

FCC Test Report

for

47 CFR, Part 15 Subpart E

Equipment : NOTEBOOK(FLYBOOK)

Trade Name : DIALOGUE

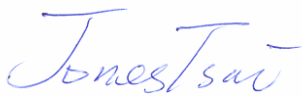
Model No. : VMW1BBHA

FCC ID : JYV-VMW1BBHA

Filing Type : Certification

Applicant : **Dialogue Technology Corp.**
10F, No. 196, Sec.2, Jungshing Rd., Shindian City,
Taipei 231, Taiwan, R.O.C.

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- The data shown in this test report were carried out on Jun. 08, 2006 at **Sporton International Inc. LAB.**
- Report No.: FR632813-07, Report Version: 01.



Jones Tsai
Manager

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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History of this test report

Report Issue Date: Aug. 22, 2007

Report No.	Description

1. General Description of Equipment under Test

1.1 Applicant

Dialogue Technology Corp.

10F, No. 196, Sec.2, Jungshing Rd., Shindian City, Taipei 231, Taiwan, R.O.C.

1.2 Manufacturer

Dialogue Technology Corp.

10F, No. 196, Sec.2, Jungshing Rd., Shindian City, Taipei 231, Taiwan, R.O.C.

1.3 Basic Description of Equipment under Test

Equipment	NOTEBOOK(FLYBOOK)
Trade Name	DIALOGUE
Model No.	VMW1BBHA
FCC ID	JYV-VMW1BBHA
Power Supply Type	Switching
AC Power Cord	AC 120V, Non-shielded, Wall-mount, 2 meter, 2 pin

1.4 Feature of Equipment under Test

Product Feature & Specification				
1. DUT Type	NOTEBOOK(FLYBOOK)			
2. Trade Name	DIALOGUE			
3. Model Name	VMW1BBHA			
4. Freq. Range/Carrier Freqs.	802.11a : 5150 ~ 5350MHz (Band I,II) / 5725MHz ~ 5850MHz (Band III) 802.11b/g : 2400MHz ~ 2483.5MHz BT : 2400MHz ~ 2483.5MHz			
5. Carrier Frequency of each channel	802.11a Band I : 5000+n*5 MHz, n=36, 40, 44, 48 802.11a Band II : 5000+n*5 MHz, n=52, 56, 60, 64 802.11a Band III : 5000+n*5 MHz, n=149, 153, 157, 161, 165 802.11b/g : 2412MHz+(n-1)*5MHz, n=1~11 BT : 2402MHz+n*1MHz, n=0~78			
6. Channel Spacing	802.11a : 5MHz 802.11b/g : 5MHz BT : 1MHz			
7. Type of Antenna Connector	I-PEX			
8. Antenna Type	PIFA Antenna			
9. Antenna Gain	802.11a : 3.49 dBi 802.11b/g : 0.1 dBi BT : -4.78 dBi			
10. Maximum Output Power to Antenna (Normal condition)	802.11a : 15.73 dBm (Band I) / 15.07 dBm (Band II) / 18.37 dBm (Band III) 802.11b : 17.77 dBm / 802.11g: 21.94dBm BT : 1.99 dBm			
11. Modulation Type/Data Rate	802.11a : OFDM 802.11b/g : DSSS / OFDM BT : GFSK			
12. Function Type	Transmitter		Transceiver	V

2. Test Configuration of Equipment under Test

2.1 Test Manner

- The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.
- The complete test system refers to section 2.2 and EUT for EMI test.
- The EUT can operate on 5150MHz to 5250MHz, 5250MHz to 5350MHz and 5470MHz to 5725MHz as listed in section 1.4.
- Test Mode for radiated emission and conducted emission:

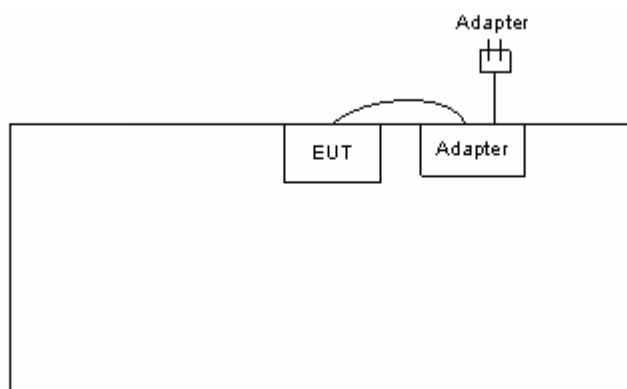
Radiated Emission	Mode 1: 802.11a Tx_CH052_5260 MHz Mode 2: 802.11a Tx_CH064_5320 MHz
Conducted Emission	Mode 1: 802.11a Tx_Link (Band2 Only)

- Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 40000MHz.

2.2 Description of Test System

N/A

2.3 Connection Diagram of Test System



3. Operation of Equipment under Test

During the test, the following programs on WINXP were executed:
one self test program "CRTU" to keep transmitting signals.

4. General Information of Test

Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park,
Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C.
TEL : 886-3-327-3456
FAX : 886-3-318-0055
Test Site No : CO01-HY, 03CH06-HY

4.1 Test Voltage

AC 120V / 60Hz

4.2 Standard for Methods of Measurement

ANSI C63.4-2003

4.3 Test Compliance

FCC Part 15, Subpart E

4.4 Frequency Range

- a. Conduction: from 150 kHz to 30 MHz
- b. Radiation: from 30 MHz to 40000MHz

4.5 Test Distance

The test distance of radiated emission from antenna to EUT is 3 m.

5. Report of Measurements and Examinations

5.1 List of Measurements and Examinations

FCC Rule	Description of Test	Result
15.407(b)(5)	Conducted Emission	Pass
15.407(a)(1)(2)	Peak Transmit Power	Pass
15.407(b)(1)(2)(5)	Radiated Emission	Pass
15.407(a)(1)(2)	Power Spectral Density	Pass
15.407(b)(1)(2)	Band Edges Measurement	Pass
15.407(a)(1)(2)	Antenna Requirement	Pass
15.407(a)(6)	Peak Excursion Ratio Measurement	Pass
15.407(c)	Automatically Discontinue Transmission	Pass

5.2 Emission Bandwidth

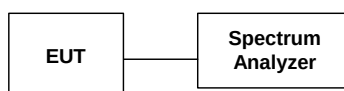
5.2.1 Measuring Instruments :

As described in chapter 6 of this test report.

5.2.2 Test Procedure :

The transmitter output is connected to the spectrum analyzer. For these tests, the resolution bandwidth is 1 MHz, video bandwidth is 3MHz, peak detection and view function is used. The 26 dB bandwidth is defined as the frequency range where the power is higher than the peak power minus 26 dB.

Test Setup Layout :



5.2.3 Test Result :

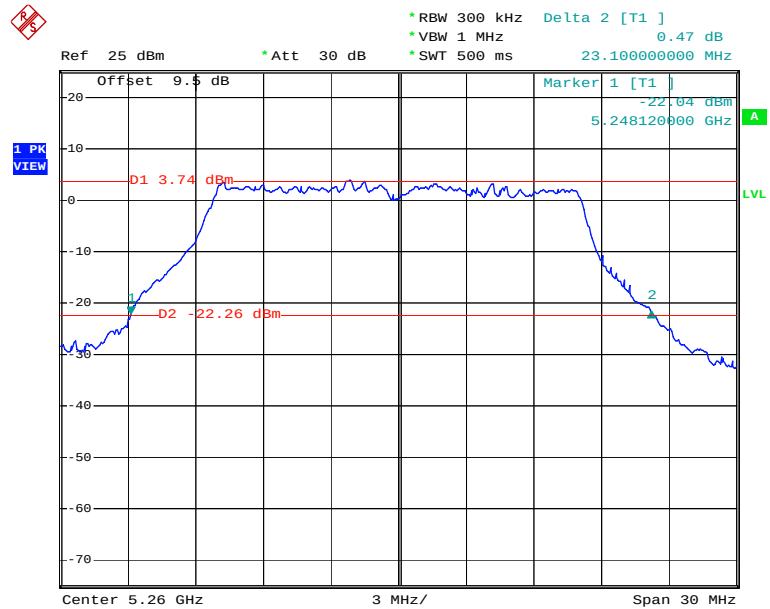
- Temperature : 26°C
- Relative Humidity :59%

➤ Application: 802.11a Normal mode

Channel	Frequency (MHz)	26dB Emission bandwidth (MHz)	Mode Ref. No.
52	5260	23.10	1
64	5320	23.22	2

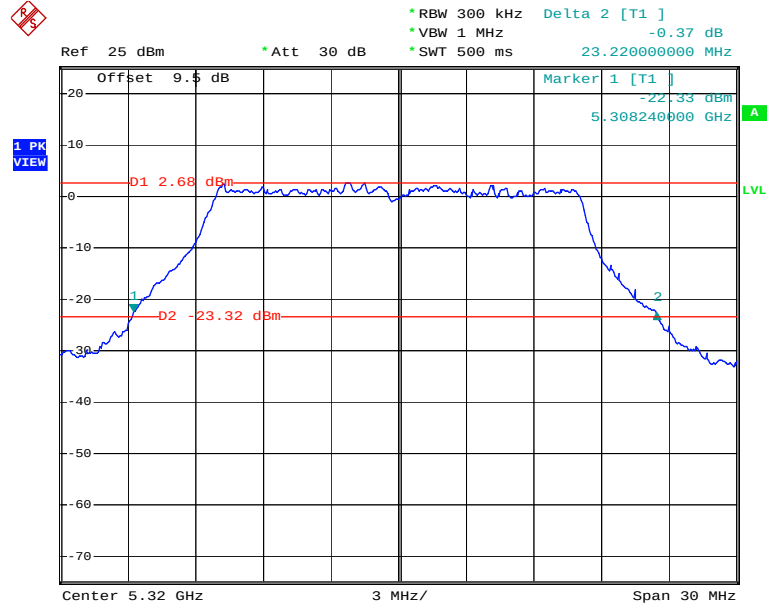
5.2.4 Test Data

1



Date: 5.MAY.2006 15:59:40

2



Date: 5.MAY.2006 16:01:24

5.3 Peak Transmit Power

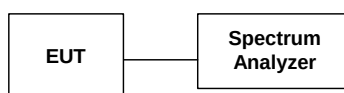
5.3.1 Measuring Instruments :

As described in chapter 6 of this test report.

5.3.2 Test Procedure :

The transmitter output is connected to the spectrum analyzer. According to the method 1 of DA-02-2138, the resolution bandwidth is set to 1 MHz, video bandwidth is 3MHz, trace average 100 traces in power averaging mode, and sample detection is used. The peak power is measured by channel power integration over the previously measured emissions bandwidth.

5.3.3 Test Setup Layout :



5.3.4 Test Result :

- Temperature : 26°C
- Relative Humidity :59%

➤ Application: 802.11a Normal mode

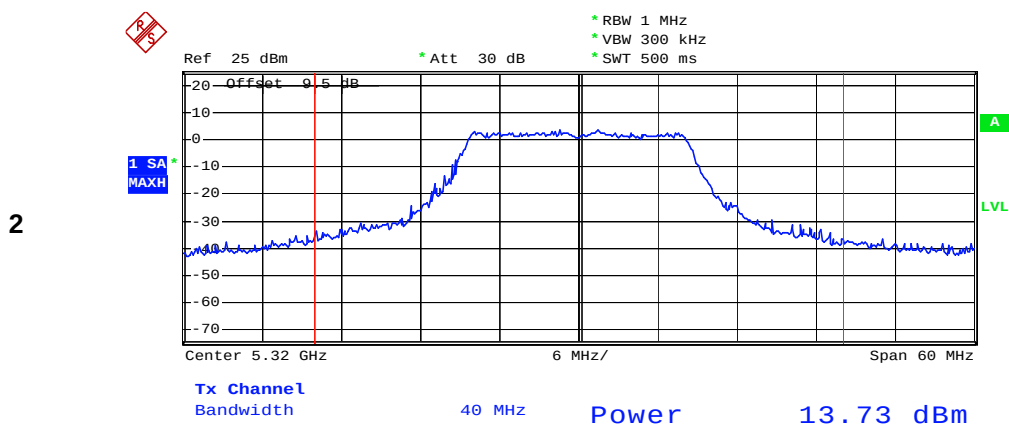
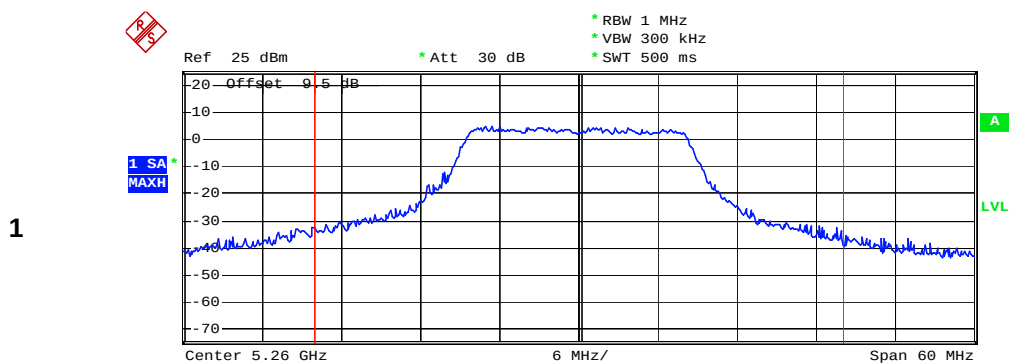
Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (dBm)	Mode Ref. No.
52	5260	15.07	24.00	1
64	5320	13.73	24.00	2

Comments : The peak transmit power shall not exceed the lesser of 24dBm or 11dBm+10logB in 5250~5350 band

Normal mode: 5260MHz 11dBm + 10log(33.44 MHz) = 24.64 dBm

5320MHz 11dBm + 10log(34.88 MHz) = 24.66 dBm

5.3.5 Test Data



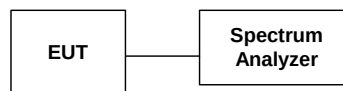
5.4 Peak Power Spectral Density

5.4.1 Measuring Instruments :

As described in chapter 6 of this test report.

