



Test Report

Product Name : 2.4GHz Detachable Solar Camera wireless CCTV
Model No. : VC401
FCC ID. : FU5VC401

Applicant : EVERSPRING INDUSTRY CO., LTD
Address : 7th fl.609 Wan Shou Road Sec. 1, Kweishan, Taoyuan Hsien
333, Taiwan, R.O.C.

Date of Receipt : Aug. 17, 2006
Issued Date : Sep. 11, 2006
Report No. : 068L134-RF-US-P07V01

The Test Results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.
This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Test Report Certification

Issued Date: Sep. 11, 2006

Report No. : 068L134-RF-US-P07V01



Accredited by NIST (NVLAP)

NVLAP Lab Code: 200533-0

Product Name : 2.4GHz Detachable Solar Camera wireless CCTV

Applicant : EVERSPRING INDUSTRY CO., LTD

Address : 7th fl.609 Wan Shou Road Sec. 1, Kweishan, Taoyuan Hsien 333, Taiwan,
R.O.C.

Manufacturer : EVERSPRING INDUSTRY CO., LTD

Model No. : VC401

Rated Voltage : AC 120V/60Hz

Working Voltage : DC 6V

Trade Name : EVERSPRING

Applicable Standard : FCC Part 15 Subpart C Paragraph 15.249: 2005
ANSI C63.4: 2003

Test Result : Complied



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(Leven Huang)

Tested By : Tom Hsieh
(Tom Hsieh)

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(Georte Chen)



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1. GENERAL INFORMATION

1.1. EUT Description

Product Name : 2.4GHz Detachable Solar Camera wireless CCTV
 Trade Name : EVERSPRING
 FCC ID. : FU5VC401
 Model No. : VC401
 Frequency Range : 2413MHz, 2432MHz, 2451MHz, 2470MHz
 Type of Modulation : FM
 Number of Channels : 4
 Channel Separation : 19MHz
 Channel Control : Manual
 Antenna Type : Connector
 Antenna Gain : 2.1dBi

Frequency of Each Channel

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2413MHz	02	2432MHz	03	2451MHz	04	2470MHz

Antenna List

Manufacturer	Model Number	Peak Gain
Bondale Industries Ltd.	G-RA-94051(DG105-001/I)	2.1dBi

Note:

1. The EUT is a 2.4GHz Detachable Solar Camera wireless CCTV with a built-in 2.4GHz transmitter.
2. These tests are conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.249.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.

EMI Test Mode	Mode 1: Transmitter
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1.2. Operation Description

The EUT is 2.4GHz Detachable Solar Camera wireless CCTV. The operation frequencies are 2413MHz, 2432MHz, 2451MHz, and 2470MHz. Four manually selectable channels are built in the EUT. The signals modulated by N/A are transmitted from the dipole antenna. DC 6V shall be provided for EUT operation.

