

FCC Test Report

Product Name	Wireless Smoke +Heat Sensor
Model No.	SMH1300
FCC ID.	OS3SMH01

Applicant	Zhuhai FTZ Oplink Communications, Inc.
Address	#29, #30 Lianfeng Avenue, Free Trade Zone, Zhuhai, Guangdong Province, China 519030

Date of Receipt	Apr. 26, 2013
Issued Date	May 07, 2013
Report No.	135017R-RFUSP04V01
Report Version	V1.0



The test results relate only to the samples tested.

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This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Test Report Certification

Issued Date : May 07, 2013

Report No. : 135017R-RFUSP04V01



Product Name	Wireless Smoke + Heat Sensor
Applicant	Zhuhai FTZ Oplink Communications, Inc.
Address	#29, #30 Lianfeng Avenue, Free Trade Zone, Zhuhai, Guangdong Province, China 519030
Manufacturer	EVERDAY Technology Co., Ltd.
Model No.	SMH1300
FCC ID.	OS3SMH01
EUT Rated Voltage	DC 3V(Power by Battery)
EUT Test Voltage	DC 3V(Power by Battery)
Trade Name	N/A
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2012 ANSI C63.4: 2003, ANSI C63.10: 2009
Test Result	Complied

Test results relate only to the samples tested.

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(Manager / Vincent Lin)

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1. General Information

1.1. EUT Description

Product Name	Wireless Smoke + Heat Sensor
Trade Name	N/A
Model No.	SMH1300
FCC ID	OS3SMH01
Frequency Range	433.92MHz
Number of Channels	1
Type of Modulation	ASK
Antenna Information	MFR: EVERDAY, M/N: N/A

Frequency of Each Channel:

Channel	Frequency
Channel 1:	433.92 MHz

Note:

1. The EUT is a Wireless Smoke + Heat Sensor with a built-in 433.92 MHz transmitter.
2. The antenna of EUT is conform to FCC 15.203
3. These tests are conducted on a sample for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.231.
4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode	Mode 1: Transmit
-----------	------------------

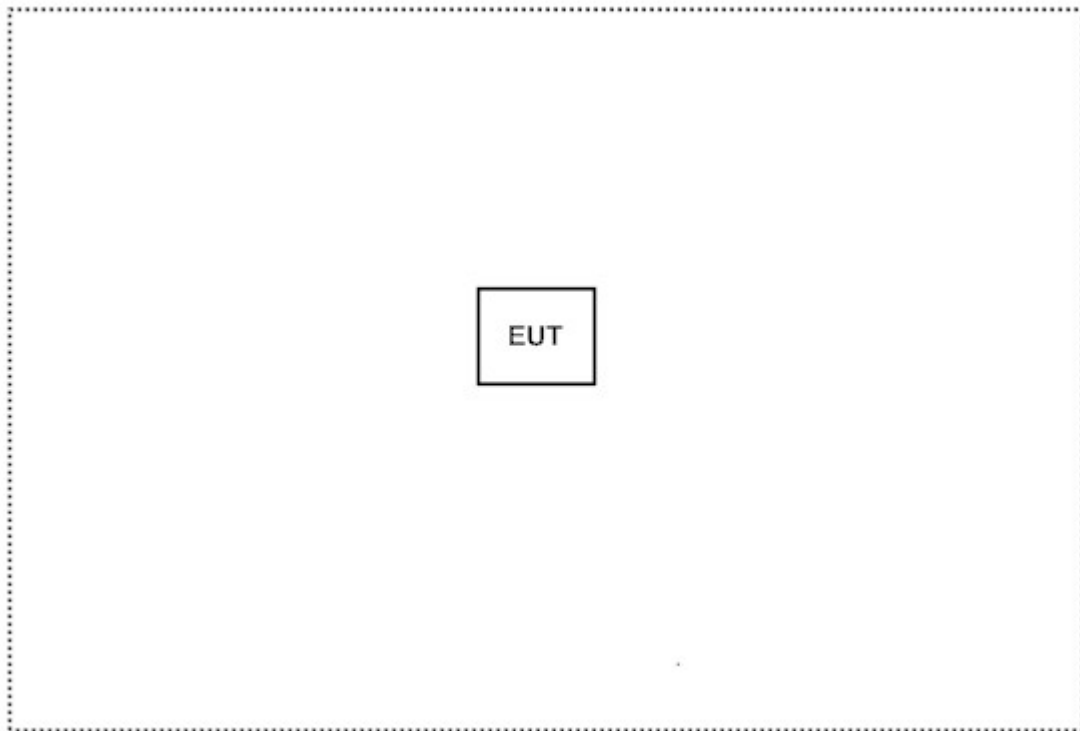
1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
N/A					

