FCC TEST REPORT

for

47 CFR, Part 15, Subpart C

Equipment	:	CF Wireless LAN Card
Model No.	:	73-TMWBF-001
FCC ID	:	QS3WBFZP1
Filing Type	:	Certification
Applicant	:	**TwinMOS Technologies Inc.** 303 No. 3, Tzu Chiang Rd., Hu Kou Xiang, Hsin Chu, Taiwan, R.O.C.

SPORTON International Inc.

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

Table of Contents

History of this test report

Original Report Issue Date: Dec. 04, 2003

■ No additional attachment.

□ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

Certificate No. : F3O0803

CERTIFICATE OF COMPLIANCE

for

47 CFR, Part 15, Subpart C

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Filing Type	:	Certification
Applicant	:	**TwinMOS Technologies Inc.** 303 No. 3, Tzu Chiang Rd., Hu Kou Xiang, Hsin Chu, Taiwan, R.O.C.

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 2001** and the equipment under test was ***passed*** all test items required in FCC Part 15 subpart C, relative to the equipment under test. Testing was carried out on Sep. 19, 2003 at **SPORTON International Inc.** LAB.

Alex Chen
Manager

SPORTON International Inc.

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

1. General Description of Equipment under Test

1.1. Applicant

TwinMOS Technologies Inc.
303 No. 3, Tzu Chiang Rd.,
Hu Kou Xiang, Hsin Chu, Taiwan, R.O.C.

1.2. Manufacturer

Same as 1.1

1.3. Basic Description of Equipment under Test

Equipment	: CF Wireless LAN Card
Model No.	: 73-TMWBF-001
FCC ID.	: QS3WBFZP1
Trade Name	: TwinMOS
Power Supply Type	: From system
AC Power Input	: N/A

1.4. Feature of Equipment under Test

Host/Radio Interface	CF Card
Type of Modulation	DBPSK,DQPSK,CCK
Number of Channels	11
Frequency Band	2400MHz-2483.5MHz
Carrier Frequency of each channel	2412,2417,2422,2427,2432,2437,2442, 2447,2452,2457,2462
Bandwidth of each channel	22MHz
Output Power to Antenna	12.71dBm
Antenna Type / Class and Gain	Chip Antenna / 2dBi
Function Type	Transceiver
Power Rating (DC/AC , Voltage)	5V
Duty Cycle	45%~55%
Basic function of product	Wireless LAN
Temperature Range (Operating)	0-55℃
Humidity	15%~95%

2. Test Configuration of Equipment under Test

2.1. Test Manner

a. The EUT has been associated with notebook and peripherals pursuant to ANSI C63.4-2001 and configuration operated in a manner, which tended to maximize its emission characteristics in a typical application.

b. The complete test system included COMPAQ NOTEOOK, VIEWSONIC Monitor, LOGITECH PS/2 Keyboard, LOGITECH USB Mouse, EPSON Printer and EUT for EMI test.

c. The EUT can operate on eleven channels from 2412.0MHz to 2462.0MHz. (as listed in section 1.4). According to 15.31(m), three channels (one near top, one near middle and one near bottom) were performed as following:
Mode 1: CH01 2412MHz
Mode 2: CH06 2437MHz
Mode 3: CH11 2462MHz

d. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 25000MHz.

2.2. Description of Test System

Support Unit 1. – Notebook (COMPAQ)

FCC ID	: N/A
Model No.	: PRESARIO 1500
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0039
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 2. -- Monitor (VIEWSONIC)

FCC ID	: N/A
Model No.	: VCDTS21553-3P
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0050
Data Cable	: Shielded, 1.7m
Remark	: This support device was tested to compy with FCC standards and authorized under a declaration of conformity.

Support Unit 3. -- PS/2 Keyboard (LOGITECH)

FCC ID	: N/A
Model No.	: Y-SJ17
Serial No.	: SP0054
Data Cable	: Shielded, 360 degree via metal backshells, 1.7m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

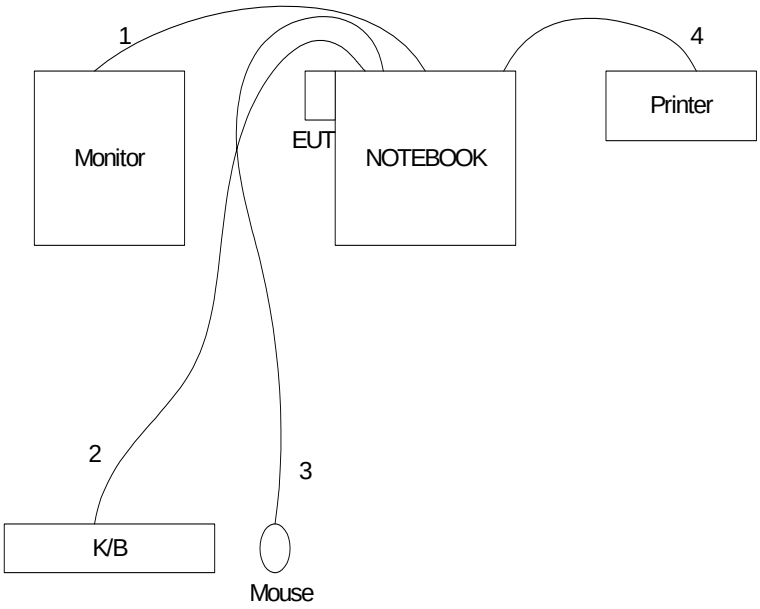
Support Unit 4. -- USB Mouse (LOGITECH)

FCC ID	: N/A
Model No.	: M-BE58
Serial No.	: SP0041
Data Cable	: Shielded, 1.7m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 5. -- Printer (EPSON)

FCC ID	: N/A
Model No.	: STYLUS COLOR 680
Power Supply Type	: Linear
Power Cord	: Non-Shielded
Serial No.	: SP0048
Data Cable	: Shielded, 1.35m

2.3. Connection Diagram of Test System



1. The I/O cable is connected from the NOTEBOOK to the support unit 2.
2. The I/O cable is connected from the NOTEBOOK to the support unit 3.
3. The I/O cable is connected from the NOTEBOOK to the support unit 4.
4. The I/O cable is connected from the NOTEBOOK to the support unit 5.

3. Operation of Equipment under Test

An executive programs, EMCTEST.EXE under WIN XP, which generate a complete line of continuously repeating " H " pattern was used as the test software.

The program was executed as follows:

a. Turn on the power of all equipment.

b. The PC reads the test program from the hard disk drive and runs it.

c. The PC sends " H" messages to the monitor, and the monitor displays " H " patterns on the screen.

d. The PC sends " H " messages to the printer, then the printer prints them on the paper.

e. The PC sends " H " messages to the internal Hard Disk, and the Hard Disk reads and writes the message.

f. Repeat the steps from c to e.

At the same time, "ZyDas " was executed to keep transmitting signals at fixed frequency.

4. General Information of Test

Test Site Location	:	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
Test Site No	:	CO01-HY, 03CH02-HY

4.1. Test Voltage

110V/ 60Hz

4.2. Standard for Methods of Measurement

ANSI C63.4-2001 for conducted power line test and radiated emission test,
"Guidance on Measurements for Direct Sequence Spread Spectrum Systems" for test of 6dB Bandwidth
"Guidance on Measurements for Direct Sequence Spread Spectrum Systems" for test of Maximum Peak Output Power
"Guidance on Measurements for Direct Sequence Spread Spectrum Systems" for test of 100kHz Bandwidth of Frequency Band Edges
"Guidance on Measurements for Direct Sequence Spread Spectrum Systems" for test of Power Spectral Density

4.3. Test in Compliance with

FCC Part 15, Subpart C

4.4. Frequency Range Investigated

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

4.5. Test Distance

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

5. Report of Measurements and Examinations

5.1. List of Measurements and Examinations

FCC Rule	Description of Test	Result
15.207	Conducted Emission	Pass
15.247(a)(2)	6dB Bandwidth	Pass
15.247(b)	Maximum Peak Output Power	Pass
15.209	Radiated Emission	Pass
15.247(c)	100kHz Bandwidth of Frequency Band Edges	Pass
15.247(d)	Power Spectral Density	Pass
15.203	Antenna Requirement	Pass
1.1307 1.1310 2.1091 2.1093	RF Exposure Compliance	Pass

5.2. 6dB Bandwidth

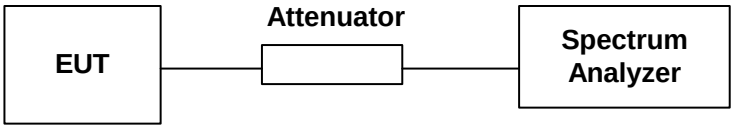
5.2.1. Measuring Instruments：

As described in chapter 7 of this test report.

5.2.2. Test Procedure：

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 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

5.2.3. Test Setup Layout：



5.2.4. Test Result：The spectrum analyzer plots are attached as below

- Temperature : 27 °C
- Relative Humidity : 62%

Channel	Frequency (MHz)	6dB Emission bandwidth (MHz)	Limits (MHz)	Plot Ref. No.
01	2412	11.00	0.5	1
06	2437	11.04	0.5	2
11	2462	11.04	0.5	3

5.3. Peak Output Power

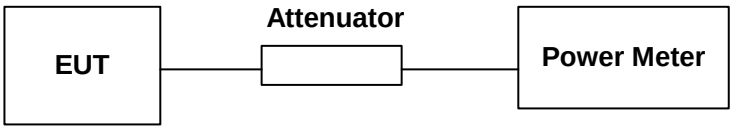
5.3.1. Measuring Instruments：

As described in chapter 7 of this test report.

5.3.2. Test Procedure：

The antenna port（RF output）of the EUT was connected to the input（RF input）of a power meter. Power was read directly from the meter and cable loss connection was added to the reading to obtain power at the EUT antenna terminal. The EUT Output Power was set to maximum to produce the worse case test result.

5.3.3. Test Setup Layout：



5.3.4. Test Result：See spectrum analyzer plots below

- Temperature : 27°C
- Relative Humidity : 62 %
- Antenna Gain: 2 dBi

Channel	Frequency (MHz)	Measured Output Power (mWatt)	Measured Output Power (dBm)	Limits (Watt/dBm)
01	2412	18.66379691	12.71	1W/30 dBm
06	2437	17.10015315	12.33	1W/30 dBm
11	2462	16.21810097	12.10	1W/30 dBm

- Comments：Maximum Peak Output Power < 30dBm (1Watt)

5.4. Power Spectral Density

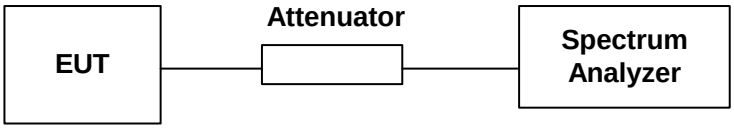
5.4.1. Measuring Instruments：

As described in chapter 7 of this test report.

5.4.2. Test Procedure：

1. The transmitter output was connected to spectrum analyzer through an attenuator.
2. The spectrum analyzer's resolution bandwidth were 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.

5.4.3. Test Setup Layout：



5.4.4. Test Result：See spectrum analyzer plots below

- Temperature : 27°C
- Relative Humidity : 62 %

Channel	Frequency (MHz)	Power Spectral Density (dBm)	Limits (dBm)	Plot Ref. No.
01	2412	-9.98	8	1
06	2437	-10.44	8	2
11	2462	-10.98	8	3

5.5. Test of Conducted Emission

Conducted Emissions were measured from 150 KHz to 30 MHz with a bandwidth of 9 KHz and return leads of the EUT according to the methods defined in ANSI C63.4-2001 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

5.5.1. Major Measuring Instruments：

● Test Receiver	(R&S ESCS 30)
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

5.5.2. 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 mains through a 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.

5.5.3. Test Result of Conducted Emission：

Frequency Range of Test : from 150KHz to 30 MHz

6dB Bandwidth : 9KHz

- Test Mode : Mode 1
- Temperature : 27°C
- Relative Humidity : 60 %

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

Line

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.150	33.82	-22.18	56.00	33.56	0.10	0.16	Average
2	0.150	43.26	-22.74	66.00	43.00	0.10	0.16	QP
3	0.190	40.93	-13.11	54.04	40.65	0.10	0.18	Average
4	0.190	43.11	-20.93	64.04	42.83	0.10	0.18	QP
5	0.289	26.12	-34.43	60.55	25.88	0.10	0.14	QP
6	0.289	19.92	-30.63	50.55	19.68	0.10	0.14	Average
7	1.600	26.49	-29.51	56.00	26.32	0.10	0.07	QP
8	1.600	23.20	-22.80	46.00	23.03	0.10	0.07	Average
9	11.080	26.17	-23.83	50.00	25.67	0.20	0.30	Average
10	11.080	31.15	-28.85	60.00	30.65	0.20	0.30	QP
11	12.520	28.97	-21.03	50.00	28.45	0.20	0.32	Average
12	12.520	33.64	-26.36	60.00	33.12	0.20	0.32	QP

Neutral

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.152	34.05	-21.84	55.89	33.79	0.10	0.16	Average
2	0.152	47.27	-18.62	65.89	47.01	0.10	0.16	QP
3	0.191	41.53	-12.46	53.99	41.25	0.10	0.18	Average
4	0.191	41.94	-22.05	63.99	41.66	0.10	0.18	QP
5	1.610	28.14	-27.86	56.00	27.96	0.10	0.08	QP
6	1.610	23.44	-22.56	46.00	23.26	0.10	0.08	Average
7	2.350	24.99	-31.01	56.00	24.76	0.12	0.11	QP
8	2.350	20.31	-25.69	46.00	20.08	0.12	0.11	Average
9	4.140	23.63	-22.37	46.00	23.27	0.20	0.16	Average
10	4.140	27.99	-28.01	56.00	27.63	0.20	0.16	QP
11	12.190	33.82	-26.18	60.00	33.25	0.25	0.32	QP
12	12.190	28.68	-21.32	50.00	28.11	0.25	0.32	Average

Test Engineer : John Huang 

- Test Mode : Mode 2
- Temperature : 27°C
- Relative Humidity : 60 %

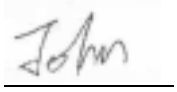
■ The test was passed at the minimum margin that marked by the frame in the following table

Line

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.152	43.71	-22.18	65.89	43.45	0.10	0.16	QP
2	0.152	41.58	-14.31	55.89	41.32	0.10	0.16	Average
3	0.201	41.73	-21.83	63.56	41.45	0.10	0.18	QP
4	0.201	41.09	-12.47	53.56	40.81	0.10	0.18	Average
5	1.540	24.70	-31.30	56.00	24.53	0.10	0.07	QP
6	1.540	17.31	-28.69	46.00	17.14	0.10	0.07	Average
7	1.900	25.09	-30.91	56.00	24.90	0.10	0.09	QP
8	1.900	19.87	-26.13	46.00	19.68	0.10	0.09	Average
9	3.820	22.60	-23.40	46.00	22.34	0.10	0.16	Average
10	3.820	27.17	-28.83	56.00	26.91	0.10	0.16	QP
11	12.320	34.56	-25.44	60.00	34.04	0.20	0.32	QP
12	12.320	30.92	-19.08	50.00	30.40	0.20	0.32	Average

Neutral

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.152	44.23	-21.66	65.89	43.97	0.10	0.16	QP
2	0.152	36.08	-19.81	55.89	35.82	0.10	0.16	Average
3	0.195	40.75	-13.05	53.80	40.47	0.10	0.18	Average
4	0.195	42.49	-21.31	63.80	42.21	0.10	0.18	QP
5	1.610	30.17	-25.83	56.00	29.99	0.10	0.08	QP
6	1.610	24.44	-21.56	46.00	24.26	0.10	0.08	Average
7	2.350	24.87	-31.13	56.00	24.64	0.12	0.11	QP
8	2.350	20.71	-25.29	46.00	20.48	0.12	0.11	Average
9	4.140	23.32	-22.68	46.00	22.96	0.20	0.16	Average
10	4.140	29.31	-26.69	56.00	28.95	0.20	0.16	QP
11	12.190	33.60	-26.40	60.00	33.03	0.25	0.32	QP
12	12.190	28.63	-21.37	50.00	28.06	0.25	0.32	Average

