

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPARTC AND CANADIAN RSS 210 ISSUE 7 REQUIREMENT**

OF

Mobile micro printer

MODEL No.: M01, M02, M03, M04, M05, M06

BRAND NAME: N/A

FCC ID: YA5-MMP01

IC: 8892A-MMP01

REPORT NO: E1003069F

ISSUE DATE: April 27, 2010

Prepared for

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VERIFICATION OF COMPLIANCE

| | |
|----------------------|---|
| Applicant: | BEIJING BRIGHT TECHNOLOGY DEVELOPMENT CO., LTD. 520th Flr, #5 Building, Huihuang Int'l Haidian Dist, Beijing China |
| Product Description: | Mobile micro printer |
| Brand Name: | N/A |
| Model Number: | M01、 M02、 M03、 M04、 M05、 M06 (Note: The samples are the same except color and model numbers are different.) |
| Serial Number: | N/A |
| File Number: | E1003069F |
| Date of Test: | March 15, 2010 to April 27, 2010 |

We hereby certify that:

The above equipment was tested by SHENZHEN EMTEK CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003), RSS GEN and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.247 and RSS 210 Issue 7.

The test results of this report relate only to the tested sample identified in this report.

Approved By



David Lee / Q.A. Manager
SHENZHEN EMTEK CO., LTD.

Table of Contents

| | | |
|-----------|--|-----------|
| 1. | GENERAL INFORMATION | 5 |
| 1.1 | PRODUCT DESCRIPTION..... | 5 |
| 1.2 | RELATED SUBMITTAL(S) / GRANT (S) | 5 |
| 1.3 | TEST METHODOLOGY | 5 |
| 1.4 | SPECIAL ACCESSORIES | 5 |
| 1.5 | EQUIPMENT MODIFICATIONS | 5 |
| 1.6 | TEST FACILITY | 6 |
| 2. | SYSTEM TEST CONFIGURATION | 7 |
| 2.1 | EUT CONFIGURATION | 7 |
| 2.2 | EUT EXERCISE | 7 |
| 2.3 | TEST PROCEDURE | 7 |
| 2.4 | LIMITATION | 7 |
| 2.5 | CONFIGURATION OF TESTED SYSTEM | 11 |
| 2.6 | EQUIPMENT USED IN TESTED SYSTEM | 11 |
| 2.7 | DESCRIPTION OF TEST MODES..... | 12 |
| 3. | SUMMARY OF TEST RESULTS | 13 |
| 4. | CONDUCTED EMISSIONS TEST | 14 |
| 4.1 | MEASUREMENT PROCEDURE:..... | 14 |
| 4.2 | TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) | 14 |
| 4.3 | MEASUREMENT EQUIPMENT USED: | 14 |
| 4.4 | CONDUCTED EMISSION LIMIT..... | 14 |
| 4.5 | MEASUREMENT RESULT:..... | 15 |
| 4.6 | CONDUCTED MEASUREMENT PHOTOS: | 16 |
| 5. | RADIATED EMISSION TEST | 17 |
| 5.1 | MEASUREMENT PROCEDURE..... | 17 |
| 5.2 | TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) | 18 |
| 5.3 | MEASUREMENT EQUIPMENT USED: | 19 |
| 5.4 | MEASUREMENT RESULT..... | 19 |
| 5.5 | RADIATED MEASUREMENT PHOTOS:..... | 27 |
| 6. | CHANNEL SEPARATION TEST | 29 |
| 6.1 | MEASUREMENT PROCEDURE..... | 29 |
| 6.2 | TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) | 29 |
| 6.3 | MEASUREMENT EQUIPMENT USED: | 29 |
| 6.4 | MEASUREMENT RESULTS:..... | 29 |
| 7. | BANDWIDTH TEST..... | 32 |
| 7.1 | MEASUREMENT PROCEDURE..... | 32 |

| | | |
|------------|--|-----------|
| 7.2 | TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) | 32 |
| 7.3 | MEASUREMENT EQUIPMENT USED: | 32 |
| 7.4 | MEASUREMENT RESULTS: | 32 |
| 8. | QUANTITY OF HOPPING CHANNEL TEST..... | 37 |
| 8.1 | MEASUREMENT PROCEDURE..... | 37 |
| 8.2 | TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) | 37 |
| 8.3 | MEASUREMENT EQUIPMENT USED: | 37 |
| 8.4 | MEASUREMENT RESULTS: | 37 |
| 8. | TIME OF OCCUPANCY (DWELL TIME) TEST | 39 |
| 9.1 | MEASUREMENT PROCEDURE..... | 39 |
| 9.2 | TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) | 39 |
| 9.3 | MEASUREMENT EQUIPMENT USED: | 39 |
| 9.4 | MEASUREMENT RESULTS: | 39 |
| 10. | MAXIMUM PEAK OUTPUT POWER TEST | 42 |
| 10.1 | MEASUREMENT PROCEDURE..... | 42 |
| 10.2 | TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) | 42 |
| 10.3 | MEASUREMENT EQUIPMENT USED: | 42 |
| 10.4 | MEASUREMENT RESULTS: | 42 |
| 11. | BAND EDGE TEST..... | 43 |
| 11.1 | MEASUREMENT PROCEDURE..... | 43 |
| 11.2 | TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) | 43 |
| 11.3 | MEASUREMENT EQUIPMENT USED: | 43 |
| 11.4 | MEASUREMENT RESULTS: | 43 |
| 12. | ANTENNA PORT EMISSION..... | 45 |
| 12.1 | TEST EQUIPMENT | 45 |
| 12.2 | MEASURING INSTRUMENTS AND SETTING..... | 45 |
| 12.3 | TEST PROCEDURES | 45 |
| 12.4 | BLOCK DIAGRAM OF TEST SETUP..... | 45 |
| 12.5. | TEST RESULT | 45 |
| 13. | ANTENNA APPLICATION..... | 47 |
| 13.1 | ANTENNA REQUIREMENT | 47 |
| 13.2. | RESULT..... | 47 |

1. GENERAL INFORMATION

1.1 Product Description

The BEIJING BRIGHT TECHNOLOGY DEVELOPMENT CO., LTD. Model: M01(referred to as the EUT in this report) The EUT is an short range, lower power, Mobile micro printer designed as an " Input Device. It is designed by way of utilizing the GFSK, DQPSK and 8DPSK modulation achieves the system operating.

A major technical descriptions of EUT is described as following:

- A). Operation Frequency: 2402-2480MHz
- B). Modulation: GFSK, DQPSK, 8DPSK
- C). Number of Channel: 79
- D). Channel space: 1MHz
- E). Rated RF Output Power: 0dBm
- F). BIT Rate of Transmission: 2Mbps, 3Mbps
- G). Antenna Type: PCB antenna
- H). Antenna GAIN: 2dBi
- I). Power Supply: DC8.5V with AC Adapter or with battery
- J). Adapter:
 - Input: 100-240V~50-60Hz, 0.3A
 - Output: DC.8.5V, 1.5A

1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: YA5-MMP01, IC: 8892A-MMP01 filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules and Canadian RSS 210 Issue 7. The composite system (receiver) is compliance with Subpart B is authorized under a DoC procedure.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003) and in RSS GEN. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Special Accessories

Not available for this EUT intended for grant.

1.5 Equipment Modifications

Not available for this EUT intended for grant.

1.6 Test Facility

Site Description

EMC Lab.

: Accredited by CNAS, 2005.11.02
The certificate is valid until 2010.11
The Laboratory has been assessed and proved to be in compliance with CNAS/CL01:2006(identical to ISO/IEC17025: 2005)
The Certificate Registration Number is L2291

Accredited by TUV Rheinland Shenzhen 2008.3
The Laboratory has been assessed according to the requirements ISO/IEC 17025

Accredited by FCC, March 18, 2008
The Certificate Registration Number is 709623.

Accredited by Industry Canada, March 5, 2010
The Certificate Registration Number is 46405-4480.

Name of Firm

: SHENZHEN EMTEK CO., LTD

Site Location

: Bldg 69, Majialong Industry Zone,
Nanshan District, Shenzhen, Guangdong, China

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The Tx frequency was fixed which was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4-2003. and RSS GEN Conducted emissions from the EUT measured in the **frequency range between 0.15 MHz and 30MHz** using **CISPR Quasi-Peak and average detector mode**.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003 and RSS GEN.

2.4 Limitation

(1) Channel Separation test

FCC Part 15, Subpart C Section 12.247(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20 Bandwidth of the hopping channel, whichever is greater.

| Frequency Range (MHz) | Limit(kHz) |
|-----------------------|------------|
| 902-928 | >25kHz |
| 2400-2483.5 | >25kHz |
| 5725-5850 | >25kHz |

| (2) Frequency Range(MHz) | 20dB Bandwidth | | | | |
|--------------------------------|-----------------------------|------------|------|-------|-------|
| | | Limit(kHz) | | | |
| | Quantity of Hopping Channel | 50 | 25 | 15 | 75 |
| | 902-928 | <250 | >250 | NA | NA |
| | 2400-2483.5 | NA | NA | >1000 | <1000 |

(3) Quantity of Hopping Channel

FCC Part 15, Subpart C Section 12.247

| Frequency Range (MHz) | Limit(Quantity of Hopping Channel) | | | |
|-----------------------|------------------------------------|------------------------|----------------------|----------------------|
| | 20dB bandwidth <250kHz | 20dB bandwidth >250kHz | 20dB bandwidth <1MHz | 20dB bandwidth >1MHz |
| 902-928 | 50 | 25 | NA | NA |
| 2400-2483.5 | NA | NA | 75 | 15 |
| 5725-5850 | NA | NA | 75 | NA |

(4) Time of Occupancy(Dwell Time)

FCC Part 15, Subpart C Section 12.247

| Frequency Range (MHz) | LIMIT(rms) | | |
|-----------------------|-----------------------------------|-----------------------------------|---------------------------------|
| | 20dB bandwidth <250kHz(50Channel) | 20dB bandwidth >250kHz(25Channel) | 20dB bandwidth <1MHz(75Channel) |
| 902-928 | 400(20S) | 400(10S) | NA |
| 2400-2483.5 | NA | NA | 400(30S) |
| 5725-5850 | NA | NA | 400(30S) |

Note: The “()”is all channel’s average time of occupancy.

