APPLICATION CERTIFICATION
On Behalf of
ZhuHai FTZ Oplink Communications,Inc.

Sonic & Heat Sensor
Model No.: SNH1300

FCC ID: OS3SNH01

Prepared for	:	ZhuHai FTZ Oplink Communications,Inc.
Address	:	#29, #30 Lianfeng Avenue,Free Trade Zone,Zhuhai City,Guangdong Province,China 519030
Prepared by	:	ACCURATE TECHNOLOGY CO., LTD
Address	:	F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China Tel: (0755) 26503290 Fax: (0755) 26503396

Report Number	:	ATE20131449
Date of Test	:	July 04-12, 2013
Date of Report	:	July 12, 2013

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Test Report Certification

Applicant	:	ZhuHai FTZ Oplink Communications,Inc. #29, #30 Lianfeng Avenue,Free Trade Zone,Zhuhai City,Guangdong Province,China 519030
Manufacturer	:	ZhuHai FTZ Oplink Communications,Inc. #29, #30 Lianfeng Avenue,Free Trade Zone,Zhuhai City,Guangdong Province,China 519030
Product	:	Sonic & Heat Sensor
Model No.	:	SNH1300

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.231(a)
ANSI 63.4: 2009

The device described above is tested by ACCURATE TECHNOLOGY CO., LTD to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.231. The measurement results are contained in this test report and ACCURATE TECHNOLOGY CO., LTD is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of ACCURATE TECHNOLOGY CO., LTD.

Date of Test : July 04-12, 2013

Prepared by :

(Tim.zhang, Engineer)

Approved & Authorized Signer :

(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	Sonic & Heat Sensor
Model Number	:	SNH1300
Power Supply	:	DC 3V (Li-Battery)
Operation Frequency	:	433.92MHz
Modulation mode	:	ASK
Trade Name	:	/
Applicant	:	ZhuHai FTZ Oplink Communications,Inc.
Address	:	#29, #30 Lianfeng Avenue,Free Trade Zone,Zhuhai City,Guangdong Province,China 519030
Manufacturer	:	ZhuHai FTZ Oplink Communications,Inc.
Address	:	#29, #30 Lianfeng Avenue,Free Trade Zone,Zhuhai City,Guangdong Province,China 519030
Date of sample received	:	July 04, 2013
Date of Test	:	July 04-12, 2013

1.2.Description of Test Facility

EMC Lab	:	Accredited by TUV Rheinland Shenzhen Listed by FCC The Registration Number is 752051 Listed by Industry Canada The Registration Number is 5077A-2 Accredited by China National Accreditation Committee for Laboratories The Certificate Registration Number is L3193
Name of Firm	:	ACCURATE TECHNOLOGY CO., LTD
Site Location	:	F1, Bldg. A, Changyuan New Material Port, Keyuan Rd. Science & Industry Park, Nanshan, Shenzhen, Guangdong P.R. China

1.3.Measurement Uncertainty

Conducted Emission Expanded Uncertainty	=	2.23dB, k=2
Radiated emission expanded uncertainty (9kHz-30MHz)	=	3.08dB, k=2
Radiated emission expanded uncertainty (30MHz-1000MHz)	=	4.42dB, k=2
Radiated emission expanded uncertainty (Above 1GHz)	=	4.06dB, k=2

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 12, 2013	Jan. 11, 2014
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 12, 2013	Jan. 11, 2014
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 12, 2013	Jan. 11, 2014
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 12, 2013	Jan. 11, 2014
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Feb. 6, 2013	Feb. 5, 2014
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Feb. 6, 2013	Feb. 5, 2014
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Feb. 6, 2013	Feb. 5, 2014
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Feb. 6, 2013	Feb. 5, 2014
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 12, 2013	Jan. 11, 2014
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 12, 2013	Jan. 11, 2014
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 12, 2013	Jan. 11, 2014
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 12, 2013	Jan. 11, 2014

3. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
Section 15.207	Conducted Emission	N/A
Section 15.231(b)	Radiated Emission	Compliant
Section 15.231(c)	20dB Bandwidth	Compliant
Section 15.231(a)(1)	Release Time Measurement	Compliant
Section 15.203	Antenna Requirement	Compliant

The product is a manually operated Sonic & Heat Sensor transmitter.
Section 15.231 (a) (2), (3), (4) and (5) are not applicable.

All normal using modes of the normal function were tested but only the worst test data of the worst mode is recorded by this report.

4. THE FIELD STRENGTH OF RADIATION EMISSION

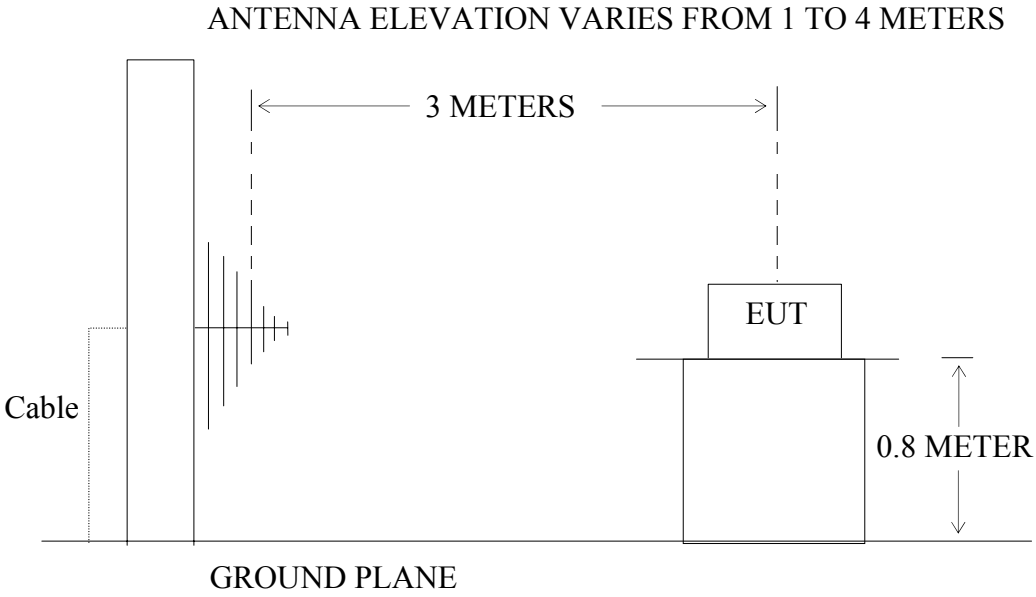
4.1.Block Diagram of Test Setup

4.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: Sonic & Heat Sensor)

