CONFORMANCE TEST REPORT
FOR
FCC 47 CFR, Part 15 Subpart C

Report No.: 12-12-MAS-296-03

Client:	Scientech Electronics Co., Ltd.
Product:	Motion Detector
Model:	PIR-3SP
Manufacturer/supplier:	Scientech Electronics Co., Ltd.

Date test item received:	2012/11/22
Date test campaign completed:	2013/05/16
Date of issue:	2013/05/16

The test result only corresponds to the tested sample. It is not permitted to copy this report, in part or in full, without the permission of the test laboratory.

Total number of pages of this test report: 20 pages

Total number of pages of photos: External photos 1 pages
Internal photos 2 pages
Setup photos 2 pages

Prepared By	Technical Acceptance By	Approved By
Phillip Luo	Perry Lin	James Cheng

ELECTRONICS TESTING CENTER, TAIWAN
NO.8, LANE 29, WENMING RD.,
LESHAN TSUEN, GUISHAN SHIANG,
TAOYUAN COUNTY, TAIWAN 33383, R.O.C.

TEL: (03) 3276170~4
INT: +886-3-3276170~4
FAX: (03) 3276188
INT: +886-3-3276188

Client	: Scientech Electronics Co., Ltd.
Address	: 4F, No. 501-17, Zhong Zheng Rd., Xin Dian Dist., New Taipei City 23148, Taiwan
Manufacturer	: Scientech Electronics Co., Ltd.
Address	: 4F, No. 501-17, Zhong Zheng Rd., Xin Dian Dist., New Taipei City 23148, Taiwan
EUT	: Motion Detector
Trade name	: ----
Model No.	: PIR-3SP
Comment Issues	: (1) The report also apply to model: PIR-3S (2) The multiple listing recognized without test basis is according to information supplied by manufacturer. A detail documentation of the above models must be verified by legal right organization for the EMC characteristic with relation to the subject model.
Power Source	: 3.0Vdc（Battery）
Regulations applied	: FCC 47 CFR, Part 15 Subpart C

The testing described in this report has been carried out to the best of our knowledge and ability, and our responsibility is limited to the exercise of reasonable care. This certification is not intended to believe the sellers from their legal and/or contractual obligations.

The compliance test is only certified for the test equipment and the results of the testing report relate only to the item tested. The compliance test of this report was conducted in accordance with the appropriate standards. It's not intention to assure the quality and performance of the product. This report shall not be reproduced except in full, without the approval of ETC. This report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

Laboratory Introduction: Electronics Testing Center, Taiwan is recognized, filed and mutual recognition arrangement as following:

① ISO9001: TüV Product Service

② ISO/IEC 17025: BSMI, TAF, NCC, NVLAP, ILAC MRA, UL, Compliance

③ Filing: FCC, Industry Canada, VCCI

④ MRA: Australia, Hong Kong, New Zealand, Singapore, USA, Japan, Korea, China, APLAC through TAF

⑤ FCC Registration Number: 91095, 392735, 278818

⑥ Industry Canada Site Registration Number: IC 2949A-2

NVLAP Lab Code 200133-0

Table of Contents *Page*

1. GENERAL INFORMATION

1.1 Product Description

a) Type of EUT : Motion Detector
b) Model No. : PIR-3SP
c) Serial No. : ----
d) Working Frequency : 915 MHz

1.2 Characteristics of Device:

PIR-3SP is a pet immune motion detector with RF transmitter; it works with LS-30 alarm base unit.

Modulation type: OOK

1.3 Test Methodology

Radiated testing were performed according to the procedures in chapter 13 of ANSI C63.4 (2003)

The device under test was operated continuously in its normal operating mode for the purpose of the measurements. In order to secure the continuous operation of the device under test, rewiring in the circuit was done by the manufacturer so as to affect its intended operation.

