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# FCC Test Report

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Report No.: AGC00M110101-3F2B

**FCC ID** : ZDIK2-544DW

**PRODUCT DESIGNATION** : 11N Wireless USB Dongle

**BRAND NAME** : KINGNET

**TEST MODEL** : K2-544DW

**CLIENT** : Shenzhen Kingnet Technology Co.,Ltd

**DATE OF ISSUE** : February 23, 2011

**STANDARD(S)** : FCC Part 15 Rules

**Attestation of Global Compliance Co., Ltd.**

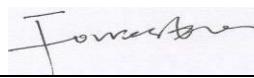
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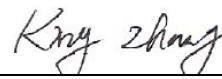
## VERIFICATION OF COMPLIANCE

|                     |  |
|---------------------|--|
| Applicant           | Shenzhen Kingnet Technology Co.,Ltd<br>3F, Building 5, Civil Science Industry Zone, Pingshan, Xili, Nanshan, Shenzhen, China   |
| Manufacturer        | Shenzhen Kingnet Electronic Co.,Ltd<br>1-4F, Building 5, Civil Science Industry Zone, Pingshan, Xili, Nanshan, Shenzhen, China |
| Product Designation | 11N Wireless USB Dongle  |
| Brand Name          | KINGNET  |
| Model Name          | K2-544D, K2-544DW, VNT9271BU05K  |
| Model difference    | The models are all the same except for model name  |
| FCC ID              | ZDIK2-544DW  |
| Report Number       | AGC00M110101-3F2B  |
| Date of Test        | February 18-February 23, 2011  |

### WE HEREBY CERTIFY THAT:

The above equipment was tested by Attestation of Global Compliance 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) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.247.

Checked By:   
Forrest Lei      Feb.23, 2011

Authorized By:   
King Zhang      Feb.23, 2011

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## 1. GENERAL INFORMATION

### 1.1 PRODUCT DESCRIPTION

The EUT is a **11N Wireless USB Dongle** designed as an “WiFi Device”. It is designed by way of utilizing the OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

|                     |                                    |
|---------------------|------------------------------------|
| Operation Frequency | 2.412 GHz to 2.462GHz              |
| Rated Output Power  | 11n(20):12.85dBm ,11n(40):12.97dBm |
| Modulation          | BPSK,QPSK,16-QAM,64-QAM            |
| Data Rate           | See Section 1.3                    |
| Number of channels  | 11                                 |
| Antenna Designation | Integrated Antenna                 |
| Antenna Gain        | 0.9dBi(max)                        |
| Power Supply        | DC5V                               |

**Note:**The test report only included 802.11n test data.

### 1.2 TABLE OF CARRIER FREQUENCYS

| Frequency Band | Channel Number | Frequency |
|----------------|----------------|-----------|
| 2400~2483.5MHZ | 1              | 2412MHZ   |
|                | 2              | 2417MHZ   |
|                | 3              | 2422 MHZ  |
|                | 4              | 2427 MHZ  |
|                | 5              | 2432 MHZ  |
|                | 6              | 2437 MHZ  |
|                | 7              | 2442 MHZ  |
|                | 8              | 2447 MHZ  |
|                | 9              | 2452 MHZ  |
|                | 10             | 2457 MHZ  |
|                | 11             | 2462MHZ   |

**Note:** For 20MHZ bandwidth system use Channel 1 to Channel 13

For 40MHZ bandwidth system use Channel 3 to Channel 9

### 1.3 IEEE 802.11N MODULATION SCHEME

| MCS Index | Nss | Modulation | R   | NBPSC | NCBPS |       | NDBPS |       | Data rate(Mbps) |       |
|-----------|-----|------------|-----|-------|-------|-------|-------|-------|-----------------|-------|
|           |     |            |     |       | 20MHz | 40MHz | 20MHz | 40MHz | 20MHz           | 40MHz |
| 0         | 1   | BPSK       | 1/2 | 1     | 52    | 108   | 26    | 54    | 6.5             | 13.5  |
| 1         | 1   | QPSK       | 1/2 | 2     | 104   | 216   | 52    | 108   | 13.0            | 27.0  |
| 2         | 1   | QPSK       | 3/4 | 2     | 104   | 216   | 78    | 162   | 19.5            | 40.5  |
| 3         | 1   | 16-QAM     | 1/2 | 4     | 208   | 432   | 104   | 216   | 26.0            | 54.0  |
| 4         | 1   | 16-QAM     | 3/4 | 4     | 208   | 432   | 156   | 324   | 39.0            | 81.0  |
| 5         | 1   | 64-QAM     | 2/3 | 6     | 312   | 648   | 208   | 432   | 52.0            | 108.0 |
| 6         | 1   | 64-QAM     | 3/4 | 6     | 312   | 648   | 234   | 486   | 58.5            | 121.5 |
| 7         | 1   | 64-QAM     | 5/6 | 6     | 312   | 648   | 260   | 540   | 65.0            | 135.0 |

| Symbol | Explanation                             |
|--------|---|
| NSS    | Number of spatial streams               |
| R      | Code rate                               |
| NBPSC  | Number of coded bits per single carrier |
| NCBPS  | Number of coded bits per symbol         |
| NDBPS  | Number of data bits per symbol          |
| GI     | guard interval                          |

### 1.4 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID:ZDIK2-544DW** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

### 1.5 TEST METHODOLOGY

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

### 1.6 TEST FACILITY

All measurement facilities used to collect the measurement data are located at  
Attestation of Global Compliance Co., Ltd.  
1F., No.2 Building, Huafeng No.1 Technical Industrial Park, Sanwei, Xixiang, Baoan District, Shenzhen  
The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003.  
FCC register No.: 259865

### 1.7 SPECIAL ACCESSORIES

Not available for this EUT intended for grant.

### 1.8 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

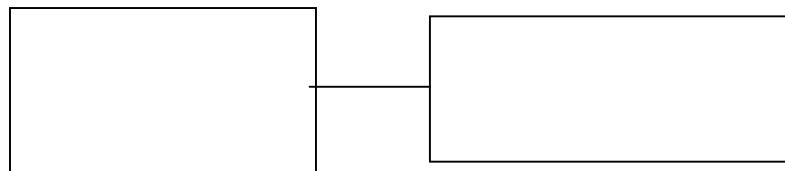
### 1.9 TABLE FOR TEST MODES

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on the entire possible configuration for searching the worst cases. The following table is a list of the test modes shown in this test report.

| Test Items   | Mode         | Data Rate | Channel |
|--|--------------|-----------|---------|
| Conducted Emissions  | MCS0 (20MHZ) | Auto      | -       |
| Maximum Conducted Output Power<br>Power Spectral Density<br>6dB Spectrum Bandwidth<br>Radiated Emissions 1GHz~10 <sup>th</sup> Harmonic<br>Band Edge Emissions | MCS0 (20MHZ) | 6.5Mbps   | 1/7/11  |
|  | MCS0 (40MHZ) | 13.5Mbps  | 3/7/9   |

## 2. SYSTEM TEST CONFIGURATION

### 2.1 CONFIGURATION OF TESTED SYSTEM



### 2.2 EQUIPMENT USED IN TESTED SYSTEM

| Item | Equipment               | Mfr/Brand          | Model/Type No. | FCC ID      |
|------|-------------------------|--------------------|----------------|-------------|
| 1    | 11N Wireless USB Dongle | Kingnet Electronic | K2-544DW       | ZDIK2-544DW |

### 3. SUMMARY OF TEST RESULTS

| FCC RULES | DESCRIPTION OF TEST    | RESULT         |
|-----------|------------------------|----------------|
| §15.207   | Conduction Emission    | Not applicable |
| §15.209   | Radiated Emission      | Compliant      |
| §15.247   | Maximum Output Power   | Compliant      |
| §15.247   | 6dB Bandwidth          | Compliant      |
| §15.247   | Band Edges             | Compliant      |
| §15.247   | Spurious Emission      | Compliant      |
| §15.247   | Power Spectral Density | Compliant      |

### 4. DESCRIPTION OF TEST MODES

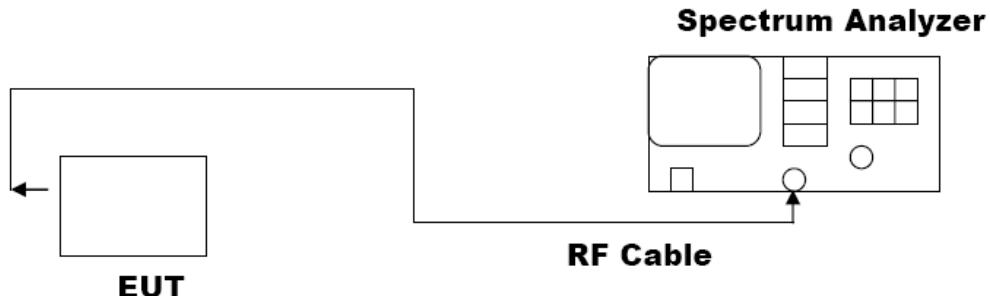
1. The EUT has been set to operate continuously on the lowest, middle and highest operation frequency individually.
2. The EUT stays in continuous transmitting mode on the operation frequency being set.

## 5MAXIMUM OUTPUT POWER

### 5.1 MEASUREMENT PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Set SPA Centre Frequency = Operation Frequency, RBW= 1 MHz,  
VBW= 1 MHz.
5. Set SPA Trace 1 Max hold, then View.