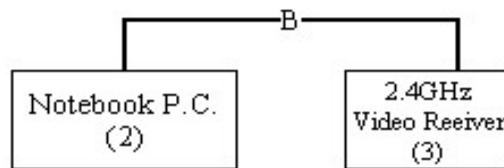
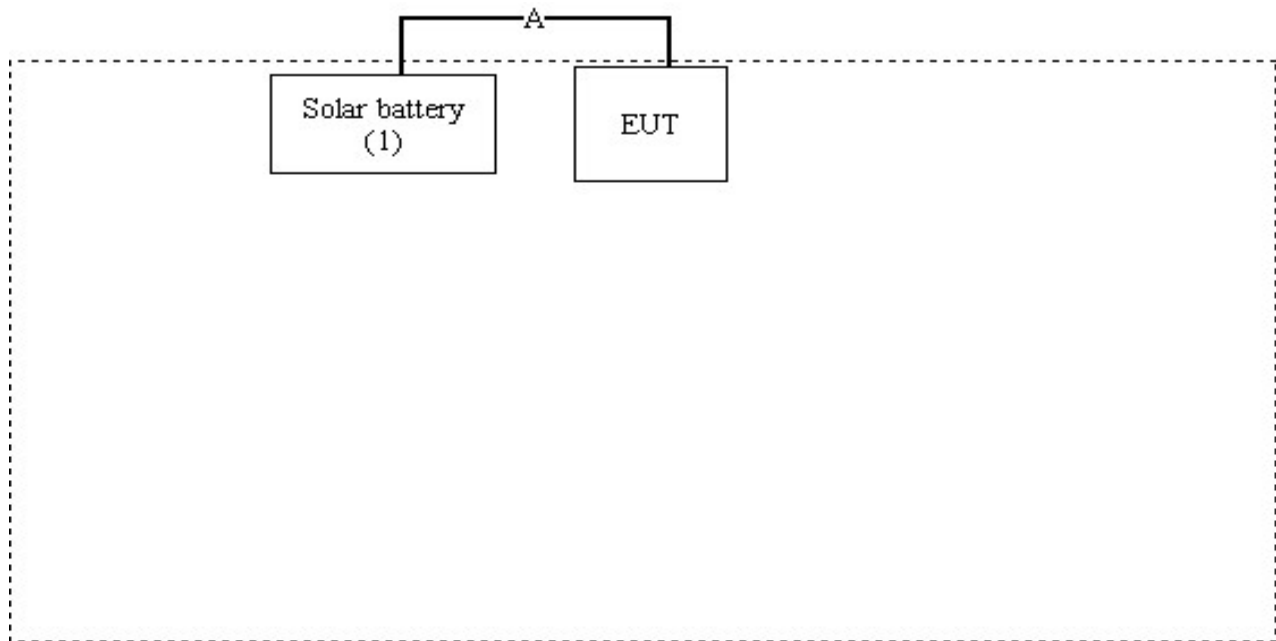
1.3. Tested System Details

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

	Product	Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
(1)	Solar Battery	N/A	N/A	N/A	N/A	N/A
(2)	Notebook PC	DELL	PP18L	42649348672	DOC	Non-Shielded, 1.8m
(3)	2.4GHz Video Receiver	EVERSPRING	VR131	0001	N/A	N/A

	Signal Cable Type	Signal Cable Description
(A)	Solar Cable	Non-Shielded, 1.8m
(B)	USB Cable	Shielded, 1.5m, with one ferrite core bonded.

1.4. Configuration of Test System



1.5. EUT Exercise Software

- (1) Setup the EUT as shown in section 1.4.
- (2) Associate the EUT with the video receiver on the test channel.
- (3) 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	50-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description: File on
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046
Reference 31040/SIT1300F2



Accreditation on NVLAP
NVLAP Lab Code: 200533-0



Site Name: Quietek Corporation
Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,
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2. Conducted Emission

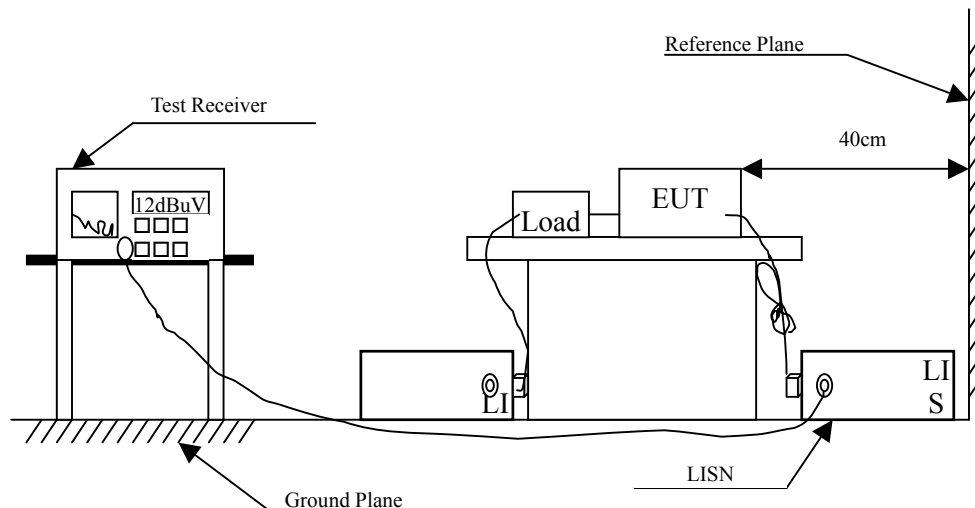
2.1. Test Equipment

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 2006	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2006	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2006	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2006	
5	No.1 Shielded Room			N/A	

Note: All instruments are calibrated every one year.

