

FCC TEST REPORT

for

47 CFR Part 15 Subpart C

Equipment : PDA
Trade Name : Unitech
Model No. : PA970
FCC ID : HLEPA970
Filing Type : Certification
Applicant : Unitech Co., Ltd.
3F, No. 236, Shinsu 2nd Rd., Neihu Chiu, Taipei,
Taiwan 114, R.O.C.

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- The data shown in this test report were carried out on Jan. 04, 2005 at Sporton International Inc. LAB.

Daniel Lee 1/4/2005

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History of this test report

Original Report Issue Date: Jan. 06, 2004

☒ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description



1. General Description of Equipment under Test

1.1. Applicant

Unitech Co., Ltd.

3F, No. 236, Shinsu 2nd Rd., Neihu Chiu, Taipei, Taiwan 114, R.O.C.

1.2 Manufacturer

Askey Computer Corp.

10F, No. 119, CHIENKANG RD., CHUNG-HO, TAIPEI, TAIWAN, R.O.C.

1.3 Basic Description of Equipment under Test

Equipment : PDA
Trade Name : Unitech
Model No. : PA970
FCC ID : HLEPA970
Power Supply Type : Switching
AC Power Cord : AC 120V, Non-shielded ,1.2meter,2pin

1.4 Feature of Equipment under Test

Product Feature & Specification				
1. Type of Modulation	802.11b:CCK(11Mbps),DQPSK(5.5Mbps) DQPSK(2Mbps),DBPSK(1Mbps) BT: GFSK			
2. Number of Channels	802.11b: 11 Channels BT: 79 Channels			
3. Frequency Band	2.4GHz~2.4835GHz			
4. Carrier Frequency of each channel	802.11b: 2412MHz+(n-1)*5MHz, n=1~11 BT: 2402MHz+n*1MHz, n=0~78			
5. Channel Spacing	802.11b: 5MHz BT: 1MHz			
6. Maximum Output Power to Antenna (Normal Condition)	802.11b: 16.73 dBm BT: -2.17 dBm			
7. Type of Antenna Connector	I-PEX			
8. Antenna Type	PIFA			
9. Antenna Gain	0 dBi			
10. Function Type	Transmitter		Transceiver	V
11. Duty Cycle	N/A			
12. Basic function of product	With Wireless LAN and BT for data networking applications			



2 Test Configuration of Equipment under Test

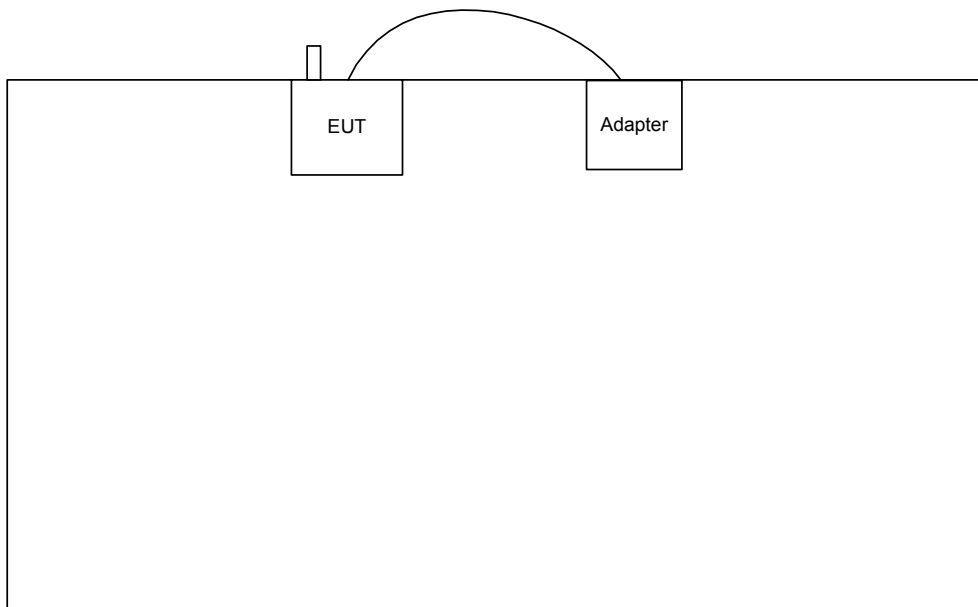
2.1 Test Manner

- a. 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.
- b. For spurious emission below 1GHz, only one channel of each application was tested because it is not related to channel selection.
- c. The EUT is programmed to transmit signal continuously for all testings.
- d. Frequency range investigated: conduction 150 kHz to 30 MHz, radiation 30 MHz to 25000MHz.
- e. The co-location for WLAN and BT was checked for Radiated Emission.

2.2 Test Mode

Application	802.11b	BT
Radiated Emission	Mode 1: Tx_CH01_2412 MHz Mode 2: Tx_CH06_2437 MHz Mode 3: Tx_CH11_2462 MHz	Mode 4: Tx_CH00_2402 MHz Mode 5: Tx_CH39_2441 MHz Mode 6: Tx_CH78_2480 MHz
	Mode 7: WLAN CH06 2437 MHz + Bluetooth CH00 2402 MHz	
Conducted Emission	Mode 1: PCS1900 Idle + WLAN + ACTIVESYNC	Mode 2: PCS1900 Idle + Bluetooth+ ACTIVESYNC

2.3 Connection Diagram of Test System



2.4 Ancillary Equipment List

N/A



3. RF Utility

The programmed RF Utility is either installed in EUT or Notebook to provide channel selection, power level, data rate and the application type. RF Utility can send transmitting signal for all testings.



4. General Information of Test

Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park,
Kwei-Shan Hsiang, 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

120V/ 60Hz

4.2 Standard for Methods of Measurement

ANSI C63.4-2003

4.3 Test in Compliance with

47 CFR Part 15 Subpart C

4.4 Frequency Range Investigated

- a. Conduction: from 150 kHz to 30 MHz
- b. Radiation: from 30 MHz to 25000 MHz

4.5 Test Distance

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



5. Test Data and Test Result

5.1 List of Measurements and Examinations

The Emission Mode: Wireless LAN

FCC Rule	Description of Test	Result
15.207	Conducted Emission	Pass
15.247(a)(2)	6dB Bandwidth	Pass
15.247(b)	Maximum Peak Output Power	Pass
15.209(a)	Radiated Emission	Pass
15.247 (c)	100kHz Bandwidth of Frequency Band Edges	Pass
15.247(d)	Power Spectral Density	Pass
15.203 15.247(b)(4)	Antenna Requirement	Pass

**The Emission Mode: Bluetooth**

FCC Rule	Description of Test	Result
<u>15.247(a) (1)</u>	Hopping Channel Bandwidth	Pass
<u>15.247(a)(1)</u>	Hopping Channel Separation	Pass
<u>15.247(a)(1)(iii)</u>	Number of Hopping Frequency Used	Pass
<u>15.247(a)(1)(iii)</u>	Dwell Time of Each Frequency	Pass
<u>15.247(b) (1)</u>	Output Power	Pass
15.247(c)	100kHz Bandwidth of Frequency Band Edges	Pass
15.207	Conducted Emission	Pass
15.209	Radiated Emission	Pass
<u>15.203</u>	Antenna Requirement	Pass

5.2 6dB Bandwidth Measurement

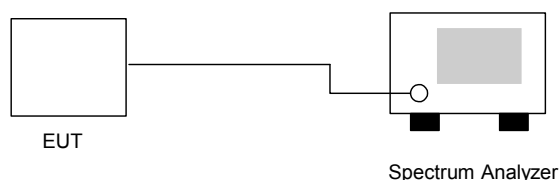
5.2.1 Measuring Instruments :

As described in chapter 6 of this test report.

5.2.2 Test Procedure :

1. The transmitter output was connected to the spectrum analyzer directly.
2. Set RBW of spectrum analyzer to 100kHz and VBW to 100kHz.
3. The 6 dB bandwidth is defined as the frequency range where the power is higher than the peak power minus 6dB.

5.2.3 Test Setup Layout :



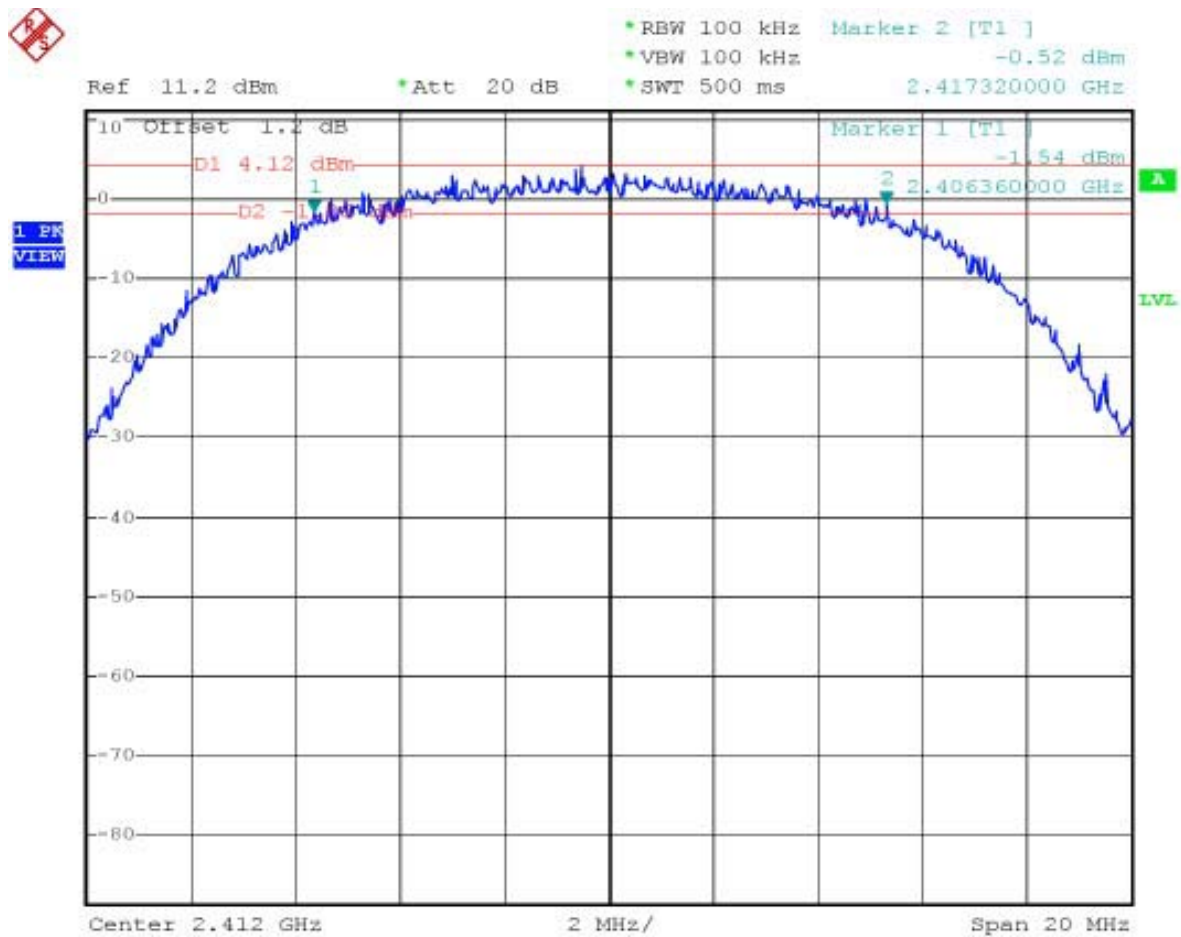
5.2.4 Test Result :

- Application Type : WLAN 802.11b
- Temperature : 24°C
- Relative Humidity : 47%
- Test Enginner : Jay

Channel	Frequency (MHz)	6dB Emission bandwidth (MHz)	Limits (MHz)	Plot Ref. No.
01	2412	10.96	0.5	Mode 1
06	2437	10.44	0.5	Mode 2
11	2462	10.88	0.5	Mode 3

