

FCC TEST REPORT

CATEGORY : Module for Professional Use Mobile Host
PRODUCT NAME : 802.11a/g Workgroup Bridge
FCC ID. : QXO-RBTSAAA
FILING TYPE : Certification
BRAND NAME : Enterasys
MODEL NAME : WP300A-E2, RBTSA-AA, RBTSA-AB

APPLICANT : **Enterasys Networks, Inc.**
50 Minuteman Road, Andover, MA 01810, USA

MANUFACTURER : **DONGGUAN G-COM COMPUTER CO., LTD.**
1st Row Yin Shan Rd., Yin Hwu Industrial Area, Qingxi Town,
Dong Guan City, Guang Dong, China

ISSUED BY : **SPORTON INTERNATIONAL INC.**
6F, No. 106, Sec. 1, Hsin Tai Wu Rd., His Chih, Taipei Hsien,
Taiwan, R.O.C.

Statements:


Only the test result of 802.11b/g part is shown in this test report.

The test result in this report refers exclusively to the presented test model / sample.

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Certificate or Test Report could not be used by the applicant to claim the product endorsement by CNLA, NVLAP or any agency of U.S. government.

The test equipment used to perform the test are calibrated and traceable to NML/ROC or NIST/USA.



Wayne Hsu



Lab Code: 200079-0



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History of this test report

- 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

Enterasys Networks, Inc.
50 Minuteman Road, Andover, MA 01810, USA

1.2. Manufacturer

DONGGUAN G-COM COMPUTER CO., LTD.
1st Row Yin Shan Rd., Yin Hwu Industrial Area, Qingxi Town, Dong Guan City, Guang Dong, China

1.3. Basic Description of Equipment under Test

This product is a Wireless Access Point / Ethernet Bridge with 802.11a/b/g wireless solution. The technical data has been listed on section "Features of Equipment under Test". 3 types of antenna are filed in this project. 2 additional diodes was added on the pins of the LAN port and the core power supply has been changed from linear to switching.

1.4. Features of Equipment under Test (802.11b/g part)

ITEMS	DESCRIPTION
Type of Modulation	DSSS, OFDM
Number of Channels	11
Frequency Band	2400MHz ~ 2483.5MHz
Carrier Frequency	Please reference table below.
Channel Bandwidth	11MHz (802.11b), 18MHz (802.11g)
Output Power	CCK : 21.02 dBm OFDM : 22.32 dBm
Antenna Type	See section 1.5 for details
Function Type	Transceiver
Power Rating (DC/AC, Voltage)	5 VDC from 100~240VAC power adapter
Temperature Range (Operating)	0 ~ 55°C

Note: Only the test result of 802.11b/g part is shown in this test report.



1.5. Antenna Description

3 types of antenna are filed in this project.

No.	Antenna Type	Gain (dBi)
1	Printed Monopole (GEM-220838-W 1500)	2.5dBi @2.4GHz 5.0dBi @5.0GHz
2	Monopole (Rubber duck antenna)	5.15dBi @2.4GHz 4.38dBi @5.0GHz
3	Chip Antenna	1.58dBi @2.4GHz 3.53dBi @5.0GHz

1.6. Table for Carrier Frequencies (802.11b/g part)

Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412 MHz	5	2432 MHz	9	2452 MHz
2	2417 MHz	6	2437 MHz	10	2457 MHz
3	2422 MHz	7	2442 MHz	11	2462 MHz
4	2427 MHz	8	2447 MHz		



2. Test Configuration of the Equipment under Test

2.1. Description of the Test

- a. During testing, the equipment was placed on a non-conducting support.
- b. Based on the description on section 1.3, only spurious emission below 1GHz and conduction has to be re-measured.
- c. The following test modes were performed:
 - Mode 1 : Ant. 1 (GEM-220838-W 1500)
 - Mode 2 : Ant. 2 (Rubber duck antenna)
 - Mode 3 : Ant. 3 (Internal antenna)
- d. Spurious emission below 1GHz is independent of channel selection, so only Channel 11 with OFDM modulation was tested.
- e. The EUT has been programmed to continuously transmit or receive during testing. The used peripherals as well as the configuration fulfill the requirements of ANSI C63.4:2003.
- f. The configuration is operated in a manner which tends to maximize its emission characteristics in a typical application.
- g. 3 meters measurement distance in semi-anechoic chamber was used in this test.

2.2. Frequency Range Investigated

- a. Conducted power line test: from 150 kHz to 30 MHz
- b. Radiated emission test: from 30 MHz to 25000 MHz

2.3. Description of Test Supporting Units

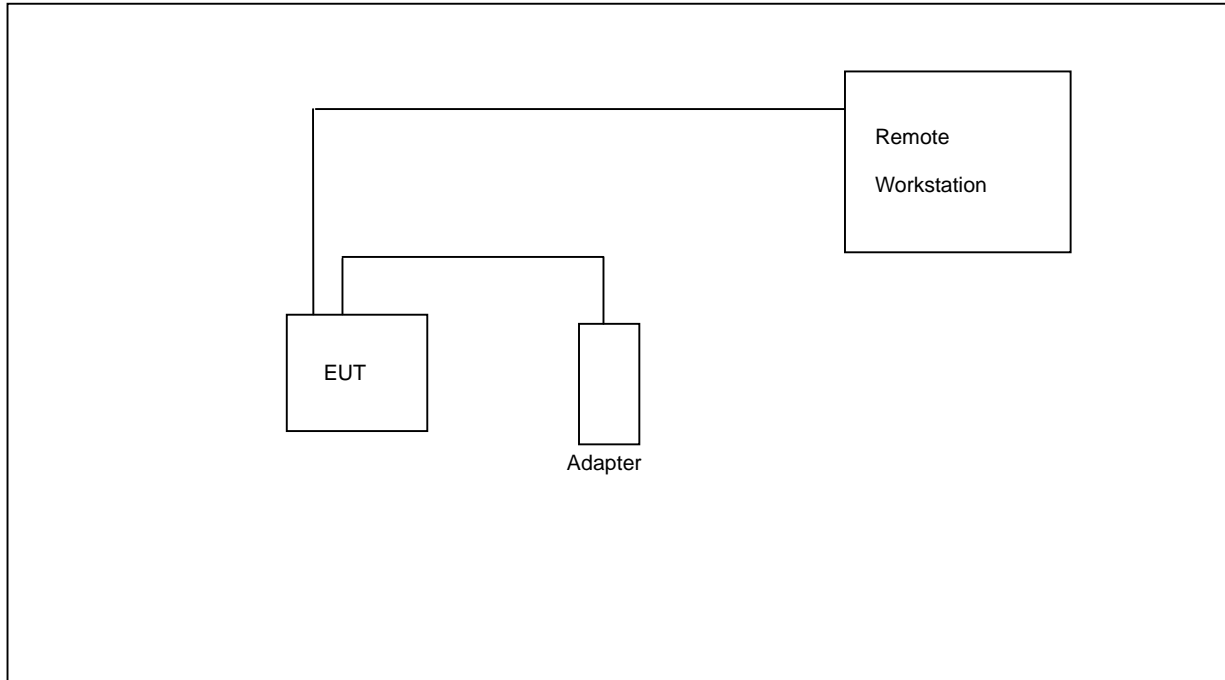
Support Unit 1. – Notebook (NEC) – for remote workstation

FCC ID	: N/A
Model No.	: VERSA VX
Serial No.	: SP0034
Remark	: This support device was tested to comply with FCC standards and authorized under Declaration of Conformity.

Support Unit 2. – Notebook (Dell) – for remote workstation

FCC ID	: N/A
Model No.	: D505
Serial No.	: SP0035
Remark	: This support device was tested to comply with FCC standards and authorized under Declaration of Conformity.

2.4. Connection Diagram of Test System



2.5. Test Software

- a. An controlling software was provided by the customer to control the channel and power of this EUT. The EUT can be controlled by the notebook computer with this software via the RJ45 port of the EUT.
- b. "H" Pattern Generator: Except Access Point, the supporting equipment such as monitor or printer is always available. Under testing, these supporting equipment has to also under working condition. "H" Pattern Generator is able to continuously transmitting "H" character to those supporting equipments.



3. Test Location and Standards

3.1. Test Location

Test Location : Sporton Hwa Ya Testing Building
Address : 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. : CO04-HY, 03CH03-HY

3.2. Test Conditions

Normal Voltage : 120V/60Hz (power adapter)
Extreme Voltage : 138V and 102V (power adapter)
Normal Temperature : 20 °C
Extreme Temperature : 0 °C and 40 °C

3.3. Standards for Methods of Measurement

Here is the list of the standards followed in this test report.

ANSI C63.4-2003
47 CFR Part 15 Subpart C (Section 15.247)

3.4. DoC Statement

This EUT is also classified as a device of computer peripheral Class B which DoC has to be followed. It has been verified according to the rule of 47 CFR part 15 Subpart B, and found that all the requirements has been fulfilled.



4. List of Measurements

4.1. Summary of the Test Results

Applied Standard: 47 CFR Part 15 and Part 2			
Paragraph	FCC Rule	Description of Test	Result
5.1	15.247(a)(2)	6dB Spectrum Bandwidth (DSSS System)	Pass
5.2	15.247(b)	Maximum Peak Output Power	Pass
5.3	15.247(d)	Peak Power Spectral Density	Pass
5.4	15.247(c)	Band Edges Emission	Pass
5.5	15.107/15.207	AC Power Line Conducted Emission	Pass
5.6	15.209/15.247(c)	Spurious Radiated Emission	Pass
5.7	15.203	Antenna Requirement	Pass
5.8	FCC 2.1091	Maximum Permissible Exposure	Pass

5. Test Result

5.1. Test of 6dB Spectrum Bandwidth

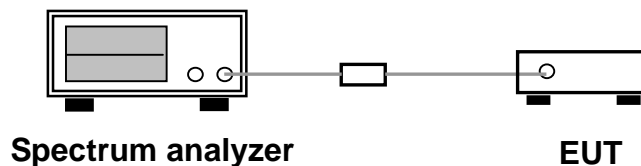
5.1.1. Measuring Instruments

Item 9 of the table on section 6.

5.1.2. Test Procedures

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 100KHz and VBW to 100KHz.
3. The 6dB bandwidth is defined as the spectrum width with level higher than 6dB below the peak level.
4. Repeat above 1~3 points for the middle and highest channel of the EUT.