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	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 C63.4: 2003 on conducted measurement.

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

2.5. Uncertainty

± 2.26 dB

2.6. Test Result of Conducted Emission

The EUT is powered by the battery. This test item is not performed.

3. Radiated Emission

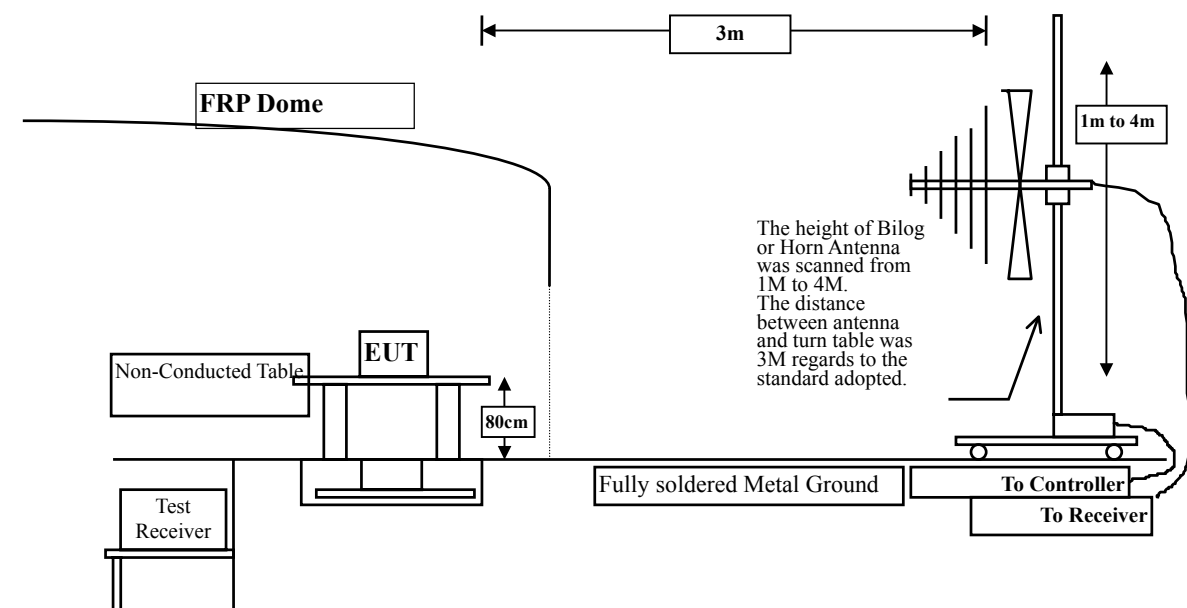
3.1. Test Equipment

The following test equipment are used during the radiated emission test:

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
Site # 1	Test Receiver	R & S	ESCS 30 / 825442/14	May, 2006
	Spectrum Analyzer	Advantest	R3261C / 71720140	May, 2006
	Pre-Amplifier	HP	8447D/3307A01812	May, 2006
	Bilog Antenna	Chase	CBL6112B / 12452	Sep., 2006
	Horn Antenna	EM	EM6917 / 103325	May, 2006
Site # 2	Test Receiver	R & S	ESCS 30 / 825442/17	May, 2006
	Spectrum Analyzer	Advantest	R3261C / 71720609	May, 2006
	Pre-Amplifier	HP	8447D/3307A01814	May, 2006
	Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2005
	Horn Antenna	EM	EM6917 / 103325	May, 2006
Site # 3	X Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2006
	X Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2006
	X Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2006
	X Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2006
	X Horn Antenna	Schwarzbeck	BBHA9170 / 208, 209	July, 2006
	X Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2006
	X Pre-Amplifier	HP	8449B / 3008A01123	July, 2006

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

3.2. Test Setup



3.3. Limits

➤ Fundamental and Harmonics Emission Limits

FCC Part 15 Subpart B Paragraph 15.249 Limits				
Frequency MHz	Field Strength of Fundamental		Field Strength of Harmonics	
	(mV/m @3m)	(dBuV/m @3m)	(uV/m @3m)	(dBuV/m @3m)
902-928	50	94	500	54
2400-2483.5	50	94	500	54
5725-5875	50	94	500	54

Remarks :

1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
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.