Signal Cable Type	Signal cable Description
N/A	

1.4. Configuration of tested System



1.5. EUT Exercise Software

1	Setup the EUT as shown in section 1.4.
2	Install the battery.
3	Start transmits continually.
4	Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	30-65
Barometric pressure (mbar)	860-1060	950-1000

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/>

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Registration Number: 92195

Accreditation on NVLAP
NVLAP Lab Code: 200533-0

Site Name: Quietek Corporation
Site Address: 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

FCC Accreditation Number: TW1014

2. Conducted Emission

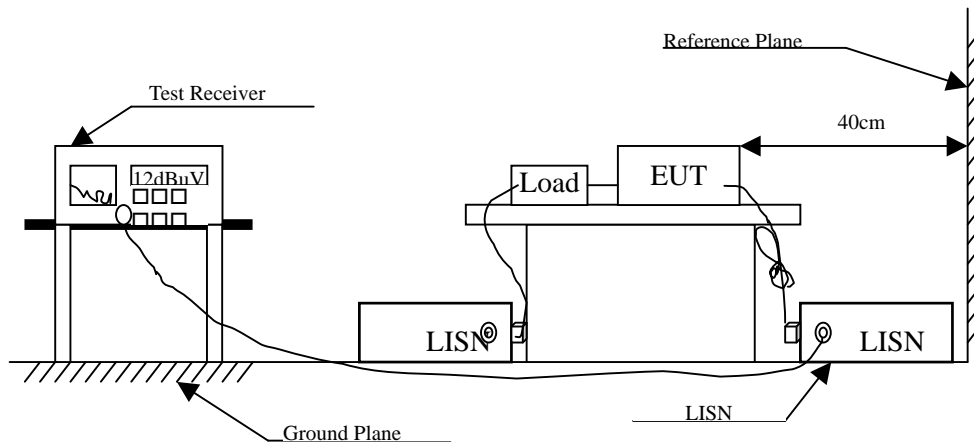
2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2012	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2013	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2013	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar, 2013	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2013	
	No.1 Shielded Room				

Note:

1. All equipments are calibrated every one year.
2. The test instruments marked by “X” are used to measure the final test results.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 Limits (dBuV)		
Frequency MHz	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

2.4. Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2009 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

2.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.231

2.6. Uncertainty

± 2.26 dB

2.7. Test Result

Owing to the DC operation of EUT, this test item is not performed.