5.1.3. Test Setup Layout



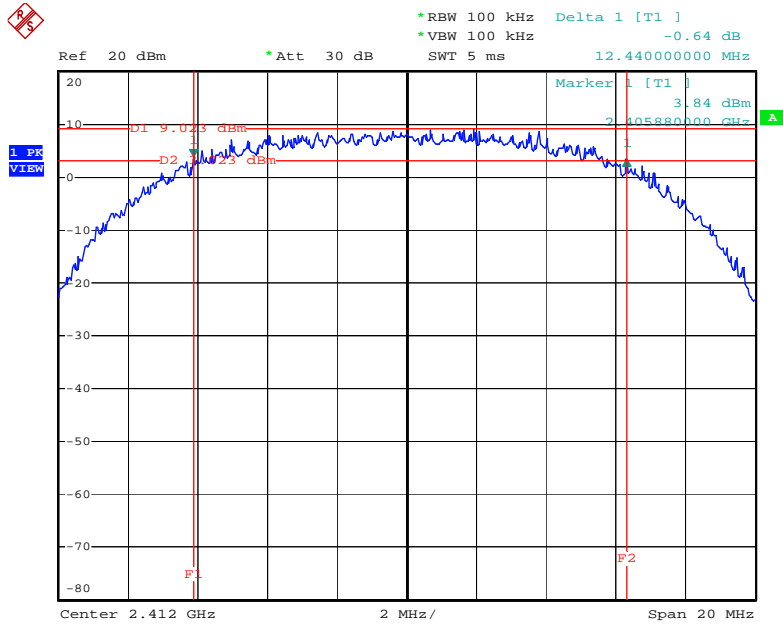
5.1.4. Test Result : See spectrum analyzer plots below

- Modulation Type: CCK
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100%
- Test Engineer: Bunny Yao

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Min. Limit (MHz)
01	2412	12.44	0.5
06	2437	11.52	0.5
11	2462	11.84	0.5

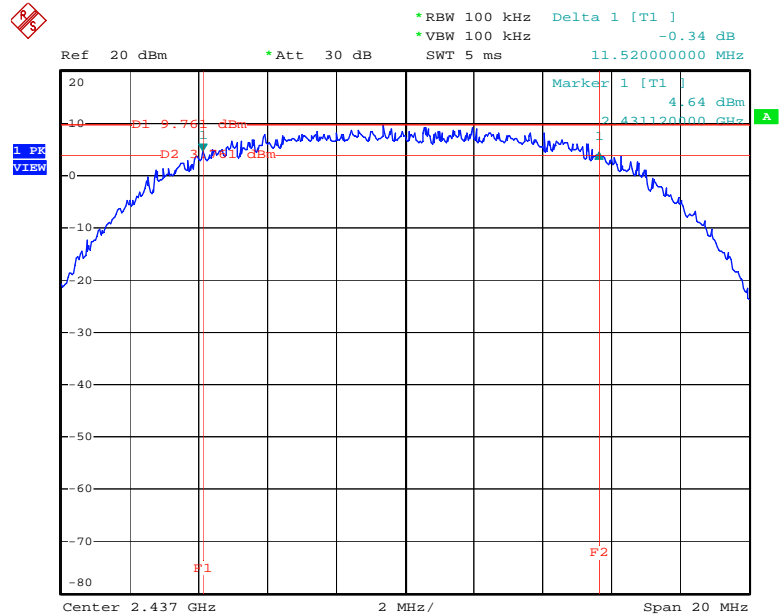


Modulation Type: CCK (Channel 01) :



Date: 30.JUN.2004 20:23:37

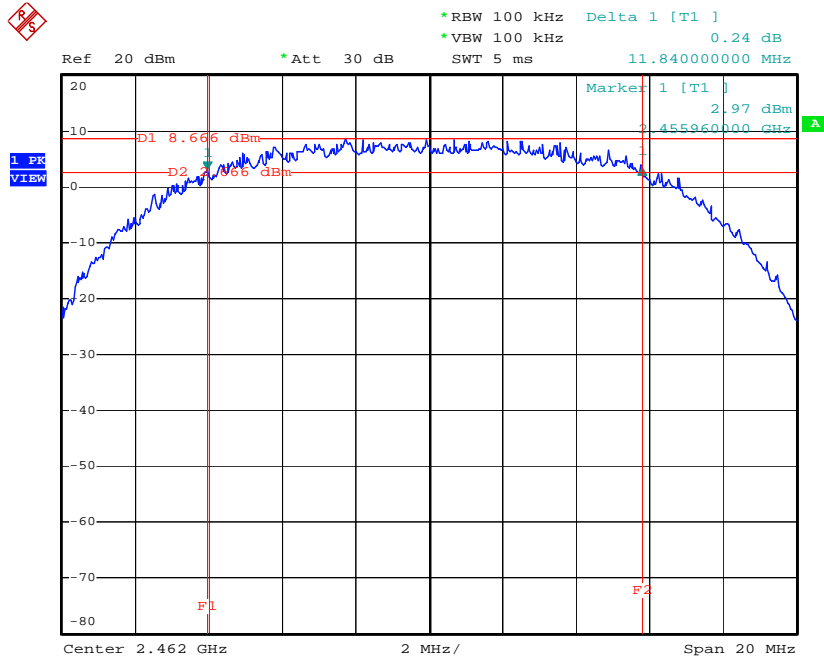
Modulation Type: CCK (Channel 06) :



Date: 30.JUN.2004 20:36:12



Modulation Type: CCK (Channel 11) :



Date: 30.JUN.2004 20:27:53

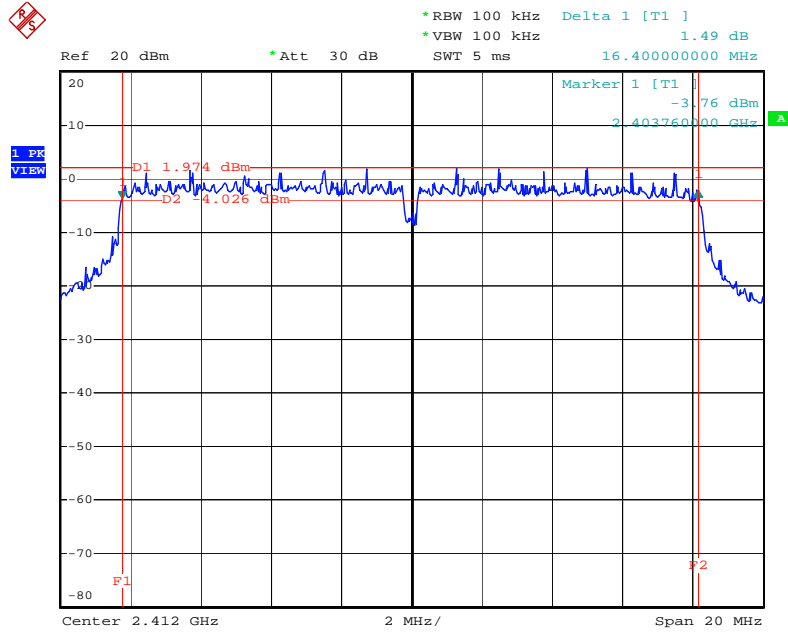
5.1.5. Test Result : See spectrum analyzer plots below

- Modulation Type: OFDM
- Temperature: 26°C
- Relative Humidity: 64 %
- Duty Cycle of the Equipment During the Test: 100%
- Test Engineer: Bunny Yao

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Min. Limit (MHz)
01	2412	16.40	0.5
06	2437	16.36	0.5
11	2462	16.40	0.5

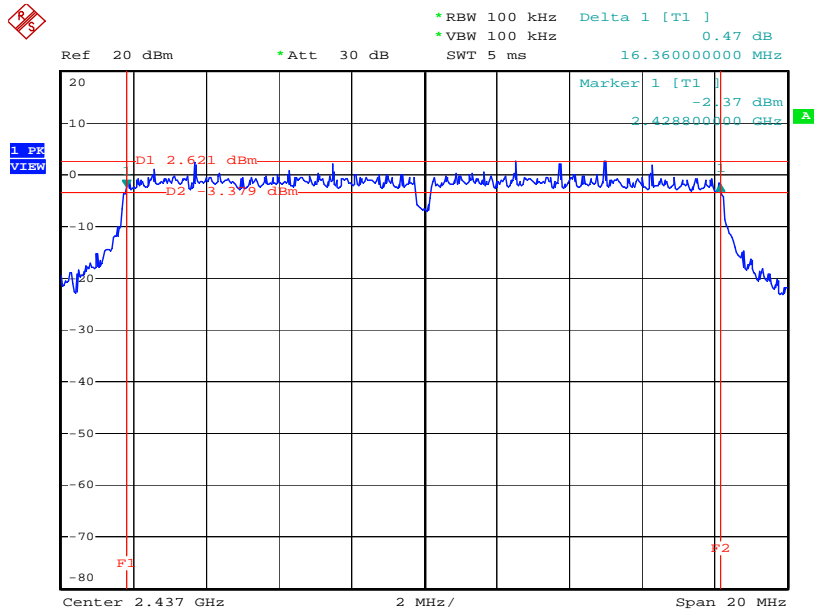


Modulation Type: OFDM (Channel 01) :



Date: 30.JUN.2004 21:11:36

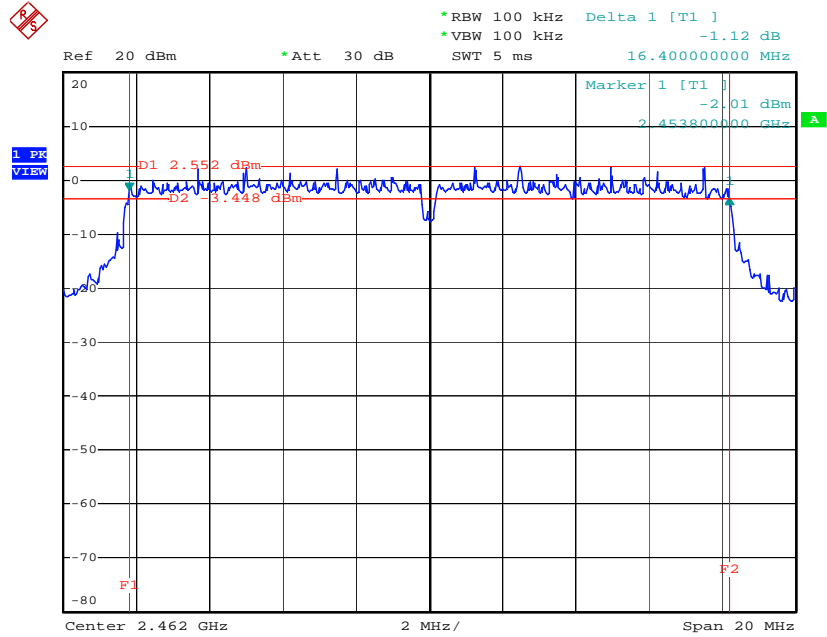
Modulation Type: OFDM (Channel 06) :



Date: 30.JUN.2004 21:08:12



Modulation Type: OFDM (Channel 11) :



Date: 30.JUN.2004 21:01:20

5.2. Test of Maximum Peak Output Power

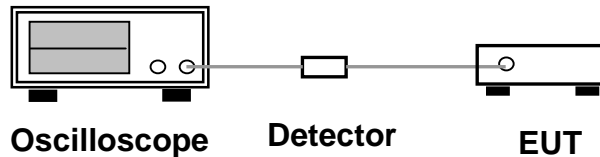
5.2.1. Measuring Instruments

Item 9 of the table on section 6.

5.2.2. Test Procedures

1. The transmitter output was connected to the vertical channel of the oscilloscope through a detector.
2. Observe the duty cycle X from the oscilloscope and the record the detected voltage level A.
3. Replace the EUT via the signal generator, calibrate the reading via the carrier frequency.
4. The duty cycle X has to be calibrated on the output power of the signal generator.
5. Repeated the 1~4 for the middle and highest channel of the EUT.

5.2.3. Test Setup Layout



5.2.4. Test Result : See spectrum analyzer plots below

- Modulation Type: CCK
- Temperature: 26°C
- Relative Humidity: 64 %
- Duty Cycle of the Equipment During the Test: 100%
- Test Engineer: Bunny Yao

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (mWatt)	Limits (dBm)
01	2412	20.52	112.72	30 dBm
06	2437	21.02	126.47	30 dBm
11	2462	20.65	116.14	30 dBm



5.2.5. Test Result : See spectrum analyzer plots below

- Modulation Type: OFDM
- Temperature: 26°C
- Relative Humidity: 64 %
- Duty Cycle of the Equipment During the Test: 100%
- Test Engineer: Bunny Yao

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (mWatt)	Limits (dBm)
01	2412	21.85	153.11	30 dBm
06	2437	22.32	170.61	30 dBm
11	2462	22.05	160.32	30 dBm

5.3. Test of Peak Power Spectral Density

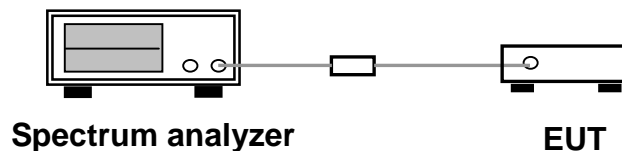
5.3.1. Measuring Instruments

Item 9 of the table on section 6.