5.4.2 Test Procedure :

The transmitter output is connected to the spectrum analyzer. According to the method 3 of DA-02-2138, the resolution bandwidth is set to 1 MHz, video bandwidth is 3MHz, trace average 100 traces in power averaging mode, and sample detection is used, and the analyzer is set for video averaging.



5.4.3 Test Result :

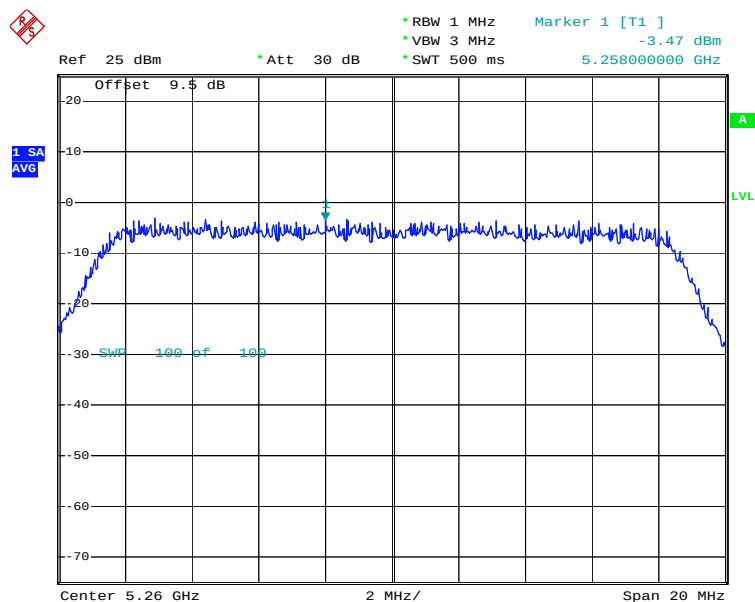
- Temperature : 26°C
- Relative Humidity :59%

➤ Application: 802.11a Normal mode

Channel	Frequency (MHz)	Power Spectral		Mode
		Density (dBm)	Limits (dBm)	
52	5260	-3.47	11	1
64	5320	-4.11	11	2

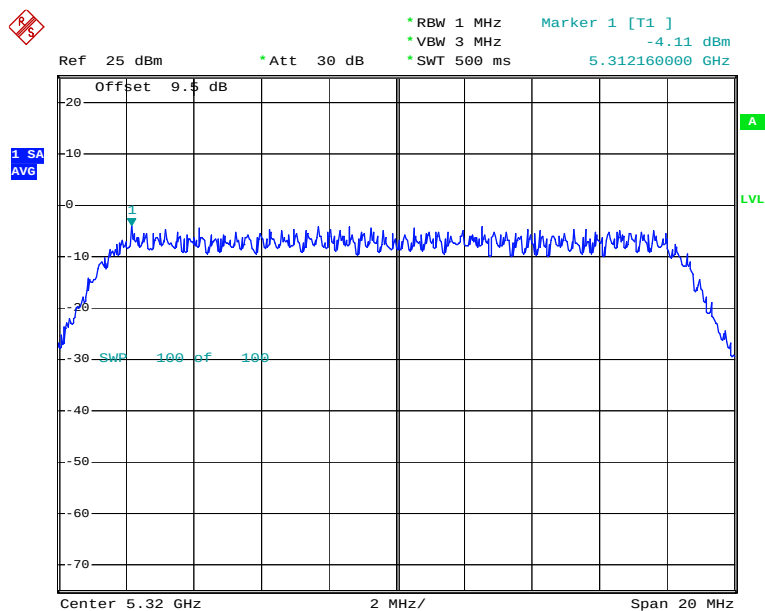
5.4.4 Test Data

1



Date: 5.MAY.2006 21:45:28

2



Date: 5.MAY.2006 21:50:22

5.5 Test of Conducted Emission

As described in chapter 6 of this test report.

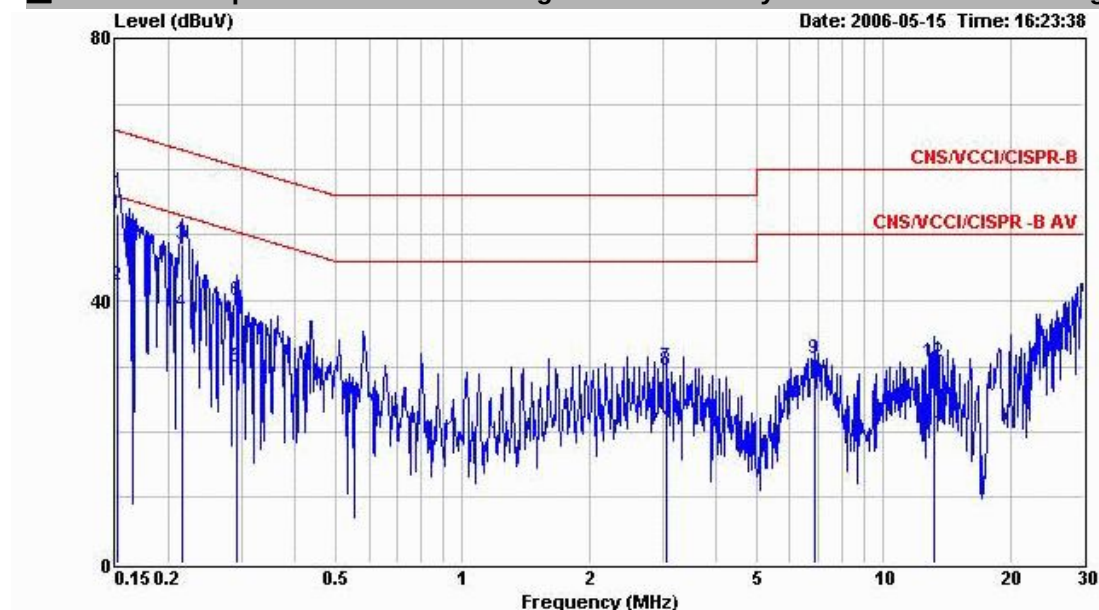
5.5.1 Test Procedures :

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power port of a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

5.5.2 Test Data

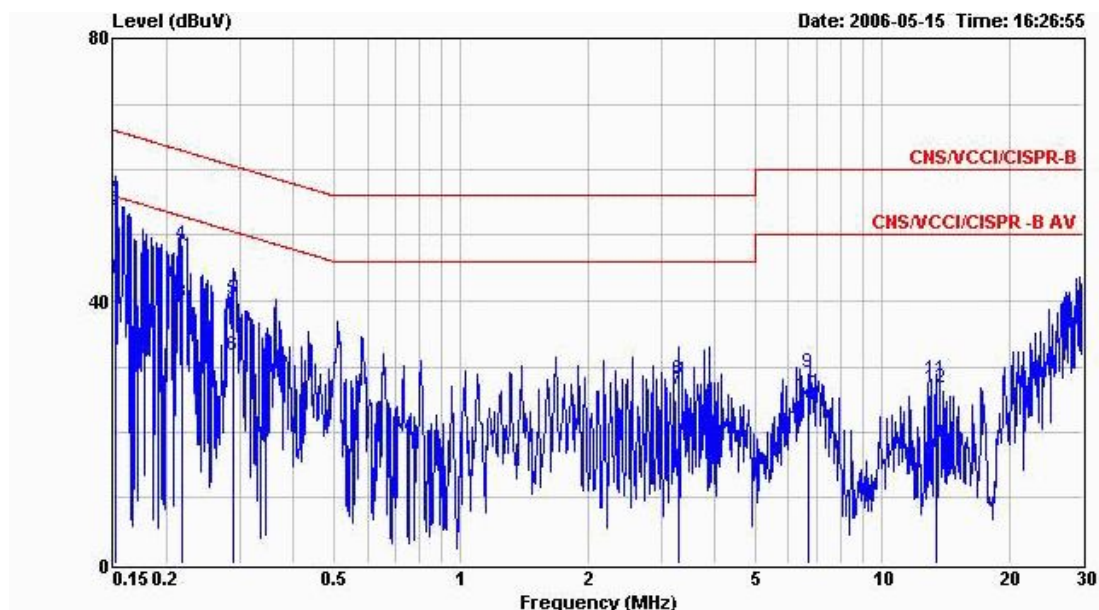
- Frequency Range of Test : 150kHz to 30 MHz
- Test Mode : Mode 1
- Temperature : 23 °C
- Relative Humidity : 47 %
- Test Engineer : James

■ The test that passed at minimum margin was marked by the frame in the following table.



Site : CO01-HY
 Condition : CNS/VCCI/CISPR-B 2001/004 200604 LINE
 EUT : VM(CPU type:UL V/dual core,LV/singlecore
 Power : 120V/60Hz
 Model :
 Memo : 11a Tx CH036
 Memo :
 Memo :

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.151	53.29	-12.65	65.94	53.14	0.10	0.05	QP
2	0.151	42.22	-13.72	55.94	42.07	0.10	0.05	Average
3	0.216	48.58	-14.39	62.97	48.42	0.10	0.06	QP
4	0.216	38.09	-14.88	52.97	37.93	0.10	0.06	Average
5	0.291	29.76	-20.74	50.50	29.59	0.10	0.07	Average
6	0.291	39.94	-20.56	60.50	39.77	0.10	0.07	QP
7	3.060	29.96	-26.04	56.00	29.68	0.16	0.12	QP
8	3.060	29.27	-16.73	46.00	28.99	0.16	0.12	Average
9	6.846	31.08	-28.92	60.00	30.69	0.26	0.13	QP
10	6.846	27.60	-22.40	50.00	27.21	0.26	0.13	Average
11	13.189	19.85	-30.15	50.00	19.40	0.30	0.15	Average
12	13.189	30.71	-29.29	60.00	30.26	0.30	0.15	QP



Site : CO01-HY
 Condition : CNS/VCCI/CISPR-B 2001/004 200604 NEUTRAL
 EUT : VM(CPU type:UL V/dual core,LV/singlecore
 Power : 120V/60Hz
 Model :
 Memo : 11a Tx CH036
 Memo :
 Memo :

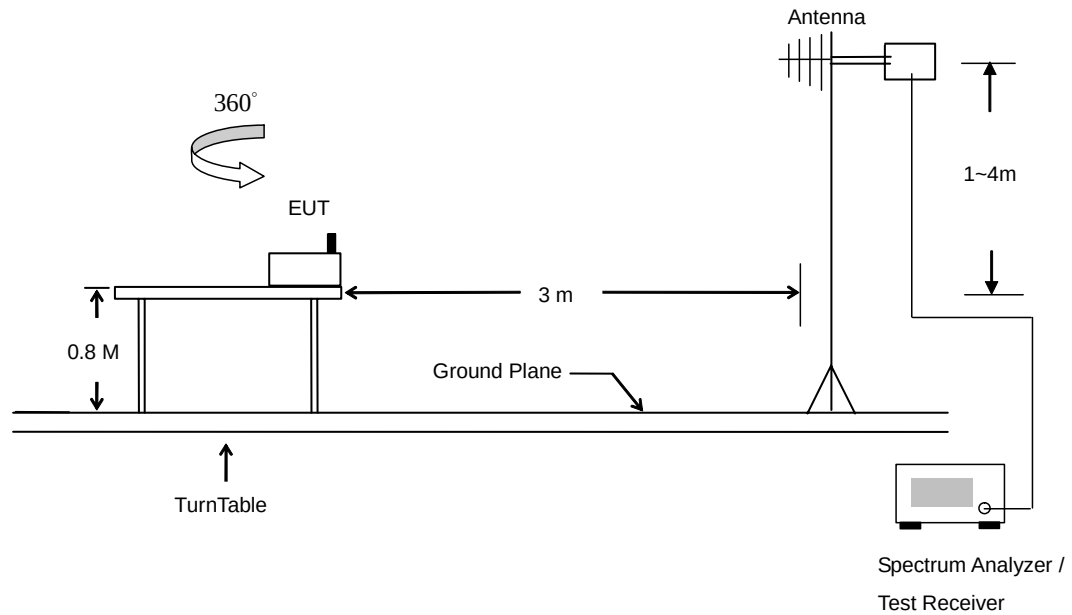
	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.151	43.35	-12.59	55.94	43.20	0.10	0.05	Average
2	0.151	53.70	-12.24	65.94	53.55	0.10	0.05	QP
3	0.217	39.73	-13.20	52.93	39.57	0.10	0.06	Average
4	0.217	48.58	-14.35	62.93	48.42	0.10	0.06	QP
5	0.289	40.26	-20.29	60.55	40.09	0.10	0.07	QP
6	0.289	31.80	-18.75	50.55	31.63	0.10	0.07	Average
7	3.284	26.38	-29.62	56.00	26.16	0.10	0.12	QP
8	3.284	28.16	-17.84	46.00	27.94	0.10	0.12	Average
9	6.712	29.10	-30.90	60.00	28.81	0.16	0.13	QP
10	6.712	25.77	-24.23	50.00	25.48	0.16	0.13	Average
11	13.504	28.12	-31.88	60.00	27.70	0.27	0.15	QP
12	13.504	26.77	-23.23	50.00	26.35	0.27	0.15	Average

5.6 Test of Radiated Emission

As described in chapter 6 of this test report.