### 5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



### 5.3 MEASUREMENT EQUIPMENT USED

| Description           | Manufacturer      | Model       | SERIAL NUMBER | Cal. Date  | Cal. Due   |
|-----------------------|-------------------|-------------|---------------|------------|------------|
| Spectrum Analyzer     | Agilent           | E4440A      | N/A           | 06/29/2010 | 06/28/2011 |
| Amplifier             | EM                | EM30180     | 0607030       | 06/29/2010 | 06/28/2011 |
| Horn Antenna          | EM                | EM-AH-10180 | N/A           | 06/29/2010 | 06/28/2011 |
| EMI Test Receiver     | Rohde & Schwarz   | ESCI        | N/A           | 06/29/2010 | 06/28/2011 |
| Amplifier             | EM                | EM30180     | N/A           | 06/29/2010 | 06/28/2011 |
| Biological Antenna    | A.H. Systems Inc. | SAS-521-4   | N/A           | 06/29/2010 | 06/28/2011 |
| Loop Antenna          | Daze              | ZN30900N    | SEL0097       | 06/29/2010 | 06/28/2011 |
| Isolation Transformer | LETEAC            | LTBK        | --            | 06/08/2010 | 06/07/2011 |

#### 5.4 LIMITS AND MEASUREMENT RESULT

802.11n(20)

| LIMITS AND MEASUREMENT RESULT |              |                         |              |
|-------------------------------|--------------|-------------------------|--------------|
| Frequency (GHz)               | Result (dBm) | Applicable Limits (dBm) | Pass or Fail |
| 2.412                         | 12.85        | 30                      | Pass         |
| 2.442                         | 12.62        | 30                      | Pass         |
| 2.462                         | 12.40        | 30                      | Pass         |

802.11n(40)

| LIMITS AND MEASUREMENT RESULT |              |                         |              |
|-------------------------------|--------------|-------------------------|--------------|
| Frequency (GHz)               | Result (dBm) | Applicable Limits (dBm) | Pass or Fail |
| 2.422                         | 12.97        | 30                      | Pass         |
| 2.442                         | 12.67        | 30                      | Pass         |
| 2.452                         | 12.76        | 30                      | Pass         |

## 6 6 DB BANDWIDTH

### 6.1 MEASUREMENT PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz,  
VBW= 100 KHz.
4. Set SPA Trace 1 Max hold, then View.

### 6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The Same as described in Section 5.2

### 6.3 MEASUREMENT EQUIPMENT USED

The same as described in Section 5.3

### 6.4 LIMITS AND MEASUREMENT RESULTS

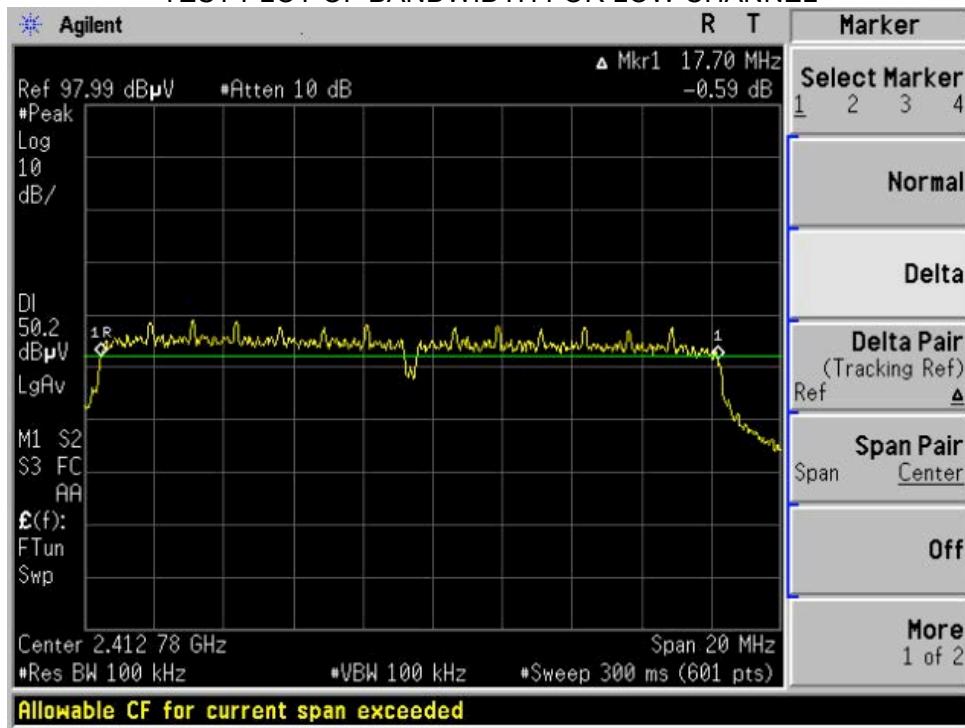
802.11n(20)

| LIMITS AND MEASUREMENT RESULT |                    |          |      |
|-------------------------------|--------------------|----------|------|
| Applicable Limits             | Measurement Result |          |      |
|                               | Test Data (MHz)    | Criteria |      |
| >500KHZ                       | Low Channel        | 17.7     | PASS |
|                               | Middle Channel     | 17.73    | PASS |
|                               | High Channel       | 17.77    | PASS |

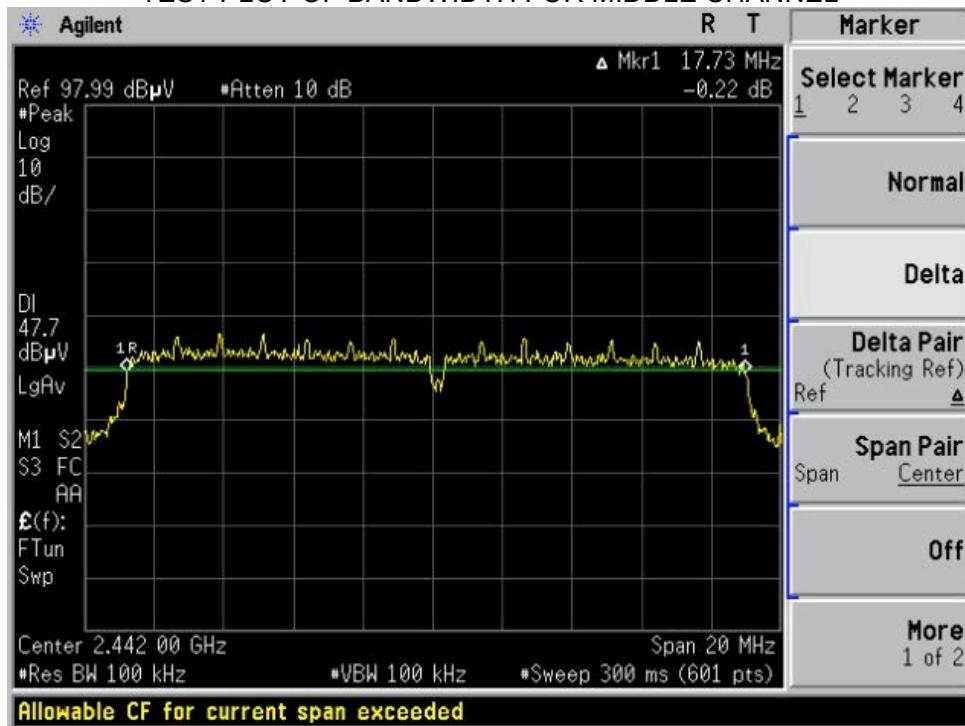
802.11n(40)