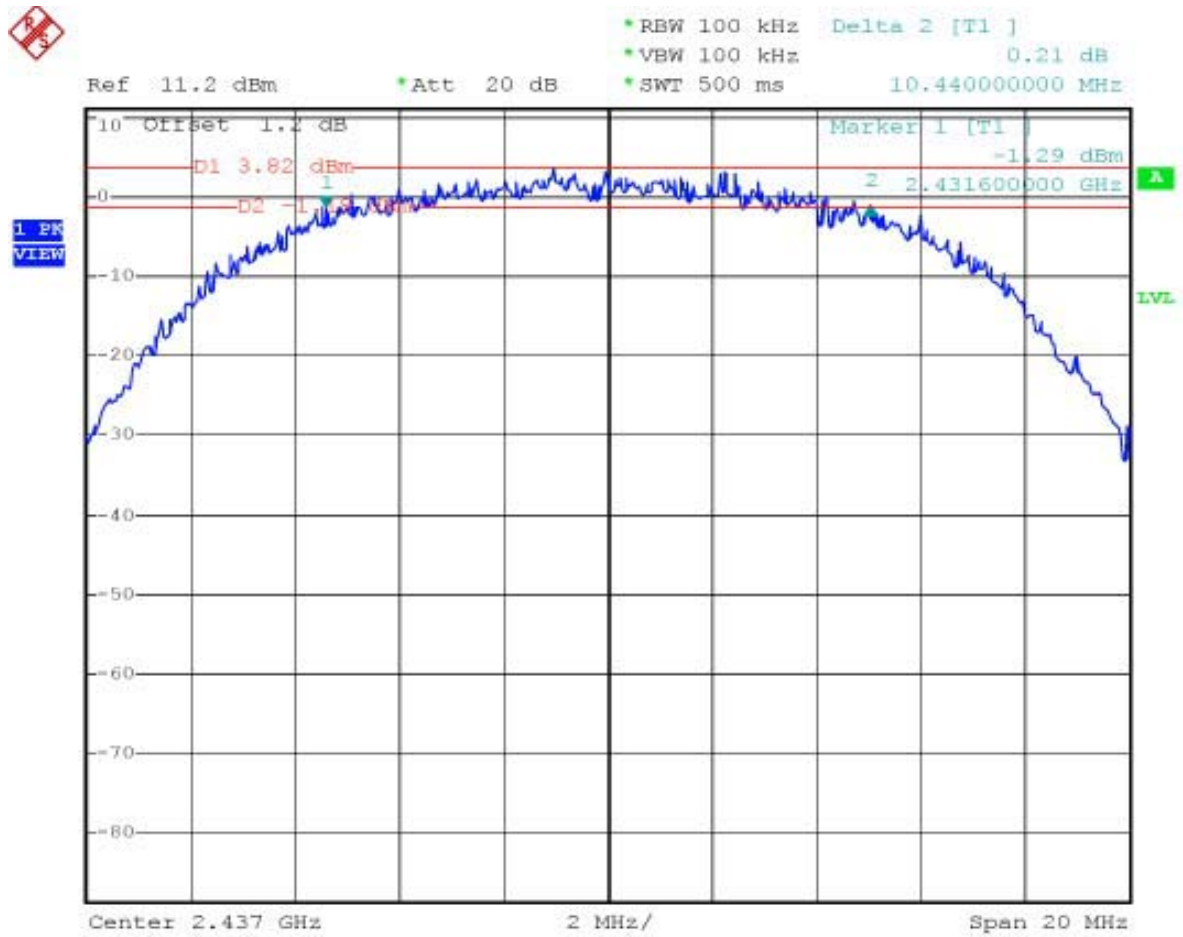
5.2.5 6dB Bandwidth

Mode 1



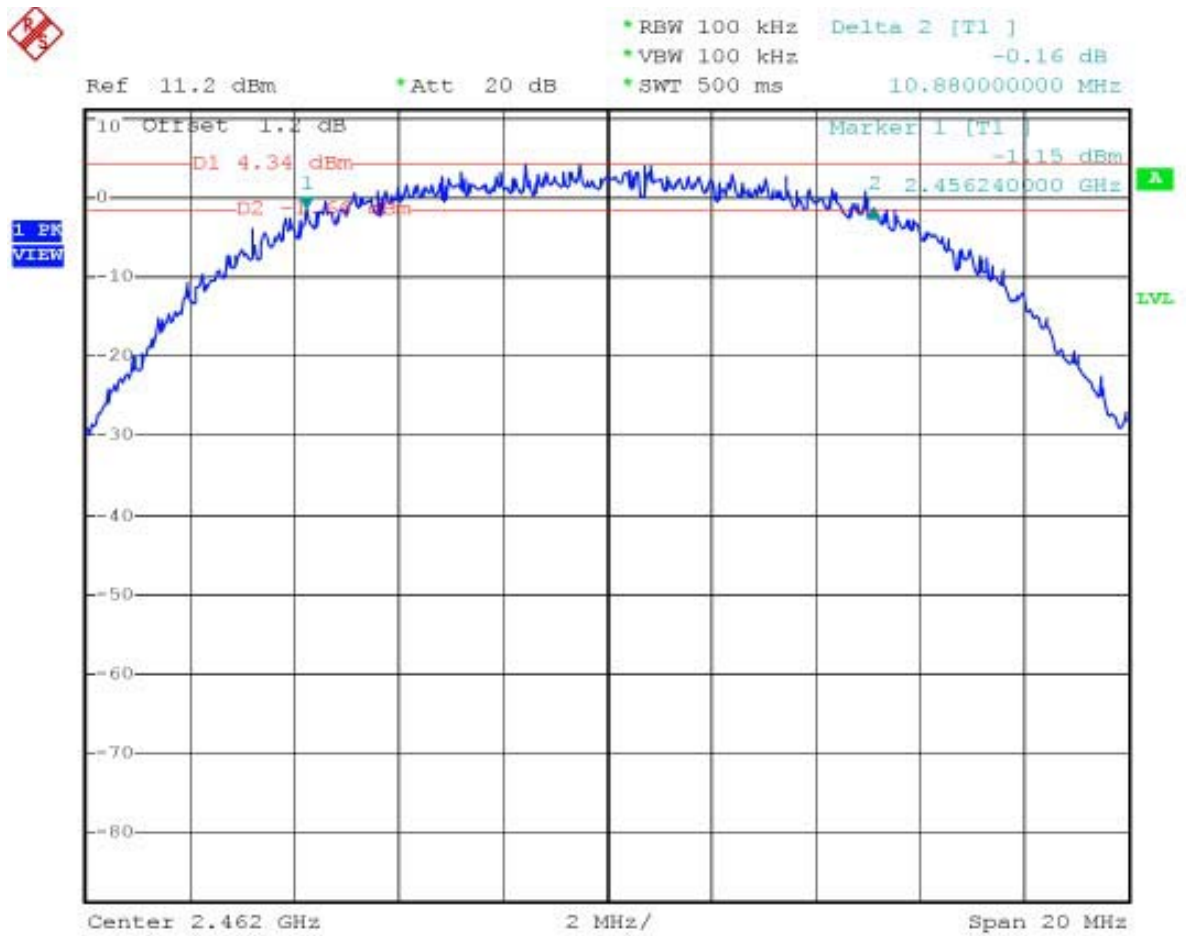


Mode 2





Mode 3



5.3 Power Spectral Density Measurement

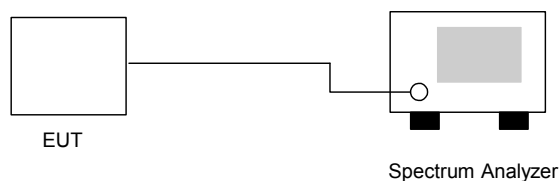
5.3.1 Measuring Instruments :

As described in chapter 6 of this test report.

5.3.2 Test Procedure :

1. The transmitter output was connected to spectrum analyzer directly.
2. The spectrum analyzer's resolution bandwidth was set at 3kHz RBW and 30kHz VBW as that of the fundamental frequency. Set the sweep time=span/3kHz.
3. The power spectral density was measured and recorded.
4. The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

5.3.3 Test Setup Layout :



5.3.4 Test Result :

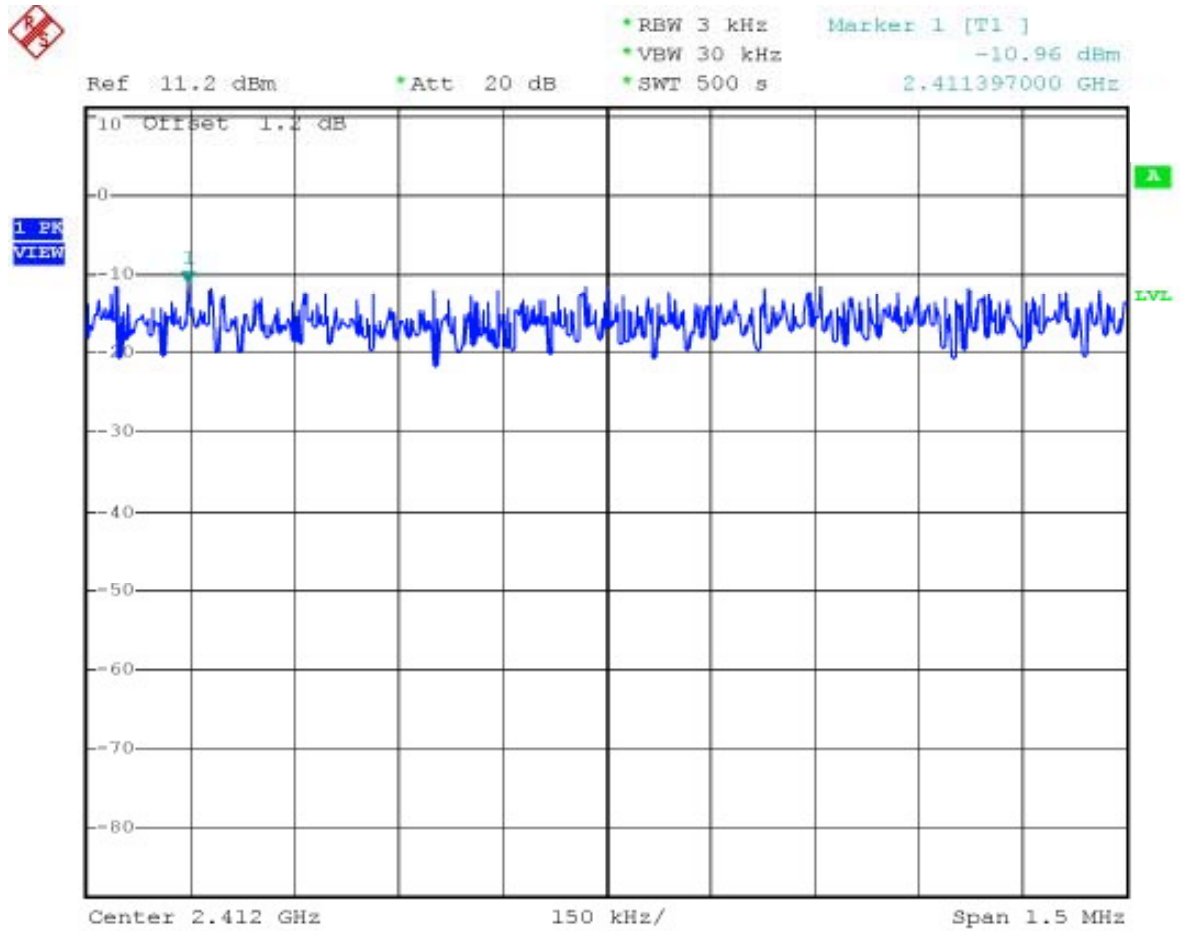
- Application Type : 802.11b
- Temperature : 24°C,
- Relative Humidity : 47%
- Test Enginner : Jay

Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limits (dBm)	Plot Ref. No.
01	2412	-10.96	8	Mode 1
06	2437	-11.57	8	Mode 2
11	2462	-9.13	8	Mode 3



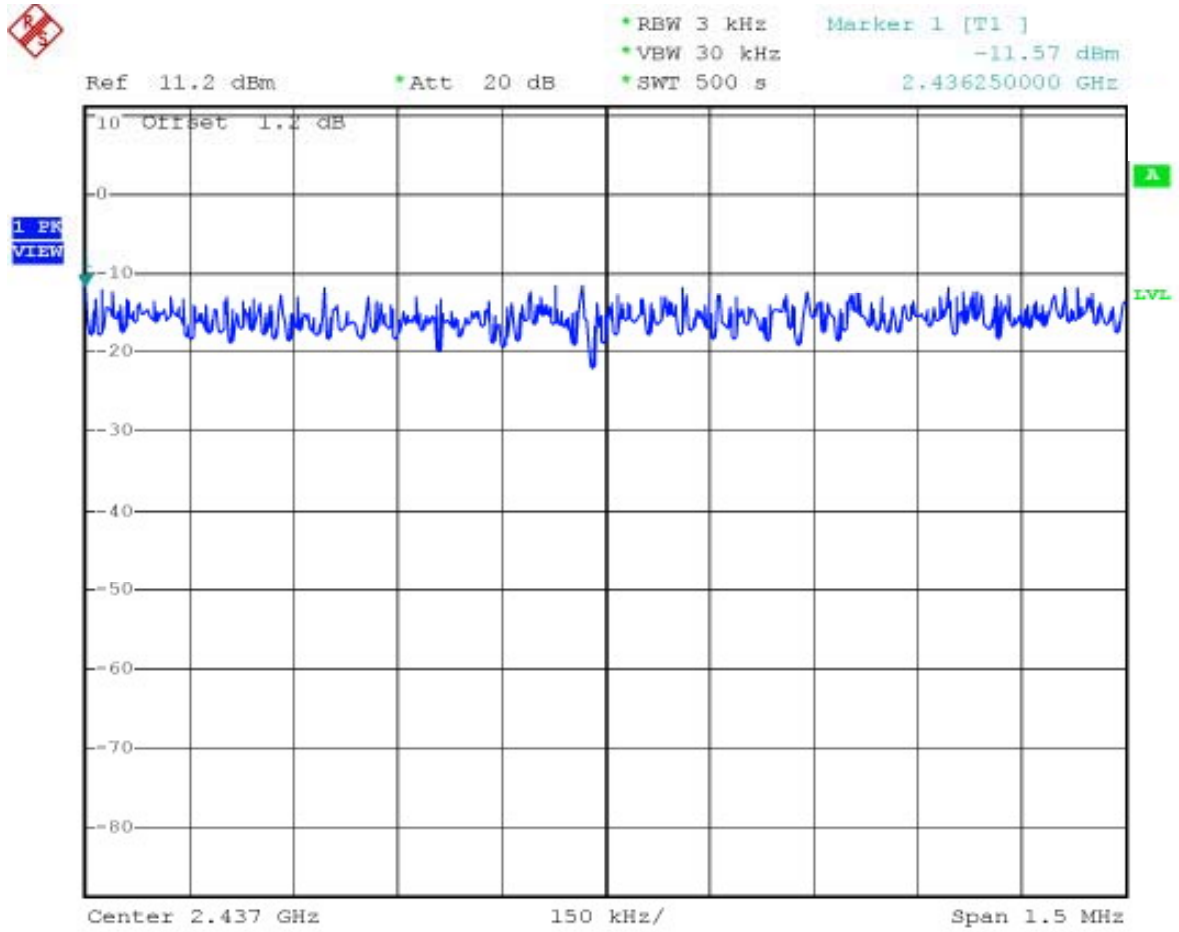
5.3.5 Power Spectral Density

Mode 1



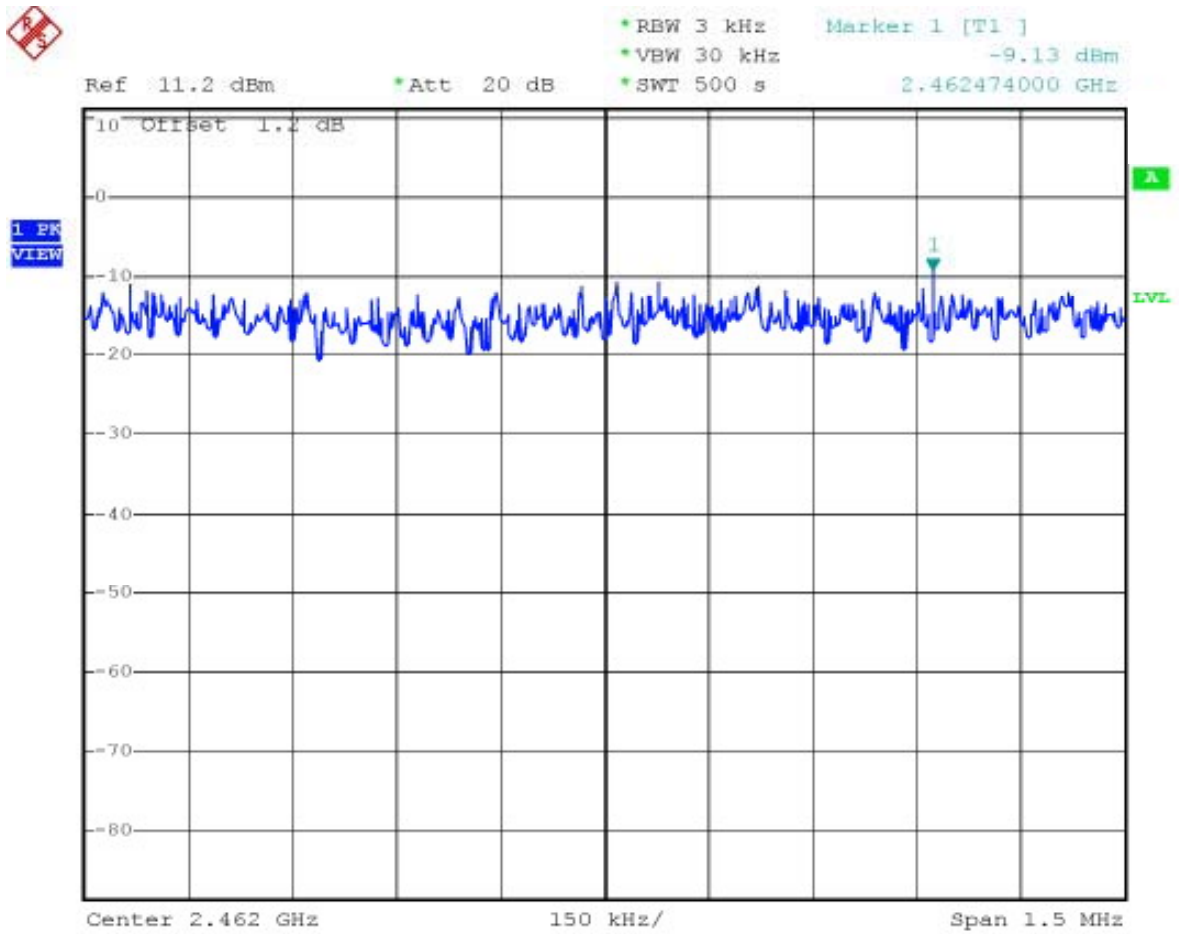


Mode 2





Mode 3



**5.4 Band Edges Measurement****5.4.1 Measuring Instruments :**

As described in chapter 6 of this test report.