5.3.2. Test Procedures

1. The transmitter output is connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 3kHz and VBW to 30kHz.
3. Mark the frequency with maximum peak power as the center of the display of the spectrum
4. Set the span to 1.5MHz and the sweep time to 500s and record the maximum peak value.
5. Repeated the 1~4 for the middle and highest channel of the EUT.

5.3.3. Test Setup Layout



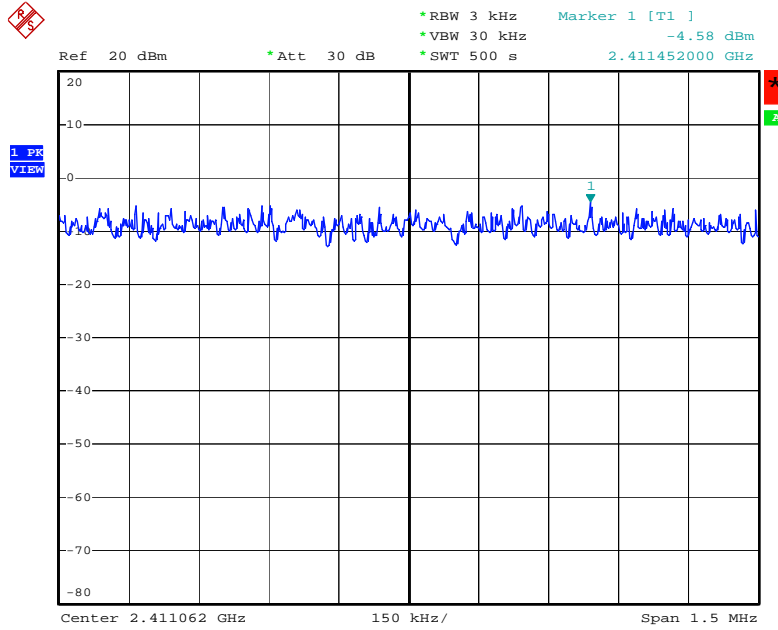
5.3.4. Test Result : See spectrum analyzer plots below

- Modulation Type: CCK
- Temperature: 26°C
- Relative Humidity: 64 %
- Duty Cycle of the Equipment During the Test: 100%
- Test Engineer: Bunny Yao

Channel	Frequency (MHz)	Power Density (dBm)	Limits (dBm)
01	2412	-4.57	8
06	2437	-4.82	8
11	2462	-5.20	8

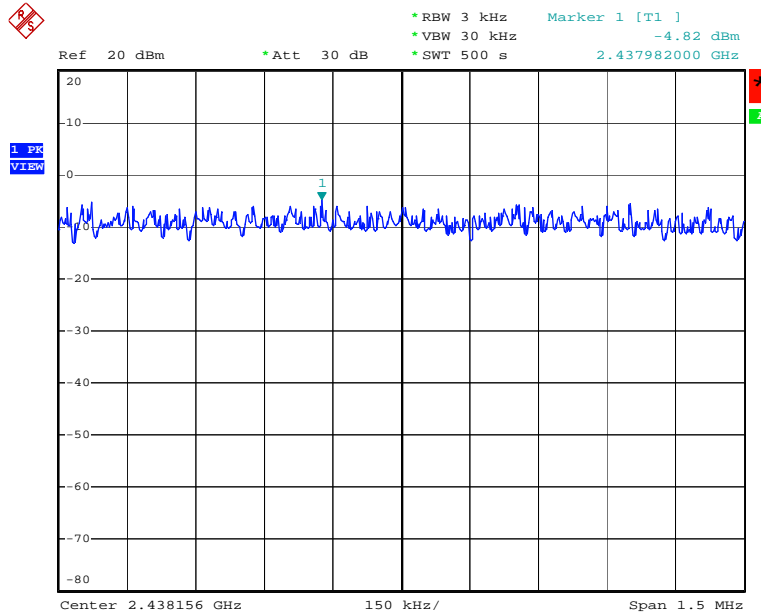


Modulation Type: CCK (Channel 01) :



Date: 30.JUN.2004 20:24:02

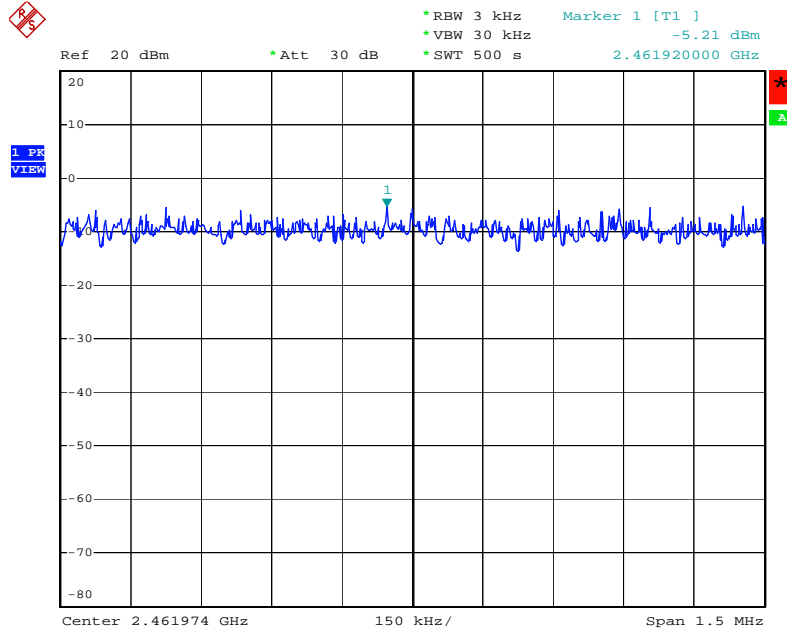
Modulation Type: CCK (Channel 06) :



Date: 30.JUN.2004 20:36:28



Modulation Type: CCK (Channel 11) :



Date: 30.JUN.2004 20:28:10

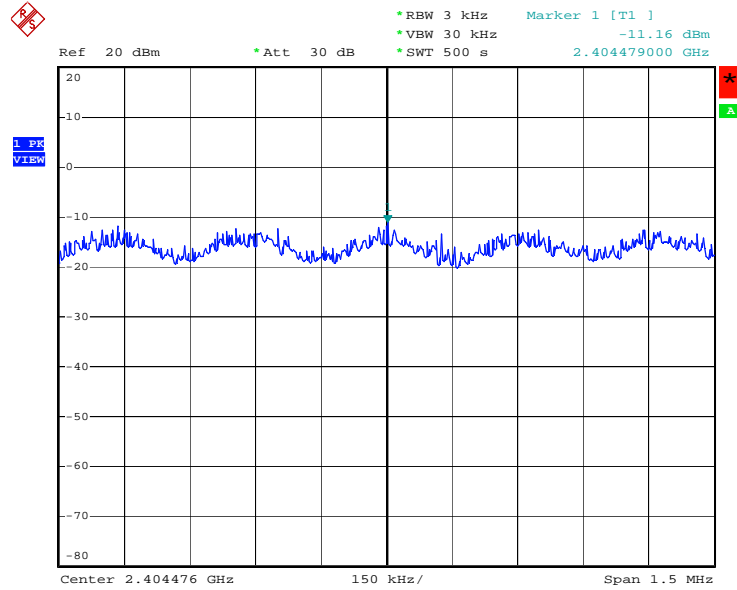
5.3.5. Test Result : See spectrum analyzer plots below

- Modulation Type: OFDM
- Temperature: 26°C
- Relative Humidity: 64 %
- Duty Cycle of the Equipment During the Test: 100%
- Test Engineer: Bunny Yao

Channel	Frequency (MHz)	Power Density (dBm)	Limits (dBm)
01	2412	-11.16	8
06	2437	-10.64	8
11	2462	-10.42	8

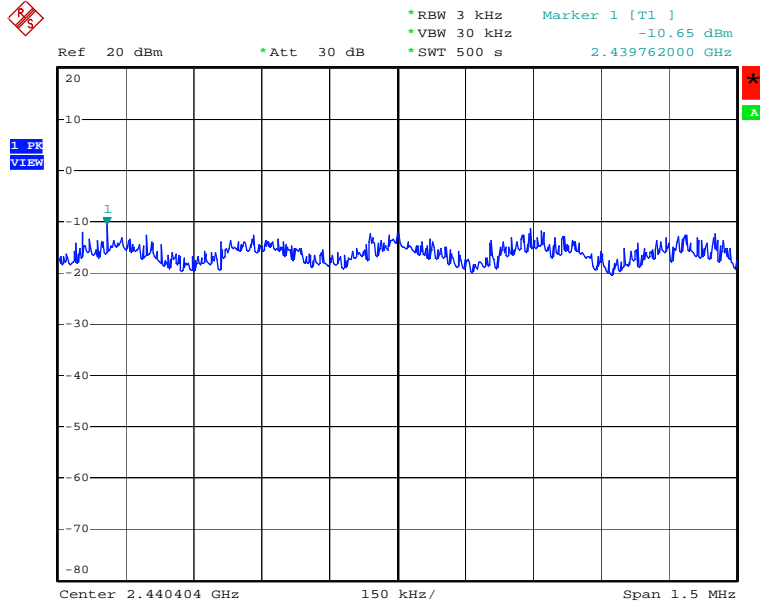


Modulation Type: OFDM (Channel 01) :



Date: 30.JUN.2004 21:12:02

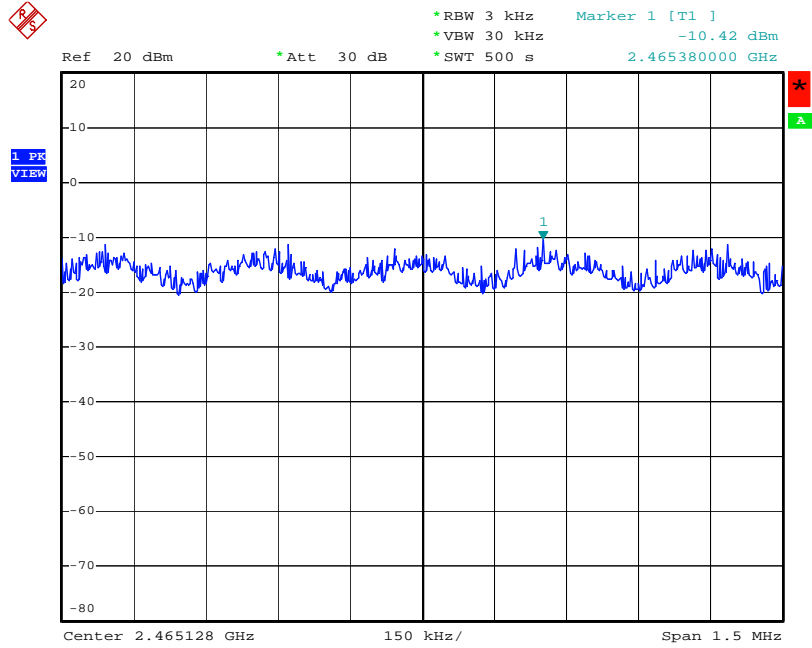
Modulation Type: OFDM (Channel 06) :



Date: 30.JUN.2004 21:08:28



Modulation Type: OFDM (Channel 11) :



Date: 30.JUN.2004 21:01:37



5.4. Test of Band Edges Emission

5.4.1. Measuring Instruments

Item 9 of the table on section 6.

5.4.2. Test Procedures

1. The transmitter is set to the lowest channel.
2. The transmitter output was connected to the spectrum analyzer via a cable and cable loss is used as the offset of the spectrum analyzer.
3. Set both RBW and VBW of spectrum analyzer to 100KHz with convenient frequency span including 100MHz bandwidth from lower band edge.
4. The lowest band edges emission was measured and recorded.
5. The transmitter set to the highest channel and repeated 2~4.