3. Radiated Emission

3.1. Test Equipment

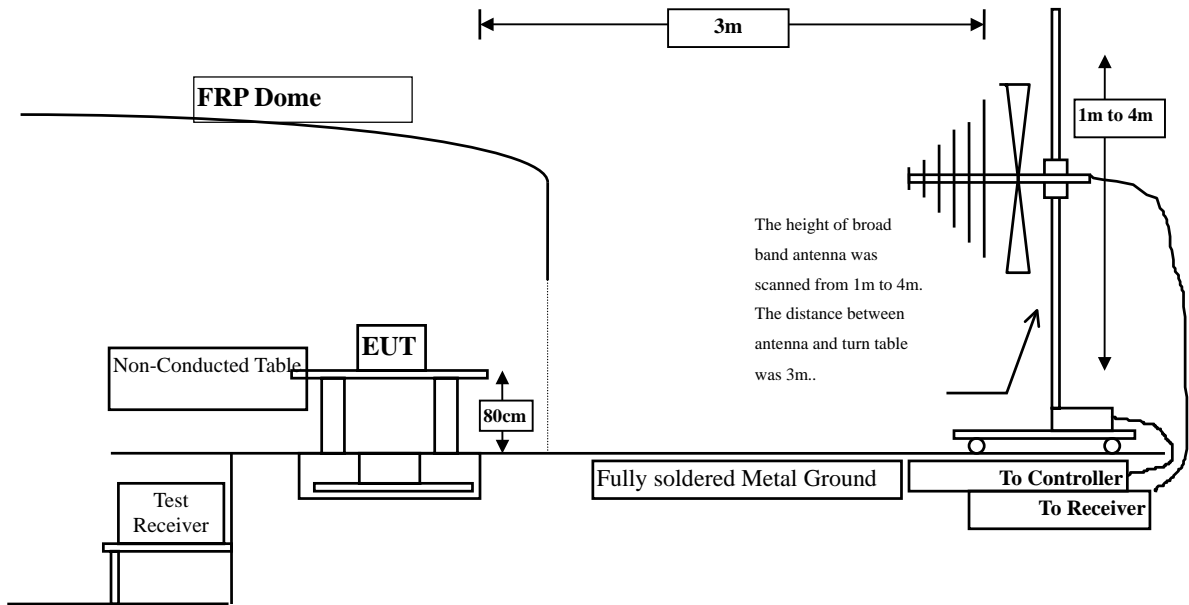
The following test equipment are used during the test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X Loop Antenna	Teseq	HLA6120 / 26739	Jul., 2012
	X Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2012
	X Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2012
	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2012
	X Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2013
	X Pre-Amplifier	QTK	AP-180C / CHM_0906076	Sep., 2012
	Pre-Amplifier	MITEQ	AMF-4D-180400-45-6P/ 925975	Mar, 2013
	X Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2013
	X Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2012
	X Coaxial Cable	Quietek	QTK-CABLE/ CAB5	Feb., 2013
	X Controller	Quietek	QTK-CONTROLLER/ CTRL3	N/A
	X Coaxial Switch	Anritsu	MP59B/6200265729	N/A

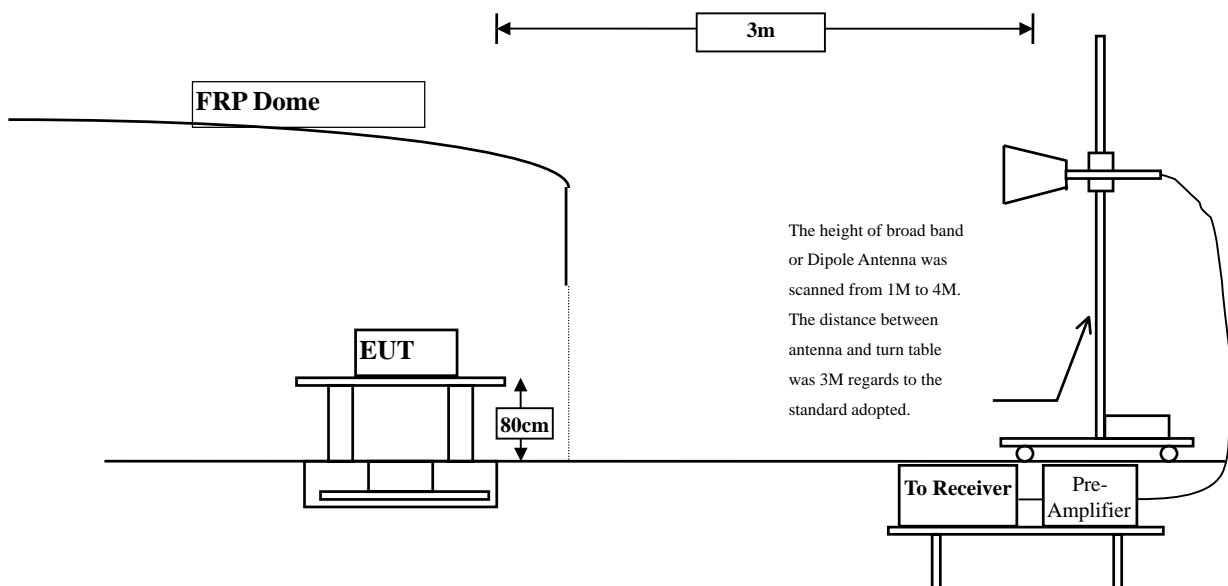
- Note:
1. All instruments are calibrated every one year.
 2. The test instruments marked by "X" are used to measure the final test results.