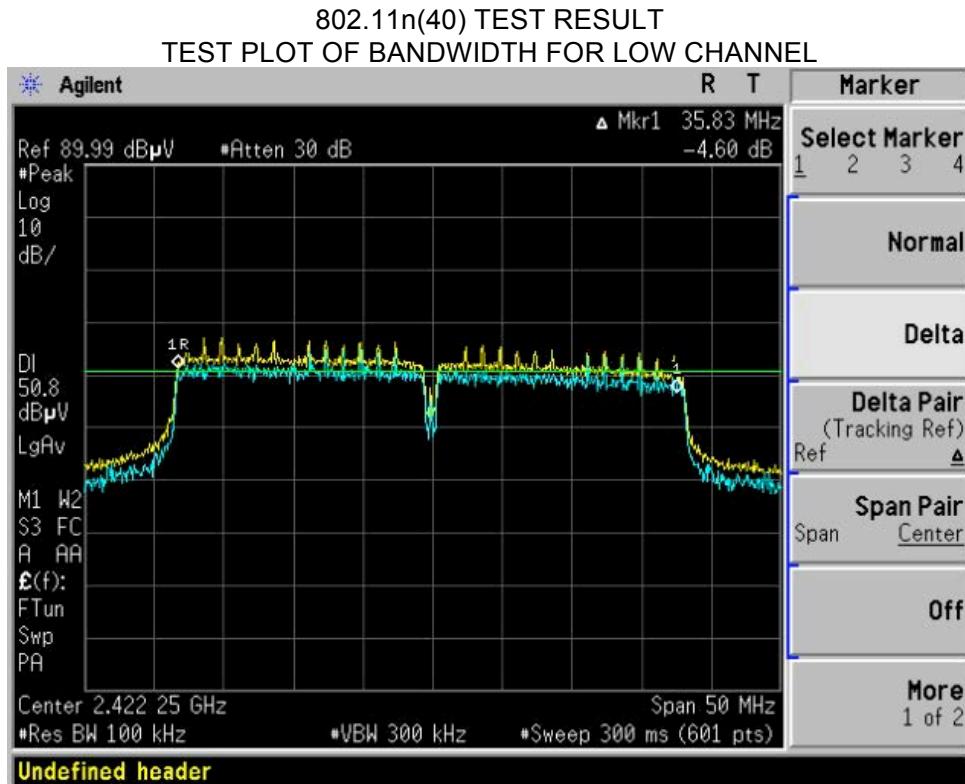
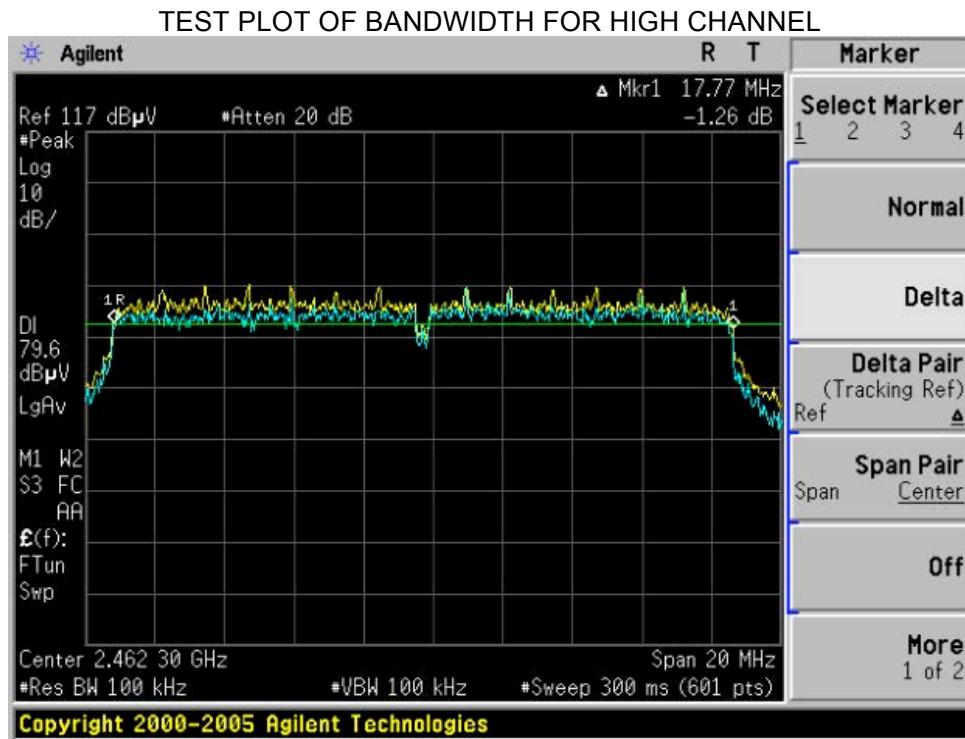
| LIMITS AND MEASUREMENT RESULT |                    |          |      |
|-------------------------------|--------------------|----------|------|
| Applicable Limits             | Measurement Result |          |      |
|                               | Test Data (MHz)    | Criteria |      |
| >500KHZ                       | Low Channel        | 35.83    | PASS |
|                               | Middle Channel     | 36.08    | PASS |
|                               | High Channel       | 36.42    | PASS |

802.11n(20) TEST RESULT  
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL

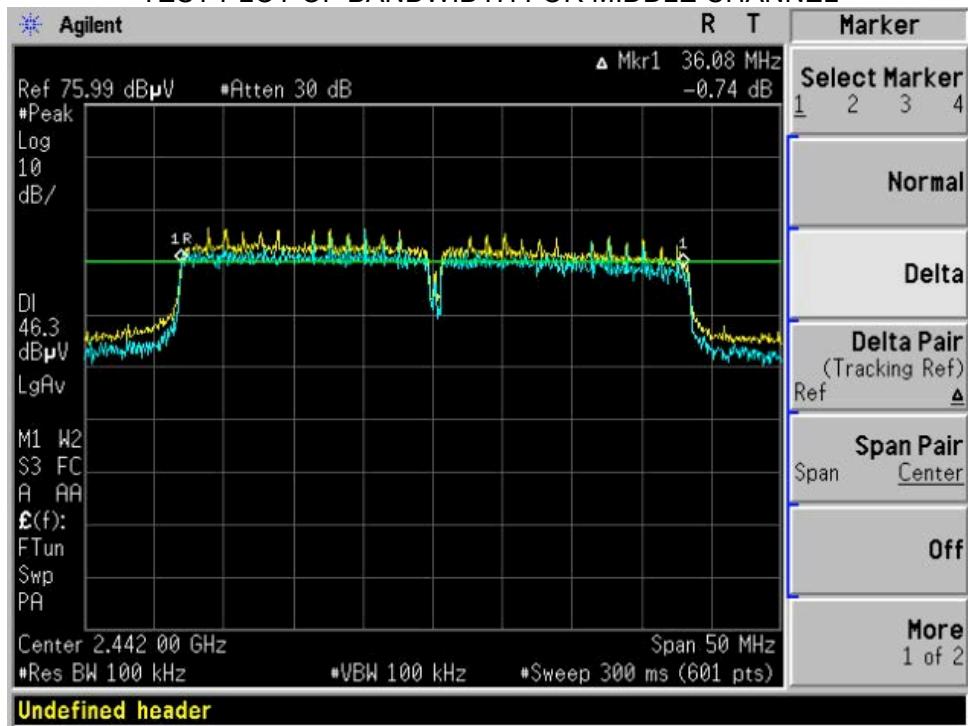


TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

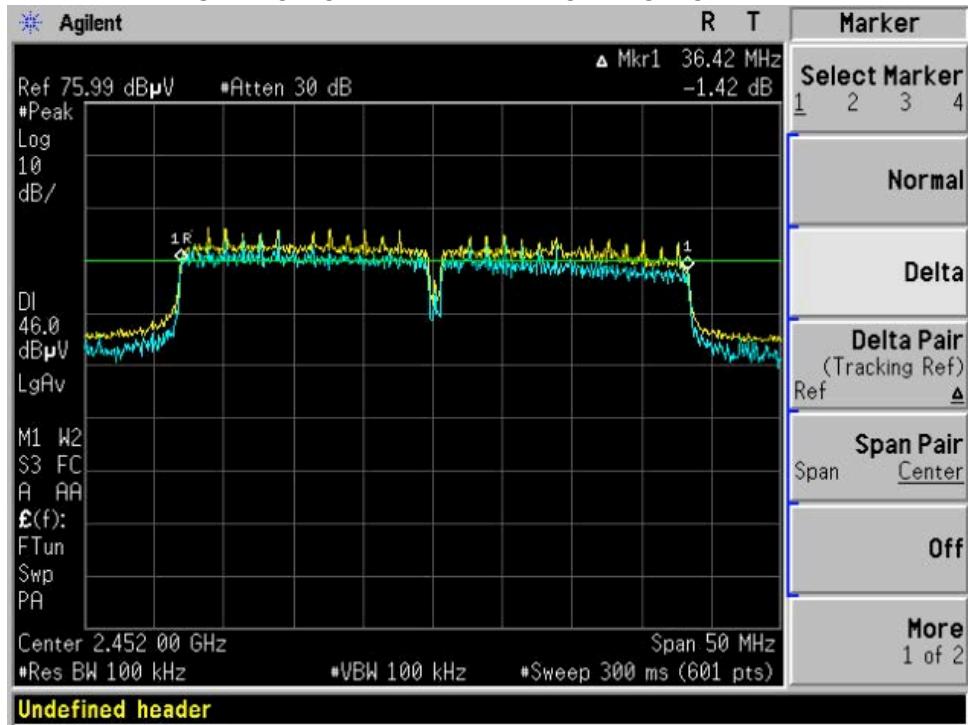




TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

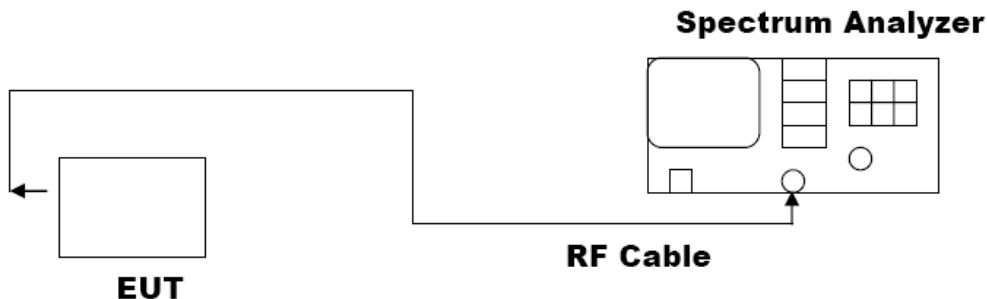


## 7. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY

### 7.1 MEASUREMENT PROCEDURE

- (1). The EUT was placed on a turn table which is 0.8m above ground plane.
- (2). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- (3). Set the EUT Work on the top, the middle and the bottom operation frequency individually.
- (4). Set SPA Centre Frequency = Operation Frequency, RBW= 3 KHz,  
VBW= 30 KHz., Sweep time= Auto
- (5). Set SPA Trace 1 Max hold, then View.