The receiving antenna was varied from 1 to 4 meters and the wooden turntable was rotated through 360 degrees to obtain the highest reading on the field strength meter or on the display of the spectrum analyzer. And also, each emission was to be maximized by changing the orientation of the device under test. The hand-held or body-worn devices rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relatives to the limit.

1.4 Test Facility

The semi-anechoic chamber and conducted measurement facility used to collect the radiated and conducted data are located inside the Building at No.8, Lane 29, Wen-ming Road, Lo-shan Tsun, Kweishan Hsiang, Taoyuan, Taiwan, R.O.C.

This site has been accreditation as a FCC filing site.

2. DEFINITION AND LIMITS

2.1 Definition

Unintentional radiator:

A device that intentionally generates and radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:

A digital device which is marketed for use in commercial or business environment; exclusive of a device which is market for use by the general public, or which is intended to be used in the home.

Class B Digital Device :

A digital device which is marketed for use in a residential environment notwithstanding use in a commercial, business of industrial environment. Example of such devices that are marketed for the general public.

Note : A manufacturer may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B digital device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

Intentional radiator:

A device that intentionally generates and emits radio frequency energy by radiation or induction.

2.2 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.25
0.495 - 0.505 **	16.69475 - 16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425 - 16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475 - 156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

Remark "**": Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

2.3 Limitation

(1) Conducted Emission Limits:

Except for Class A digital devices, for equpment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency MHz	**Quasi Peak dB μ V**	**Average dB μ V**
0.15 - 0.5	66-56*	56-46*
0.5 - 5.0	56	46
5.0 - 30.0	60	50

* Decreases with the logarithm of the frequency

(2) Radiated Emission Limits:

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency MHz	Distance Meters	Radiated dB μ V/m	Radiated μ V/m
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional radiator device, according to §15.209(a), the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table::

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

For intentional radiator device, per §15.249(a), the field strength of emissions shall comply with the following :

Frequency MHz	Distance Meters	Fundamental dBµV/m	mV/m	Harmonic dBµV/m	µV/m
902 - 928	3	94	50	54	500
2400 - 2483.5	3	94	50	54	500
5725 - 5875	3	94	50	54	500
24000 - 24250	3	108	250	68	2500

In accordance with §15.249(d), limits shown in above table are based on average limits for frequencies above 1000 MHz, and frequencies below 1000 MHz are based on quasi peak. However, the peak field strength of any emission shall not exceed the maximum permitted average limits by more than 20 dB.

(3) Spurious in Out Band Requirement

For intentional device, according to §15.249 (c), emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of fundamental or to the general radiated emission limits in §15.209.

(4) Antenna Requirement

For intentional device, according to §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.

2.4 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.5 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual.

The Federal Communications Commission Radio Frequency Interference Statement includes the following paragraph.

This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio / TV technician for help.

3. SYSTEM TEST CONFIGURATION

3.1 Devices for Tested System

Device	Manufacture	Model No.	Cable Description
* Motion Detector	Scientech Electronics Co., Ltd.	PIR-3SP	----

Note:

1. Remark "*" means equipment under test.
2. The device is a fixed transmitter with an omnidirectional antenna communicating with a base unit, but not point to point operation and not use the frequency band from 24.05 to 24.25 GHz. 15.249(b) is not applicable.

4. RADIATED EMISSION MEASUREMENT

4.1 Applicable Standard

For intentional radiators, according to §15.249 (a), operation within the frequency band of 902 to 928 MHz, the fundamental field strength shall not exceed 94 dBuV/m and the harmonics shall not exceed 54 dBuV/m. For out band emission except for harmonics shall be comply with §15.209 or at least attenuated by 50 dB below the level of the fundamental.

4.2 Measurement Procedure

A.Preliminary Measurement For Portable Devices.