5.6.1 Test Procedures

- a. The EUT was placed on a turntable with 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
- e. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. For testing below 1GHz, If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported.
- h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

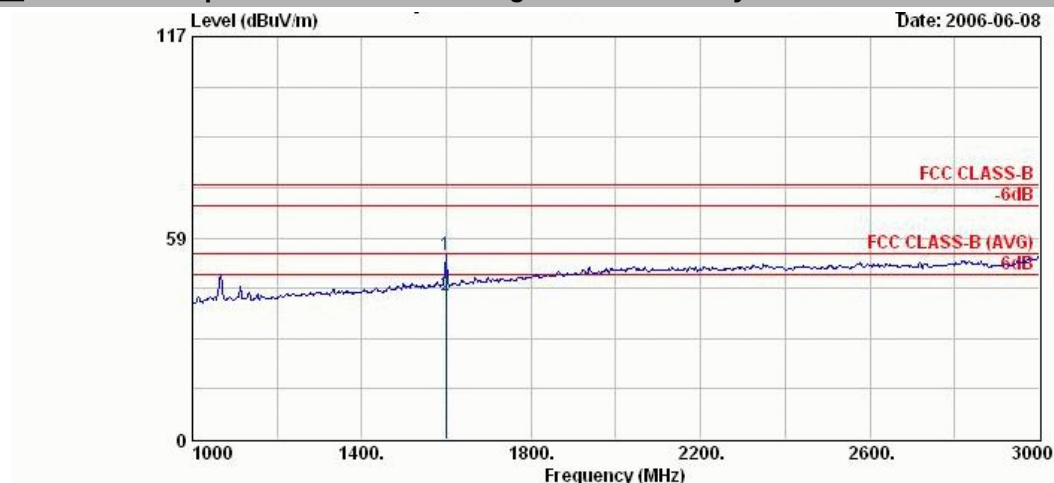
5.6.2 Typical Test Setup Layout of Radiated Emission

5.6.3 Test Data

➤ Test Mode : Mode 1

- Temperature : 26°C
- Relative Humidity :54%
- Test Engineer : Anderson
- Polarization : Horizontal

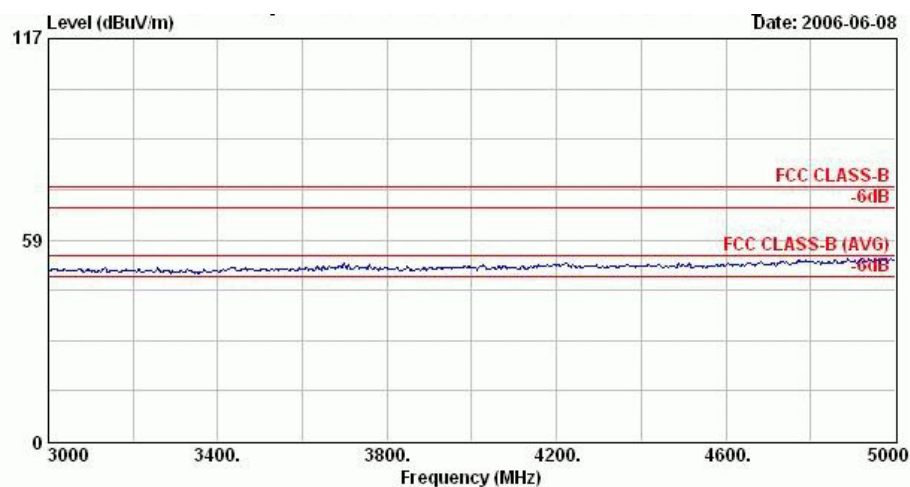
■ The test that passed at minimum margin was marked by the boldface in the following table.



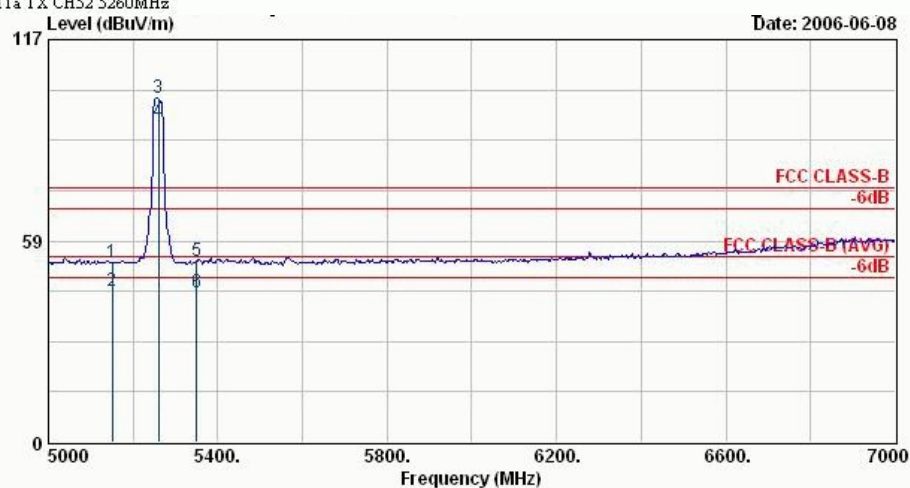
Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : VM(CPU type:ULV/dual core, LV/single core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH52 5260MHz

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level Factor	Loss Factor	Factor	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1 @	1598.00	53.52	-20.48	74.00	58.78	26.90	3.46	35.62	100	360 Peak
2 @	1598.00	41.64	-12.36	54.00	46.90	26.90	3.46	35.62	100	36 Average

Remark: Frequency from 9KHz to 30MHz, the emission emitted by the EUT is too low to be measured.



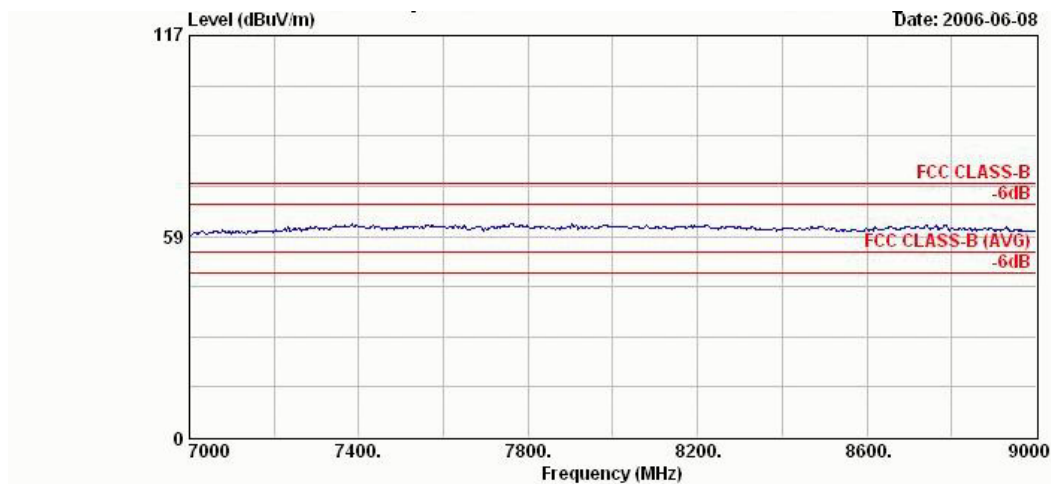
Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : VM(CPU type:ULV/dual core, LV/single
: core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH52 5260MHz



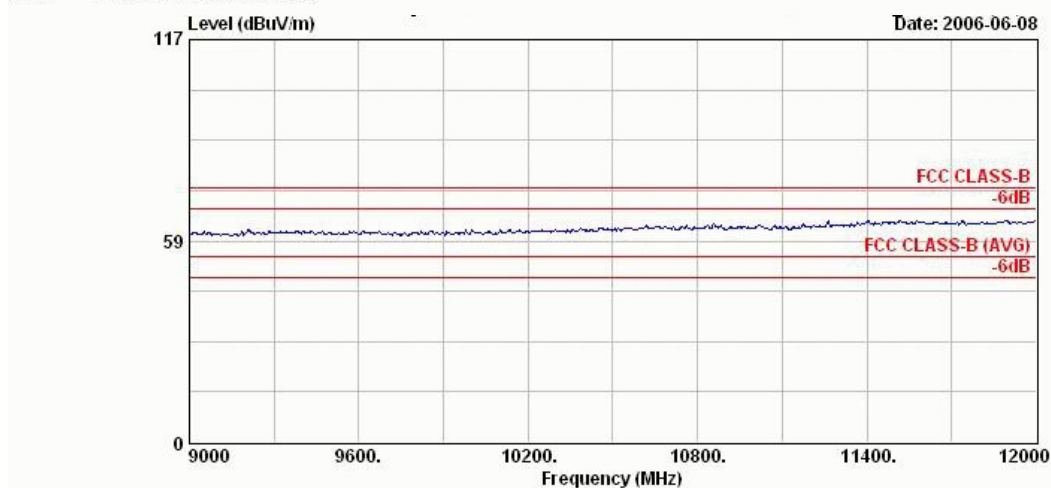
Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : VM(CPU type:ULV/dual core, LV/single
: core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH52 5260MHz

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	5150.00	52.13	-21.87	74.00	48.22	33.60	6.50	36.19	100	360
2 @	5150.00	43.95	-10.05	54.00	40.04	33.60	6.50	36.19	133	119
3 @	5260.00			74.00	95.97	33.60	6.53	36.14	100	360
4 @	5260.00			54.00	89.14	33.60	6.53	36.14	133	119
5 @	5350.00	52.45	-21.55	74.00	48.37	33.60	6.56	36.08	100	360

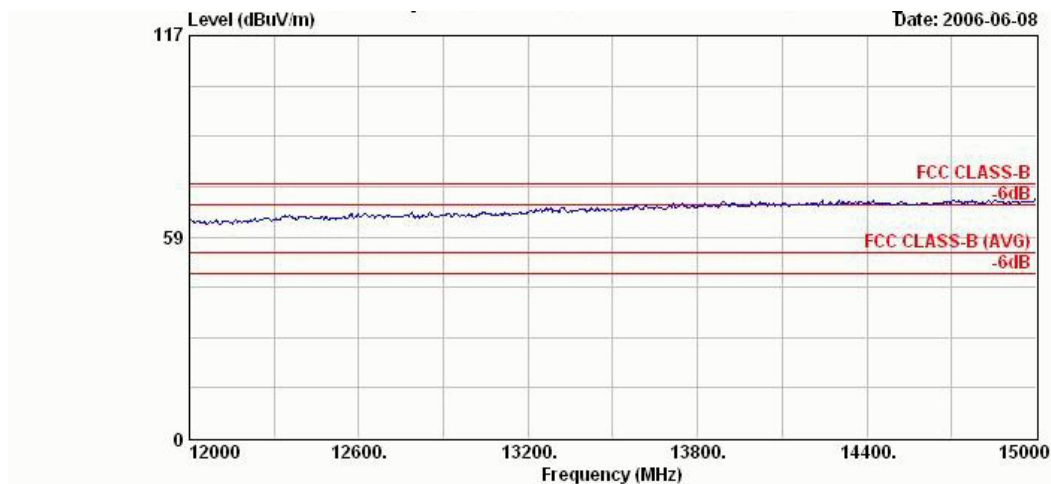
Remark: #3 and #4 Fundamental Signal



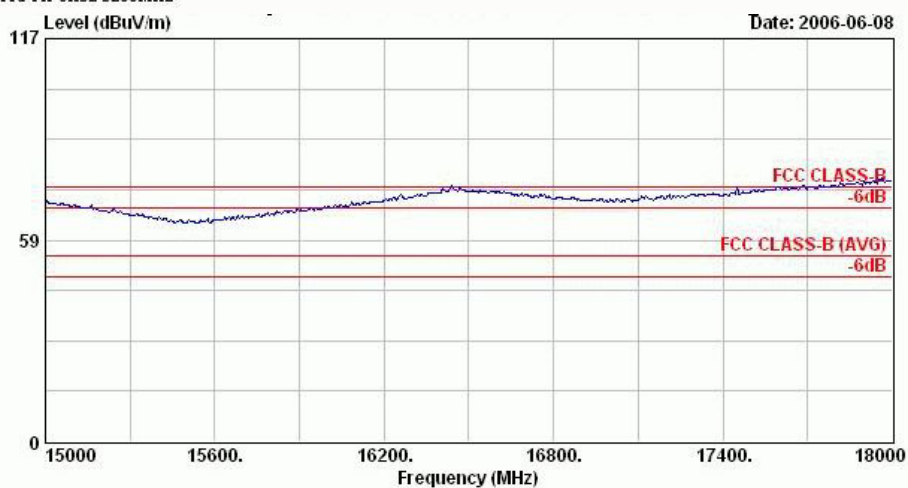
Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : VM(CPU type:ULV/dual core, LV/single
: core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH52 5260MHz



Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : VM(CPU type:ULV/dual core, LV/single
: core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH52 5260MHz



Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : VM(CPU type:ULV/dual core, LV/single
: core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH52 5260MHz

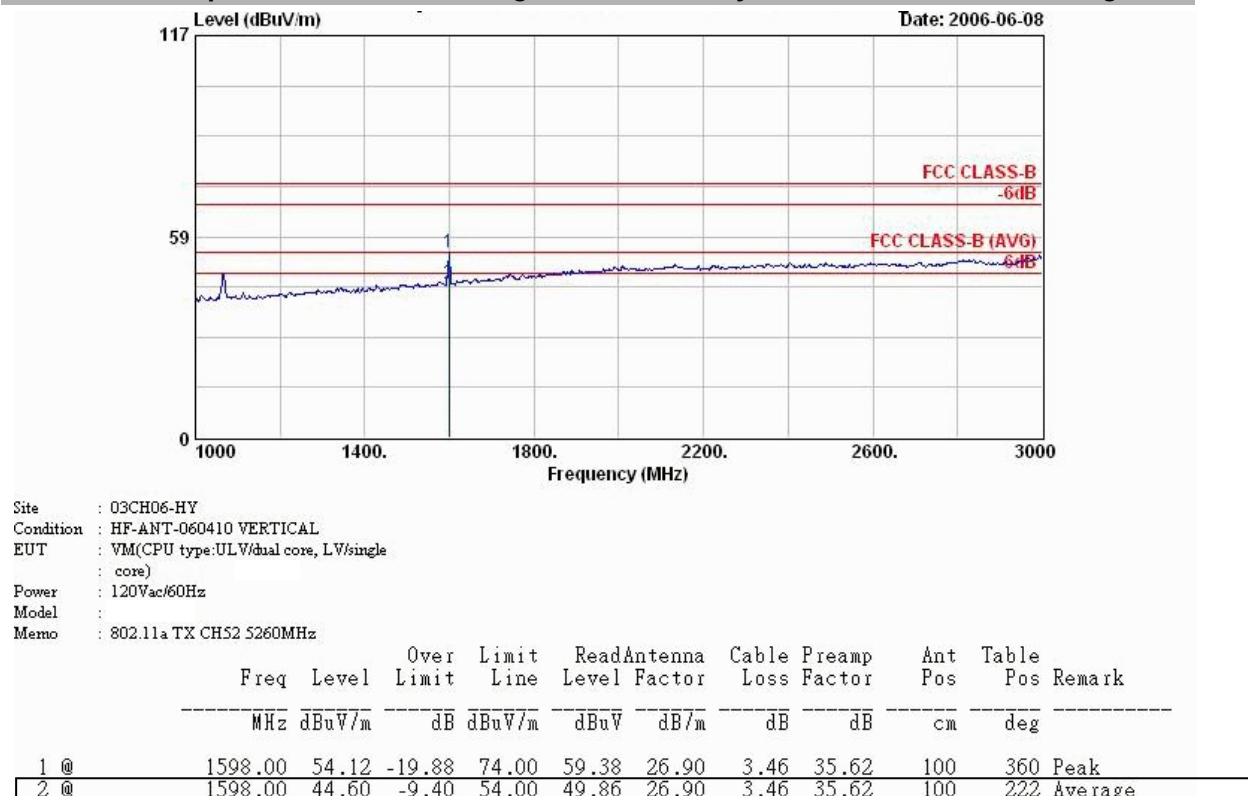


Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : VM(CPU type:ULV/dual core, LV/single
: core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH52 5260MHz

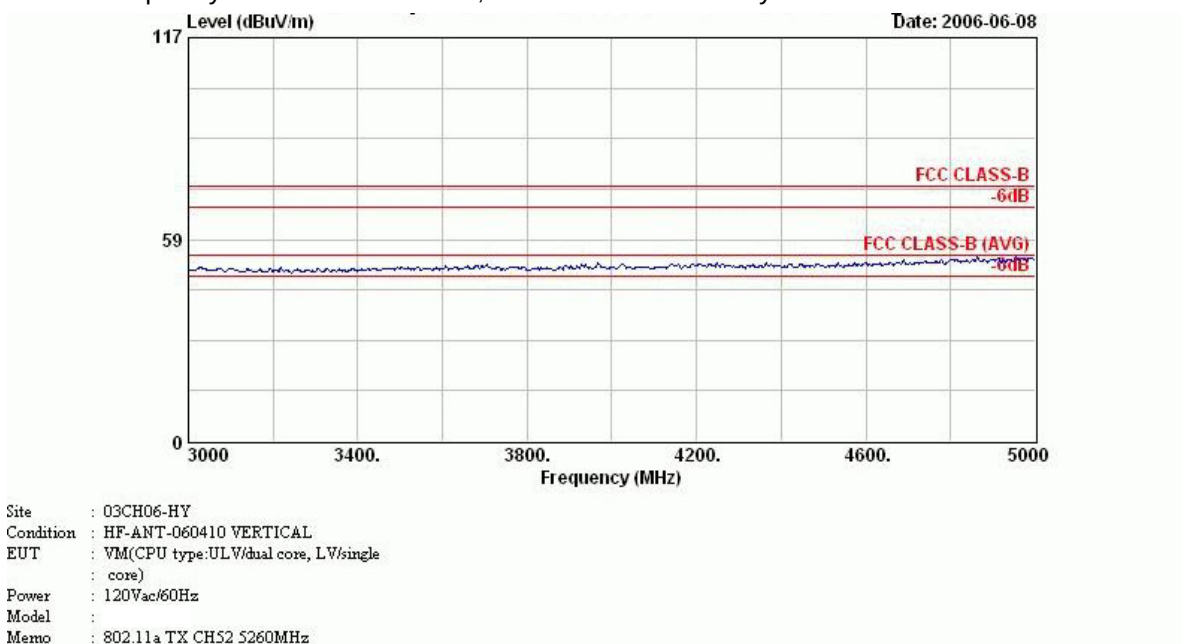
Remark: Frequency from 18GHz to 40GHz, the emission emitted by the EUT is too low to be measured.

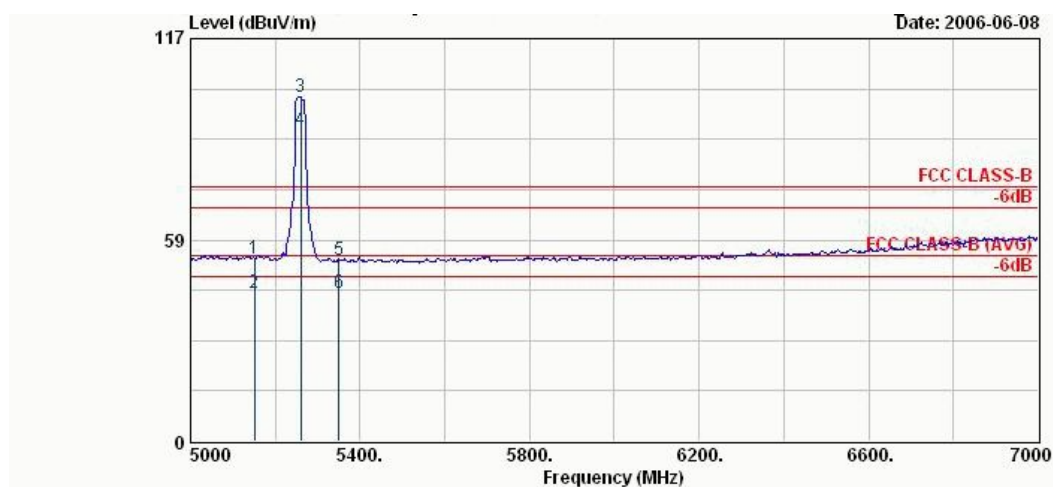
- Polarization : Vertical

■ The test that passed at minimum margin was marked by the boldface in the following table.



Remark: Frequency from 9KHz to 30MHz, the emission emitted by the EUT is too low to be measured.

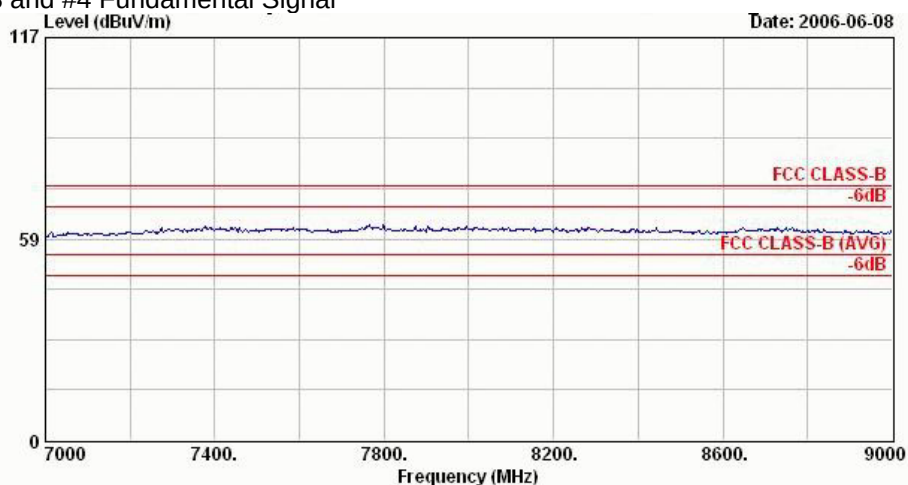




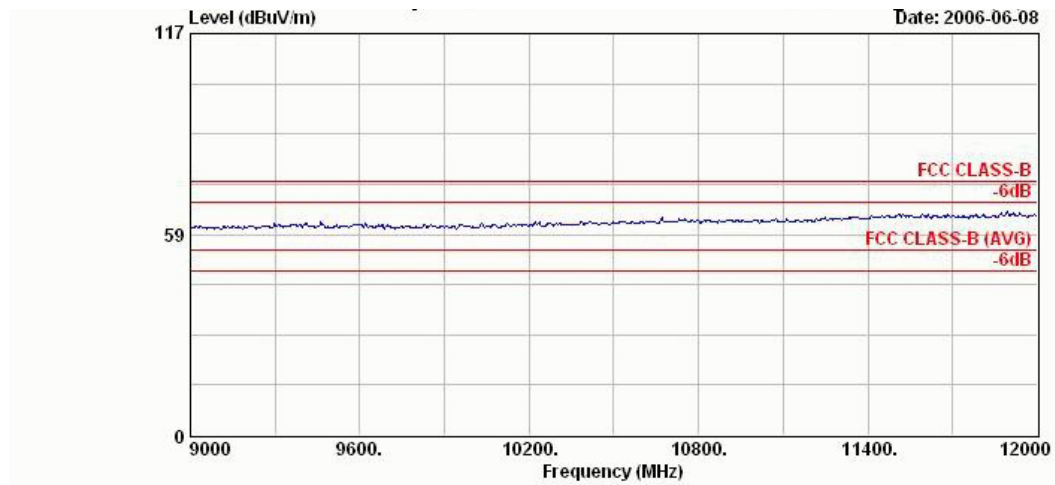
Site : 03CH06-HY
Condition : HF-ANT-060410 VERTICAL
EUT : VM(CPU type:ULV/dual core, LV/single core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH52 5260MHz

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	5150.00	53.20	-20.80	74.00	49.29	33.60	6.50	36.19	100	360	Peak
2 @	5150.00	43.16	-10.84	54.00	39.25	33.60	6.50	36.19	100	208	Average
3 @	5260.00	100.23			96.23	33.60	6.53	36.14	100	360	Peak
4 @	5260.00	90.32			86.33	33.60	6.53	36.14	100	208	Average
5 @	5350.00	52.74	-21.26	74.00	48.66	33.60	6.56	36.08	100	360	Peak