Test Engineer : 

John Huang

- Test Mode : Mode 3
- Temperature : 27°C
- Relative Humidity : 60 %

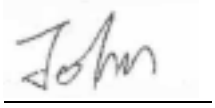
■ The test was passed at the minimum margin that marked by the frame in the following table

Line

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.152	38.05	-17.84	55.89	37.79	0.10	0.16	Average
2	0.152	43.87	-22.02	65.89	43.61	0.10	0.16	QP
3	0.199	39.72	-13.94	53.66	39.44	0.10	0.18	Average
4	0.199	41.08	-22.58	63.66	40.80	0.10	0.18	QP
5	1.540	25.34	-30.66	56.00	25.17	0.10	0.07	QP
6	1.540	18.66	-27.34	46.00	18.49	0.10	0.07	Average
7	3.820	27.63	-28.37	56.00	27.37	0.10	0.16	QP
8	3.820	22.77	-23.23	46.00	22.51	0.10	0.16	Average
9	12.320	34.92	-25.08	60.00	34.40	0.20	0.32	QP
10	12.320	30.34	-19.66	50.00	29.82	0.20	0.32	Average
11	19.220	26.56	-33.44	60.00	25.87	0.29	0.40	QP
12	19.220	21.69	-28.31	50.00	21.00	0.29	0.40	Average

Neutral

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.152	34.60	-21.29	55.89	34.34	0.10	0.16	Average
2	0.152	45.16	-20.73	65.89	44.90	0.10	0.16	QP
3	0.163	41.96	-23.35	65.31	41.70	0.10	0.16	QP
4	0.163	35.31	-20.00	55.31	35.05	0.10	0.16	Average
5	0.199	41.22	-22.43	63.65	40.94	0.10	0.18	QP
6	0.199	29.74	-23.91	53.65	29.46	0.10	0.18	Average
7	1.040	27.54	-18.46	46.00	27.42	0.10	0.02	Average
8	1.040	31.29	-24.71	56.00	31.17	0.10	0.02	QP
9	1.610	22.86	-23.14	46.00	22.68	0.10	0.08	Average
10	1.610	29.18	-26.82	56.00	29.00	0.10	0.08	QP
11	12.720	34.41	-25.59	60.00	33.82	0.26	0.33	QP
12	12.720	28.34	-21.66	50.00	27.75	0.26	0.33	Average

Test Engineer : 

John Huang

5.6. Test of Radiated Emission

Radiated emissions from 30 MHz to 25 GHz were measured according to the methods defines in ANSI C63.4-2001. The EUT was placed, 0.8 meter above the ground plane, as shown in section 5.6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions

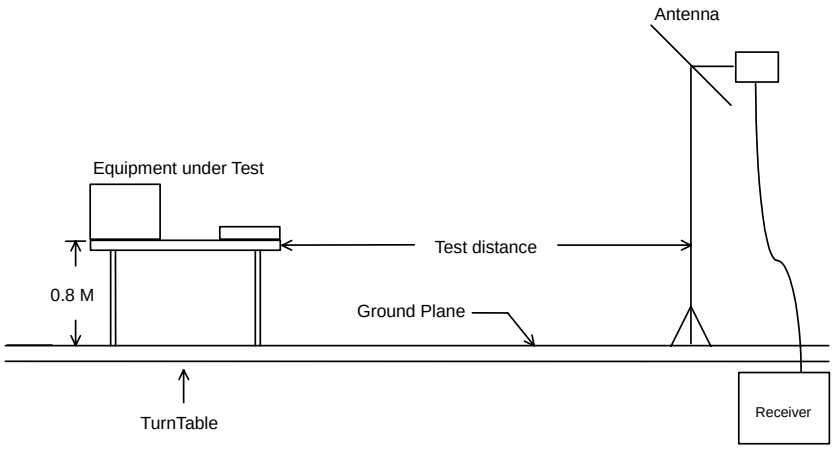
5.6.1. Major Measuring Instruments

• Amplifier	(ADVANTEST BB525C)
RF Gain	30 dB
Signal Input	9 KHz to 3 GHz
• Amplifier	(MITEQ AFS44)
RF Gain	40 dB
Signal Input	100 MHz to 26.5 GHz
• Spectrum analyzer	(R&S FSP40)
Attenuation	10 dB
Start Frequency	1 GHz
Stop Frequency	25 GHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	9 KHz to 40 GHz
• Spectrum Analyzer	(R&S FSP7)
• Attenuation	10 dB
Start Frequency	30 MHz
Stop Frequency	1000 MHz
Resolution Bandwidth	120 KHz
Signal Input	9 KHz to 7 GHz

5.6.2. 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 both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
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 turn table (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. 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 which do not have 3 dB margin 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 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. Typical Test Setup Layout of Radiated Emission



5.6.4. Test Result of Radiated Emission

- Test Mode: Mode 1 (2412MHz)
- Test Distance : 3 M
- Temperature : 27 °C
- Relative Humidity : 62 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