For portable devices, the following procedure was performed to determine the maximum emission axis of EUT (X , Y and Z axis):

1. With the receiving antenna is H polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
2. With the receiving antennna is V polarization, rotate the EUT in turns with three orthogonal axes to determine the axis of maximum emission.
3. Compare the results derived from above two steps. The axis of maximum emission from EUT was determined and the configuration was used to perform the final measurement.
4. The position in which the maximum noise occurred was “X axis”. (Please see the test setup photos)

B. Final Measurement

1. Setup the configuration per figure 3 and 4 for frequencies measured below and above 1 GHz respectively.
2. For emission frequencies measured below 1 GHz, it is performed in a semi-anechoic chamber to determine the accurate frequencies of higher emissions. For emission frequencies measured above 1 GHz, a pre-scan be performed with a 1 meter measuring distance before final test.
3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 120 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.

   Note : A filter was used to avoid pre-amplifier saturated when measure TX operation mode.
5. Repeat step 4 until all frequencies need to be measured were complete.
6. Repeat step 5 with search antenna in vertical polarized orientations.
7. Check the six frequencies of highest emission with varying the datarate, placement of ANT. cables associated with EUT to obtain the worse case and record the result.

Figure 1 : Frequencies measured below 1 GHz configuration

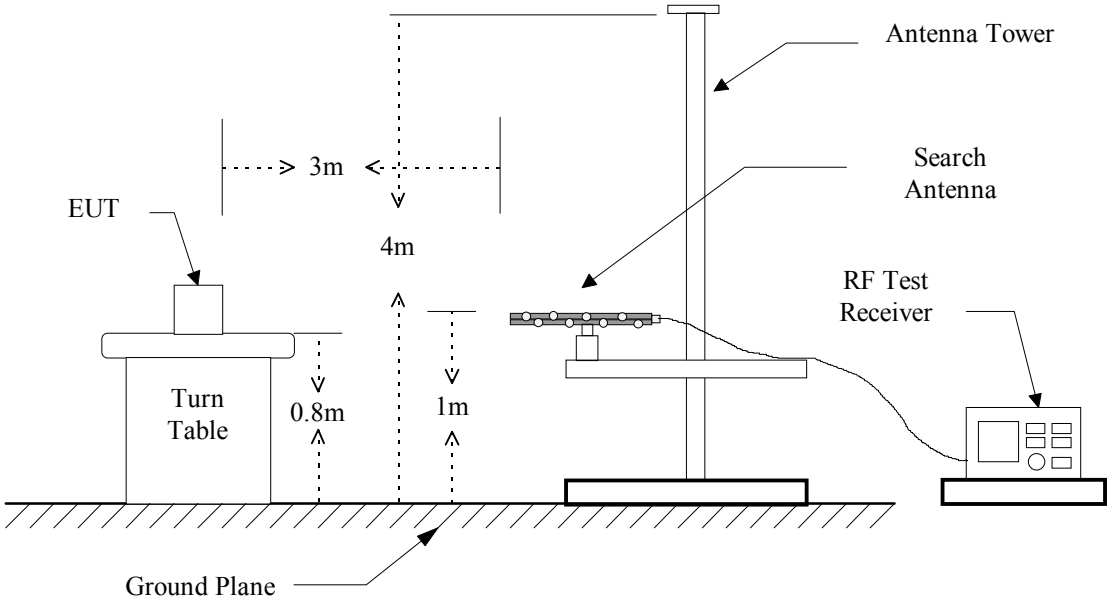
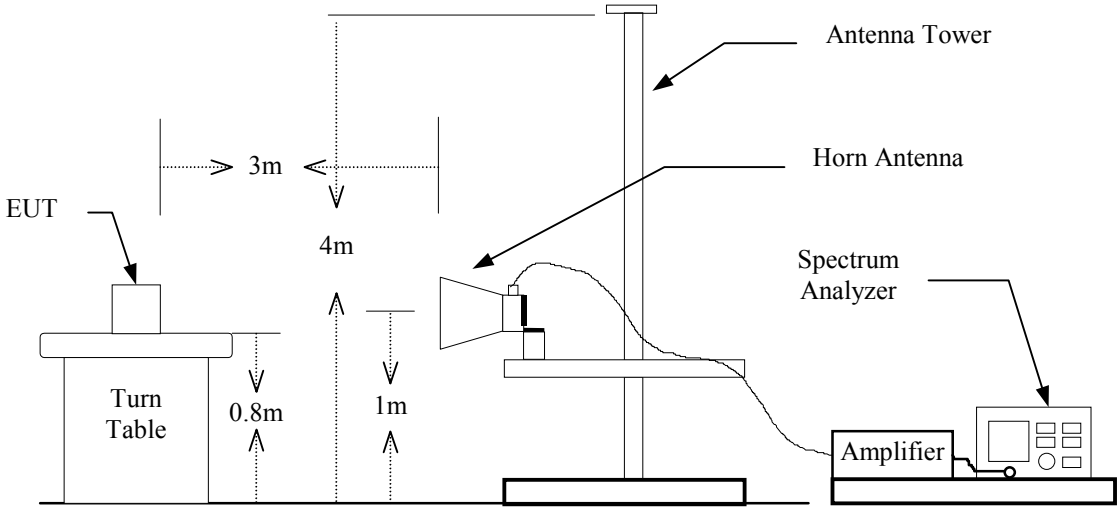