3.2. Test Setup

Radiated Emission Below 1GHz



Radiated Emission Above 1GHz



3.3. Limits

➤ Fundamental and Harmonics Emission Limits

Fundamental Frequency MHz	Field Strength of Fundamental	Field Strength of Spurious Emission
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

- Remarks :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
 3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

➤ Spurious electric field strength limits

FCC Part 15 Subpart C Paragraph 15.209 Limits			
Frequency MHz	uV/m	dBuV/m	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	See Remark ¹	300
0.490-1.705	24000/F(kHz)	See Remark ¹	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

- Remarks :
1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
 2. In the Above Table, the tighter limit applies at the band edges.
 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.4. Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10, 2009 on radiated measurement.

On the field strength of fundamental and harmonics, the limits shown are based on measuring equipment employing a average detector function. As an alternative, compliance with the limits may be based on the use of measurement instrumentation with a CISPR quasi-peak detector.

On the field strength of spurious electric, on any frequency or frequencies below or equal to 1000 MHz, the limits shown are based on measuring equipment employing a quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limits shown are based upon the use of measurement instrumentation employing an average detector function.

When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

The bandwidth The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

3.5. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.231

3.6. Uncertainty

± 3.8 dB below 1GHz

± 3.9 dB above 1GHz

3.7. Test Result

Product	Wireless Smoke + Heat Sensor		
Test Item	Fundamental Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2013/03/07	Test Site	No.3 OATS

Fundamental Power (X-Line)

Peak Detector:

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-----------------

Horizontal

433.920	22.230	70.170	92.400	-8.430	100.830
---------	--------	--------	--------	--------	---------

Vertical

433.920	21.300	63.970	85.270	-15.560	100.830
---------	--------	--------	--------	---------	---------

Average Detector:

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-----------------

Horizontal

433.920	22.230	55.720	77.950	-2.880	80.830
---------	--------	--------	--------	--------	--------

Vertical

433.920	21.300	50.700	72.000	-8.830	80.830
---------	--------	--------	--------	--------	--------

Note:

1. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain
2. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
3. Limit=20dB+(20log(41.667(433.9)-7083.333))

Product	Wireless Smoke + Heat Sensor		
Test Item	Fundamental Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2013/03/07	Test Site	No.3 OATS

Fundamental Power (Y-Line)

Peak Detector:

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-----------------

Horizontal

433.920	22.230	64.720	86.950	-13.880	100.830
---------	--------	--------	--------	---------	---------

Vertical

433.920	21.300	67.500	88.800	-12.030	100.830
---------	--------	--------	--------	---------	---------

Average Detector:

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-----------------

Horizontal

433.920	22.230	50.450	72.680	-8.150	80.830
---------	--------	--------	--------	--------	--------

Vertical

433.920	21.300	53.400	74.700	-6.130	80.830
---------	--------	--------	--------	--------	--------

Note:

1. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain
2. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
3. Limit=20dB+(20log(41.667(433.9)-7083.333))

Product	Wireless Smoke + Heat Sensor		
Test Item	Fundamental Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2013/03/07	Test Site	No.3 OATS

Fundamental Power (Z-Line)

Peak Detector:

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-----------------

Horizontal

433.920	22.230	69.270	91.500	-9.330	100.830
---------	--------	--------	--------	--------	---------

Vertical

433.920	21.300	64.360	85.660	-15.170	100.830
---------	--------	--------	--------	---------	---------

Average Detector:

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-----------------

Horizontal

433.920	22.230	55.360	77.590	-3.240	80.830
---------	--------	--------	--------	--------	--------

Vertical

433.920	21.300	51.400	72.700	-8.130	80.830
---------	--------	--------	--------	--------	--------

Note:

1. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain
2. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.
3. Limit=20dB+(20log(41.667(433.9)-7083.333))

Product	Wireless Smoke + Heat Sensor		
Test Item	Harmonic Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2013/04/30	Test Site	No.3 OATS

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Peak Limit dBuV/m	Average Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-------------------------	----------------------------