4.1.2.Semi-Anechoic Chamber Test Setup Diagram



(EUT: Sonic & Heat Sensor)

4.2. The Field Strength of Radiation Emission Measurement Limits

4.2.1. Radiation Emission Measurement Limits According to FCC Part 15 Section 15.231(b)

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Average] [μV/m]	Field Strength of Spurious Emission [Average] [μV/m]
40.66-40.70	2250	225
70-130	1250	125
130-174	1250-3750	125-375
174-260	3750	375
260-470	3750-12500	375-1250
Above 470	12500	1250

Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, uV/m at 3 meters = 56.81818(F) - 6136.3636; for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F) - 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.

4.2.2. Restricted Band Radiation Emission Measurement Limits According to FCC part 15 Section 15.205 and Section15.209.

4.3. Configuration of EUT on Measurement

The equipment is installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

4.4. Operating Condition of EUT

4.4.1. Setup the EUT and simulator as shown as Section 4.1.

4.4.2. Turn on the power of all equipment.

4.4.3. Let the EUT work in TX mode measure it.

4.5. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI 63.4 on radiated emission measurement. The EUT was tested in 3 orthogonal planes.

The bandwidth of test receiver is set at 120 kHz in 30-1000 MHz, and 1 MHz in 1000-4000 MHz.

4.6. The Field Strength of Radiation Emission Measurement Results

PASS.

Note:
1. The minimum clock frequency was 26MHz,I tested Radiation Emission form 9KHz to 5000MHz and recorded the worst mode data.
2. Test was repeated in three different EUT positions.
3. The EUT belongs to class 15.231(a) of product.
4. Please see the detail test plots from page 24 to 27.

For 9KHz to 30MHz

Frequency (MHz)	Corrected Reading (dBμV/m)@3m	FCC Limit (dBμV/m) @3m	Margin (dB)	Detector	Result
1.32	43.61	65.19	21.58	QP	Pass
16.05	41.96	69.54	27.58	QP	Pass
21.36	45.78	69.54	23.76	QP	Pass

For 30MHz to 5000MHz

Frequency (MHz)	Reading (dBμV/m)	Factor	Average Factor	Result(dBμV/m)		Limit(dBμV/m)		Margin(dB)		Polarization
	PEAK	Corr. (dB)	(dB)	AV	PEAK	AV	PEAK	AV	PEAK	
433.92	**93.39**	**-6.03**	**-9.79**	**77.57**	**87.36**	**80.8**	**100.8**	**3.23**	**13.44**	Horizontal
867.84	57.23	0.74	-9.79	48.18	57.97	60.8	80.8	12.62	22.83	
1301.76	64.96	-12.22	-9.79	42.95	52.74	54	74	11.05	21.26	
2169.60	56.39	-8.51	-9.79	38.09	47.88	54	74	15.91	26.12	
433.92	**91.30**	**-6.03**	**-9.79**	**75.48**	**85.27**	**80.8**	**100.8**	**5.32**	**15.53**	Vertical
867.84	34.89	0.74	-9.79	25.84	35.63	60.8	80.8	34.96	45.17	
1301.76	64.34	-12.22	-9.79	42.33	52.12	54	74	11.67	21.88	
2169.60	61.18	-8.51	-9.79	42.88	52.67	54	74	11.12	21.33	
3037.44	57.65	-5.18	-9.79	42.68	52.47	54	74	11.32	21.53	

Note:

1. Emissions attenuated more than 20 dB below the permissible value are not reported.

2. *: Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission falling within the restricted bands of FCC Part 15 Section 15.205 were compliance with the emission limit of FCC Part 15 Section 15.209.

3. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

   Result = Reading + Corrected Factor

   Where Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss – Amplifier Gain

4. FCC Limit for Average Measurement = 41.6667(433.92)-7083.3333 = 6077.5064 μV/m =80.8 dBμV/m

5. Average value= PK value + Average Factor (duty factor)

The duty cycle is simply the on time divided by the period:

The duration of one cycle Tp= 57.45 ms

Effective period of the cycle = (0.45×29) + (1.11×5)ms= 18.6 ms

DutyCycle = 18.6 ms/57.45 ms = 0.3238

Therefore, the average factor is found by 20log0.3238 = -9.79dB

5. 20DB OCCUPIED BANDWIDTH

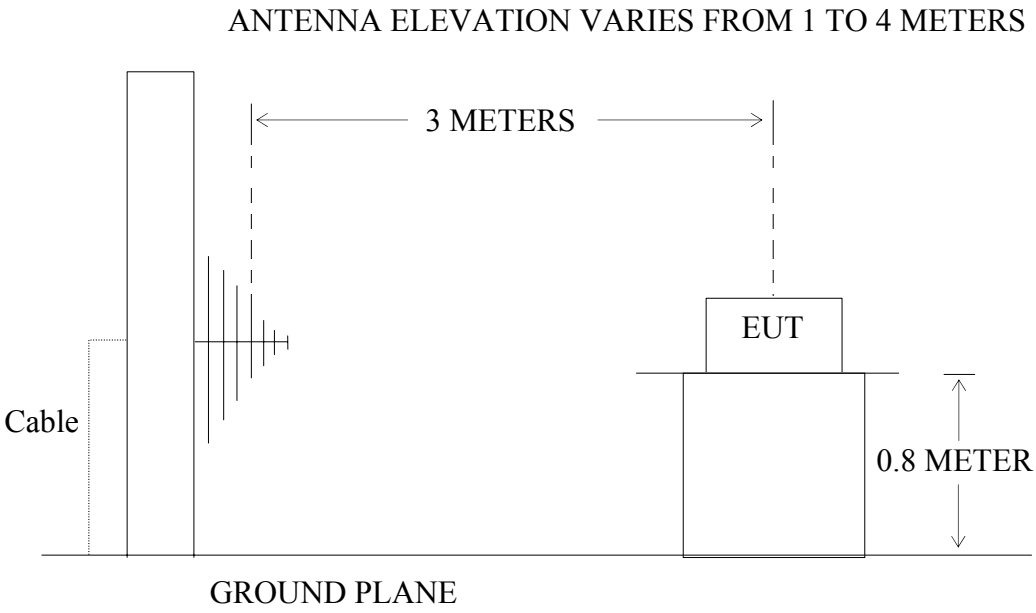
5.1.Block Diagram of Test Setup

5.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: Sonic & Heat Sensor)

5.1.2.Semi-Anechoic Chamber Test Setup Diagram



(EUT: Sonic & Heat Sensor)

5.2.The Bandwidth of Emission Limit According To FCC Part 15 Section 15.231(c)

The bandwidth of emission shall be no wider than 0.25% of the center frequency. Therefore, the bandwidth of the emission limit is 433.92 MHz×0.25% = 1084.75 kHz. Bandwidth is determined at the two points 20 dB down from the top of modulated carrier.

5.3. EUT Configuration on Measurement

The equipment are installed on the bandwidth of emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

5.4. Operating Condition of EUT

5.4.1. Setup the EUT and simulator as shown as Section 5.1.

5.4.2. Turn on the power of all equipment.

5.4.3. Let the EUT work in TX mode measure it.

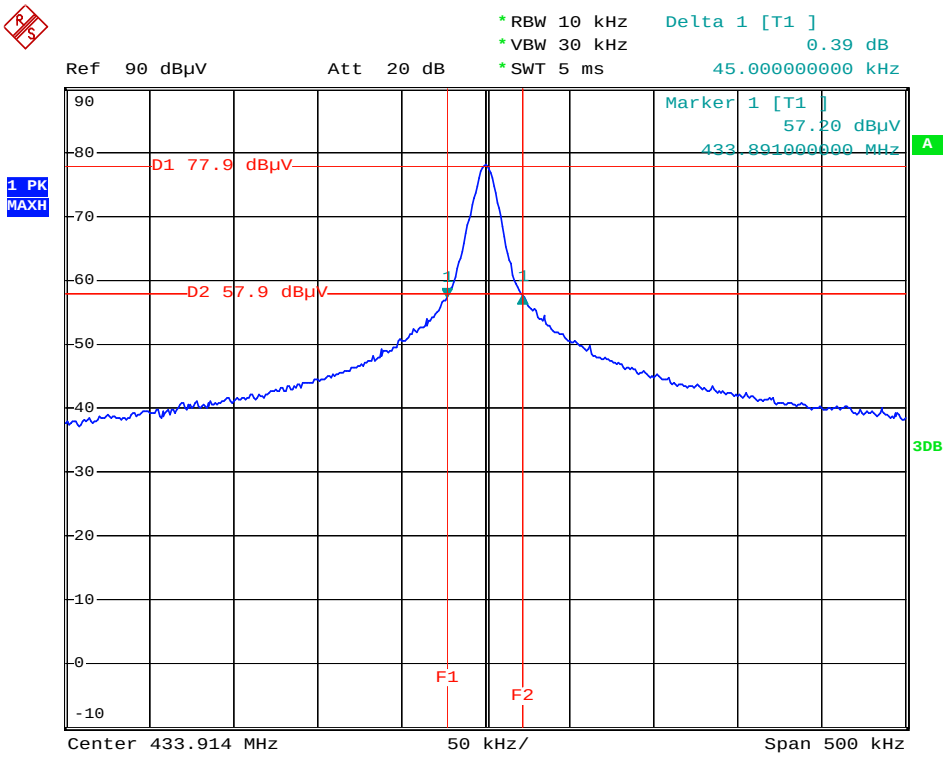
5.5. Test Procedure

5.5.1. Set SPECTRUM ANALYZER Center Frequency = Fundamental frequency, RBW = 10 kHz, VBW = 30 kHz, Spectrum Analyzern = 500 kHz.