Figure 2 : Frequencies measured above 1 GHz configuration



4.3 Test Data

4.3.1 Fundamental and Harmonic Emissions

Operated mode : Transmitting

Test Date: Nov. 22, 2012 Temperature: 23℃ Humidity: 58%

Frequency (MHz)	Ant Pol H/V	Reading (dBuV/m) @3m QP	Correct Factor (dB)	Result (dBuV/m) @3m QP	Limit (dBuV/m) @3m QP	Margin (dB)
Fundamental						
914.8548	H	64.2	25.64	89.8	94.0	-4.2
914.8548	V	56.0	25.64	81.6	94.0	-12.4

Frequency (MHz)	Ant Pol H/V	Reading (dBuV/m) @3m Peak	Reading (dBuV/m) @3m AVG	Correct Factor (dB)	Duty Cycle (dB)	Result (dBuV/m) @3m Peak	Result (dBuV/m) @3m AVG	Limit (dBuV/m) @3m Peak	Limit (dBuV/m) @3m AVG	Margin (dB)
Harmonic										
1829.7096	H	52.9	----	-10.29	n/a	42.6	----	74.0	54.0	-11.4
1829.7096	V	58.3	----	-10.29	n/a	48.0	----	74.0	54.0	-6.0
*2744.5644	H	55.4	----	-7.12	n/a	48.3	----	74.0	54.0	-5.7
*2744.5644	V	54.1	----	-7.12	n/a	47.0	----	74.0	54.0	-7.0
*3659.4192	H	----	----	-4.26	n/a	----	----	74.0	54.0	----
*3659.4192	V	49.0	----	-4.26	n/a	44.7	----	74.0	54.0	-9.3
*4574.2740	H	56.4	44.9	-2.93	n/a	53.5	42.0	74.0	54.0	-12.0
*4574.2740	V	60.0	46.4	-2.93	n/a	57.1	43.5	74.0	54.0	-10.5
5489.1288	H	----	----	-1.11	n/a	----	----	74.0	54.0	----
5489.1288	V	----	----	-1.11	n/a	----	----	74.0	54.0	----
6403.9836	H	49.9	----	-1.02	n/a	48.9	----	74.0	54.0	-5.1
6403.9836	V	----	----	-1.02	n/a	----	----	74.0	54.0	----
*7318.8384	H	----	----	0.77	n/a	----	----	74.0	54.0	----
*7318.8384	V	----	----	0.77	n/a	----	----	74.0	54.0	----
*8233.6932	H	----	----	1.68	n/a	----	----	74.0	54.0	----
*8233.6932	V	----	----	1.68	n/a	----	----	74.0	54.0	----
*9148.5480	H	----	----	2.44	n/a	----	----	74.0	54.0	----
*9148.5480	V	----	----	2.44	n/a	----	----	74.0	54.0	----