5.4.3. Test Result :

- Modulation Type: CCK
- Test Engineer: Bunny Yao

(A) Left Edge

The band edge emission plot shows 54.22 dB delta between carrier maximum power and local maximum emission in the restricted band.

Mode 1

CH01 Carrier power strength (dBuV/m)	Delta (dB)	The maximum field strength in restrict band (dBuV/m)	Limit (dBuV/m)	Margin (dB)
103.32	54.22	49.10	54.00	-4.90

Mode 2

CH01 Carrier power strength (dBuV/m)	Delta (dB)	The maximum field strength in restrict band (dBuV/m)	Limit (dBuV/m)	Margin (dB)
102.44	54.22	48.22	54.00	-5.78



Mode 3

CH01 Carrier power strength (dBuV/m)	Delta (dB)	The maximum field strength in restrict band (dBuV/m)	Limit (dBuV/m)	Margin (dB)
98.82	54.22	44.60	54.00	-9.40

(B) Right Edge

The band edge emission plot shows 54.90 dB delta between carrier maximum power and local maximum emission in the restricted band.

Mode 1

CH11 Carrier power strength (dBuV/m)	Delta (dB)	The maximum field strength in restrict band (dBuV/m)	Limit (dBuV/m)	Margin (dB)
103.68	54.90	48.78	54.00	-5.22

Mode 2

CH11 Carrier power strength (dBuV/m)	Delta (dB)	The maximum field strength in restrict band (dBuV/m)	Limit (dBuV/m)	Margin (dB)
104.34	54.90	49.44	54.00	-4.56

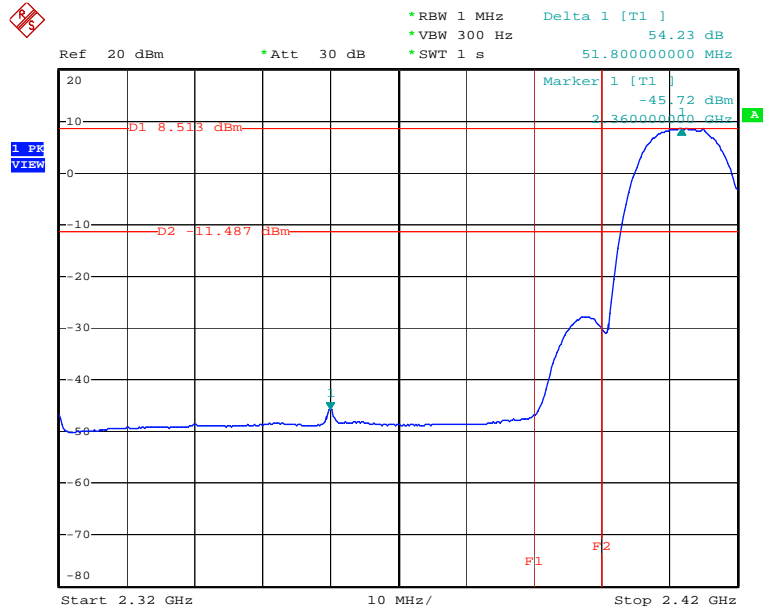
Mode 3

CH11 Carrier power strength (dBuV/m)	Delta (dB)	The maximum field strength in restrict band (dBuV/m)	Limit (dBuV/m)	Margin (dB)
98.70	54.90	43.80	54.00	-10.20

* The maximum field strength in restricted band is the emission of carrier power strength subtract to the delta between carrier maximum power and local maximum emission in the restricted band.

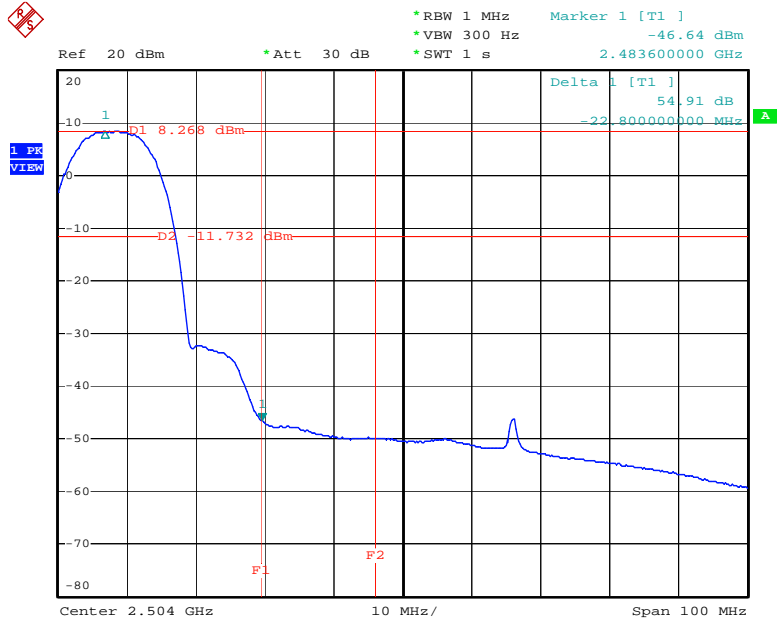


Modulation Type: CCK (Channel 01) :



Date: 30.JUN.2004 20:24:20

Modulation Type: CCK (Channel 11) :



Date: 30.JUN.2004 20:30:58

Observation : All emissions in the 100kHz bandwidth are 20dB lower than the carrier strength.



5.4.4. Test Result :

- Modulation Type: OFDM
- Test Engineer: Bunny Yao

(A) Left Edge

The band edge emission plot shows 44.39dB delta between carrier maximum power and local maximum emission in the restricted band.

Mode 1

CH01 Carrier power strength (dBuV/m)	Delta (dB)	The maximum field strength in restrict band (dBuV/m)	Limit (dBuV/m)	Margin (dB)
98.27	44.39	53.88	54.00	-0.12

Mode 2

CH01 Carrier power strength (dBuV/m)	Delta (dB)	The maximum field strength in restrict band (dBuV/m)	Limit (dBuV/m)	Margin (dB)
96.25	44.39	51.86	54.00	-2.14

Mode 3

CH01 Carrier power strength (dBuV/m)	Delta (dB)	The maximum field strength in restrict band (dBuV/m)	Limit (dBuV/m)	Margin (dB)
95.21	44.39	50.82	54.00	-3.18



(B) Right Edge

The band edge emission plot shows 45.29dB delta between carrier maximum power and local maximum emission in the restricted band.

Mode 1

CH11 Carrier power strength (dBuV/m)	Delta (dB)	The maximum field strength in restrict band (dBuV/m)	Limit (dBuV/m)	Margin (dB)
98.32	45.29	53.03	54.00	-0.97

Mode 2

CH11 Carrier power strength (dBuV/m)	Delta (dB)	The maximum field strength in restrict band (dBuV/m)	Limit (dBuV/m)	Margin (dB)
97.99	45.29	52.70	54.00	-1.30

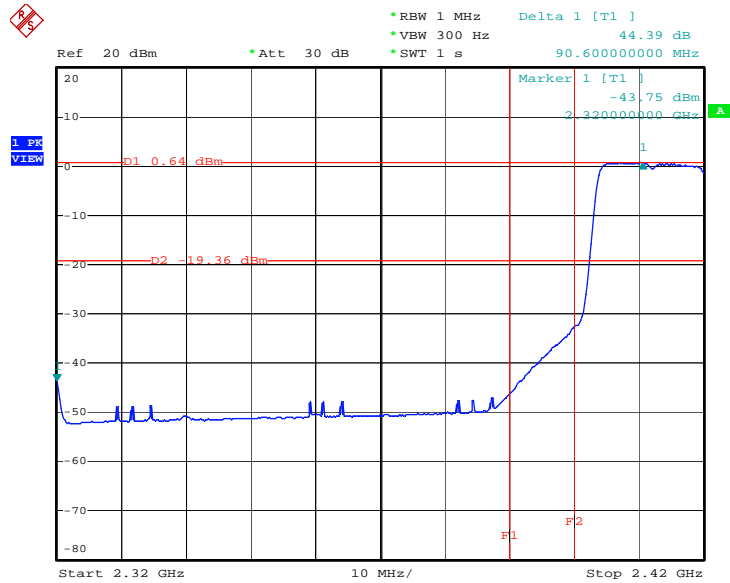
Mode 3

CH11 Carrier power strength (dBuV/m)	Delta (dB)	The maximum field strength in restrict band (dBuV/m)	Limit (dBuV/m)	Margin (dB)
95.82	45.29	50.53	54.00	-3.47

* The maximum field strength in restricted band is the emission of carrier power strength subtract to the delta between carrier maximum power and local maximum emission in the restricted band

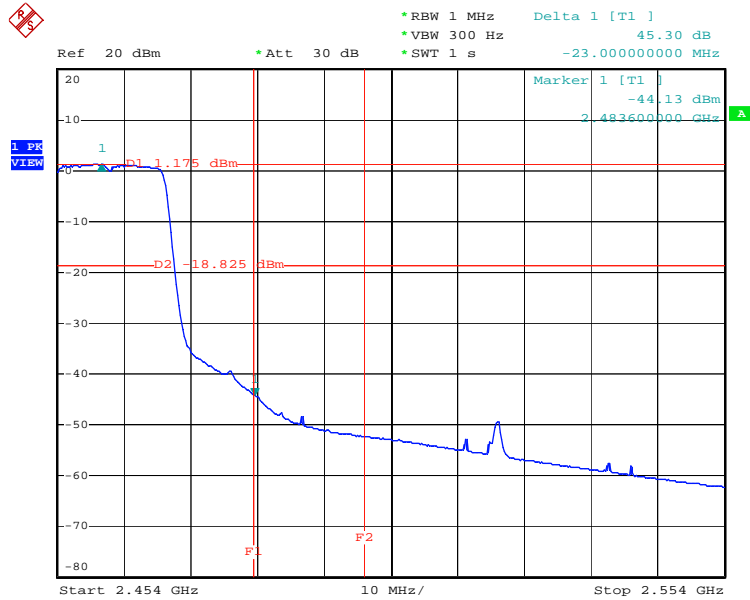


Modulation Type: OFDM (Channel 01) :



Date: 30.JUN.2004 21:12:19

Modulation Type: OFDM (Channel 11) :



Date: 30.JUN.2004 21:01:56

Observation : All emissions in the 100kHz bandwidth are 20dB lower than the carrier strength.



5.5. Test of AC Power Line Conducted Emission

5.5.1. Measuring Instruments

Please reference item 1~7 in chapter 6 for the instruments used for testing.

5.5.2. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connected to the other LISNs. The LISN should provides 50uH/50ohms coupling impedance.
5. The frequency range from 150 KHz to 30 MHz was searched.
6. Use the Channel & Power Controlling software to make the EUT working on selected channel and expected output power, then use the "H" Patter Generator software to make the supporting equipments stay on working condition.
7. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
8. The measurement has to be done between each power line and ground at the power terminal for each RF channel. Only one RF channel has to be investigated since this test is independent with the RF channel selection.