5.5.2. Set SPECTRUM ANALYZER Max hold, Mark peak, -20 dB.

5.6.Measurement Result

Frequency(MHz)	20dB bandwith(KHz)	Limit(KHz)	Result
433.92	45	1084.75	PASS



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6. RELEASE TIME MEASUREMENT

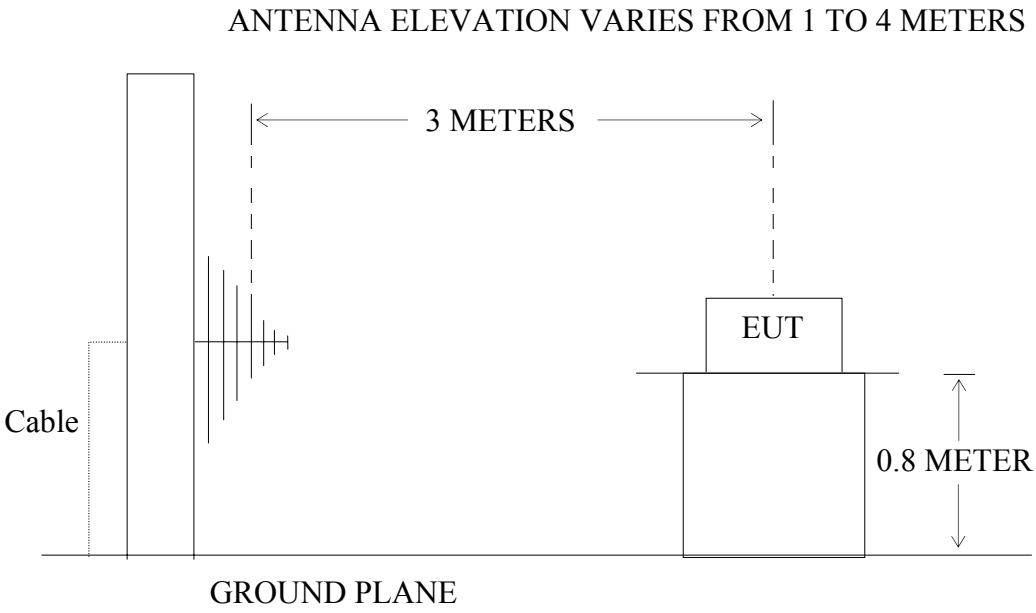
6.1.Block Diagram of Test Setup

6.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: Sonic & Heat Sensor)

6.1.2.Semi-Anechoic Chamber Test Setup Diagram



(EUT: Sonic & Heat Sensor)

6.2.Release Time Measurement According To FCC Part 15 Section 15.231(a)

Section 15.231(a) (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

6.3. EUT Configuration on Measurement

The following equipment are installed on Release Time Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.4. Operating Condition of EUT

6.4.1. Setup the EUT and simulator as shown as Section 6.1.

6.4.2. Turn on the power of all equipment.

6.4.3. Let the EUT work in TX mode measure it.

6.5. Test Procedure

6.5.1. Set SPECTRUM ANALYZER Center Frequency = Fundamental frequency, RBW = 100 kHz, VBW = 300 kHz, Spectrum Analyzern = 0 Hz. Sweep time = 6 s.

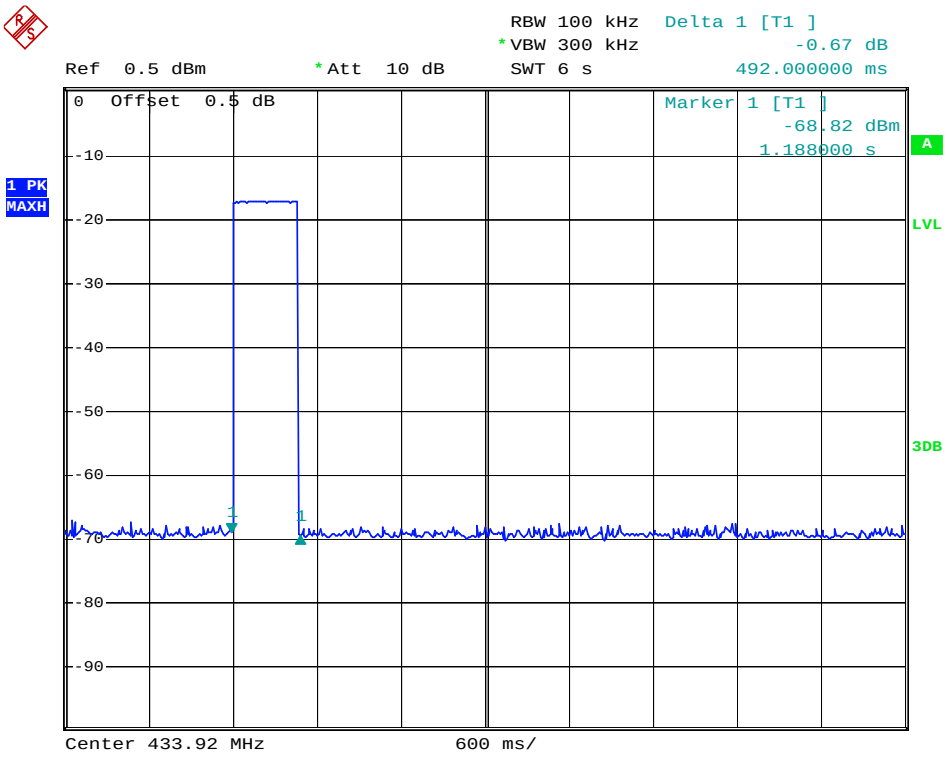
6.5.2. Set EUT as normal operation and press Transmitter button.

6.5.3. Set SPECTRUM ANALYZER View. Delta Mark time.

6.6. Measurement Result

The release time less than 5 seconds.

Release Time = 492ms



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7. AVERAGE FACTOR MEASUREMENT

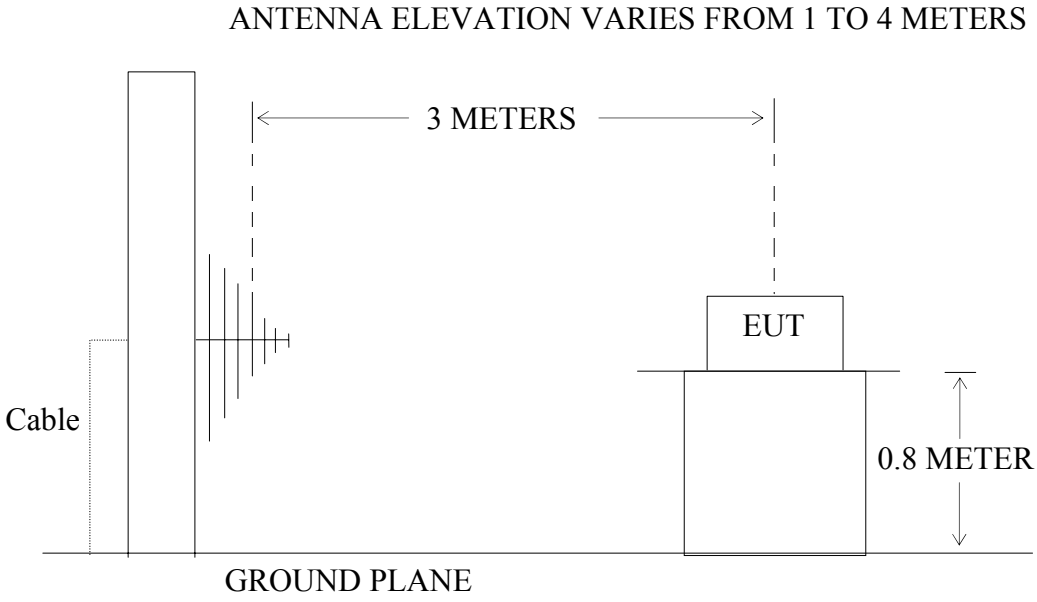
7.1.Block Diagram of Test Setup

7.1.1.Block diagram of connection between the EUT and simulators

EUT

(EUT: Sonic & Heat Sensor)