Note: *1. Peak Result =Peak Reading + Correct Factor*

2. AVG Result = Peak Result + Duty Factor

3. If the result of peak value is under the limit of average, the average value doesn't need to be measured.

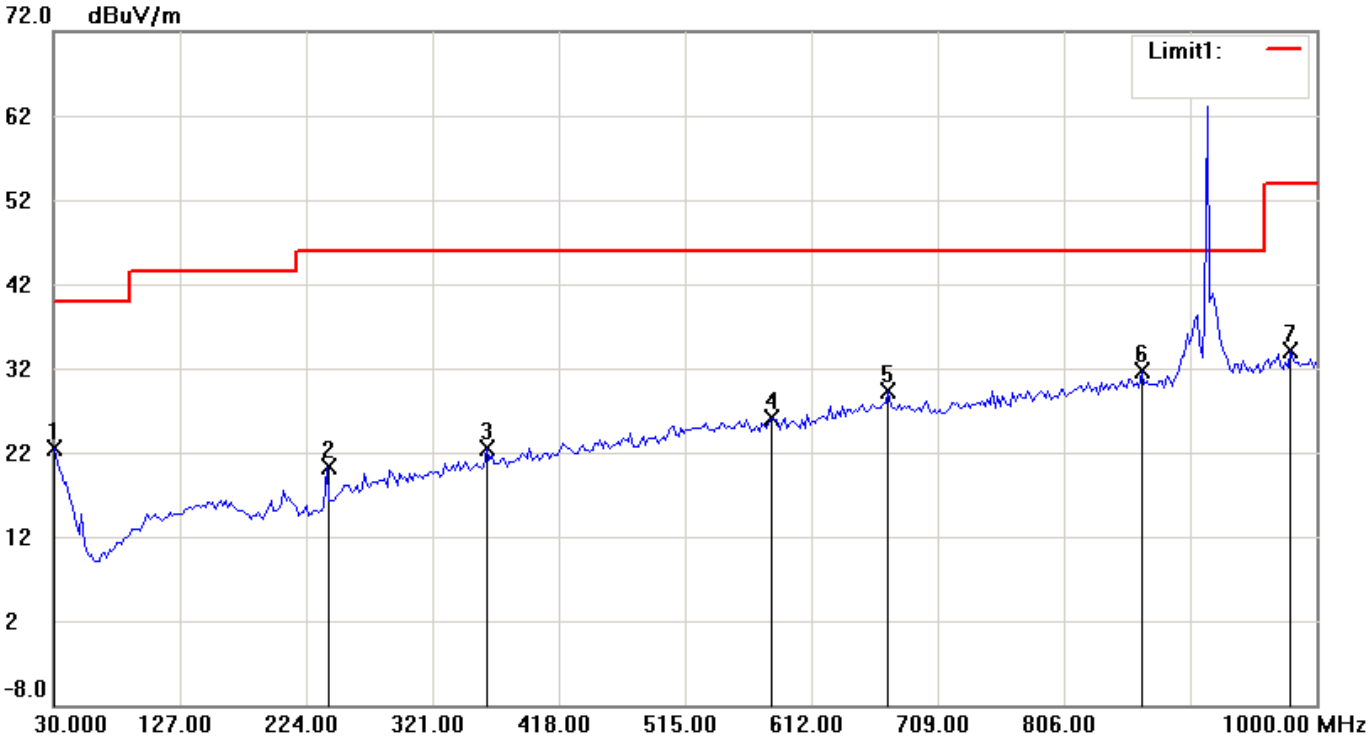
4. "" means the frequency is in the Restricted Bands.*