(5) Maximum Peak Output Power

FCC Part 15, Subpart C Section 12.247

| Frequency Range (MHz) | Quantity of Hopping Channel | LIMIT(W) | | | |
|-----------------------|-----------------------------|----------|--------------|--------------|----------|
| | | 50 | 25 | 15 | 75 |
| 902-928 | | 1(30dBm) | 0.125(21dBm) | NA | NA |
| 2400-2483.5 | | NA | NA | 0.125(21dBm) | 1(30dBm) |
| 5725-5850 | | NA | NA | NA | 1(30dBm) |

(6) Band edge

FCC Part15, Subpart C Section 15.247, In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, attenuation below the general limits specified in section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in section 15.205(a), must also comply with the radiated emission limits specified in section 15.209(a).

| Operating Frequency Range(MHz) | Spurious emission frequency | Limit Peak power ration to emission(dBc) | Emission level(dBuV/m) |
|---|--|---|-----------------------------------|
| 902-928 | <902 | >20 | NA |
| | >928 | >20 | NA |
| | 960-1240 | NA | 54 |
| 2400-2483.5 | <2400 | >20 | NA |
| | >2483.5-2500 | NA | 54 |
| 5725-5850 | <5350-5460 | NA | 54 |
| | <5725 | >20 | NA |
| | >5850 | >20 | NA |

(7) Conducted Emission

| Frequency(MHz) | Quasi-peak | Average |
|-----------------------|-------------------|----------------|
| 0.15-0.5 | 66-56 | 56-46 |
| 0.5-5.0 | 56 | 46 |
| 5.0-30.0 | 60 | 50 |

Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

(8) Radiated Emission

FCC Part 15, Subpart C Section 15.209 limit of radiated emission for frequency below 1000GHz. The emissions from an intentional radiator shall not exceed the field strength level specified in the following table:

| Frequency (MHz) | Field strength $\mu\text{V/m}$ | Distance(m) | Field strength at 3m $\text{dB}\mu\text{V/m}$ |
|--------------------|-----------------------------------|-------------|--|
| 30-88 | 100 | 3 | 40 |
| 88-216 | 150 | 3 | 43.5 |
| 216-960 | 200 | 3 | 46 |
| Above 960 | 500 | 3 | 54 |

Remark: 1. Emission level in $\text{dB}\mu\text{V/m} = 20 \log (\mu\text{V/m})$
 2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

FCC Part 15, Section 15.35(b) limit of radiated emission for frequency above 1000MHz

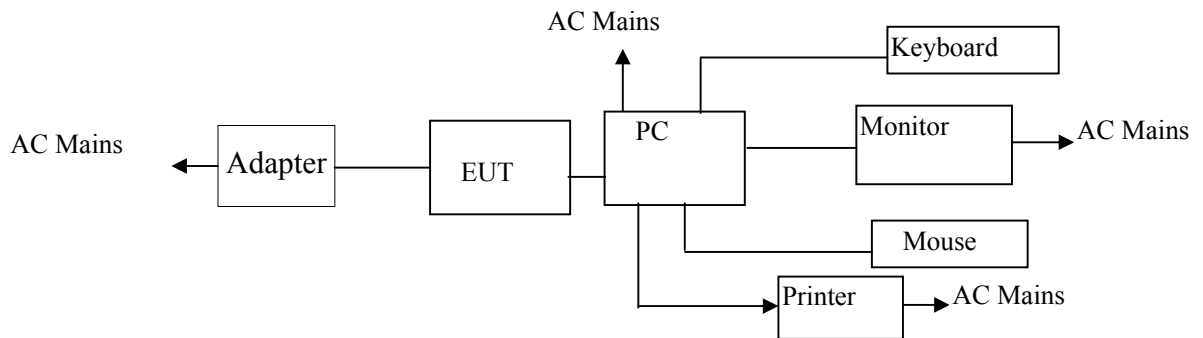
| Frequency(MHz) | Class A($\text{dB}\mu\text{V/m}$)(at 3m) | | Class B($\text{dB}\mu\text{V/m}$)(at 3m) | |
|----------------|--|---------|--|---------|
| | PEAK | AVERAGE | PEAK | AVERAGE |
| Above 1000 | 80.0 | 60.0 | 74.0 | 54.0 |

FCC Part 15, Subpart C Section 15.249 The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Frequency(MHz) | Filed Strength of Fundamental(at 3m) | | Filed Strength of Harmonics(at 3m) | |
|----------------|---|---------|---------------------------------------|---------|
| | PEAK | AVERAGE | PEAK | AVERAGE |
| 902-928 | 114 | 94 | 74.0 | 54.0 |
| 2400-2483.5 | 114 | 94 | 74.0 | 54.0 |
| 5725-5875 | 114 | 94 | 74.0 | 54.0 |
| 24000-24250 | 128 | 108 | 88.0 | 68.0 |

2.5 Configuration of Tested System

Fig. 2-1 Configuration of Tested System



2.6 Equipment Used in Tested System

| Item | Equipment | Mfr/Brand | Model/Type No. | FCC ID | Series No. | Note |
|------|----------------------|-----------|----------------|-----------|------------|------------|
| 1. | Mobile micro printer | N/A | N/A | YA5-MMP01 | N/A | EUT |
| 2 | External adaptor | CGS | CGSW-0851500 | N/A | N/A | |

Note:

- (1) Unless otherwise denoted as EUT in 『Remark』 column , device(s) used in tested system is a support equipment.

2.7 Description of test modes

The EUT (Mobile micro printer) has been tested under normal operating condition.

This EUT is a FHSS system, we use blue test to control the EUT with parallel port, Let EUT hopping on and transmit at every channel with highest power, Only output power use conducted method, others are using radiated method. After sirfdemo330R1 send the command to EUT, it can be removed, and the EUT keep hopping. 79 Channels are provided by EUT. The 3 channels of lower, medium and higher were chosen for best.

| Channel | Frequency(MHz) |
|---------|----------------|
| 1 | 2402 |
| 40 | 2441 |
| 79 | 2480 |

3. Summary of Test Results

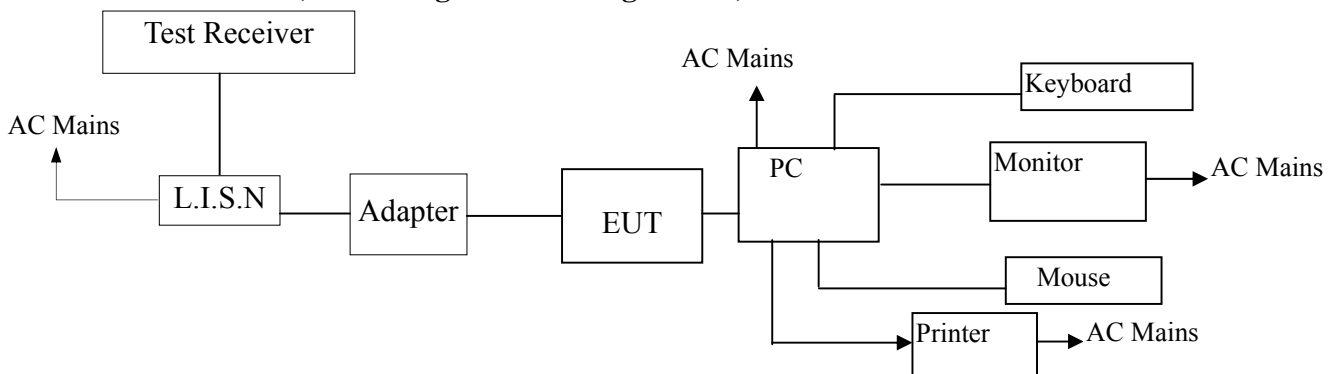
| FCC Rules | IC Rules | Description Of Test | Result |
|--------------------|--------------------------|--------------------------------|-----------|
| §15.247(a)(1) | RSS 210 A8.1(2) | Channel Separation test | Compliant |
| §15.247(a)(1) | -- | 20dB Bandwidth | Compliant |
| -- | RSS 210 A8.1(1) | 99%dB Bandwidth | Compliant |
| §15.247(a)(1)(iii) | RSS 210 A8.1(4) | Quantity of Hopping Channel | Compliant |
| §15.247(a)(1)(iii) | RSS 210 A8.1(4) | Time of Occupancy (Dwell Time) | Compliant |
| §15.247(b) | RSS 210 A8.4 | Max Peak output Power test | Compliant |
| §15.247(d) | RSS 210 A8.5 | Band edge test | Compliant |
| §15.207 | RSS GEN Table 2 | AC Power Conducted Emission | Compliant |
| §15.247(d),§15.209 | RSS 210 A8.5 | Radiated Emission | Compliant |
| §15.203 | -- | Antenna Requirement | Compliant |
| §15.109 | RSS GEN 7.2.3 Table 1 | Receiver spurious emissions | Compliant |

4. Conducted Emissions Test

4.1 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

4.2 Test SET-UP (Block Diagram of Configuration)



4.3 Measurement Equipment Used:

| Conducted Emission Test Site # 4 | | | | | |
|----------------------------------|-----------------|--------------|---------------|-------------|------------|
| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | CAL DUE. |
| Test Receiver | Rohde & Schwarz | ESCS30 | 828985/018 | 05/29/2009 | 05/29/2010 |
| L.I.S.N | Rohde & Schwarz | ESH2-Z5 | 834549/005 | 05/29/2009 | 05/29/2010 |
| L.I.S.N | Rohde & Schwarz | ESH2-Z5 | 834549/005 | 05/29/2009 | 05/29/2010 |
| 50ΩCoaxial Switch | Anritsu | MP59B | M20531 | 005/29/2009 | 05/29/2010 |

4.4 Conducted Emission Limit

(7) Conducted Emission

Frequency(MHz)

