

Radio Frequency Exposure Report

On Behalf of

GL Technologies (Hong Kong) Limited

210D Enterprise Place, Hong Kong Science Park, Sha Tin, NT, Hong Kong

Product Name:	GL-MT300N mini router
Model/Type No.:	GL-MT300N-POE, GL-MT300N
FCC ID:	2AFIW-MT300N
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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	GL Technologies (Hong Kong) Limited.
Address of Applicant:	210D Enterprise Place, Hong Kong Science Park, Sha Tin, NT, Hong Kong
Manufacturer 1:	GL Technologies (Hong Kong) Limited.
Address of manufacturer:	210D Enterprise Place, Hong Kong Science Park, Sha Tin, NT, Hong Kong

General Description of E.U.T

Items	Description
EUT Description:	GL-MT300N mini router
Model No.:	GL-MT300N-POE
Supplementary Model:	GL-MT300N
Frequency Band:	IEEE 802.11b : 2412MHz~2462MHz; IEEE 802.11g : 2412MHz~2462MHz; IEEE 802.11n(HT20) : 2412MHz~2462MHz; IEEE 802.11n(HT40) : 2422MHz~2452MHz;
Number of Channels:	IEEE 802.11b : 11 Channels; IEEE 802.11g : 11 Channels; IEEE 802.11n(HT20) : 11 Channels; IEEE 802.11n(HT40) : 7 Channels;
Channels Spacing:	IEEE 802.11b : 5MHz IEEE 802.11g : 5MHz IEEE 802.11n(HT20) : 5MHz IEEE 802.11n(HT40) : 5MHz
Type of Modulation:	IEEE 802.11b: CCK IEEE 802.11g: OFDM IEEE 802.11n(HT20): OFDM IEEE 802.11n(HT40): OFDM
Antenna Gain:	3.7dBi
Antenna Type:	Ant 1:3.7dBi, Ant2:3.7dBi
Rated Voltage:	DC 5V/1A from micro USB

Remark: * The test data gathered are from the production sample provided by the manufacturer.
* Supplementary models have the same base board circuit, the appearance is different.

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 ~ 5.825GHz ☐ Others: _____
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others _____
Exposure classification	☐ Occupational/Controlled exposure ($S = 5\text{mW/cm}^2$) ☒ General Population/Uncontrolled exposure ($S=1\text{mW/cm}^2$) ☐ Others: _____
Antenna diversity	☒ Single antenna ☐ Multiple antennas: ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	Ant 1:24.17dBm (0.261W) Ant 2:24.87dBm (0.306W)
Antenna gain (Max)	Ant 1:3.7dBi (Numeric gain:2.34) Ant 2: 3.7dBi (Numeric gain:2.34)
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation
Note: Ant 1:1. The maximum output power is 24.17dBm at 802.11n(HT20) mode 2462MHz (with 2.34 numeric antenna gain.) Ant 2: 2. The maximum output power is 24.87dBm at 802.11g mode 2462MHz (with 2.34 numeric antenna gain.) 3. For mobile or fixed location transmitters, no SAR consideration applied. The minimum separation generally be used is at least s20 cm, even if the calculations indicate that the MPE distance would be lesser.	

1.4 Human Exposure Assessment Results

Calculation

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

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:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = 100 * d \text{ (m)}$$

Yields

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

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 $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$	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)	Ant 1:24.17dBm (0.261W) Ant 2:24.87dBm (0.306W)
Antenna gain (G)	Ant 1:3.7dBi (Numeric gain:2.34) Ant 2: 3.7dBi (Numeric gain:2.34)
Exposure classification	S=1mW/cm ²
Minimum distance in meter (d) (from transmitting structure to the human body)	20cm (0.2m)

Yields

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

Ant 1: P1=0.261W, G1=2.34, d1=0.2, S1=0.1215mW/cm²

Ant 2: P2=0.306W, G2=2.34, d2=0.2, S2=0.1424mW/cm²

Or

$$d = \sqrt{\frac{30 \times P \times G}{3770 S}},$$

Ant 1: S1=1, P1=0.261W, G1=2.34, d1=0.0697m

Ant 2: S2=1, P2=0.306W, G2=2.34, d2=0.0754m

Conclusion:

S1=0.1215mW/cm² and S2=0.1424mW/cm² is significant lower than the General Population Exposure Power Density Limit 1mW/cm² or except the distance when human body proximity to the antenna is less than 2.67cm then will reach the General Population Exposure Power Density Limit (For mobile or fixed location transmitters, the maximum power density is 1.0 mW / cm² even if the calculation indicates that the power density would be larger.)