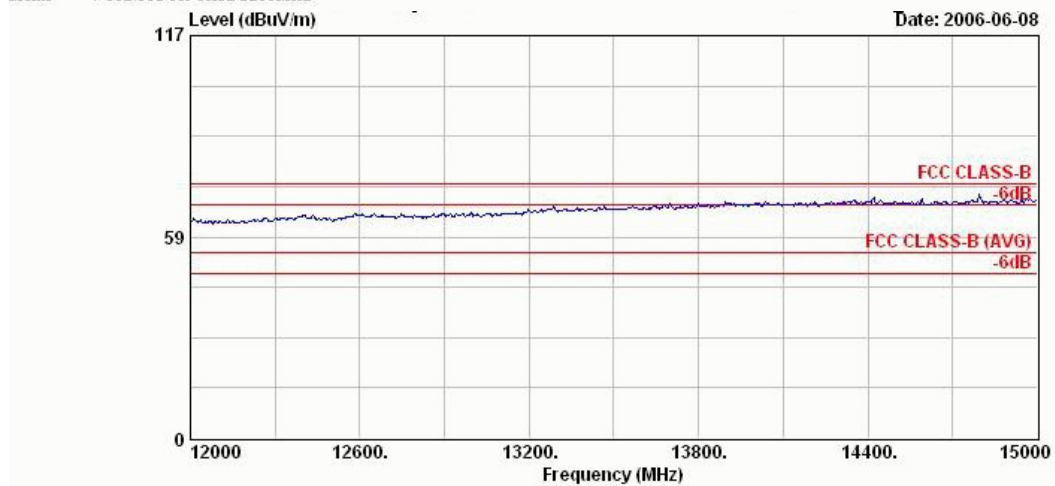
Remark: #3 and #4 Fundamental Signal



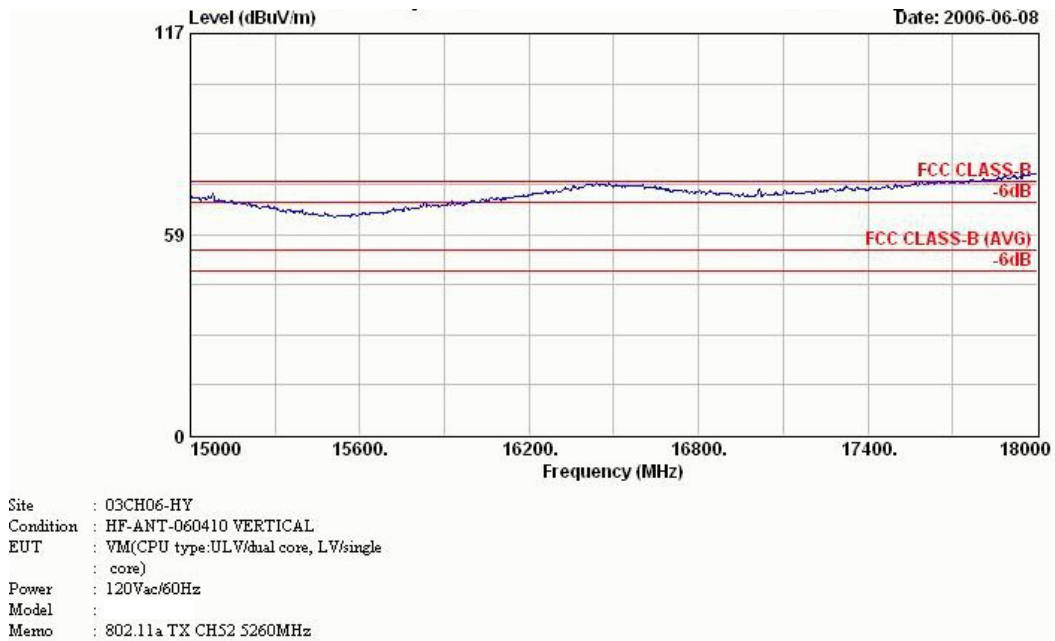
Site : 03CH06-HY
Condition : HF-ANT-060410 VERTICAL
EUT : VM(CPU type:ULV/dual core, LV/single core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH52 5260MHz



Site : 03CH06-HY
Condition : HF-ANT-060410 VERTICAL
EUT : VM(CPU type:ULV/dual core, LV/single
: core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH52 5260MHz



Site : 03CH06-HY
Condition : HF-ANT-060410 VERTICAL
EUT : VM(CPU type:ULV/dual core, LV/single
: core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH52 5260MHz

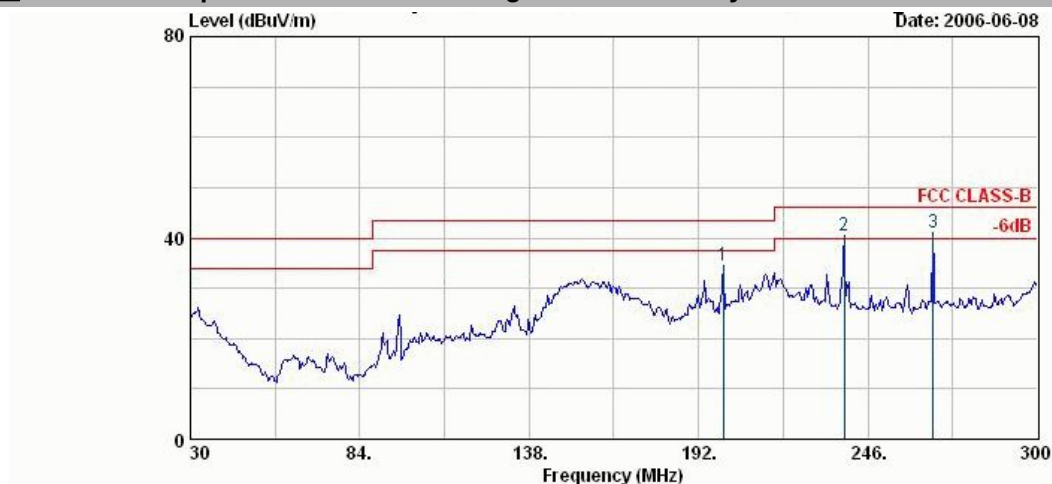


Remark: Frequency from 18GHz to 40GHz, the emission emitted by the EUT is too low to be measured.

➤ Test Mode : Mode 2

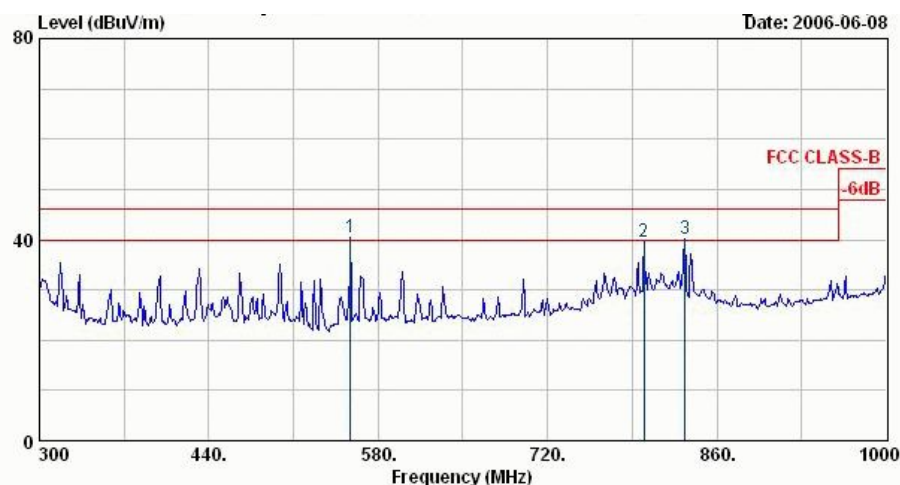
- Temperature : 26°C
- Relative Humidity :54%
- Test Engineer : Anderson
- Polarization : Horizontal

■ The test that passed at minimum margin was marked by the boldface in the following table.



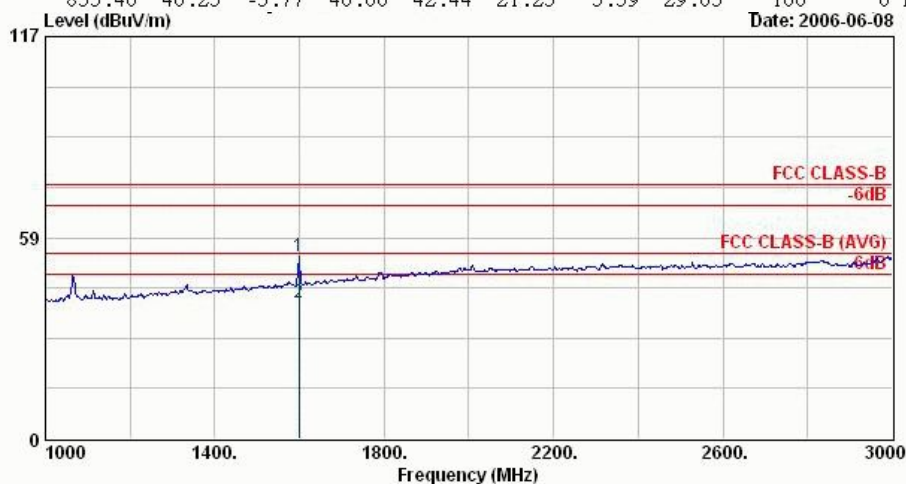
Site : 03CH06-HY
 Condition : BI-LOG-2004-1122 HORIZONTAL
 EUT : VM(CPU type:ULV/dual core, LV/single core)
 Power : 120Vac/60Hz
 Model :
 Memo : 802.11a TX CH64 5320MHz

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1 @	199.83	34.52	-8.98	43.50	50.74	9.93	2.52	28.68	400	0 Peak
2 @	238.44	40.56	-5.44	46.00	55.82	10.87	2.79	28.93	400	0 Peak
3 @	266.79	40.94	-5.06	46.00	54.14	12.91	2.85	28.95	136	199 Peak



Site : 03CH06-HY
Condition : BI-LOG-2004-1122 HORIZONTAL
EUT : VM(CPU type:ULV/dual core, LV/single core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH64 5320MHz

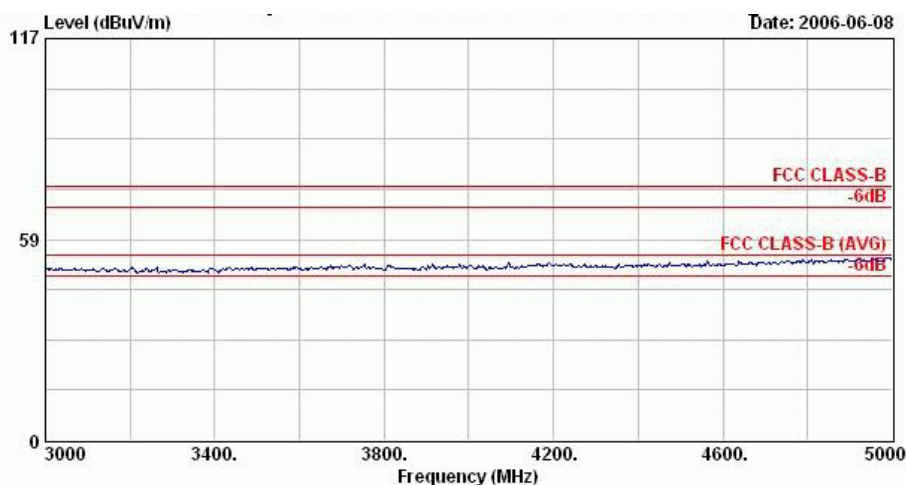
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1 @	556.90	40.53	-5.47	46.00	46.64	18.59	4.36	29.06	100	0 Peak
2 @	799.80	39.49	-6.51	46.00	40.84	21.90	5.62	28.87	100	0 Peak
3 @	833.40	40.23	-5.77	46.00	42.44	21.25	5.59	29.05	100	0 Peak



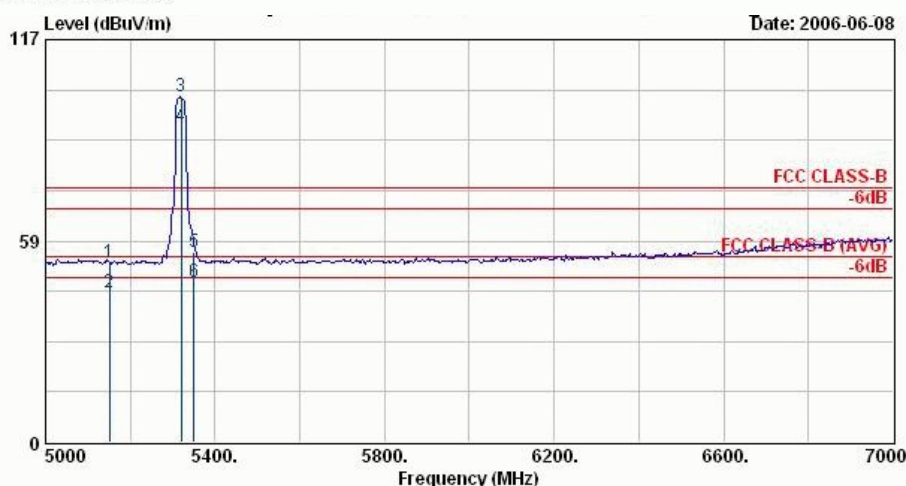
Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : VM(CPU type:ULV/dual core, LV/single core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH64 5320MHz

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1 @	1598.00	53.17	-20.83	74.00	58.43	26.90	3.46	35.62	100	360 Peak
2 @	1598.00	39.65	-14.35	54.00	44.91	26.90	3.46	35.62	100	35 Average

Remark: Frequency from 9KHz to 30MHz, the emission emitted by the EUT is too low to be measured.