0.15-0.5

0.5-5.0

5.0-30.0

Quasi-peak

66-56

56

60

Average

56-46

46

50

Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.5 Measurement Result:

| | | | |
|---------------------|-----------------------|--------------|-----------------------|
| Date of Test: | <u>April 03, 2010</u> | Temperature: | <u>22</u> |
| Frequency Detector: | <u>0.15~30MHz</u> | Humidity: | <u>50%</u> |
| Test Result: | <u>PASS</u> | Test Mode: | <u>Bluetooth Mode</u> |

| Test Line | Frequency MHz | Emission Level QP dB(μV) | Emission Level AV dB(μV) | Limits QP dB(μV) | Limits AV dB(μV) | Margin QP dB(μV) | Margin AV dB(μV) |
|-----------|---------------|--------------------------|--------------------------|------------------|------------------|------------------|------------------|
| Neutral | 0.58 | 42.51 | 29.37 | 56 | 46 | -13.49 | -16.63 |
| | 1.01 | 42.28 | 29.41 | 56 | 46 | -13.72 | -16.59 |
| | 1.34 | 43.48 | 30.13 | 56 | 46 | -12.52 | -15.87 |
| | 9.4 | 37.44 | 26.36 | 60 | 50 | -22.56 | -23.64 |
| | 11.77 | 38.56 | 24.87 | 60 | 50 | -21.44 | -25.13 |
| | 14.15 | 37.01 | 24.72 | 60 | 50 | -22.99 | -25.28 |
| Line | 1.99 | 35.69 | 20.34 | 56 | 46 | -20.31 | -25.66 |
| | 5.5 | 29.89 | 16.77 | 60 | 50 | -30.11 | -33.23 |
| | 9.79 | 30.91 | 19.08 | 60 | 50 | -29.09 | -30.92 |
| | 13.5 | 35.3 | 23.64 | 60 | 50 | -24.7 | -26.36 |
| | 29.85 | 42.64 | 27.79 | 60 | 50 | -17.36 | -22.21 |
| | 0.58 | 42.51 | 29.37 | 56 | 46 | -13.49 | -16.63 |

4.6 Conducted Measurement Photos:



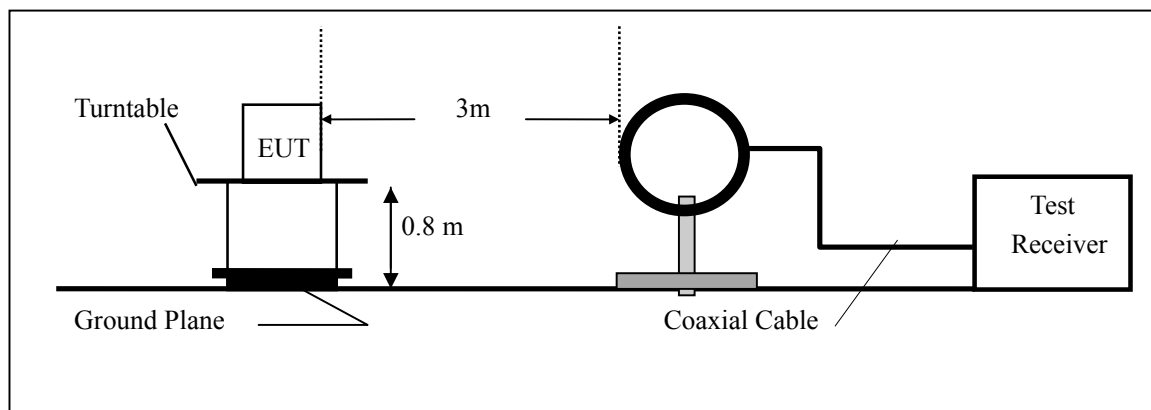
5. Radiated Emission Test

5.1 Measurement Procedure

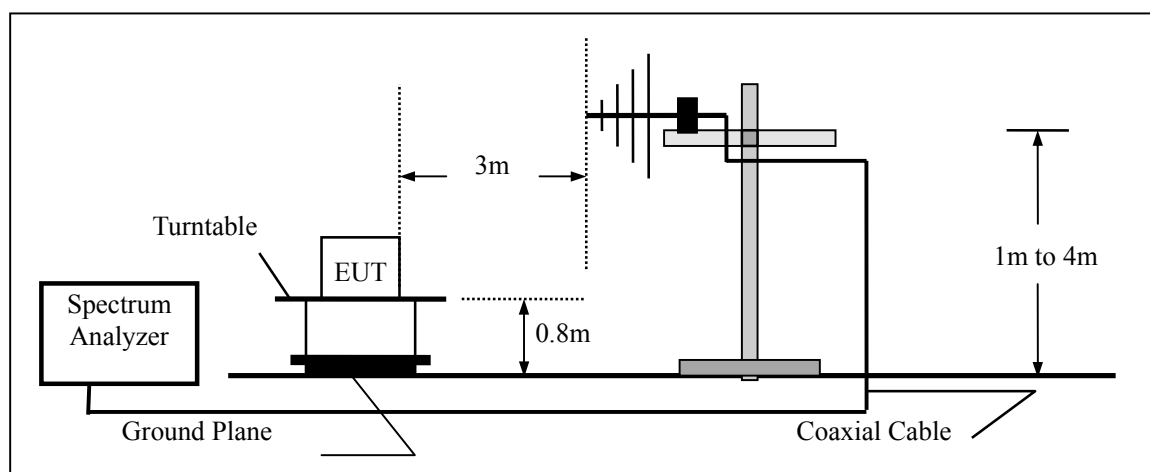
- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.

5.2 Test SET-UP (Block Diagram of Configuration)

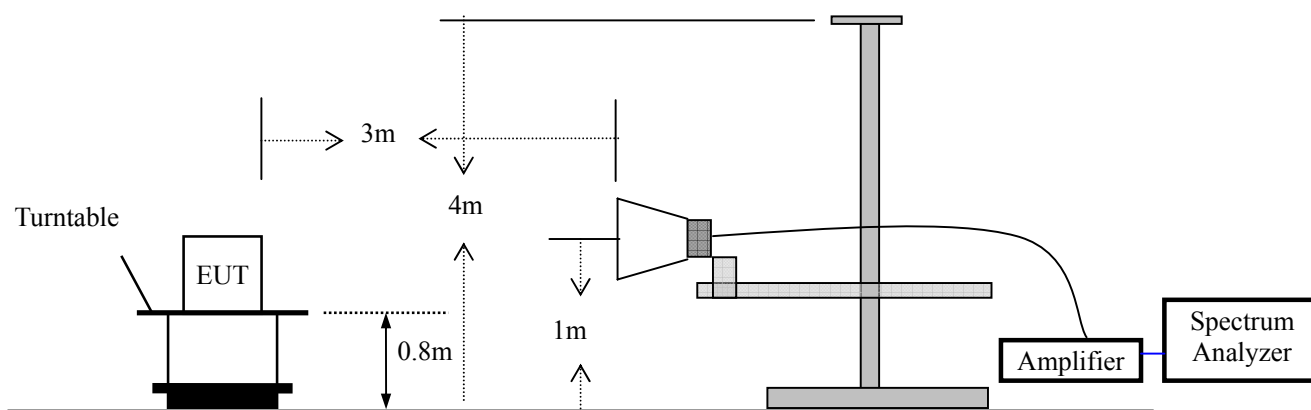
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



5.3 Measurement Equipment Used:

| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | CAL DUE. |
|-------------------|-----------------|--------------|---------------|------------|------------|
| Spectrum Analyzer | Rohde & Schwarz | FSP7 | 839511/010 | 05/29/2009 | 05/29/2010 |
| Spectrum Analyzer | HP | E4407B | 839840481 | 05/29/2009 | 05/29/2010 |
| EMI Test Receiver | Rohde & Schwarz | ESCS30 | 828985/018 | 05/29/2009 | 05/29/2010 |
| Pre-Amplifier | HP | 8447D | 2944A07999 | 05/29/2009 | 05/29/2010 |
| Bilog Antenna | Schwarzbeck | VULB9163 | 142 | 05/29/2009 | 05/29/2010 |
| Loop Antenna | ARA | PLA-1030/B | 1029 | 05/29/2009 | 05/29/2010 |
| Horn Antenna | Electro-Metrics | EM-6961 | 103314 | 05/29/2009 | 05/29/2010 |
| Horn Antenna | Schwarzbeck | BBHA 9120 | D143 | 05/29/2009 | 05/29/2010 |

5.4 Measurement Result**TX mode:**

Operation Mode: 2402MHz Test Date : 04/01/2010
 Frequency Range: 30~1000MHz Temperature : 28
 Test Result: PASS Humidity : 65 %
 Measured Distance: 3m Test By: KL

| Freq. (MHz) | Ant.Pol. H/V | Emission Level (dBuV) | Limit 3m (dBuV/m) | Margin (dB) | Note |
|----------------|-----------------|--------------------------|----------------------|----------------|------|
| 191.16 | V | 35.94 | 43.5 | -7.56 | PK |
| 288.34 | V | 33.09 | 46 | -12.91 | PK |
| 383.97 | V | 29.55 | 46 | -16.45 | PK |
| 480.8 | V | 33.83 | 46 | -12.17 | PK |
| 575.49 | V | 34.56 | 46 | -11.44 | PK |
| 672.45 | V | 36.4 | 46 | -9.6 | PK |
| 191.16 | H | 32.55 | 43.5 | -10.95 | PK |
| 288.044 | H | 42.33 | 46 | -3.67 | PK |
| 384.42 | H | 40.92 | 46 | -5.08 | PK |
| 480.98 | H | 36.25 | 46 | -9.75 | PK |
| 575.52 | H | 35.86 | 46 | -10.14 | PK |
| 672.40 | H | 36.56 | 46 | -9.44 | PK |

- Note:**
- (1) All Readings are Peak Value.
 - (2) Emission Level= Reading Level+Probe Factor +Cable Loss
 - (3) The average measurement was not performed when the peak measured data under the limit of average detection.