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

■ Spurious Emission

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	220.250	30.85	-15.15	46.00	50.60	10.05	2.80	32.60	Peak	---	---
2	245.830	30.81	-15.19	46.00	48.88	11.57	2.96	32.60	Peak	---	---
3	266.450	29.74	-16.26	46.00	46.81	12.42	3.14	32.63	Peak	---	---
1	343.400	38.95	-7.05	46.00	53.58	14.39	3.50	32.52	Peak	---	---
2	441.400	37.14	-8.86	46.00	49.62	15.97	3.85	32.30	Peak	---	---
3	786.500	37.32	-8.68	46.00	43.36	20.24	5.27	31.55	Peak	---	---
1	1526.000	38.13	-35.87	74.00	36.39	25.47	3.31	27.04	Peak	---	---
2	1526.000	29.55	-24.45	54.00	27.81	25.47	3.31	27.04	Average	---	---
3	2244.000	44.38	-29.62	74.00	39.61	27.90	4.01	27.14	Peak	---	---
4	2244.000	40.59	-13.41	54.00	35.82	27.90	4.01	27.14	Average	---	---

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	98.430	31.96	-11.54	43.50	52.03	11.22	1.91	33.20	Peak	---	---
2	104.750	31.08	-12.42	43.50	51.02	11.31	1.97	33.22	Peak	---	---
3	132.530	32.07	-11.43	43.50	51.68	11.32	2.19	33.12	Peak	---	---
1	631.800	36.33	-9.67	46.00	44.42	18.88	5.00	31.97	Peak	---	---
2	699.000	35.32	-10.68	46.00	42.65	19.30	5.17	31.80	Peak	---	---
3 !	786.500	42.30	-3.70	46.00	48.34	20.24	5.27	31.55	Peak	100	105
1	1590.000	42.62	-31.38	74.00	40.56	25.73	3.38	27.05	Peak	---	---
2	1590.000	33.16	-20.84	54.00	31.10	25.73	3.38	27.05	Average	---	---

➢ For 5GHz ~ 25GHz

Remark: Frequency from 5000MHz to 25000MHz, the emission emitted by the EUT is too low to be measured

■ Field strength of fundamental and harmonics

Frequency	Polarity	Antenna Factor	Cable Loss	Reading	Limits		Emission Level		Margin	Detect
(MHz)		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(uV/m)	(dBuV/m)	(uV/m)	(dB)	Mode
2412.000	H	28.24	4.16	64.99	-	-	97.39	74045.73		AV
2412.000	H	28.24	4.16	66.36	-	-	98.76	86696.19		Peak
2412.000	V	28.24	4.16	61.86	-	-	94.26	51641.64		Peak
2412.000	V	28.24	4.16	60.38	-	-	92.78	43551.19		AV
4828.000	H	33.08	7.30	7.93	74.00	5011.87	48.31	260.32	-25.69	Peak
4828.000	H	33.08	7.30	2.86	54.00	501.19	43.24	145.21	-10.76	AV
4822.000	V	33.06	7.28	8.21	74.00	5623.41	48.55	267.61	-26.45	Peak
4822.000	V	33.06	7.28	3.74	54.00	501.19	44.08	159.96	-9.92	AV
9648.000	V/H						-			AV/Peak
12060.000	V/H						-			AV/Peak
14472.000	V/H						-			AV/Peak
16884.000	V/H						-			AV/Peak
19296.000	V/H						-			AV/Peak
21708.000	V/H						-			AV/Peak
24120.000	V/H						-			AV/Peak

Remark: The emission emitted by the EUT is too low to be measured except the emission listed above,

Test Engineer : Steve

Steve Chen

- Test Mode: Mode 2 (2437 MHz)
- Test Distance : 3 M
- Temperature : 27 °C
- Relative Humidity : 62 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

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

■ Spurious Emission

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	219.810	30.90	-15.10	46.00	50.68	10.02	2.80	32.60	Peak	---	---
2	245.730	30.99	-15.01	46.00	49.06	11.57	2.96	32.60	Peak	---	---
3	265.980	29.15	-16.85	46.00	46.24	12.40	3.14	32.63	Peak	---	---
1	343.400	38.62	-7.38	46.00	53.25	14.39	3.50	32.52	Peak	100	105
2	396.600	37.50	-8.50	46.00	50.57	15.36	3.88	32.31	Peak	---	---
3	786.500	37.71	-8.29	46.00	43.75	20.24	5.27	31.55	Peak	---	---

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	219.810	29.92	-16.08	46.00	49.70	10.02	2.80	32.60	Peak	---	---
2	245.730	30.27	-15.73	46.00	48.34	11.57	2.96	32.60	Peak	---	---
3	298.380	31.85	-14.15	46.00	47.72	13.52	3.31	32.70	Peak	---	---
1	343.400	35.44	-10.56	46.00	50.07	14.39	3.50	32.52	Peak	---	---
2	388.900	36.00	-10.00	46.00	49.31	15.24	3.79	32.34	Peak	---	---
3	786.500	38.17	-7.83	46.00	44.21	20.24	5.27	31.55	Peak	---	---

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	1588.000	38.18	-35.82	74.00	36.13	25.72	3.38	27.05	Peak	---	---
2	1588.000	31.87	-22.13	54.00	29.82	25.72	3.38	27.05	Average	---	---
3	2244.000	43.30	-30.70	74.00	38.53	27.90	4.01	27.14	Peak	---	---
4	2244.000	35.03	-18.97	54.00	30.26	27.90	4.01	27.14	Average	---	---
5	2332.000	43.77	-30.23	74.00	38.75	28.08	4.09	27.15	Peak	---	---
6	2332.000	36.48	-17.52	54.00	31.46	28.08	4.09	27.15	Average	---	---
7	2374.000	45.13	-28.87	74.00	39.99	28.17	4.13	27.16	Peak	---	---
8	2374.000	37.59	-16.41	54.00	32.45	28.17	4.13	27.16	Average	---	---
11	2486.000	45.01	-28.99	74.00	39.56	28.40	4.22	27.17	Peak	---	---
12	2486.000	37.19	-16.81	54.00	31.74	28.40	4.22	27.17	Average	---	---