Harmonic Radiated Emission

Horizontal

Peak

1301.760	-6.411	46.210	39.799	-34.201	74.000	54.000
1735.680	-2.831	42.350	39.519	-34.481	74.000	54.000
2169.600	-3.702	47.578	43.876	-30.124	74.000	54.000
2603.520	-3.079	42.050	38.971	-35.029	74.000	54.000
3037.440	-3.164	46.060	42.896	-31.104	74.000	54.000
3471.360	-2.054	42.680	40.626	-33.374	74.000	54.000
3905.280	-0.432	41.670	41.238	-32.762	74.000	54.000
4339.200	0.360	41.920	42.280	-31.720	74.000	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	Wireless Smoke + Heat Sensor		
Test Item	Harmonic Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2013/04/30	Test Site	No.3 OATS

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Peak Limit dBuV/m	Average Limit dBuV/m
------------------	-------------------------	--------------------------	--------------------------------	--------------	-------------------------	----------------------------

Harmonic Radiated Emission

Vertical

Peak

1301.760	-5.568	45.650	40.082	-33.918	74.000	54.000
1735.680	-2.056	42.400	40.344	-33.656	74.000	54.000
2169.600	-3.817	43.070	39.253	-34.747	74.000	54.000
2603.520	-3.246	41.910	38.663	-35.337	74.000	54.000
3037.440	-3.146	46.930	43.784	-30.216	74.000	54.000
3471.360	-1.966	42.530	40.564	-33.436	74.000	54.000
3905.280	0.079	41.970	42.049	-31.951	74.000	54.000
4339.200	1.116	43.070	44.186	-29.814	74.000	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	Wireless Smoke + Heat Sensor		
Test Item	General Radiated Emission		
Test Mode	Mode 1: Transmit		
Date of Test	2013/04/30	Test Site	No.3 OATS

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
Horizontal					
Quasi-Peak					
105.660	-7.676	29.982	22.305	-21.195	43.500
544.100	4.373	29.170	33.543	-12.457	46.000
608.120	3.925	29.202	33.127	-12.873	46.000
757.500	5.107	29.247	34.354	-11.646	46.000
867.840	6.048	28.205	34.253	-11.747	46.000
930.160	7.530	29.147	36.677	-9.323	46.000
Vertical					
Quasi-Peak					
179.380	-0.824	38.198	37.374	-6.126	43.500
377.260	0.647	38.855	39.502	-6.498	46.000
606.180	2.246	38.864	41.110	-4.890	46.000
755.560	2.829	39.561	42.390	-3.610	46.000
867.840	-0.357	38.539	38.182	-7.818	46.000
968.960	3.936	38.957	42.893	-11.107	54.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
4. Measurement Level = Reading Level + Correct Factor.
5. Correct Factor = Antenna factor + Cable loss – Amplifier gain.
6. The average measurement was not performed when the peak measured data under the limit of average detection.
7. The emission levels of other frequencies are very lower than the limit and not show in test report.
8. No emission found between lowest internal used/generated frequency to 30MHz.

4. Transmit time

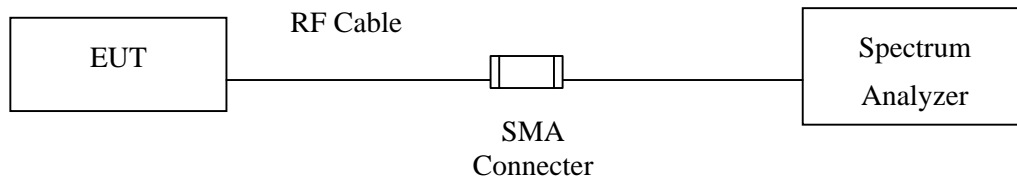
4.1. Test Equipment

The following test equipment are used during the test:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2012
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2012
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2013

Note: 1. All equipments are calibrated every one year.
 2. The test instruments marked by “X” are used to measure the final test results.

4.2. Test Setup



4.3. Limits

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

A transmitter activated automatically shall cease transmission within 5 seconds after activation.