TX mode:

| | | | |
|--------------------|------------|---------------|------------|
| Operation Mode: | 2441MHz | Test Date : | 04/01/2010 |
| Frequency Range: | 30~1000MHz | Temperature : | 28 |
| Test Result: | PASS | Humidity : | 65 % |
| Measured Distance: | 3m | Test By: | KL |

| Freq. (MHz) | Ant.Pol. H/V | Emission Level (dBUV) | Limit 3m (dBUV/m) | Margin (dB) | Note |
|----------------|-----------------|--------------------------|----------------------|----------------|------|
| 191.66 | V | 36.14 | 43.5 | -7.36 | PK |
| 288.04 | V | 33.39 | 46 | -12.61 | PK |
| 384.42 | V | 30.55 | 46 | -15.45 | PK |
| 480.8 | V | 35.33 | 46 | -10.67 | PK |
| 575.62 | V | 36.16 | 46 | -9.84 | PK |
| 672.00 | V | 37.2 | 46 | -8.8 | PK |
| 191.66 | H | 33.05 | 43.5 | -10.45 | PK |
| 288.044 | H | 42.93 | 46 | -3.07 | PK |
| 384.42 | H | 41.02 | 46 | -4.98 | PK |
| 480.98 | H | 37.05 | 46 | -8.95 | PK |
| 575.62 | H | 36.26 | 46 | -9.74 | PK |
| 672.00 | H | 37.36 | 46 | -8.64 | PK |

Note:

- (1) All Readings are Peak Value.
- (2) Emission Level= Reading Level+Probe Factor +Cable Loss
- (3) The average measurement was not performed when the peak measured data under the limit of average detection.

TX mode:

| | | | |
|--------------------|------------|---------------|------------|
| Operation Mode: | 2480MHz | Test Date : | 04/01/2010 |
| Frequency Range: | 30~1000MHz | Temperature : | 28 |
| Test Result: | PASS | Humidity : | 65 % |
| Measured Distance: | 3m | Test By: | KL |

| Freq. (MHz) | Ant.Pol. H/V | Emission Level (dBuV) | Limit 3m (dBuV/m) | Margin (dB) | Note |
|----------------|-----------------|--------------------------|----------------------|----------------|------|
| 191.66 | V | 34.84 | 43.5 | -8.66 | PK |
| 288.04 | V | 33.29 | 46 | -12.71 | PK |
| 384.42 | V | 29.75 | 46 | -16.25 | PK |
| 480.8 | V | 33.83 | 46 | -12.17 | PK |
| 575.62 | V | 34.56 | 46 | -11.44 | PK |
| 672 | V | 36.4 | 46 | -9.6 | PK |
| 191.66 | H | 32.65 | 43.5 | -10.85 | PK |
| 288.044 | H | 42.33 | 46 | -3.67 | PK |
| 384.42 | H | 40.92 | 46 | -5.08 | PK |
| 480.98 | H | 36.25 | 46 | -9.75 | PK |
| 575.62 | H | 35.46 | 46 | -10.54 | PK |
| 672 | H | 36.76 | 46 | -9.24 | PK |

- Note:**
- (1) All Readings are Peak Value.
 - (2) Emission Level= Reading Level+Probe Factor +Cable Loss
 - (3) The average measurement was not performed when the peak measured data under the limit of average detection.

TX mode:

Operation Mode: CH1: 2402MHz Test Date : 04/01/2010
 Frequency Range: 1-25GHz Temperature : 28
 Test Result: PASS Humidity : 65 %
 Measured Distance: 3m Test By: Andy

| Freq. (MHz) | Ant.Pol. H/V | Emission Level(dBuV) | | Limit 3m(dBuV/m) | | Margin(dB) | |
|----------------|-----------------|----------------------|-------|------------------|-------|------------|--------|
| | | PK | AV | PK | AV | PK | AV |
| 1599.359 | V | 47.09 | 28.40 | 74.00 | 54.00 | -26.91 | -25.60 |
| 8573.718 | V | 52.08 | 40.06 | 74.00 | 54.00 | -21.92 | -13.94 |
| 14512.82 | V | 60.30 | 48.11 | 74 | 54 | -13.70 | -5.89 |
| -- | V | -- | -- | 74 | 54 | -- | -- |
| -- | V | -- | -- | 74 | 54 | -- | -- |
| 1980.769 | H | 43.83 | 26.90 | 74.00 | 54.00 | -30.17 | -27.10 |
| 10807.69 | H | 57.21 | 44.73 | 74.00 | 54.00 | -16.79 | -9.27 |
| 14294.87 | H | 60.67 | 48.15 | 74.00 | 54.00 | -13.33 | -5.85 |
| -- | H | -- | -- | 74 | 54 | -- | -- |
| -- | H | -- | -- | 74 | 54 | -- | -- |

Other harmonics emissions are lower than 20dB below the allowable limit.

Note:

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level + Probe Factor +Cable Loss
- (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

TX mode:

Operation Mode: CH40: 2441MHz Test Date : 04/01/2010
 Frequency Range: 1-25GHz Temperature : 28
 Test Result: PASS Humidity : 65 %
 Measured Distance: 3m Test By: Andy

| Freq. (MHz) | Ant.Pol. H/V | Emission Level(dBuV) | | Limit 3m(dBuV/m) | | Margin(dB) | |
|----------------|-----------------|----------------------|-------|------------------|-------|------------|--------|
| | | PK | AV | PK | AV | PK | AV |
| 4868.59 | V | 53.39 | 35.57 | 74.00 | 54.00 | -20.61 | -18.43 |
| 10971.15 | V | 56.89 | 45.24 | 74.00 | 54.00 | -17.11 | -8.76 |
| 14948.71 | V | 60.48 | 48.03 | 74.00 | 54.00 | -13.52 | -5.97 |
| -- | V | -- | -- | -- | -- | -- | -- |
| -- | V | -- | -- | -- | -- | -- | -- |
| 4868.59 | H | 53.72 | 35.56 | 74.00 | 54.00 | -20.28 | -18.44 |
| 9799.679 | H | 55.86 | 43.43 | 74.00 | 54.00 | -18.14 | -10.57 |
| 14458.33 | H | 60.34 | 48.52 | 74.00 | 54.00 | -13.66 | -5.48 |
| -- | H | -- | -- | -- | -- | -- | -- |
| -- | H | -- | -- | -- | -- | -- | -- |

Other harmonics emissions are lower than 20dB below the allowable limit.

Note:

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level+Probe Factor +Cable Loss
- (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

TX mode:

Operation Mode: CH79: 2480MHz Test Date : 04/01/2010
 Frequency Range: 1-25GHz Temperature : 28
 Test Result: PASS Humidity : 65 %
 Measured Distance: 3m Test By: Andy

| Freq. (MHz) | Ant.Pol. H/V | Emission Level(dBuV) | | Limit 3m(dBuV/m) | | Margin(dB) | |
|----------------|-----------------|----------------------|-------|------------------|-------|------------|--------|
| | | PK | AV | PK | AV | PK | AV |
| 4950.321 | V | 54.89 | 36.79 | 74.00 | 54.00 | -19.11 | -17.21 |
| 10017.62 | V | 56.53 | 44.09 | 74.00 | 54.00 | -17.47 | -9.91 |
| 14866.98 | V | 60.74 | 48.73 | 74.00 | 54.00 | -13.26 | -5.27 |
| -- | V | -- | -- | 74.00 | 54.00 | -- | -- |
| -- | V | -- | -- | 74.00 | 54.00 | -- | -- |
| 4950.321 | H | 54.16 | 37.11 | 74.00 | 54.00 | -19.84 | -16.89 |
| 9254.808 | H | 56.28 | 42.34 | 74.00 | 54.00 | -17.72 | -11.66 |
| 14594.55 | H | 60.86 | 48.68 | 74.00 | 54.00 | -13.14 | -5.32 |
| -- | H | -- | -- | 74.00 | 54.00 | -- | -- |
| -- | H | -- | -- | 74.00 | 54.00 | -- | -- |

Other harmonics emissions are lower than 20dB below the allowable limit.

Note:

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level+Probe Factor +Cable Loss
- (3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

RX mode:

| | | | |
|--------------------|---------|---------------|------------|
| Operation Mode: | RX | Test Date : | 04/01/2010 |
| Frequency Range: | 30-1GHz | Temperature : | 28 |
| Test Result: | PASS | Humidity : | 65 % |
| Measured Distance: | 3m | Test By: | Andy |

| Freq. (MHz) | Ant.Pol. H/V | Emission Level (dBuV) | Limit 3m (dBuV/m) | Margin (dB) | Note |
|----------------|-----------------|--------------------------|----------------------|----------------|------|
| 192.55 | V | 32.15 | 43.5 | -11.35 | PK |
| 289.36 | V | 34.56 | 46 | -11.44 | PK |
| 383.61 | V | 30.15 | 46 | -15.85 | PK |
| 481.35 | V | 32.69 | 46 | -13.31 | PK |
| 575.32 | V | 32.65 | 46 | -13.35 | PK |
| 673.6 | V | 35.69 | 46 | -10.31 | PK |
| 191.12 | H | 31.35 | 43.5 | -12.15 | PK |
| 288.044 | H | 35.44 | 46 | -10.56 | PK |
| 384.42 | H | 34.77 | 46 | -11.23 | PK |
| 480.98 | H | 33.57 | 46 | -12.43 | PK |
| 575.62 | H | 34.87 | 46 | -11.13 | PK |
| 672 | H | 35.38 | 46 | -10.62 | PK |

Other harmonics emissions are lower than 20dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss
 (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

RX mode:

| | | | |
|--------------------|---------|---------------|------------|
| Operation Mode: | RX | Test Date : | 04/02/2010 |
| Frequency Range: | 1-25GHz | Temperature : | 28 |
| Test Result: | PASS | Humidity : | 65 % |
| Measured Distance: | 3m | Test By: | Andy |

| Freq. (MHz) | Ant.Pol. H/V | Emission Level(dBuV) | | Limit 3m(dBuV/m) | | Margin(dB) | |
|----------------|-----------------|----------------------|--------|------------------|-------|------------|--------|
| | | PK | AV | PK | AV | PK | AV |
| 4950.12 | V | 43.25 | 32.612 | 74.00 | 54.00 | -30.75 | -21.39 |
| -- | V | -- | -- | 74.00 | 54.00 | -- | -- |
| -- | V | -- | -- | 74.00 | 54.00 | -- | -- |
| -- | V | -- | -- | 74.00 | 54.00 | -- | -- |
| -- | V | -- | -- | 74.00 | 54.00 | -- | -- |
| 4950.321 | H | 44.16 | 31.11 | 74.00 | 54.00 | -29.84 | -22.89 |
| -- | H | -- | -- | 74.00 | 54.00 | -- | -- |
| -- | H | -- | -- | 74.00 | 54.00 | -- | -- |
| -- | H | -- | -- | 74.00 | 54.00 | -- | -- |
| -- | H | -- | -- | 74.00 | 54.00 | -- | -- |

Other harmonics emissions are lower than 20dB below the allowable limit.

