



FCC Test Report

EQUIPMENT : MOBILE INTERNET NAVIGATION DEVICE

BRAND NAME : CLARIONMIND

MODEL NAME : NR1**, NH1**

FCC ID : HFS-NR1-NH1

STANDARD : FCC Part 15 Subpart C §15.247

CLASSIFICATION : Digital Spread Spectrum (DSS)

APPLICANT : QUANTA COMPUTER INC.

NO. 211, WEN HWA 2ND ROAD, KUEI SHAN HSIANG, TAO YUAN SHIEN, TAIWAN

The product sample received on Sep. 24, 2008 and completely tested on Oct. 07, 2008. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Roy Wu / Manager



Testing Laboratory
1190

SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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APPENDIX A. PHOTOGRAPHS OF EUT

APPENDIX B. SETUP PHOTOGRAPHS



SUMMARY OF TEST RESULT

| Report Section | FCC Rule | IC Rule | Description | Limit | Result | Remark |
|----------------|-----------------------|-----------|-------------------------------|--|--------|--|
| 3.1 | 15.247(b)(1) | A8.4(2) | Number of Channels | $\geq 15\text{Chs}$ | Pass | |
| 3.2 | 15.247(a)(1) | A8.1(a) | 20dB Bandwidth | NA | Pass | - |
| 3.3 | 15.247(a)(1) | A8.1(b) | Channel Separation | $\geq 2/3 \text{ of } 20\text{dB BW}$ | Pass | - |
| 3.4 | 15.247(a)(1) | A8.1(d) | Dwell Time of Each Channel | $\leq 0.4\text{sec in } 31.6\text{sec period}$ | Pass | - |
| 3.5 | 15.247(a)(1) | A8.1(b) | Peak Output Power | $\leq 0.125\text{W}$ | Pass | - |
| 3.6 | 15.247(d) | A8.5 | Frequency Band Edges | $\leq 20\text{dBc}$ | Pass | - |
| 3.7 | 15.207 | Gen 7.2.2 | AC Conducted Emission | 15.207(a) | Pass | Under limit 11.0 dB at 0.15 MHz |
| 3.8 | 15.247(d) | A8.5 | Transmitter Radiated Emission | 15.209(a) & 15.247(d) | Pass | Under limit 3.55 dB at 31.89 MHz |
| 3.9 | 15.203 & 15.247(b) | A8.4 | Antenna Requirement | N/A | Pass | - |



REVISION HISTORY



1 General Description

1.1 Applicant

Quanta COMPUTER INC.

No. 211, WEN HWA 2ND ROAD, KUEI SHAN HSIANG, TAO YUAN SHIEN, TAIWAN

1.2 Manufacturer

Quanta COMPUTER INC.

No. 211, WEN HWA 2ND ROAD, KUEI SHAN HSIANG, TAO YUAN SHIEN, TAIWAN

1.3 Feature of Equipment Under Test

| Product Feature & Specification | |
|-----------------------------------|--|
| Equipment | MOBILE INTERNET NAVIGATION DEVICE |
| Brand Name | CLARIONMIND |
| Model Name | NR1**, NH1** |
| Tx/Rx Frequency Range | 2400 MHz ~ 2483.5 MHz |
| Number of Channels | 79 |
| Carrier Frequency of Each Channel | 2402+n*1 MHz; n=0~78 |
| Channel Spacing | 1 MHz |
| Maximum Output Power to Antenna | Bluetooth: -0.56 dBm (1Mbps) Bluetooth EDR: -1.61dBm (2Mbps) / -1.67dBm (3Mbps) |
| Antenna Type | Fixed Internal Antenna with gain 1.8 dBi |
| Antenna Connector Type | N/A |
| HW Version | BC41B143A06 |
| SW Version | A06 |
| Type of Modulation | Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : $\pi/4$ -DQPSK Bluetooth EDR (3Mbps) : 8-DPSK |
| EUT Stage | Production Unit |

**Accessories List:**

| Accessories Specification | | |
|---------------------------|---------------------------|---|
| AC Adapter | Brand Name | Clarion(Bestec) |
| | Model Name | PQA-167-100(NA241WDA) |
| | Power Rating | I/P: 100-240Vac, 50-60Hz, 1A; O/P: 12Vdc, 2A |
| | AC Power Cord Type | 1.85 meter shielded cable without ferrite core |
| Car Charger | Brand Name | Clarion |
| | Model Name | GSA-1215 |
| | Power Cord Type | 1.88 meter non-shielded cable with ferrite core |
| Battery | Brand Name | Clarion |
| | Model Name | PQA-165-100 |
| | Power Rating | 7.4Vdc, 850mAh |
| | Type | Li-ion |

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. This test report recorded only product characteristics and test results of Digital Spread Spectrum (DSS).
3. For accessories equipped with this EUT, please refer to the appendix of the external photo.
4. For other wireless features of this EUT, test report will be issued separately.



1.4 Testing Site

| | | | |
|---------------------------|---|-----------|--------------------------------|
| Test Site | SPORTON INTERNATIONAL INC. | | |
| Test Site Location | No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C TEL: +886-3-3273456 / FAX: +886-3-3284978 | | |
| Test Site No. | Sporton Site No. | | FCC/IC Registration No. |
| | CO05-HY | 03CH07-HY | TW1022/4086B-1 |

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC Public Notice DA 00-705
- ANSI C63.4-2003
- IC RSS-210 Issue 7

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B (DoC) which recorded in a separate test report.

1.6 Ancillary Equipment List

| Item | Equipment | Trade Name | Model Name | FCC ID | Data Cable | Power Cord |
|------|-----------------|------------|------------|-----------------|------------|-------------------|
| 1. | BT Base Station | Anritus | 8852B | N/A | N/A | Unshielded, 1.8 m |
| 2. | Mobile Phone | PHILPS | CT9A9R | RXSCT9A9R | N/A | N/A |
| 3. | WLAN AP | D-Link | DWL-7100AP | KA22003040018-1 | N/A | Unshielded, 1.8 m |



2 Test Configuration of Equipment Under Test

2.1 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and recorded the RF output power in the following table:

| RF Output Power | | | | | |
|-----------------|-----------|------------------------|----------------|-----------|--|
| Channel | Frequency | Data Rate / Modulation | | | |
| | | GFSK | $\pi/4$ -DQPSK | 8-DPSK | |
| | | 1Mbps | 2Mbps | 3Mbps | |
| Ch00 | 2402MHz | -0.69 dBm | -1.72 dBm | -1.67 dBm | |
| Ch39 | 2441MHz | -0.96 dBm | -2.06 dBm | -2.07 dBm | |
| Ch78 | 2480MHz | -0.56 dBm | -1.61 dBm | -1.71 dBm | |

Remark:

1. The data rate 1Mbps was set for all the test cases, due to the highest RF output power.
2. The data rate 1Mbps was set for 20 dB band width and dwell time test cases.
3. The EUT is programmed to transmit signal continuously for all testing.



2.2 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). Pre-scanned tests were conducted to determine the final configuration from all possible combinations. The following tables are showing the test modes as the worst cases and recorded in this report.

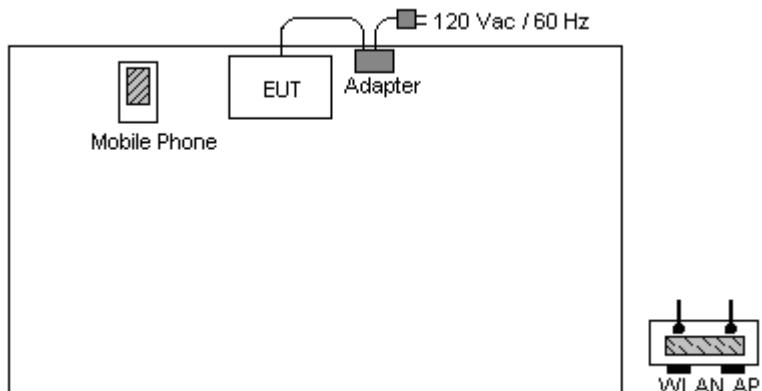
| Test Cases | | | |
|-----------------------|---|---|---|
| Test Item | Modulation | | |
| | Bluetooth 1Mbps GFSK | Bluetooth EDR 2Mbps $\pi/4$ -DQPSK | Bluetooth EDR 3Mbps 8-DPSK |
| Conducted TCs | ■ Mode 1: CH00_2402 MHz ■ Mode 2: CH39_2441 MHz ■ Mode 3: CH78_2480 MHz | ■ Mode 4: CH00_2402 MHz ■ Mode 5: CH39_2441 MHz ■ Mode 6: CH78_2480 MHz | ■ Mode 7: CH00_2402 MHz ■ Mode 8: CH39_2441 MHz ■ Mode 9: CH78_2480 MHz |
| Radiated TCs | ■ Mode 1: CH00_2402 MHz ■ Mode 2: CH39_2441 MHz ■ Mode 3: CH78_2480 MHz | N/A | N/A |
| AC Conducted Emission | Mode 1 : BT Link + WLAN Link + MPEG4 + Adapter | | |

Remark:

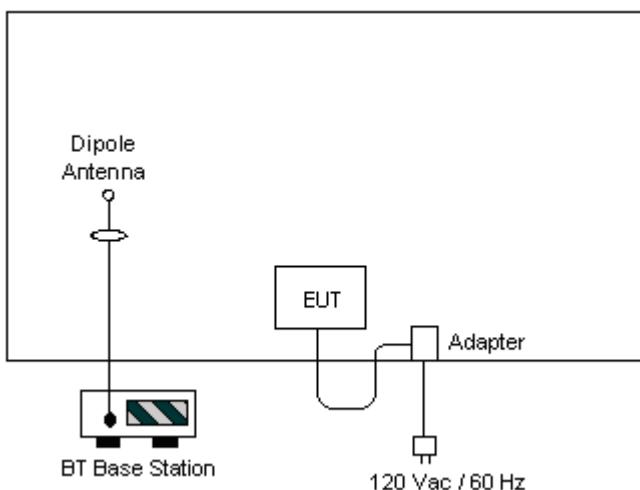
1. The worst case of conducted TCs is Bluetooth 1Mbps, only the test data of these modes was reported.
2. The worst cases of Radiated emission were Bluetooth 1Mbps link modes; only the test data of these modes were reported.

2.3 Connection Diagram of Test System

<Conducted Emission>



<Radiated Emission>



2.4 RF Utility

For Bluetooth function, the RF Utility, "X Terminal" was installed in EUT which was programmed in order to make the EUT into the engineering modes to contact with BT base station for continuous transmitting and receiving signals.

3 Test Result

3.1 Number of Channel Measurement

3.1.1 Limits of Number of Hopping Frequency

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

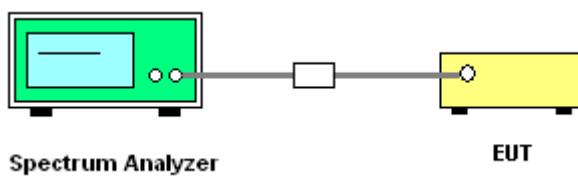
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedure

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The modulation types of EUT are irrelevant to number of hopping channels deviation.
4. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = the frequency band of operation; RBW \geq 1% of the span; VBW \geq RBW; Sweep = auto;
Detector function = peak; Trace = max hold.
5. The number of hopping frequency used is defined as the device has the numbers of total channel.