7.1.2.Semi-Anechoic Chamber Test Setup Diagram



(EUT: Sonic & Heat Sensor)

7.2.Average factor Measurement according to ANSI 63.4: 2009

ANSI 63.4: 2009 Section 13.4.2 Devices transmitting pulsed emissions and subject to a limit requiring an average detector function for radiated emissions shall initially be measured with an instrument that uses a peak detector. A radiated emission measured with a peak detector may then be corrected to a true average using the appropriate factor for emission duty cycle. This correction factor relates the measured peak level to the average limit and is derived by averaging absolute field strength over one complete pulse train that is 0.1 s, or less, in length. If the pulse train is longer than 0.1 s, the average shall be determined from the average absolute field strength during the 0.1 s interval in which the field strength is at a maximum.

Average factor in dB = 20 log (duty cycle)

7.3. EUT Configuration on Measurement

The following equipment are installed on average factor Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.4. Operating Condition of EUT

7.4.1. Setup the EUT and simulator as shown as Section 7.1.

7.4.2. Turn on the power of all equipment.

7.4.3. Let the EUT work in TX mode measure it.

7.5. Test Procedure

7.5.1. The time period over which the duty cycle is measured is 100 milliseconds, or the repetition cycle, whichever is a shorter time frame. The worst case (highest percentage on) duty cycle is used for the calculation.

7.5.2. Set SPECTRUM ANALYZER Center Frequency = Fundamental frequency, RBW = 100 kHz, VBW = 300 kHz, Spectrum Analyzern = 0 Hz.

7.5.3. Set EUT as normal operation.

7.5.4. Set Spectrum Analyzer View. Delta Mark time.

7.6. Measurement Result

The duty cycle is simply the on time divided by the period:

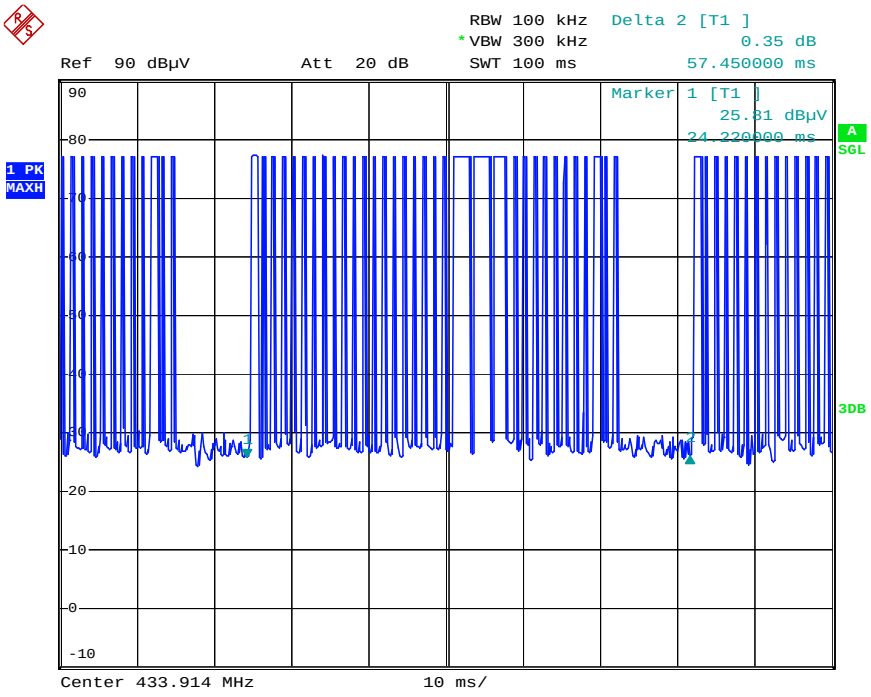
The duration of one cycle Tp= 57.45 ms

Effective period of the cycle = (0.45×29) + (1.11×5)ms= 18.6 ms

DutyCycle = 18.6 ms/57.45 ms = 0.3238

Therefore, the average factor is found by 20log0.3238 = -9.79dB

Tp



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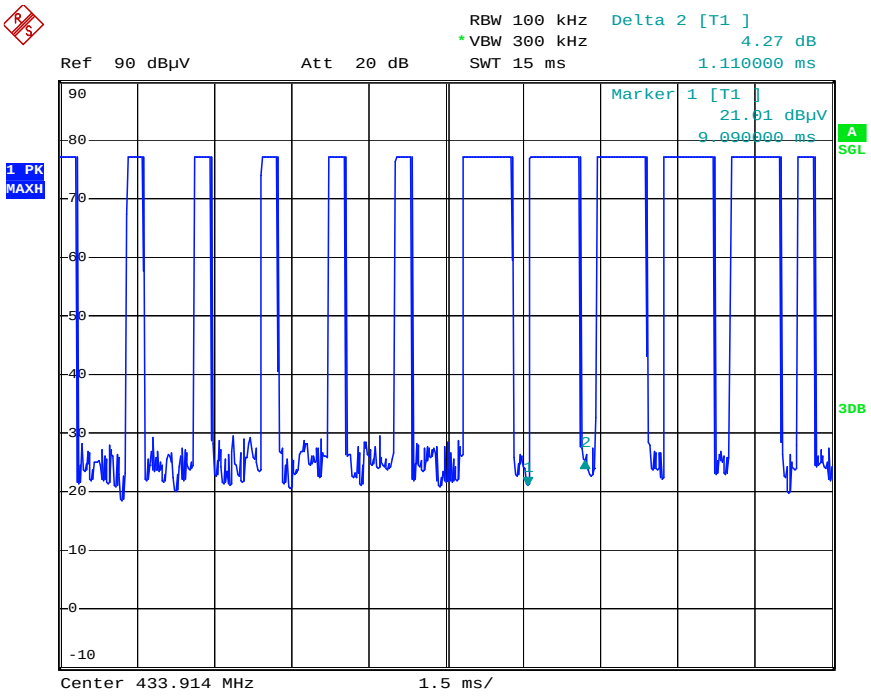