5.5.3. Test Result of Conducted Emission

Test Mode	RF Link	Tested By	Hikaru Chan
Temperature / Humidity	29deg. C / 54%		

Line to Ground

Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Read Level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Remark
0.239	46.00	-6.14	52.14	45.85	0.10	0.05	Average
0.239	55.88	-6.26	62.14	55.73	0.10	0.05	QP
0.369	30.89	-17.63	48.52	30.7	0.10	0.09	Average
0.369	48.12	-10.4	58.52	47.93	0.10	0.09	QP
0.481	36.18	-10.14	46.32	36.07	0.10	0.01	Average
0.481	36.38	-19.94	56.32	36.27	0.10	0.01	QP
17.696	43.66	-6.34	50.00	43.23	0.26	0.17	Average
17.696	46.07	-13.93	60.00	45.64	0.26	0.17	QP
19.710	41.54	-8.46	50.00	41.03	0.30	0.21	Average
19.710	43.79	-16.21	60.00	43.28	0.30	0.21	QP
22.458	40.78	-9.22	50.00	40.28	0.30	0.20	Average
22.458	43.87	-16.13	60.00	43.37	0.30	0.20	QP

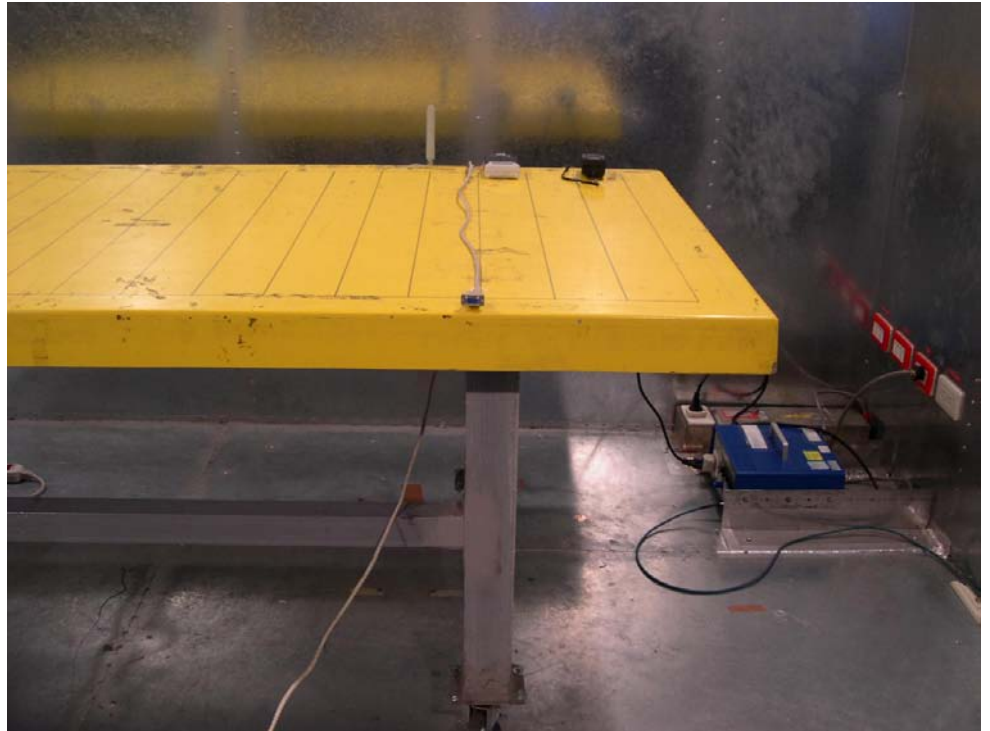
Neutral to Ground

Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Read Level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Remark
0.239	46.98	-5.16	52.14	46.83	0.10	0.05	Average
0.239	56.30	-5.84	62.14	56.15	0.10	0.05	QP
0.363	36.29	-12.37	48.66	36.10	0.10	0.09	Average
0.363	50.11	-8.55	58.66	49.92	0.10	0.09	QP
0.604	27.17	-18.83	46.00	26.77	0.10	0.30	Average
0.604	33.05	-22.95	56.00	32.65	0.10	0.30	QP
2.510	14.57	-31.43	46.00	14.42	0.10	0.05	Average
2.510	32.18	-23.82	56.00	32.03	0.10	0.05	QP
17.696	43.28	-6.72	50.00	42.85	0.26	0.17	Average
17.696	45.81	-14.19	60.00	45.38	0.26	0.17	QP
19.710	42.01	-7.99	50.00	41.50	0.30	0.21	Average
19.710	44.24	-15.76	60.00	43.73	0.30	0.21	QP

5.5.4. Photographs of Conducted Emission Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW



REAR VIEW





5.6. Test of Spurious Radiated Emission

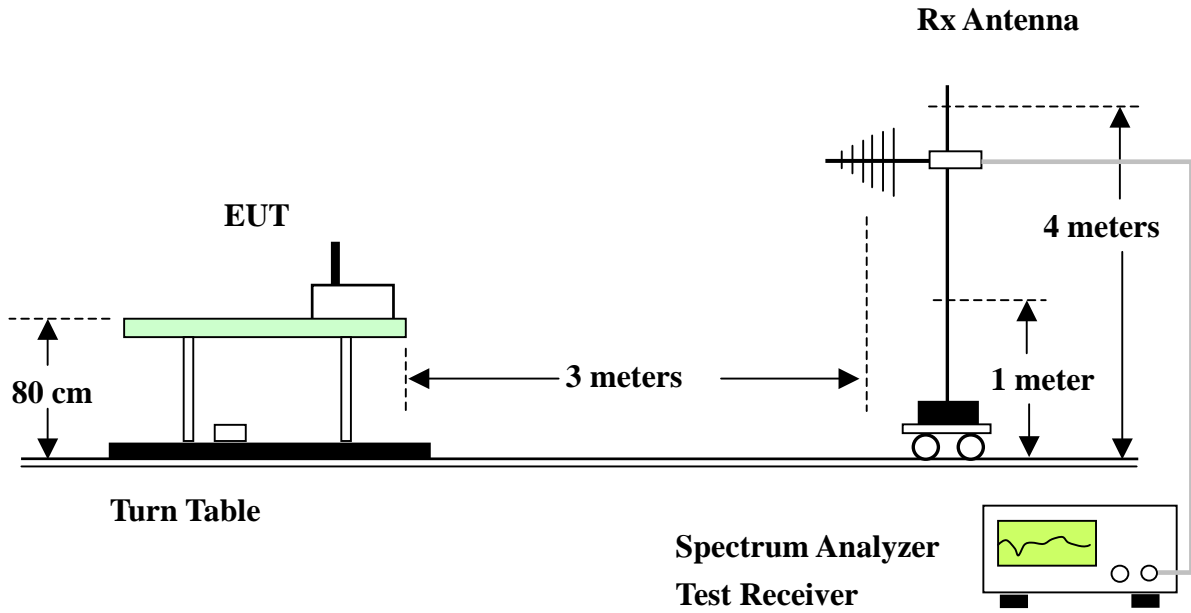
5.6.1. Measuring Instruments

Please reference item 8~19 in chapter 6 for the instruments used for testing.

5.6.2. Test Procedures

- a) Configure the EUT according to ANSI C63.4.
- b) The EUT was placed on the top of the turn table 0.8 meter above ground.
- c) The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turn table.
- d) Power on the EUT and all the supporting units.
- e) The turn table was rotated by 360 degrees to determine the position of the highest radiation.
- f) The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
- g) For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- h) Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- i) For emission above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
- j) If the emission level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz and average method for above the 1GHz. the reported.
- k) For testing above 1GHz, the emission level of the EUT in peak mode was 20dB higher than average limit (that means the emission level in peak 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.

5.6.3. Test Setup Layout





5.6.4. Test Results for spurious emission below 1GHz

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

Modulation Type	OFDM				
Test Mode	Mode 1 (CH 11 2462MHz)	Temperature	27 deg. C	Tested By	Ted Chiu
Freq. Range	30MHz~1GHz	Humidity	45%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	56.350	29.00	-11.00	40.00	44.45	10.83	1.27	27.55	Peak	---	---
2	89.670	30.50	-13.00	43.50	47.64	8.52	1.62	27.28	Peak	---	---
3	143.220	26.73	-16.77	43.50	39.37	12.36	2.11	27.11	Peak	---	---
1 !	374.400	42.44	-3.56	46.00	50.41	16.04	3.38	27.39	Peak	---	---
2	400.000	36.04	-9.96	46.00	43.47	16.80	3.47	27.70	Peak	---	---
3	900.000	38.67	-7.33	46.00	38.83	21.70	5.34	27.20	Peak	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1 !	34.420	36.55	-3.45	40.00	50.97	12.02	1.01	27.45	QP	---	---
2 !	58.390	36.49	-3.51	40.00	52.10	10.64	1.28	27.53	QP	---	---
3 !	80.830	36.82	-3.18	40.00	53.21	9.41	1.55	27.35	QP	139	70
1	448.800	36.23	-9.77	46.00	44.01	16.41	3.71	27.90	Peak	---	---
2	630.400	36.99	-9.01	46.00	40.35	20.49	4.46	28.31	Peak	---	---
3	720.000	38.02	-7.98	46.00	40.33	20.95	4.76	28.02	Peak	---	---



Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

Modulation Type	OFDM				
Test Mode	Mode 2 (CH 11 2462MHz)	Temperature	27 deg. C	Tested By	Ted Chiu
Freq. Range	30MHz~1GHz	Humidity	45%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	37.140	23.54	-16.46	40.00	37.78	12.19	1.04	27.47	Peak	---	---
2	58.390	26.39	-13.61	40.00	42.00	10.64	1.28	27.53	Peak	---	---
3	180.110	28.42	-15.08	43.50	38.83	14.20	2.43	27.04	Peak	---	---
1 !	900.000	40.04	-5.96	46.00	40.20	21.70	5.34	27.20	Peak	---	---
2 !	944.800	41.65	-4.35	46.00	40.74	22.69	5.51	27.29	Peak	---	---
3 !	957.600	42.49	-3.51	46.00	41.20	22.96	5.65	27.32	QP	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1 !	34.420	36.15	-3.85	40.00	50.57	12.02	1.01	27.45	QP	---	---
2 !	58.390	36.77	-3.23	40.00	52.38	10.64	1.28	27.53	QP	---	---
3 !	89.670	38.43	-5.07	43.50	55.57	8.52	1.62	27.28	QP	---	---
1	810.400	36.60	-9.40	46.00	37.25	21.88	5.12	27.65	Peak	---	---
2	902.400	37.45	-8.55	46.00	37.56	21.75	5.35	27.21	Peak	---	---
3 !	957.600	42.89	-3.11	46.00	41.60	22.96	5.65	27.32	QP	118	79



Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

Modulation Type	OFDM				
Test Mode	Mode 3 (CH 11 2462MHz)	Temperature	27 deg. C	Tested By	Ted Chiu
Freq. Range	30MHz~1GHz	Humidity	45%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	58.390	24.13	-15.87	40.00	39.74	10.64	1.28	27.53	Peak	---	---
2	89.670	18.38	-25.12	43.50	35.52	8.52	1.62	27.28	Peak	---	---
3	180.110	21.49	-22.01	43.50	31.90	14.20	2.43	27.04	Peak	---	---
1 !	908.800	42.37	-3.63	46.00	42.32	21.90	5.37	27.22	Peak	---	---
2 !	915.200	42.03	-3.97	46.00	41.83	22.04	5.39	27.23	Peak	---	---
3 !	957.600	42.65	-3.35	46.00	41.36	22.96	5.65	27.32	QP	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1 !	34.420	36.85	-3.15	40.00	51.27	12.02	1.01	27.45	QP	148	89
2 !	62.470	36.27	-3.73	40.00	52.12	10.33	1.32	27.50	QP	---	---
3 !	89.670	40.15	-3.35	43.50	57.29	8.52	1.62	27.28	Peak	---	---
1	249.600	39.25	-6.75	46.00	50.87	12.30	2.83	26.75	Peak	---	---
2 !	902.400	42.48	-3.52	46.00	42.59	21.75	5.35	27.21	QP	---	---
3 !	957.600	42.39	-3.61	46.00	41.10	22.96	5.65	27.32	QP	---	---



5.6.5. Test Results for spurious emission above 1GHz

Modulation Type	CCK				
Test Mode	Mode 1 (CH 01 2412MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2014.000	40.72	-13.28	54.00	52.92	27.15	1.57	40.92	Average	---	---
2	2358.000	44.90	-9.10	54.00	56.27	28.06	1.69	41.12	Average	---	---
3	2502.000	40.51	-13.49	54.00	51.41	28.45	1.85	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2014.000	43.84	-10.16	54.00	56.04	27.15	1.57	40.92	Average	---	---
2	2358.000	56.48	-17.52	74.00	67.85	28.06	1.69	41.12	Peak	---	---
3	2358.000	47.09	-6.91	54.00	58.46	28.06	1.69	41.12	Average	102	216
4	2508.000	51.83	-22.17	74.00	62.70	28.47	1.86	41.20	Peak	---	---
5	2508.000	44.03	-9.97	54.00	54.90	28.47	1.86	41.20	Average	---	---
1	4822.000	42.80	-11.20	54.00	49.47	33.23	2.47	42.37	Average	---	---

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	CCK				
Test Mode	Mode 1 (CH 06 2437MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2294.000	41.72	-12.28	54.00	53.16	27.89	1.75	41.08	Average	---	---
2	2358.000	45.37	-8.63	54.00	56.74	28.06	1.69	41.12	Average	---	---
3	2510.000	40.45	-13.55	54.00	51.32	28.47	1.86	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1078.000	38.27	-15.73	54.00	53.21	24.04	1.21	40.19	Average	---	---
2	2350.000	50.82	-3.18	54.00	62.22	28.04	1.68	41.12	Average	105	212
3	2502.000	47.63	-6.37	54.00	58.53	28.45	1.85	41.20	Average	---	---

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	CCK				
Test Mode	Mode 1 (CH 11 2462MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2300.000	41.45	-12.55	54.00	52.89	27.90	1.75	41.09	Average	---	---
2	2358.000	45.13	-8.87	54.00	56.50	28.06	1.69	41.12	Average	---	---
3	2508.000	42.23	-11.77	54.00	53.10	28.47	1.86	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2244.000	46.81	-7.19	54.00	58.38	27.76	1.72	41.05	Average	106	218
2	2350.000	45.58	-8.42	54.00	56.98	28.04	1.68	41.12	Average	---	---
3	2350.000	56.30	-17.70	74.00	67.70	28.04	1.68	41.12	Peak	---	---
4	2510.000	42.37	-11.63	54.00	53.24	28.47	1.86	41.20	Average	---	---
5	2510.000	52.73	-21.27	74.00	63.60	28.47	1.86	41.20	Peak	---	---

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	OFDM				
Test Mode	Mode 1 (CH 01 2412MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1078.000	37.50	-16.50	54.00	52.44	24.04	1.21	40.19	Average	---	---
2	2372.000	38.62	-15.38	54.00	49.96	28.09	1.70	41.13	Average	---	---
3	2516.000	38.46	-15.54	54.00	49.30	28.50	1.86	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2236.000	44.04	-9.96	54.00	55.65	27.73	1.71	41.05	Average	102	218
2	2358.000	53.37	-20.63	74.00	64.74	28.06	1.69	41.12	Peak	---	---
3	2358.000	42.91	-11.09	54.00	54.28	28.06	1.69	41.12	Average	---	---
4	2510.000	51.73	-22.27	74.00	62.60	28.47	1.86	41.20	Peak	---	---
5	2510.000	41.24	-12.76	54.00	52.11	28.47	1.86	41.20	Average	---	---

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	OFDM				
Test Mode	Mode 1 (CH 06 2437MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2358.000	42.10	-11.90	54.00	53.47	28.06	1.69	41.12	Average	---	---
2	2358.000	42.10	-31.90	74.00	53.47	28.06	1.69	41.12	Peak	---	---
3	2516.000	37.87	-16.13	54.00	48.71	28.50	1.86	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2324.000	50.25	-23.75	74.00	61.66	27.97	1.72	41.10	Peak	---	---
2	2324.000	39.01	-14.99	54.00	50.42	27.97	1.72	41.10	Average	---	---
3	2358.000	53.04	-20.96	74.00	64.41	28.06	1.69	41.12	Peak	---	---
4	2358.000	42.66	-11.34	54.00	54.03	28.06	1.69	41.12	Average	105	258
5	2510.000	49.15	-24.85	74.00	60.02	28.47	1.86	41.20	Peak	---	---
6	2510.000	39.60	-14.40	54.00	50.47	28.47	1.86	41.20	Average	---	---

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	OFDM				
Test Mode	Mode 1 (CH 11 2462MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2014.000	37.39	-16.61	54.00	49.59	27.15	1.57	40.92	Average	---	---
2	2358.000	42.20	-11.80	54.00	53.57	28.06	1.69	41.12	Average	---	---
3	2532.000	38.69	-15.31	54.00	49.47	28.55	1.87	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2318.000	49.68	-24.32	74.00	61.10	27.95	1.73	41.10	Peak	---	---
2	2318.000	40.55	-13.45	54.00	51.97	27.95	1.73	41.10	Average	---	---
3	2358.000	53.25	-20.75	74.00	64.62	28.06	1.69	41.12	Peak	---	---
4	2358.000	43.35	-10.65	54.00	54.72	28.06	1.69	41.12	Average	105	219
5	2518.000	48.52	-25.48	74.00	59.35	28.51	1.86	41.20	Peak	---	---
6	2518.000	37.92	-16.08	54.00	48.75	28.51	1.86	41.20	Average	---	---

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	CCK				
Test Mode	Mode 2 (CH 01 2412MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2340.000	47.74	-26.26	74.00	59.15	28.01	1.69	41.11	Peak	---	---
2	2340.000	37.66	-16.34	54.00	49.07	28.01	1.69	41.11	Average	---	---
3	2364.000	47.52	-26.48	74.00	58.87	28.07	1.70	41.12	Peak	---	---
4	2364.000	36.19	-17.81	54.00	47.54	28.07	1.70	41.12	Average	---	---
5	2502.000	42.76	-31.24	74.00	53.66	28.45	1.85	41.20	Peak	---	---
6	2502.000	32.12	-21.88	54.00	43.02	28.45	1.85	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2318.000	53.88	-20.12	74.00	65.30	27.95	1.73	41.10	Peak	---	---
2	2318.000	44.22	-9.78	54.00	55.64	27.95	1.73	41.10	Average	---	---
3	2374.000	54.10	-19.90	74.00	65.42	28.10	1.71	41.13	Peak	---	---
4	2374.000	44.48	-9.52	54.00	55.80	28.10	1.71	41.13	Average	101	228
5	2508.000	51.99	-22.01	74.00	62.86	28.47	1.86	41.20	Peak	---	---
6	2508.000	40.49	-13.51	54.00	51.36	28.47	1.86	41.20	Average	---	---

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	CCK				
Test Mode	Mode 2 (CH 06 2437MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1438.000	40.56	-13.44	54.00	54.58	25.07	1.46	40.55	Average	---	---
2	2318.000	47.48	-26.52	74.00	58.90	27.95	1.73	41.10	Peak	---	---
3	2318.000	37.11	-16.89	54.00	48.53	27.95	1.73	41.10	Average	---	---
4	2502.000	43.90	-30.10	74.00	54.80	28.45	1.85	41.20	Peak	---	---
5	2502.000	32.22	-21.78	54.00	43.12	28.45	1.85	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2014.000	41.99	-12.01	54.00	54.19	27.15	1.57	40.92	Average	106	253
2	2318.000	53.55	-20.45	74.00	64.97	27.95	1.73	41.10	Peak	---	---
3	2318.000	43.30	-10.70	54.00	54.72	27.95	1.73	41.10	Average	---	---
4	2500.000	51.18	-22.82	74.00	62.09	28.44	1.85	41.20	Peak	---	---
5	2500.000	40.18	-13.82	54.00	51.09	28.44	1.85	41.20	Average	---	---

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	CCK				
Test Mode	Mode 2 (CH 11 2462MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2014.000	38.73	-15.27	54.00	50.93	27.15	1.57	40.92	Average	---	---
2	2318.000	46.22	-27.78	74.00	57.64	27.95	1.73	41.10	Peak	---	---
3	2318.000	35.54	-18.46	54.00	46.96	27.95	1.73	41.10	Average	---	---
4	2508.000	43.87	-30.13	74.00	54.74	28.47	1.86	41.20	Peak	---	---
5	2508.000	33.84	-20.16	54.00	44.71	28.47	1.86	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2014.000	41.82	-12.18	54.00	54.02	27.15	1.57	40.92	Average	---	---
2	2318.000	53.64	-20.36	74.00	65.06	27.95	1.73	41.10	Peak	---	---
3	2318.000	44.37	-9.63	54.00	55.79	27.95	1.73	41.10	Average	102	235
4	2508.000	52.29	-21.71	74.00	63.16	28.47	1.86	41.20	Peak	---	---
5	2508.000	41.19	-12.81	54.00	52.06	28.47	1.86	41.20	Average	---	---

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	OFDM				
Test Mode	Mode 2 (CH 01 2412MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2028.000	42.52	-11.48	54.00	54.64	27.18	1.62	40.92	Average	---	---
2	2334.000	47.03	-26.97	74.00	58.45	27.99	1.70	41.11	Peak	---	---
3	2334.000	35.64	-18.36	54.00	47.06	27.99	1.70	41.11	Average	---	---
4	2518.000	44.69	-29.31	74.00	55.52	28.51	1.86	41.20	Peak	---	---
5	2518.000	33.83	-20.17	54.00	44.66	28.51	1.86	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2022.000	48.68	-25.32	74.00	60.83	27.17	1.60	40.92	Peak	---	---
2	2022.000	36.93	-17.07	54.00	49.08	27.17	1.60	40.92	Average	---	---
3	2372.000	53.79	-20.21	74.00	65.13	28.09	1.70	41.13	Peak	---	---
4	2372.000	43.43	-10.57	54.00	54.77	28.09	1.70	41.13	Average	103	248
5	2510.000	51.98	-22.02	74.00	62.85	28.47	1.86	41.20	Peak	---	---
6	2510.000	39.16	-14.84	54.00	50.03	28.47	1.86	41.20	Average	---	---

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	OFDM				
Test Mode	Mode 2 (CH 06 2437MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1438.000	40.04	-13.96	54.00	54.06	25.07	1.46	40.55	Average	---	---
2	2342.000	44.05	-29.95	74.00	55.46	28.01	1.69	41.11	Peak	---	---
3	2342.000	33.65	-20.35	54.00	45.06	28.01	1.69	41.11	Average	---	---
4	2508.000	42.10	-31.90	74.00	52.97	28.47	1.86	41.20	Peak	---	---
5	2508.000	31.86	-22.14	54.00	42.73	28.47	1.86	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2014.000	42.10	-11.90	54.00	54.30	27.15	1.57	40.92	Average	105	260
2	2334.000	53.60	-20.40	74.00	65.02	27.99	1.70	41.11	Peak	---	---
3	2334.000	43.33	-10.67	54.00	54.75	27.99	1.70	41.11	Average	---	---
4	2510.000	51.48	-22.52	74.00	62.35	28.47	1.86	41.20	Peak	---	---
5	2510.000	42.00	-12.00	54.00	52.87	28.47	1.86	41.20	Average	---	---

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	OFDM				
Test Mode	Mode 2 (CH 11 2462MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1438.000	39.78	-14.22	54.00	53.80	25.07	1.46	40.55	Average	---	---
2	2318.000	47.24	-26.76	74.00	58.66	27.95	1.73	41.10	Peak	---	---
3	2318.000	37.38	-16.62	54.00	48.80	27.95	1.73	41.10	Average	---	---
4	2518.000	43.42	-30.58	74.00	54.25	28.51	1.86	41.20	Peak	---	---
5	2518.000	32.43	-21.57	54.00	43.26	28.51	1.86	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2014.000	41.60	-12.40	54.00	53.80	27.15	1.57	40.92	Average	---	---
2	2358.000	53.41	-20.59	74.00	64.78	28.06	1.69	41.12	Peak	---	---
3	2358.000	42.75	-11.25	54.00	54.12	28.06	1.69	41.12	Average	102	218
4	2502.000	51.51	-22.49	74.00	62.41	28.45	1.85	41.20	Peak	---	---
5	2502.000	41.56	-12.44	54.00	52.46	28.45	1.85	41.20	Average	---	---

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	CCK				
Test Mode	Mode 3 (CH 01 2412MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1078.000	37.38	-16.62	54.00	52.32	24.04	1.21	40.19	Average	---	---
2	2358.000	41.31	-12.69	54.00	52.68	28.06	1.69	41.12	Average	105	111
3	2532.000	39.02	-14.98	54.00	49.80	28.55	1.87	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1078.000	38.79	-15.21	54.00	53.73	24.04	1.21	40.19	Average	---	---
2	2374.000	39.52	-14.48	54.00	50.84	28.10	1.71	41.13	Average	---	---
3	2502.000	38.98	-15.02	54.00	49.88	28.45	1.85	41.20	Average	---	---

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	CCK				
Test Mode	Mode 3 (CH 06 2437MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1078.000	37.52	-16.48	54.00	52.46	24.04	1.21	40.19	Average	---	---
2	2340.000	41.68	-12.32	54.00	53.09	28.01	1.69	41.11	Average	---	---
3	2508.000	38.67	-15.33	54.00	49.54	28.47	1.86	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1078.000	39.20	-14.80	54.00	54.14	24.04	1.21	40.19	Average	---	---
2	2340.000	37.94	-16.06	54.00	49.35	28.01	1.69	41.11	Average	---	---
3	2510.000	39.16	-14.84	54.00	50.03	28.47	1.86	41.20	Average	---	---
1	4876.000	42.04	-11.96	54.00	48.61	33.35	2.52	42.44	Average	107	191

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	CCK				
Test Mode	Mode 3 (CH 11 2462MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1622.000	37.43	-16.57	54.00	50.88	25.71	1.52	40.68	Average	---	---
2	2340.000	41.48	-12.52	54.00	52.89	28.01	1.69	41.11	Average	---	---
3	2510.000	39.00	-15.00	54.00	49.87	28.47	1.86	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1078.000	39.17	-14.83	54.00	54.11	24.04	1.21	40.19	Average	---	---
2	2340.000	38.63	-15.37	54.00	50.04	28.01	1.69	41.11	Average	---	---
3	2510.000	39.86	-14.14	54.00	50.73	28.47	1.86	41.20	Average	---	---
1	4926.000	42.71	-11.29	54.00	49.29	33.46	2.47	42.51	Average	105	169

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	OFDM				
Test Mode	Mode 3 (CH 01 2412MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2022.000	39.44	-14.56	54.00	51.59	27.17	1.60	40.92	Average	---	---
2	2340.000	41.82	-12.18	54.00	53.23	28.01	1.69	41.11	Average	---	---
3	2796.000	46.96	-7.04	54.00	56.72	29.49	1.95	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2374.000	39.51	-14.49	54.00	50.83	28.10	1.71	41.13	Average	---	---
2	2510.000	40.16	-13.84	54.00	51.03	28.47	1.86	41.20	Average	---	---
3	2798.000	47.43	-6.57	54.00	57.19	29.49	1.95	41.20	Average	108	141

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	OFDM				
Test Mode	Mode 3 (CH 06 2437MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1438.000	37.40	-16.60	54.00	51.42	25.07	1.46	40.55	Average	---	---
2	2340.000	41.79	-12.21	54.00	53.20	28.01	1.69	41.11	Average	106	158
3	2518.000	38.98	-15.02	54.00	49.81	28.51	1.86	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1078.000	38.88	-15.12	54.00	53.82	24.04	1.21	40.19	Average	---	---
2	2332.000	38.90	-15.10	54.00	50.31	27.99	1.71	41.11	Average	---	---
3	2510.000	40.45	-13.55	54.00	51.32	28.47	1.86	41.20	Average	---	---

Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.



Modulation Type	OFDM				
Test Mode	Mode 3 (CH 11 2462MHz)	Temperature	25 deg. C	Tested By	Steve Chen
Freq. Range	1GHz~25GHz	Humidity	66%		

(A) Polarization: Horizontal

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1078.000	37.76	-16.24	54.00	52.70	24.04	1.21	40.19	Average	---	---
2	2358.000	41.45	-12.55	54.00	52.82	28.06	1.69	41.12	Average	102	167
3	2508.000	39.19	-14.81	54.00	50.06	28.47	1.86	41.20	Average	---	---

(B) Polarization: Vertical

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	1078.000	38.63	-15.37	54.00	53.57	24.04	1.21	40.19	Average	---	---
2	2340.000	38.71	-15.29	54.00	50.12	28.01	1.69	41.11	Average	---	---
3	2502.000	40.40	-13.60	54.00	51.30	28.45	1.85	41.20	Average	---	---

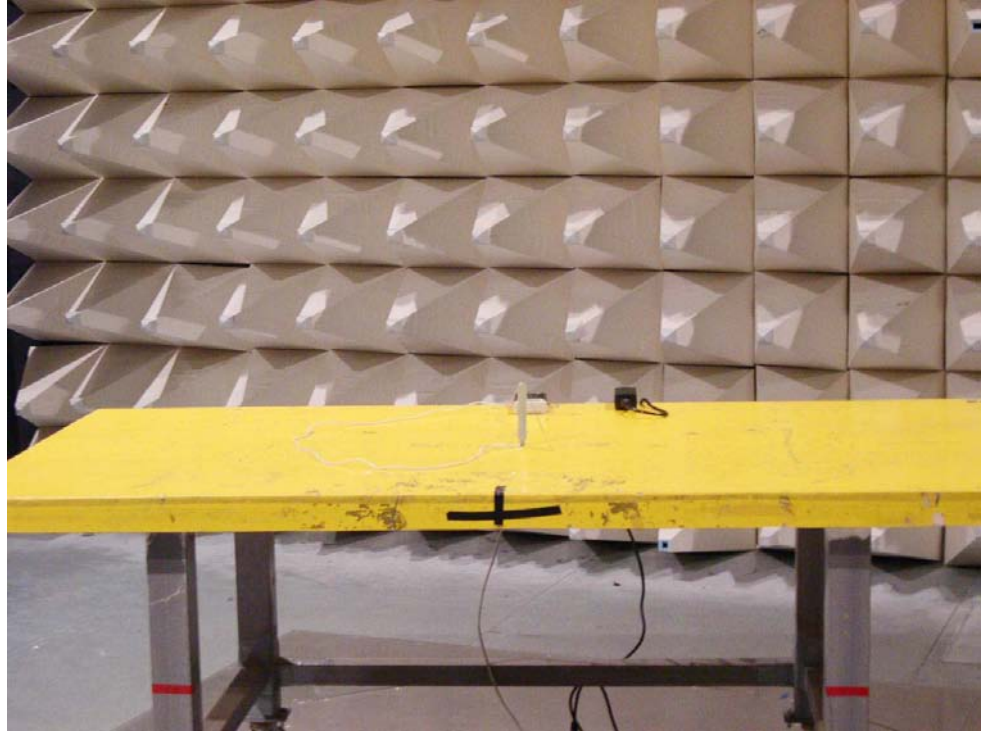
Remark: Spurious on higher frequency band, the emission emitted by the EUT is too low to be measured.

5.6.5 Photographs of Radiated Emission Test Configuration

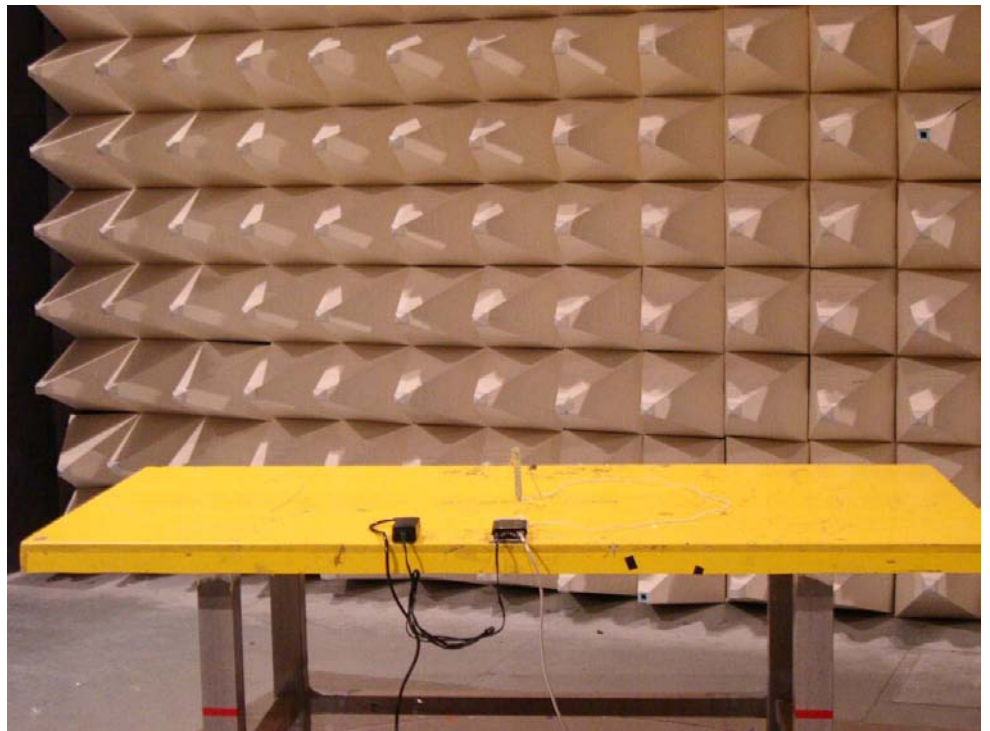
- The photographs show the configuration that generates the maximum emission.