➤ General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart B Paragraph 15.209 Limits		
Frequency MHz	uV/m @3m	dBuV/m@3m
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Remarks :

1. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)
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 EUT was positioned such that the distance from antenna to the EUT was 3 meters.

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 C63.4: 2003 on radiated measurement.

Radiated emissions were investigated over the frequency range from 30MHz to 1GHz using a receiver bandwidth of 120kHz. Radiated was performed at an antenna to EUT distance of 3 meters.

The frequency range from 30MHz to 10th harmonics is checked.

3.5. Uncertainty

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

3.6. Test Result of Radiated Emission

Product : 2.4GHz Detachable Solar Camera wireless CCTV
Test Item : Fundamental Radiated Emission
Test Site : No.3OATS
Test Mode : Mode 1: Transmitter

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Average Limit dBuV/m
Horizontal					
Peak Detector:					
Channel 01					
2413.000	-2.178	85.628	83.450	-30.550	114.000
Channel 02					
2432.000	-2.105	85.568	83.463	-30.537	114.000
Channel 04					
2470.000	-1.953	86.560	84.607	-29.393	114.000
Average Detector					
--					
Vertical					
Peak Detector:					
Channel 01					
2413.000	-2.178	91.426	89.248	-24.752	114.000
Channel 02					
2432.000	-2.105	89.213	87.108	-26.892	114.000
Channel 04					
2470.000	-1.953	91.029	89.076	-24.924	114.000
Average Detector					
--					

Note:

1. Emission Level = Reading Level + Correct Factor.
2. Correct Factor = Antenna Factor + Cable Loss – PreAMP.

Product : 2.4GHz Detachable Solar Camera wireless CCTV
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (2413MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Average Limit dBuV/m
Horizontal					
Peak Detector:					
4826.000	3.786	46.542	50.328	-23.672	74.000
7239.000	10.991	44.979	55.970	-18.030	74.000
9652.000	14.885	38.426	53.311	-20.689	74.000
Average Detector					
7239.000	10.991	41.860	52.852	-1.148	54.000
Vertical					
Peak Detector:					
4826.000	3.786	44.169	47.955	-26.045	74.000
7239.000	10.991	41.632	52.623	-21.377	74.000
9652.000	14.885	37.563	52.448	-21.552	74.000
Average Detector					
--	--	--	--	--	--

Note:

1. Readings below 1GHz are quasi-peak and readings above 1GHz are peak and/or average.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz.
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz.
4. Emission Level = Reading Level + Correct Factor.
5. 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.

Product : 2.4GHz Detachable Solar Camera wireless CCTV
Test Item : Harmonic Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (2432MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Average Limit dBuV/m
Horizontal					
Peak Detector:					
4864.000	3.888	46.368	50.256	-23.744	74.000
7296.000	11.434	43.114	54.547	-19.453	74.000
9728.000	14.944	41.252	56.196	-17.804	74.000
12160.000	17.272	37.514	54.785	-19.215	74.000
Average Detector					
7296.000	11.434	39.800	51.234	-2.766	54.000
9728.000	14.944	36.520	51.464	-2.536	54.000
12160.000	17.272	30.774	48.045	-5.955	54.000
Vertical					
Peak Detector:					
4864.000	3.888	43.628	47.516	-26.484	74.000
7296.000	11.434	41.512	52.945	-21.055	74.000
9728.000	14.944	38.410	53.354	-20.646	74.000
12160.000	17.272	37.236	54.507	-19.493	74.000
Average Detector					
12160.000	17.272	30.890	48.161	-5.839	54.000

Note:

1. Readings below 1GHz are quasi-peak and readings above 1GHz are peak and/or average.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz.
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz.
4. Emission Level = Reading Level + Correct Factor.
5. 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.