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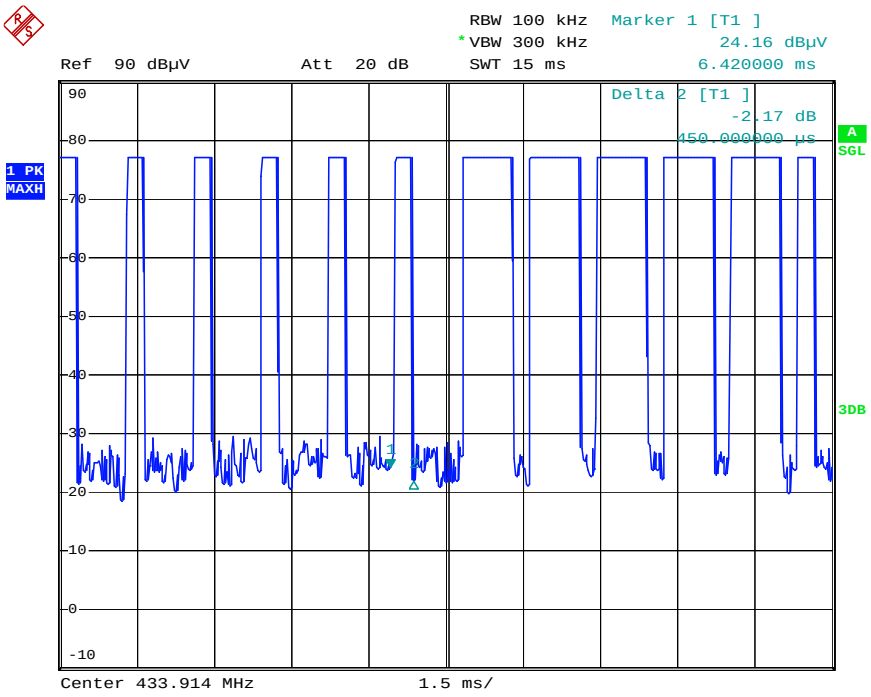

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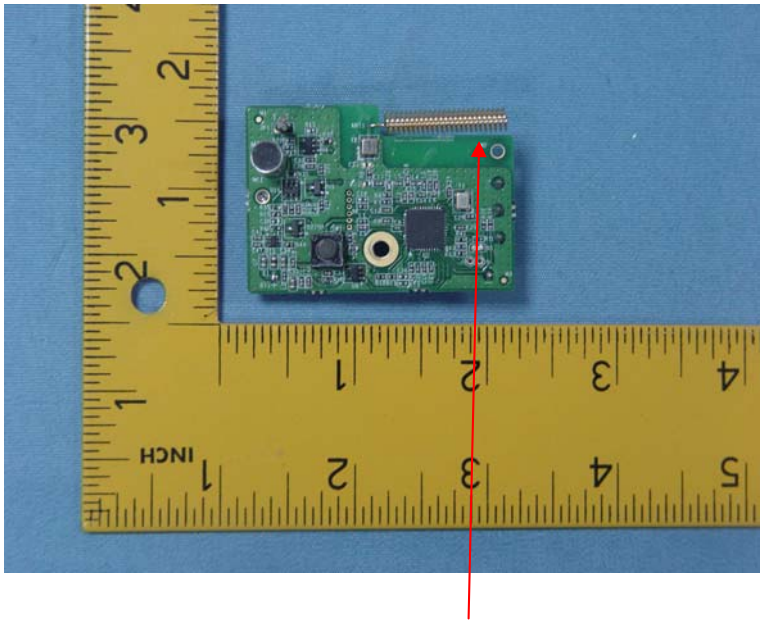
8. ANTENNA REQUIREMENT

8.1. The Requirement

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.2. Antenna Construction

Device is equipped with unique antenna, which isn't displaced by other antenna. Therefore, the equipment complies with the antenna requirement of Section 15.203.