5.4.2 Test Procedure :

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100 kHz bandwidth from band edge.
3. The band edges was measured and recorded.

5.4.3 Test Result :

- Application Type : WLAN 802.11b and BT
- Temperature : 24°C,
- Relative Humidity : 47%
- Test Enginner : Jay

- Test Result in WLAN lower band (Channel 1) : PASS
- Test Result in WLAN higher band (Channel 11) : PASS
- Test Result in BT lower band (Channel 00) : PASS
- Test Result in BT higher band (Channel 78) : PASS

5.4.4 Note on Band Edge Emission :**➤WLAN 802.11b****CH01 (Horizontal)**

Frequency	Level	Over	Limit	Read	Antenna	Preamp	Cable	Detect
(MHz)	(dBuV/m)	Limit	Line	Level	Factor	Factor	Loss	Mode
(dB)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	
2390.00	49.65	-24.35	74.00	53.18	28.40	35.25	3.32	Peak
2390.00	34.06	-19.94	54.00	37.59	28.40	35.25	3.32	Average

CH01 (Vertical)

Frequency	Level	Over	Limit	Read	Antenna	Preamp	Cable	Detect
(MHz)	(dBuV/m)	Limit	Line	Level	Factor	Factor	Loss	Mode
(dB)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	
2390.00	49.07	-24.93	74.00	52.60	28.40	35.25	3.32	Peak
2390.00	34.64	-19.36	54.00	38.17	28.40	35.25	3.32	Average

**CH11 (Horizontal)**

Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Detect
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	Mode
2483.50	45.08	-28.92	74.00	48.48	28.48	35.26	3.38	Peak
2483.50	34.99	-19.01	54.00	38.39	28.48	35.26	3.38	Average

CH11 (Vertical)

Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Detect
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	Mode
2484.00	44.29	-29.71	74.00	47.69	28.48	35.26	3.38	Peak
2484.00	34.20	-19.80	54.00	37.60	28.48	35.26	3.38	Average

➤BT**CH00 (Horizontal)**

Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Detect
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	Mode
2390.00	56.10	-17.90	74.00	59.63	28.40	35.25	3.32	Peak
2390.00	31.53	-22.47	54.00	35.06	28.40	35.25	3.32	Average

CH00 (Vertical)

Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Detect
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	Mode
2390.00	53.45	-20.55	74.00	56.98	28.40	35.25	3.32	Peak
2390.00	31.48	-22.52	54.00	35.01	28.40	35.25	3.32	Average

**CH78 (Horizontal)**

Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Detect
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	Mode
2483.5	68.27	-5.73	74.00	71.66	28.48	35.26	3.38	Peak
2483.5	46.94	-7.06	54.00	50.34	28.48	35.26	3.38	Average

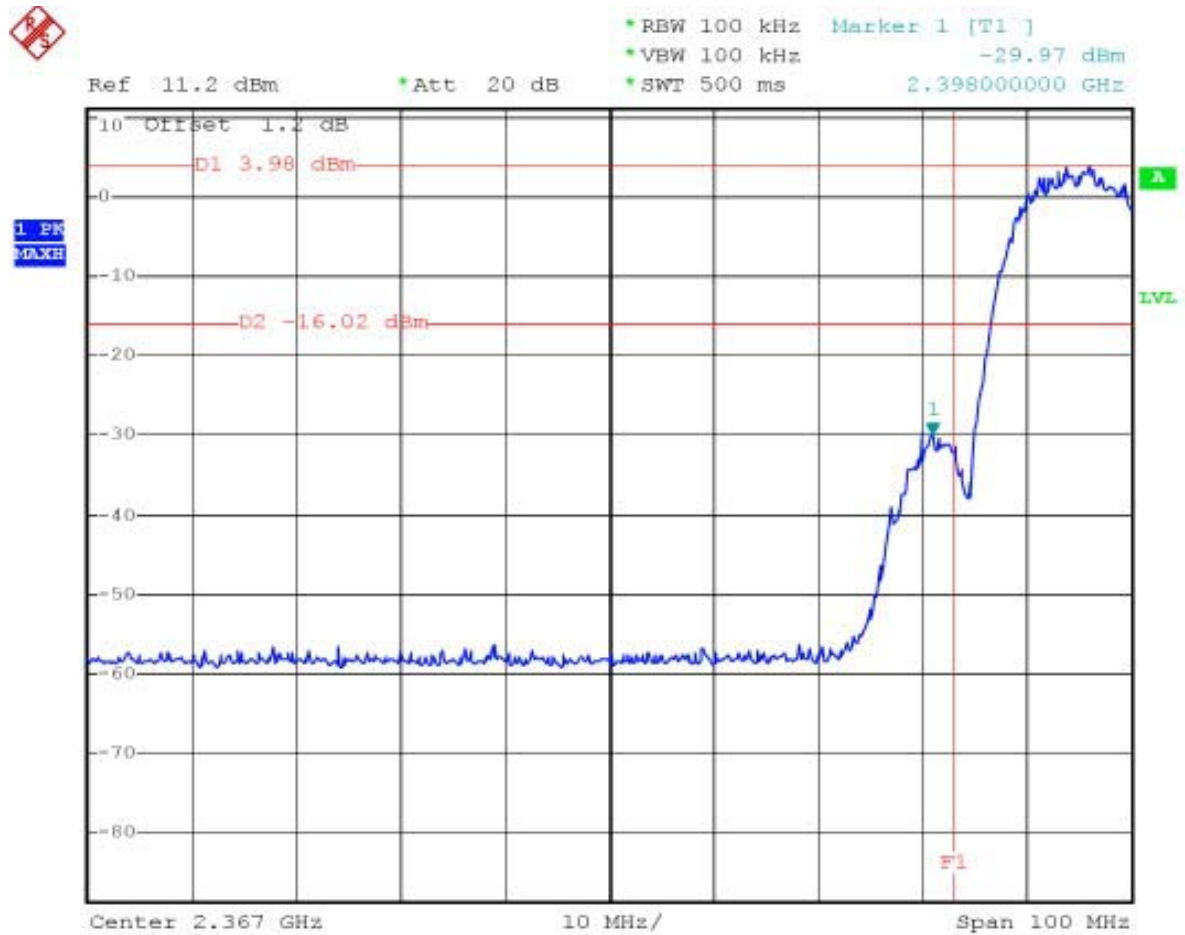
CH78 (Vertical)

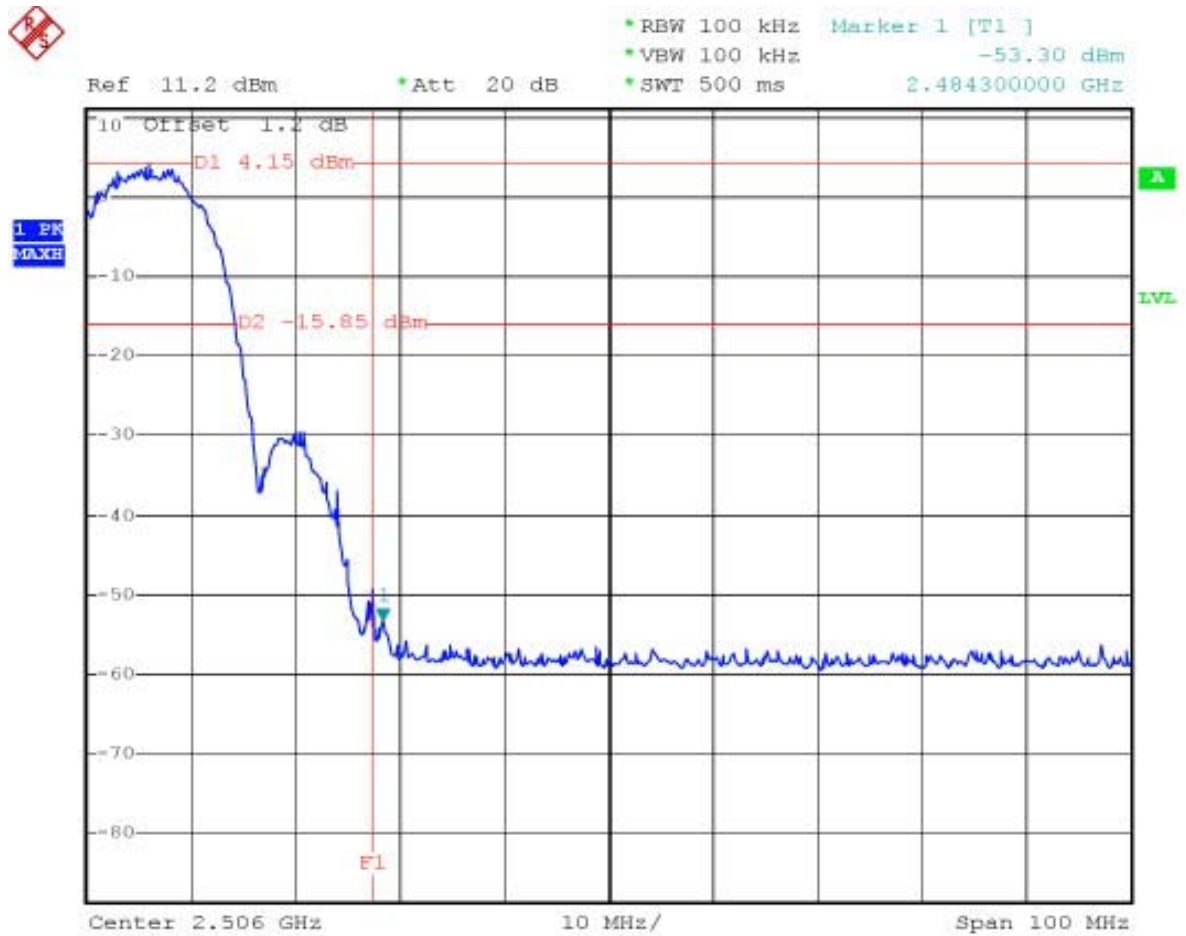
Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Detect
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV)	(dB)	(dB)	(dB)	Mode
2483.5	63.28	-10.72	74.00	66.68	28.48	35.26	3.38	Peak
2483.5	40.55	-13.45	54.00	43.95	28.48	35.26	3.38	Average



5.4.5 20dB Band Edge

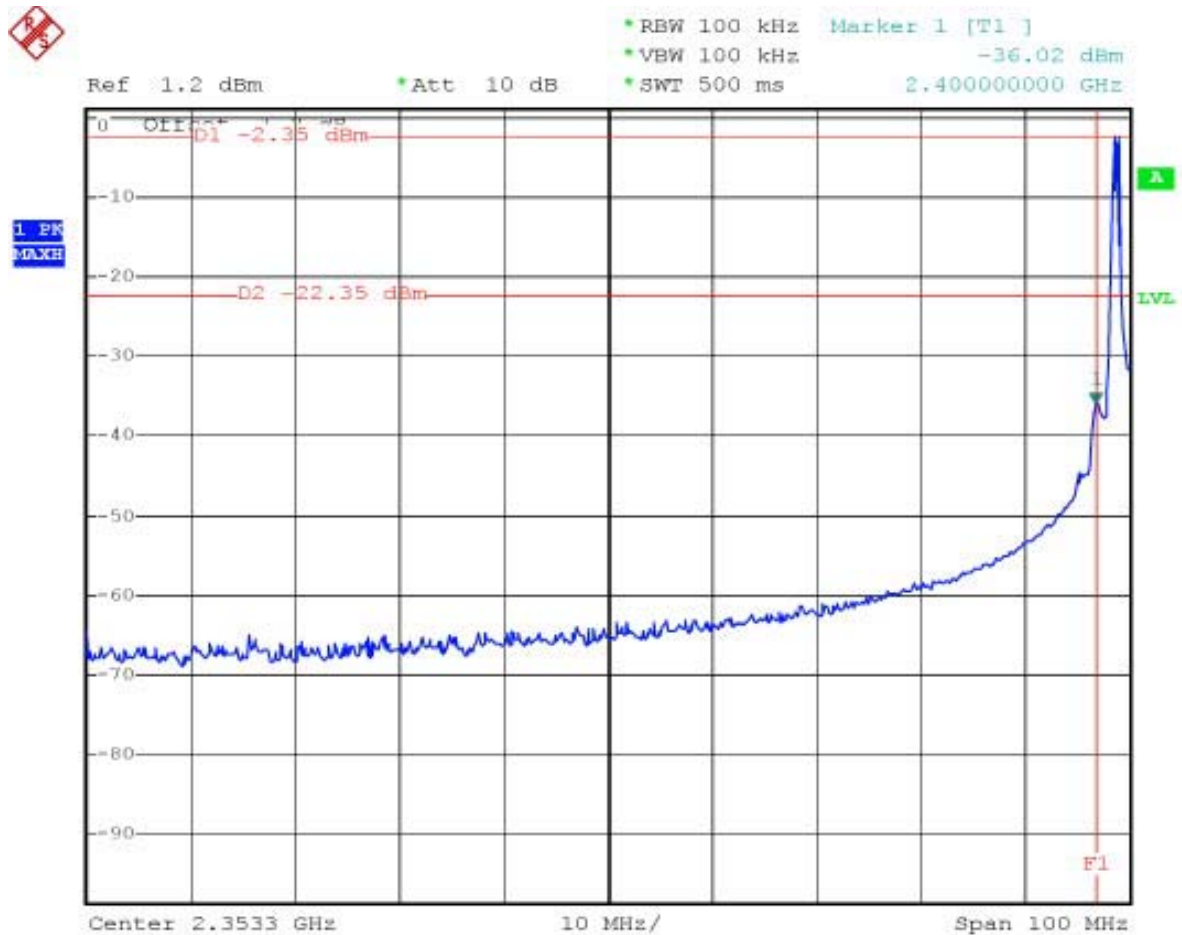
WLAN 802.11b:

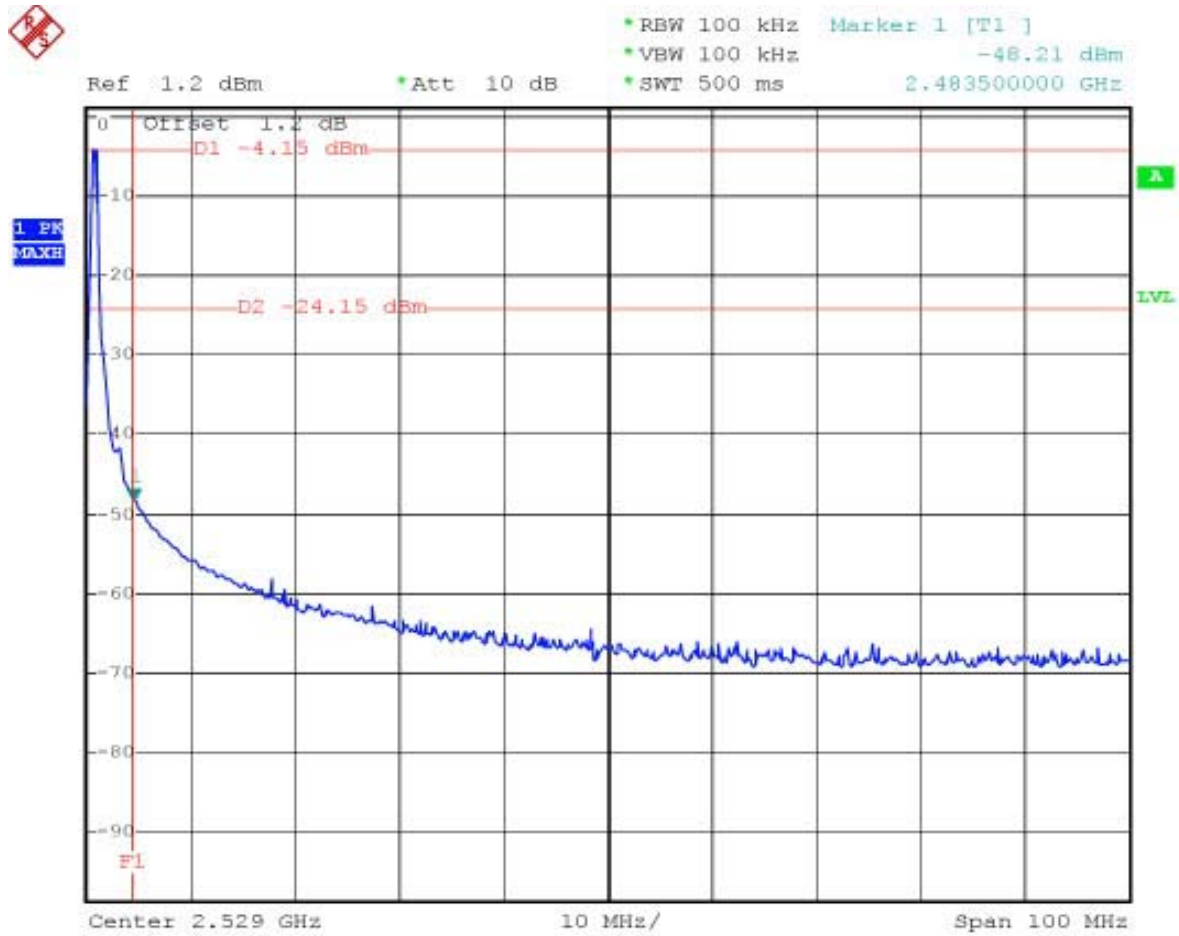






Bluetooth:





5.5 Hopping Channel Separation

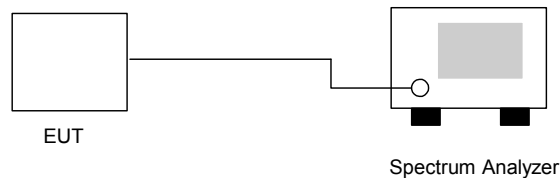
5.5.1 Measuring Instruments :

As described in chapter 9 of this test report.

5.5.2 Test Procedure :

1. The output of EUT was connected to the spectrum analyzer by a low loss cable..
2. Set RBW of spectrum analyzer to 100kHz and VBW to 100kHz.
3. The Hopping Channel Separation is defined as the channel is separated with the next channel.

5.5.3 Test Setup Layout :



5.5.4 Test Result : The spectrum analyzer plots are attached as below

- Application Type : BT
- Temperature : 24°C,
- Relative Humidity : 47%
- Test Enginner : Jay

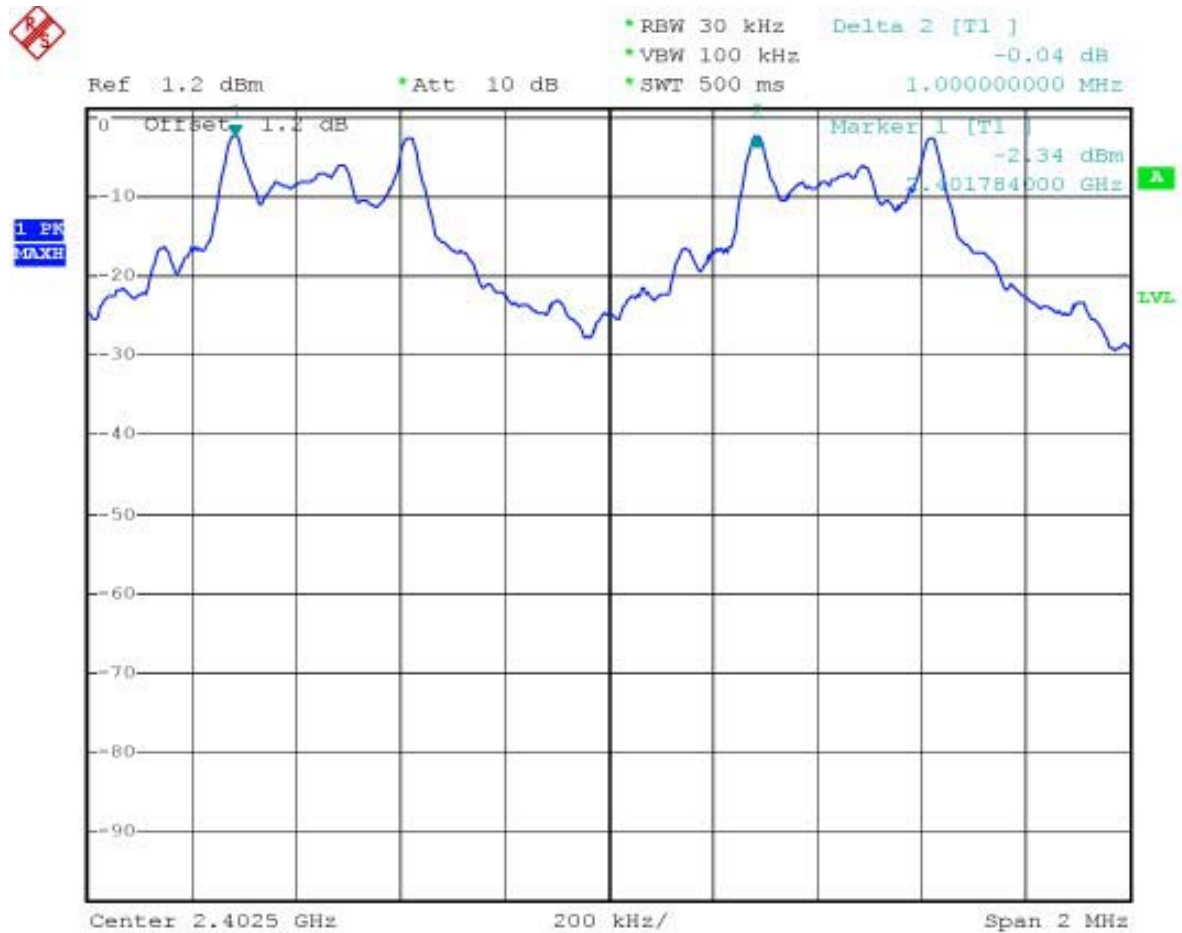
Channel	Carrier Frequency		Limits	Plot
	Frequency (MHz)	Separation (kHz)		
00	2402	1000	672kHz	Mode 1
39	2441	1000	724kHz	Mode 2
78	2480	1000	716kHz	Mode 3

Note: Limits =25kHz or the 20dB bandwidth of the hopping channel, which ever is greater



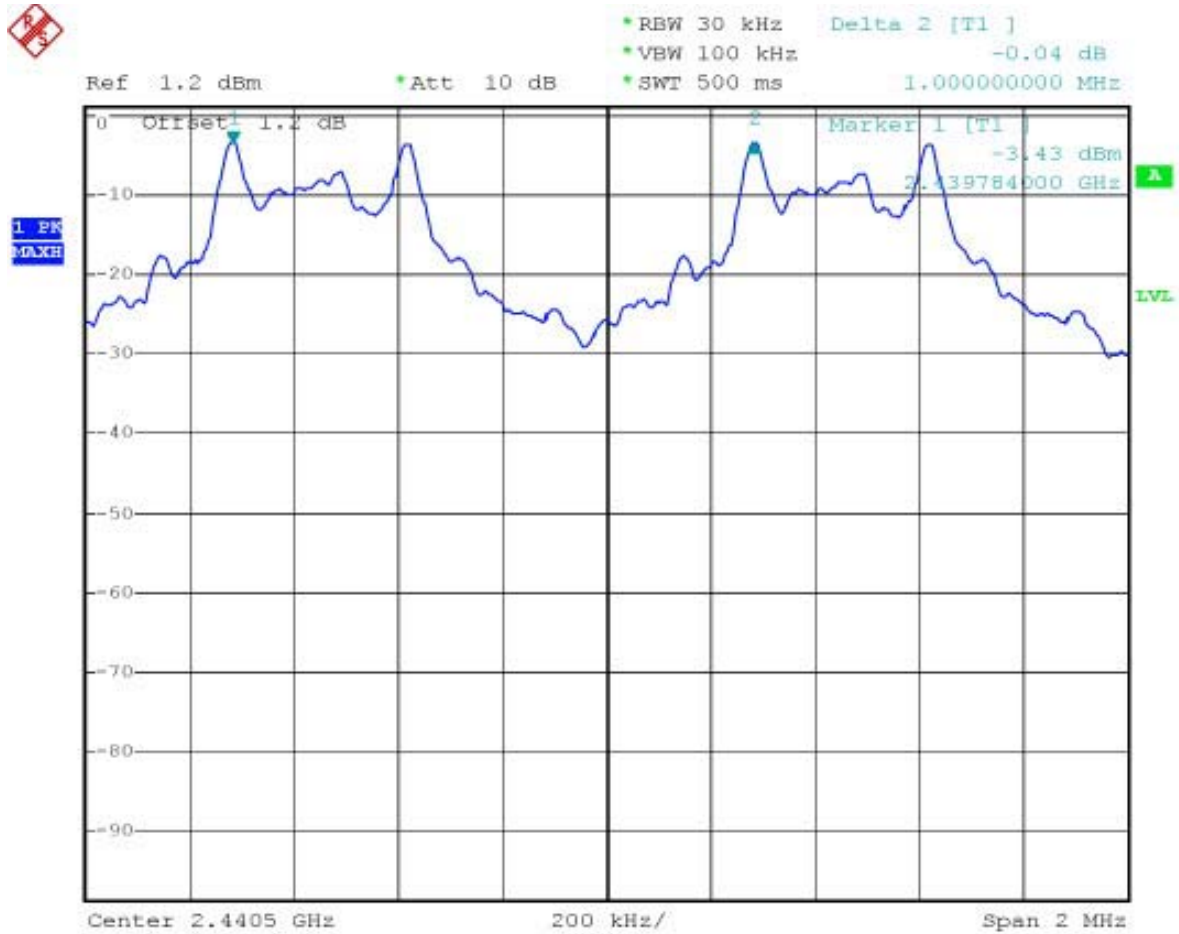
5.5.5 Hopping Channel Separation

Mode 1



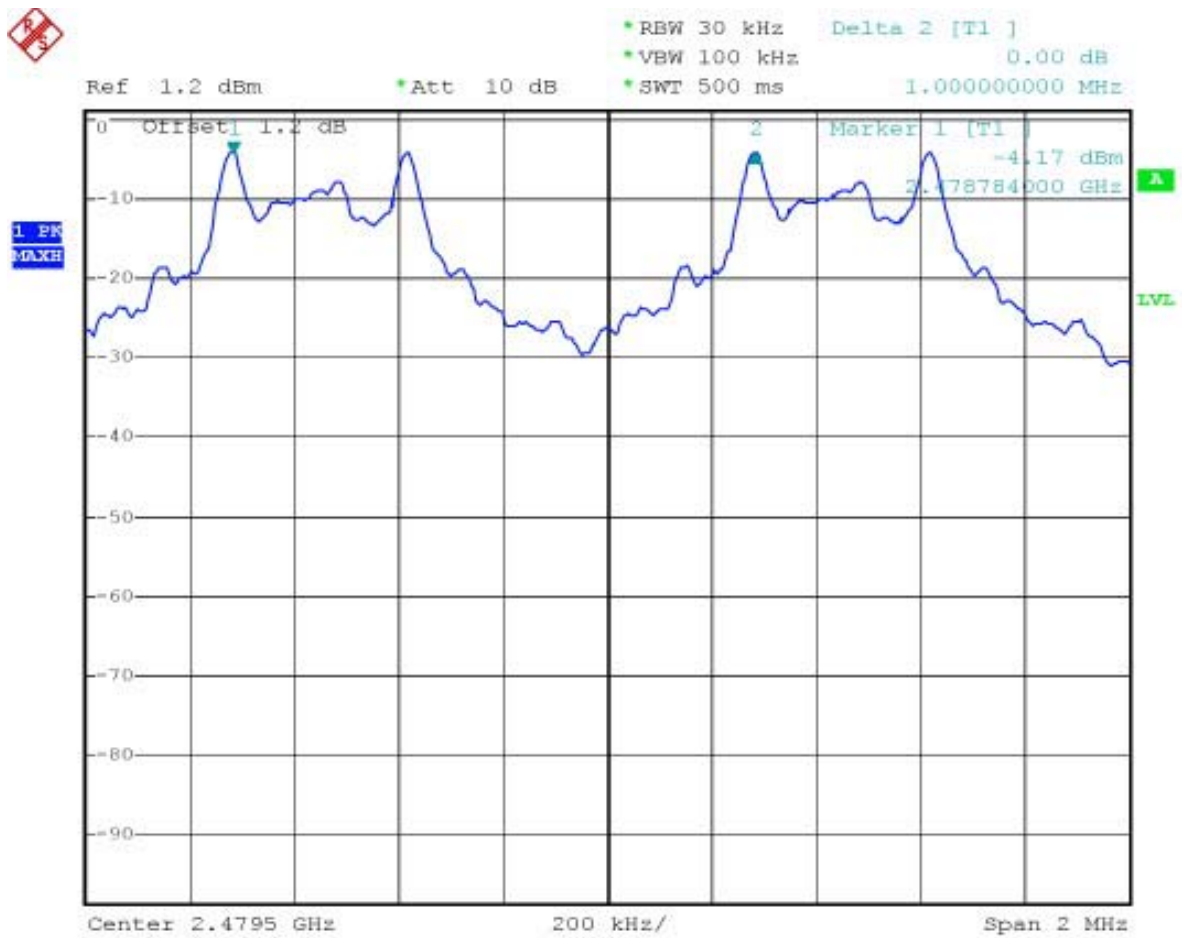


Mode 2





Mode 3



5.6 Number of Hopping Frequency

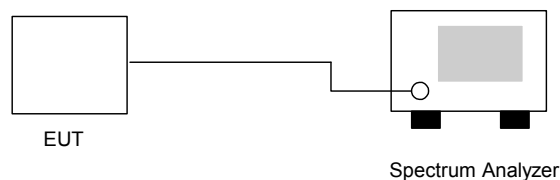
5.6.1 Measuring Instruments :

As described in chapter 9 of this test report.

