

RF Exposure Evaluation Declaration

Product Name : Zipp Mini
Model No. : LTH200
FCC ID : Y2SLTH200
IC ID : 9452A-LTH200

Applicant : LIBRATONE A/S

Address : Marielundvej 43A, DK-2730 Herlev, Denmark

Date of Receipt : Jun. 25, 2015
Test Date : Jun. 25, 2015~ Aug. 25, 2015
Issued Date : Sep. 09, 2015
Report No. : 1560642R-RF-US-P20V01
Report Version : V1.1

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF or any agency of the government.

The test report shall not be reproduced without the written approval of QuieTek Corporation.

Test Report Certification

Issued Date : Sep. 09, 2015

Report No. : 1560642R-RF-US-P20V01



Product Name : Wi-Fi Module
Applicant : LIBRATONE A/S
Address : Marielundvej 43A, DK-2730 Herlev, Denmark
Manufacturer : Goertek Inc
Address : No 268 Dongfang Rd., New&high-tech Industry
Development Zone Weifang Shandong Province 261031,
PRC.
Model No. : LTH200
FCC ID : Y2SLTH200
IC ID : 9452A-LTH200
EUT Voltage : AC 100~240V, 50/60Hz, 1.0A
Brand Name : LIBRATONE
Applicable Standard : KDB 447498D01V05V02
FCC Part1.1310(b)
Test Result : Complied
Performed Location : Suzhou EMC Laboratory
No.99 Hongye Rd., Suzhou Industrial Park,
Suzhou,215006, Jiangsu,China
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Registration Number: 800392

Documented By

:

Elaine Wang Senior Engineer

Reviewed By

:

Harry Zhao RF Engineering Manager

Approved By

:

Dream Cao Director

Laboratory Information

We, **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

| | | |
|----------------------|----------|------------------|
| Taiwan R.O.C. | : | BSMI, NCC |
| USA | : | FCC |
| Japan | : | VCCI |
| China | : | CNAS |

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site :<http://www.quietek.com/tw/ctg/cts/accreditations.htm>
The address and introduction of Quietek Corporation's laboratories can be founded in our Web site :
<http://www.quietek.com/>

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory :

No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

LinKou Testing Laboratory :

No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789 E-Mail : service@quietek.com

Suzhou Testing Laboratory :

No.99 Hongye Rd., Suzhou Industrial Park, Suzhou,215006, Jiangsu,China
TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098 E-Mail : service@quietek.com

History of This Test Report

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|-----------------------|---------|--|---------------|
| 1560642R-RF-US-P20V01 | V1.0 | Initial Issued Report | Sep. 01, 2015 |
| 1560642R-RF-US-P20V01 | V1.1 | Add Standalone transmission of RF Exposure Evaluation | Sep. 09, 2015 |
| | | | |
| | | | |

1. RF Exposure Evaluation

1.1. Limits

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 ²) | Average Time (Minutes) |
|---|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| (A) Limits for Occupational/ Control Exposures | | | | |
| 300-1500 | -- | -- | F/300 | 6 |
| 1500-100,000 | -- | -- | 5 | 6 |
| (B) Limits for General Population/ Uncontrolled Exposures | | | | |
| 300-1500 | -- | -- | F/1500 | 6 |
| 1500-100,000 | -- | -- | 1 | 30 |

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

1.2. Test Procedure

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

The temperature and related humidity: 18°C and 78% RH.

1.3. Test Result of RF Exposure Evaluation

| | | |
|-----------|---|------------------------|
| Product | : | Zipp Mini |
| Test Item | : | RF Exposure Evaluation |
| Test Site | : | AC-6 |

WIFI Antenna Gain:

| Antenna | Manufacturer | Model No. | Peak Gain |
|--------------|--|---------------------------------|--|
| PIFA Antenna | Suzhou Walsin Technology Electronics Co.,Ltd | Z_2.4/5G_R_R4; Z_2.4/5G_L_R4 | 2.4GHz band: 3.5dBi 5GHz Band: 2dBi |

Bluetooth Antenna List:

| Antenna | Manufacturer | Model No. | Peak Gain |
|--------------|--------------|-----------|-------------------|
| PIFA Antenna | Goertek | N/A | 1.2dBi for 2.4GHz |

● WIFI Output Power into Antenna & RF Exposure Evaluation Distance:

| Test Mode | Frequency Band (MHz) | Maximum Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
|--------------------|----------------------|--------------------------------------|--|
| 802.11b/g/n(20MHz) | 2412~2462MHz | 311.1716 | 0.1386 |
| 802.11n(40MHz) | 2422~2452MHz | 140.6048 | 0.0626 |
| 802.11a/n(20MHz) | 5180~5240MHz | 156.6751 | 0.0494 |
| 802.11a/n(20MHz) | 5745~5825MHz | 532.1083 | 0.1678 |
| 802.11n(40MHz) | 5190~5230MHz | 140.2814 | 0.0442 |
| 802.11n(40MHz) | 5755~5795MHz | 370.6807 | 0.1169 |

● BT Output Power into Antenna & RF Exposure Evaluation Distance:

| Frequency Band (MHz) | Maximum Output Power to Antenna (mW) | Power Density at R = 20 cm (mW/cm ²) |
|----------------------|--------------------------------------|--|
| 2402 - 2480 MHz | 6.6573 | 0.0017 |

Note:

The power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is below the limit of 1 mW/cm².

● Simultaneous transmission of RF Exposure Evaluation:

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 . The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

- The $[\sum \text{ of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance) / 1.6 W/kg}] + [\sum \text{ of MPE ratios}]$ is ≤ 1.0 .
- The SAR to peak location separation ratios of all simultaneous transmitting antenna pairs operating in portable exposure conditions are all ≤ 0.04 and the $[\sum \text{ of MPE ratios}]$ is ≤ 1.0 .

| Frequency Band (MHz) | WIFI Power Density at R = 20 cm (mW/cm ²) | BT Power Density at R = 20 cm (mW/cm ²) | Σ Power Density at R = 20 cm (mW/cm ²) |
|----------------------|---|---|---|
| 2412~2462MHz | 0.1386 | 0.0017 | 0.1403 |
| 2422~2452MHz | 0.0626 | 0.0017 | 0.0643 |
| 5180~5240MHz | 0.0494 | 0.0017 | 0.0511 |
| 5745~5825MHz | 0.1678 | 0.0017 | 0.1695 |
| 5190~5230MHz | 0.0442 | 0.0017 | 0.0459 |
| 5755~5795MHz | 0.1169 | 0.0017 | 0.1186 |

Note: The simultaneous power density Pd (4th column) at a distance of 20 cm calculated from the Friis transmission formula is below the limit of 1 mW/cm².

_____ The End _____