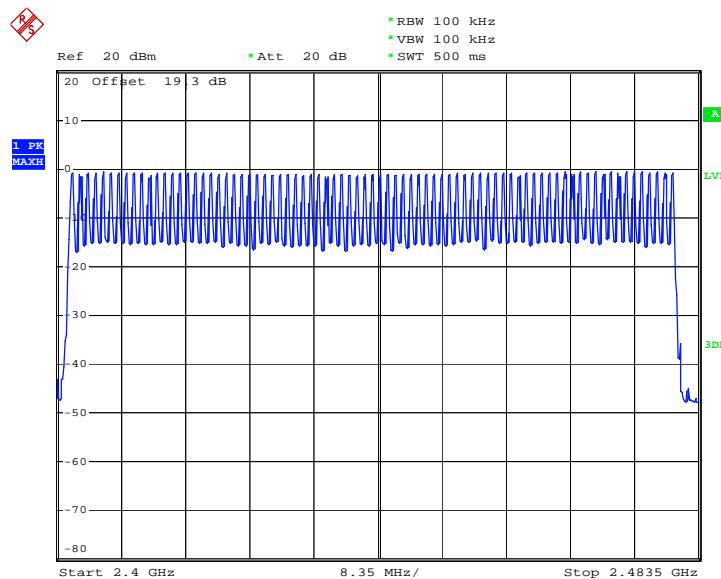
3.1.4 Test Setup



3.1.5 Test Result of Number of Hopping Frequency

| Test Mode : | Mode 1~9 | Temperature : | 25~26°C |
|---|----------|-----------------------------|------------------|
| Test Engineer : | Ken Hsu | Relative Humidity : | 50~51% |
| Number of Hopping Channels (Channel) | | Limits (Channel) | Pass/Fail |
| 79 | | > 15 | Pass |

Number of Hopping Channel Plot on Channel 00 - 78



Date: 21.OCT.2008 14:53:26

3.2 20dB Bandwidth Measurement

3.2.1 Limit of 20dB Bandwidth

N/A

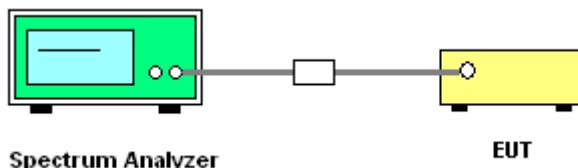
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel;
RBW \geq 1% of the 20 dB bandwidth; VBW \geq RBW; Sweep = auto; Detector function = peak;
Trace = max hold.
5. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

3.2.4 Test Setup

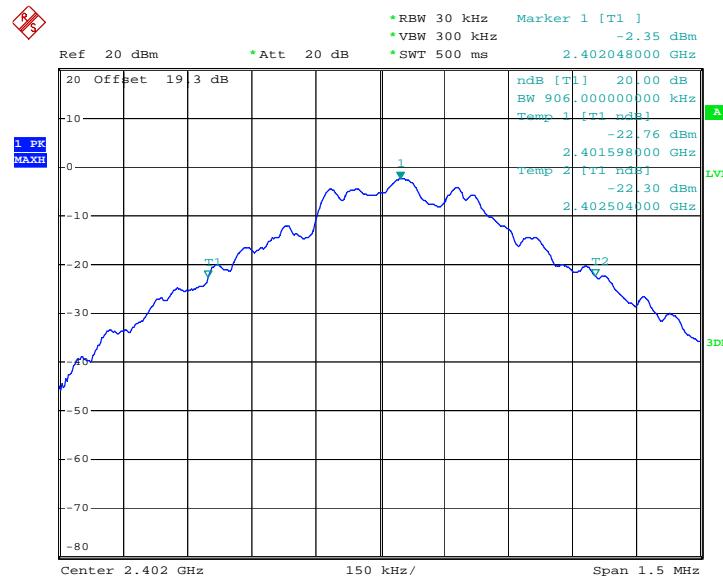


3.2.5 Test Result of 20dB Bandwidth

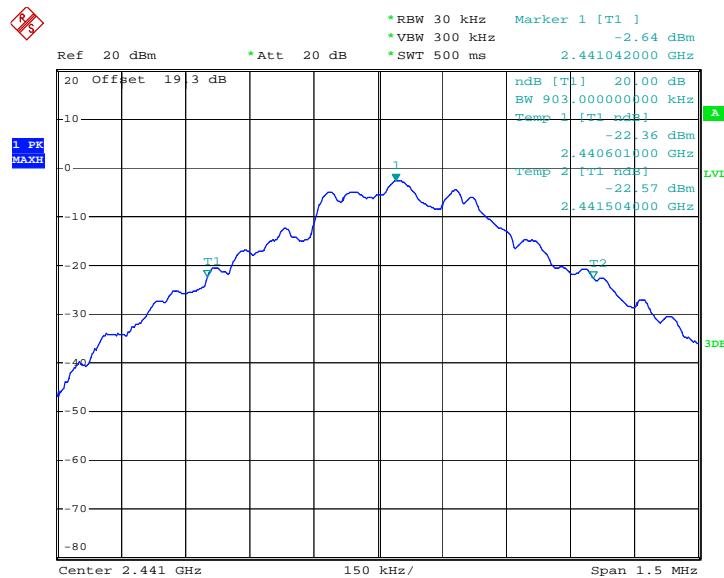
| | | | |
|------------------------|--------------|----------------------------|---------|
| Test Mode : | Mode 1, 2, 3 | Temperature : | 25~26°C |
| Test Engineer : | Ken Hsu | Relative Humidity : | 50~51% |

| Channel | Frequency (MHz) | 20dB Bandwidth (MHz) |
|---------|-----------------|----------------------|
| 00 | 2402 | 0.906 |
| 39 | 2441 | 0.903 |
| 78 | 2480 | 0.906 |

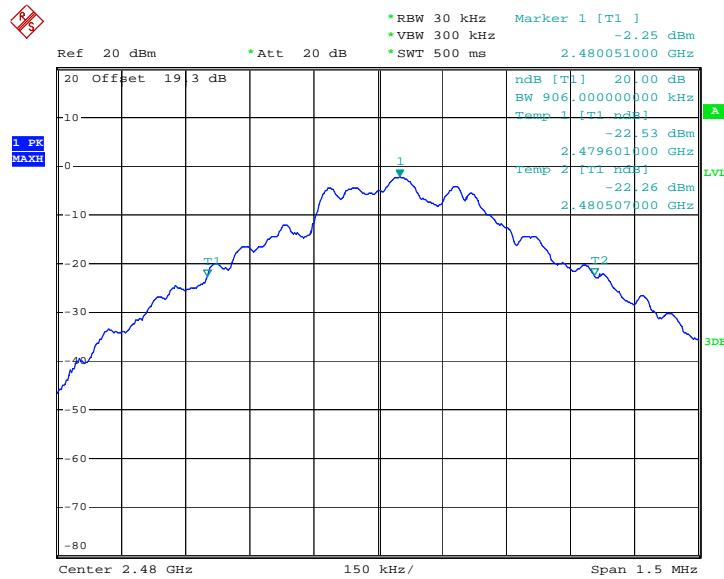
20 dB Bandwidth Plot on Channel 00



Date: 21.OCT.2008 14:20:22

20 dB Bandwidth Plot on Channel 39


Date: 21.OCT.2008 14:21:26

20 dB Bandwidth Plot on Channel 78


Date: 21.OCT.2008 14:21:47

3.3 Hopping Channel Separation Measurement

3.3.1 Limit of Hopping Channel Separation

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

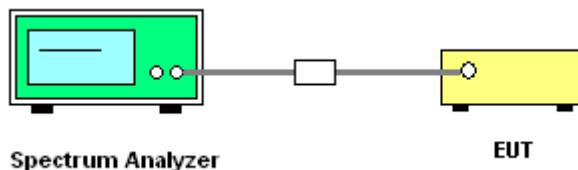
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. Please refer FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. Use the following spectrum analyzer settings:
Span = wide enough to capture the peaks of two adjacent channels; RBW \geq 1% of the span;
VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold.
5. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

3.3.4 Test Setup

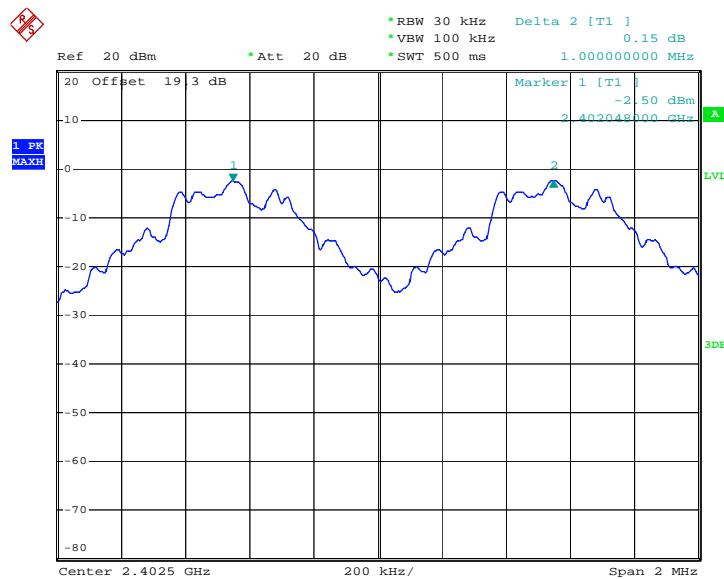


3.3.5 Test Result of Hopping Channel Separation

| | | | |
|------------------------|--------------|----------------------------|---------|
| Test Mode : | Mode 1, 2, 3 | Temperature : | 25~26°C |
| Test Engineer : | Ken Hsu | Relative Humidity : | 50~51% |

| Channel | Frequency (MHz) | Frequency Separation (MHz) | (2/3 of 20dB BW) Limits (MHz) | Pass/Fail |
|---------|-----------------|----------------------------|-------------------------------|-----------|
| 00 | 2402 | 1.000 | 0.604 | Pass |
| 39 | 2441 | 1.004 | 0.602 | Pass |
| 78 | 2480 | 1.004 | 0.604 | Pass |

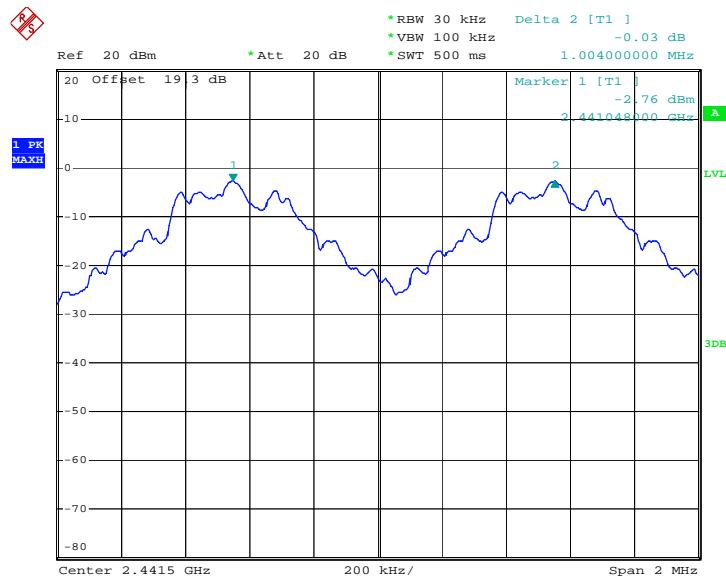
Channel Separation Plot on Channel 00 - 01



Date: 21.OCT.2008 14:36:55

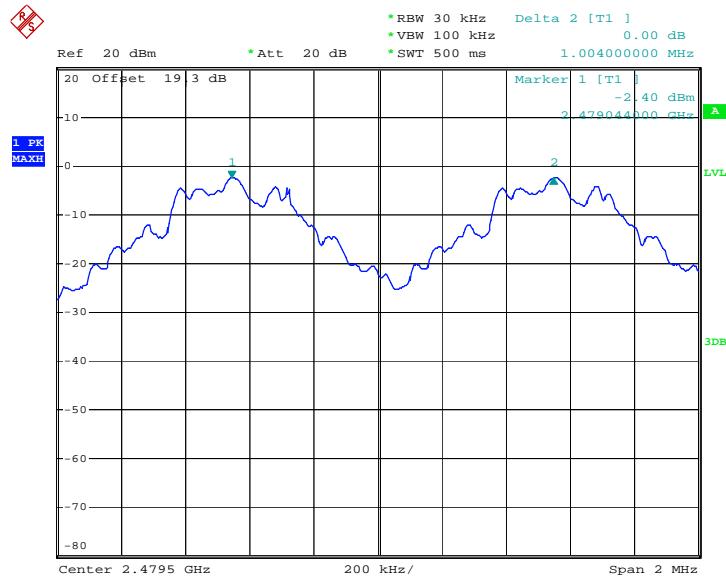


Channel Separation Plot on Channel 39 - 40



Date: 21.OCT.2008 14:37:16

Channel Separation Plot on Channel 77 - 78



Date: 21.OCT.2008 14:37:43

3.4 Dwell Time Measurement

3.4.1 Limit of Dwell Time

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

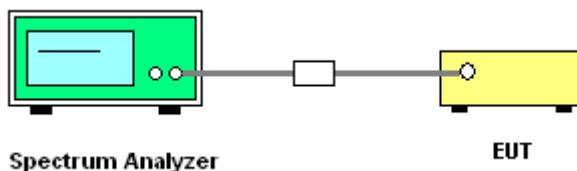
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW \geq RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.
5. Use the marker-delta function to calculate the dwell time.

3.4.4 Test Setup

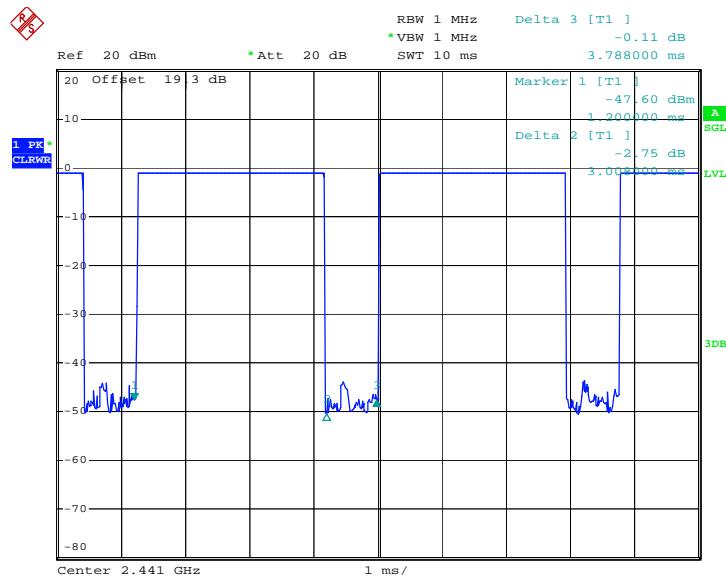


3.4.5 Test Result of Dwell Time

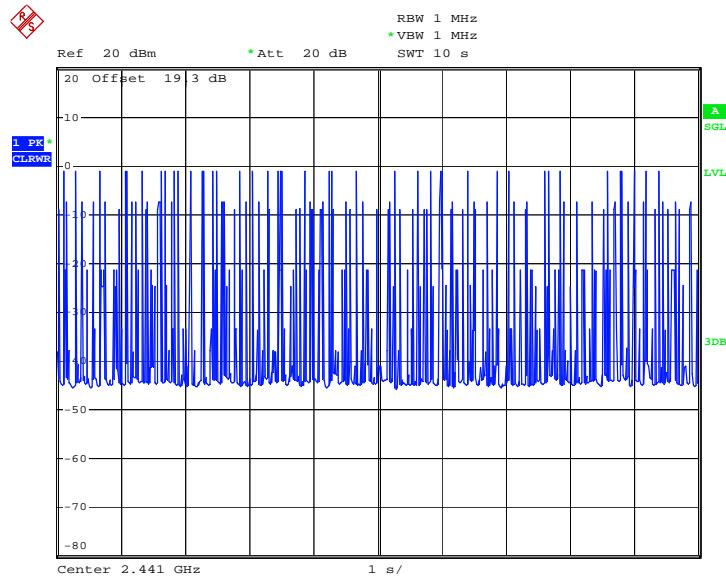
| Test Mode : | Mode 2 | Temperature : | 25~26°C | | |
|------------------------|-------------------------|------------------------------|------------------|--------------|-----------|
| Test Engineer : | Ken Hsu | Relative Humidity : | 50~51% | | |
| Package Mode | Average Hopping Channel | Package Transfer Time (usec) | Dwell Time (sec) | Limits (sec) | Pass/Fail |
| DH5 | 3.70 | 3008.00 | 0.352 | 0.4 | Pass |

Remark:

1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79 channels come from the Hopping Channel number.
3. Average Hopping Channel = hops/sweep time
4. t: Package Transfer Time(us)

DH5 Dwell Time (One Pulse) Plot on Channel 39


Date: 21.OCT.2008 14:43:08

DH5 Dwell Time (Count Pulses) Plot on Channel 39


Date: 21.OCT.2008 15:06:08

3.5 Peak Output Power Measurement

3.5.1 Limit of Peak Output Power

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 1W (30dBm).

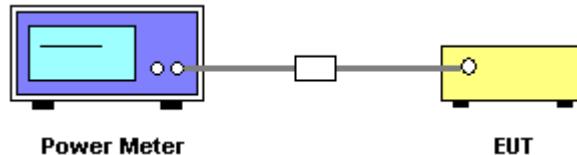
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the peak power meter by a low loss cable.

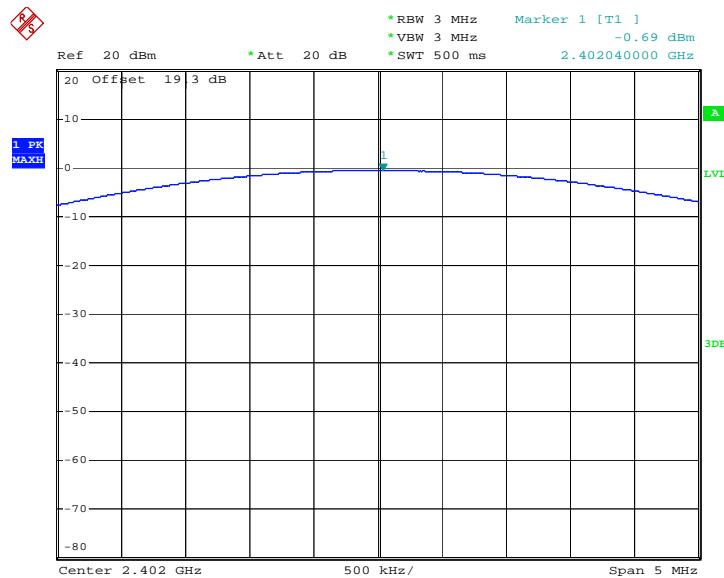
3.5.4 Test Setup



3.5.5 Test Result of Peak Output Power

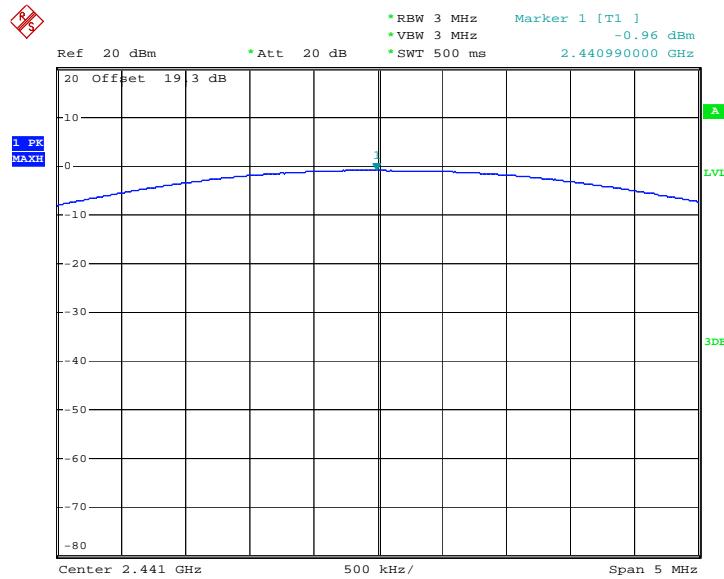
| Test Mode : | Mode 1, 2, 3 | Temperature : | 25~26°C | |
|------------------------|--------------------|----------------------------|------------------------------|------------------|
| Test Engineer : | Ken Hsu | Relative Humidity : | 50~51% | |
| Channel | Frequency (MHz) | RF Power (dBm) | | |
| | | GFSK | Max. Limits (dBm) | Pass/Fail |
| | | 1 Mbps | | |
| 00 | 2402 | -0.69 | 30 | Pass |
| 39 | 2441 | -0.96 | 30 | Pass |
| 78 | 2480 | -0.56 | 30 | Pass |

Peak Output Power Plot on Channel 00



Date: 21.OCT.2008 11:51:30

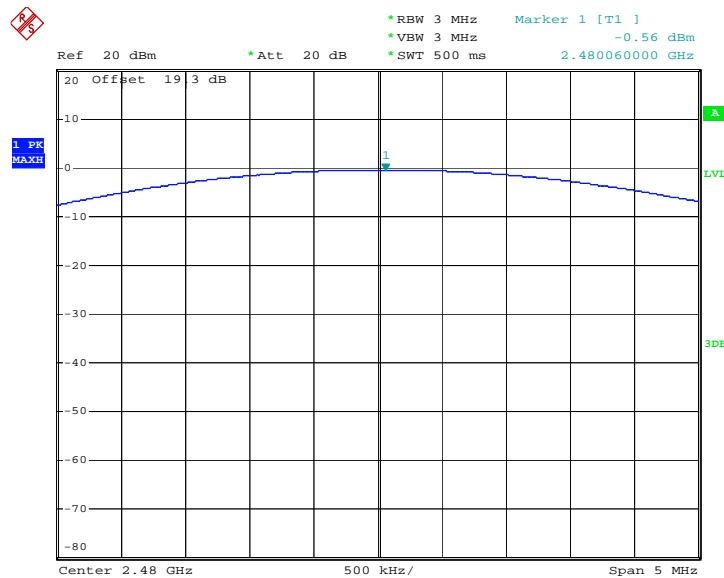
Peak Output Power Plot on Channel 39



Date: 21.OCT.2008 11:52:53



Peak Output Power Plot on Channel 78



Date: 21.OCT.2008 11:59:18

3.6 Band Edges Measurement

3.6.1 Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

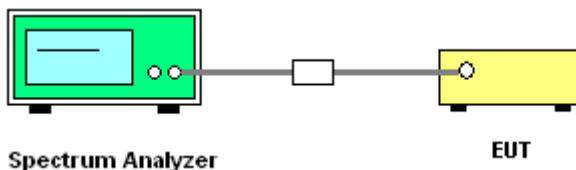
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

1. The testing follows the guidelines in ANSI C63.4-2003 and FCC Public Notice DA 00-705 Measurement Guidelines.
2. RF antenna conducted test: Set RBW = 100 kHz, Video bandwidth (VBW) > RBW, scan up through 10th harmonic. Bandedge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. Note: If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.
3. Radiated emission test: Applies to bandedge emissions that fall in the restricted bands listed in FCC Section 15.205. The maximum permitted average field strength is listed in FCC Section 15.209. A pre-amp is necessary for this measurement. For measurements above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See FCC Section 15.35(b) and (c).

3.6.4 Test Setup





3.6.5 Test Result of Radiated Band Edges

| | | | | | | | | |
|-----------------|--------|--|--|---------------------|--|---------|--|--|
| Test Mode : | Mode 1 | | | Temperature : | | 25~27°C | | |
| Test Channel : | 00 | | | Relative Humidity : | | 47~49% | | |
| Test Engineer : | Kay Wu | | | | | | | |

| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency (MHz) | Level (dBuV/m) | Over Limit (dB) | Limit Line (dBuV/m) | Read Level (dBuV) | Antenna Factor (dB) | Cable Loss (dB) | Preamp Factor (dB) | Ant Pos (cm) | Table Pos (deg) | Remark |
| 2389.61 | 32.69 | -21.31 | 54.00 | 30.59 | 32.32 | 5.46 | 35.68 | 107 | 125 | Average |
| 2389.61 | 47.62 | -26.38 | 74.00 | 45.52 | 32.32 | 5.46 | 35.68 | 100 | 0 | Peak |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency (MHz) | Level (dBuV/m) | Over Limit (dB) | Limit Line (dBuV/m) | Read Level (dBuV) | Antenna Factor (dB) | Cable Loss (dB) | Preamp Factor (dB) | Ant Pos (cm) | Table Pos (deg) | Remark |
| 2389.61 | 33.04 | -20.96 | 54.00 | 30.96 | 32.30 | 5.46 | 35.68 | 100 | 59 | Average |
| 2389.61 | 48.17 | -25.83 | 74.00 | 46.09 | 32.30 | 5.46 | 35.68 | 100 | 0 | Peak |

| | | | | | | | | |
|-----------------|--------|--|--|---------------------|--|---------|--|--|
| Test Mode : | Mode 3 | | | Temperature : | | 25~27°C | | |
| Test Channel : | 78 | | | Relative Humidity : | | 47~49% | | |
| Test Engineer : | Kay Wu | | | | | | | |

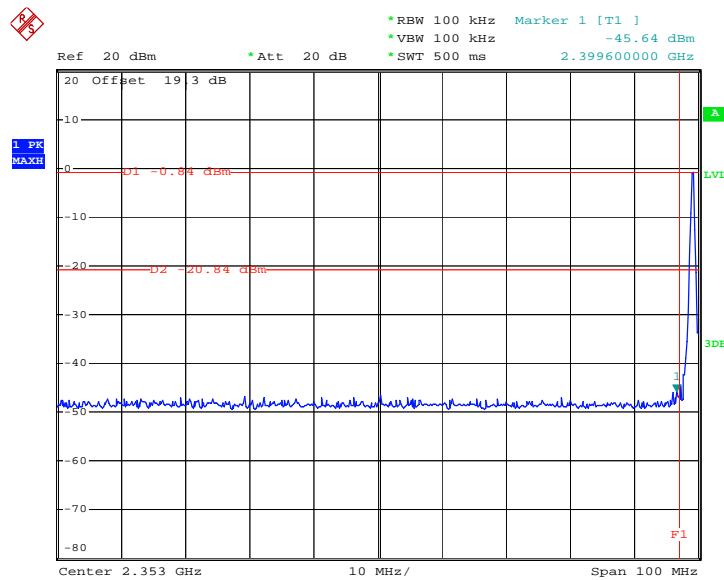
| ANTENNA POLARITY : HORIZONTAL | | | | | | | | | | |
|-------------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency (MHz) | Level (dBuV/m) | Over Limit (dB) | Limit Line (dBuV/m) | Read Level (dBuV) | Antenna Factor (dB) | Cable Loss (dB) | Preamp Factor (dB) | Ant Pos (cm) | Table Pos (deg) | Remark |
| 2483.50 | 49.32 | -4.68 | 54.00 | 47.33 | 32.30 | 5.38 | 35.70 | 100 | 126 | Average |
| 2483.50 | 58.23 | -15.77 | 74.00 | 56.24 | 32.30 | 5.38 | 35.70 | 100 | 0 | Peak |

| ANTENNA POLARITY : VERTICAL | | | | | | | | | | |
|-----------------------------|---------------------|-------------------------|-----------------------------|---------------------------|-----------------------------|-------------------------|----------------------------|----------------------|-------------------------|---------|
| Frequency (MHz) | Level (dBuV/m) | Over Limit (dB) | Limit Line (dBuV/m) | Read Level (dBuV) | Antenna Factor (dB) | Cable Loss (dB) | Preamp Factor (dB) | Ant Pos (cm) | Table Pos (deg) | Remark |
| 2483.50 | 49.62 | -4.38 | 54.00 | 47.63 | 32.30 | 5.38 | 35.70 | 100 | 68 | Average |
| 2483.50 | 58.82 | -15.18 | 74.00 | 56.83 | 32.30 | 5.38 | 35.70 | 100 | 0 | Peak |

3.6.6 Test Result of Conducted Band Edges

| | | | |
|------------------------|---------|----------------------------|---------|
| Test Mode : | Mode 1 | Temperature : | 25~26°C |
| Test Channel : | 00 | Relative Humidity : | 50~51% |
| Test Engineer : | Ken Hsu | | |

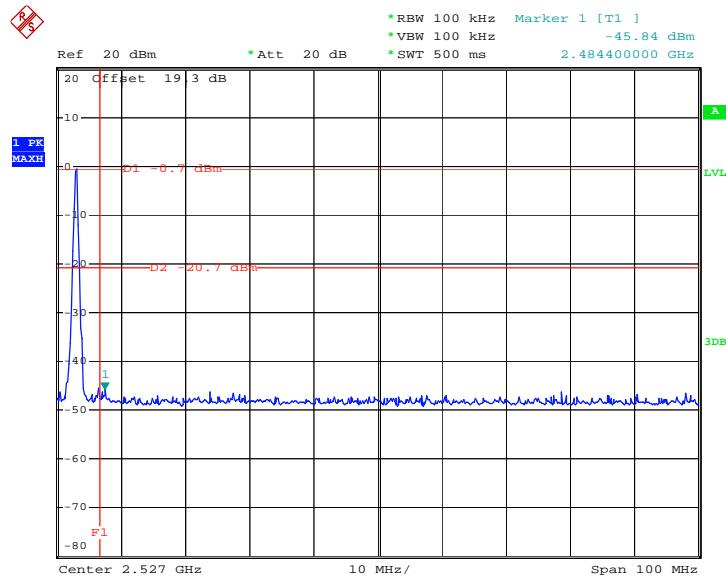
Low Band Edge Plot on Channel 00



Date: 21.OCT.2008 14:30:41

| | | | |
|------------------------|---------|----------------------------|---------|
| Test Mode : | Mode 3 | Temperature : | 25~26°C |
| Test Channel : | 78 | Relative Humidity : | 50~51% |
| Test Engineer : | Ken Hsu | | |

High Band Edge Plot on Channel 78



Date: 21.OCT.2008 14:36:00



3.7 AC Conducted Emission Measurement

3.7.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

| Frequency of emission (MHz) | Conducted limit (dBuV) | |
|-----------------------------|------------------------|-----------|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

*Decreases with the logarithm of the frequency.

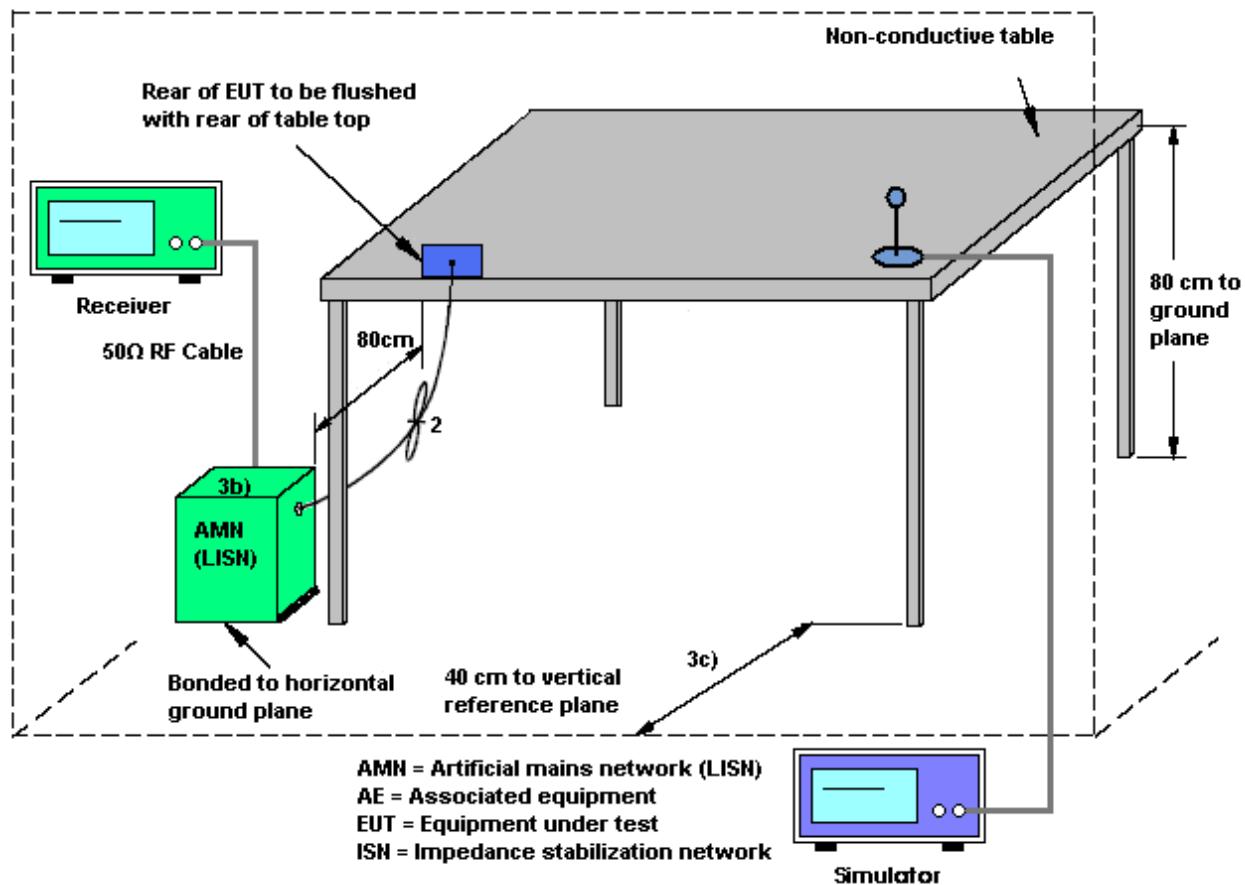
3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

3.7.3 Test Procedures

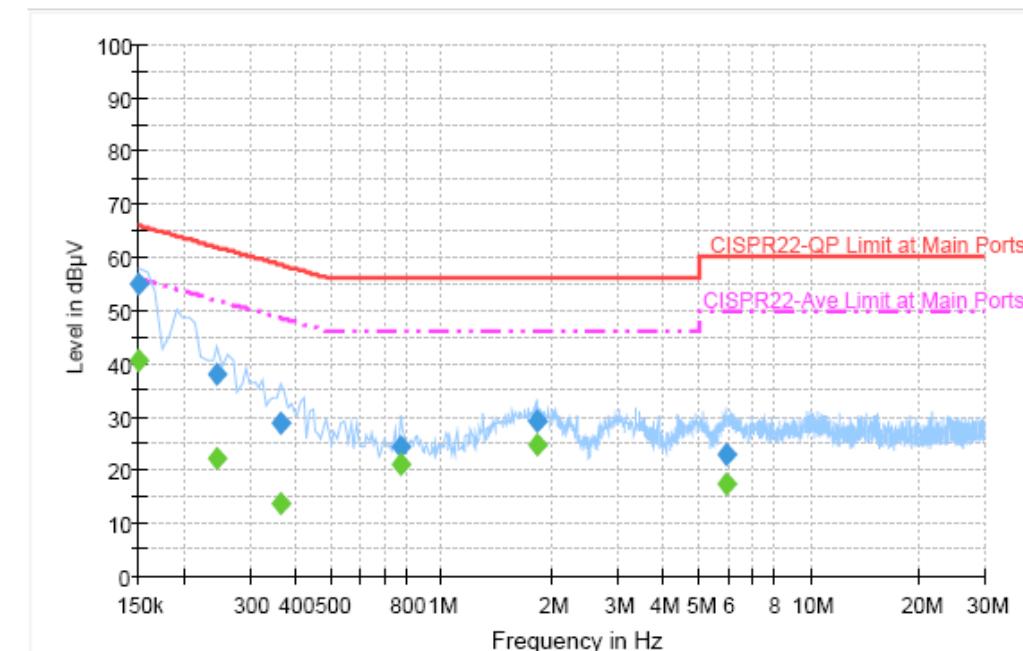
1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.7.4 Test Setup



3.7.5 Test Result of AC Conducted Emission

| | | | |
|------------------------|---|----------------------------|---------|
| Test Mode : | Mode 1 | Temperature : | 25~26°C |
| Test Engineer : | Cona Huang | Relative Humidity : | 50~51% |
| | | Phase : | Line |
| Function Type : | BT Link + WLAN Link + MPEG4 + Adapter | | |
| Remark : | All emissions not reported here are more than 10 dB below the prescribed limit. | | |



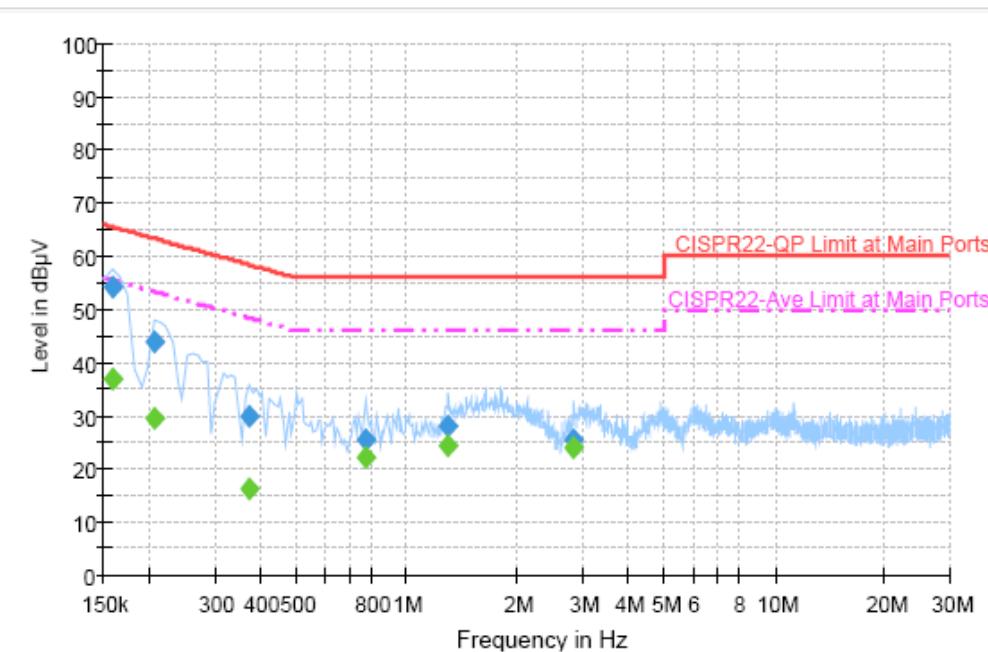
Final Result 1

| Frequency (MHz) | QuasiPeak (dB μ V) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dB μ V) |
|-----------------|------------------------|--------|------|------------|-------------|--------------------|
| 0.150000 | 55.0 | Off | L1 | 19.4 | 11.0 | 66.0 |
| 0.246000 | 38.2 | Off | L1 | 19.4 | 23.7 | 61.9 |
| 0.366000 | 28.8 | Off | L1 | 19.3 | 29.8 | 58.6 |
| 0.774000 | 24.4 | Off | L1 | 19.4 | 31.6 | 56.0 |
| 1.814000 | 29.1 | Off | L1 | 19.5 | 26.9 | 56.0 |
| 5.918000 | 22.9 | Off | L1 | 19.5 | 37.1 | 60.0 |

Final Result 2

| Frequency (MHz) | Average (dB μ V) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dB μ V) |
|-----------------|----------------------|--------|------|------------|-------------|--------------------|
| 0.150000 | 40.6 | Off | L1 | 19.4 | 15.4 | 56.0 |
| 0.246000 | 22.1 | Off | L1 | 19.4 | 29.8 | 51.9 |
| 0.366000 | 13.7 | Off | L1 | 19.3 | 34.9 | 48.6 |
| 0.774000 | 21.0 | Off | L1 | 19.4 | 25.0 | 46.0 |
| 1.814000 | 24.6 | Off | L1 | 19.5 | 21.4 | 46.0 |
| 5.918000 | 17.3 | Off | L1 | 19.5 | 32.7 | 50.0 |

| | | | |
|------------------------|---|----------------------------|---------|
| Test Mode : | Mode 1 | Temperature : | 25~26°C |
| Test Engineer : | Cona Huang | Relative Humidity : | 50~51% |
| | | Phase : | Neutral |
| Function Type : | BT Link + WLAN Link + MPEG4 + Adapter | | |
| Remark : | All emissions not reported here are more than 10 dB below the prescribed limit. | | |



Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|--------|------|------------|-------------|--------------|
| 0.158000 | 54.3 | Off | N | 19.4 | 11.3 | 65.6 |
| 0.206000 | 44.0 | Off | N | 19.3 | 19.4 | 63.4 |
| 0.374000 | 29.8 | Off | N | 19.4 | 28.6 | 58.4 |
| 0.774000 | 25.6 | Off | N | 19.4 | 30.4 | 56.0 |
| 1.294000 | 28.0 | Off | N | 19.5 | 28.0 | 56.0 |
| 2.846000 | 25.4 | Off | N | 19.5 | 30.6 | 56.0 |

Final Result 2

| Frequency (MHz) | Average (dBµV) | Filter | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|----------------|--------|------|------------|-------------|--------------|
| 0.158000 | 37.0 | Off | N | 19.4 | 18.6 | 55.6 |
| 0.206000 | 29.4 | Off | N | 19.3 | 24.0 | 53.4 |
| 0.374000 | 16.2 | Off | N | 19.4 | 32.2 | 48.4 |
| 0.774000 | 22.1 | Off | N | 19.4 | 23.9 | 46.0 |
| 1.294000 | 24.4 | Off | N | 19.5 | 21.6 | 46.0 |
| 2.846000 | 24.0 | Off | N | 19.5 | 22.0 | 46.0 |



3.8 Radiated Emission Measurement

3.8.1 Limit of Radiated Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|--------------------|--------------------------------------|----------------------------------|
| 0.009 – 0.490 | 2400/F(kHz) | 300 |
| 0.490 – 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30.0 | 30 | 30 |
| 30 – 88 | 100 | 3 |
| 88 – 216 | 150 | 3 |
| 216 - 960 | 200 | 3 |
| Above 960 | 500 | 3 |

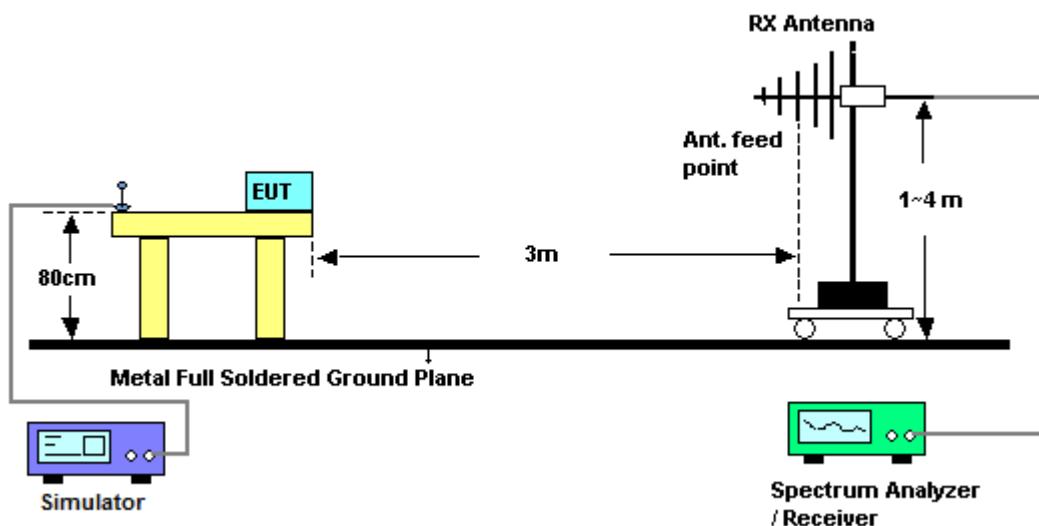
3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

3.8.3 Test Procedures

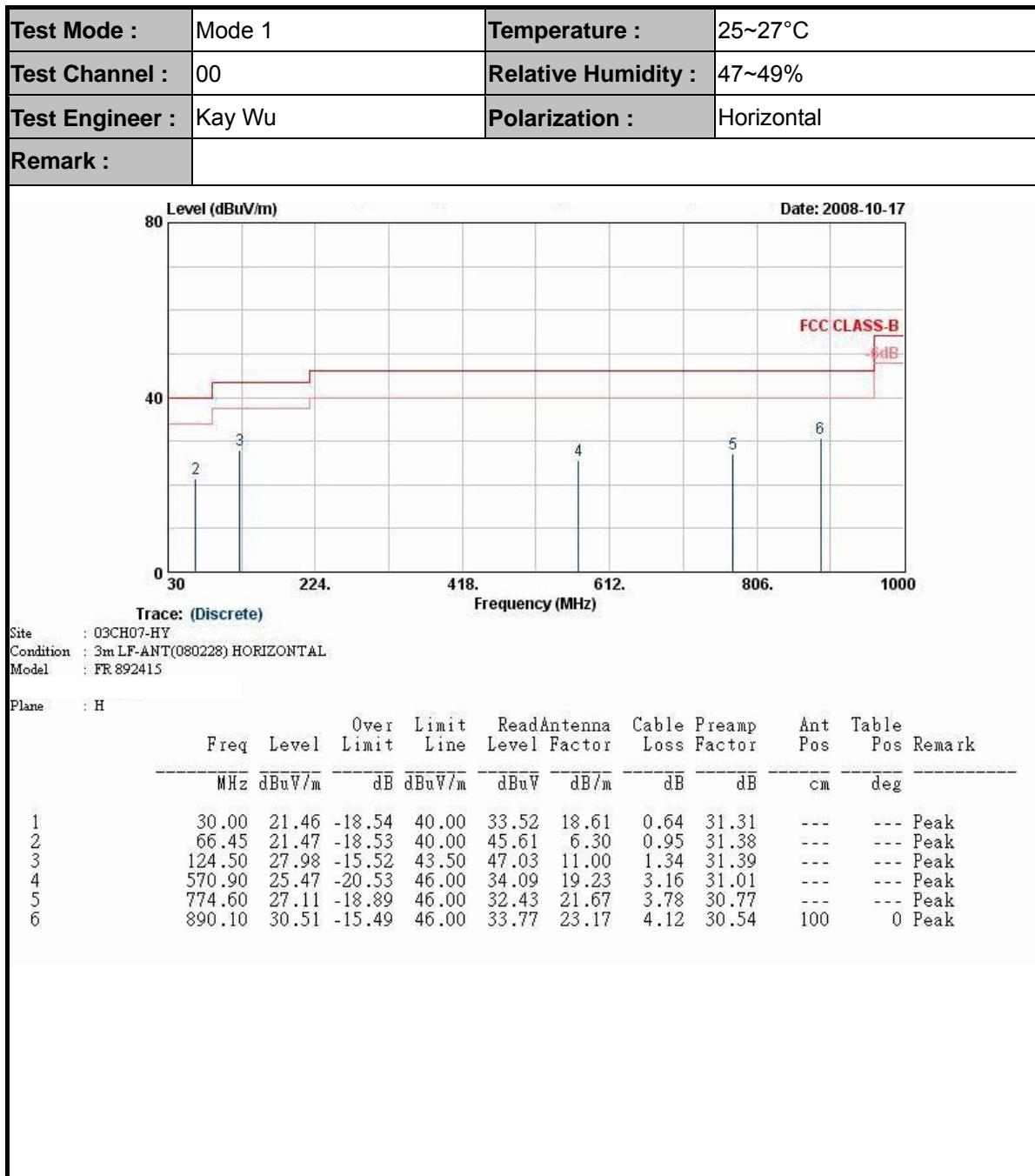
1. The testing follows the guidelines in FCC Public Notice DA 00-705 Measurement Guidelines.
2. Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold.
3. Follow the guidelines in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

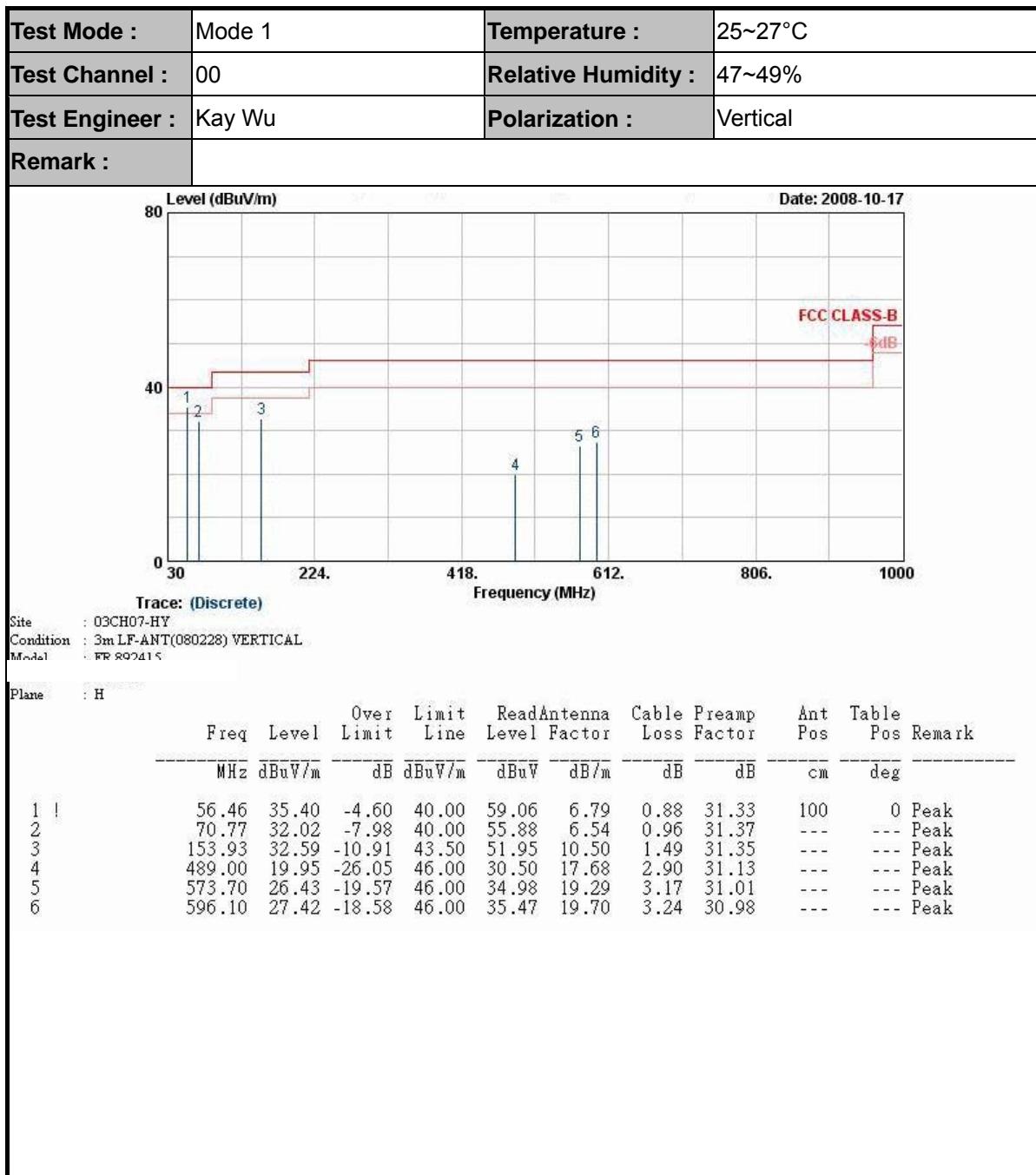
3.8.4 Test Setup

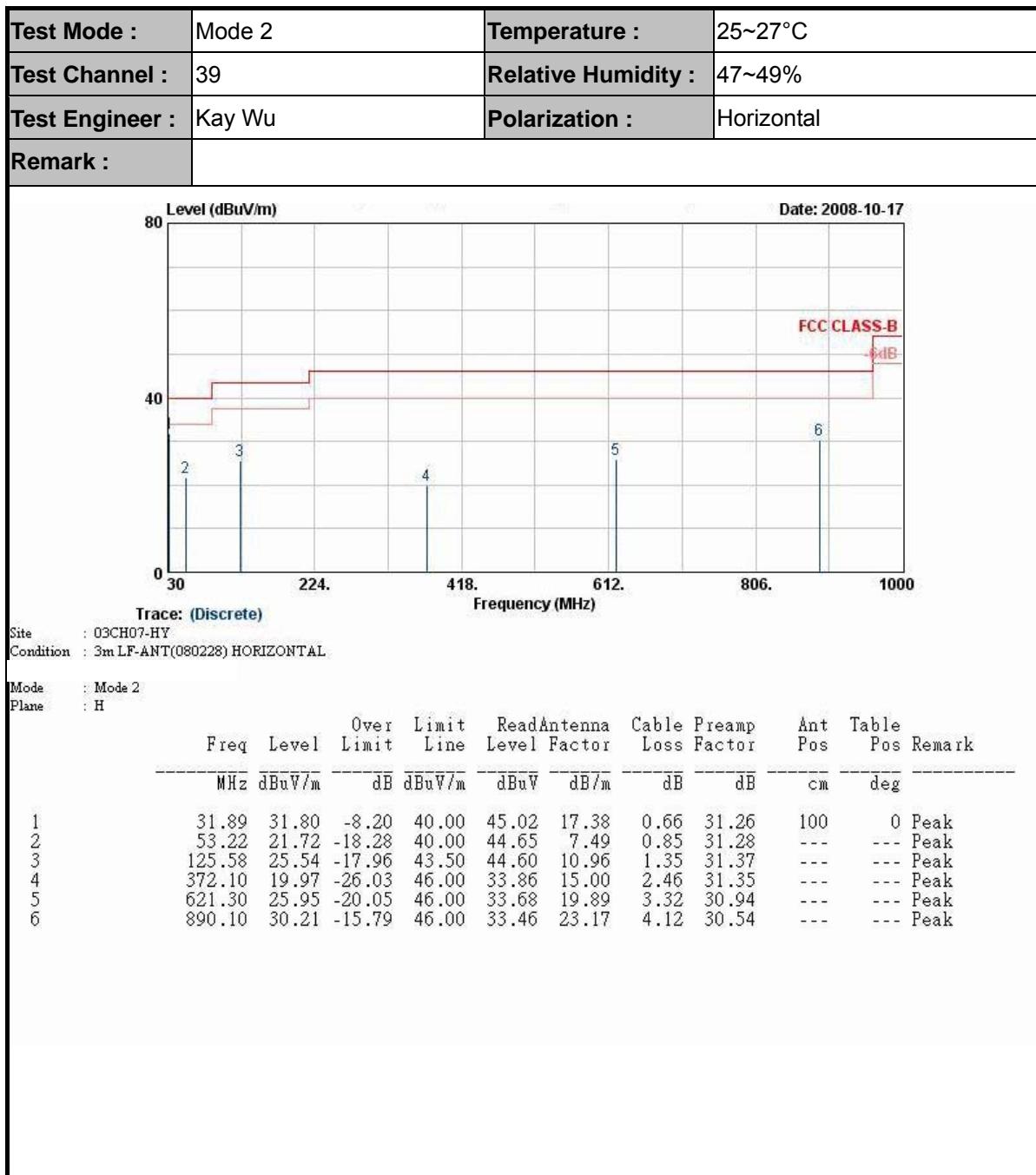


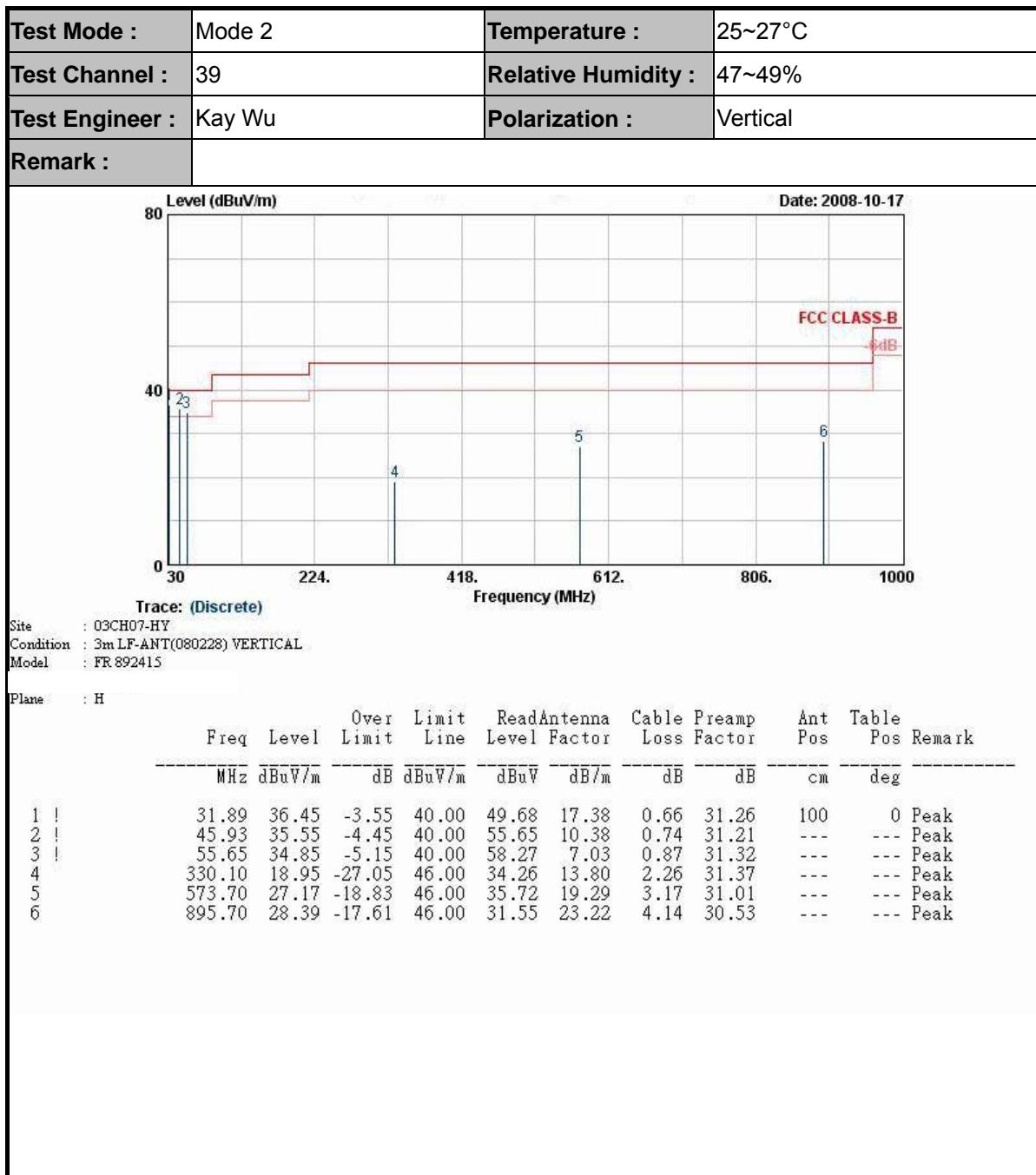


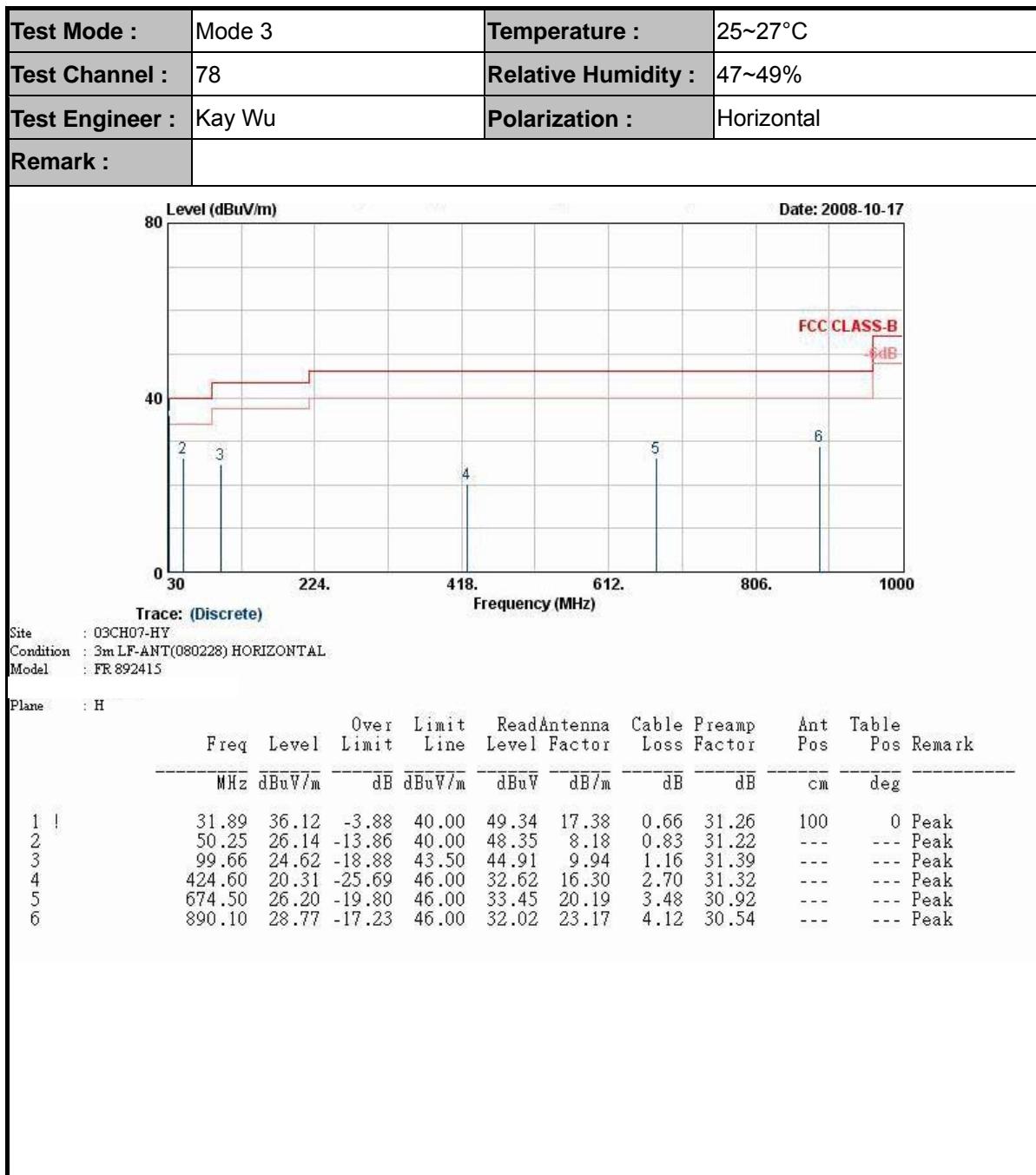
3.8.5 Test Result of Radiated Emission < 1GHz

