



Test Report

Product Name : Wireless outdoor color camera

Model No. : TTA-47T

FCC ID.: O6LTTA-47T

Applicant : TRANWO TECHNOLOGY CORP.

Address : 6F., No.49,Guangming 6th Rd.,JubeiCity, Hsinchu ,Taiwan ,R.O.C.

Date of Receipt : Dec. 16, 2003

Date of Test : Dec. 31, 2003

Report No. : 03CH059FI

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

Test Date : Dec. 31, 2003

Report No. : 03CH059FI



Accredited by NIST (NVLAP)

NVLAP Lab Code: 200347-0

Product Name : Wireless outdoor color camera

Applicant : TRANWO TECHNOLOGY CORP.

Address : 6F., No.49,Guangming 6th Rd.,JubeiCity, Hsinchu ,Taiwan ,R.O.C.

Manufacturer : TRANWO TECHNOLOGY CORP.

Model No. : TTA-47T

FCC ID. : O6LTTA-47T

Rated Voltage : AC 120V/60Hz

Trade Name : TRANWO

Measurement Standard : FCC Part 15 Subpart C Paragraph 15.249

Measurement Procedure : ANSI C63.4:1992

Test Result : Complied



NVLAP Lab Code : 200347-0

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

Documented By : Carol Tsai
(Carol Tsai)

Tested By : Dampier Chang
(Dampier Chang)

Approved By : Kevin Wang
(Kevin Wang)

TABLE OF CONTENTS

Description	Page
1. GENERAL INFORMATION	4
1.1. EUT Description	4
1.2. Operation Description	5
1.3. Tested System Details	6
1.4. Configuration of Tested System	6
1.5. EUT Exercise Software	6
1.6. Test Facility	7
2. Conducted Emission	8
2.1. Test Equipment	8
2.2. Test Setup	8
2.3. Limits	8
2.4. Test Procedure	9
2.5. Test Result of Conducted Emission	10
3. Radiated Emission	16
3.1. Test Equipment	16
3.2. Test Setup	16
3.3. Limits	17
3.4. Test Procedure	18
3.5. Test Result of Radiated Emission	19
4. Band Edge	26
4.1. Test Equipment	26
4.2. Test Setup	27
4.3. Test Condition	28
4.4. Standard Requirement	28
4.5. Test Result of Band Edge	29
5. EMI Reduction Method During Compliance Testing.....	31
Attachment 1: EUT Test Photographs	
Attachment 2: EUT Detailed Photographs	

1. GENERAL INFORMATION

1.1. EUT Description

Product Name : Wireless outdoor color camera
 Trade Name : TRANWO
 FCC ID. : O6LTTA-47T
 Model No. : TTA-47T
 Frequency Range : 2411MHz ~ 2473MHz
 Channel Number : 4
 Antenna Gain : 0dBi
 Type of Modulation : FM
 Antenna type : Soldered on PCB
 Operator Selection of : Manual Switch
 Operating Frequency
 Power Cable : Non-shielded, 2.5m
 Power Adapter : HON-KWANG, HKKD-01497
 Cable Out: Non-shielded, 5m

Frequency of each Channel

Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 1:	2434MHz	Channel 2:	2453MHz	Channel 3:	2473MHz
Channel	Frequency				
Channel 4:	2411MHz				

Note:

1. This device is a 2.4GHz Wireless outdoor color camera included a 2.4GHz transmitting function.
2. Regards to the frequency band operation, the lowest 、 middle and highest frequency of channel were selected to perform the test, then shown on this report.
3. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.249.
4. This device is a composite device in accordance with part 15 regulations. The function for the receiver was measured and made a test report that the report number is 035H042F (TTA-61R), certified under verification.
5. Quietek had verified the construction and function in typical operation, then shown in this test report.

1.2. Operation Description

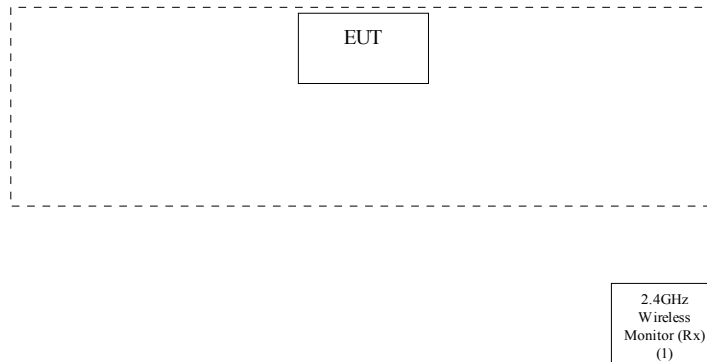
The EUT is Wireless outdoor color camera. The operation frequency is from 2.411GHz to 2.473GHz with FM modulation. Four manually selectable channels were built in the EUT. the signal will be transmitted through 2.4 GHz FM RF signal from the soldered on PCB antenna from EUT to receiver. DC 9V shall be 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:

N/A

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- 1.4.1 Setup the EUT and display as shown on 1.3.
- 1.4.2 Turn on the power of all equipment.
- 1.4.3 The EUT(Tx) will start to operate.
- 1.4.4 The EUT(Tx) will transmit the video signal to Rx.
- 1.4.5 Monitor will display “video figure” on monitor in the same time.