5. If the data table appeared symbol of "---" means the value was too low to be measured.

4.3.2 Other emissions

A. 30MHz to 1GHz

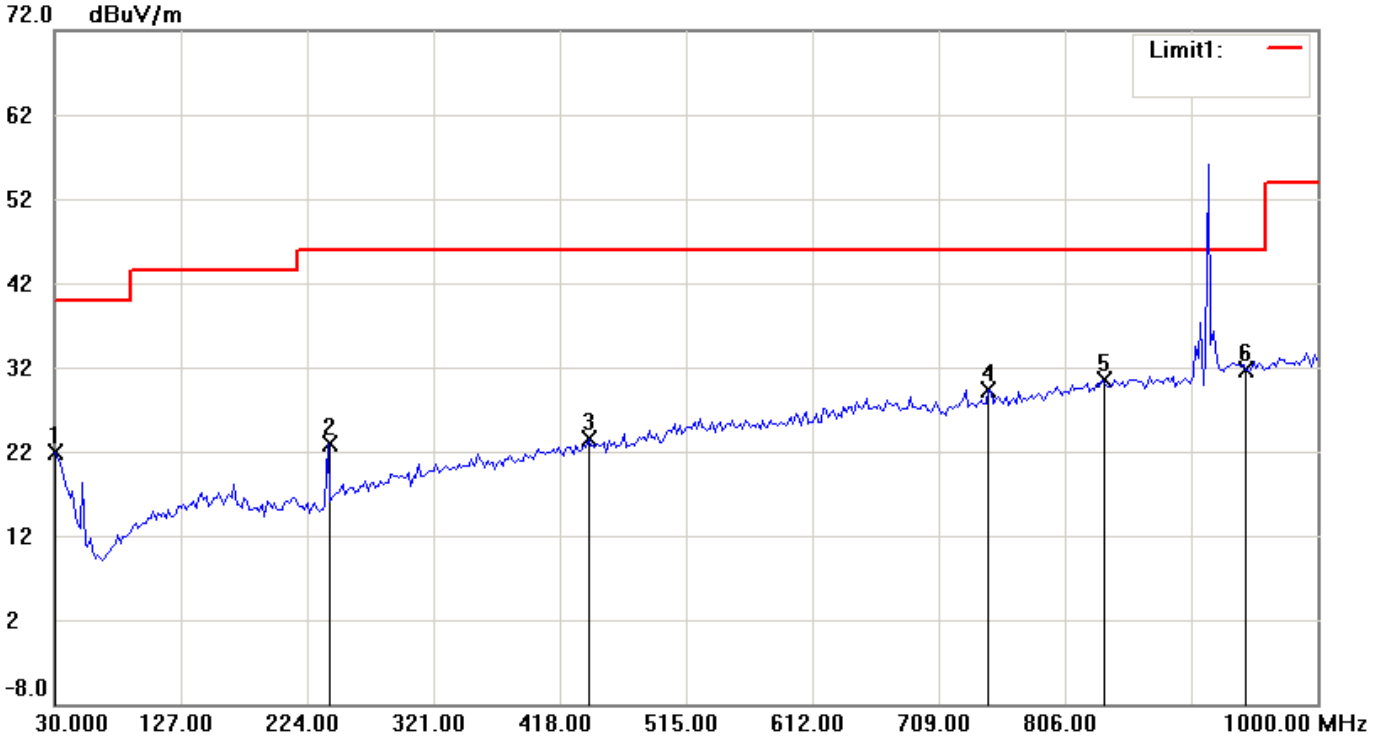
File: PIR-3SP **Data:** #8 **Date:** 2012/11/22 **Temperature:** 23 ℃
Time: AM 11:33:54 **Humidity:** 58 %



Condition: FCC Part15 RE-Class B_30-1000MHz **Polarization:** Horizontal
EUT: **Distance:**
Model:
Test Mode:
Note: Z