Note: (1) All Readings are Peak Value and AV.
 (2) Emission Level= Reading Level+Probe Factor +Cable Loss
 (3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5.5 Radiated Measurement Photos:



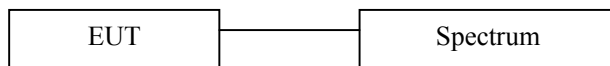


6. Channel Separation test

6.1 Measurement Procedure

The EUT was operating in hopping mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

6.2 Test SET-UP (Block Diagram of Configuration)



6.3 Measurement Equipment Used:

Same as 4.3 Radiated Emission Measurement.

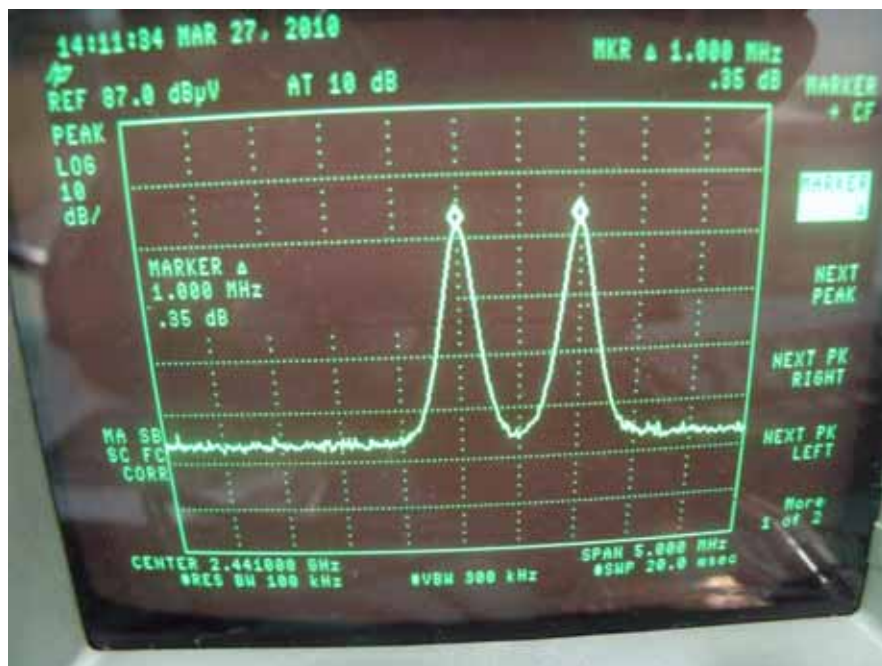
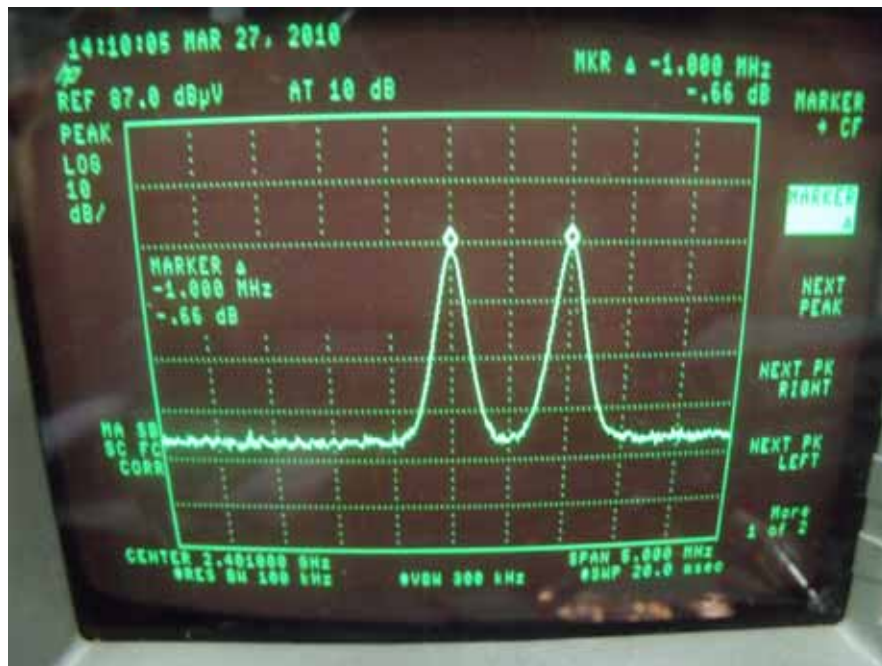
6.4 Measurement Results:

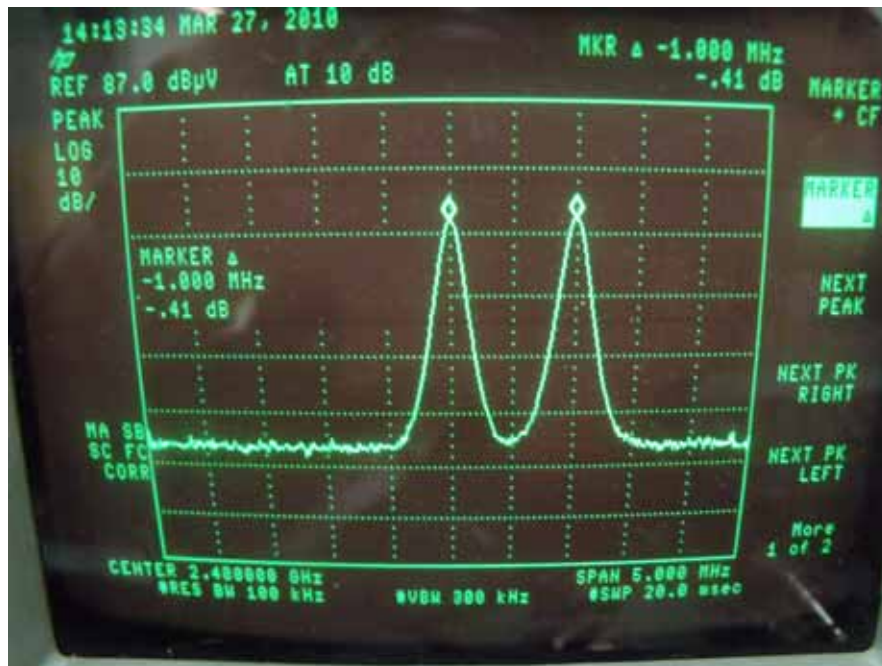
Refer to attached data chart.

| | | | |
|--------------------|------|---------------|------------|
| Spectrum Detector: | PK | Test Date : | 04/01/2010 |
| Test By: | Andy | Temperature : | 28 |
| Test Result: | PASS | Humidity : | 65 % |

| Channel number | Channel frequency (MHz) | Separation Read Value (kHz) | Separation Limit (kHz) |
|----------------|-------------------------|-----------------------------|------------------------|
| 1 | 2402 | 1000.00 | >775 kHz |
| 40 | 2441 | 1000.00 | >775 kHz |
| 79 | 2480 | 1000.00 | >758 kHz |

NOTE: For two-third of the 20db bandwidth (page33) is greater than 25kHz. So the limit of Separation Limit are just as the above table.



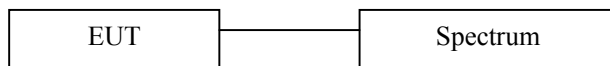


7. Bandwidth test

7.1 Measurement Procedure

The EUT was operating in hopping mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

7.2 Test SET-UP (Block Diagram of Configuration)



7.3 Measurement Equipment Used:

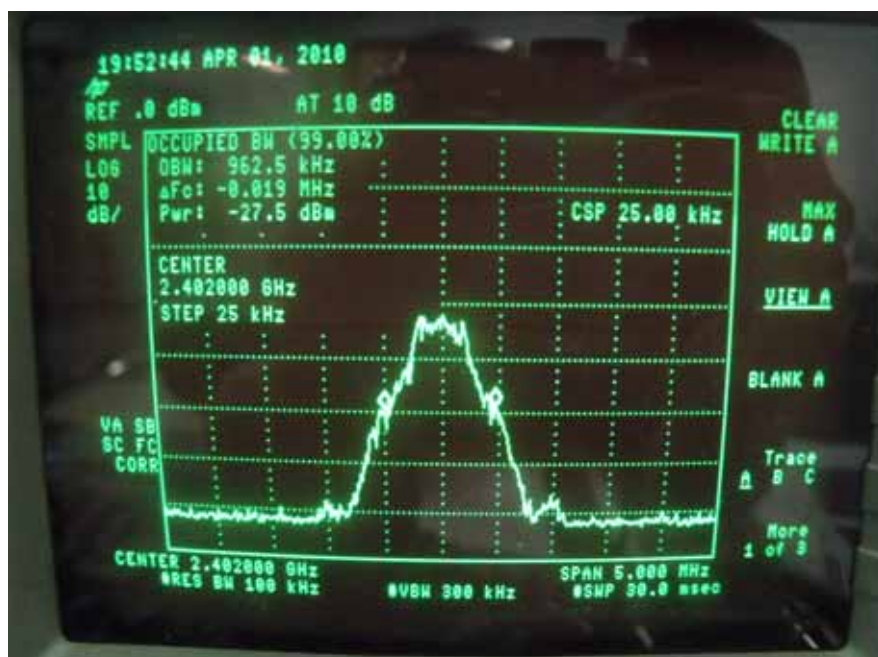
Same as 4.3 Radiated Emission Measurement.