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: November 3, 1998 File on
 Federal Communications Commission
 FCC Engineering Laboratory
 7435 Oakland Mills Road
 Columbia, MD 21046
 Reference 31040/SIT1300F2
 September 30, 2003 Accreditation on NVLAP
 NVLAP Lab Code: 200347-0



Site Name: Quietek Corporation

Site Address: No. 75-1, Wang-Yeh Valley, Yung-Hsing,
 Chiung-Lin, Hsin-Chu County,
 Taiwan, R.O.C.
 TEL : 886-3-592-8858 / FAX : 886-3-592-8859
 E-Mail: service@quietek.com

2. Conducted Emission

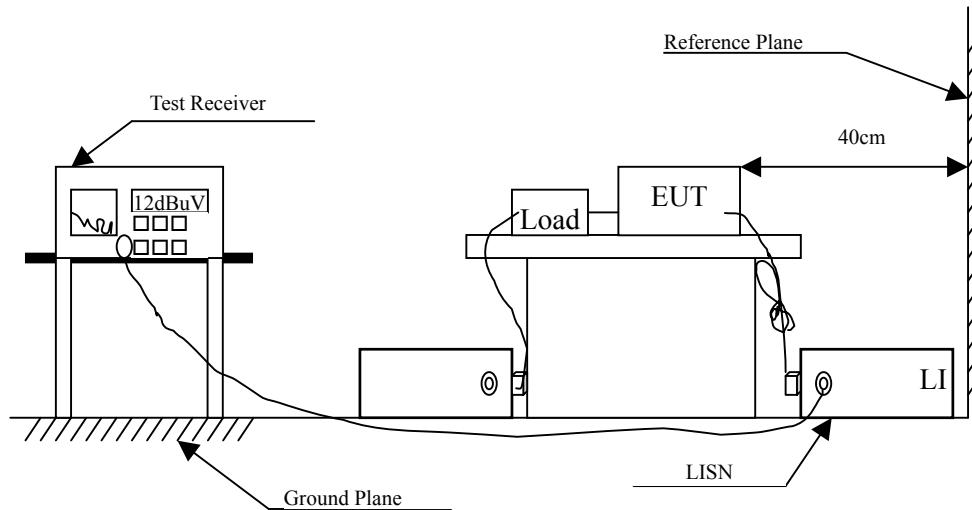
2.1. Test Equipment

The following test equipment are used during the test:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2003	
2	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2003	Peripherals
3	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2003	EUT
4	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2003	
5	No.2 Shielded Room			N/A	

Note: All equipment upon which need to calibrated are with calibration period of 1 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 C63.4:1992 on conducted measurement.

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

2.5. Test Result of Conducted Emission

Product : Wireless outdoor color camera
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Channel 1

Frequency MHz	Cable Loss dB	LISN Factor dB	Reading Level dBuV	Emission Level dBuV	Limits dBuV
Quasi-Peak					
* 0.181	0.05	0.12	23.10	23.27	64.44
0.284	0.02	0.16	13.00	13.18	60.70
0.344	0.02	0.18	7.70	7.90	59.11
7.001	0.31	0.46	8.70	9.47	60.00
10.001	0.05	0.50	19.30	19.85	60.00
18.005	0.22	0.55	6.10	6.88	60.00
Average					
0.181	0.05	0.12	22.90	23.07	54.44
0.284	0.02	0.16	15.50	15.68	50.70
0.344	0.02	0.18	12.00	12.20	49.11
7.001	0.31	0.46	7.50	8.27	50.00
* 10.001	0.05	0.50	20.10	20.65	50.00
18.005	0.22	0.55	3.10	3.88	50.00

Note:

1. All Reading Levels are Quasi-Peak and Average value.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Wireless outdoor color camera
 Test Item : Conducted Emission
 Power Line : Line 2
 Test Mode : Channel 1