5.6.2 Test Procedure :

1. The output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Set RBW of spectrum analyzer to 100kHz and VBW to 100kHz.
3. The number of hopping frequency used is defined as the device has the numbers of total channel.

5.6.3 Test Setup Layout :



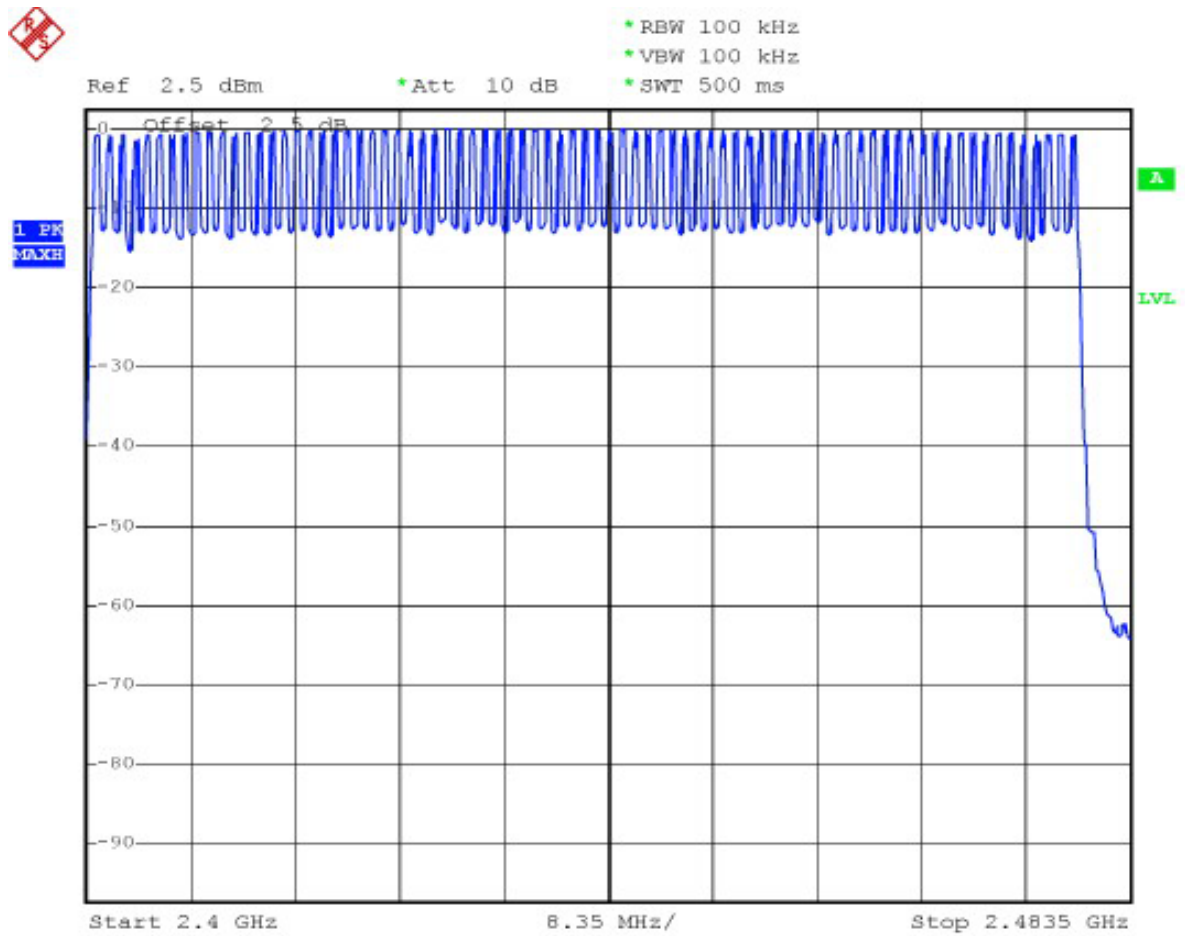
5.6.4 Test Result : See spectrum analyzer plots below

- Application Type : BT
 - Temperature : 24°C,
 - Relative Humidity : 47%
- Test Enginner : Jay

Number of Hopping Frequency (Channel)	Limits (Channel)
79	75



5.6.5 Number of Hopping Frequency



5.7 Hopping Channel Bandwidth

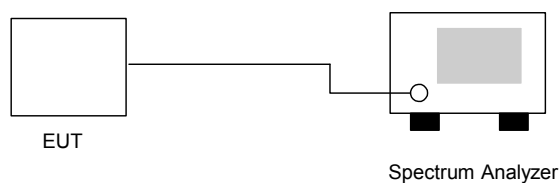
5.7.1 Measuring Instruments :

As described in chapter 9 of this test report.

5.7.2 Test Procedure :

1. The transmitter output was connected to the spectrum analyzer by a low loss cable.
2. Set RBW of spectrum analyzer to 30kHz and VBW to 300kHz.
3. The Hopping Channel bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20 dB.

5.7.3 Test Setup Layout :



5.7.4 Test Result : See spectrum analyzer plots below

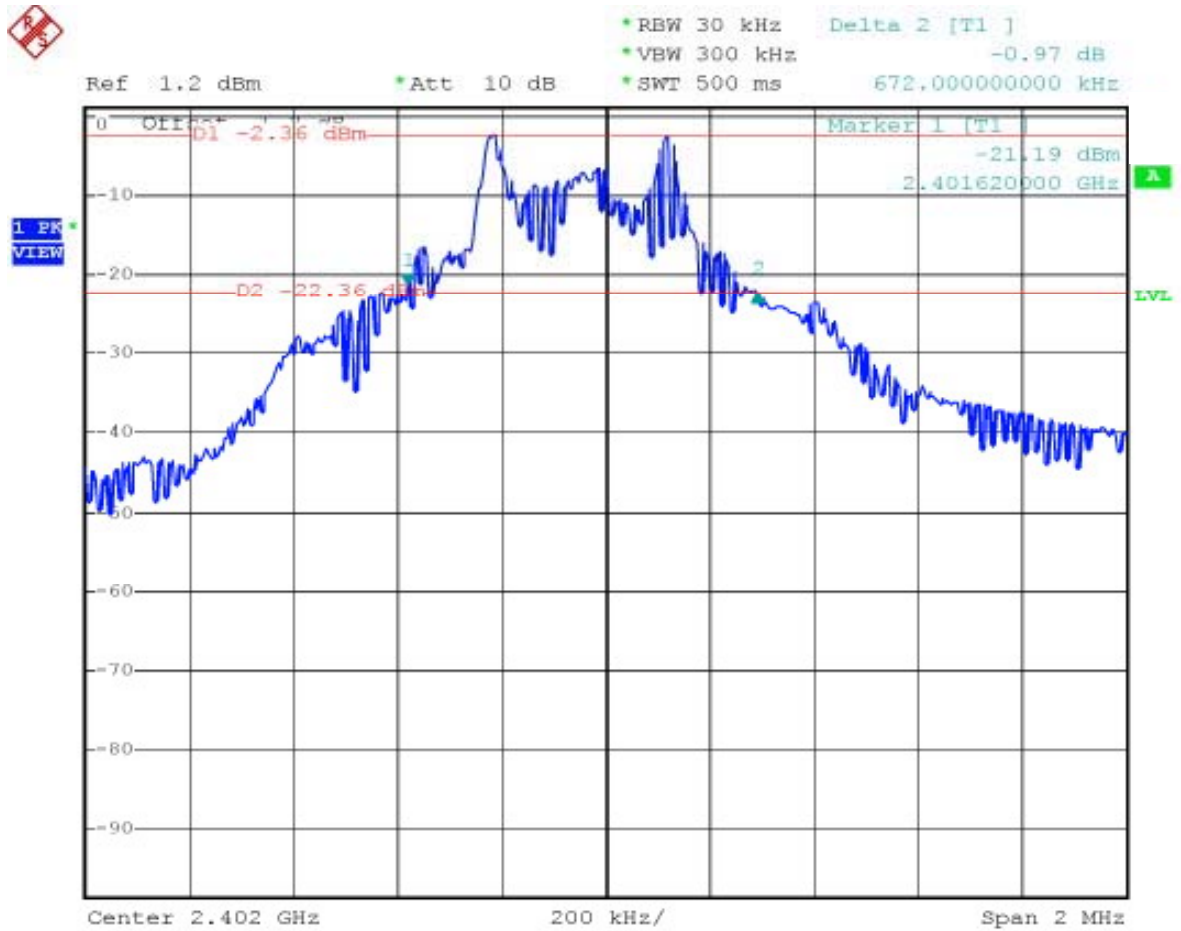
- Application Type : BT
- Temperature : 24°C,
- Relative Humidity : 47%
- Test Enginner : Jay

Channel	Frequency (MHz)	Hopping Channel Bandwidth (MHz)	Limits (MHz)	Plot Ref. No.
00	2402	0.672	1.0	Mode 1
39	2441	0.724	1.0	Mode 2
78	2480	0.716	1.0	Mode 3

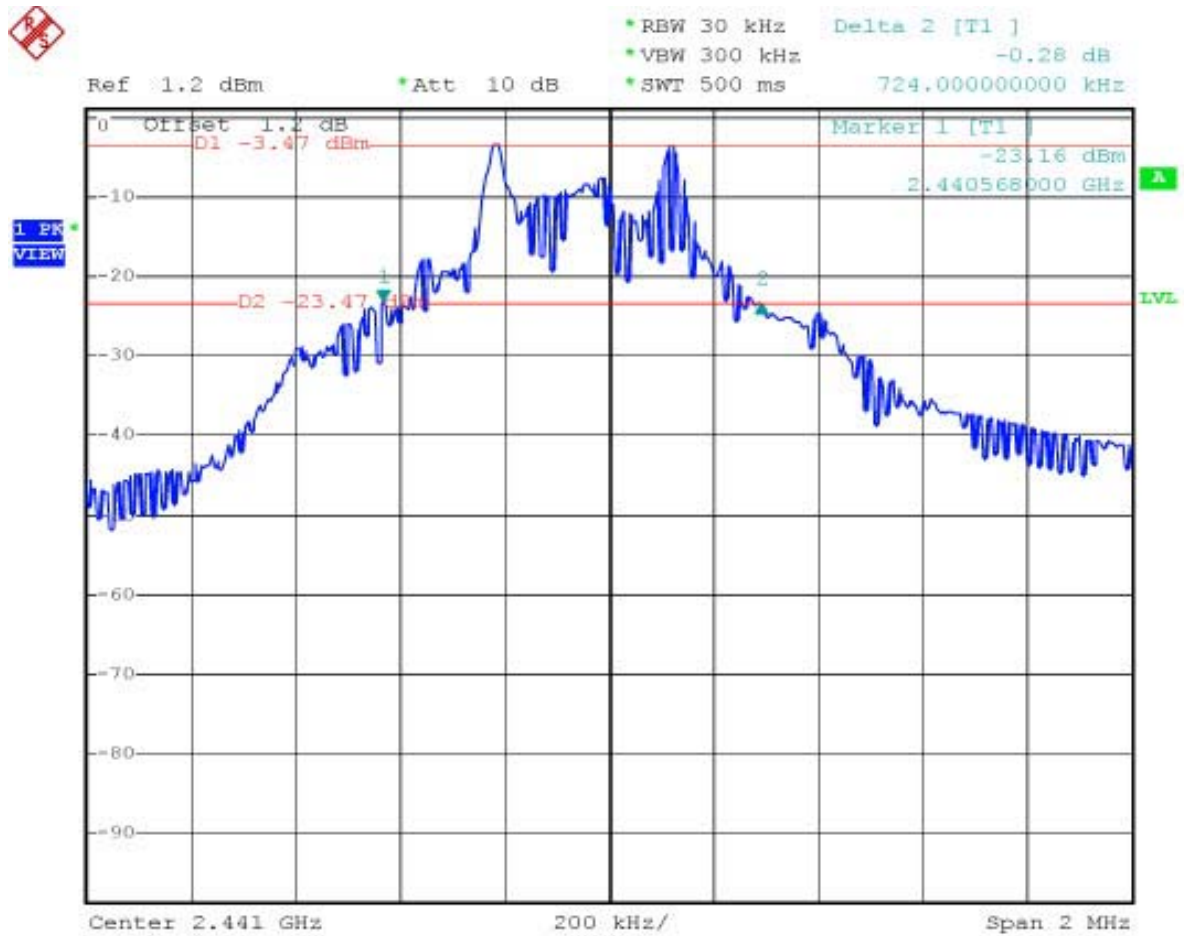


5.7.5 Hopping Channel Bandwidth

Mode 1

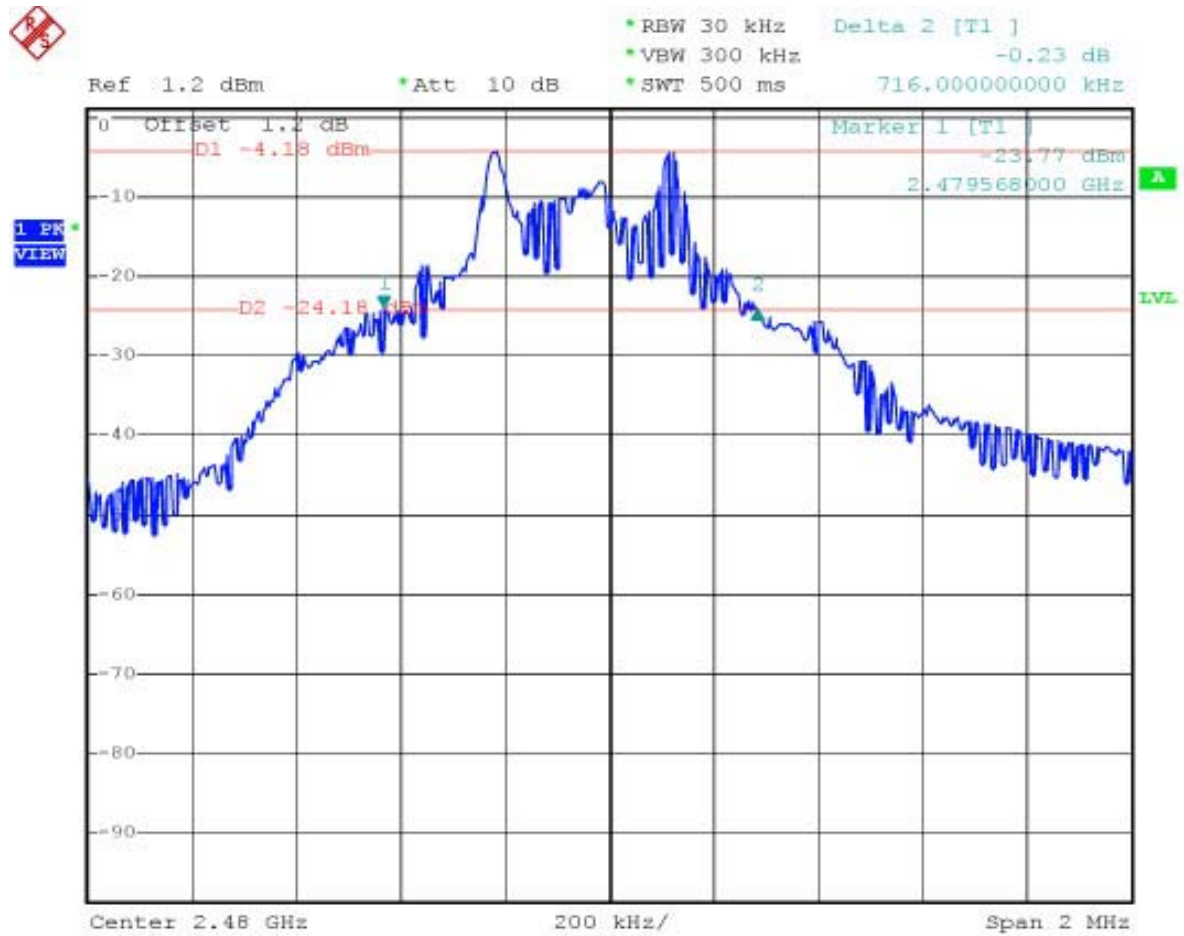


Mode 2





Mode 3



5.8 Dwell Time of Each Frequency within a 30 Seconds Period

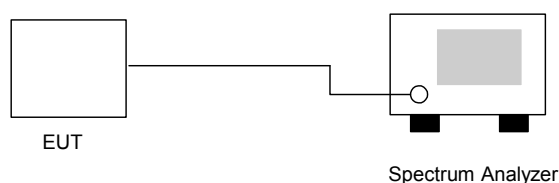
5.8.1 Measuring Instruments :

As described in chapter 9 of this test report.