Product : 2.4GHz Detachable Solar Camera wireless CCTV
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (2470MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Average Limit dBuV/m
Horizontal					
Peak Detector:					
4940.000	4.094	46.672	50.766	-23.234	74.000
7410.000	11.960	44.026	55.985	-18.015	74.000
9880.000	13.468	41.598	55.066	-18.934	74.000
12350.000	17.531	38.454	55.984	-18.016	74.000
14820.000	19.262	39.330	58.592	-15.408	74.000
Average Detector					
7410.000	11.960	36.320	48.279	-5.721	54.000
9880.000	13.468	36.800	50.268	-3.732	54.000
12350.000	17.531	32.461	49.991	-4.009	54.000
14820.000	19.262	33.310	52.572	-1.428	54.000
Vertical					
Peak Detector:					
4940.000	4.094	45.108	49.202	-24.798	74.000
7410.000	11.960	43.827	55.786	-18.214	74.000
9880.000	13.468	39.206	52.674	-21.326	74.000
Average Detector					
7410.000	11.960	40.040	51.999	-2.001	54.000

Note:

1. Readings below 1GHz are quasi-peak and readings above 1GHz are peak and/or average.
2. Receiver setting (Peak Detector) : RBW:1MHz; VBW:1MHz; Span:100MHz.
3. Receiver setting (AVG Detector) : RBW:1MHz; VBW:30Hz; Span:20MHz.
4. Emission Level = Reading Level + Correct Factor.
5. 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.

Product : 2.4GHz Detachable Solar Camera wireless CCTV
Test Item : General Radiated Emission Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmitter (2432MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
34.800	17.481	15.150	32.631	-7.369	40.000
165.900	10.337	14.600	24.936	-18.564	43.500
221.500	10.024	11.500	21.524	-24.476	46.000
330.100	14.124	17.100	31.224	-14.776	46.000
592.600	20.032	11.600	31.632	-14.368	46.000
609.500	20.378	14.410	34.788	-11.212	46.000
Vertical					
129.900	11.834	7.600	19.434	-24.066	43.500
158.500	9.930	7.400	17.330	-26.170	43.500
199.900	9.703	8.600	18.303	-25.197	43.500
236.400	11.818	10.000	21.818	-24.182	46.000
459.200	18.401	16.800	35.202	-10.798	46.000
485.900	18.545	16.100	34.645	-11.355	46.000

Note:

1. Readings below 1GHz are quasi-peak and readings above 1GHz are peak and/or average.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor
4. The radiated emissions below 1GHz of the lowest, middle, highest frequency are pretested. Only the worst case is shown on the report.

4. Band Edge

4.1. Test Equipment

The following test equipments are used during the band edge tests:

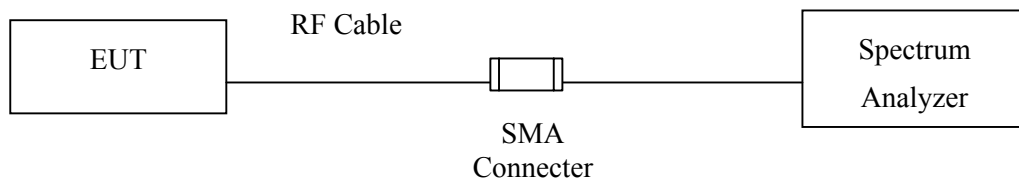
Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2006
X Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2006
X Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2006
X Horn Antenna	Schwarzbeck	BBHA9120D / 305, 306	July, 2006
X Horn Antenna	Schwarzbeck	BBHA9170 / 208, 209	July, 2006
X Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2006
X Pre-Amplifier	HP	8449B / 3008A01123	July, 2006