Frequency MHz	Cable Loss dB	Probe Factor dB	Reading Level dBuV	Emission Level dBuV	Limits dBuV
Quasi-Peak					
0.156	-0.01	0.10	15.40	15.49	65.67
0.177	0.05	0.12	12.40	12.57	64.63
0.187	0.05	0.12	11.40	11.57	64.17
0.220	-0.03	0.14	7.10	7.21	62.82
0.254	0.01	0.15	11.20	11.36	61.63
* 10.001	0.05	0.50	17.30	17.85	60.00
Average					
0.156	-0.01	0.10	4.80	4.89	55.67
0.177	0.05	0.12	7.50	7.67	54.63
0.187	0.05	0.12	4.90	5.07	54.17
0.220	-0.03	0.14	2.10	2.21	52.82
0.254	0.01	0.15	4.90	5.06	51.63
* 10.001	0.05	0.50	17.60	18.15	50.00

Note:

1. All Reading Levels are Quasi-Peak and Average value.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Wireless outdoor color camera
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Channel 3

Frequency MHz	Cable Loss dB	LISN Factor dB	Reading Level dBuV	Emission Level dBuV	Limits dBuV
Quasi-Peak					
0.159	-0.01	0.11	15.10	15.19	65.52
0.181	0.05	0.12	12.70	12.87	64.44
0.222	-0.03	0.14	9.00	9.11	62.74
0.252	0.01	0.15	6.10	6.26	61.69
* 10.001	0.05	0.50	16.60	17.15	60.00
14.003	0.04	0.53	8.50	9.07	60.00
Average					
0.159	-0.01	0.11	6.60	6.69	55.52
0.181	0.05	0.12	9.00	9.17	54.44
0.222	-0.03	0.14	5.10	5.21	52.74
0.252	0.01	0.15	3.00	3.16	51.69
* 10.001	0.05	0.50	16.60	17.15	50.00
14.003	0.04	0.53	7.10	7.67	50.00

Note:

1. All Reading Levels are Quasi-Peak and Average value.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Wireless outdoor color camera
 Test Item : Conducted Emission
 Power Line : Line 2
 Test Mode : Channel 3

Frequency	Cable	Probe	Reading	Emission	Limits
	Loss	Factor	Level	Level	
MHz	dB	dB	dBuV	dBuV	dBuV
Quasi-Peak					
0.159	-0.01	0.11	15.80	15.89	65.52
0.222	-0.03	0.14	7.60	7.71	62.74
8.000	0.21	0.48	7.10	7.79	60.00
* 10.000	0.05	0.50	17.40	17.95	60.00
13.002	0.01	0.52	9.60	10.13	60.00
17.735	0.23	0.55	7.20	7.98	60.00
Average					
0.159	-0.01	0.11	6.80	6.89	55.52
0.222	-0.03	0.14	3.40	3.51	52.74
8.000	0.21	0.48	4.80	5.49	50.00
* 10.000	0.05	0.50	17.70	18.25	50.00
13.002	0.01	0.52	8.60	9.13	50.00
17.735	0.23	0.55	5.20	5.98	50.00

Note:

1. All Reading Levels are Quasi-Peak and Average value.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Wireless outdoor color camera
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Channel 4

Frequency MHz	Cable Loss dB	LISN Factor dB	Reading Level dBuV	Emission Level dBuV	Limits dBuV
Quasi-Peak					
0.159	-0.01	0.11	14.90	14.99	65.52
0.180	0.05	0.12	13.10	13.27	64.49
0.219	-0.03	0.14	7.60	7.71	62.86
0.252	0.01	0.15	4.80	4.96	61.69
* 10.001	0.05	0.50	15.60	16.15	60.00
13.002	0.01	0.52	9.00	9.53	60.00
Average					
0.159	-0.01	0.11	6.40	6.49	55.52
0.180	0.05	0.12	9.50	9.67	54.49
0.219	-0.03	0.14	3.60	3.71	52.86
0.252	0.01	0.15	1.50	1.66	51.69
* 10.001	0.05	0.50	15.60	16.15	50.00
13.002	0.01	0.52	7.80	8.33	50.00

Note:

1. All Reading Levels are Quasi-Peak and Average value.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

Product : Wireless outdoor color camera
 Test Item : Conducted Emission
 Power Line : Line 2
 Test Mode : Channel 4

Frequency MHz	Cable Loss dB	Probe Factor dB	Reading Level dBuV	Emission Level dBuV	Limits dBuV
Quasi-Peak					
0.158	-0.01	0.10	15.10	15.19	65.57
0.188	0.05	0.12	12.10	12.27	64.12
0.221	-0.03	0.14	8.40	8.51	62.78
* 10.001	0.05	0.50	17.20	17.75	60.00
13.002	0.01	0.52	9.20	9.73	60.00
17.734	0.23	0.55	7.20	7.98	60.00
Average					
0.158	-0.01	0.10	6.90	6.99	55.57
0.188	0.05	0.12	7.50	7.67	54.12
0.221	-0.03	0.14	4.30	4.41	52.78
* 10.001	0.05	0.50	17.40	17.95	50.00
13.002	0.01	0.52	8.30	8.83	50.00
17.734	0.23	0.55	5.30	6.08	50.00

Note:

1. All Reading Levels are Quasi-Peak and Average value.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + LISN Factor + Cable Loss.