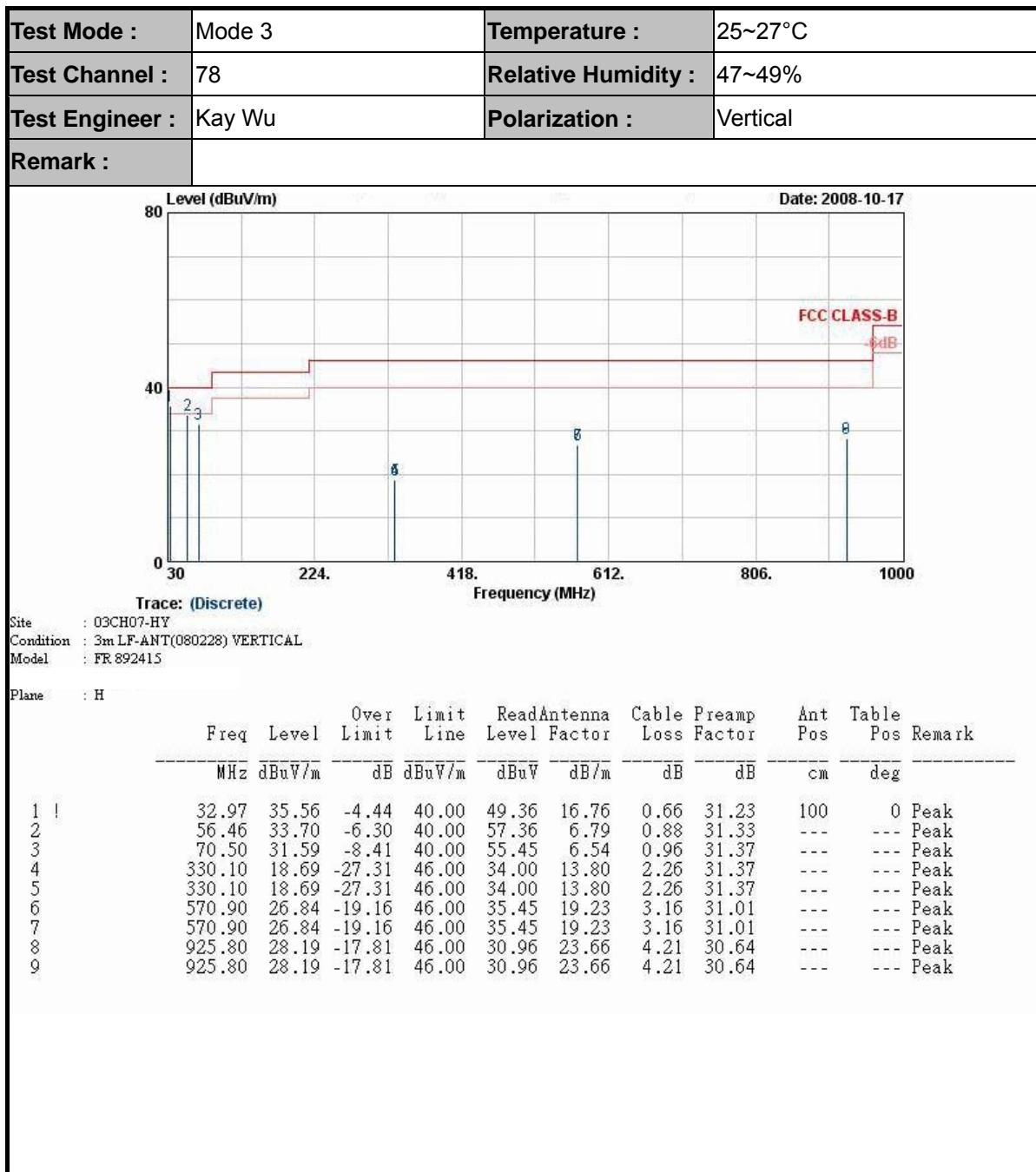






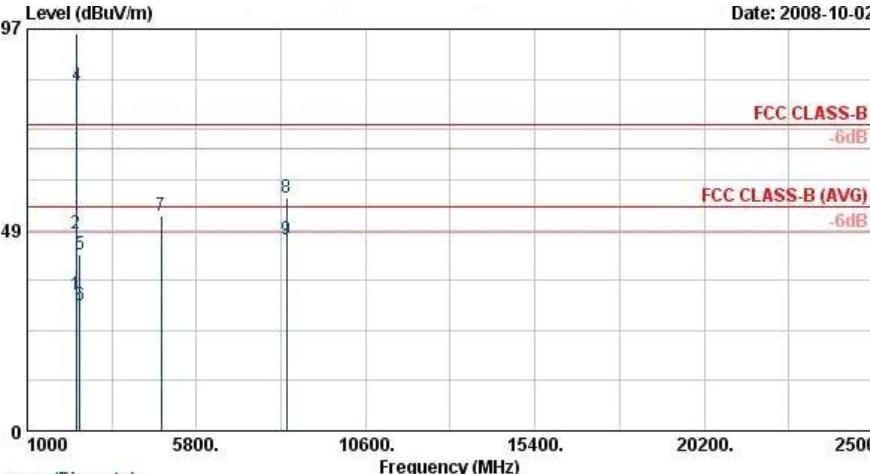


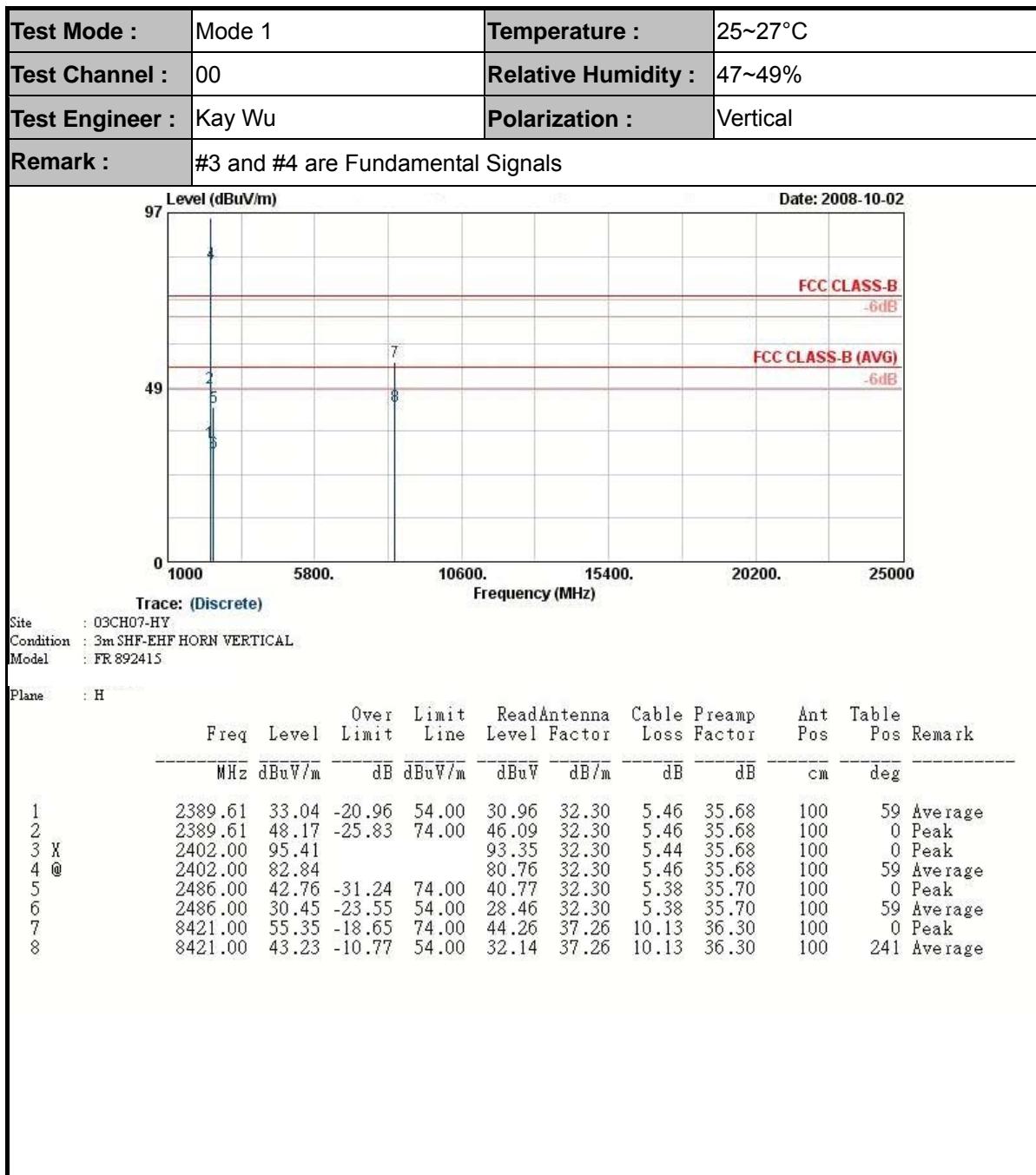


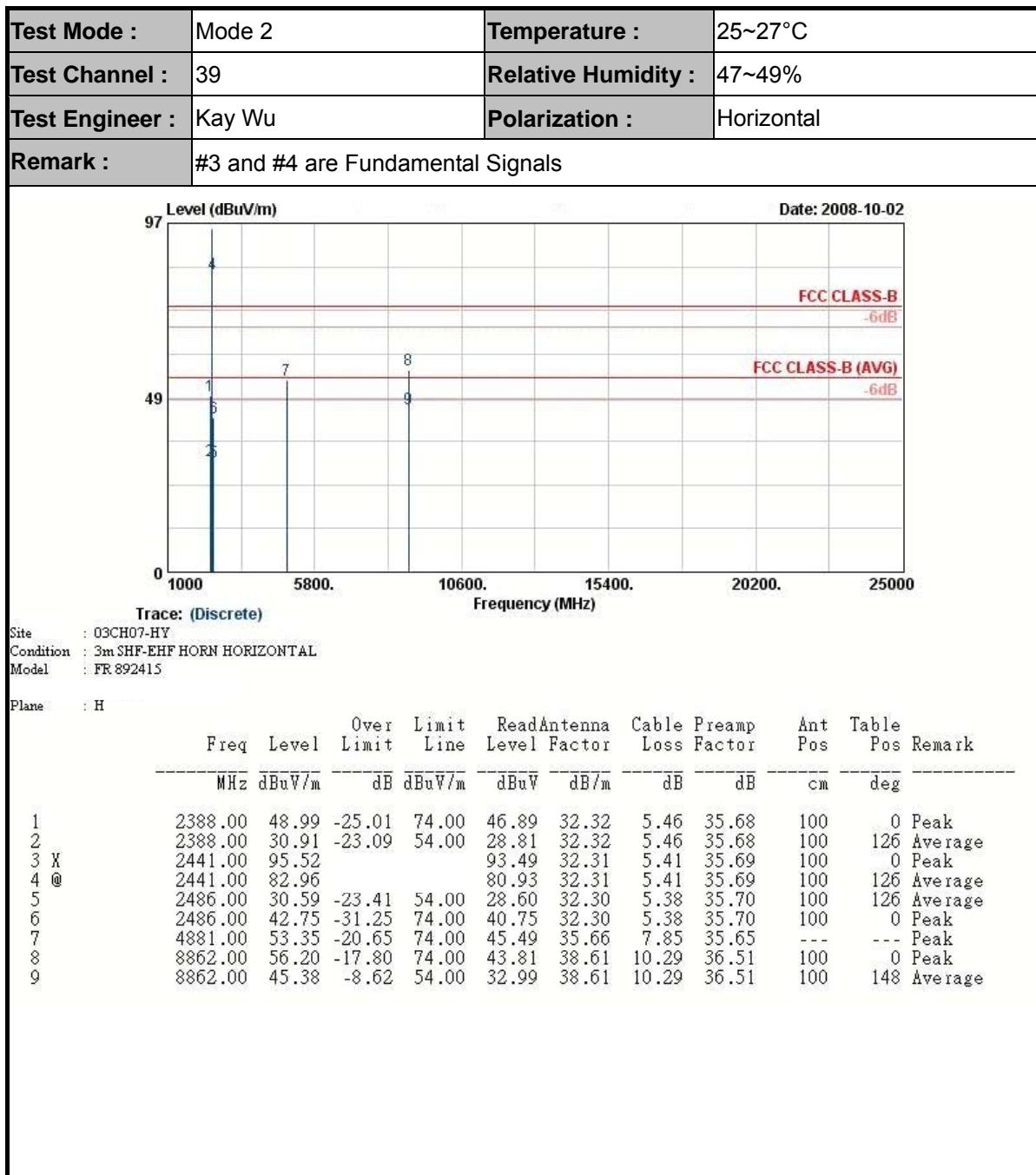


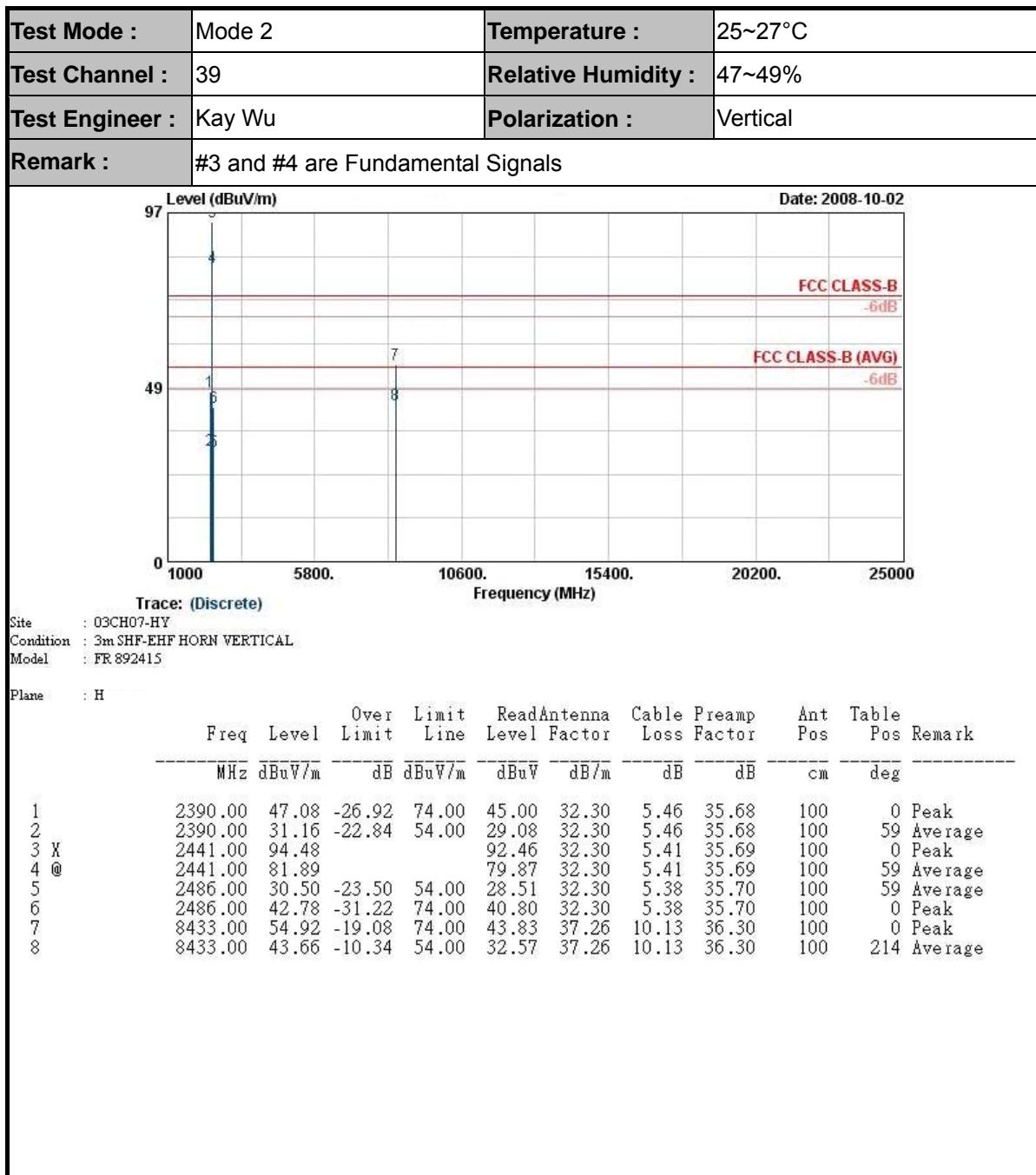


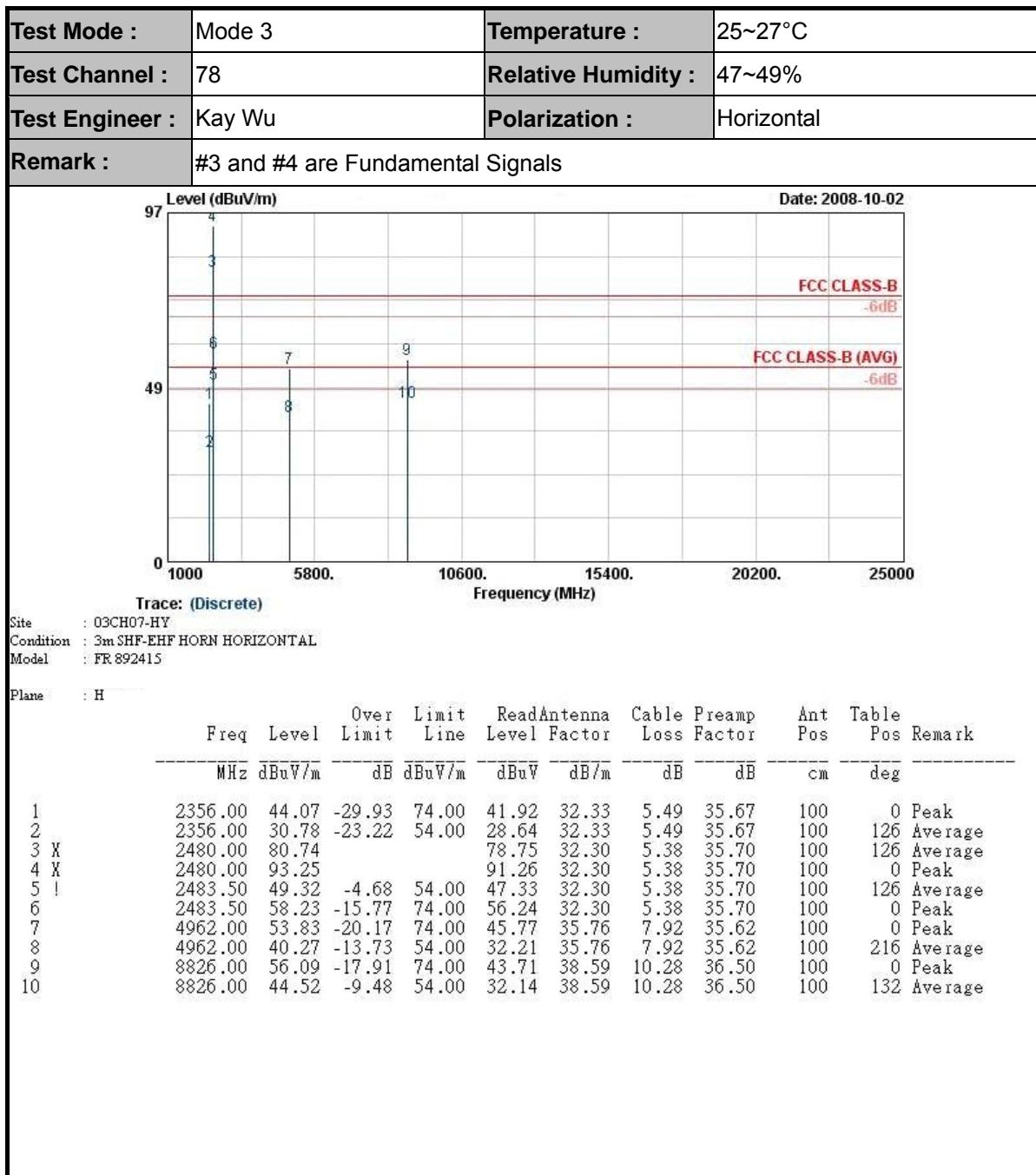
3.8.6 Test Result of Radiated Emission $\geq 1\text{GHz}$

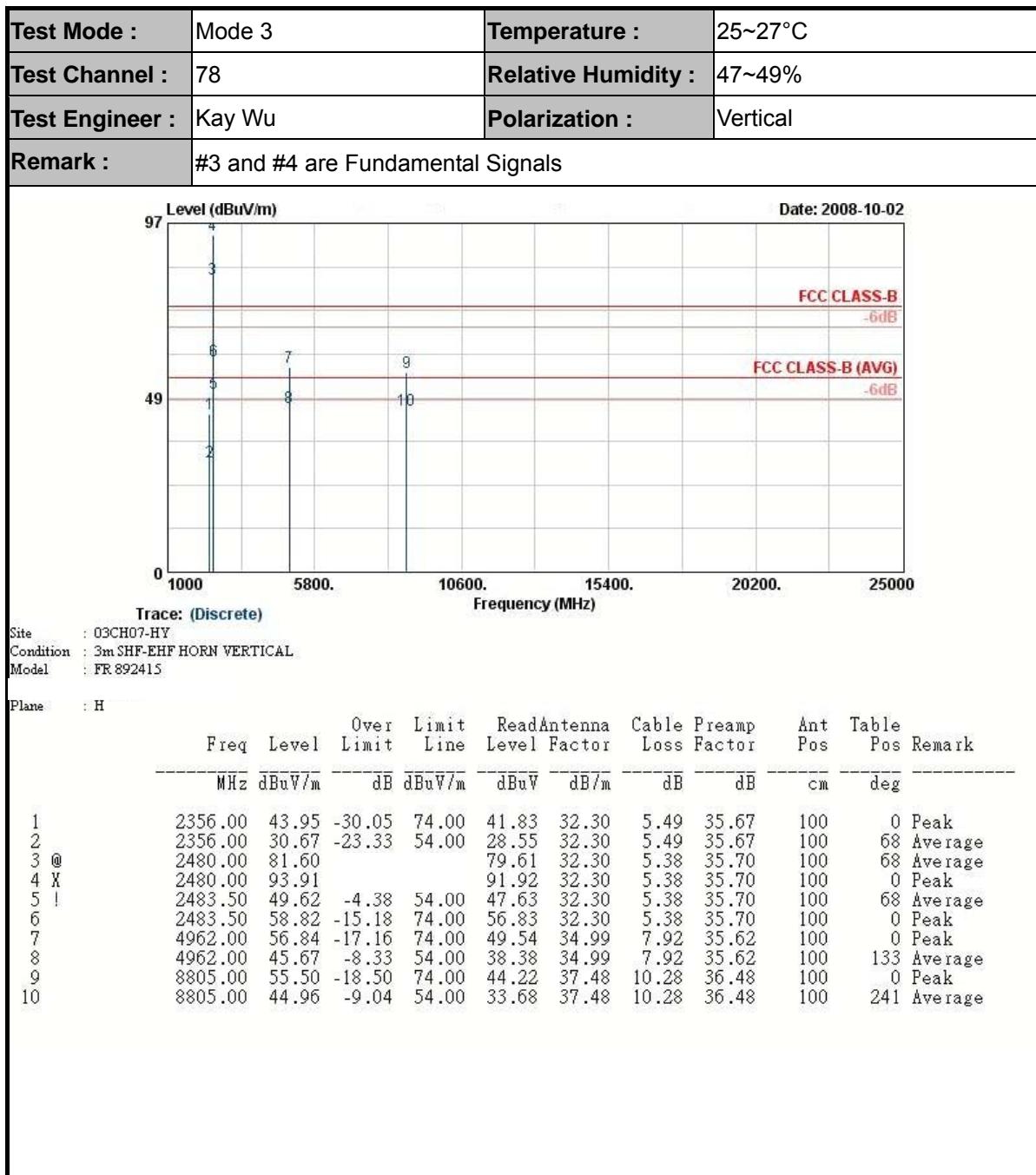
| Test Mode : | Mode 1 | Temperature : | 25~27°C | | | | | | | | |
|---|-----------------------------------|---------------------|------------------|------------|--------------------|----------------|------------|---------------|---------|-----------|--------------|
| Test Channel : | 00 | Relative Humidity : | 47~49% | | | | | | | | |
| Test Engineer : | Kay Wu | Polarization : | Horizontal | | | | | | | | |
| Remark : | #3 and #4 are Fundamental Signals | | | | | | | | | | |
|  | | | Date: 2008-10-02 | | | | | | | | |
| Trace: (Discrete) Site : 03CH07-HY Condition : 3m SHF-EHF HORN HORIZONTAL Model : FR 892415 | | | | | | | | | | | |
| Plane : | H | | | | | | | | | | |
| | Freq | Level | Over Limit | Limit Line | Read Antenna Level | Antenna Factor | Cable Loss | Preamp Factor | Ant Pos | Table Pos | Table Remark |
| | MHz | dBuV/m | dB | dBuV/m | dBuV | dB/m | dB | dB | cm | deg | |
| 1 | 2389.61 | 32.69 | -21.31 | 54.00 | 30.59 | 32.32 | 5.46 | 35.68 | 107 | 125 | Average |
| 2 | 2389.61 | 47.62 | -26.38 | 74.00 | 45.52 | 32.32 | 5.46 | 35.68 | 100 | 0 | Peak |
| 3 X | 2402.00 | 95.95 | | | 93.87 | 32.32 | 5.44 | 35.68 | 100 | 0 | Peak |
| 4 @ | 2402.00 | 83.22 | | | 81.12 | 32.32 | 5.46 | 35.68 | 107 | 125 | Average |
| 5 | 2484.00 | 42.57 | -31.43 | 74.00 | 40.57 | 32.30 | 5.38 | 35.70 | 100 | 0 | Peak |
| 6 | 2484.00 | 30.42 | -23.58 | 54.00 | 28.43 | 32.30 | 5.38 | 35.70 | 107 | 125 | Average |
| 7 | 4806.00 | 51.96 | -22.04 | 74.00 | 44.27 | 35.57 | 7.79 | 35.68 | --- | --- | Peak |
| 8 | 8361.00 | 56.40 | -17.60 | 74.00 | 44.24 | 38.37 | 10.09 | 36.30 | 100 | 0 | Peak |
| 9 | 8361.00 | 46.04 | -7.96 | 54.00 | 33.88 | 38.37 | 10.09 | 36.30 | 100 | 202 | Average |













3.9 Antenna Requirements

3.9.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

3.9.2 Antenna Connected Construction

The antennas type used in this product is fixed internal antenna without connector and it is considered to meet antenna requirement.

3.9.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



4 List of Measuring Equipments

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Due Date | Remark |