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	1164.000	37.02	-36.98	74.00	36.63	24.52	2.86	26.99	Peak	---	---
2	1164.000	28.13	-25.87	54.00	27.74	24.52	2.86	26.99	Average	---	---
3	1596.000	42.15	-31.85	74.00	40.06	25.75	3.39	27.05	Peak	---	---
4	1596.000	33.73	-20.27	54.00	31.64	25.75	3.39	27.05	Average	---	---

- For 5GHz ~ 25GHz

  Remark: Frequency from 5000MHz to 25000MHz, the emission emitted by the EUT is too low to be measured

■ Field strength of fundamental and harmonics

Frequency	Polarity	Antenna Factor	Cable Loss	Reading	Limits		Emission Level		Margin	Detect
(MHz)		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(uV/m)	(dBuV/m)	(uV/m)	(dB)	Mode
2436.000	H	28.29	4.18	64.33	-	-	96.80	69183.10		Peak
2436.000	H	28.29	4.18	61.41	-	-	93.88	49431.07		AV
2436.000	V	28.29	4.18	60.81	-	-	93.28	46131.76		Peak
2436.000	V	28.29	4.18	58.31	-	-	90.78	34593.94		AV
4874.000	V/H						-			AV/Peak
4876.000	V/H									AV/Peak
4876.000	V/H									AV/Peak
7311.000	V/H						-			AV/Peak
9748.000	V/H						-			AV/Peak
12185.000	V/H						-			AV/Peak
14622.000	V/H						-			AV/Peak
17059.000	V/H						-			AV/Peak
19496.000	V/H						-			AV/Peak
21933.000	V/H						-			AV/Peak
24370.000	V/H						-			AV/Peak

Remark: The emission emitted by the EUT is too low to be measured except the emission listed above,

Test Engineer : Steve

Steve Chen

- Test Mode: Mode 3 (2462 MHz)
- Test Distance : 3 M
- Temperature : 27 °C
- Relative Humidity : 62 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

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

■ Spurious Emission

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	219.810	30.92	-15.08	46.00	50.70	10.02	2.80	32.60	Peak	---	---
2	245.730	30.41	-15.59	46.00	48.48	11.57	2.96	32.60	Peak	---	---
3	266.250	29.68	-16.32	46.00	46.76	12.41	3.14	32.63	Peak	---	---
1	343.400	38.62	-7.38	46.00	53.25	14.39	3.50	32.52	Peak	---	---
2	430.900	35.45	-10.55	46.00	47.89	15.84	4.02	32.30	Peak	---	---
3	786.500	38.01	-7.99	46.00	44.05	20.24	5.27	31.55	Peak	---	---

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	219.810	30.00	-16.00	46.00	49.78	10.02	2.80	32.60	Peak	---	---
2	245.730	30.41	-15.59	46.00	48.48	11.57	2.96	32.60	Peak	---	---
3	266.250	30.28	-15.72	46.00	47.36	12.41	3.14	32.63	Peak	---	---
1	343.400	38.75	-7.25	46.00	53.38	14.39	3.50	32.52	Peak	100	100
2	397.300	35.92	-10.08	46.00	48.96	15.38	3.89	32.31	Peak	---	---
3	430.900	37.72	-8.28	46.00	50.16	15.84	4.02	32.30	Peak	---	---

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	2286.000	43.24	-30.76	74.00	38.34	27.99	4.05	27.14	Peak	---	---
2	2286.000	33.25	-20.75	54.00	28.35	27.99	4.05	27.14	Average	---	---
3	2332.000	44.45	-29.55	74.00	39.43	28.08	4.09	27.15	Peak	---	---
4	2332.000	35.54	-18.46	54.00	30.52	28.08	4.09	27.15	Average	---	---
5	2374.000	46.53	-27.47	74.00	41.39	28.17	4.13	27.16	Peak	---	---
6	2374.000	38.39	-15.61	54.00	33.25	28.17	4.13	27.16	Average	---	---
7	2420.000	46.60	-27.40	74.00	41.33	28.26	4.17	27.16	Peak	---	---
8	2420.000	37.41	-16.59	54.00	32.14	28.26	4.17	27.16	Average	---	---
11	2508.000	46.90	-27.10	74.00	41.37	28.46	4.25	27.18	Peak	---	---
12	2508.000	39.17	-14.83	54.00	33.64	28.46	4.25	27.18	Average	---	---

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	1164.000	37.57	-36.43	74.00	37.18	24.52	2.86	26.99	Peak	---	---
2	1164.000	25.87	-28.13	54.00	25.48	24.52	2.86	26.99	Average	---	---
3	1588.000	39.92	-34.08	74.00	37.87	25.72	3.38	27.05	Peak	---	---
4	1588.000	31.90	-22.10	54.00	29.85	25.72	3.38	27.05	Average	---	---
5	2374.000	41.77	-32.23	74.00	36.63	28.17	4.13	27.16	Peak	---	---
6	2374.000	34.10	-19.90	54.00	28.96	28.17	4.13	27.16	Average	---	---
7	2420.000	42.54	-31.46	74.00	37.27	28.26	4.17	27.16	Peak	---	---
8	2420.000	35.52	-18.48	54.00	30.25	28.26	4.17	27.16	Average	---	---
11	2502.000	43.91	-30.09	74.00	38.41	28.44	4.24	27.18	Peak	---	---
12	2502.000	35.55	-18.45	54.00	30.05	28.44	4.24	27.18	Average	---	---