5.8.2 Test Procedure :

1. The transmitter output was connected to the spectrum analyzer by a low loss cable.
2. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
3. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
4. The calculate $= 0.4 * 79 * (1600/79) * t$ (t = the time duration of one single pulse)

5.8.3 Test Setup Layout :



5.8.4 Test Result : See spectrum analyzer plots below

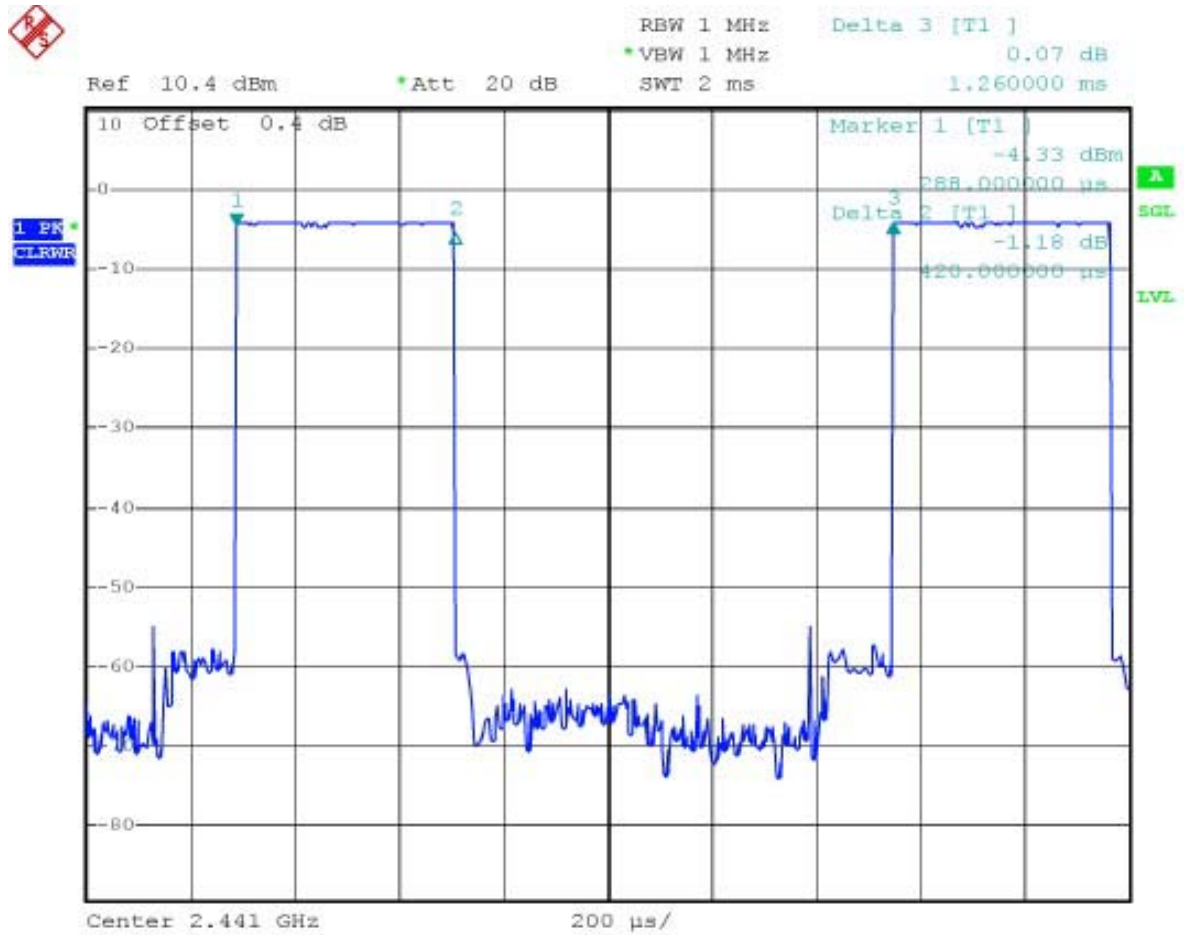
- Application Type : BT
- Temperature : 24°C,
- Relative Humidity : 47%
- Test Enginner : Jay

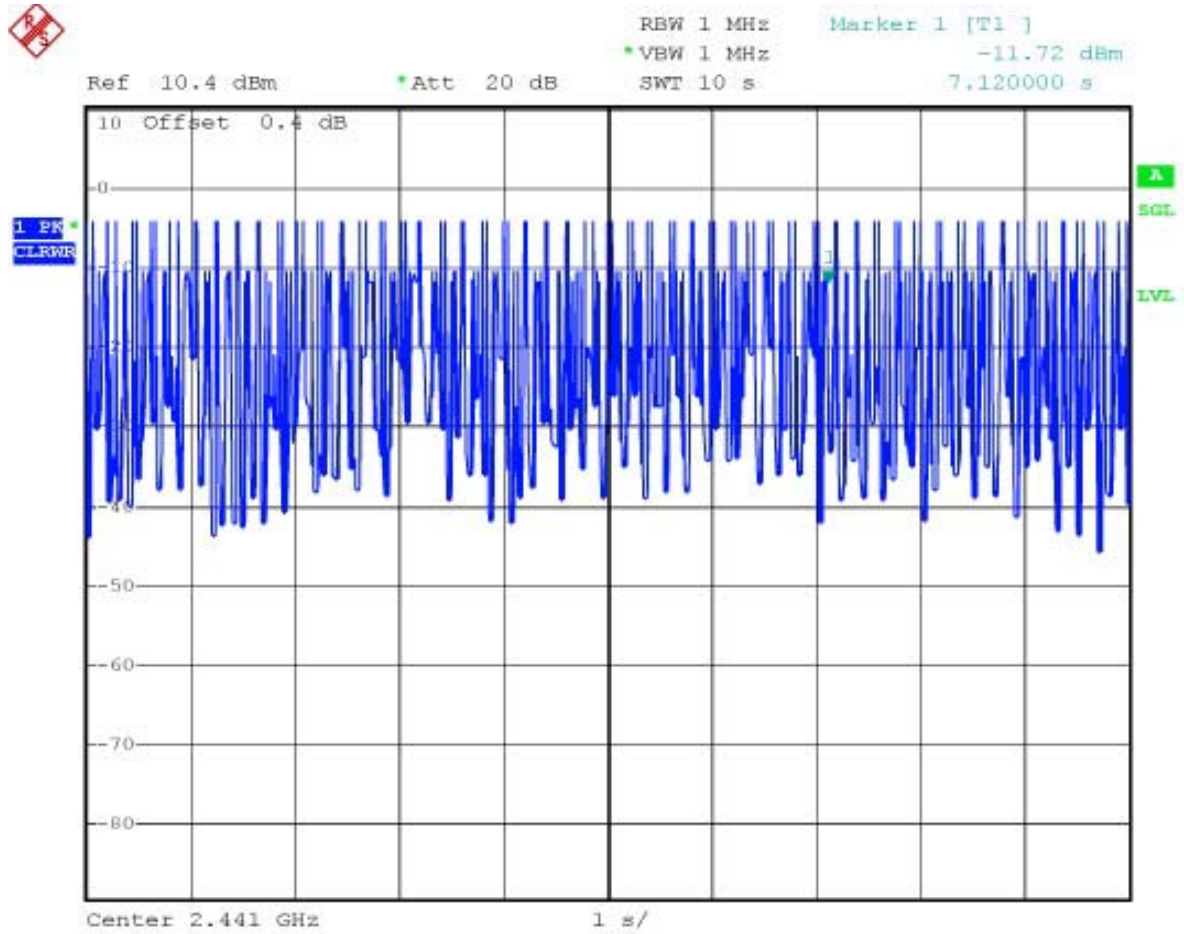
Channel	Dwell Time (s)	Limits (s)	Plot Ref. No.
39	0.11	0.4	Mode 1



5.8.5 Dell Time

Mode 1





5.9 Peak Output Power Measurement

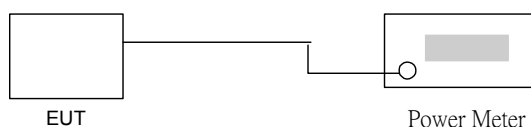
5.9.1 Measuring Instruments :

As described in chapter 6 of this test report.

5.9.2 Test Procedure :

The antenna port (RF output) of the EUT was connected to the input (RF input) of a power meter.
The power is equal to the reading level on power meter plus cable loss at the EUT antenna terminal.

5.9.3 Test Setup Layout :



5.9.4 Test Result :

- Application Type : WLAN 802.11b and BT
- Temperature : 24°C
- Relative Humidity : 47 %
- Test Enginner : Jay

WLAN 802.11b

Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)
01	2412	15.36	1W/30 dBm
06	2437	16.73	1W/30 dBm
11	2462	15.85	1W/30 dBm

BT

Channel	Frequency (MHz)	Measured Output Power (dBm)	Limits (Watt/dBm)
00	2402	-2.17	1W/30 dBm
39	2441	-3.22	1W/30 dBm



78

2480

-4.00

1W/30 dBm

5.10 Conducted Emission Measurement

5.10.1 Measuring Instruments

As described in chapter 6 of this test Report.

5.10.2 Test Procedures

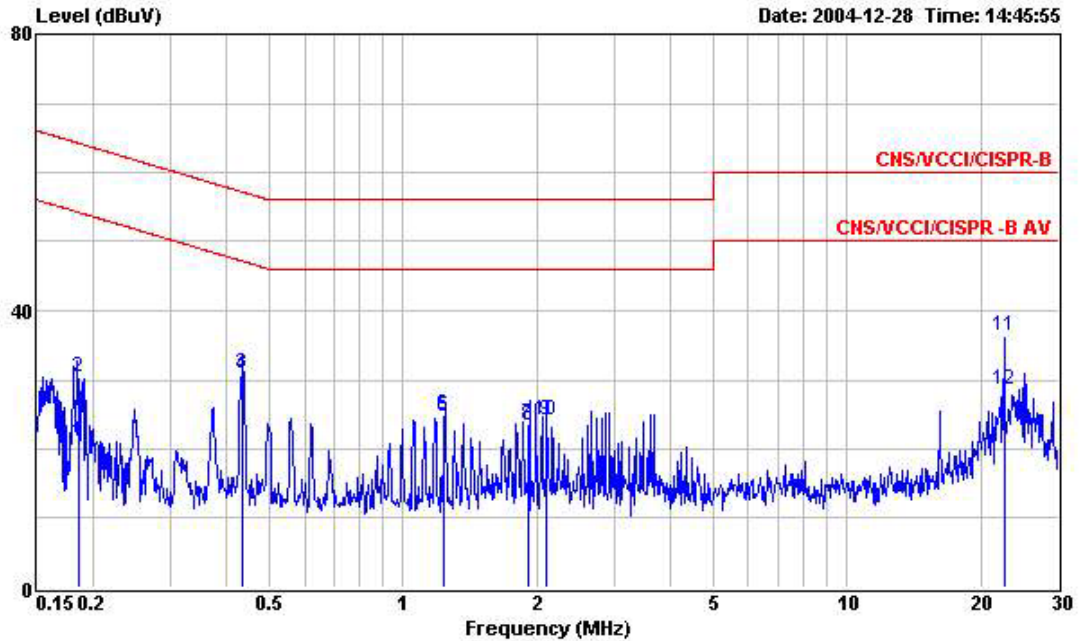
- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power port of the line impedance stabilization network (LISN).
- c. All the support units are connect to the other LISN.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



5.10.3 Test Data

- Temperature : 24 °C
- Relating Humidity : 47 %
- Test Enginner : Jay
- Test Mode : Mode 1

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



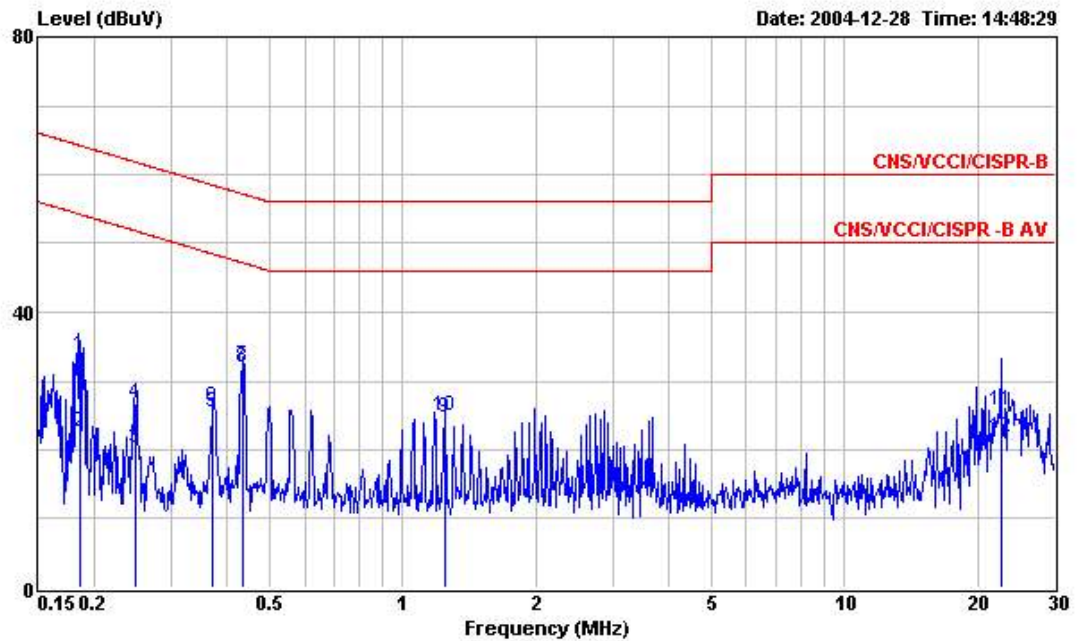
Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2003 2001/008 LINE
EUT : PDA
Power : 120V 60Hz
Model : FD 4D1706
Memo : PCS1900 IDLE+WLAN+ACTIVESYNC

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.185	21.08	-33.17	54.25	20.96	0.10	0.02	Average
2	0.185	30.35	-33.90	64.25	30.23	0.10	0.02	QP
3	0.434	30.97	-16.21	47.18	30.85	0.10	0.02	Average
4	0.434	30.63	-26.55	57.18	30.51	0.10	0.02	QP
5	1.240	24.63	-31.37	56.00	24.48	0.10	0.05	QP
6	1.240	24.87	-21.13	46.00	24.72	0.10	0.05	Average
7	1.922	23.66	-32.34	56.00	23.50	0.10	0.06	QP
8	1.922	23.49	-22.51	46.00	23.33	0.10	0.06	Average
9	2.109	24.06	-31.94	56.00	23.90	0.10	0.06	QP
10	2.109	24.17	-21.83	46.00	24.01	0.10	0.06	Average
11	22.653	36.25	-23.75	60.00	35.57	0.41	0.27	QP
12	22.653	28.65	-21.35	50.00	27.97	0.41	0.27	Average



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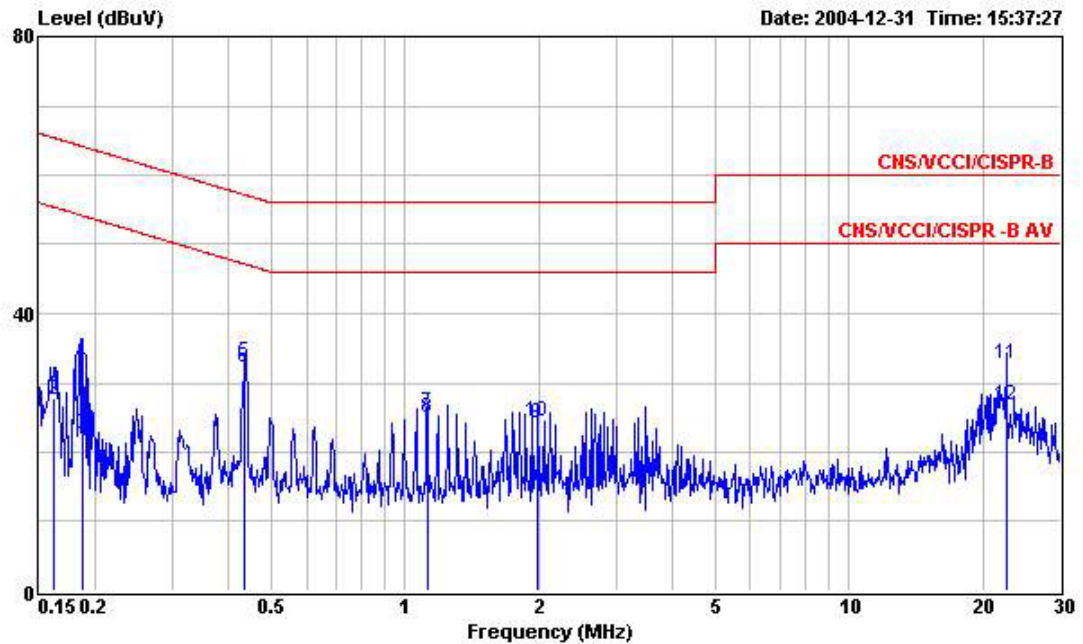
Site : CO01-HY
 Condition : CNS/VCCI/CISPR-B 2003 2001/008 NEUTRAL
 EUT : PDA
 Power : 120V 60Hz
 Model : FD 4D1706
 Memo : PCS1900 IDLE+WLAN+ACTIVESYNC

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.185	33.72	-30.53	64.25	33.60	0.10	0.02	QP
2	0.185	22.56	-31.69	54.25	22.44	0.10	0.02	Average
3	0.248	20.19	-31.64	51.83	20.07	0.10	0.02	Average
4	0.248	26.80	-35.03	61.83	26.68	0.10	0.02	QP
5	0.372	25.45	-23.01	48.46	25.33	0.10	0.02	Average
6	0.372	26.27	-32.19	58.46	26.15	0.10	0.02	QP
7	0.434	32.17	-15.01	47.18	32.05	0.10	0.02	Average
8	0.434	31.89	-25.29	57.18	31.77	0.10	0.02	QP
9	1.241	24.77	-31.23	56.00	24.62	0.10	0.05	QP
10	1.241	25.06	-20.94	46.00	24.91	0.10	0.05	Average
11	22.642	25.69	-34.31	60.00	25.01	0.41	0.27	QP
12	22.642	21.92	-28.08	50.00	21.24	0.41	0.27	Average



- Temperature : 24 °C
- Relating Humidity : 47 %
- Test Enginner : Jay
- Test Mode : Mode 2

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



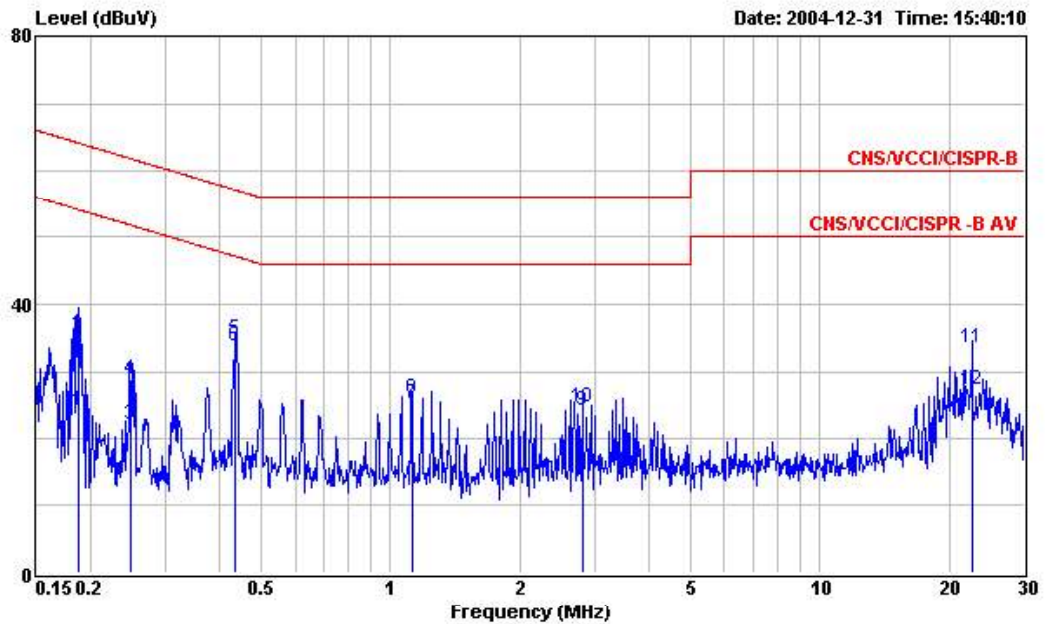
Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2003 2001/008 LINE
EUT : PDA
Power : 120V 60Hz
Model : FD 4D1706
Memo : PCS1900 IDLE+BLUETOOTH+ACTIVESYNC

	Freq	Level	Over	Limit	Read	Probe	Cable	Remark
			Limit	Line	Level	Factor	Loss	
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.162	27.66	-27.70	55.36	27.55	0.10	0.01	Average
2	0.162	27.50	-37.86	65.36	27.39	0.10	0.01	QP
3	0.187	22.62	-31.54	54.16	22.50	0.10	0.02	Average
4	0.187	32.82	-31.34	64.16	32.70	0.10	0.02	QP
5	0.435	33.07	-14.09	47.16	32.95	0.10	0.02	Average
6	0.435	32.28	-24.88	57.16	32.16	0.10	0.02	QP
7	1.120	25.73	-20.27	46.00	25.59	0.10	0.04	Average
8	1.120	24.81	-31.19	56.00	24.67	0.10	0.04	QP
9	1.991	24.14	-31.86	56.00	23.98	0.10	0.06	QP
10	1.991	24.30	-21.70	46.00	24.14	0.10	0.06	Average
11	22.583	32.83	-27.17	60.00	32.15	0.41	0.27	QP
12	22.583	26.85	-23.15	50.00	26.17	0.41	0.27	Average



FCC TEST REPORT

Report No. : FR4D1706



Site : CO01-HY
Condition : CNS/VCCI/CISPR-B 2003 2001/008 NEUTRAL
EUT : PDA
Power : 120V 60Hz
Model : FD 4D1706
Memo : PCS1900 IDLE+BLUETOOTH+ACTIVESYNC

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV		dB	dBuV	dB	dB	
1	0.187	24.04	-30.13	54.17	23.92	0.10	0.02	Average
2	0.187	35.27	-28.90	64.17	35.15	0.10	0.02	QP
3	0.248	22.18	-29.63	51.81	22.06	0.10	0.02	Average
4	0.248	28.89	-32.92	61.81	28.77	0.10	0.02	QP
5	0.436	34.68	-12.46	47.14	34.56	0.10	0.02	Average
6	0.436	33.80	-23.34	57.14	33.68	0.10	0.02	QP
7	1.120	25.09	-30.91	56.00	24.95	0.10	0.04	QP
8	1.120	25.85	-20.15	46.00	25.71	0.10	0.04	Average
9	2.799	24.16	-31.84	56.00	23.92	0.15	0.09	QP
10	2.799	24.78	-21.22	46.00	24.54	0.15	0.09	Average
11	22.584	33.54	-26.46	60.00	32.86	0.41	0.27	QP
12	22.584	27.18	-22.82	50.00	26.50	0.41	0.27	Average

5.11 Radiated Emission Measurement

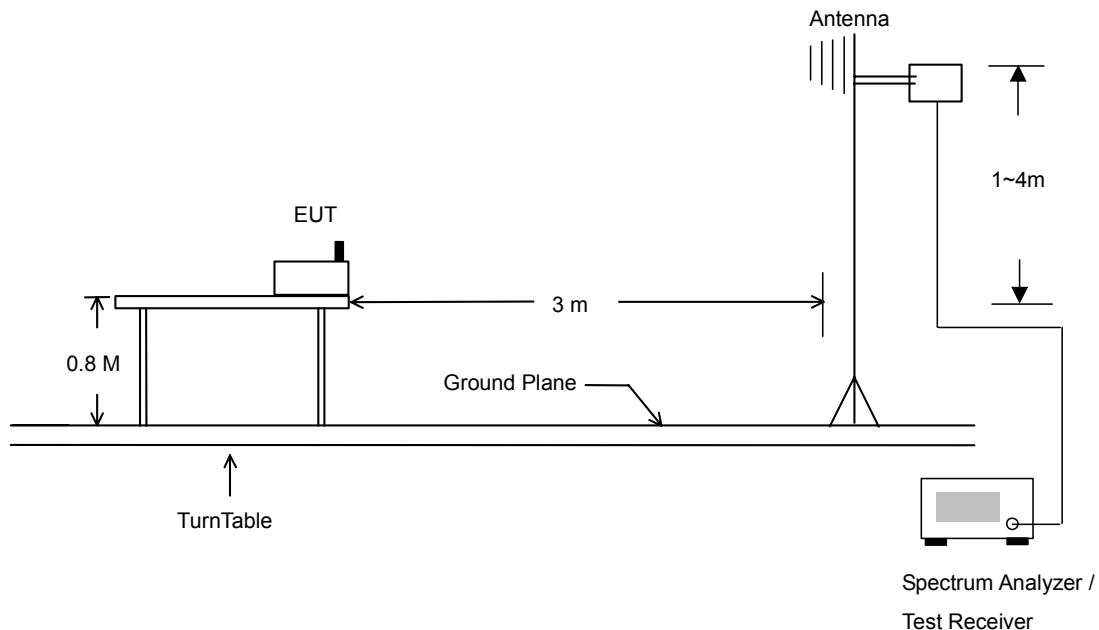
5.11.1 Measuring Instruments

As described in chapter 6 of this Report.

5.11.2 Test Procedures

1. The EUT was placed on a rotatable table top 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. 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.
5. 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.
6. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. 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.
8. 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.

5.11.3 Typical Test Setup Layout of Radiated Emission





5.11.4 Test Data

- Temperature : 26°C
- Relating Humidity : 53%
- Test Enginner : Jay
- Test Mode : Mode 1
- Polarization : Horizontal

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

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	2390.00	49.65	-24.35	74.00	53.18	28.40	35.25	3.32 Peak	---	---
2 @	2390.00	34.06	-19.94	54.00	37.59	28.40	35.25	3.32 Average	---	---
3 @	2414.00	101.44			104.95	28.41	35.25	3.32 Peak	---	---
4 @	2414.00	86.69			90.20	28.41	35.25	3.32 Average	100	237
5 @	2494.00	44.04	-29.96	74.00	47.40	28.50	35.26	3.39 Peak	---	---
6 @	2494.00	31.87	-22.13	54.00	35.23	28.50	35.26	3.39 Average	---	---

Remark: #3 and 4 Fundamental Signal

- Polarization : Vertical

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

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB		cm	deg
1 @	1688.00	46.95	-27.05	74.00	53.17	26.42	35.41	2.78 Peak	---	---
2 @	2390.00	49.07	-24.93	74.00	52.60	28.40	35.25	3.32 Peak	---	---
3 @	2390.00	34.64	-19.36	54.00	38.17	28.40	35.25	3.32 Average	---	---
4 @	2410.00	99.32			102.83	28.41	35.25	3.32 Peak	---	---
5 @	2410.00	87.62			91.13	28.41	35.25	3.32 Average	106	186
6 @	2494.00	43.75	-30.25	74.00	47.12	28.50	35.26	3.39 Peak	---	---
7 @	2494.00	32.25	-21.75	54.00	35.61	28.50	35.26	3.39 Average	---	---

Remark: #4 and 5 Fundamental Signal



- Test Mode : Mode 2
- Polarization : Horizontal

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

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	134.49	19.68	-23.82	43.50	39.04	11.32	32.23	1.54	Peak	---	---
2 @	260.58	22.09	-23.91	46.00	38.92	12.90	31.89	2.16	Peak	---	---
3 @	298.38	27.01	-18.99	46.00	43.62	12.94	31.92	2.38	Peak	---	---
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	355.30	33.99	-12.01	46.00	48.44	14.56	31.52	2.51	Peak	---	---
2 @	497.40	43.01	-2.99	46.00	54.20	17.10	31.43	3.14	QP	206	282
3 @	843.90	35.80	-10.20	46.00	41.30	21.04	31.73	5.19	Peak	---	---
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	2364.00	44.81	-29.19	74.00	48.40	28.36	35.24	3.29	Peak	---	---
2 @	2364.00	31.92	-22.08	54.00	35.51	28.36	35.24	3.29	Average	---	---
3 @	2438.00	99.86			103.32	28.45	35.25	3.34	Peak	---	---
4 @	2438.00	87.24			90.70	28.45	35.25	3.34	Average	130	159
5 @	2498.00	44.02	-29.98	74.00	47.39	28.50	35.26	3.39	Peak	---	---
6 @	2498.00	32.29	-21.71	54.00	35.65	28.50	35.26	3.39	Average	---	---