No.3 OATS

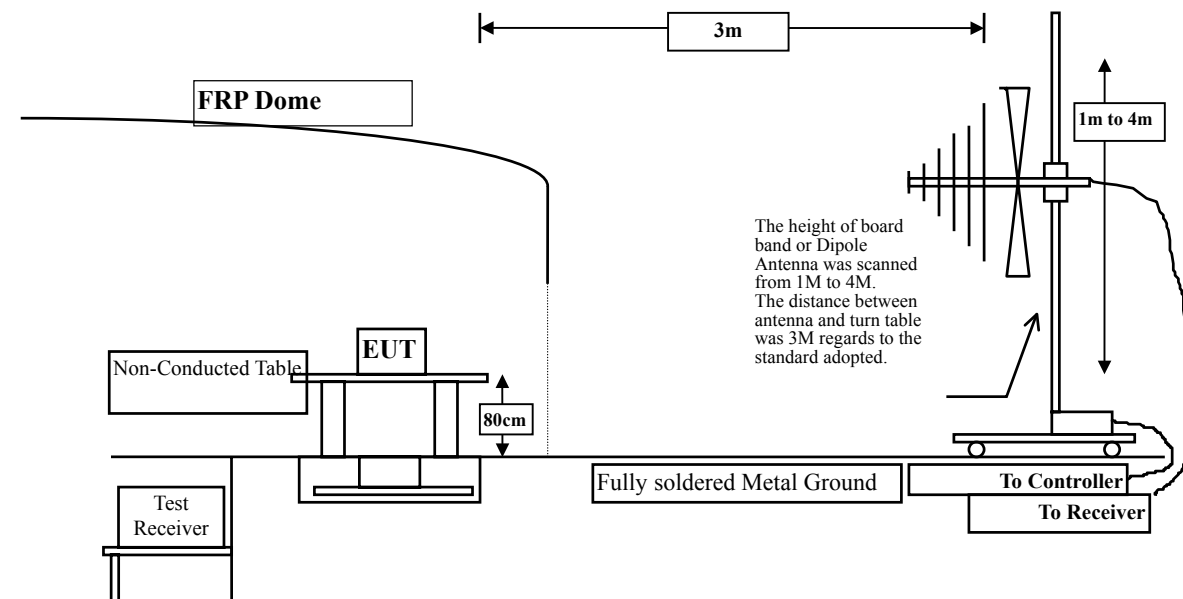
- Note:
1. All instruments are calibrated every one year.
 2. The test instruments marked by "X" are used to measure the final test results.

4.2. Test Setup

RF Conducted Measurement:



RF Radiated Measurement:



4.3. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 50 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

4.4. 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 EUT was positioned such that the distance from antenna to the EUT was 3 meters.

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 C63.4:2003 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter (R&S Test Receiver ESCS 30)is 120 kHz, above 1GHz are 1 MHz.

4.5. Uncertainty

Conducted is ± 1.27 dB

Radiated is ± 3.9 dB.

4.6. Test Result of Band Edge

Product : 2.4GHz Detachable Solar Camera wireless CCTV
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (2413MHz)

RF Conducted Measurement

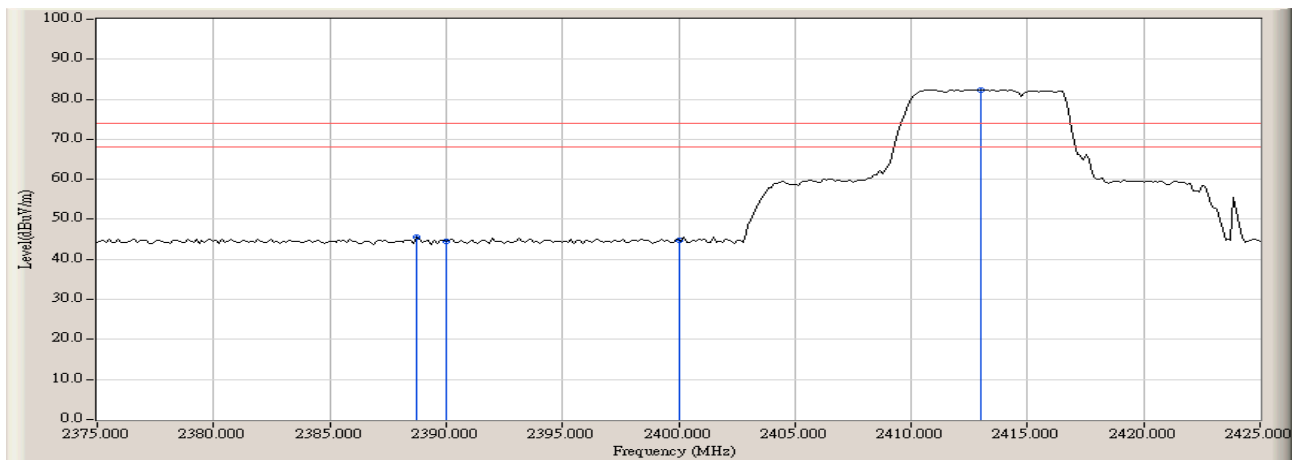
Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
01	<2400	>20	Pass