- For 5GHz ~ 25GHz

  Remark: Frequency from 5000MHz to 25000MHz, the emission emitted by the EUT is too low to be measured

■ Field strength of fundamental and harmonics

Frequency	Polarity	Antenna Factor	Cable Loss	Reading	Limits		Emission Level		Margin	Detect
(MHz)		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(uV/m)	(dBuV/m)	(uV/m)	(dB)	Mode
2462.000	H	28.35	4.20	63.46	-	-	96.01	63168.42		Peak
2462.000	H	28.35	4.20	59.62	-	-	92.17	40597.57		AV
2462.000	V	28.35	4.20	59.82	-	-	92.37	41543.21		Peak
2462.000	V	28.35	4.20	58.55	-	-	91.10	35892.19		AV
4924.000	V/H						-			AV/ Peak
4924.000	V/H									AV/ Peak
4924.000	V/H									AV/ Peak
7386.000	V/H						-			AV/ Peak
9848.000	V/H						-			AV/ Peak
12310.000	V/H						-			AV/ Peak
14772.000	V/H						-			AV/ Peak
17234.000	V/H						-			AV/ Peak
19696.000	V/H						-			AV/ Peak
22158.000	V/H						-			AV/ Peak
24620.000	V/H						-			AV/ Peak

Remark: The emission emitted by the EUT is too low to be measured except the emission listed above,

Test Engineer : Steve

Steve Chen

5.7. Band Edges Measurement

5.7.1. Measuring Instruments：

As described in chapter 7 of this test report.

5.7.2. 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 convenient frequency span including 100 KHz bandwidth from band edge.
3. The band edges was measured and recorded.

5.7.3. Test Result：

- Test Result in lower band (Channel 1) ：PASS
- Test Result in higher band(Channel 11)：PASS

5.7.4. Note on Band edge Emission

The band edge emission plot on appendix B page B8. shows 53.29dB delta between carrier maximum power and local maximum emission in the restricted band (2.4835GHz).

Polarity	The emission of carrier power strength (dB μ V/m)	The maximum field strength in restrict band (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
H	98.76	43.90	74.00	-30.10	Peak
H	96.01	42.72	74.00	-31.28	Peak
H	97.39	42.53	54.00	-11.47	Average
H	92.17	38.88	54.00	-15.12	Average
V	94.26	39.40	74.00	-34.60	Peak
V	92.37	39.08	74.00	-34.92	Peak
V	92.78	37.92	54.00	-16.08	Average
V	91.10	37.81	54.00	-16.19	Average

5.8. Antenna Requirements

The EUT use a undetachable Chip antenna on PCB board external connector. It is considered meet antenna requirement of FCC.

5.8.1. Standard Applicable

For intentional device, according to FCC 47 CFR 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.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

5.8.2. Antenna Connected Construction

The maximum Gain antenna used in this product is Chip antenna. On PCB board, No antenna connector.

5.9. RF Exposure

FCC Rules and Regulations Part 1.1307,1.1310,2.1091,2.1093:

RF Exposure Compliance

5.9.1. Limit For Maximum Permissible Exposure (MPE)

(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/ cm2)	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/cm2)	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

5.9.2. MPE Calculations

$$E\ (V/m) = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density:} \quad Pd\ (mW/cm^2) = \frac{E^2}{377}$$

E＝Electric field (V/m)

P＝Peak output power (mW)

G＝Antenna numeric gain (numeric)

d＝Separation distance (m)

Because the EUT is belong to General Population/ Uncontrolled Exposure. So the Limit of Power Density is 1.0 mW/m^2. We can change the formula to:

$$d = \sqrt{\frac{30 \times P \times G}{377}}$$

Channel No.	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated RF Exposure Separation Distance (cm)	Minimum RF Exposure Separation Distance (cm)
Channel 01	2.00	1.58	12.71	18.7	1.53	20
Channel 06	2.00	1.58	12.33	17.1	1.47	20
Channel 11	2.00	1.58	12.10	16.2	1.43	20

5.9.3. FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm (8 inches) during normal operation. Proposed RF exposure safety information to include in User's Manual.

6. EMI Suppression Component List

No EMI suppression components.