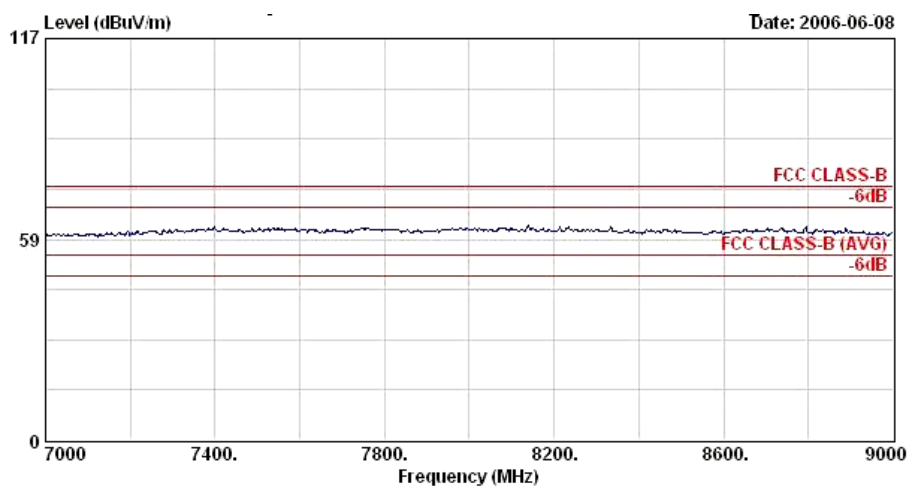
Site : 03CH06-HY
 Condition : HF-ANT-060410 HORIZONTAL
 EUT : VM(CPU type:ULV/dual core, LV/single core)
 Power : 120Vac/60Hz
 Model :
 Memo : 802.11a TX CH64 5320MHz



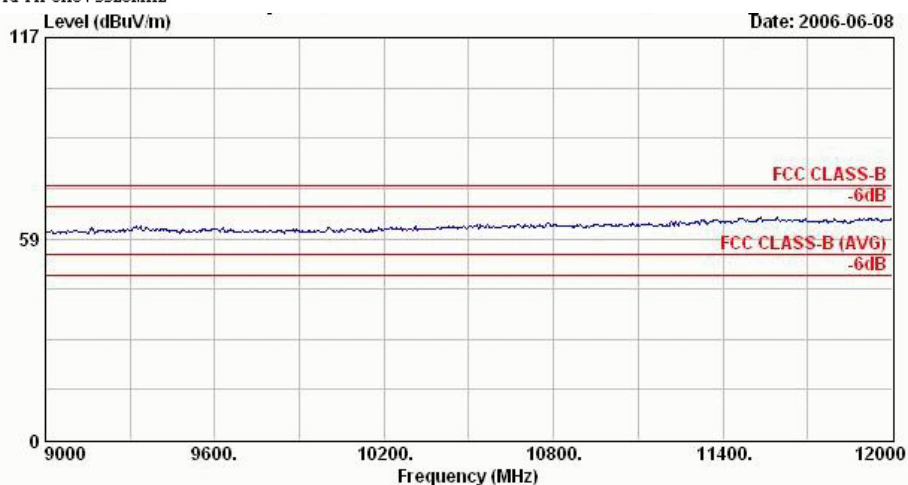
Site : 03CH06-HY
 Condition : HF-ANT-060410 HORIZONTAL
 EUT : VM(CPU type:ULV/dual core, LV/single core)
 Power : 120Vac/60Hz
 Model :
 Memo : 802.11a TX CH64 5320MHz

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Remark
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	5150.00	52.29	-21.71	74.00	48.38	33.60	6.50	36.19	100	360	Peak
2 @	5150.00	43.56	-10.44	54.00	39.65	33.60	6.50	36.19	130	120	Average
3 @	5320.00			74.00	96.39	33.60	6.54	36.11	100	360	Peak
4 @	5320.00			54.00	87.52	33.60	6.54	36.11	130	120	Average
5 @	5350.00	55.44	-18.56	74.00	51.36	33.60	6.56	36.08	100	360	Peak

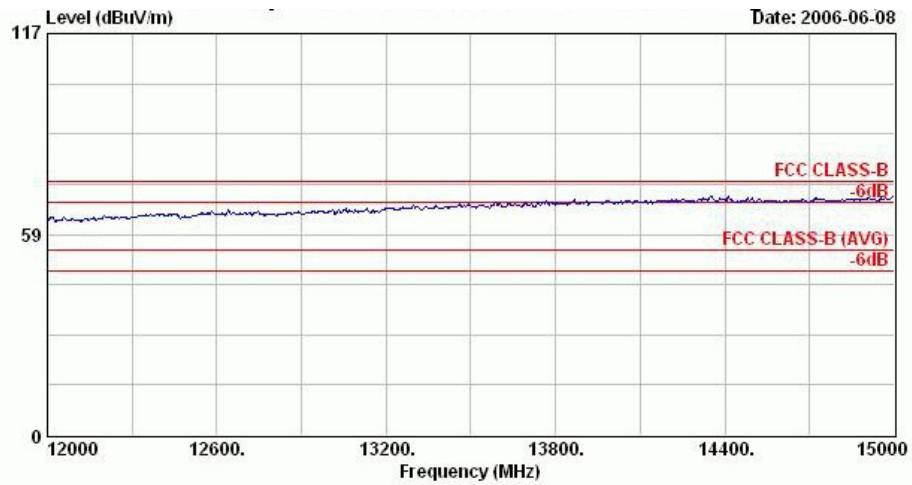
Remark: #3 and #4 Fundamental Signal



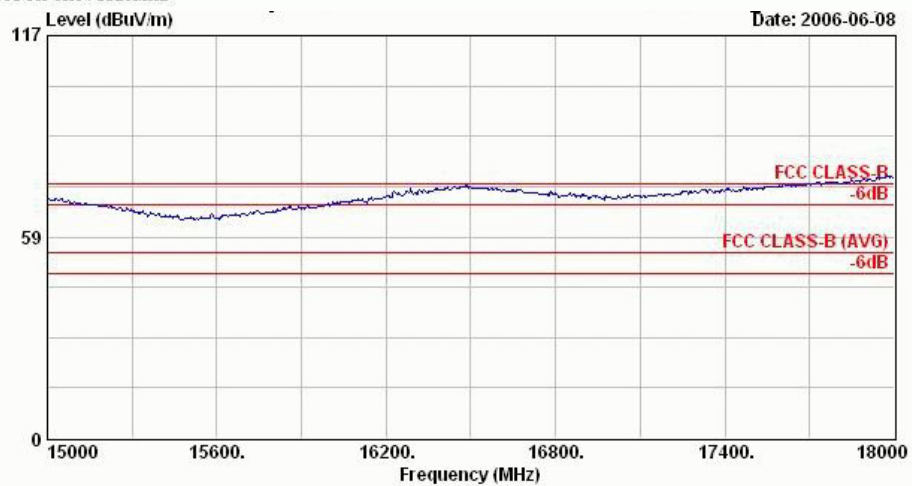
Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : VM(CPU type:ULV/dual core, LV/single
: core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH64 5320MHz



Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : VM(CPU type:ULV/dual core, LV/single
: core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH64 5320MHz



Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : VM(CPU type:ULV/dual core, LV/single
: core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH64 5320MHz

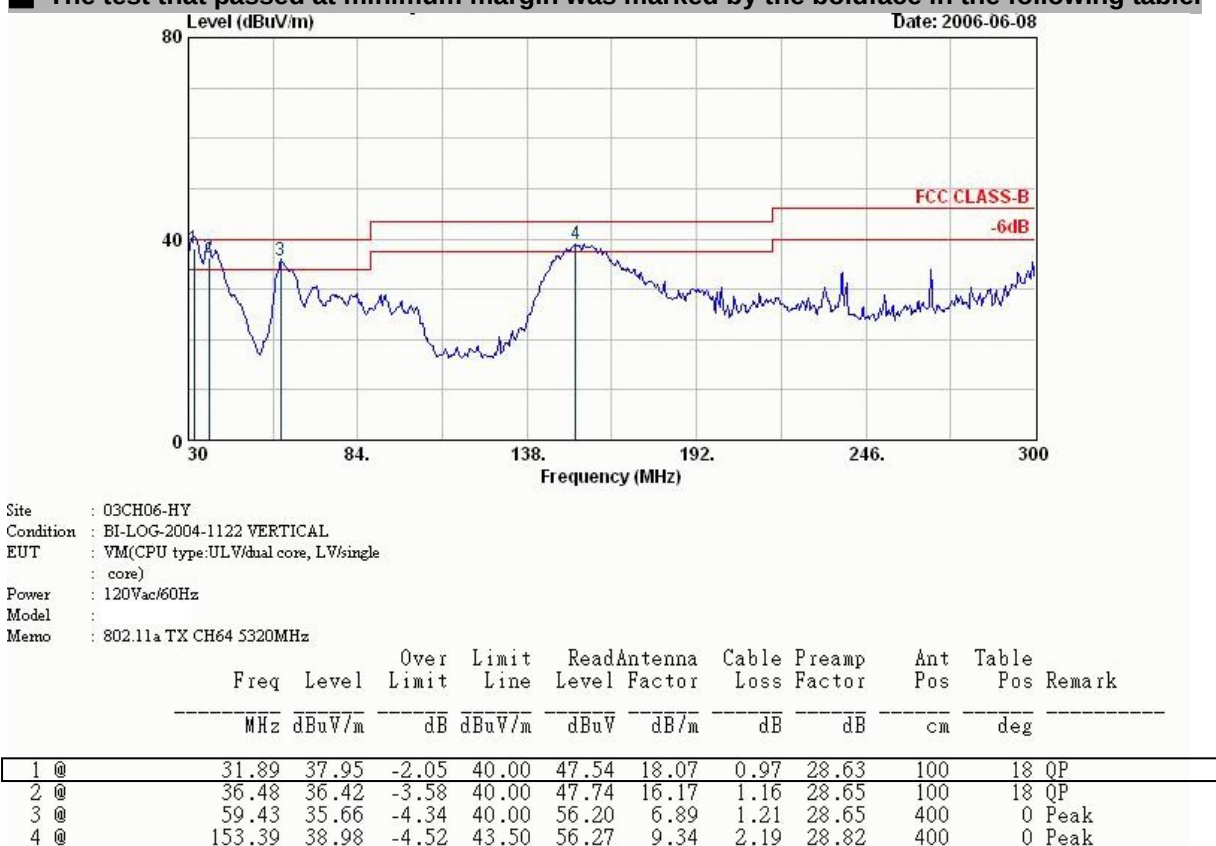


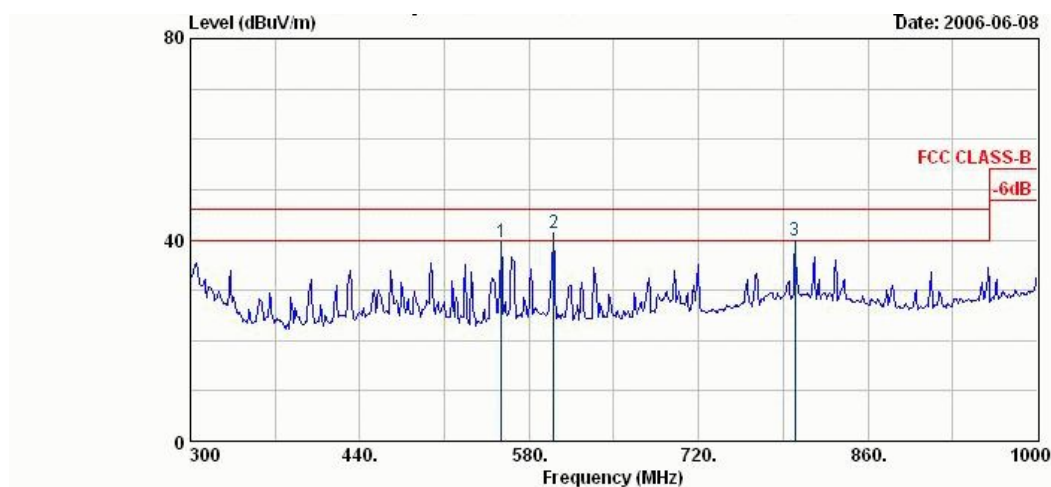
Site : 03CH06-HY
Condition : HF-ANT-060410 HORIZONTAL
EUT : VM(CPU type:ULV/dual core, LV/single
: core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH64 5320MHz

Remark: Frequency from 18GHz to 40GHz, the emission emitted by the EUT is too low to be measured.