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2388.750	-2.261	47.732	45.471	74.00	54.00	Pass
01 (Avg)	--	--	--	--	74.00	54.00	Pass

Figure Channel 01:

Horizontal



Note:

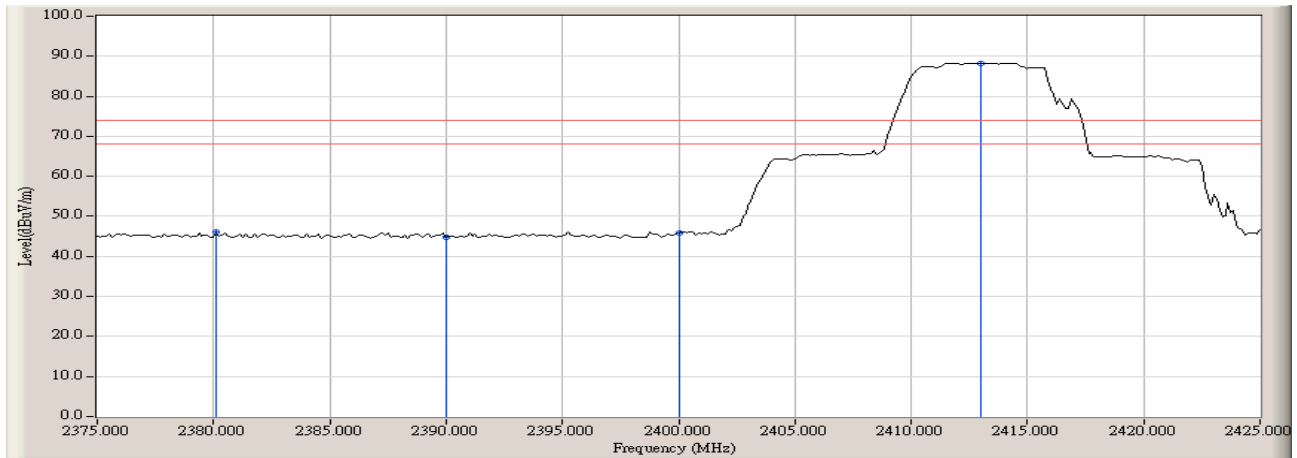
RBW=1MHz, VBW=1MHz, Sweep Time=500ms

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
01 (Peak)	2380.125	-2.290	48.388	46.098	74.00	54.00	Pass
01 (Avg)	--	--	--	--	74.00	54.00	Pass

Figure Channel 01:

Vertical



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms

Product : 2.4GHz Detachable Solar Camera wireless CCTV
 Test Item : Band Edge Data
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmitter (2470MHz)

