



Test Report

Product Name : Wireless Alarm system
Model No. : H202M
FCC ID : FU5H202M

Applicant : EVERSFRING INDUSTRY CO., LTD
Address : 6th fl. 609 Wan Shou Road Sec. 1, Kweishan,
Taoyuan Hsien 333, Taiwan, R.O.C.

Date of Receipt : Feb. 19, 2004
Date of Test : Mar. 09, 2004
Report No. : 043L062FI

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 : Mar. 09, 2004

Report No. : 043L062FI



Accredited by NIST (NVLAP)

NVLAP Lab Code: 200533-0

Product Name : Wireless Alarm system

Applicant : EVERSPRING INDUSTRY CO., LTD

Address : 6th fl. 609 Wan Shou Road Sec. 1, Kweishan, Taoyuan Hsien 333,
Taiwan, R.O.C.

Manufacturer : EVERSPRING INDUSTRY CO., LTD

Model No. : H202M

FCC ID. : FU5H202M

Rated Voltage : DC 6V

Trade Name : EVERSPRING

Measurement Standard : FCC Part 15 Subpart C Paragraph 15.231

Measurement Procedure : ANSI C63.4: 2001

Test Result : Complied

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

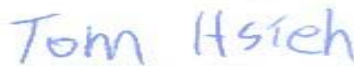
:



(Grace Lin)

Tested By

:



(Tom Hsieh)

Approved By

:



(Gene Chang)

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.....	11
3.1. Test Equipment	11
3.2. Test Setup	11
3.3. Limits	12
3.4. Test Procedure	13
3.5. Test Result of Radiated Emission	14
4. Occupied Bandwidth.....	19
4.1. Test Equipment	19
4.2. Test Setup	19
4.3. Limits	19
4.4. Test Result of Occupied Bandwidth.....	20
5. Duty Cycle.....	21
5.1. Test Equipment	21
5.2. Test Setup	21
5.3. Test Result of Duty Cycle	22
6. EMI Reduction Method During Compliance Testing	23
Attachment 1: EUT Test Photographs	
Attachment 2: EUT Detailed Photographs	

1. GENERAL INFORMATION

1.1. EUT Description

Product Name : Wireless Alarm system
Trade Name : EVERSPRING
FCC ID. : FU5H202M
Model No. : H202M
Type of Modulation : DTMF
Antenna type : Printed
Operating Frequency : 433.92±200K MHz
Power Adapter : MFR: EVERSPRING, M/N: MW48-1350800,
Cable Out: Non-Shielded, 1.8m

Note:

1. This device is a Wireless Alarm system, a 433.92±200K MHz transmitting function.
2. These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15 Subpart C Paragraph 15.231.
3. 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 042L134F, certified under Declaration of Conformity.
4. Quietek had verified the construction and function in typical operation, Then shown in this test report.

1.2. Operation Description

The EUT is a 433.92±200K MHz transmitter. The radio remote control signal can be transferred to 433.92±200K MHz radio frequency in DTMF modulation. The transmission antenna is printed on the EUT.

The radio remote control signal can be control the alarm system.

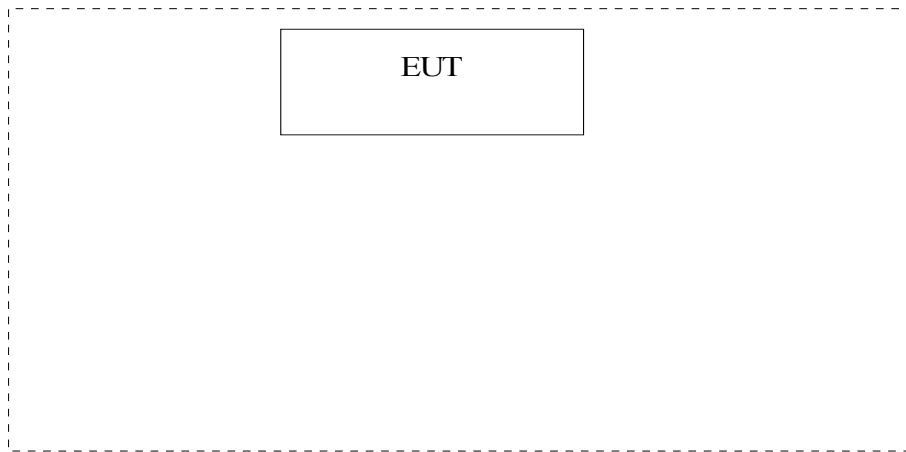
1.3. Tested System Details

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.	Power Cord
(1)	N/A	N/A	N/A	N/A	N/A