4.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.231

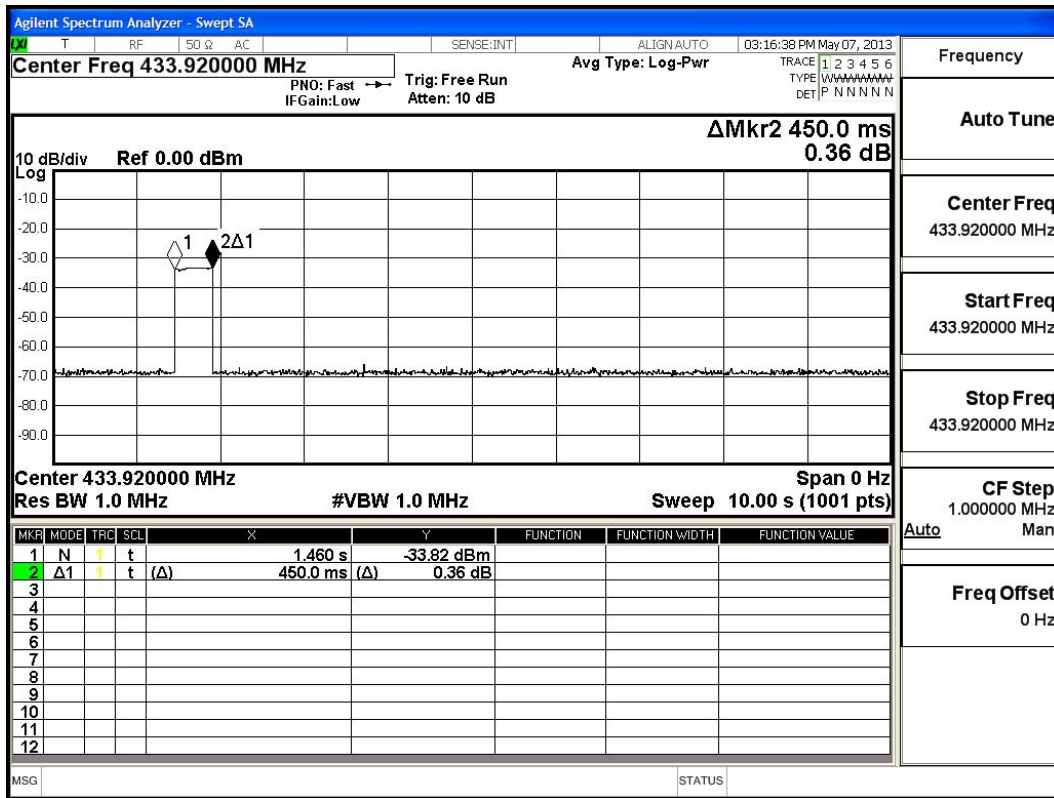
4.5. Uncertainty

± 25ms

4.6. Test Result

Product	Wireless Smoke + Heat Sensor		
Test Item	Transmit time		
Test Mode	Mode 1: Transmit		
Date of Test	2013/03/07	Test Site	No.3 OATS

Channel No.	Frequency (MHz)	Measurement Value (Sec)	Limit (Sec)	Result
1	433.8	0.450	< 5	Pass



5. Occupied Bandwidth

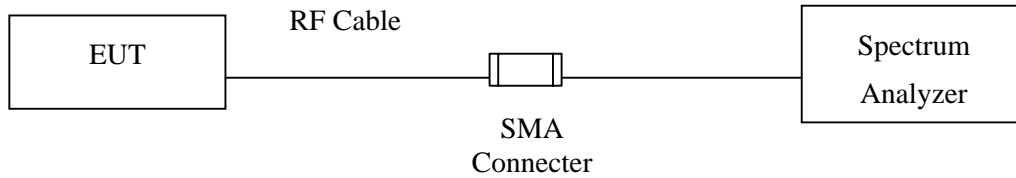
5.1. Test Equipment

The following test equipment are used during the test:

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2012
Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2012
X Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2013

Note: 1. All equipments are calibrated every one year.
 2. The test instruments marked by “X” are used to measure the final test results.

5.2. Test Setup



5.3. Limits

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. For devices operating above 900MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier

5.4. Test Specification

According to FCC Part 15 Subpart C Paragraph 15.231

5.5. Uncertainty

± 150Hz

5.6. Test Result

Product	Wireless Smoke + Heat Sensor		
Test Item	Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2013/05/02	Test Site	No.3 OATS

Channel No.	Frequency (MHz)	Measurement Value (MHz)	Limit (MHz)	Result
1	433.92	0.046365	1.08475	Pass

Note: Limit = 433.92MHz * 0.25%= 1.08475MHz

Figure Channel 1:

