

MPE TEST REPORT

FCC Per 47 CFR 2.1091(d)

Report Reference No..... : A1212086016-2

FCC ID ZRD-T301

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Date of issue.....: Jan 10, 2013

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Testing Laboratory Name: DTT Services Co.,Ltd

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Applicant's name.....: Shenzhen livall Netwotk Technology Co ltd

Address.....: 9/F, Jiuzhou Electric Building, Southern No.12 rd Technology Park, Shenzhen

Test specification:

Standard: FCC Per 47 CFR 2.1091(b)

TRF Originator.....: Shenzhen CTL Electron Technology Co., Ltd.

Master TRF.....: Dated 2012-06

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Test item description: TV Dongle

Trade Mark: Livall

Manufacturer: Shenzhen livall Netwotk Technology Co ltd

Model/Type reference.....: T301

Listed Models: /

Operation Frequency: From 2412MHz to 2462MHz

Modulation Type: CCK,OFDM

Result : **Positive**

TEST REPORT

Test Report No. : A1212086016-2	Jan 10, 2013 Date of issue
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Equipment under Test : TV Dongle

Model /Type : T301

Listed Models : /

Applicant : **Shenzhen livall Network Technology Co Ltd**

Address : 9/F, Jiuzhou Electric Building, Southern No.12 rd
Technology Park, Shenzhen

Manufacturer : **Shenzhen livall Network Technology Co Ltd**

Address : 9/F, Jiuzhou Electric Building, Southern No.12 rd
Technology Park, Shenzhen

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. SUMMARY

1.1. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

○	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
○	Multimeter	Manufacturer :	/
		Model No. :	/

1.2. Power supply system utilised

Power supply voltage	:	○ 120V / 60 Hz	○ 115V / 60Hz
		○ 12 V DC	○ 24 V DC
		● Other (specified in blank below)	

DC 5.0V

1.3. Description of the test mode

IEEE 802.11b/g/n: Eleven channels are provided to the EUT.

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432		
6	2437		
7	2442		

1.4. NOTE

1. The functions of the EUT are listed as below:

	Test Standards	Reference Report
WLAN Radio	FCC Part 15 Subpart C (Section15.247)	A1212086016-1
WLAN MPE	MPE report	A1212086016-2
USB Port	FCC Part 15 Subpart B	A1212086016-3

2. The frequency bands used in this EUT are listed as follows:

Frequency Band(MHz)	2400-2483.5	5150-5350	5470-5725	5725-5850
802.11b	✓	—	—	—
802.11g	✓	—	—	—
802.11n(20MHz)	✓	—	—	—
802.11n(40MHz)	✓	—	—	—

3. The EUT incorporates a SISO function, Physically, the EUT provides one completed transmitter and one completed receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX
802.11n (40MHz)	1TX

2. TEST ENVIRONMENT

2.1. Address of the test laboratory

DTT Services Co.,Ltd
1F,2 Block,Jiaquan Building,Guanlan High-tech Park,Bao'an District, Shenzhen,Guangdong,China.
518110

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

2.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	<u>15-35 ° C</u>
Humidity:	<u>30-60 %</u>
Atmospheric pressure:	<u>950-1050mbar</u>

2.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the DTT Services Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for DTT Services Co.,Ltd is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

3. Method of measurement

3.1. Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §RSS-102, Devices that have a radiating element normally operating at separation distances greater than 20 cm between the user and the device shall undergo an RF exposure evaluation. SAR evaluation may be performed in lieu of an RF exposure evaluation for devices operating below 6 GHz with a separation distance of greater than 20 cm between the user and the device.

According to §1.1310 and §2.1091 RF exposure is calculated.

3.2. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	6
3.0 – 30	1842/f	4.89/f	(900/f)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	/	/	f/300	6
1500 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	(180/f)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

F=frequency in MHz

*=Plane-wave equivalent power density

F=frequency in GHz

3.3. MPE Calculation Method

Predication of MPE limit at a given distance

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 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

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna is 2.0dBi, the RF power density can be obtained.

TEST RESULTS

For 802.11 b

Test Frequency (MHz)	Minimum Separation Distance	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm ²)	Power Density At 20 cm (mW/cm ²)	Test Results
2412	20.00	13.94	24.7742	1.5849	1.000	0.0044	Pass
2437	20.00	14.23	26.4850	1.5849	1.000	0.0045	Pass
2462	20.00	13.55	22.6464	1.5849	1.000	0.0043	Pass

For 802.11 g

Test Frequency (MHz)	Minimum Separation Distance	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm ²)	Power Density At 20 cm (mW/cm ²)	Test Results
2412	20.00	14.67	29.3089	1.5849	1.000	0.0046	Pass
2437	20.00	14.44	27.7971	1.5849	1.000	0.0046	Pass
2462	20.00	13.63	23.0675	1.5849	1.000	0.0043	Pass

For 802.11 n(20MHz)

Test Frequency (MHz)	Minimum Separation Distance	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm ²)	Power Density At 20 cm (mW/cm ²)	Test Results
2412	20.00	13.36	21.6770	1.5849	1.000	0.0042	Pass
2437	20.00	12.96	19.7697	1.5849	1.000	0.0041	Pass
2462	20.00	12.23	16.7109	1.5849	1.000	0.0039	Pass

For 802.11 n(40MHz)

Test Frequency (MHz)	Minimum Separation Distance	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm ²)	Power Density At 20 cm (mW/cm ²)	Test Results
2422	20.00	12.52	17.8649	1.5849	1.000	0.0039	Pass
2437	20.00	12.85	19.2752	1.5849	1.000	0.0041	Pass
2452	20.00	12.40	17.3780	1.5849	1.000	0.0039	Pass

4. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 (b) for the uncontrolled RF Exposure.

.....**End of Report**.....