

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.

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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

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Laboratory Information

We, **QuiTek 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 QuiTek Corporation's Web Site :<http://www.quietek.com/tw/ctg/cts/accreditations.htm>
The address and introduction of QuiTek 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:

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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 P_d (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 $[\sum \text{ of (the highest measured or estimated SAR for each standalone antenna configuration, adjusted for maximum tune-up tolerance)} / 1.6 \text{ W/kg}] + [\sum \text{ of MPE ratios}]$ 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/cm2)	BT Power Density at R = 20 cm (mW/cm2)	\sum Power Density at R = 20 cm (mW/cm2)
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 P_d (4th column) at a distance of 20 cm calculated from the Friis transmission formula is below the limit of 1 mW/cm2.

————— The End —————