	Signal Cable Type	Signal cable Description
A.	N/A	N/A

1.4. Configuration of Tested System



1.5. EUT Exercise Software

- 1.5.1 Setup the EUT and simulators as shown on 1.4.
- 1.5.2 Turn on the power of all equipment.
- 1.5.3 The EUT will transmission the signal form transmitter.
- 1.5.4 Repeat the above procedure 1.5.2 to 1.5.3

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: June 22, 2001 File on
 Federal Communications Commission
 FCC Engineering Laboratory
 7435 Oakland Mills Road
 Columbia, MD 21046
 Reference 31040/SIT1300F2



June 30, 2002 Accreditation on NVLAP
 NVLAP Lab Code: 200533-0



Site Name: Quietek Corporation

Site Address: No. 5-22, Ruei-Shu Valley, Ruei-Ping Tsuen,
 Lin Kou Shiang, Taipei 244 Taiwan, R.O.C.
 TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
 E-Mail : service@quietek.com



2. Conducted Emission

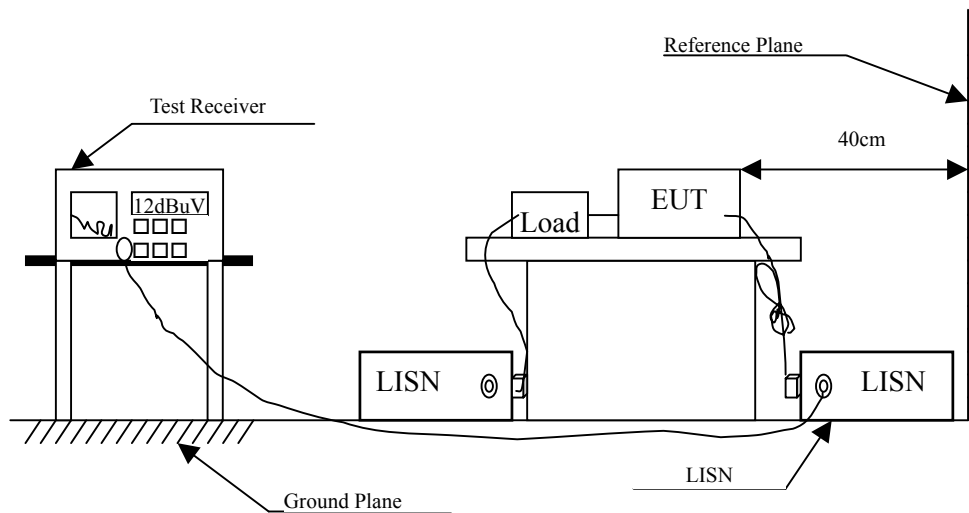
2.1. Test Equipment

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 30/838251/0001	May, 2003	
2	L.I.S.N.	R & S	ESH3-Z5/836679/0023	May, 2003	EUT
3	L.I.S.N.	R & S	ENV 4200/833209/0023	May, 2003	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2003	
5	No.4 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: 2001 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 Alarm system
Test Item : Conducted Emission