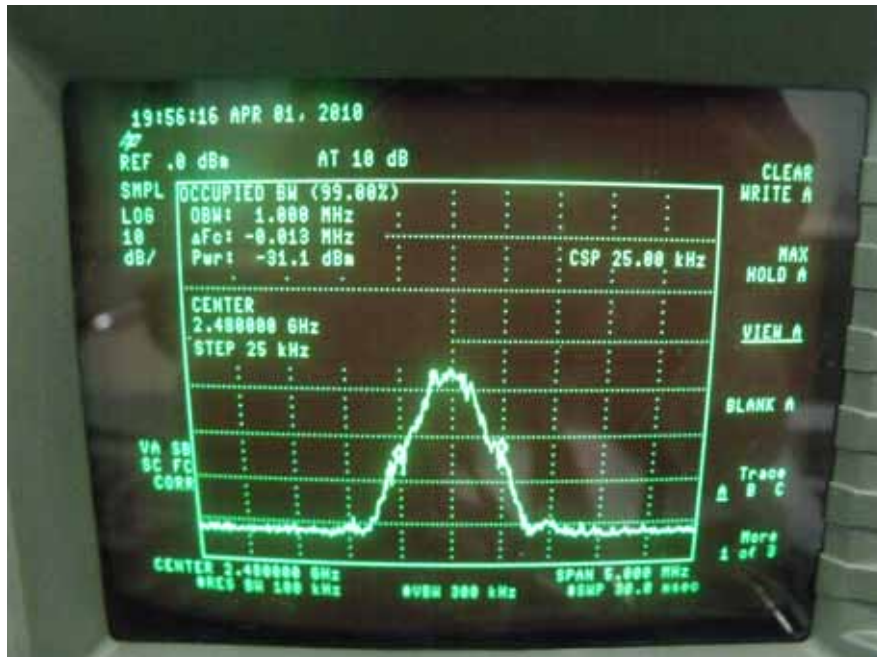
7.4 Measurement Results:

7.4.1 99% Bandwidth test data Chart:

| | | | |
|--------------------|------|--------------|------------|
| Spectrum Detector: | PK | Test Date: | 04/01/2010 |
| Test By: | Andy | Temperature: | 28 |
| Test Result: | PASS | Humidity: | 65 % |

| Channel number | Channel frequency (MHz) | 99% Down BW(kHz) |
|----------------|-------------------------|------------------|
| 1 | 2402 | 962.5 |
| 40 | 2441 | 975 |
| 79 | 2480 | 1000 |



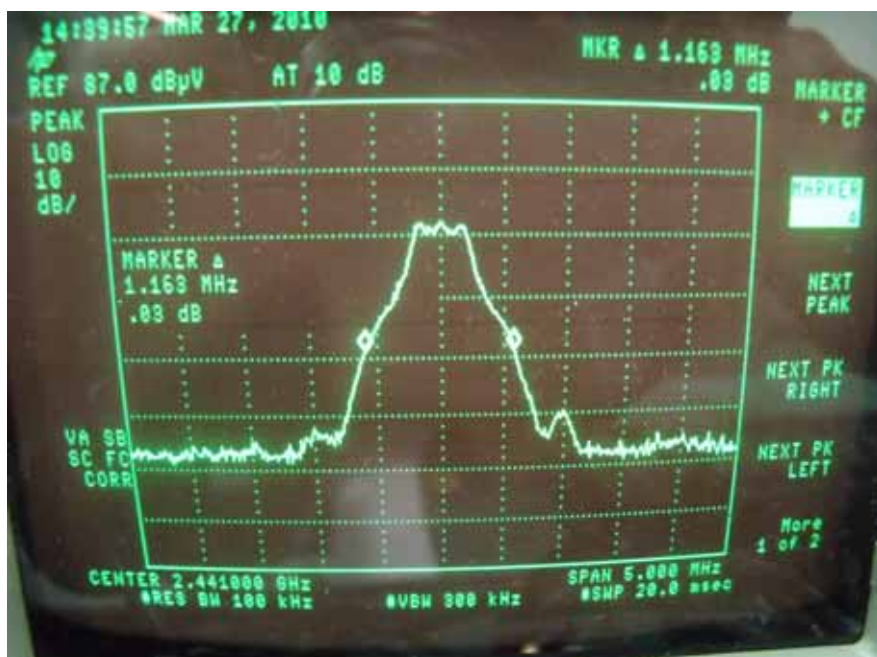
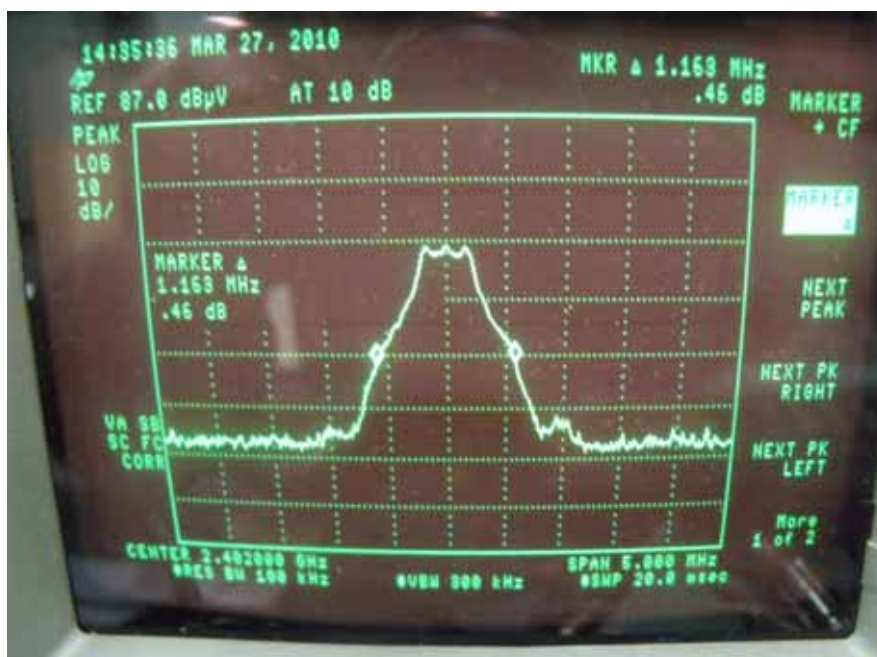


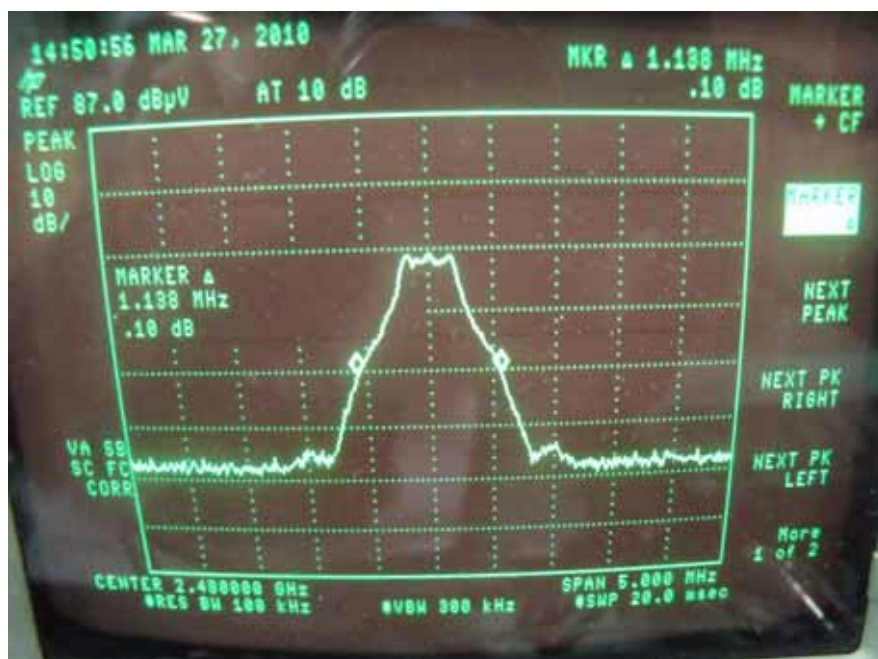
7.4.2 20dB Bandwidth test data Chart:

Refer to attached data chart.

| | | | |
|--------------------|------|--------------|------------|
| Spectrum Detector: | PK | Test Date: | 03/27/2010 |
| Test By: | Andy | Temperature: | 28 |
| Test Result: | PASS | Humidity: | 65 % |

| Channel number | Channel frequency (MHz) | 20dB Down BW(kHz) |
|----------------|-------------------------|-------------------|
| 1 | 2402 | 1163 |
| 40 | 2441 | 1163 |
| 79 | 2480 | 1138 |



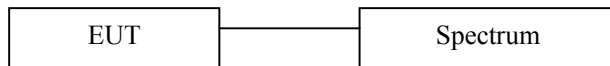


8. Quantity of Hopping Channel Test

8.1 Measurement Procedure

The EUT was operating in hopping mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

8.2 Test SET-UP (Block Diagram of Configuration)



8.3 Measurement Equipment Used:

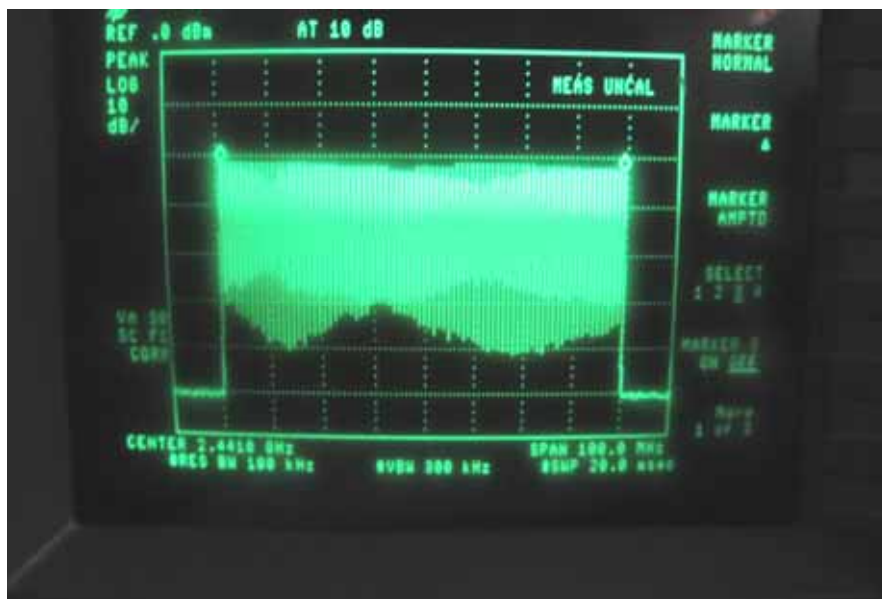
Same as 4.3 Radiated Emission Measurement.