3. Radiated Emission

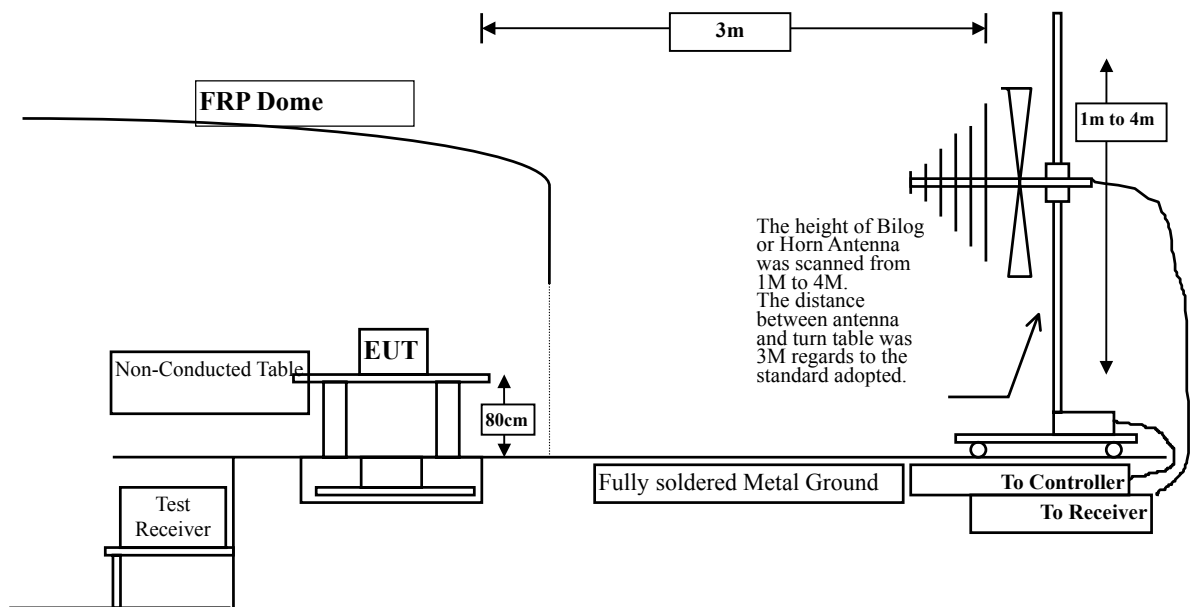
3.1. Test Equipment

The following test equipment are used during the test:

Item		Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	X	Test Receiver	R & S	ESCS 30 / 825442/017	Jan., 2003
2	X	Spectrum Analyzer	Advantest	R3261C / 81720266	N/A
3	X	Pre-Amplifier	HP	8447D / 2944A09276	N/A
4	X	Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2003
5	X	Spectrum Analyzer	R & S	FSP40 / 100005	Aug., 2003
6	X	Pre-Amplifier	HP	8449B / 3008A01123	Feb., 2003
7	X	Horn Antenna	Schwarzbeck	BBHA 9120D / BBHA9120D312	Jul., 2003
8		No.1 OATS			Sep., 2003

- Note: 1. All equipments that need to calibrate are with calibration period of 1 year.
 2. Mark "X" test instruments 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(a) 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 (Average)	114 (Peak)	500	54 (Average)	74 (Peak)
2400-2483.5	50	94 (Average)	114 (Peak)	500	54 (Average)	74 (Peak)
5725-5875	50	94 (Average)	114 (Peak)	500	54 (Average)	74 (Peak)

➤ 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(a) 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 C63.4:1992 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. Test Result of Radiated Emission

Product : Wireless outdoor color camera
 Test Item : Fundamental Radiated Emission Data
 Test Site : No.1 OATS
 Test Mode : Normal Operation

Freq.	Cable Loss	Probe Factor	PreAMP	Reading Level	Emission Level	Margin	Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m

Peak Detector (Horizontal)