Mode 1

FRONT VIEW

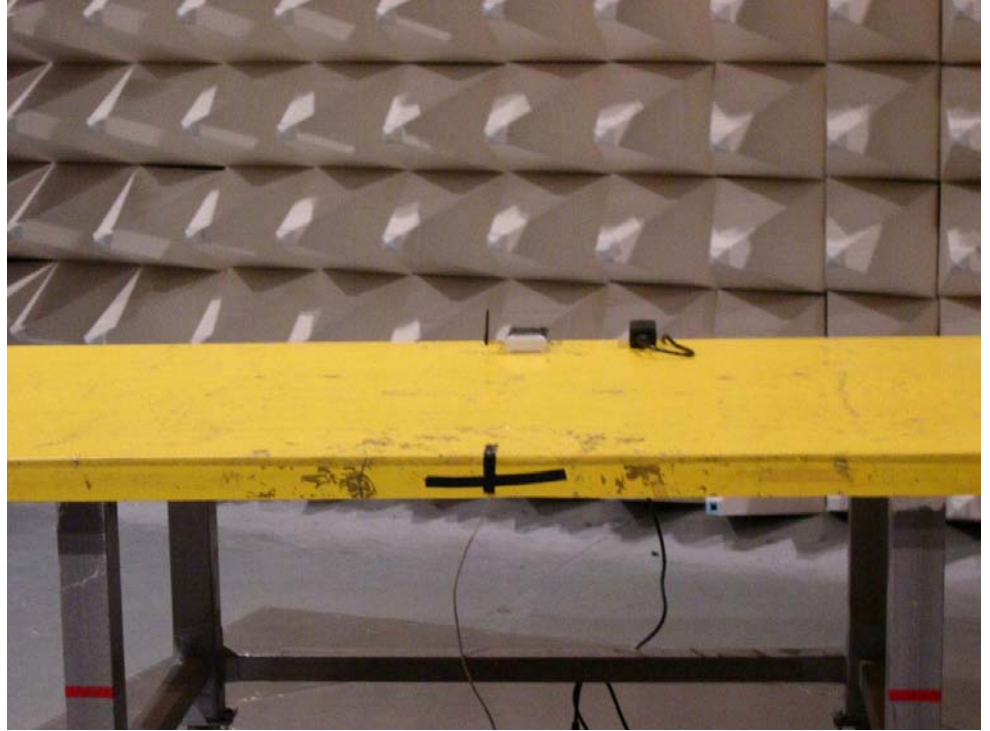


REAR VIEW

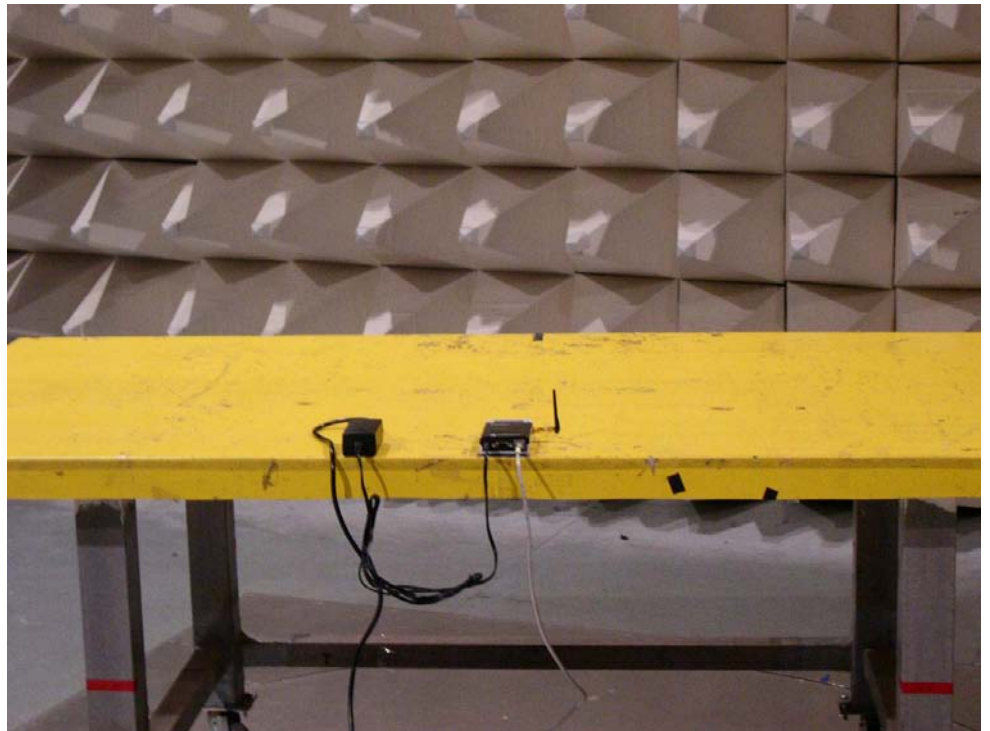


Mode 2

FRONT VIEW



REAR VIEW

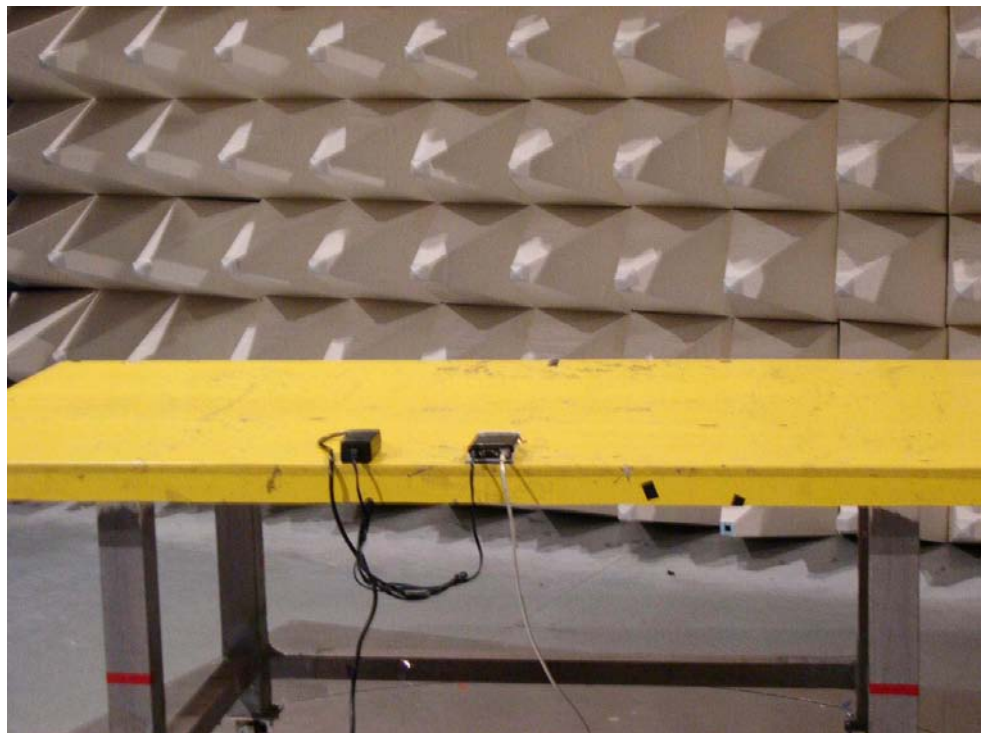


Mode 3

FRONT VIEW



REAR VIEW





5.7. Antenna Requirements

5.7.1. Standard Applicable

47 CFR Part15 Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

47 CFR Part15 Section 15.247 (b):

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

If the intentional radiator is used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

5.7.2. Antenna Connected Construction

There is no antenna connector for integral chip antenna. The connector for monopole antenna is reversed SMA and standard SMA. But this product is classified as professional use, so there is no need to fulfill the unique antenna connector requirement.



5.8. RF Exposure

5.8.1. Limit For Maximum Permissible Exposure (MPE)

This product can be classified as mobile device, so the 20cm separation distance warning is required.

In this section, the power density at 20cm location is calculated to examine if it is lower than the limit.

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

F = frequency in MHz

*Plane-wave equivalent power density



5.8.2. MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d}$$

$$\text{Power Density: } Pd \text{ (mW/cm}^2\text{)} = \frac{E^2}{377}$$

- E** = Electric field (V/m)
- P** = Peak RF output power (mW)
- G** = EUT Antenna numeric gain (numeric)
- d** = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=20cm, as well as the gain of the used antenna, the RF power density can be obtained.

5.8.3. Calculated Result and Limit

- Modulation Type: CCK
- Test Engineer: Bunny Yao

Mode 1

Channel No.	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)
Channel 1	2.5	1.78	20.52	112.7197	0.0399	1
Channel 6	2.5	1.78	21.02	126.4736	0.0448	1
Channel 11	2.5	1.78	20.65	116.1449	0.0411	1



Mode 2

Channel No.	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)
Channel 1	5.15	3.27	20.52	112.7197	0.0734	1
Channel 6	5.15	3.27	21.02	126.4736	0.0824	1
Channel 11	5.15	3.27	20.65	116.1449	0.0757	1

Mode 3

Channel No.	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)
Channel 1	1.58	1.44	20.52	112.7197	0.0324	1
Channel 6	1.58	1.44	21.02	126.4736	0.0364	1
Channel 11	1.58	1.44	20.65	116.1449	0.0333	1

* From the calculated result shown in above table, the power density is lower than limit at location 20cm far away.



- Modulation Type: OFDM
- Test Engineer: Bunny Yao

Mode 1

Channel No.	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)
Channel 1	2.5	1.78	21.85	153.1087	0.0542	1
Channel 6	2.5	1.78	22.32	170.6082	0.0604	1
Channel 11	2.5	1.78	22.05	160.3245	0.0567	1

Mode 2

Channel No.	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)
Channel 1	5.15	3.27	21.85	153.1087	0.0998	1
Channel 6	5.15	3.27	22.32	170.6082	0.1112	1
Channel 11	5.15	3.27	22.05	160.3245	0.1045	1



Mode 3

Channel No.	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)
Channel 1	1.58	1.44	21.85	153.1087	0.0440	1
Channel 6	1.58	1.44	22.32	170.6082	0.0490	1
Channel 11	1.58	1.44	22.05	160.3245	0.0459	1

* From the calculated result shown in above table, the power density is lower than limit at location 20cm far away.



6. List of Measuring Equipments Used

Items	Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
1	EMC Receiver	R&S	ESCS 30	100174	9 KHz – 2.75 GHz	Feb. 16, 2004	Conduction (CO04-HY)
2	LISN	MessTec	NNB-2/16Z	2001/004	9 KHz – 30 MHz	Jun. 09, 2004	Conduction (CO04-HY)
3	LISN (Support Unit)	MessTec	NNB-2/16Z	99041	9 KHz – 30 MHz	Apr. 27, 2004	Conduction (CO04-HY)
4	EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)
5	RF Cable-CON	UTIFLEX	3102-26886-4	CB044	9KHz~30MHz	Apr. 21, 2004	Conduction (CO04-HY)
6	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 21, 2004	Radiation (03CH03-HY)
7	Spectrum analyzer	R&S	FSP40	100004	9KHZ~40GHz	Aug. 22, 2004	Radiation (03CH03-HY)
8	Amplifier	HP	8447D	2944A09072	100KHz – 1.3GHz	Nov. 04, 2004	Radiation (03CH03-HY)
9	Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz – 200MHz	Jul. 23, 2004	Radiation (03CH03-HY)
10	Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz -1GHz	Jul. 23, 2004	Radiation (03CH03-HY)
11	RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	Dec. 03, 2003	Radiation (03CH03-HY)
12	Amplifier	MITEQ	AFS44	879981	100MHz~26.5GHz	Jul. 22, 2004	Radiation (03CH03-HY)
13	Horn Antenna	EMCO	3115	6821	1GHz – 18GHz	Sep. 11, 2004	Radiation (03CH03-HY)
14	Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
15	Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
16	Horn Antenna	Schwarzbeck	BBHA9170	154	15GHz~40GHz	Jun. 09, 2004	Radiation (03CH03-HY)
17	RF Cable-HIGH	Jye Bao	RG142	CB030-HIGH	1GHz~29.5GHz	Dec. 05, 2003	Radiation (03CH03-HY)

※ Calibration Interval of instruments listed above is one year.



Items	Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
18	Spectrum analyzer	R&S	FSP7	838858/014	9KHZ~7GHZ	Sep. 02, 2004	Conducted (TH01-HY)
19	Power meter	R&S	NRVS	100444	DC~40GHz	Jun. 15, 2004	Conducted (TH01-HY)
20	Power sensor	R&S	NRV-Z55	100049	DC~40GHz	Jun. 15, 2004	Conducted (TH01-HY)
21	Power Sensor	R&S	NRV-Z32	100057	30MHz-6GHz	Jun. 15, 2004	Conducted (TH01-HY)
22	AC power source	HPC	HPA-500W	HPA-9100024	AC 0~300V	Jun. 16, 2004	Conducted (TH01-HY)
23	AC power source	G.W.	GPC-6030D	C671845	DC 1V~60V	Nov. 05, 2004	Conducted (TH01-HY)
24	Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Oct. 01, 2004	Conducted (TH01-HY)
25	RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz~7GHz	Jan. 01, 2004	Conducted (TH01-HY)
26	RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz~1GHz	Jan. 01, 2004	Conducted (TH01-HY)

※ Calibration Interval of instruments listed above is one year.