8.4 Measurement Results:

Refer to attached data chart.

| | | | |
|--------------------|------|---------------|------------|
| Spectrum Detector: | PK | Test Date : | 04/01/2010 |
| Test By: | Andy | Temperature : | 28 |
| Test Result: | PASS | Humidity : | 65 % |

| Hopping Channel Frequency Range | Quantity of Hopping Channel | Quantity of Hopping Channel |
|------------------------------------|-----------------------------|-----------------------------|
| 2402-2480 | 79 | 79 |

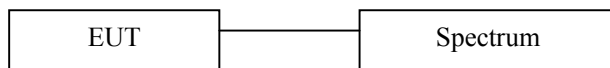


8. Time of Occupancy (Dwell Time) test

9.1 Measurement Procedure

- Check the calibration of the measuring instrument(SA) using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
- Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
- Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
- Repeat above procedures until all different time-slot modes have been completed.

9.2 Test SET-UP (Block Diagram of Configuration)



9.3 Measurement Equipment Used:

Same as 4.3 Radiated Emission Measurement.

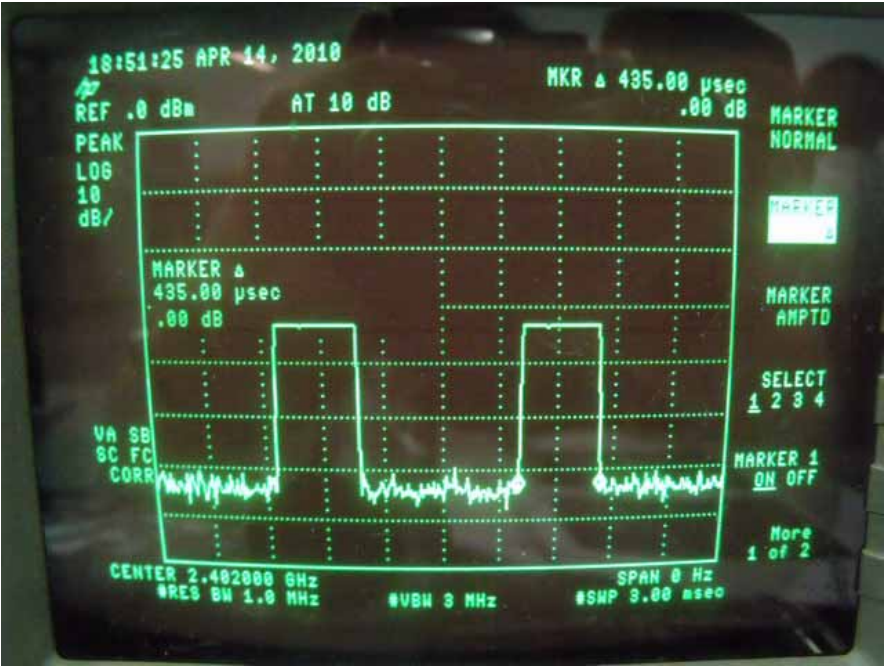
9.4 Measurement Results:

Refer to attached data chart.

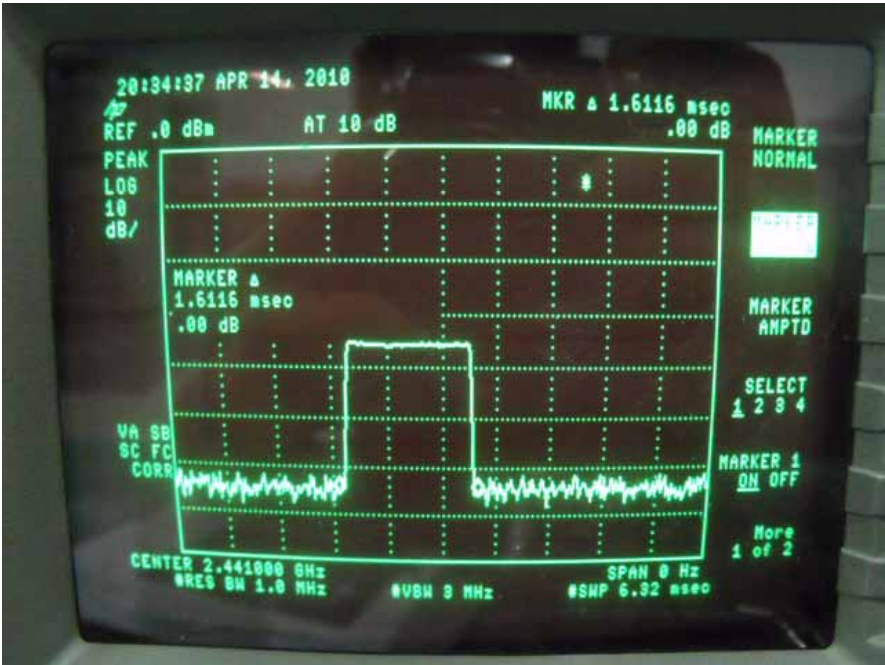
| | | | |
|--------------------|------|---------------|-------------------|
| Spectrum Detector: | PK | Test Date : | November 12, 2009 |
| Test By: | Andy | Temperature : | 28 |
| Test Result: | PASS | Humidity : | 65 % |

| Mode | Number of transmission in a 31.6(79 Hopping*0.4) | Length of transmissions time(msec) | Result (msec) | Limit (msec) |
|------|--|--|------------------|-----------------|
| DH1 | 51(times/5 sec)*6.32=322.32 times | 0.435 | 140.2092 | 400 |
| DH3 | 26(times/5 sec)*6.32=164.32 times | 1.616 | 265.5411 | 400 |
| DH5 | 15(times/5 sec)*6.32=94.80 times | 2.717 | 257.5716 | 400 |

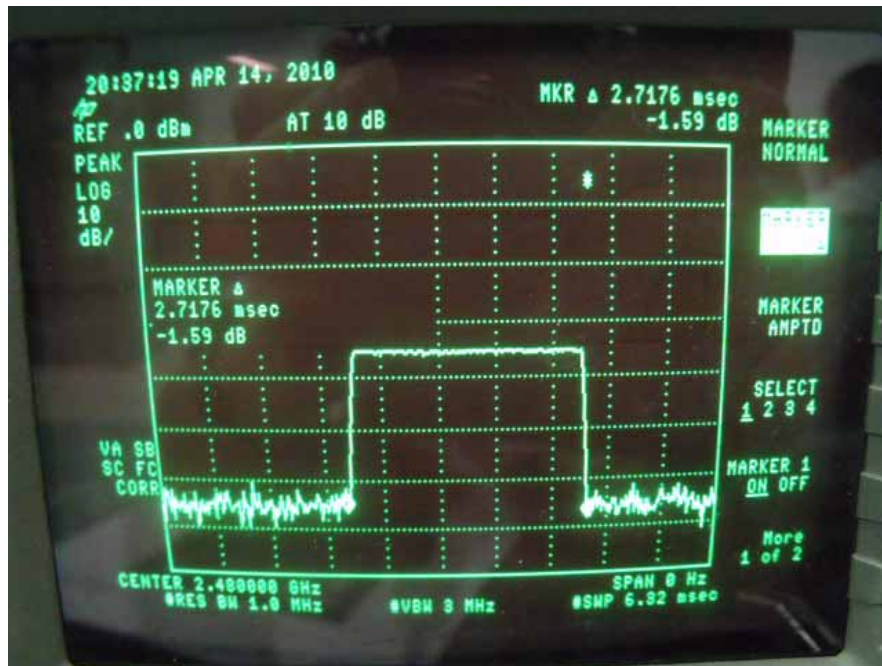
DH1



DH3



DH5

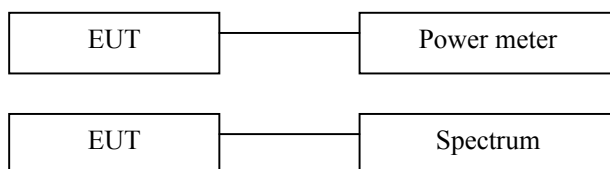


10. MAXIMUM PEAK OUTPUT POWER TEST

10.1 Measurement Procedure

- Check the calibration of the measuring instrument(SA) using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- The center frequency of the spectrum analyzer is set to the fundamental frequency and using proper RBW and VBW setting.
- Measure the captured power within the band and recording the plot.
- Repeat above procedures until all frequencies required were complete.

10.2 Test SET-UP (Block Diagram of Configuration)



10.3 Measurement Equipment Used:

| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | CAL DUE. |
|-------------------|-----------------|--------------|---------------|------------|------------|
| Spectrum Analyzer | Rohde & Schwarz | FSP7 | 839511/010 | 05/29/2009 | 05/29/2010 |
| Power meter | Boonton | 4232A | 29001 | 05/29/2009 | 05/29/2010 |
| Power sensor | Boonton | 51011-EMC | 31184 | 05/29/2009 | 05/29/2010 |

10.4 Measurement Results:

Refer to attached data chart.

| | | | |
|--------------------|------|---------------|------------|
| Spectrum Detector: | PK | Test Date : | 04/01/2010 |
| Test By: | Andy | Temperature : | 28 |
| Test Result: | PASS | Humidity : | 65 % |

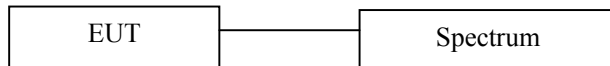
| Channel number | Channel Frequency (MHz) | Peak Power output(dBm) | Peak Power output(mW) | Peak Power Limit(mW) | Pass/Fail |
|----------------|-------------------------|------------------------|-----------------------|----------------------|-----------|
| 1 | 2401.00 | -3.00 | 0.50 | 125 | PASS |
| 40 | 2440.00 | -2.58 | 0.55 | 125 | PASS |
| 79 | 2480.00 | -2.90 | 0.512 | 125 | PASS |

11. Band EDGE test

11.1 Measurement Procedure

1. The EUT was Operating in hopping mode or could be controlled its channel. Printed out test result from the spectrum by hard copy function.
2. The EUT was placed on a turn table which is 0.8m above ground plane.
3. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
4. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Repeat above procedures until all frequency measured were complete.

11.2 Test SET-UP (Block Diagram of Configuration)



11.3 Measurement Equipment Used:

Same as 4.3 Radiated Emission Measurement.

11.4 Measurement Results:

Refer to attached data chart.