|---------------------------|--------------|-----------|------------|--------------------------|------------------|---------------|-----------------------|
| Spectrum Analyzer | R&S | FSP40 | 100055 | 9KHz~40GHz | Jun. 26, 2008 | Jun. 25, 2009 | Conducted (TH02-HY) |
| Power Meter | Agilent | E4416A | GB41292344 | N/A | Feb. 21, 2008 | Feb. 20, 2009 | Conducted (TH02-HY) |
| Power Sensor | Agilent | E9327A | US40441548 | N/A | Feb. 21, 2008 | Feb. 20, 2009 | Conducted (TH02-HY) |
| Bilog Antenna | SCHAFFNER | CBL6111C | 2726 | 30MHz-1GHz | Dec. 01, 2007 | Nov. 30, 2008 | Radiation (03CH07-HY) |
| Spectrum Analyzer | R&S | FSP | 101067 | 9KHz~30GHz | Dec. 05, 2007 | Dec. 04, 2008 | Radiation (03CH07-HY) |
| Double Ridge Horn Antenna | ESCO | 3117 | 75962 | 1G~18GHz | Aug. 13, 2008 | Aug. 12, 2009 | Radiation (03CH07-HY) |
| PreAmplifier | Agilent | 8449B | 3008A02362 | 1~26.5GHz | Dec. 22, 2007 | Dec. 21, 2008 | Radiation (03CH07-HY) |
| PreAmplifier | COM-POWER | PA-103A | 161241 | 10-1000MHz. 32dB.GAIN | Mar. 31, 2008 | Mar. 30, 2009 | Radiation (03CH07-HY) |
| Double Ridge Horn Antenna | ESCO | 3117 | 66584 | 1G~18GHz | Aug. 06, 2008 | Aug. 05, 2009 | Radiation (03CH07-HY) |
| BT Base Station | Anritsu | MT8852B | 6K00005722 | N/A | Oct. 23, 2007 | Oct. 22, 2008 | Radiation (03CH07-HY) |



5 Uncertainty of Evaluation

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

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

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

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

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

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



6 Certification of TAF Accreditation



Certificate No. : L1190-070110

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sportun International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,
Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria : ISO/IEC 17025:2005
Accreditation Number : 1190
Originally Accredited : December 15, 2003
Effective Period : January 10, 2007 to January 09, 2010
Accredited Scope : Testing Field, see described in the Appendix
Specific Accreditation Program : Accreditation Program for Designated Testing Laboratory
for Commodities Inspection
Accreditation Program for Telecommunication Equipment
Testing Laboratory

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : January 10, 2007

P1, total 9 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when used without the Appendix.



Appendix A. Photographs of EUT

Please refer to Sporton report number EP892415 as below.