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	30.0000	2.00	peak	20.45	22.45	40.00	-17.55
2	239.9400	5.46	peak	14.89	20.35	46.00	-25.65
3	362.4048	2.92	peak	19.53	22.45	46.00	-23.55
4	582.0641	2.80	peak	23.39	26.19	46.00	-19.81
5	671.4830	3.96	peak	25.34	29.30	46.00	-16.70
6	865.8717	3.80	peak	27.91	31.71	46.00	-14.29
7	980.5611	4.06	peak	29.99	34.05	54.00	-19.95

File: **PIR-3SP** **Data:** **#7** **Date:** **2012/11/22** **Temperature:** **23 ℃**
Time: **AM 11:28:29** **Humidity:** **58 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Vertical**
EUT: **Distance:**
Model:
Test Mode:
Note: **Z**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	30.0000	1.43	peak	20.45	21.88	40.00	-18.12
2	239.9400	8.08	peak	14.89	22.97	46.00	-23.03
3	440.1603	2.18	peak	21.32	23.50	46.00	-22.50
4	747.2945	3.46	peak	25.82	29.28	46.00	-16.72
5	834.7695	3.13	peak	27.45	30.58	46.00	-15.42
6	945.5711	2.24	peak	29.50	31.74	46.00	-14.26

B. above 1GHz

Frequency (MHz)	Reading (dBuV) H Peak	H Ave	V Peak	V Ave	Factor (dB) Corr.	Result @3m (dBuV/m) Peak	Result @3m Ave	Limit @3m (dBuV/m) Peak	Limit @3m Ave.
Radiated emission frequencies above 1 GHz to10 GHz were too low to be measured.									

C. below 30MHz

Frequency (MHz)	. Reading (dBuV/m) Peak	Duty (dB)	Factor (dB)	Result @3m (dBuV/m) Peak	QP	AVG	Limit @3m (dBuV/m) Peak	AVG
Radiated emission frequencies from 9 kHz to 30 MHz were too low to be measured.								

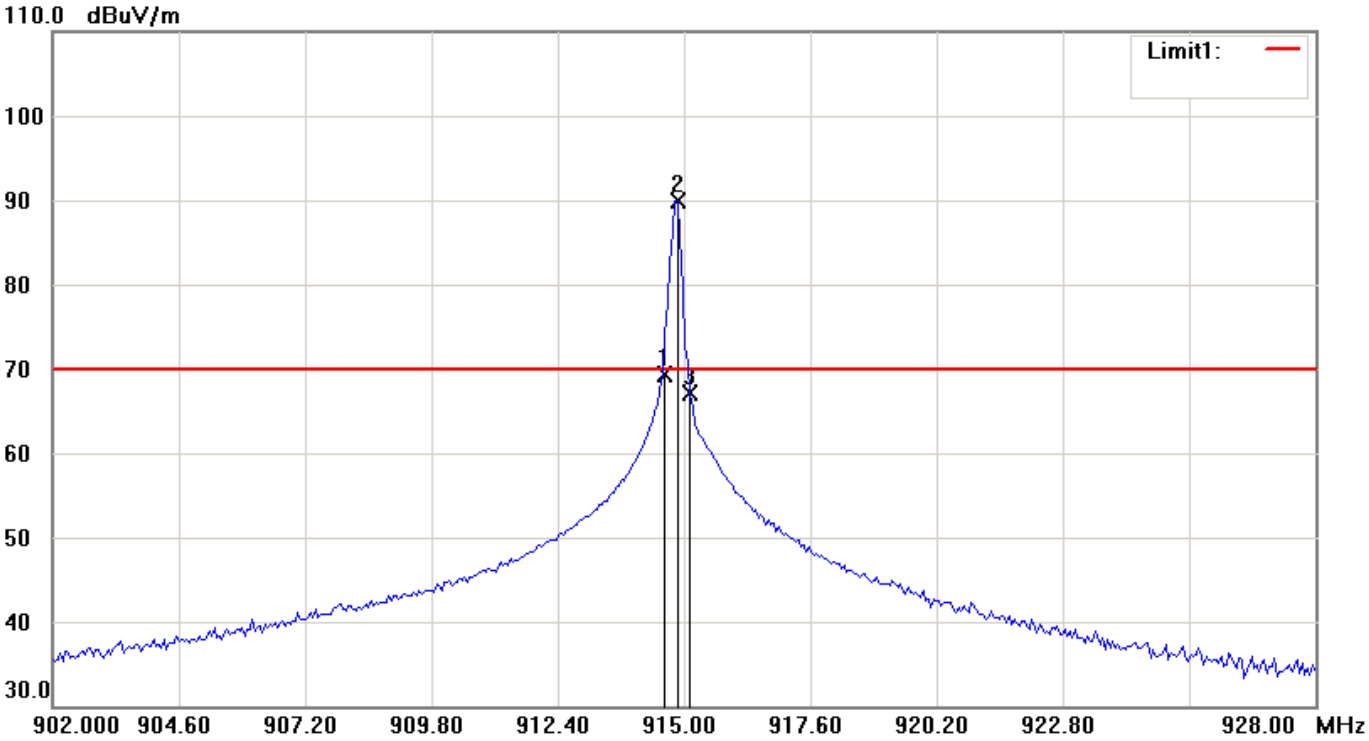
Note :1. Place of Measurement: Measuring site of the ETC.