### 7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



### 7.3 MEASUREMENT EQUIPMENT USED

| SHIELDING ROOM    |         |              |               |            |            |
|-------------------|---------|--------------|---------------|------------|------------|
| EQUIPMENT TYPE    | MFR     | MODEL NUMBER | SERIAL NUMBER | LAST CAL.  | CAL DUE.   |
| Spectrum Analyzer | Agilent | E4440A       | N/A           | 06/29/2010 | 06/28/2011 |

### 7.4 LIMITS AND MEASUREMENT RESULT

802.11n(20)

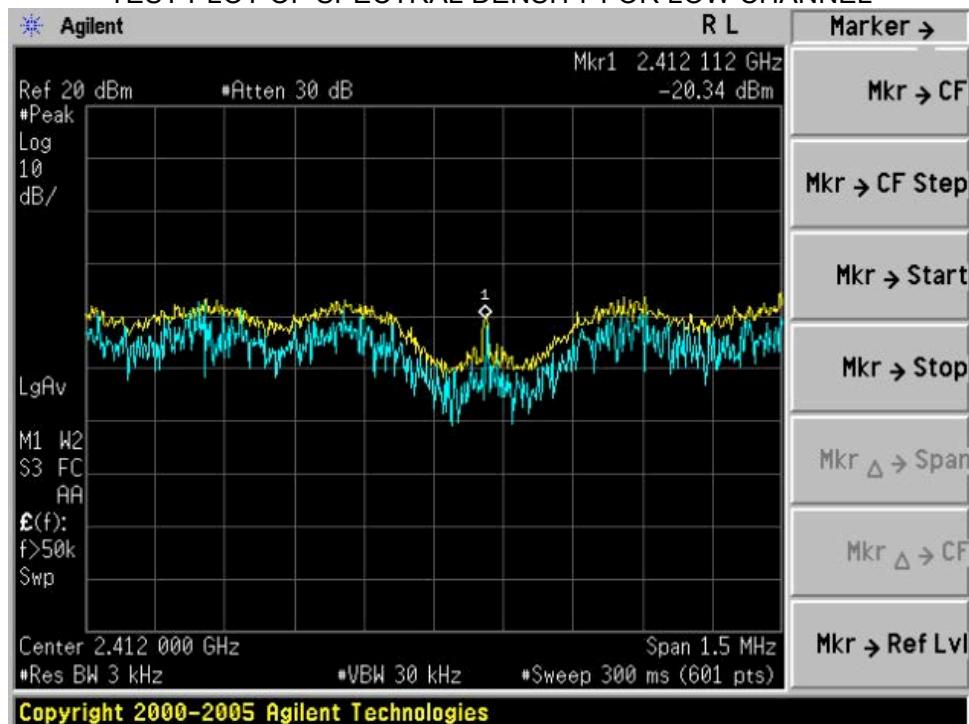
| LIMITS AND MEASUREMENT RESULT |                      |        |          |
|-------------------------------|----------------------|--------|----------|
| Applicable Limits             | Measurement Result   |        |          |
|                               | Test Data (dBm/3KHz) |        | Criteria |
| 8 dBm / 3KHz                  | Low Channel          | -20.34 | Pass     |
|                               | Middle Channel       | -22.12 | Pass     |
|                               | High Channel         | -17.62 | Pass     |

802.11n(40)

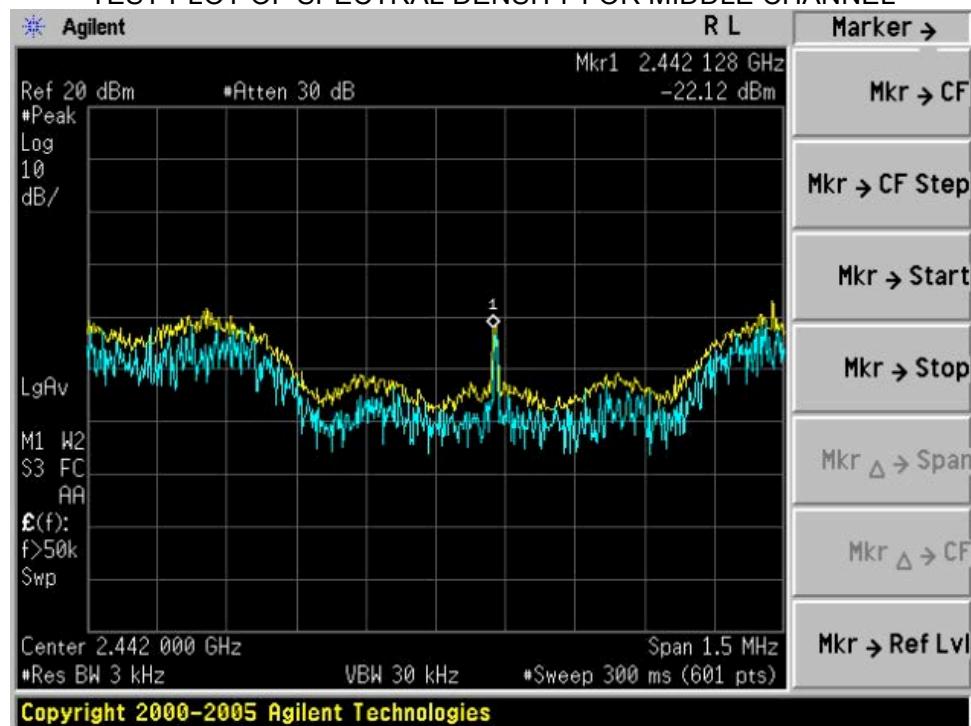
| LIMITS AND MEASUREMENT RESULT |                      |        |          |
|-------------------------------|----------------------|--------|----------|
| Applicable Limits             | Measurement Result   |        |          |
|                               | Test Data (dBm/3KHz) |        | Criteria |
| 8 dBm / 3KHz                  | Low Channel          | -14.34 | Pass     |
|                               | Middle Channel       | -15.01 | Pass     |
|                               | High Channel         | -15.41 | Pass     |

802.11n(20) TEST RESULT

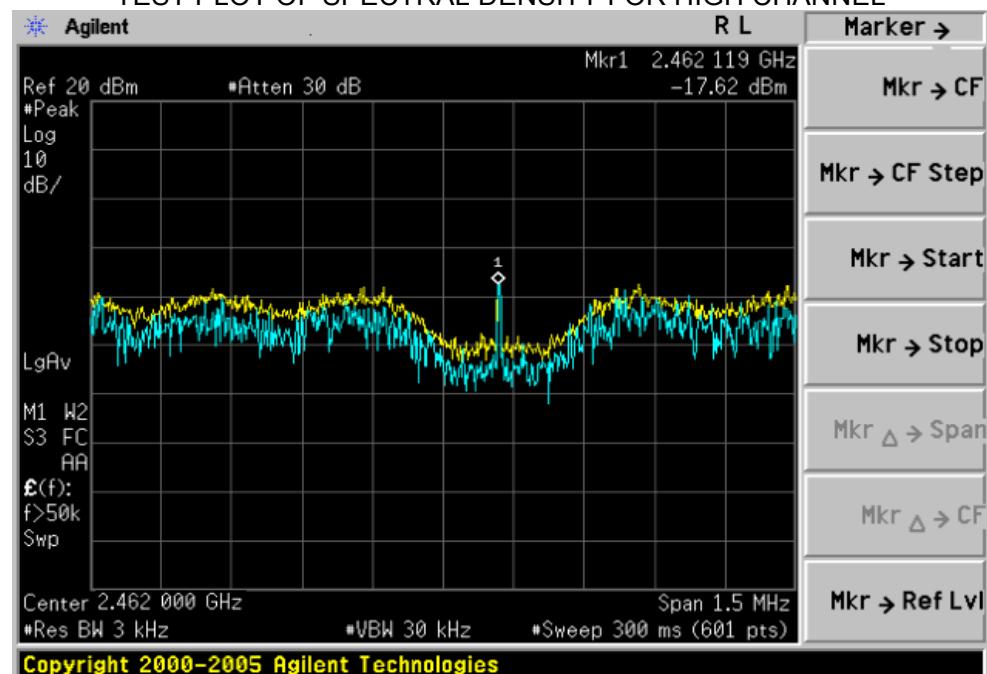
TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL



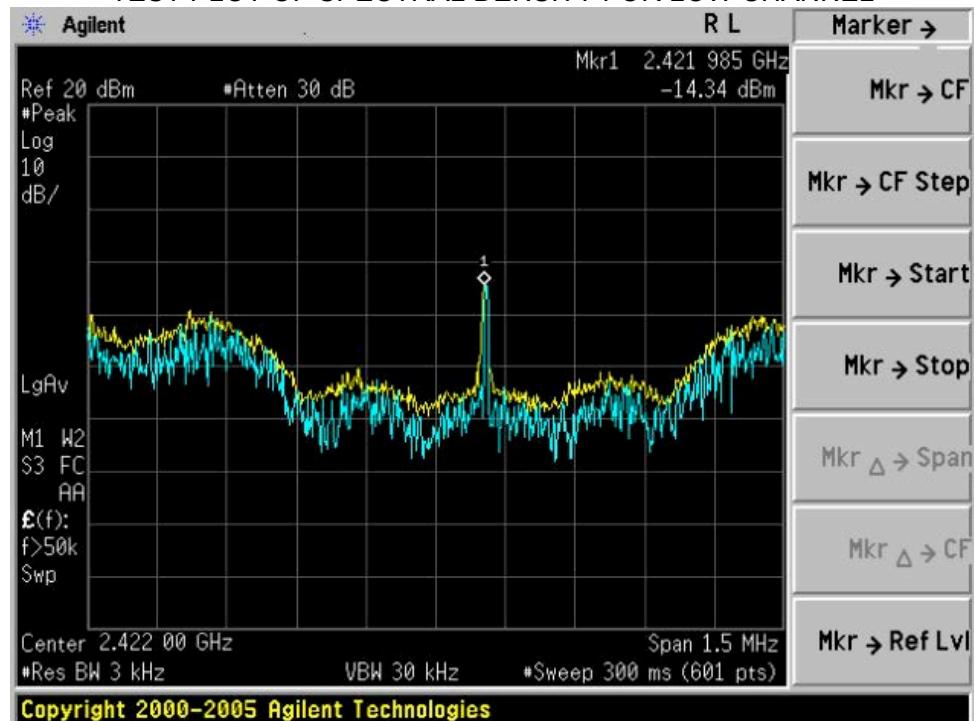
TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



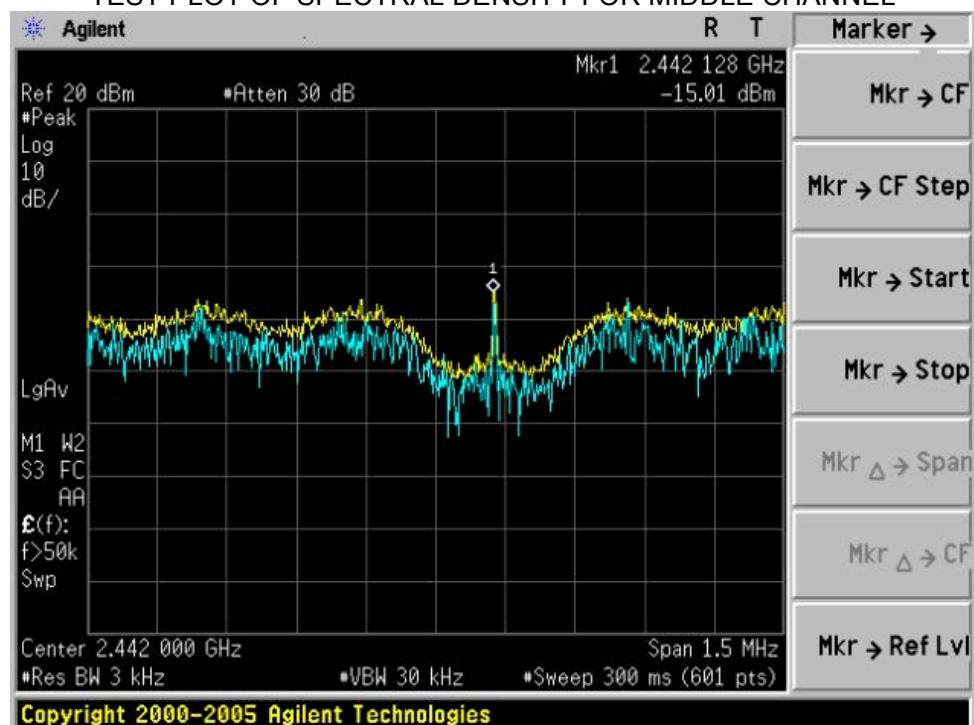
TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL



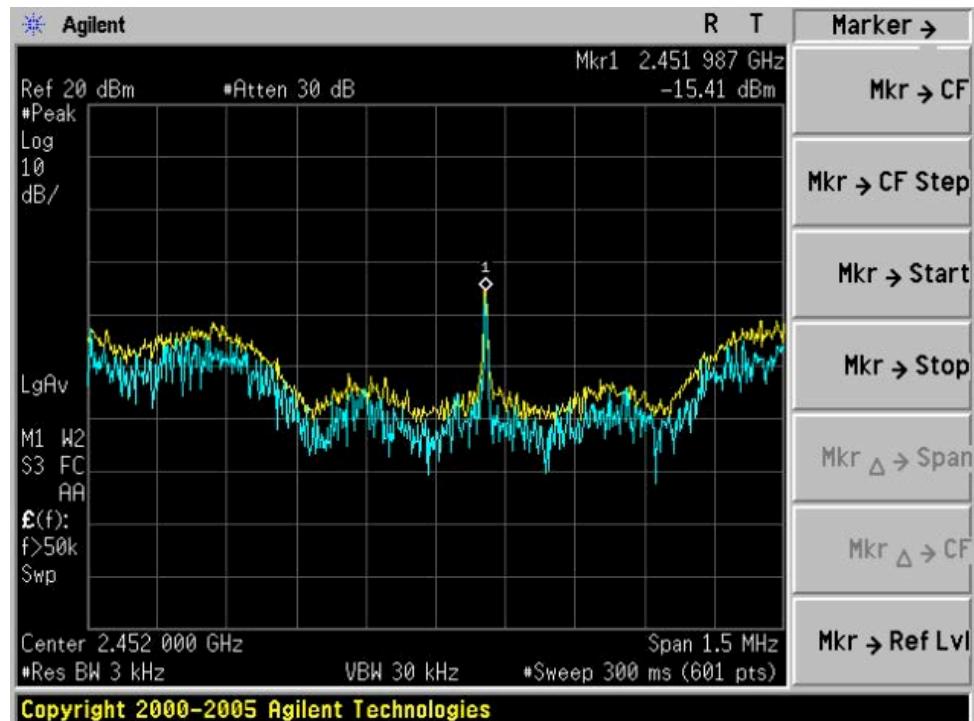
802.11n(40) TEST RESULT  
TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL



TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL



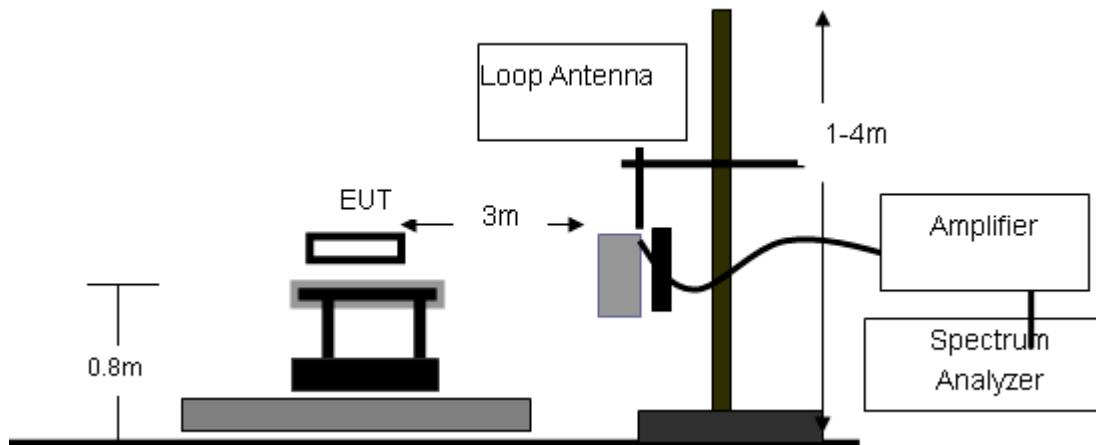
## 8. RADIATED EMISSION MEASUREMENT

### 8.1 MEASUREMENT PROCEDURE

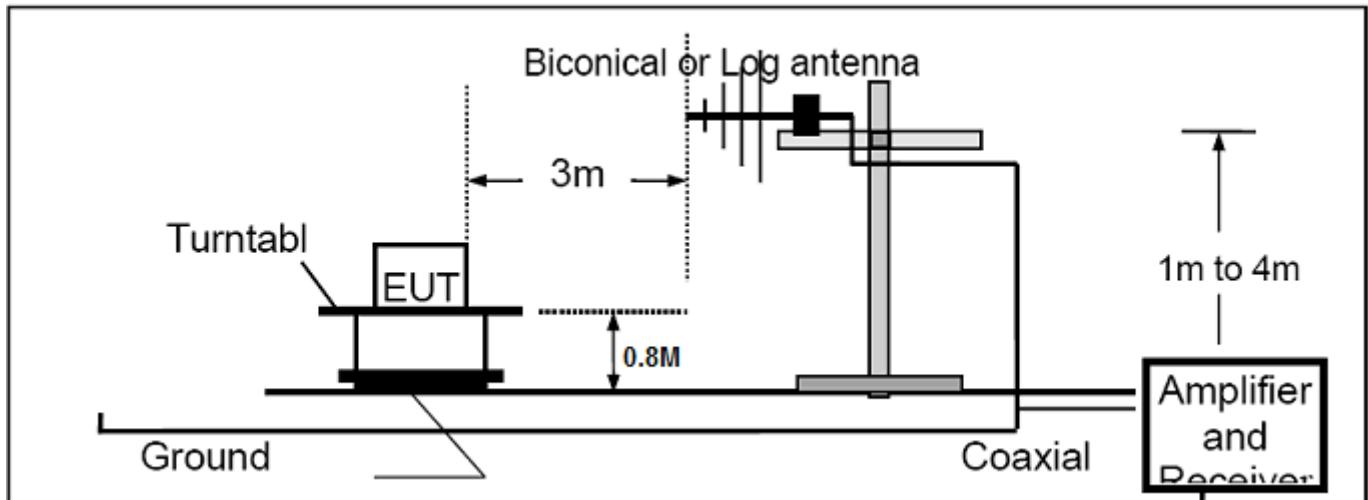
- 1 Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 Meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2 Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine The position of the highest radiation.
- 3 The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4 For each suspected emissions, the antenna tower was scan (from 1M to 4M) and then the turntable was Rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5 Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode
- 6 For emission above 1GHZ, use 1MHZ VBW and RBW for peak reading. Then 1MHZ RBW and 10Hz VBW For average reading in spectrum analyzer.
- 7 When the radiated eemissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one Complete pulse train, including blanking interavls, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the Pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 seconds interval during which the field strength is at its maximum value.
- 8 If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9 For testing above 1GHZ, the emissions level of the EUT in peak mode was lower than average limit (that Means the emissions 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.
- 10 in case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded Data should be QP measured by receiver. High-Low scan is not required in this case.