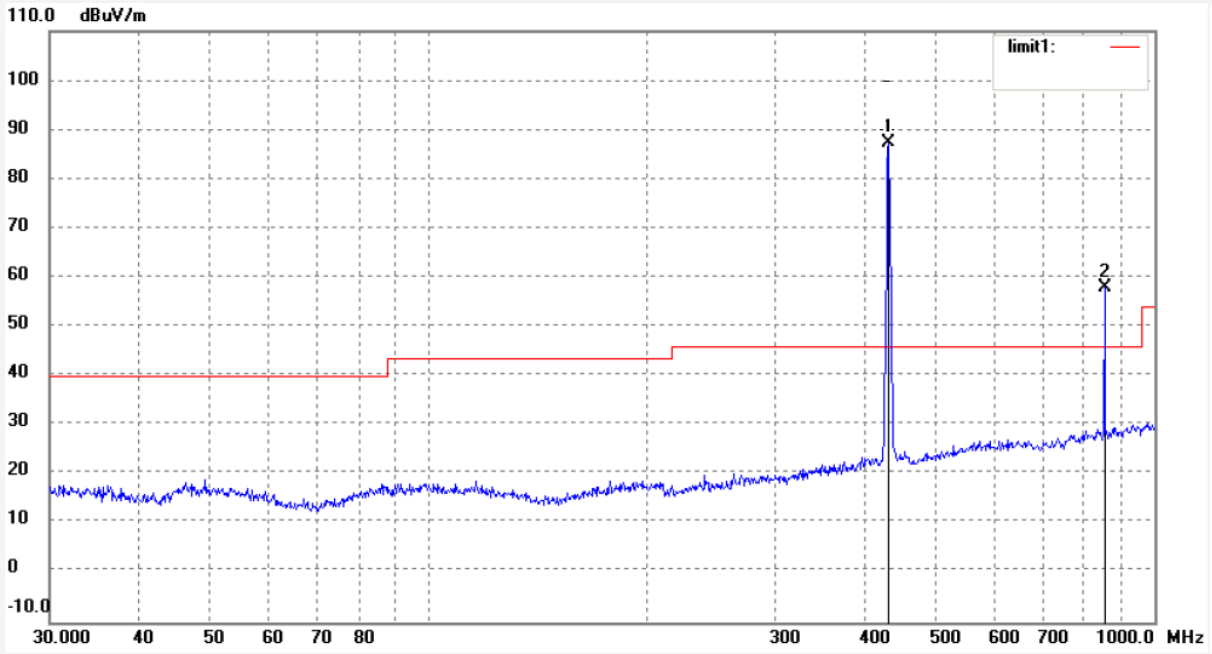
Antenna

Radiation Emission test plots(30MHz-1GHz)

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR #4892	Polarization: Horizontal
Standard: FCC 3M Radiated	Power Source: DC 3V
Test item: Radiation Test	Date: 13/07/06/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/00/51
EUT: Sonic & Heat Sensor	Engineer Signature:
Mode: TX	Distance: 3m
Model: SNH1300	
Manufacturer: Oplink	

Note: Report No.:ATE20131449

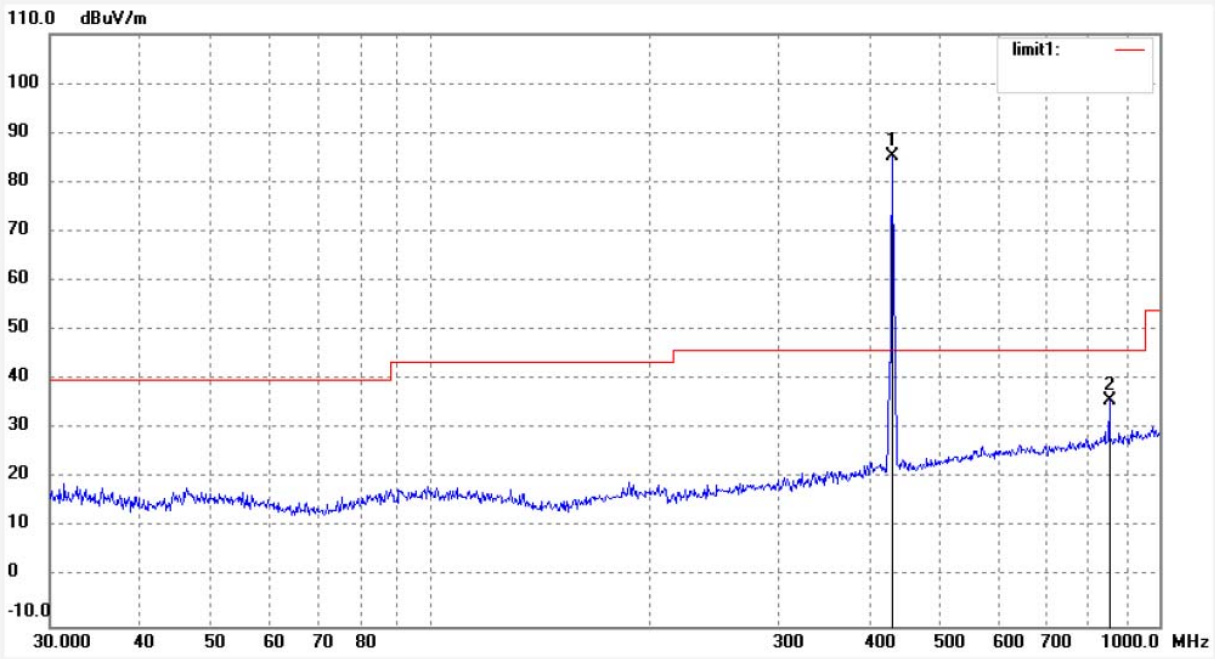


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	433.9052	93.39	-6.03	87.36	46.00	40.36	peak			
2	867.8546	57.23	0.74	57.97	46.00	11.97	peak			

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR #4893	Polarization: Vertical
Standard: FCC 3M Radiated	Power Source: DC 3V
Test item: Radiation Test	Date: 13/07/06/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/06/47
EUT: Sonic & Heat Sensor	Engineer Signature:
Mode: TX	Distance: 3m
Model: SNH1300	
Manufacturer: Oplink	