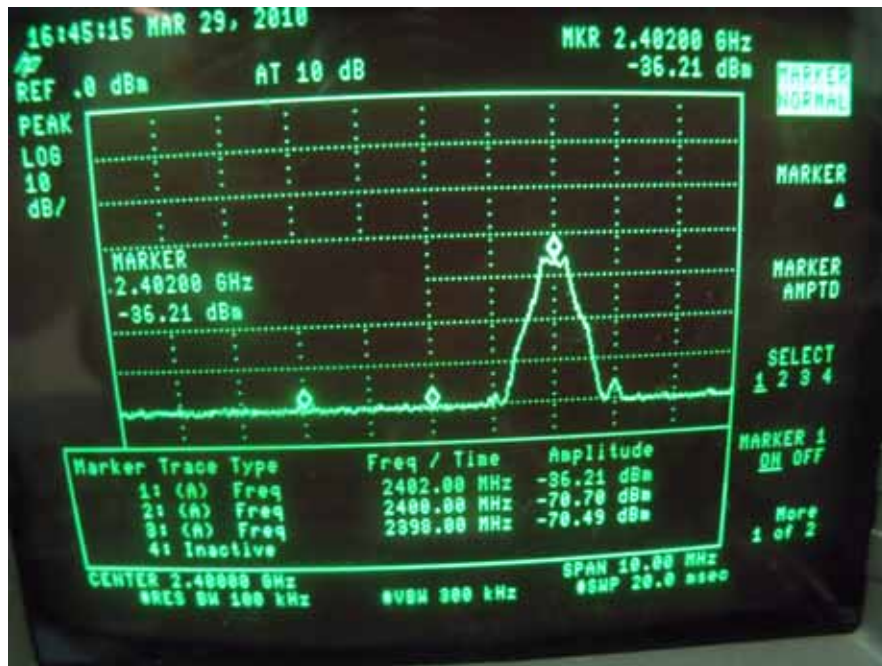
| | | | |
|--------------------|------|---------------|------------|
| Spectrum Detector: | PK | Test Date : | 04/01/2010 |
| Test By: | Andy | Temperature : | 28 |
| Test Result: | PASS | Humidity : | 65 % |

1. Conducted Test

| Frequency (MHz) | Peak Power Output(dBm) | Emission read Value(dBm) | Result of Band edge(dBc) | Band edge Limit(dBc) |
|-----------------|------------------------|--------------------------|--------------------------|----------------------|
| <2400 | -36.21 | -70.7 | -34.49 | >20dBc |
| >2483.5 | -38.78 | -71.48 | -32.70 | >20dBc |

2. Radiated emission test

| Frequency (MHz) | Antenna polarization (H/V) | Emission (dBuV/m) | | Band edge Limit (dBuV/m) | |
|-----------------|----------------------------|-------------------|-------|--------------------------|-------|
| | | QP | AV | QP | AV |
| <2400 | V | 53.69 | 35.78 | 74.00 | 54.00 |
| >2483.5 | V | 55.21 | 36.17 | 74.00 | 54.00 |



12. Antenna Port Emission

12.1 Test Equipment

| EQUIPMENT TYPE | MFR | MODEL NUMBER | SERIAL NUMBER | LAST CAL. | CAL DUE. |
|-------------------|-----------------|--------------|---------------|------------|------------|
| EMI Test Receiver | Rohde & Schwarz | ESU | 1302.6005.26 | 05/29/2009 | 05/29/2010 |

12.2 Measuring Instruments and setting

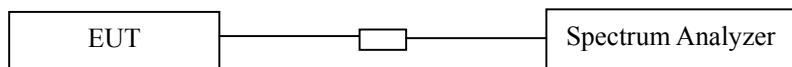
The following table is the setting of spectrum analyzer.

| | |
|-------------------|----------|
| Spectrum analyzer | Setting |
| Attenuation | Auto |
| RB | 100kHz |
| VB | 300kHz |
| Detector | Peak |
| Trace | Max hold |

12.3 Test Procedures

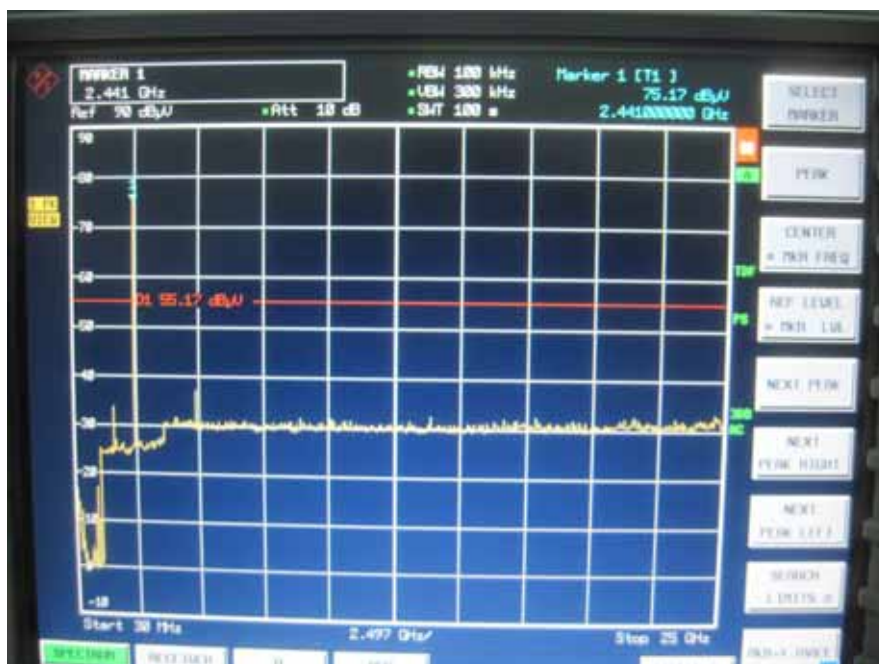
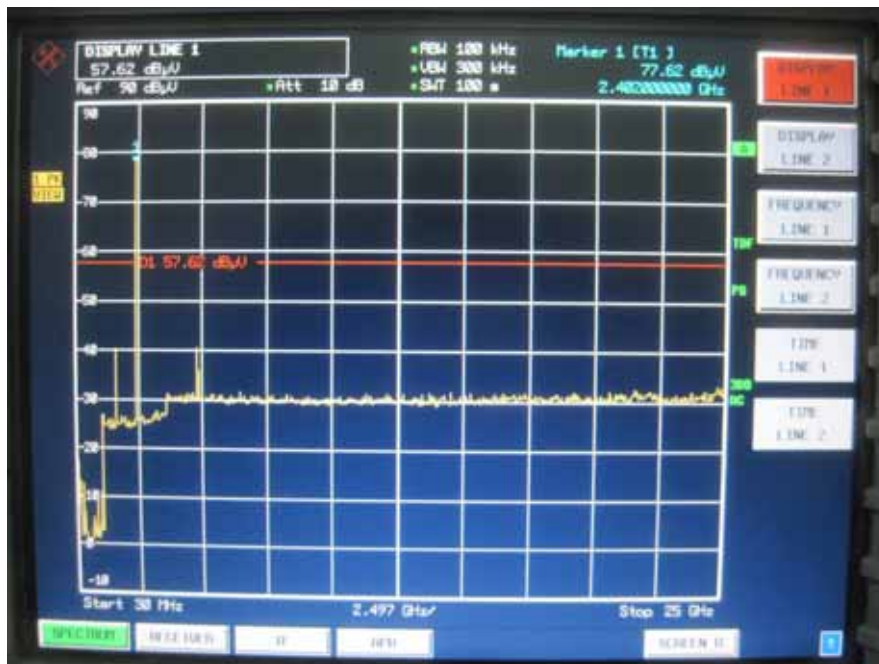
The conducted spurious emissions were measured conducted using a spectrum analyzer at low, mid, and hi channels, The limit was determined by attenuation 20dB of the RF peak power output.

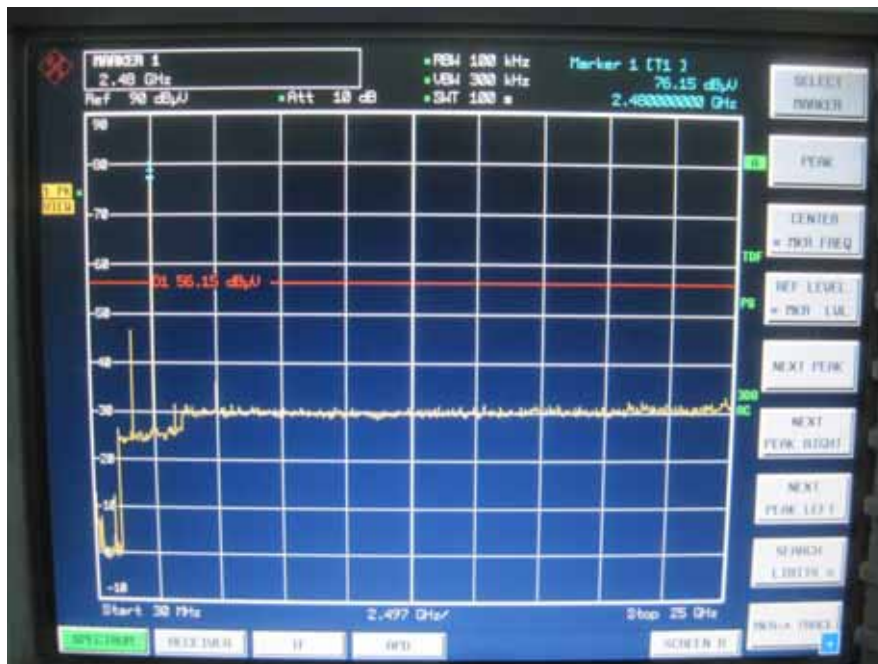
12.4 Block Diagram of Test setup



12.5. Test Result

PASS.





13. Antenna Application

13.1 Antenna requirement

The EUT'S antenna is met the requirement of FCC part 15C section 15.203 and 15.240, RSS 210 Issue 7.

FCC part 15C section 15.247 and RSS 210 Issue 7 requirements:

Systems operating in the 2402-2480MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

13.2. Result

The EUT's antenna used a chip antenna and integrated on PCB, The antenna's gain is 2dBi and meets the requirement.