### 8.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

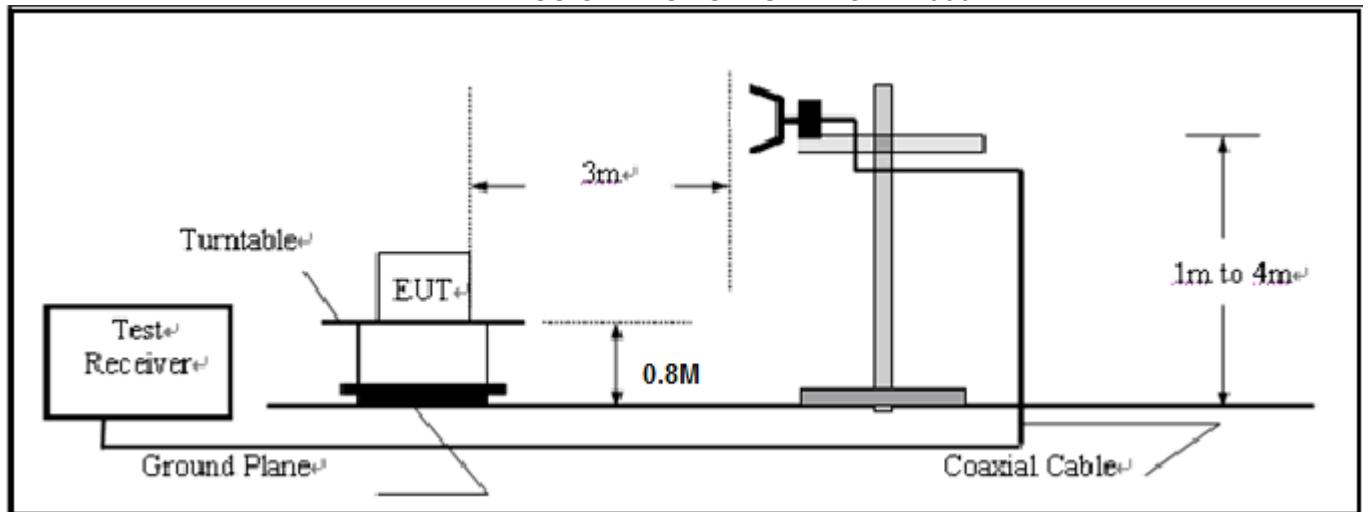
#### RADIATED EMISSION TEST SETUP BELOW 30MHz



RADIATED MISSION TEST SETUP 30MHz-1000MHz



RADIATED MISSION TEST SETUP ABOVE 1000MHz



### 8.3 MEASUREMENT EQUIPMENT USED

The Same as described in section 6.3

#### 8.4 LIMITS AND MEASUREMENT RESULT

| LIMITS AND MEASUREMENT RESULT   |  |          |
|---|--|----------|
| Applicable Limits   | Measurement Result   |          |
|   | Test Data  | Criteria |
| In any 100 KHz 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 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power. | At least -20dBc than the limit Specified on the BOTTOM Channel | PASS     |
| In addition, radiation emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in§15.209(a))   | At least -20dBc than the limit Specified on the TOP Channel    | PASS     |

15.209(a) Limit in the below table has to be followed

| Frequencies<br>(MHz) | Field Strength<br>(micorvolts/meter) | Measurement Distance<br>(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                                |

### RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequency to 30MHz.

### RADIATED EMISSION BELOW 1GHZ

|             |                         |                   |             |
|-------------|-------------------------|-------------------|-------------|
| EUT         | 11N Wireless USB Dongle | Model Name        | K2-544DW    |
| Temperature | 25° C                   | Relative Humidity | 55.4%       |
| Pressure    | 960hPa                  | Test Voltage      | DC5V        |
| Test Mode   | 2412MHZ                 | Modulation        | 802.11n(20) |

| Freq.<br>(MHZ) | Ant.Pol.<br>H/V | Detector<br>(PK/QP) | Reading<br>(dBuV) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|----------------|-----------------|---------------------|-------------------|----------------|--------------------|-------------------|----------------|
| 55.74          | H               | Peak                | 16.23             | 12.43          | 28.66              | 40                | -11.34         |
| 135.68         | H               | Peak                | 13.54             | 13.22          | 26.76              | 43.5              | -16.74         |
| 214.45         | H               | Peak                | 12.18             | 16.83          | 29.01              | 46                | -16.99         |
| 467.68         | H               | Peak                | 8.87              | 16.24          | 25.11              | 46                | -20.89         |
| 575.48         | H               | Peak                | 9.33              | 20.48          | 29.81              | 46                | -16.19         |
| 923.25         | H               | Peak                | 5.89              | 24.27          | 30.16              | 46                | -15.84         |
|                |                 |                     |                   |                |                    |                   |                |
| 69.98          | V               | Peak                | 16.35             | 11.25          | 27.6               | 40                | -12.4          |
| 88.56          | V               | Peak                | 12.65             | 9.46           | 22.11              | 40                | -17.89         |
| 234.47         | V               | Peak                | 11.45             | 15.31          | 26.76              | 43.5              | -16.74         |
| 278.39         | V               | Peak                | 8.13              | 17.65          | 25.78              | 43.5              | -17.72         |
| 735.45         | V               | Peak                | 6.93              | 22.67          | 29.6               | 46                | -16.4          |
| 928.38         | V               | Peak                | 8.45              | 23.39          | 31.84              | 46                | -14.16         |

|           |                         |                   |             |
|-----------|-------------------------|-------------------|-------------|
| EUT       | 11N Wireless USB Dongle | Model Name        | K2-544DW    |
|           | 25° C                   | Relative Humidity | 55.4%       |
| Pressure  | 960hPa                  | Test Voltage      | DC5V        |
| Test Mode | 2442MHZ                 | Modulation        | 802.11n(20) |

| Freq.<br>(MHZ) | Ant.Pol.<br>H/V | Detector<br>(PK/QP) | Reading<br>(dBuV) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|----------------|-----------------|---------------------|-------------------|----------------|--------------------|-------------------|----------------|
| --             | H               | Peak                | --                | --             | --                 | --                | --             |
| --             | H               | Peak                | --                | --             | --                 | --                | --             |
| --             | V               | Peak                | --                | --             | --                 | --                | --             |
| --             | V               | Peak                | --                | --             | --                 | --                | --             |

|             |                         |                   |             |
|-------------|-------------------------|-------------------|-------------|
| EUT         | 11N Wireless USB Dongle | Model Name        | K2-544DW    |
| Temperature | 25° C                   | Relative Humidity | 55.4%       |
| Pressure    | 960hPa                  | Test Voltage      | DC5V        |
| Test Mode   | 2462MHZ                 | Modulation        | 802.11n(20) |

| Freq.<br>(MHZ) | Ant.Pol.<br>H/V | Detector<br>(PK/QP) | Reading<br>(dBuV) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|----------------|-----------------|---------------------|-------------------|----------------|--------------------|-------------------|----------------|
| --             | H               | Peak                | --                | --             | --                 | --                | --             |
| --             | H               | Peak                | --                | --             | --                 | --                | --             |
| --             | V               | Peak                | --                | --             | --                 | --                | --             |
| --             | V               | Peak                | --                | --             | --                 | --                | --             |

|             |                         |                   |             |
|-------------|-------------------------|-------------------|-------------|
| EUT         | 11N Wireless USB Dongle | Model Name        | K2-544DW    |
| Temperature | 25° C                   | Relative Humidity | 55.4%       |
| Pressure    | 960hPa                  | Test Voltage      | DC5V        |
| Test Mode   | 2422/2442/2462MHZ       | Modulation        | 802.11n(40) |

| Freq.<br>(MHZ) | Ant.Pol.<br>H/V | Detector<br>(PK/QP) | Reading<br>(dBuV) | Factor<br>(dB) | Result<br>(dBuV/m) | Limit<br>(dBuV/m) | Margin<br>(dB) |
|----------------|-----------------|---------------------|-------------------|----------------|--------------------|-------------------|----------------|
| --             | H               | Peak                | --                | --             | --                 | --                | --             |
| --             | H               | Peak                | --                | --             | --                 | --                | --             |
| --             | V               | Peak                | --                | --             | --                 | --                | --             |
| --             | V               | Peak                | --                | --             | --                 | --                | --             |