Note: Report No.:ATE20131449



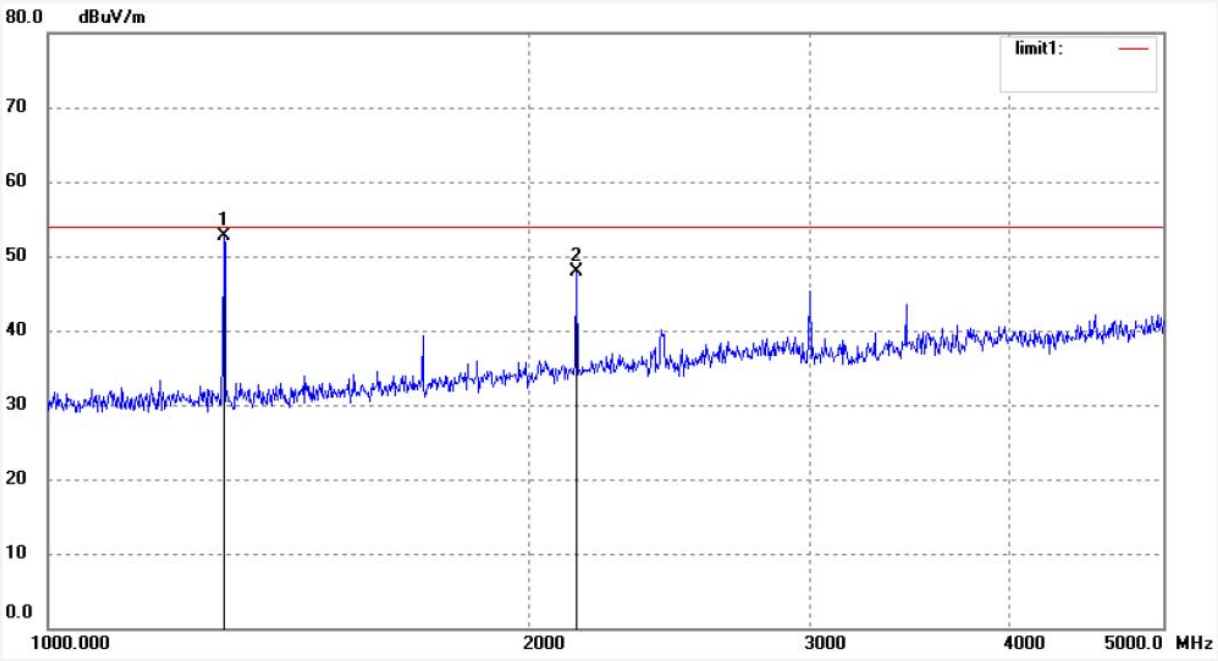
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	433.9052	91.30	-6.03	85.27	46.00	39.27	peak			
2	867.8546	34.89	0.74	35.63	46.00	-10.37	peak			

Radiation Emission test plots(1GHz-5GHz)

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR #4899	Polarization: Horizontal
Standard: FCC 3M Radiated	Power Source: DC 3V
Test item: Radiation Test	Date: 13/07/06/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/28/12
EUT: Sonic & Heat Sensor	Engineer Signature:
Mode: TX	Distance: 3m
Model: SNH1300	
Manufacturer: Oplink	

Note: Report No.:ATE20131449

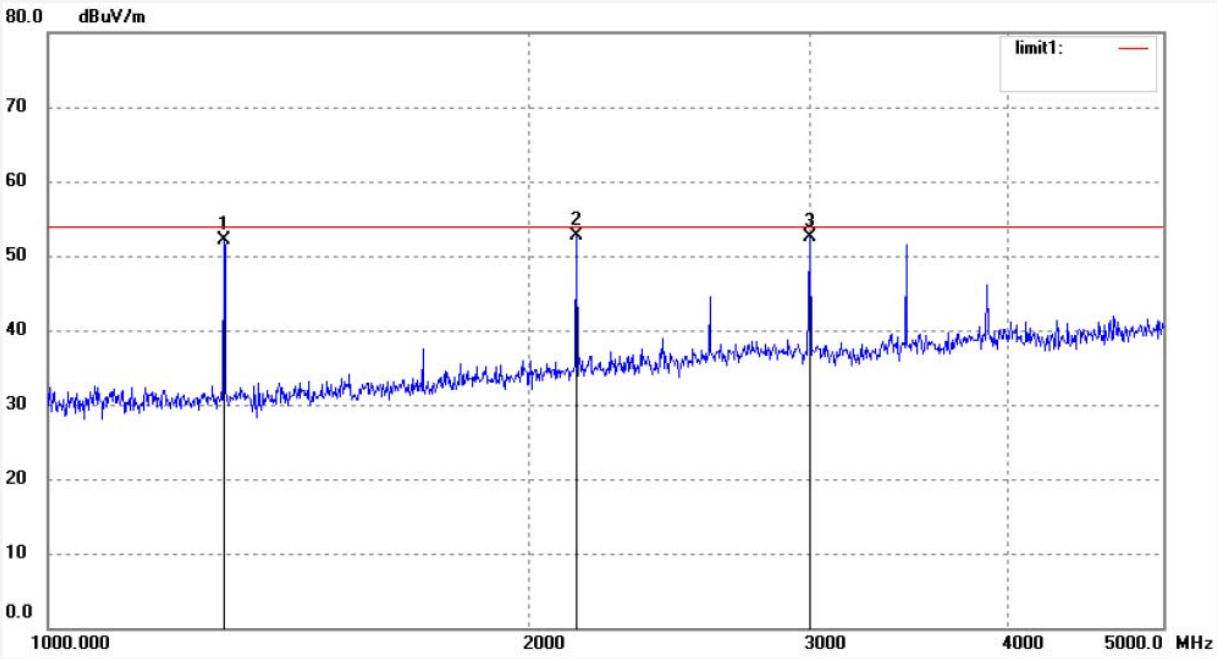


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1301.769	64.96	-12.22	52.74	54.00	-1.26	peak			
2	2169.688	56.39	-8.51	47.88	54.00	-6.12	peak			

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: STAR #4900	Polarization: Vertical
Standard: FCC 3M Radiated	Power Source: DC 3V
Test item: Radiation Test	Date: 13/07/06/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 11/33/32
EUT: Sonic & Heat Sensor	Engineer Signature:
Mode: TX	Distance: 3m
Model: SNH1300	
Manufacturer: Oplink	

Note: Report No.:ATE20131449



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	1301.769	64.34	-12.22	52.12	54.00	-1.88	peak			
2	2169.688	61.18	-8.51	52.67	54.00	-1.33	peak			
3	3037.378	57.65	-5.18	52.47	54.00	-1.53	peak			