7. Antenna Factor & Cable Loss

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)	Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	15.35	1.60	1000	24.10	3.92
35	13.83	1.83	2000	27.40	5.66
40	12.41	1.85	3000	30.00	7.20
45	11.69	2.07	4000	32.60	9.36
50	7.77	2.21	5000	33.40	9.16
55	6.68	2.20.	6000	34.20	10.70
60	5.58	2.42	7000	35.30	12.16
65	5.51	2.30	8000	36.90	13.12
70	5.43	2.67	9000	38.10	13.81
75	6.65	2.44	10000	39.00	14.83
80	8.11	2.77	11000	38.60	15.83
85	9.23	2.66	12000	39.50	17.11
90	10.34	2.50	13000	39.30	17.62
95	10.85	2.52	14000	41.60	18.37
100	11.36	2.75	15000	40.60	19.10
110	11.27	2.69	16000	37.20	19.72
120	11.17	2.78	17000	40.20	21.98
130	11.17	2.46	18000	48.90	21.22
140	11.72	2.70	19000	37.60	23.90
150	10.52	3.06	20000	37.30	24.07
160	9.39	2.78	21000	37.00	25.49
170	8.93	3.07	22000	38.00	24.92
180	9.20	2.97	23000	38.70	25.60
190	8.98	2.80	24000	38.60	25.70
200	8.76	2.98	25000	24.10	3.92
220	10.01	2.91	14000	27.40	5.66
240	11.20	3.28	15000	30.00	7.20
260	12.19	3.21	16000	32.60	9.36
280	12.89	3.32	17000	33.40	9.16
300	13.56	3.48	18000	34.20	10.70
320	13.94	3.76	19000	35.30	12.16
340	14.32	3.60	20000	36.90	13.12
360	14.69	3.83	21000	38.10	13.81
380	15.07	3.66	22000	39.00	14.83
400	15.43	2.90	23000	38.60	15.83
450	16.08	3.99	24000	39.50	17.11
500	16.73	4.31	25000	39.30	17.62
550	17.70	4.40			
600	18.69	4.39			
650	18.99	4.72			
700	19.30	5.06			
750	19.84	5.07			
800	20.39	5.27			
850	20.60	5.63			
900	20.82	5.63			
950	20.98	5.96			
1000	21.15	6.03			

8. List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100132	9 KHz – 2.75 GHz	Jun. 12, 2003	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001-008	9 KHz – 30 MHz	Apr. 29, 2003	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001-009	9 KHz – 30 MHz	Apr. 29, 2003	Conduction (CO01-HY)
EMI Filter	LINDGREN	LRE-2060	1004	< 450 Hz	N/A	Conduction (CO01-HY)
EMI Filter	LINDGREN	N6006	201052	0 ~ 60 Hz	N/A	Conduction (CO01-HY)
RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9KHz~30MHz	Jan. 07, 2003	Conduction (CO01-HY)
50 ohm BNC type Terminal	NOBLE	50ohm	TM009	50 ohm	Apr. 24, 2003	Conduction (CO01-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30MHz~1GHz 3m	Jun. 14, 2003	Radiation (03CH02-HY)
Spectrum analyzer	R&S	FSP7	838858/039	9KHz~7GHz	Jan. 20, 2003	Radiation (03CH02-HY)
Receiver	SCHAFFNER	SCR 3501	416	9 KHz –1GHz	Feb. 19, 2003	Radiation (03CH02-HY)
Amplifier	ADVANTEST	BB525C	CH300001	100KHz – 3GHz	Nov. 14, 2002	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2681	30MHz –2GHz	Dec. 21, 2002	Radiation (03CH02-HY)
RF Cable-R03m	Jye Bao	RG142	CB020	30MHz~1GHz	Jan. 02, 2003	Radiation (03CH02-HY)
Turn Table	HD	DS 420	420/649/00	0 ~ 360 degree	N/A	Radiation (03CH02-HY)
Antenna Mast	HD	MA 240	240/559/00	1 m - 4 m	N/A	Radiation (03CH02-HY)
Power meter	R&S	NRVS	100444	DC~40GHz	May 28, 2003	Conducted
Power sensor	R&S	NRV-Z55	100049	DC~40GHz	May 28, 2003	Conducted
Power Sensor	R&S	NRV-Z32	100057	30MHz-6GHz	May 28, 2003	Conducted
AC power source	HPC	HPA-500W	HPA-9100024	AC 0~300V	May 27, 2003	Conducted
Temp. and Humidity	KSON	THS-C3L	612	N/A	Oct. 01, 2002	Conducted
Power meter	R&S	NRVS	100444	DC~40GHz	May 28, 2003	Conducted

※ Calibration Interval of instruments listed above is one year.

9. Uncertainty of Test Site

Uncertainty of Radiated Emission Measurement

Contribution	Probability Distribution	3m
Antenna factor calibration	normal(k=2)	±1
cable loss calibration	normal(k=2)	±0.3
RCV/SPA specification	rectangular	±2
Antenna Directivity	rectangular	±3
Antenna Factor V.S. Height	rectangular	±2
Antenna Factor Interpolation for Frequency	rectangular	±0.25
site imperfection	rectangular	±2
Mismatch Receiver VSWR Γ1=0.09 Antenna VSWR Γ2=0.67 Uncertainty=20log(1-Γ1*Γ2)	U-shaped	±0.54
combined standard uncertainty Ue(y)	normal	±2.7
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	normal (k=2)	±5.4

$U=\sqrt{\{(1/2)^2+(0.3/2)^2+(2^2+0.5^2+2^2+0.25^2+2^2)/3+(0.54)^2/2\}}=2.2$ for 10m test distance

$U=\sqrt{\{(1/2)^2+(0.3/2)^2+(2^2+3^2+2^2+0.25^2+2^2)/3+(0.54)^2/2\}}=2.7$ for 3m test distance

Uncertainty of Conducted Emission Measurement

Contribution	Probability Distribution	150KHz – 30MHz
Cable and I/P attenuator calibration	normal(k=2)	±0.3
RCV/SPA specification	rectangular	±2
LISN coupling specification	rectangular	±1.5
Transducer factor frequency interpolation	rectangular	±0.2
Mismatch Receiver VSWR Γ1=0.09 LISN VSWR Γ2=0.33 Uncertainty=20log(1-Γ1*Γ2)	U-shaped	0.2
combined standard uncertainty Ue(y)	normal	±1.66
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	normal (k=2)	±3.32

$U=\sqrt{\{(0.3/2)^2+(2^2+1.5^2+0.2^2)/3+(0.2)^2/2\}}=1.66$