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

3. Radiated Emission

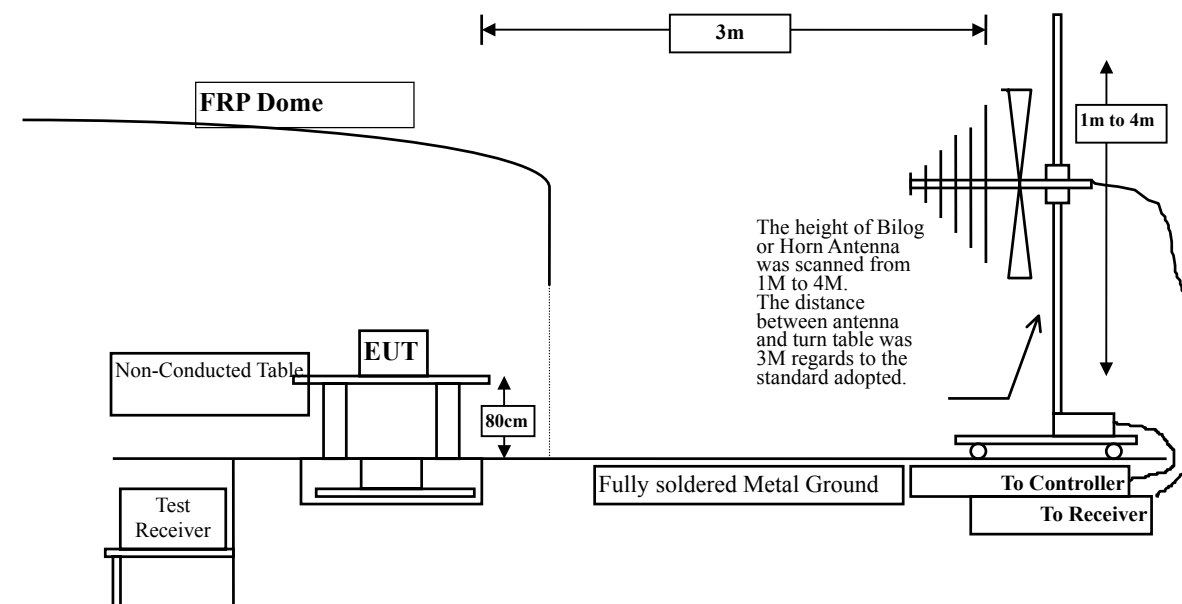
3.1. Test Equipment

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

Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
<input type="checkbox"/> Site # 1	Test Receiver	R & S	ESVS 10 / 834468/003	July, 2003
	Spectrum Analyzer	Advantest	R3162/ 00803480	May, 2003
	Pre-Amplifier	Advantest	BB525C/ 3307A01812	May, 2003
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	Nov., 2003
<input type="checkbox"/> Site # 2	Test Receiver	R & S	ESCS 30 / 836858 / 022	Nov., 2003
	Spectrum Analyzer	Advantest	R3162 / 100803466	May, 2003
	Pre-Amplifier	Advantest	BB525C/3307A01814	May, 2003
	Bilog Antenna	SCHAFFNER	CBL6112B / 2705	Oct., 2003
	Horn Antenna	ETS	3115 / 0005-6160	July, 2003
	Pre-Amplifier	QTK	QTK-AMP-01/ 0001	July, 2003
<input checked="" type="checkbox"/> Site # 3	Test Receiver	R & S	ESI 26 / 838786 / 004	May, 2003
	Spectrum Analyzer	Advantest	R3162 / 100803480	May, 2003
	Pre-Amplifier	QTK	QTK-AMP-03 / 0003	May, 2003
	Bilog Antenna	SCHAFFNER	CBL6112B / 2697	May, 2003
	Horn Antenna	ETS	3115 / 0005-6160	July, 2003
	Pre-Amplifier	QTK	QTK-AMP-01 / 0001	July, 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

➤ FCC Part 15 Subpart C Paragraph 15.231 Limit

FCC Part 15 Subpart C Paragraph 15.231 Limits				
Fundamental Frequency MHz	Field strength of fundamental		Field Strength of spurious emissions	
	uV/m	dBuV/m	uV/m	dBuV/m
40.66-40.70	2250	67.0	225	47.0
70-130	1250	61.9	125	41.9
130-174	1250-3750 ¹	61.9 – 71.5	125-375 ¹	41.9 – 51.5
174-260	3750	71.5	375	51.5
260-470	3750-12500 ¹	71.5 – 81.9	375-1250 ¹	51.5 – 61.9
above 470	12500	82.0	1250	62.0

- 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.

➤ Frequencies in restricted band are complied to limits on Paragraph 15.209.

FCC Part 15 Subpart C 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: 2001 on radiated measurement.

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

3.5. Test Result of Radiated Emission

Product : Wireless Alarm system
 Test Item : Fundamental Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Normal Operation

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

Horizontal

Peak Detector:

433.840	2.95	15.75	0.00	31.57	50.28	449.72	500.00
---------	------	-------	------	-------	-------	--------	--------

Peak=50.28dBuV/m; Duty Cycle=20Log(0.59)=-4.5829dB

Average=Peak+Duty Cycle= 45.6971dBuV/m

Average Limit=20log[41.6667*(433.84 MHz)-7083.333]=80.822599dBuV/m

Peak Limit=80.822599+20dB=100.822599dBuV/m

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.

Product : Wireless Alarm system
 Test Item : Fundamental Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Normal Operation

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

Vertical

Peak Detector:

433.840 2.95 17.29 0.00 15.60 35.85 464.15 500.00

Peak=35.85dBuV/m; Duty Cycle=20Log(0.59)=-4.5829dB

Average=Peak+Duty Cycle= 31.2671dBuV/m

Average Limit=20log[41.6667*(433.84 MHz)-7083.3333]=80.822599dBuV/m

Peak Limit=80.822599+20dB=100.822599dBuV/m

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.