**Note:** "--"means the mode other frequencies at least have 20dB margin.

## RADIATED EMISSION ABOVE 1GHZ

|             |                         |                   |             |
|-------------|-------------------------|-------------------|-------------|
| EUT         | 11N Wireless USB Dongle | Model Name        | K2-544DW    |
| Temperature | 25° C                   | Relative Humidity | 55.4%       |
| Pressure    | 960hPa                  | Test Voltage      | DC5V        |
| Test Mode   | 2412MHZ                 | Modulation        | 802.11n(20) |

|             |                         |                   |             |
|-------------|-------------------------|-------------------|-------------|
| EUT         | 11N Wireless USB Dongle | Model Name        | K2-544DW    |
| Temperature | 25° C                   | Relative Humidity | 55.4%       |
| Pressure    | 960hPa                  | Test Voltage      | DC5V        |
| Test Mode   | 2442MHZ                 | Modulation        | 802.11n(20) |

|             |                         |  |                   |  |             |  |
|-------------|-------------------------|--|-------------------|--|-------------|--|
| EUT         | 11N Wireless USB Dongle |  | Model Name        |  | K2-544DW    |  |
| Temperature | 25° C                   |  | Relative Humidity |  | 55.4%       |  |
| Pressure    | 960hPa                  |  | Test Voltage      |  | DC5V        |  |
| Test Mode   | 2462MHZ                 |  | Modulation        |  | 802.11n(20) |  |

| Freq.<br>(MHZ) | Ant.Pol.<br>H/V | Peak<br>Reading<br>(dBuV) | AV<br>Reading<br>(dBuV) | Factor<br>(dB) | Result           |                | Peak<br>Limit<br>(dBuV/m) | AV<br>Limit<br>(dBuV/m) | Margin |
|----------------|-----------------|---------------------------|-------------------------|----------------|------------------|----------------|---------------------------|-------------------------|--------|
|                |                 |                           |                         |                | Peak<br>(dBuV/m) | AV<br>(dBuV/m) |                           |                         |        |
| --             | H               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |
| --             | H               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |
| --             | V               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |
| --             | V               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |

|             |                         |  |                   |  |             |  |
|-------------|-------------------------|--|-------------------|--|-------------|--|
| EUT         | 11N Wireless USB Dongle |  | Model Name        |  | K2-544DW    |  |
| Temperature | 25° C                   |  | Relative Humidity |  | 55.4%       |  |
| Pressure    | 960hPa                  |  | Test Voltage      |  | DC5V        |  |
| Test Mode   | 2422/2442/2452MHZ       |  | Modulation        |  | 802.11n(40) |  |

| Freq.<br>(MHZ) | Ant.Pol.<br>H/V | Peak<br>Reading<br>(dBuV) | AV<br>Reading<br>(dBuV) | Factor<br>(dB) | Result           |                | Peak<br>Limit<br>(dBuV/m) | AV<br>Limit<br>(dBuV/m) | Margin |
|----------------|-----------------|---------------------------|-------------------------|----------------|------------------|----------------|---------------------------|-------------------------|--------|
|                |                 |                           |                         |                | Peak<br>(dBuV/m) | AV<br>(dBuV/m) |                           |                         |        |
| --             | H               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |
| --             | H               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |
| --             | V               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |
| --             | V               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |

**Note:** This EUT was tested worst-case data was presented.

-- means the mode at least have 20dB margin.

## 9 BAND EDGE EMISSION

### 9.1 MEASUREMENT PROCEDURE

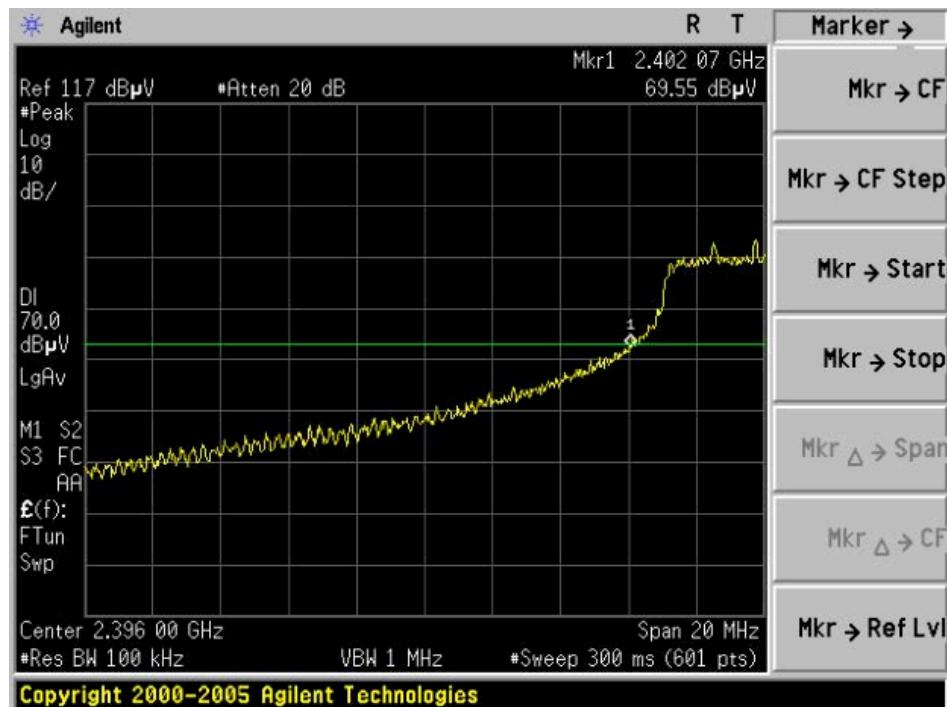
1. Set the EUT Work on the top, the bottom operation frequency individually.
2. Set SPA Start or Stop Frequency = Operation Frequency, RBW= 1MHz, VBW= 1MHz.
3. The band edges was measured and receorded.

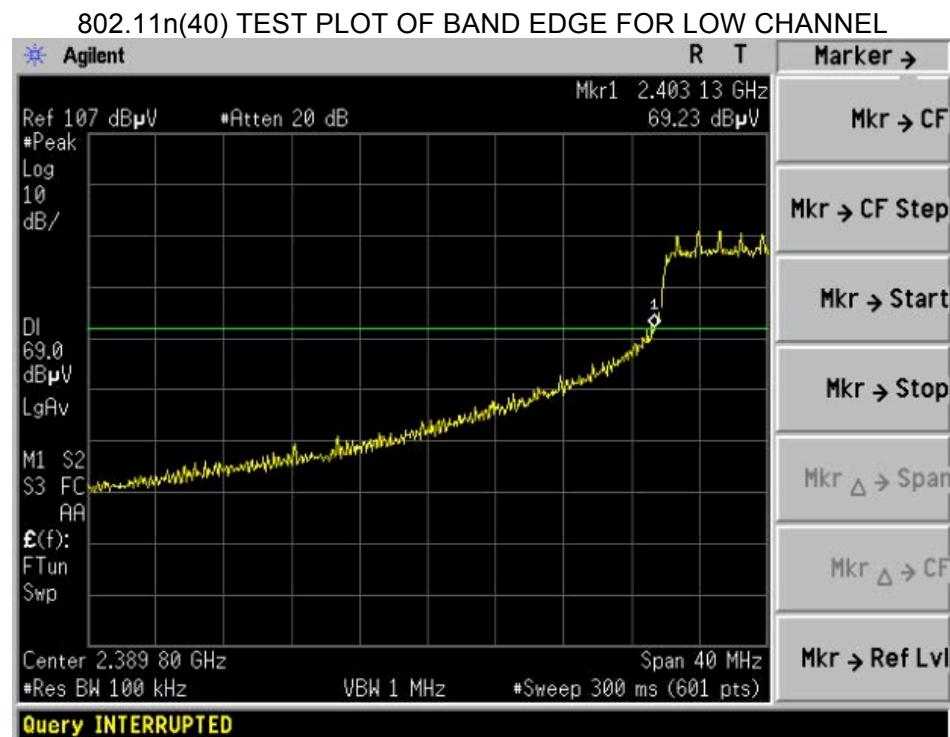
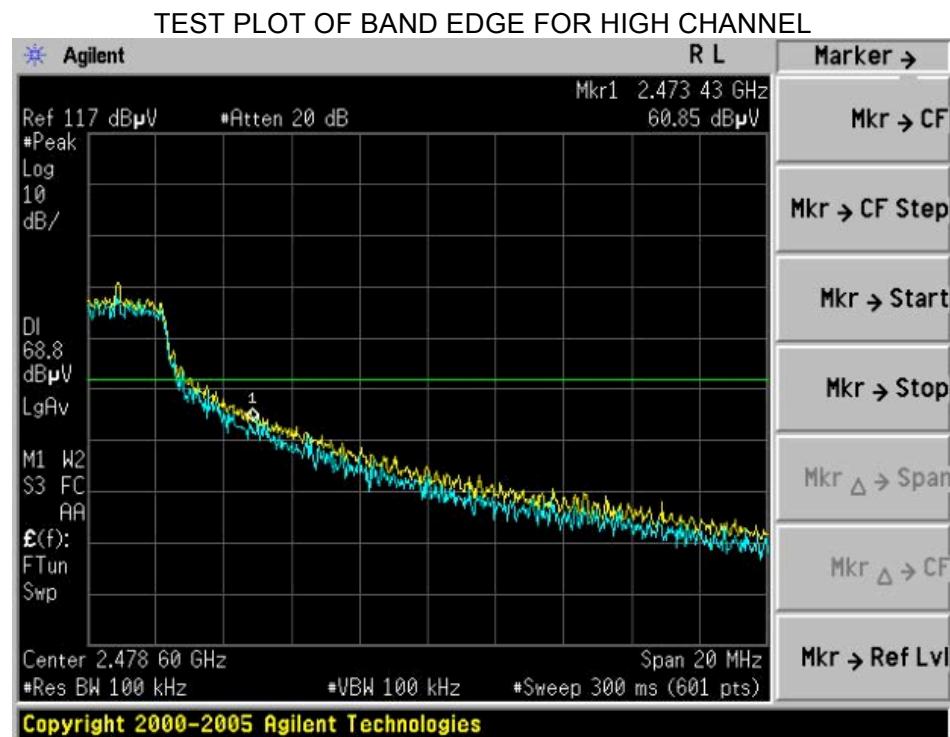
### 9.2 TEST SET-UP