- Polarization : Vertical

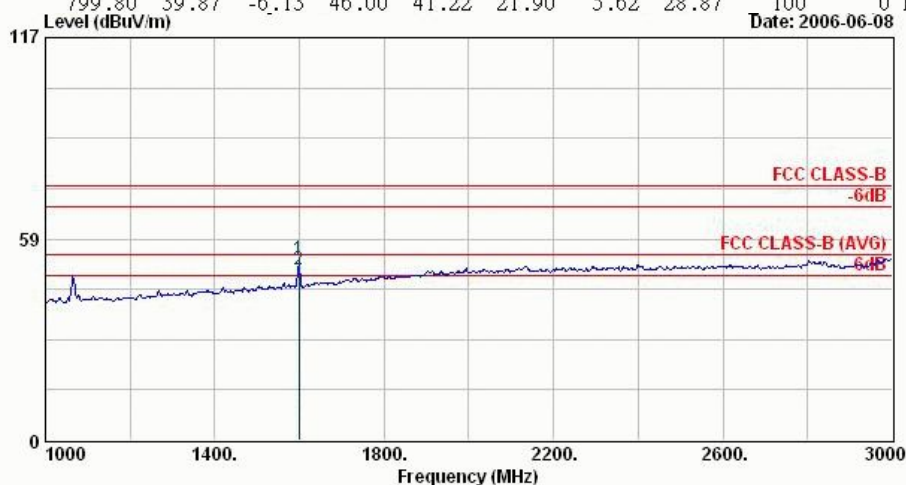
■ The test that passed at minimum margin was marked by the boldface in the following table.





Site : 03CH06-HY
Condition : BI-LOG-2004-1122 VERTICAL
EUT : VM(CPU type:ULV/dual core, LV/single core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH64 5320MHz

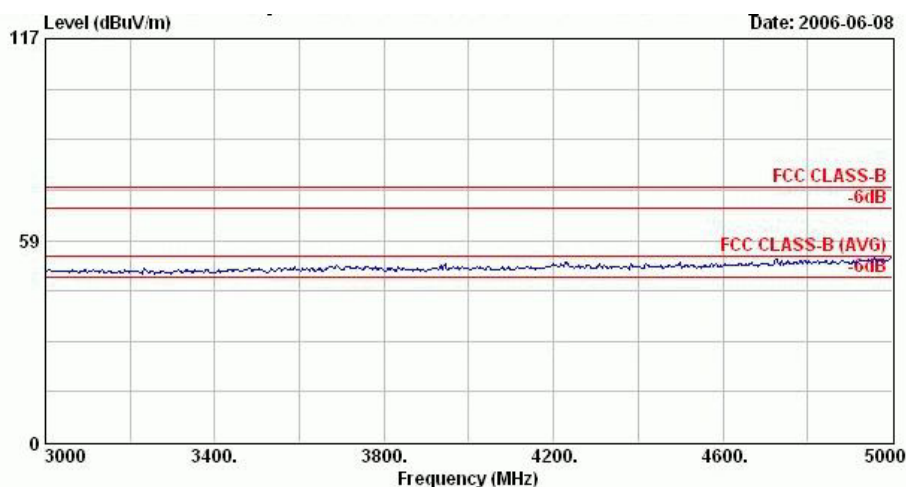
	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1 @	556.90	39.41	-6.59	46.00	45.52	18.59	4.36	29.06	100	0 Peak
2 @	600.30	41.30	-4.70	46.00	47.48	17.94	4.65	28.77	100	0 Peak
3 @	799.80	39.87	-6.13	46.00	41.22	21.90	5.62	28.87	100	0 Peak



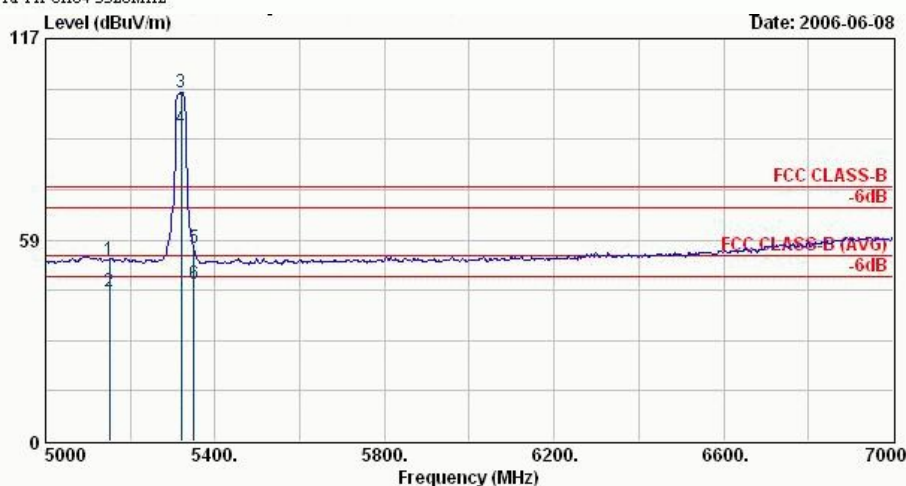
Site : 03CH06-HY
Condition : HF-ANT-060410 VERTICAL
EUT : VM(CPU type:ULV/dual core, LV/single core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH64 5320MHz

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Pos	Pos	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	cm	deg	
1 @	1598.00	52.79	-21.21	74.00	58.05	26.90	3.46	35.62	100	360 Peak
2 @	1598.00	49.64	-4.36	54.00	54.90	26.90	3.46	35.62	100	224 Average

Remark: Frequency from 9KHz to 30MHz, the emission emitted by the EUT is too low to be measured.



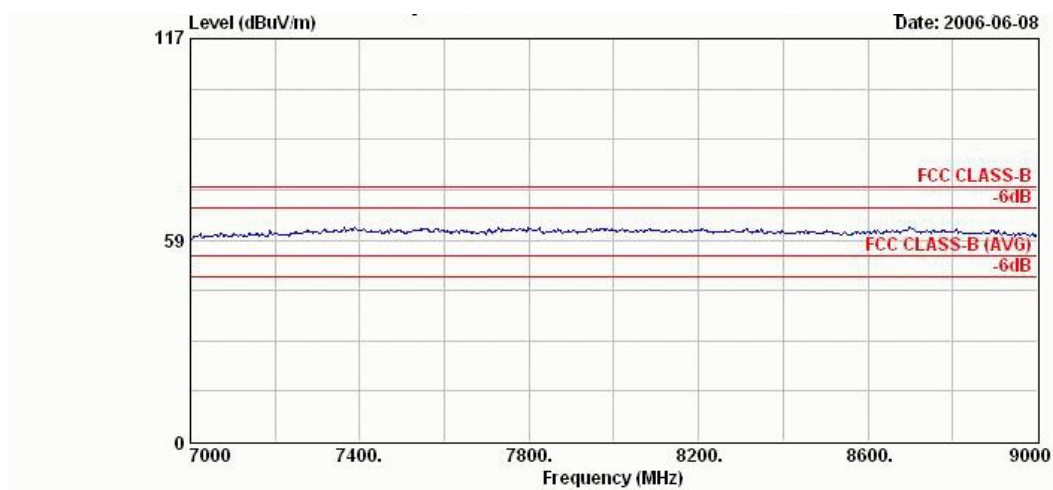
Site : 03CH06-HY
 Condition : HF-ANT-060410 VERTICAL
 EUT : VM(CPU type:ULV/dual core, LV/single core)
 Power : 120Vac/60Hz
 Model :
 Memo : 802.11a TX CH64 5320MHz



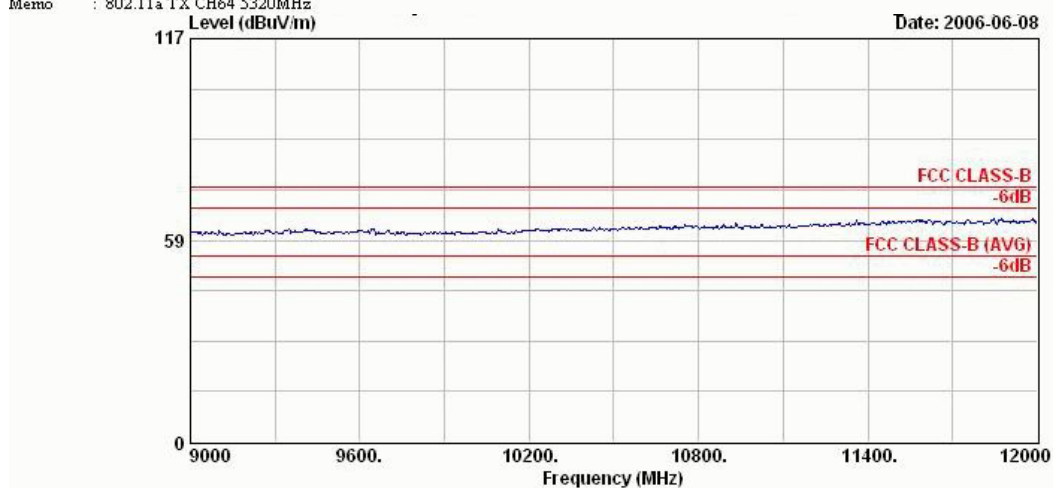
Site : 03CH06-HY
 Condition : HF-ANT-060410 VERTICAL
 EUT : VM(CPU type:ULV/dual core, LV/single core)
 Power : 120Vac/60Hz
 Model :
 Memo : 802.11a TX CH64 5320MHz

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 @	5150.00	52.82	-21.18	74.00	48.91	33.60	6.50	36.19	100	360	Peak
2 @	5150.00	43.48	-10.52	54.00	39.57	33.60	6.50	36.19	100	210	Average
3 @	5320.00			74.00	97.16	33.60	6.54	36.11	100	360	Peak
4 @	5320.00			54.00	86.79	33.60	6.54	36.11	100	210	Average
5 @	5350.00	55.97	-18.03	74.00	51.89	33.60	6.56	36.08	100	360	Peak

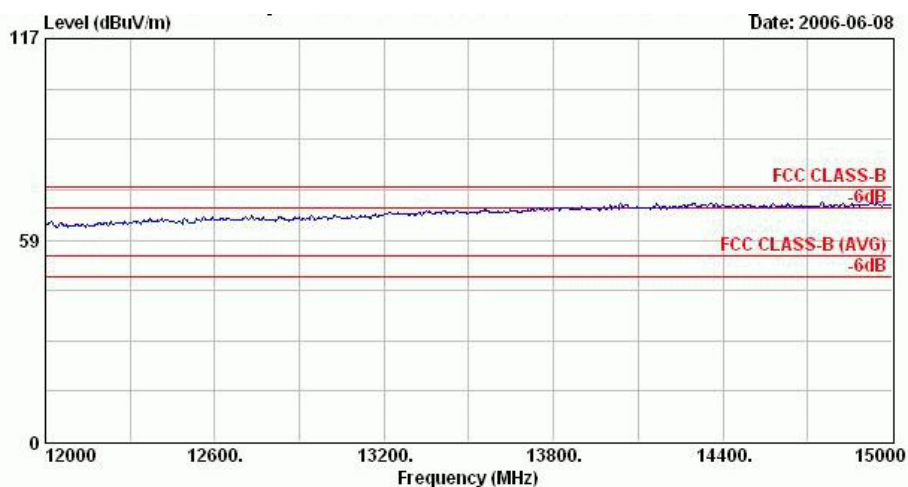
Remark: #3 and #4 Fundamental Signal



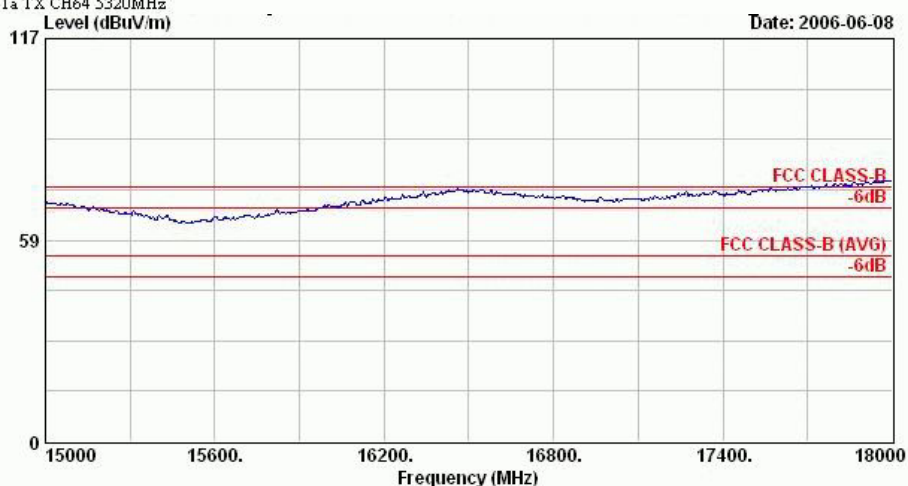
Site : 03CH06-HY
Condition : HF-ANT-060410 VERTICAL
EUT : VM(CPU type:ULV/dual core, LV/single core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH64 5320MHz



Site : 03CH06-HY
Condition : HF-ANT-060410 VERTICAL
EUT : VM(CPU type:ULV/dual core, LV/single core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH64 5320MHz



Site : 03CH06-HY
Condition : HF-ANT-060410 VERTICAL
EUT : VM(CPU type:ULV/dual core, LV/single
: core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH64 5320MHz



Site : 03CH06-HY
Condition : HF-ANT-060410 VERTICAL
EUT : VM(CPU type:ULV/dual core, LV/single
: core)
Power : 120Vac/60Hz
Model :
Memo : 802.11a TX CH64 5320MHz

Remark: Frequency from 18GHz to 40GHz, the emission emitted by the EUT is too low to be measured.