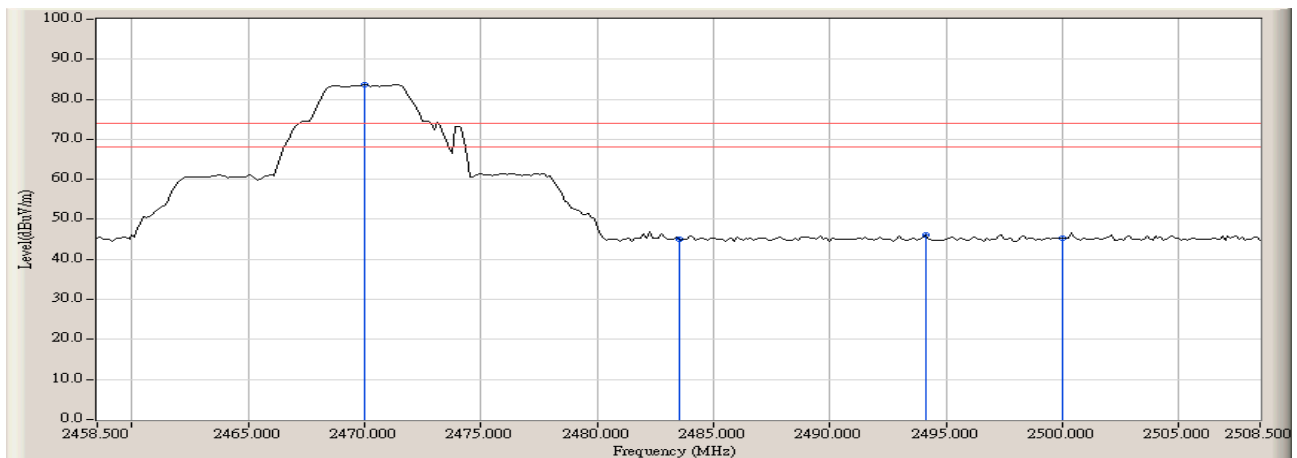
RF Conducted Measurement

Channel No.	Frequency (MHz)	Required Limit (dBc)	Result
04	>2400	>20	Pass

RF Radiated Measurement (Horizontal):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
04 (Peak)	2494.125	-1.859	47.964	46.105	74.00	54.00	Pass
04 (Avg)	--	--	--	--	74.00	54.00	Pass

Figure Channel 01: Horizontal

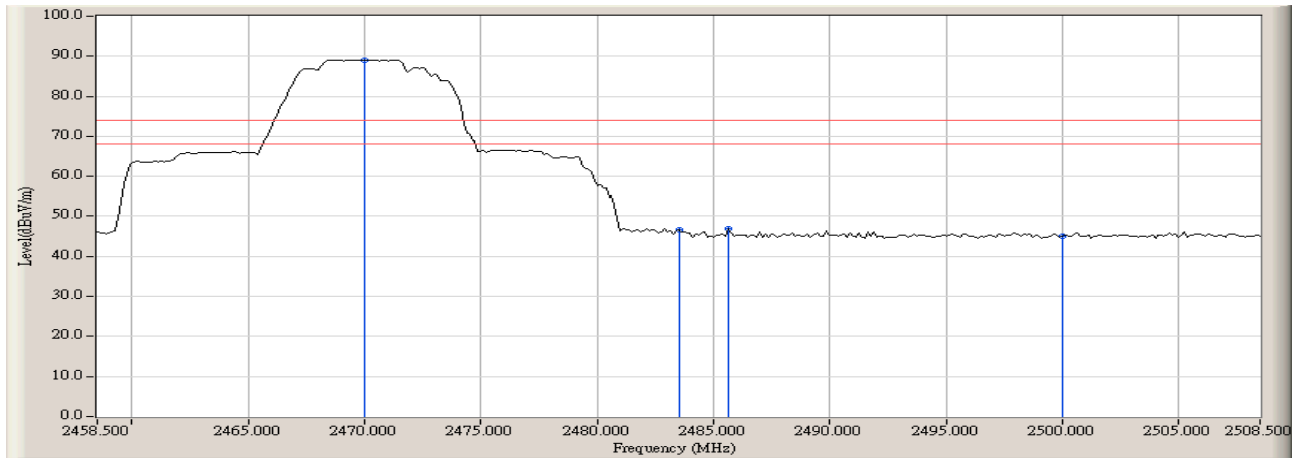


Note:
 RBW=1MHz, VBW=1MHz, Sweep Time=500ms

RF Radiated Measurement (Vertical):

Channel No.	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
04 (Peak)	2485.625	-1.889	48.771	46.883	74.00	54.00	Pass
04 (Avg)	--	--	--	--	74.00	54.00	Pass

Figure Channel 01: Vertical



Note:

RBW=1MHz, VBW=1MHz, Sweep Time=500ms

Note: 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.

5. EMI Reduction Method During Compliance Testing

No modification was made during testing.