2. Remark "***" means that the emissions level is too low to be measured.
3. Remark "#" means the noise was low, so record the peak value.
4. Item "Margin" referred to Q.P. limit while there is only peak result.
5. The estimated measurement uncertainty of the result measurement is
   ±4.2dB (9kHz≦f≦30MHz)
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f<1000MHz)
   ±4.1dB (1GHz≦f<18GHz).

4.3.3 20dB Emission Bandwidth

For reporting purposes.

File: **PIR-3SP** **Data:** **#13** **Date:** **2012/11/28** **Temperature:** **23 ℃**
Time: **PM 05:18:16** **Humidity:** **58 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Horizontal**
EUT: **Distance:** **3m**
Model:
Test Mode:
Note: **Z**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector
1	914.5571	40.60	peak
2	914.8176	61.28	peak
3	915.1303	38.38	peak

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	0.5732	-2.21

4.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

RESULT = READING + CORR. FACTOR

where CORR. FACTOR = Antenna FACTOR + Cable FACTOR

4.5 Radiated Test Equipment

The following instrument are used for radiated emissions measurement:

Equipment	Manufacturer	Model No.	Cal.date	Next Cal. Due
EMI Receiver	R&S	ESIB 7	07/26/2012	07/25/2013
Horn Antenna	EMCO	3115	07/18/2012	07/17/2013
BiLog Antenna	ETC	MCTD2986	11/26/2012	11/25/2013
Horn Antenna	EMCO	3116	07/18/2012	07/17/2013
Preamplifier	Hewlett-Packard	8449B	03/27/2012	03/26/2013
Spectrum Analyzer	R&S	FSU46	01/10/2012	01/09/2013
Loop Antenna	EMCO	6512	07/22/2012	07/21/2013
PRE-Amplifier	EMCI	PA303N	05/23/2012	05/22/2013

Note: The standards used to perform this calibration are traceable to NML/ROC, NIST/USA and NPL.

4.6 Measuring Instrument Setup

Measuring instrument setup in measured frequency band when specified detector function is used:

Frequency Band (MHz)	Instrument	Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	RF Test Receiver	Quasi-Peak	120 kHz	300 kHz
	RF Test Receiver	Peak	120 kHz	300 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
	Spectrum Analyzer	Average	1 MHz	10 Hz

5. CONDUCTED EMISSION MEASUREMENT

This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to §15.207 (d), measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

6 ANTENNA REQUIREMENT

6.1 Standard Applicable

According to §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.

6.2 Antenna Construction

Internal type. Please see photos submitted in Exhibit B.