Channel 1							
2434.000	2.87	27.60	0.00	47.30	77.77	36.23	114.00
Channel 3							
2473.200	2.90	27.59	0.00	48.84	79.33	34.67	114.00
Channel 4							
2411.000	2.86	27.61	0.00	46.58	77.05	36.95	114.00

Peak Detector (Vertical)

Channel 1							
2433.000	2.87	27.61	0.00	42.19	72.67	41.33	114.00
Channel 3							
2473.200	2.90	27.59	0.00	43.45	73.94	40.06	114.00
Channel 4							
2411.200	2.86	27.61	0.00	41.11	71.58	42.42	114.00

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. Emission Level = Reading Level + Probe Factor + Cable Loss – PreAMP.
3. 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 : Wireless outdoor color camera
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.1 OATS
 Test Mode : Channel 1

Freq.	Cable	Probe	PreAMP	Reading	Emission	Margin	Limit
MHz	Loss	Factor		Level	Level		
	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

4868.000	4.27	31.37	31.95	45.05	48.74	25.26	74.00
7302.600	5.67	36.56	32.60	41.64	51.27	22.73	74.00
9736.200	7.06	38.10	31.70	43.33	56.80	17.20	74.00
12170.60	8.46	38.52	31.23	37.78	53.53	20.47	74.00

Average Detector:

9736.200	7.06	38.10	31.70	36.12	49.59	4.41	54.00
----------	------	-------	-------	-------	-------	------	-------

Vertical

Peak Detector:

4868.000	4.27	31.37	31.95	42.42	46.11	27.89	74.00
7302.400	5.67	36.56	32.60	42.54	52.17	21.83	74.00
9737.400	7.06	38.10	31.70	41.83	55.30	18.70	74.00
12169.40	8.46	38.52	31.23	36.47	52.22	21.78	74.00

Average Detector:

9737.000	7.06	38.10	31.70	31.85	45.32	8.68	54.00
----------	------	-------	-------	-------	-------	------	-------

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
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 + Probe Factor + Cable Loss – PreAMP.
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 : Wireless outdoor color camera
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.1 OATS
 Test Mode : Channel 3

Freq.	Cable Loss	Probe Factor	PreAMP	Reading Level	Emission Level	Margin	Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

4946.200	4.31	31.47	31.96	46.16	49.99	24.01	74.00
7418.200	5.74	36.56	32.48	43.90	53.72	20.28	74.00
9893.200	7.15	38.16	31.37	44.46	58.40	15.60	74.00
12365.60	8.57	38.39	31.04	34.87	50.79	23.21	74.00

Average Detector:

9892.500	7.15	38.16	31.37	37.06	51.00	3.00	54.00
----------	------	-------	-------	-------	-------	------	-------

Vertical

Peak Detector:

4946.200	4.31	31.47	31.96	41.95	45.78	28.22	74.00
7420.200	5.74	36.56	32.48	42.83	52.65	21.35	74.00
9892.000	7.15	38.16	31.37	43.13	57.07	16.93	74.00
12363.20	8.56	38.39	31.06	34.87	50.76	23.24	74.00

Average Detector:

9892.300	7.15	38.16	31.37	34.10	48.04	5.96	54.00
----------	------	-------	-------	-------	-------	------	-------

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
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 + Probe Factor + Cable Loss – PreAMP.
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 : Wireless outdoor color camera
 Test Item : Harmonic Radiated Emission Data
 Test Site : No.1 OATS
 Test Mode : Channel 4

Freq.	Cable Loss	Probe Factor	PreAMP	Reading Level	Emission Level	Margin	Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m

Horizontal

Peak Detector:

4822.200	4.24	31.31	31.95	42.26	45.86	28.14	74.00
7233.200	5.63	36.54	32.67	42.10	51.59	22.41	74.00
9645.200	7.00	37.98	31.91	40.15	53.22	20.78	74.00
12054.40	8.39	38.60	31.33	35.87	51.52	22.48	74.00

Vertical

Peak Detector:

4822.200	4.24	31.31	31.95	43.56	47.16	26.84	74.00
7233.400	5.63	36.54	32.67	40.57	50.06	23.94	74.00
9644.600	7.00	37.98	31.91	39.80	52.87	21.13	74.00
12052.60	8.39	38.60	31.33	38.01	53.66	20.34	74.00

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
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 + Probe Factor + Cable Loss – PreAMP.
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 : Wireless outdoor color camera
 Test Item : General Radiated Emission Data
 Test Site : No.1 OATS
 Test Mode : Channel 1