Product : Wireless Alarm system
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Normal Operation

Freq. MHz	Cable Loss dB	Probe Factor dB/m	PreAMP Reading dB	Reading Level dBuV	Emission dBuV/m	Margin dB	Limit dBuV/m
Horizontal							
Peak Detector:							
1301.800	2.23	24.76	35.54	53.79	45.23	28.77	74.00
1735.900	2.48	24.97	35.10	49.36	41.71	32.29	74.00
2169.600	2.72	26.48	34.93	46.00	40.27	33.73	74.00
2601.800	2.98	27.72	34.96	44.95	40.68	33.32	74.00
3034.800	3.22	28.22	34.95	44.71	41.20	32.80	74.00
Average Detector:							
--							
Vertical							
Peak Detector:							
1301.900	2.23	24.76	35.54	48.57	40.01	33.99	74.00
1735.800	2.48	24.97	35.10	52.58	44.93	29.07	74.00
2169.800	2.72	26.48	34.93	43.35	37.62	36.38	74.00
2603.600	2.98	27.72	34.96	48.61	44.34	29.66	74.00
3036.100	3.22	28.22	34.95	47.38	43.87	30.13	74.00
Average Detector:							
--							

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 Alarm system
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Normal Operation

Freq. MHz	Cable Loss dB	Probe Factor dB/m	PreAMP Reading Level dB	Reading Level dBuV	Emission dBuV/m	Margin dB	Limit dBuV/m
Horizontal							
199.750	1.74	8.40	0.00	13.16	23.30	20.20	43.50
367.080	2.60	13.98	0.00	7.10	23.69	22.31	46.00
384.060	2.69	14.01	0.00	6.87	23.57	22.43	46.00
* 388.000	2.71	14.19	0.00	13.40	30.30	15.70	46.00
510.150	3.34	16.84	0.00	2.99	23.17	22.83	46.00
609.580	3.86	18.11	0.00	1.93	23.90	22.10	46.00
Vertical							
127.100	1.37	10.47	0.00	11.50	23.34	20.16	43.50
199.750	1.74	8.40	0.00	18.16	28.30	15.20	43.50
367.080	2.60	14.67	0.00	12.83	30.10	15.90	46.00
388.900	2.72	15.43	0.00	12.72	30.87	15.13	46.00
822.900	4.95	18.88	0.00	0.07	23.90	22.10	46.00
* 830.230	4.99	18.82	0.00	9.88	33.70	12.30	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 Alarm system
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Normal Operation

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

Horizontal:

867.850	5.19	19.34	0.00	8.19	32.72	13.28	46.00
---------	------	-------	------	------	-------	-------	-------

Vertical:

867.843	5.19	19.51	0.00	5.11	29.81	16.19	46.00
---------	------	-------	------	------	-------	-------	-------

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.

4. Occupied Bandwidth

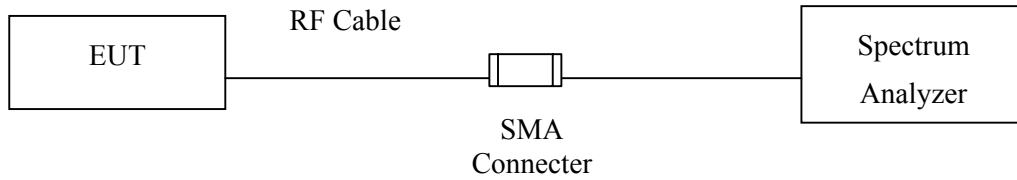
4.1. Test Equipment

The following test equipments are used during the radiated emission tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Spectrum Analyzer	Advantest	R3272 / 72421194	May, 2003

Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
 2. Mark "X" test instruments are used to measure the final test results.