Remark: #3 and 4 Fundamental Signal



- Polarization : Vertical

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

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preampl Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	32.43	26.43	-13.57	40.00	40.13	17.73	32.13	0.70	Peak	---	---
2 @	199.29	26.88	-16.62	43.50	47.18	9.93	32.06	1.83	Peak	---	---
3 @	298.38	33.72	-12.28	46.00	50.33	12.94	31.92	2.38	Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preampl Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	497.40	45.41	-0.59	46.00	56.60	17.10	31.43	3.14	QP	100	209
2 @	652.80	40.35	-5.65	46.00	49.85	18.52	31.57	3.56	Peak	---	---
3 @	967.80	36.23	-17.77	54.00	40.58	22.00	30.96	4.61	Peak	---	---

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preampl Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	1694.00	46.51	-27.49	74.00	52.64	26.50	35.41	2.78	Peak	---	---
2 @	2388.00	32.13	-21.87	54.00	35.67	28.40	35.24	3.31	Average	---	---
3 @	2388.00	43.69	-30.31	74.00	47.23	28.40	35.24	3.31	Peak	---	---
4 @	2438.00	104.92			108.38	28.45	35.25	3.34	Peak	---	---
5 @	2438.00	87.94			91.40	28.45	35.25	3.34	Average	126	191
6 @	2498.00	43.81	-30.19	74.00	47.17	28.50	35.26	3.39	Peak	---	---
7 @	2498.00	32.40	-21.60	54.00	35.76	28.50	35.26	3.39	Average	---	---

Remark: #4 and 5 Fundamental Signal



Test Mode : Mode 3

- Polarization : Horizontal

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

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	2328.00	43.59	-30.41	74.00	47.23	28.33	35.24	3.27	Peak	---	---
2 @	2328.00	32.17	-21.83	54.00	35.81	28.33	35.24	3.27	Average	---	---
3 @	2464.00	102.42			105.85	28.47	35.25	3.36	Peak	---	---
4 @	2464.00	87.60			91.03	28.47	35.25	3.36	Average	100	178
5 @	2483.50	45.08	-28.92	74.00	48.48	28.48	35.26	3.38	Peak	---	---
6 @	2483.50	34.99	-19.01	54.00	38.39	28.48	35.26	3.38	Average	---	---

Remark: #3 and 4 Fundamental Signal

- Polarization : Vertical

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

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	1558.00	47.18	-26.82	74.00	54.17	25.83	35.50	2.67	Peak	---	---
2 @	2328.00	43.69	-30.31	74.00	47.33	28.33	35.24	3.27	Peak	---	---
3 @	2328.00	32.18	-21.82	54.00	35.82	28.33	35.24	3.27	Average	---	---
4 @	2464.00	100.59			104.02	28.47	35.25	3.36	Peak	---	---
5 @	2464.00	87.53			90.96	28.47	35.25	3.36	Average	128	179
6 @	2484.00	44.29	-29.71	74.00	47.69	28.48	35.26	3.38	Peak	---	---
7 @	2484.00	34.20	-19.80	54.00	37.60	28.48	35.26	3.38	Average	---	---

Remark: #4 and 5 Fundamental Signal



Test Mode : Mode 4

- Polarization : Horizontal

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

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	2390.00	56.10	-17.90	74.00	59.63	28.40	35.25	3.32	Peak	---	---
2 @	2390.00	31.53	-22.47	54.00	35.06	28.40	35.25	3.32	Average	---	---
3 @	2404.00	92.25			95.76	28.41	35.25	3.32	Peak	---	---
4 @	2404.00	74.74			78.25	28.41	35.25	3.32	Average	120	200
5 @	2498.00	43.53	-30.47	74.00	46.89	28.50	35.26	3.39	Peak	---	---
6 @	2498.00	32.08	-21.92	54.00	35.44	28.50	35.26	3.39	Average	---	---

Remark: #3 and 4 Fundamental Signal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7204.00	56.05	-17.95	74.00	50.04	35.24	35.48	6.25	Peak	---	---

- Polarization : Vertical

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

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	1144.00	44.64	-29.36	74.00	54.38	24.41	36.41	2.25	Peak	---	---
2 @	2390.00	31.48	-22.52	54.00	35.01	28.40	35.25	3.32	Average	---	---
3 @	2390.00	53.45	-20.55	74.00	56.98	28.40	35.25	3.32	Peak	---	---
4 @	2404.00	87.78			91.28	28.41	35.25	3.32	Peak	---	---
5 @	2404.00	71.62			75.13	28.41	35.25	3.32	Average	128	169
6 @	2498.00	43.39	-30.61	74.00	46.75	28.50	35.26	3.39	Peak	---	---
7 @	2498.00	32.10	-21.90	54.00	35.46	28.50	35.26	3.39	Average	---	---

Remark: #4 and 5 Fundamental Signal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7204.00	55.59	-18.41	74.00	49.58	35.24	35.48	6.25	Peak	---	---

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Test Mode : Mode 5

- Polarization : Horizontal

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

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	129.09	19.17	-24.33	43.50	38.08	11.71	32.13	1.51	Peak	---	---
2 @	272.19	21.82	-24.18	46.00	38.62	12.91	31.95	2.24	Peak	---	---
3 @	298.38	26.51	-19.49	46.00	43.12	12.94	31.92	2.38	Peak	---	---
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	497.40	41.70	-4.30	46.00	52.89	17.10	31.43	3.14	Peak	142	122
2 @	649.30	33.93	-12.07	46.00	43.30	18.47	31.54	3.69	Peak	---	---
3 @	838.30	37.44	-8.56	46.00	43.18	21.16	31.77	4.88	Peak	---	---
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	2388.00	45.46	-28.54	74.00	49.00	28.40	35.24	3.31	Peak	---	---
2 @	2388.00	31.64	-22.36	54.00	35.18	28.40	35.24	3.31	Average	---	---
3 @	2438.00	89.13			92.59	28.45	35.25	3.34	Peak	---	---
4 @	2438.00	72.87			76.33	28.45	35.25	3.34	Average	165	112
5 @	2484.00	44.08	-29.92	74.00	47.48	28.48	35.26	3.38	Peak	---	---
6 @	2484.00	31.40	-22.60	54.00	34.80	28.48	35.26	3.38	Average	---	---

Remark: #3 and 4 Fundamental Signal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7324.00	55.20	-18.80	74.00	48.94	35.55	35.51	6.21	Peak	---	---



- Polarization : Vertical

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

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	31.08	25.61	-14.39	40.00	38.64	18.40	32.13	0.70	Peak	---	---
2 @	194.43	25.97	-17.53	43.50	46.47	9.72	32.02	1.79	Peak	---	---
3 @	298.38	32.53	-13.47	46.00	49.14	12.94	31.92	2.38	Peak	---	---
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	497.40	44.61	-1.39	46.00	55.80	17.10	31.43	3.14	QP	123	177
2 @	647.90	39.23	-6.77	46.00	48.58	18.46	31.53	3.72	Peak	---	---
3 @	964.30	35.66	-18.34	54.00	40.15	21.88	30.92	4.55	Peak	---	---
	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	1154.00	42.44	-31.56	74.00	52.13	24.47	36.41	2.25	Peak	---	---
2 @	2328.00	43.69	-30.31	74.00	47.33	28.33	35.24	3.27	Peak	---	---
3 @	2328.00	32.12	-21.88	54.00	35.76	28.33	35.24	3.27	Average	---	---
4 @	2438.00	84.55			88.01	28.45	35.25	3.34	Peak	---	---
5 @	2438.00	69.96			73.42	28.45	35.25	3.34	Average	186	186
6 @	2498.00	43.49	-30.51	74.00	46.86	28.50	35.26	3.39	Peak	---	---
7 @	2498.00	32.34	-21.66	54.00	35.70	28.50	35.26	3.39	Average	---	---

Remark: #4 and 5 Fundamental Signal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7324.00	56.61	-17.39	74.00	50.35	35.55	35.51	6.21	Peak	---	---



Test Mode : Mode 6

- Polarization : Horizontal

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

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	1704.00	45.44	-28.56	74.00	51.53	26.50	35.39	2.80	Peak	---	---
2 @	2328.00	32.07	-21.93	54.00	35.71	28.33	35.24	3.27	Average	---	---
3 @	2328.00	43.88	-30.12	74.00	47.52	28.33	35.24	3.27	Peak	---	---
4 @	2478.00	87.93			91.33	28.48	35.26	3.38	Peak	---	---
5 @	2478.00	72.11			75.51	28.48	35.26	3.38	Average	127	108
6 @	2483.50	68.27	-5.73	74.00	71.66	28.48	35.26	3.38	Peak	---	---
7 @	2483.50	46.94	-7.06	54.00	50.34	28.48	35.26	3.38	Average	---	---

Remark: #4 and 5 Fundamental Signal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7438.00	53.81	-20.19	74.00	47.30	35.87	35.54	6.19	Peak	---	---

- Polarization : Vertical

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

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	1048.00	43.78	-30.22	74.00	54.16	24.16	36.67	2.14	Peak	---	---
2 @	2344.00	31.65	-22.35	54.00	35.26	28.34	35.24	3.29	Average	---	---
3 @	2344.00	43.63	-30.37	74.00	47.24	28.34	35.24	3.29	Peak	---	---
4 @	2478.00	81.68			85.07	28.48	35.26	3.38	Peak	---	---
5 @	2478.00	67.06			70.46	28.48	35.26	3.38	Average	101	129
6 @	2483.50	63.28	-10.72	74.00	66.68	28.48	35.26	3.38	Peak	---	---
7 @	2483.50	40.55	-13.45	54.00	43.95	28.48	35.26	3.38	Average	---	---

Remark: #4 and 5 Fundamental Signal

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamplifier Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	7438.00	53.53	-20.47	74.00	47.02	35.87	35.54	6.19	Peak	---	---

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Test Mode : Mode 7

- Polarization : Horizontal

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

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	2390.00	60.80	-13.20	74.00	64.32	28.40	35.25	3.32	Peak	---	---
2	2390.00	38.45	-15.55	54.00	41.98	28.40	35.25	3.32	Average	---	---
3 X	2404.00	96.75			100.26	28.41	35.25	3.32	Peak	---	---
4 X	2404.00	78.68			82.19	28.41	35.25	3.32	Average	117	210
5 X	2434.00	100.37			103.85	28.43	35.25	3.34	Peak	---	---
6 @	2434.00	97.02			100.50	28.43	35.25	3.34	Average	100	309
7	2483.50	49.03	-24.97	74.00	52.43	28.48	35.26	3.38	Peak	---	---
8	2483.50	38.54	-15.46	54.00	41.94	28.48	35.26	3.38	Average	---	---

Remark: #3 and 4 Fundamental Signal with Bluetooth.

#4 and 5 Fundamental Signal with WLAN.

- Polarization : Vertical

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

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Preamp Factor	Cable Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	1028.00	52.57	-21.43	74.00	63.09	24.10	36.73	2.11	Peak	---	---
2	1028.00	47.60	-6.40	54.00	58.12	24.10	36.73	2.11	Average	---	---
3	2390.00	54.93	-19.07	74.00	58.46	28.40	35.25	3.32	Peak	---	---
4	2390.00	32.81	-21.19	54.00	36.34	28.40	35.25	3.32	Average	---	---
5 X	2404.00	88.34			91.85	28.41	35.25	3.32	Peak	---	---
6 X	2404.00	71.71			75.22	28.41	35.25	3.32	Average	117	195
7 X	2434.00	100.89			104.37	28.43	35.25	3.34	Peak	---	---
8 X	2434.00	86.62			90.10	28.43	35.25	3.34	Average	100	252
9	2484.00	43.77	-30.23	74.00	47.17	28.48	35.26	3.38	Peak	---	---
10	2484.00	31.69	-22.31	54.00	35.09	28.48	35.26	3.38	Average	---	---

Remark: #5 and 6 Fundamental Signal with Bluetooth.

#7 and 8 Fundamental Signal with WLAN.



5.12 Antenna Requirements

5.12.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no other antenna except assembled by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

5.12.2 Antenna Connected Construction

The antenna used in this product are 2 PIFA antennas for WLAN and BT with I-PEX connector 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	9 KHz – 2.75 GHz	Jun. 23, 2004	Jun. 23, 2005	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001/008	9 KHz – 30 MHz	May 03, 2004	May 03, 2005	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001/009	9 KHz – 30 MHz	Apr. 19, 2004	Apr. 19, 2005	Conduction (CO01-HY)
EMI Filter	LINDGREN	LRE-2060	1004	< 450 Hz	N/A	N/A	Conduction (CO01-HY)
EMI Filter	LINDGREN	N6006	201052	0 ~ 60 Hz	N/A	N/A	Conduction (CO01-HY)
RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9KHz~30MHz	Dec. 23, 2004	Dec. 23, 2005	Conduction (CO01-HY)
Spectrum analyzer	Agilent	E4408B	MY44211030	9KHz-26.5GHz	Jul. 27, 2004	Jul. 26, 2005	Radiation (03CH06-HY)
Receiver	R&S	ESCS30	100356	9KHz-2.75GHz	Jul,09,2004	Jul, 10,2005	Radiation (03CH06-HY)
Controller	CT	SC100	N/A	N/A	N/A	N/A	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Nov. 22, 2004	Nov. 21, 2005	Radiation (03CH06-HY)
Horn Antenna	Com-Power	AH118	071025	1G-18G	Feb. 11, 2004	Feb. 11, 2005	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBECK	BBHA 9170	9170-249	14G - 40G	Jun. 22, 2004	Jun. 22, 2005	Radiation (03CH06-HY)
PreAmplifier	Com-Power	PA-103	161055	1MHz - 1000MHz	Apr. 26, 2004	Apr. 26, 2005	Radiation (03CH06-HY)
HF Amplifier	MITEQ	AFS44	973248	0.1G - 26.5G	May. 20, 2004	May. 20, 2005	Radiation (03CH06-HY)
Amplifier	MITEQ	AMF-6F	997165	26G - 40G	Jun. 24, 2004	Jun. 24, 2005	Radiation (03CH06-HY)
Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	N/A	Radiation (03CH06-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	N/A	Radiation (03CH06-HY)
Wireless Communications Test Set	Agilent	8960/E5515C	9343460754	Qual-band	Jan,12,2004	Jan,11,2005	Radiation (03CH06-HY)
Wireless Communications Test Set	R&S	CMU 200	103937	Qual-band	Oct,20,2003	Oct,19,2005	Radiation (03CH06-HY)
Base Station Emulator	Agilent	E5515C	GB43460754	N/A	Jan. 12, 2004	Jan. 12, 2005	Base Station
Radio Communication Tester	R&S	CMU200	105934	N/A	Aug. 24, 2004	Aug. 24, 2005	Base Station
Thermal Chamber	Ten Billion	TTH-D35P	N/A	N/A	NCR	NCR	EMS Chamber

7. Uncertainty Evaluation

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 $U_c(y)$	2.36				
Measuring uncertainty for a level of confidence of 95% $U = 2U_c(y)$	4.72				