Freq.	Cable Loss	Probe Factor	PreAMP	Reading Level	Emission Level	Margin	Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal:							
50.370	1.10	3.71	22.60	40.20	22.41	17.59	40.00
114.390	1.36	7.14	22.60	30.00	15.91	27.59	43.50
390.840	2.50	16.41	22.60	25.20	21.51	24.49	46.00
595.510	3.34	21.12	22.60	25.60	27.46	18.54	46.00
821.520	4.27	24.46	22.60	25.60	31.73	14.27	46.00
* 927.250	4.70	25.17	22.60	25.80	33.07	12.93	46.00

Vertical:							
50.370	1.10	3.71	22.60	40.20	22.41	17.59	40.00
114.390	1.36	7.14	22.60	30.00	15.91	27.59	43.50
391.810	2.50	16.36	22.60	25.20	21.47	24.53	46.00
595.510	3.34	21.12	22.60	25.60	27.46	18.54	46.00
820.550	4.26	24.39	22.60	25.60	31.65	14.35	46.00
* 927.250	4.70	25.17	22.60	25.80	33.07	12.93	46.00

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss-PreAMP.

Product : Wireless outdoor color camera
 Test Item : General Radiated Emission Data
 Test Site : No.1 OATS
 Test Mode : Channel 3

Freq.	Cable Loss	Probe Factor	PreAMP	Reading Level	Emission Level	Margin	Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal:							
30.000	1.02	13.10	22.60	32.60	24.12	15.38	39.50
114.390	1.36	7.14	22.60	29.40	15.31	28.19	43.50
385.020	2.48	16.12	22.60	25.40	21.40	24.60	46.00
549.920	3.15	21.99	22.60	25.60	28.14	17.86	46.00
773.990	4.07	20.94	22.60	26.00	28.42	17.58	46.00
* 937.920	4.74	25.18	22.60	25.20	32.53	13.47	46.00

Vertical:

* 36.790	1.04	11.23	22.60	37.20	26.87	13.13	40.00
164.830	1.57	21.10	22.60	25.00	25.07	18.43	43.50
299.660	2.12	17.53	22.60	25.80	22.85	23.15	46.00
555.740	3.18	20.64	22.60	24.80	26.01	19.99	46.00
825.400	4.28	24.56	22.60	25.40	31.65	14.35	46.00
880.690	4.51	23.56	22.60	26.40	31.87	14.13	46.00

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss-PreAMP.

Product : Wireless outdoor color camera
 Test Item : General Radiated Emission Data
 Test Site : No.1 OATS
 Test Mode : Channel 4

Freq.	Cable	Probe	PreAMP	Reading	Emission	Margin	Limit
MHz	Loss	Factor		Level	Level		
	dB	dB/m	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal:							
30.000	1.02	13.10	22.60	29.60	21.12	18.38	39.50
115.360	1.37	7.13	22.60	28.80	14.70	28.80	43.50
393.750	2.51	16.27	22.60	25.60	21.79	24.21	46.00
532.460	3.08	21.63	22.60	25.40	27.51	18.49	46.00
* 825.400	4.28	24.57	22.60	25.60	31.85	14.15	46.00
963.140	4.85	24.73	22.60	25.80	32.78	21.22	54.00

Vertical:

* 50.370	1.10	11.50	22.60	37.60	27.60	12.40	40.00
164.830	1.57	21.10	22.60	25.20	25.27	18.23	43.50
304.510	2.14	17.26	22.60	25.80	22.61	23.39	46.00
557.680	3.18	20.68	22.60	24.60	25.86	20.14	46.00
845.770	4.37	24.70	22.60	26.20	32.67	13.33	46.00
980.600	4.92	21.15	22.60	26.20	29.67	24.33	54.00

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. “ * ”, means this data is the worst emission level.
3. Emission Level = Reading Level + Probe Factor + Cable Loss-PreAMP.

4. Band Edge

4.1. Test Equipment

The following test equipment are used during the test:

RF Conducted Measurement:

Item	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
1	Spectrum Analyzer	R & S	FSP / 100561	Mar., 2003	
2	No.1 OATS			Sep., 2003	

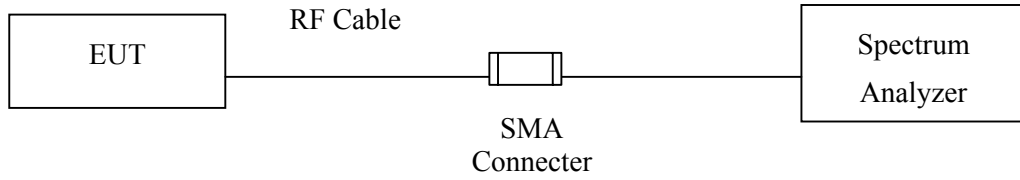
RF Radiated Measurement:

Item		Equipment	Manufacturer	Model No. / Serial No.	Last Cal.
1	X	Spectrum Analyzer	R & S	FSP40 / 100005	Aug., 2003
2	X	Pre-Amplifier	HP	8449B / 3008A01123	Feb., 2003
3		Pre-Amplifier	HP	8447D / 2944A09276	N/A
4		Loop Antenna	R & S	HFH2-Z2 / 833799/004	Sep., 2003
5		BiconiLog Antenna	Schwarzbeck	VULB 9166 / 1061	Sep., 2003
6		Bilog Antenna	Chase	CBL6112B / 2455	Sep., 2003
7	X	Horn Antenna	Schwarzbeck	BBHA 9120D / BBHA9120D312	Jul., 2003
8		No.1 OATS			Sep., 2003

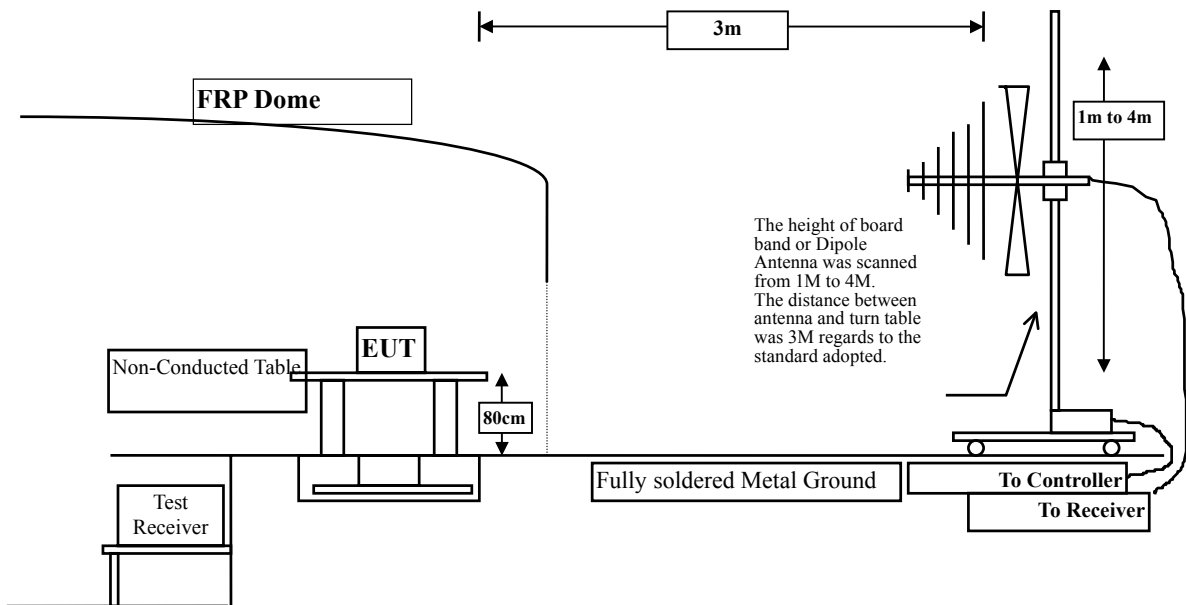
- Note:
1. All equipments that need to calibrate are with calibration period of 1 year.
 2. Mark "X" test instruments are used to measure the final test results.

4.2. Test Setup

RF Conducted Measurement:



RF Radiated Measurement:



4.3. Test Condition

Standard Temperature and Humidity, Standard Test Voltage

4.4. Standard Requirement

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)).

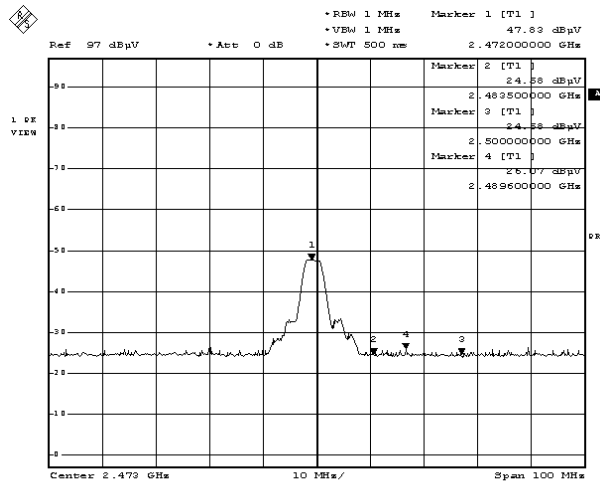
4.5. Test Result of Band Edge

Product : Wireless outdoor color camera
 Test Item : Band Edge Data
 Test Site : No.1 OATS
 Test Mode : Channel 3