4.2. Test Setup



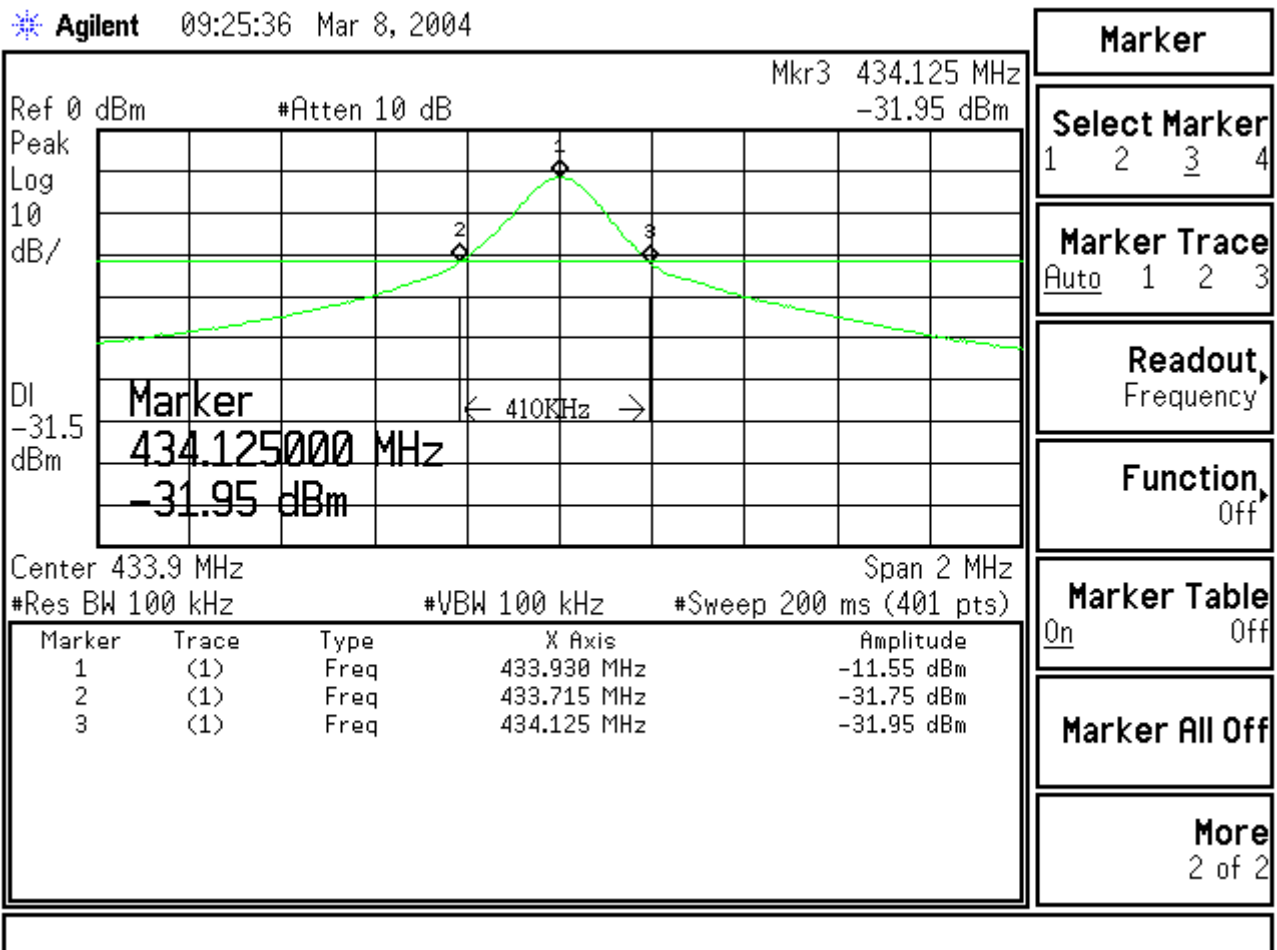
4.3. Limits

- (1) The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz.
- (2) The bandwidth of the emission shall be no wider than 0.5% of the center frequency for devices operating above 900MHz.

4.4. Test Result of Occupied Bandwidth

Product : Wireless Alarm system
 Test Item : Occupied Bandwidth
 Test Site : No.3 OATS
 Test Mode : Normal Operation

Center Frequency	433.930	MHz
Allowable Bandwidth (70-900 MHz:0.25%, Above 900MHz: 0.5%)	1080	kHz
Bandwidth at 20dB down (Max)	410	kHz
Result	Complied with regulation	



5. Duty Cycle

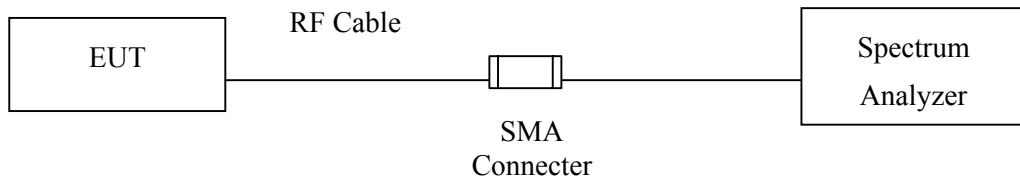
5.1. Test Equipment

The following test equipments are used during the radiated emission tests:

Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X Spectrum Analyzer	Advantest	R3272 / 72421194	May, 2003

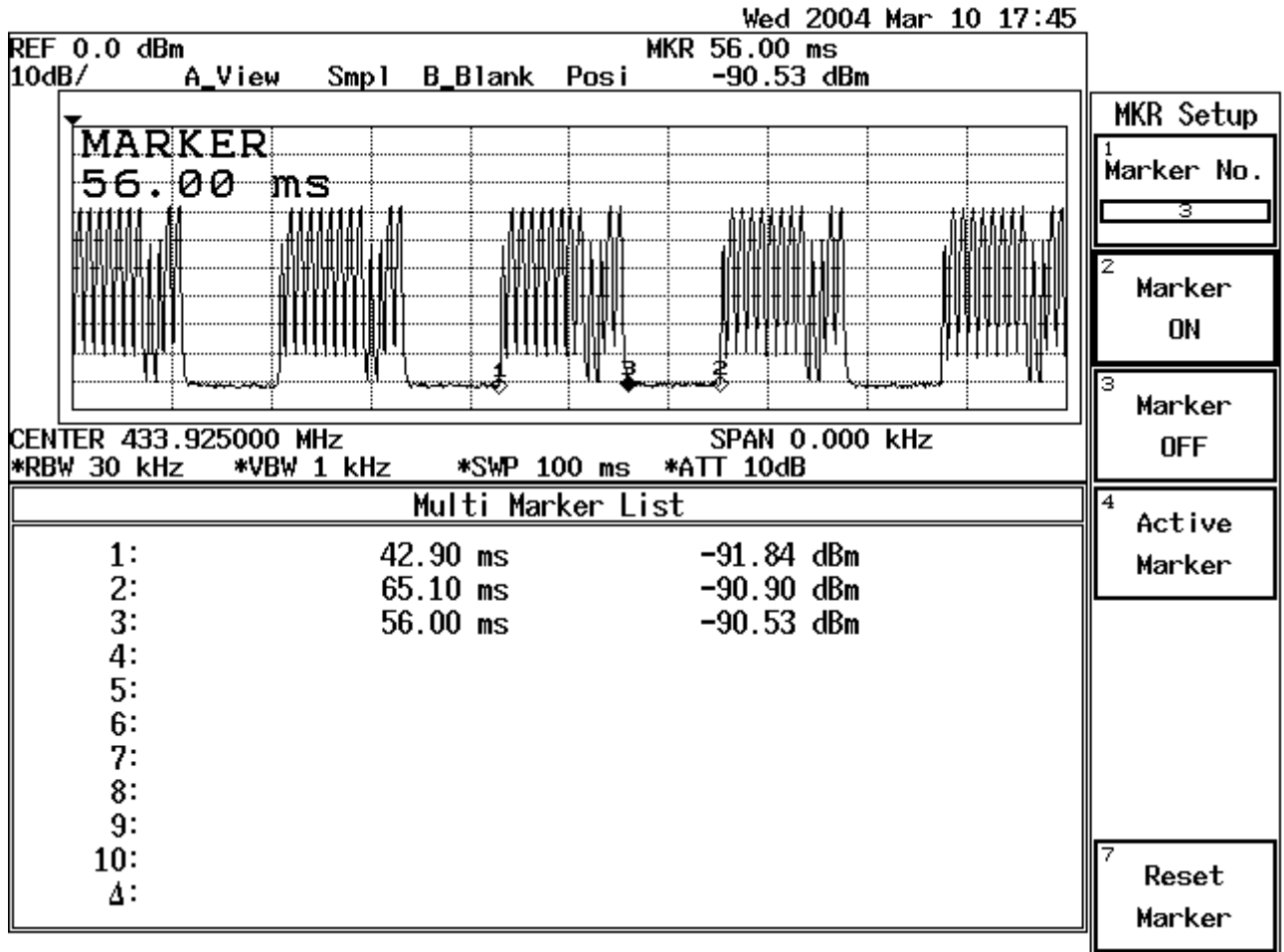
Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
 2. Mark “X” test instruments are used to measure the final test results.

5.2. Test Setup



5.3. Test Result of Duty Cycle

Product : Wireless Alarm system
 Test Item : Duty Cycle
 Test Site : No.3 OATS
 Test Mode : Normal Operation



Duty Cycle: 65.1-42.9=22.2ms

56.0-42.9=13.1ms

13.1ms /22.2ms=0.59ms

20 log 0.59= -4.5829dB

Duty Cycle= -4.5829dB

6. EMI Reduction Method During Compliance Testing

No modification was made during testing.

