, 802.11n HT20/HT40: 5MHz
Number of Channels:	IEEE 802.11b/g, 802.11n HT20:11 Channels IEEE 802.11n HT40 :7 Channels
Transmit Data Rate:	maximum of 150Mbps
Type of Modulation:	IEEE 802.11b：DSSS (CCK, DQPSK, DBPSK) IEEE 802.11g：OFDM (64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20/40：OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Type:	Built-in Antenna
Antenna Gain:	1 dBi
Power Supply:	Input: 19VDC 3.42A from AC/DC adapter
Adapter Information:	Model:MN-A065-H190 Input: AC 100-240V 47-63Hz 1.5A MAX Output: 19VDC 3.42A

Remark: * *The test data gathered are from the production sample provided by the manufacturer.*

1.2 Objective

The objective of the following report is used to demonstrate that EUT operated in a manner that ensures the public is not exposed to radio frequency energy levels in excess of the relative provisions of FCC 47CFR Part 1.1307

1.3 General Description of Test

Items	Description
EUT Frequency band	☐ FHSS: 2.400GHz ~ 2.483GHz ☒ WLAN: 2.400GHz ~ 2.483GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5825GHz ☐ Others: _____
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others _____
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm2) ☒ General Population/Uncontrolled exposure (S=1mW/cm^2) ☐ Others: _____

Antenna diversity	☒ Single antenna
	☐ Multiple antennas:
	    ☐ Tx diversity
	    ☐ Rx diversity
	    ☐ Tx/Rx diversity

Max. output power	9.92dBm (0.0098W)
Antenna gain (Max)	1dBi (Numeric gain:1.23)
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation
Note: *1. The maximum output power is 9.92dBm (0.0098W) at 2462MHz (with 1.23numeric antenna gain.)* *2. For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least 20 cm, even if the calculations indicate that the MPE distance would be lesser.*	

1.4 Human Exposure Assessment Results

<u>Calculation</u>

Given $E = \dfrac{\sqrt{30 \times P \times G}}{d}$ & $S = \dfrac{E^2}{3770}$

Where E = Field Strength in Volts / meter
P = Power in Watts
G=Numeric antenna gain
d=Distance in meters
S=Power Density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

$P\,(mW) = P\,(W) / 1000$ and
$d\,(cm) = 100 * d\,(m)$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \qquad \textit{Equation 1}$$

Where d = distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power Density in mW / cm²

EUT parameter (data from the separate report)	
Given $E = \dfrac{\sqrt{30 \times P \times G}}{d}$ & $S = \dfrac{E^2}{3770}$	Where G: numerical gain of transmitting antenna; TP: Transmitted power in watt; d: distance from the transmitting antenna in meter
Max average output power in Watt (TP)	9.93dBm (*0.0098*W)
Antenna gain (G)	1.0 dBi (Numeric gain: 1.23)
Exposure classification	S=1mW/cm²
Minimum distance in meter (d) (from transmitting structure to the human body)	20cm (0.2m)

Yields

$$S = \frac{30 \times P \times G}{3770 d^2}, \quad P=0.0098W, G=1.23, d=0.2$$

S=0.00239mW/cm^2

Or

$$d = \sqrt{\frac{30 \times P \times G}{3770 S}}, \quad S=1, P=0.0098W, G=1.23$$

d=0.0098m

Conclusion:

S=0.00239mW/cm^2 is significant lower than the General Population Exposure Power Density Limit 1mW/cm^2 or except the distance when human body proximity to the antenna is less than 0.98cm then will reach the General Population Exposure Power Density Limit

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW / cm^2 even if the calculation indicates that the power density would be larger.)