RF Radiated Measurement: (Peak Detector)

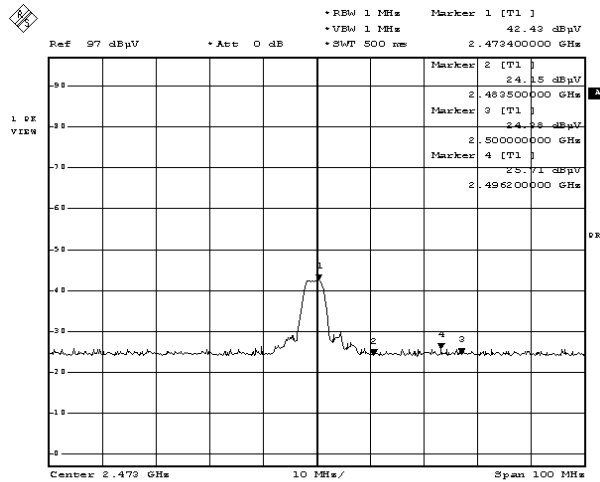
Channel No.	Frequency (MHz)	Reading Level (dBuV)	Probe Factor (dB/m)	Cable Loss (dB)	PreAMP (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Result
3(Horizontal)	2489.600	26.07	27.58	2.91	31.81	24.75	74	Pass
3 (Vertical)	2496.200	25.71	27.58	2.91	31.81	24.39	74	Pass

Horizontal



Date: 30. DEC. 2008 05:13:36

Vertical



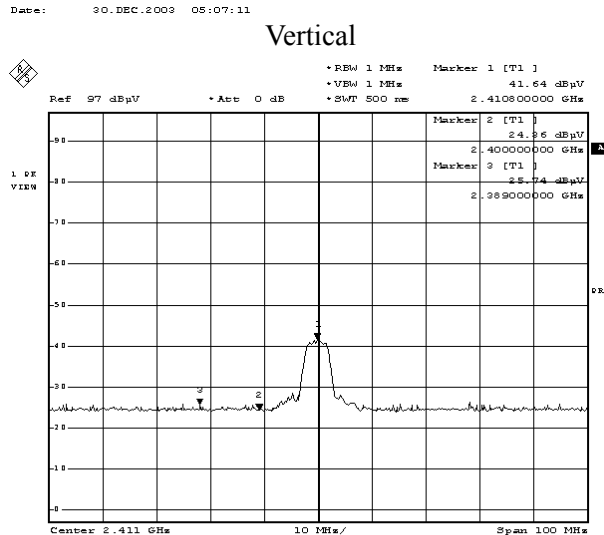
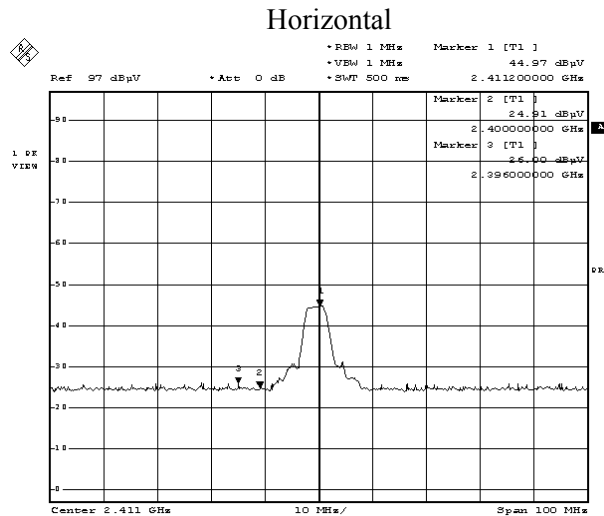
Date: 30. DEC. 2008 05:19:25

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.

Product : Wireless outdoor color camera
 Test Item : Band Edge Data
 Test Site : No.1 OATS
 Test Mode : Channel 4

RF Radiated Measurement: (Peak Detector)

Channel No.	Frequency (MHz)	Reading Level (dBuV)	Probe Factor (dB/m)	Cable Loss (dB)	PreAMP (dB)	Emission Level (dBuV/m)	Limit (dBuV/m)	Result
4(Horizontal)	2396.000	26.00	27.62	2.85	31.86	24.61	74	Pass
4 (Vertical)	2389.000	25.74	27.62	2.85	31.86	24.35	74	Pass



Date: 30.DEC.2008 05:01:29

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.

Attachment 1 : EUT Test Photographs

Attachment 2 : EUT Detailed Photographs