Attachment 1 : EUT Test Photographs

Attachment 1: EUT Test Setup Photographs

Front View of Radiated Test (H202M)



Back View of Radiated Test (H202M)



Front View of Radiated Test (Hom) (H202M)



Back View of Radiated Test (Hom) (H202M)



Attachment 2 : EUT Detailed Photographs

Attachment 2 : EUT Detailed Photographs

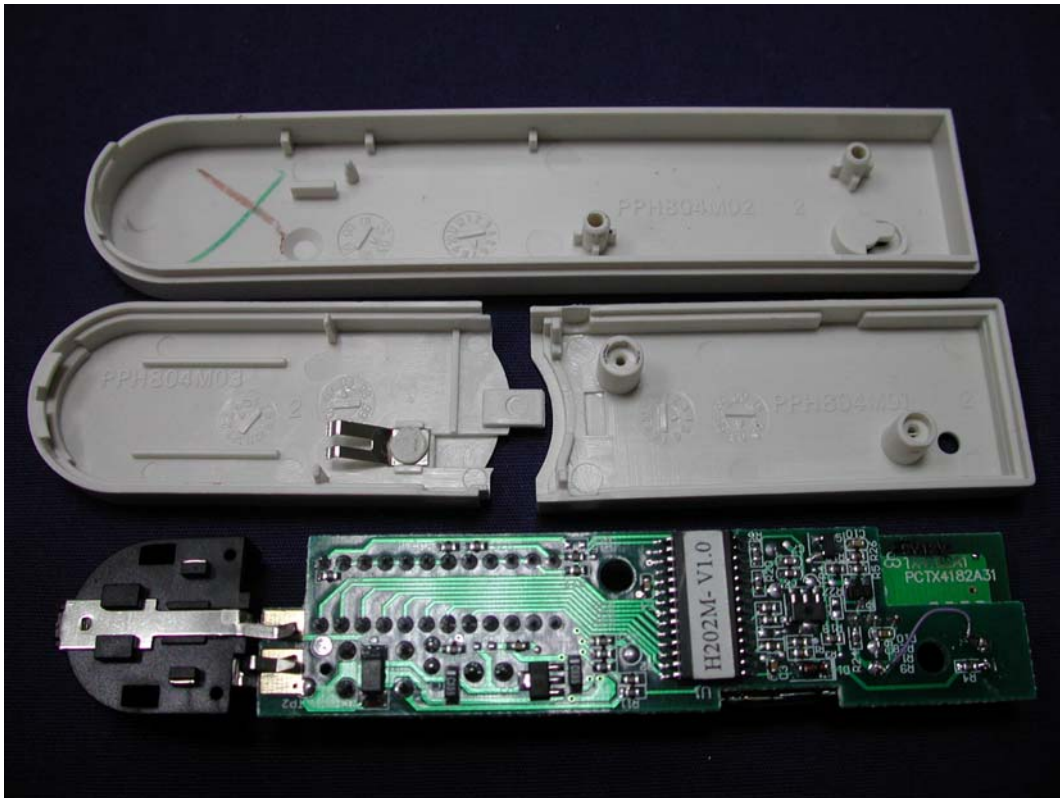
(1) EUT Photo



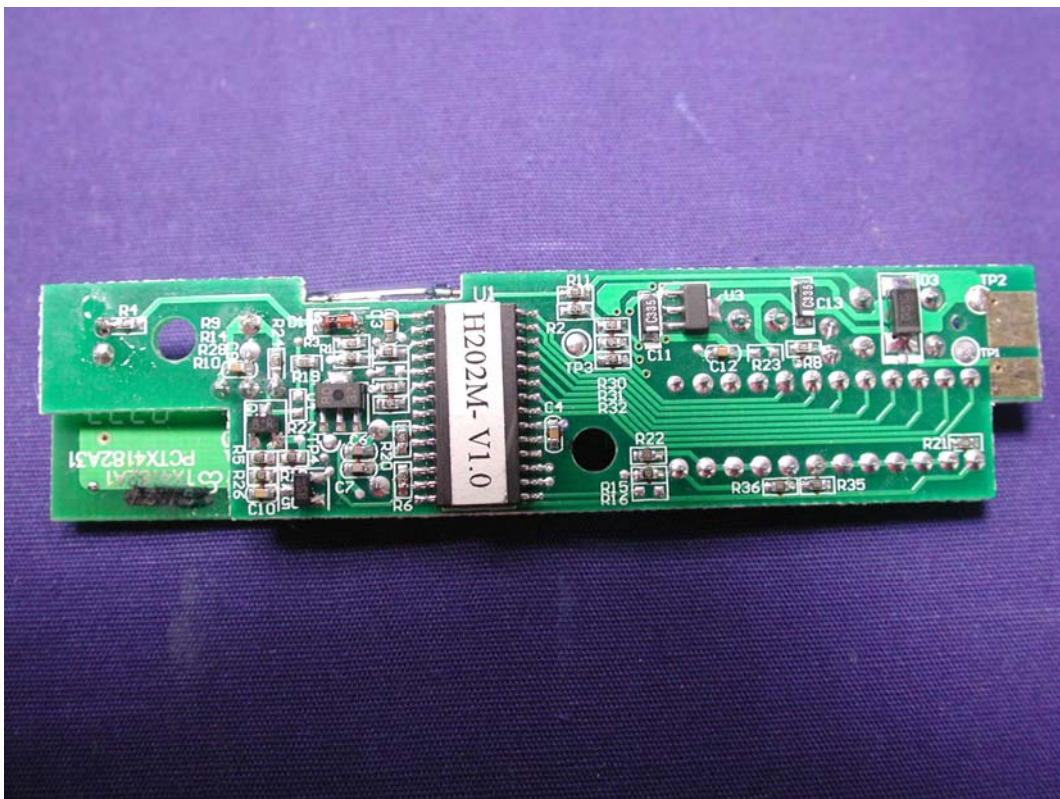
(2) EUT Photo



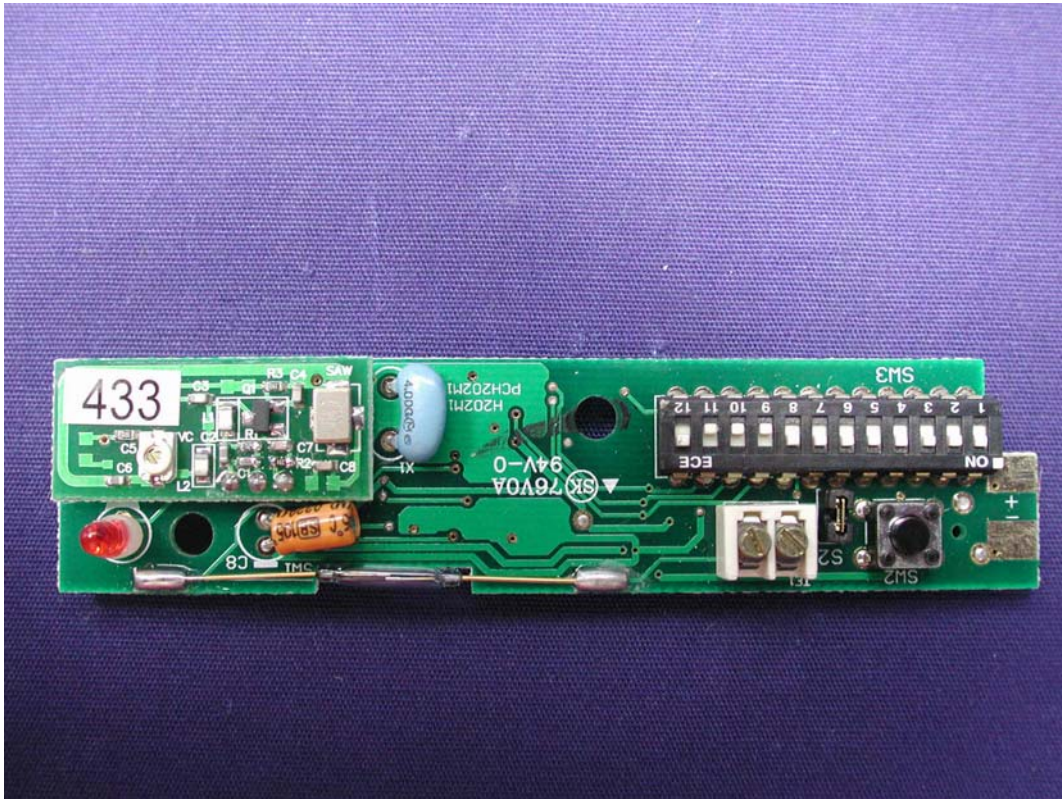
(3) EUT Photo



(4) EUT Photo



(5) EUT Photo



(6) EUT Photo

