

MPE TEST REPORT**FCC Per 47 CFR 2.1091(d)****Report Reference No.**.....: **A1310086032-3****FCC ID**.....: **2ABAB-MC600**

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Date of issue.....: Nov 07, 2013

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Testing Laboratory Name: DTT Services Co.,Ltd

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Applicant's name.....: **Sumavision Technologies Co., Ltd.**

Address: Sumavision Plaza, No.15, KaiTuo Road, Shangdi Information and Industry Base, Haidian District, Beijing 100085, China

Test specification:Standard: **FCC Per 47 CFR 2.1091(b)**

TRF Originator.....: Shenzhen Tian Hai Test Technology Co.,Ltd

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Test item description: Network set-top box

Trade Mark: sumavision

Manufacturer.....: **Shenzhen Zowee Technologies Co., Ltd.**

Model/Type reference.....: MC600

Operation Frequency: From 2412MHz to 2462MHz

Modulation Type: CCK,OFDM

Rating: DC 5.0 V Adapter from AC 120V/60Hz

Result : **Positive**

TEST REPORT

Test Report No. : A1310086032-3	Nov 07, 2013 Date of issue
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Equipment under Test : Network set-top box

Model /Type : MC600

Applicant : **Sumavision Technologies Co., Ltd.**

Address : Sumavision Plaza, No.15, KaiTuo Road, Shangdi
Information and Industry Base, Haidian District, Beijing
100085, China

Manufacturer : **Shenzhen Zowee Technologies Co., Ltd.**

Address : Zowee Factory, Tongfuyu Industrial Zone, Songgang,
Baoan District, Shenzhen, Guangdong, China 518105

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.

Contents

<u>1.</u>	<u>SUMMARY</u>	<u>4</u>
1.1.	EUT configuration	4
1.2.	Product Description	4
1.3.	Power supply system utilised	4
1.4.	Description of the test mode	4
1.5.	NOTE	5
<u>2.</u>	<u>TEST ENVIRONMENT.....</u>	<u>6</u>
2.1.	Address of the test laboratory	6
2.2.	Environmental conditions	6
2.3.	Statement of the measurement uncertainty	6
<u>3.</u>	<u>METHOD OF MEASUREMENT</u>	<u>6</u>
3.1.	Applicable Standard	6
3.2.	Limit	7
3.3.	MPE Calculation Method	7
<u>4.</u>	<u>CONCLUSION</u>	<u>8</u>

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. Product Description

The **Sumavision Technologies Co., Ltd.**'s Model: MC600 or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

Name of EUT	Network set-top box
Model Number	MC600
FCC ID	2ABAB- MC600
WLAN Modulation Type	IEEE 802.11 b:DSSS(CCK,DQPSK,DBPSK) IEEE 802.11 g:OFDM(64QAM,16QAM,QPSK,BPSK) IEEE 802.11 n HT20: OFDM(64QAM,16QAM,QPSK,BPSK) IEEE 802.11 n HT40: OFDM(64QAM,16QAM,QPSK,BPSK)
Antenna Type	Internal
WLAN FCC Operation Frequency	IEEE 802.11 b:2412-2462MHz IEEE 802.11 g: 2412-2462MHz IEEE 802.11 n HT20: 2412-2462MHz IEEE 802.11 n HT40: 2422-2452MHz
WLAN	Supported 802.11b/g/n
Bluetooth	Not Supported

1.3. 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 Adapter from AC 120V/60Hz

1.4. Description of the test mode

IEEE 802.11b/g/n: The product support Third channels but only use Eleventh channels in USA.

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		

1.5. NOTE

1. The EUT is a Network set-top box with WLAN function, The functions of the EUT listed as below:

	Test Standards	Reference Report
WLAN	FCC Part 15 C 15.247	A1310086032-1
USB Port	FCC Part 15 B	A1310086032-2
MPE	FCC Part 2 §2.1091	A1310086032-3

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.

447498 D01 General RF Exposure Guidance v05r01: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

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 ²)*	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 ²)*	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 antenna is 2.0 dBi, the RF power density can be obtained.

TEST RESULTS

For 802.11 b

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 20 cm (mW/cm ²)	Power Density Limit (mW/cm ²)	Test Results
2412	20.00	16.34	43.0527	1.5849	0.0136	1.0000	PASS
2437	20.00	15.52	35.6451	1.5849	0.0112	1.0000	PASS
2462	20.00	14.98	31.4775	1.5849	0.0099	1.0000	PASS

For 802.11 g

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 20 cm (mW/cm ²)	Power Density Limit (mW/cm ²)	Test Results
2412	20.00	19.13	81.8465	1.5849	0.0258	1.0000	PASS
2437	20.00	18.68	73.7904	1.5849	0.0233	1.0000	PASS
2462	20.00	18.17	65.6145	1.5849	0.0207	1.0000	PASS

For 802.11 n(20MHz)

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 20 cm (mW/cm ²)	Power Density Limit (mW/cm ²)	Test Results
2412	20.00	19.57	90.5733	1.5849	0.0286	1.0000	PASS
2437	20.00	18.85	76.7361	1.5849	0.0242	1.0000	PASS
2462	20.00	18.26	66.9885	1.5849	0.0211	1.0000	PASS

For 802.11 n (40MHz)

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Numeric)	Power Density At 20 cm (mW/cm ²)	Power Density Limit (mW/cm ²)	Test Results
2422	20.00	16.99	50.0035	1.5849	0.0158	1.0000	PASS
2437	20.00	16.63	46.0257	1.5849	0.0145	1.0000	PASS
2452	20.00	16.60	45.7088	1.5849	0.0144	1.0000	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**.....