5.7 Band Edges Measurement

5.7.1 Measuring Instruments :

As described in chapter 6 of this test report.

5.7.2 Test Procedure :

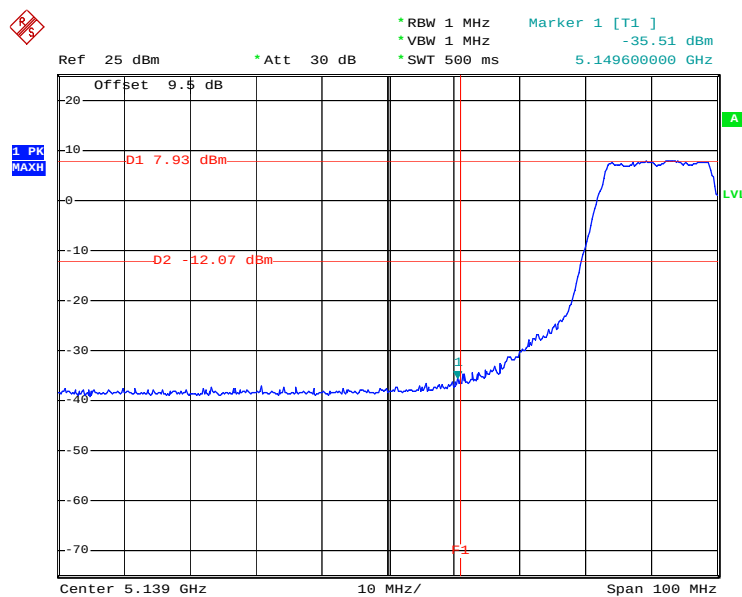
1. Set both RBW and VBW of spectrum analyzer to 1MHz with convenient frequency span including 1MHz bandwidth from band edge.
2. The band edges was measured and recorded.

5.7.3 Test Result :

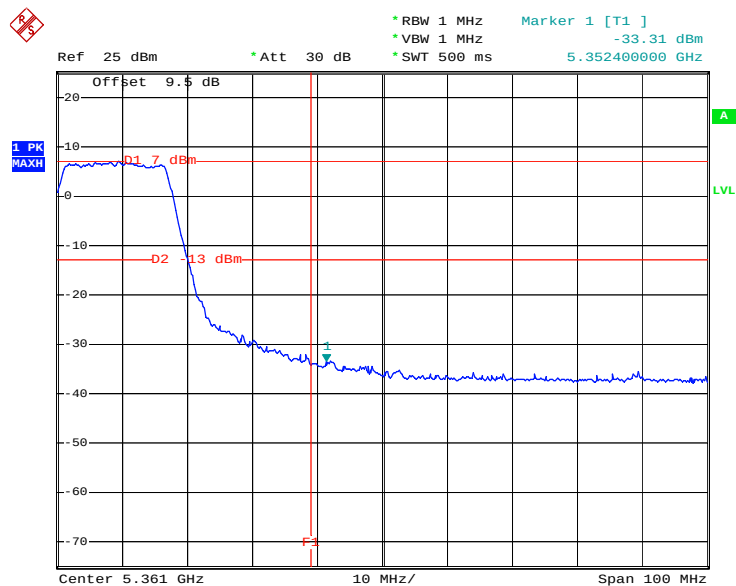
- Temperature : 26°C
- Relative Humidity :59%

Test Result Mode	Verdict
Test Result for 802.11a band II	PASS

5.7.4 Test Data



802.11a CH36



802.11a CH64

5.8 Peak Excursion Ratio Measurement

5.8.1 Measuring Instruments :

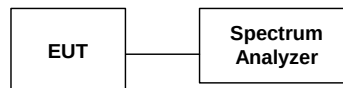
As described in chapter 6 of this test report.

5.8.2 Test Procedure :

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to and maintained at 1 MHz. The video bandwidth is set to 3 MHz. Trace A is set peak detector and to Max Hold, then to View. Then the detector is readjusted to sample detector, trace average 100 traces in power averaging mode, and the signal under this measurement condition is captured in Trace B in Accordance with the method 1 of DA-02-2138.

The difference between the traces is investigated. The marker is placed at the frequency which shows the largest difference. The amplitude delta between the traces at this frequency is the peak excursion.

5.8.3 Test Setup Layout :



5.8.4 Test Result :

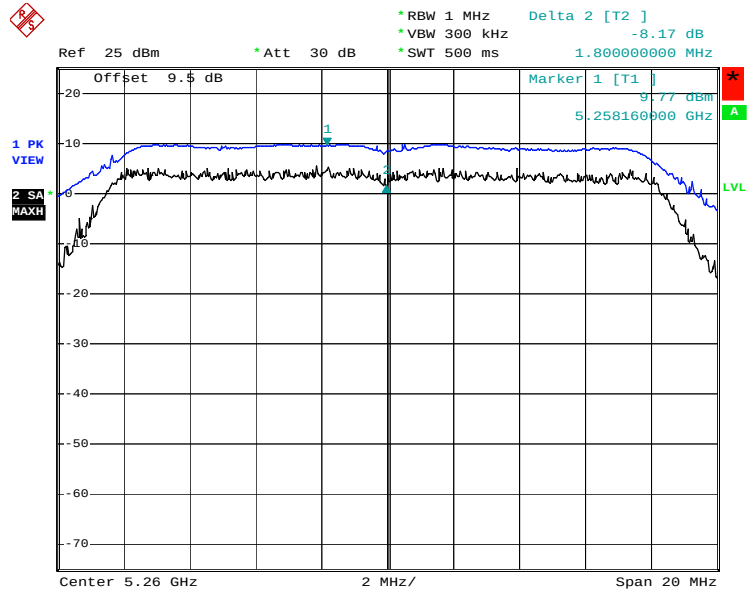
- Temperature : 26°C
- Relative Humidity :59%

➤ Application: 802.11a Normal mode

Channel	Frequency (MHz)	Peak Excursion (dB)	Limits (dB)	Mode Ref. No.
52	5260	-8.17	13	1
64	5320	-8.00	13	2

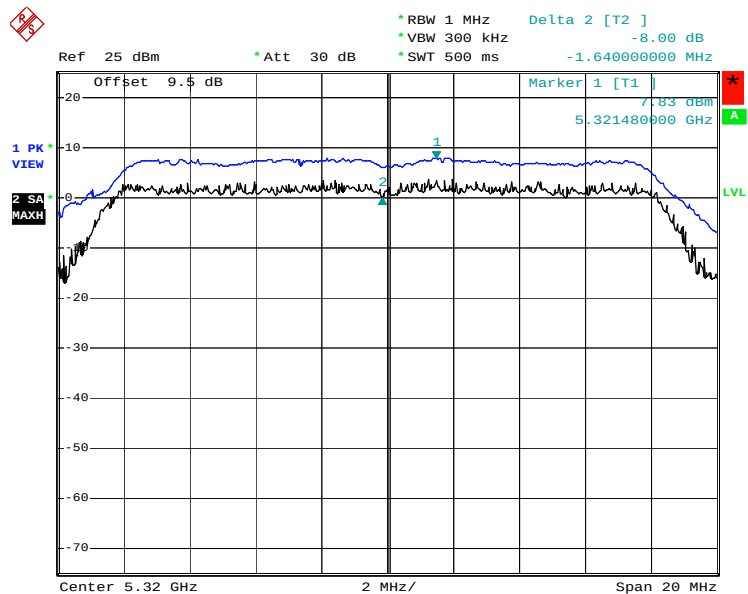
5.8.5 Test Data

1



Date: 5.MAY.2006 15:17:59

2



Date: 5.MAY.2006 17:24:28

5.9 Frequency Stability

To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.

The EUT was operated at the maximum output power, and connected to the spectrum analyzer which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

Normal mode

Frequency(MHz)	Low Frequency (Fl)	High Frequency (Fh)	Center Frequency (Fc)	Frequency Stability (ppm)
5260	5251.68	5268.32	5260	0
5320	5311.68	5328.32	5320	0

5.10 Automatically discontinue transmission

When there is not information transmission, the EUT can automatically discontinue transmission and become standby mode for power saving .The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission .

5.11 Antenna Requirements

The EUT meets antenna requirement of FCC for the following reasons.

5.11.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2), if transmitting antennas of directional gain greater than 6 dBi are used, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.11.2 Antenna Connected Construction

The antenna used in this product is PIFA for both WLAN and BT. The connector is I-PEX on antenna port and it is considered to meet antenna requirement of FCC.

6 List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
EMC Receiver	R&S	ESCS 30	100132	9kHz – 2.75GHz	Aug. 30, 2006	Aug. 29, 2007	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001/004	9kHz – 30MHz	Mar. 30, 2007	Mar. 29, 2008	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001/009	9kHz – 30MHz	Mar. 30, 2007	Mar. 29, 2008	Conduction (CO01-HY)
EMI Filter	LINDGREN	LRE-2060	1004	< 450Hz	N/A	N/A	Conduction (CO01-HY)
EMI Filter	LINDGREN	N6006	201052	0 – 60Hz	N/A	N/A	Conduction (CO01-HY)
RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9kHz – 30MHz	Dec. 04, 2006	Dec. 03, 2007	Conduction (CO01-HY)
Isolation Transformer	Erika Fiedler OHG	D-65396 Walluf	58	45MHz-2.15GHz	N/A	N/A	Conduction (CO01-HY)
Spectrum analyzer	Agilent	E4408B	MY44211030	9KHz-26.5GHz	Oct. 05, 2006	Oct. 04, 2007	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESCS30	100356	9KHz-2.75GHz	Jul. 26, 200	Jul. 25, 2008	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Nov. 20, 2006	Nov. 19, 2007	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Com-Power	AH118	071025	1G~18G	Jun. 04, 2007	Jun. 03, 2008	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-249	14G - 40G	Nov. 20, 2006	Nov. 19, 2008	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1G - 26.5G	Nov. 15, 2006	Nov. 14, 2007	Radiation (03CH06-HY)
Pre Amplifier	Mini Circuits	ZKL-2	D092004-1	10~2500MHz	Nov. 15, 2006	Nov. 14, 2007	Radiation (03CH06-HY)
Base Station Simulator	R & S	CMU200	106656	WCDMA	Nov. 20, 2006	Nov. 19, 2007	Radiation (03CH06-HY)
Controller	INN-CO	CO2000	N/A	N/A	N/A	N/A	Radiation (03CH06-HY)
Turn Table	INN-CO	DS2000	420/650/00	0 ~ 360 degree	N/A	N/A	Radiation (03CH06-HY)
Antenna Mast	INN-CO	MM3000	114/8000604/L	1 m - 4 m	N/A	N/A	Radiation (03CH06-HY)

7 Uncertainty of Test Site

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.10	Normal(k=2)	0.05
Cable loss	0.10	Normal(k=2)	0.05
AMN insertion loss	2.50	Rectangular	0.63
Receiver Spec	1.50	Rectangular	0.43
Site imperfection	1.39	Rectangular	0.80
Mismatch	+0.34/-0.35	U-shape	0.24
combined standard uncertainty Uc(y)	1.13		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	2.26		

Uncertainty of Radiated Emission Measurement (30MHz ~ 1000MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.41	Normal(k=2)	0.21
Antenna factor calibration	0.83	Normal(k=2)	0.42
Cable loss calibration	0.25	Normal(k=2)	0.13
Pre Amplifier Gain calibration	0.27	Normal(k=2)	0.14
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.43	Rectangular	0.83
Mismatch	+0.39/-0.41	U-shaped	0.28
combined standard uncertainty Uc(y)	1.27		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	2.54		

Uncertainty of Radiated Emission Measurement (1GHz ~ 40GHz)

Contribution	Uncertainty of x_i		$u(x_i)$	C_i	$C_i * u(x_i)$
	dB	Probability Distribution			
Receiver reading	± 0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	± 1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	± 0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	± 2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	± 1.50	Rectangular	0.87	1	0.87
Site imperfection	± 2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20 \log(1 - \Gamma_1 \Gamma_2 \Gamma_3)$	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty Uc(y)	2.36				
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	4.72				