The Same as described in section 6.2

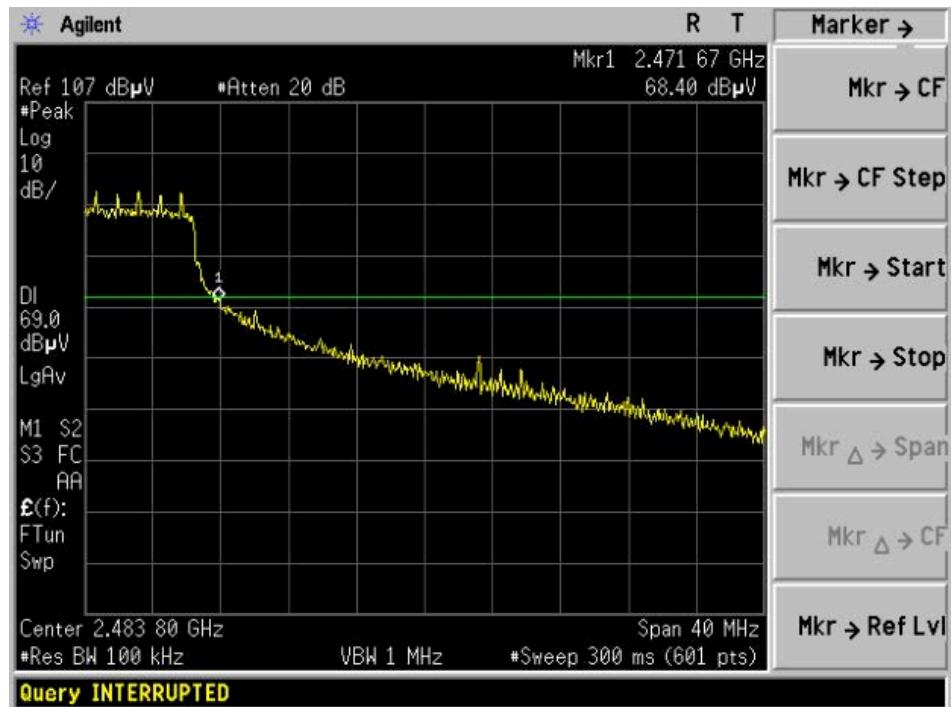
### 9.3 TEST RESULT

802.11n(20) TEST PLOT OF BAND EDGE FOR LOW CHANNEL





TEST PLOT OF BAND EDGE FOR HIGH CHANNEL



|             |                          |  |  |                   |  |             |  |  |
|-------------|--------------------------|--|--|-------------------|--|-------------|--|--|
| EUT         | 11 N Wireless USB Dongle |  |  | Model Name        |  | K2-544DW    |  |  |
| Temperature | 25° C                    |  |  | Relative Humidity |  | 55.4%       |  |  |
| Pressure    | 960hPa                   |  |  | Test Voltage      |  | DC5V        |  |  |
| Test Mode   | 2412MHZ                  |  |  | Modulation        |  | 802.11n(20) |  |  |

| Freq.<br>(MHZ) | Ant.Pol.<br>H/V | Peak<br>Reading<br>(dBuV) | AV<br>Reading<br>(dBuV) | Factor<br>(dB) | Result           |                | Peak<br>Limit<br>(dBuV/m) | AV<br>Limit<br>(dBuV/m) | Margin |
|----------------|-----------------|---------------------------|-------------------------|----------------|------------------|----------------|---------------------------|-------------------------|--------|
|                |                 |                           |                         |                | Peak<br>(dBuV/m) | AV<br>(dBuV/m) |                           |                         |        |
| 2359.30        | H               | 48.92                     | 38.47                   | 1.39           | 50.31            | 39.86          | 74                        | 54                      | -14.14 |
| --             | H               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |
| 2359.30        | V               | 51.19                     | 41.35                   | 1.52           | 52.71            | 42.87          | 74                        | 54                      | -11.33 |
| --             | V               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |

|             |                          |  |  |                   |  |             |  |  |
|-------------|--------------------------|--|--|-------------------|--|-------------|--|--|
| EUT         | 11 N Wireless USB Dongle |  |  | Model Name        |  | K2-544DW    |  |  |
| Temperature | 25° C                    |  |  | Relative Humidity |  | 55.4%       |  |  |
| Pressure    | 960hPa                   |  |  | Test Voltage      |  | DC5V        |  |  |
| Test Mode   | 2462MHZ                  |  |  | Modulation        |  | 802.11n(20) |  |  |

| Freq.<br>(MHZ) | Ant.Pol.<br>H/V | Peak<br>Reading<br>(dBuV) | AV<br>Reading<br>(dBuV) | Factor<br>(dB) | Result           |                | Peak<br>Limit<br>(dBuV/m) | AV<br>Limit<br>(dBuV/m) | Margin |
|----------------|-----------------|---------------------------|-------------------------|----------------|------------------|----------------|---------------------------|-------------------------|--------|
|                |                 |                           |                         |                | Peak<br>(dBuV/m) | AV<br>(dBuV/m) |                           |                         |        |
| --             | H               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |
| --             | H               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |
| --             | V               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |
| --             | V               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |

**Note:** "--"means other frequencies at least have 20dB margin.

|             |                          |  |  |                   |  |             |  |  |
|-------------|--------------------------|--|--|-------------------|--|-------------|--|--|
| EUT         | 11 N Wireless USB Dongle |  |  | Model Name        |  | K2-544DW    |  |  |
| Temperature | 25° C                    |  |  | Relative Humidity |  | 55.4%       |  |  |
| Pressure    | 960hPa                   |  |  | Test Voltage      |  | DC5V        |  |  |
| Test Mode   | 2422MHZ                  |  |  | Modulation        |  | 802.11n(40) |  |  |

| Freq.<br>(MHZ) | Ant.Pol.<br>H/V | Peak<br>Reading<br>(dBuV) | AV<br>Reading<br>(dBuV) | Factor<br>(dB) | Result           |                | Peak<br>Limit<br>(dBuV/m) | AV<br>Limit<br>(dBuV/m) | Margin |
|----------------|-----------------|---------------------------|-------------------------|----------------|------------------|----------------|---------------------------|-------------------------|--------|
|                |                 |                           |                         |                | Peak<br>(dBuV/m) | AV<br>(dBuV/m) |                           |                         |        |
| 2388.16        | H               | 48.32                     | 35.02                   | 1.27           | 49.59            | 36.29          | 74                        | 54                      | -17.71 |
| --             | H               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |
| 2389.84        | V               | 47.29                     | 34.17                   | 1.65           | 48.94            | 35.82          | 74                        | 54                      | -18.18 |
| --             | V               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |

|             |                          |  |  |                   |  |             |  |  |
|-------------|--------------------------|--|--|-------------------|--|-------------|--|--|
| EUT         | 11 N Wireless USB Dongle |  |  | Model Name        |  | K2-544DW    |  |  |
| Temperature | 25° C                    |  |  | Relative Humidity |  | 55.4%       |  |  |
| Pressure    | 960hPa                   |  |  | Test Voltage      |  | DC5V        |  |  |
| Test Mode   | 2452MHZ                  |  |  | Modulation        |  | 802.11n(40) |  |  |

| Freq.<br>(MHZ) | Ant.Pol.<br>H/V | Peak<br>Reading<br>(dBuV) | AV<br>Reading<br>(dBuV) | Factor<br>(dB) | Result           |                | Peak<br>Limit<br>(dBuV/m) | AV<br>Limit<br>(dBuV/m) | Margin |
|----------------|-----------------|---------------------------|-------------------------|----------------|------------------|----------------|---------------------------|-------------------------|--------|
|                |                 |                           |                         |                | Peak<br>(dBuV/m) | AV<br>(dBuV/m) |                           |                         |        |
| --             | H               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |
| --             | H               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |
| --             | V               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |
| --             | V               | --                        | --                      | --             | --               | --             | --                        | --                      | --     |

**Note:** "--"means other frequencies at least have 20dB margin.

## 10 FCC LINE CONDUCTED EMISSION TEST

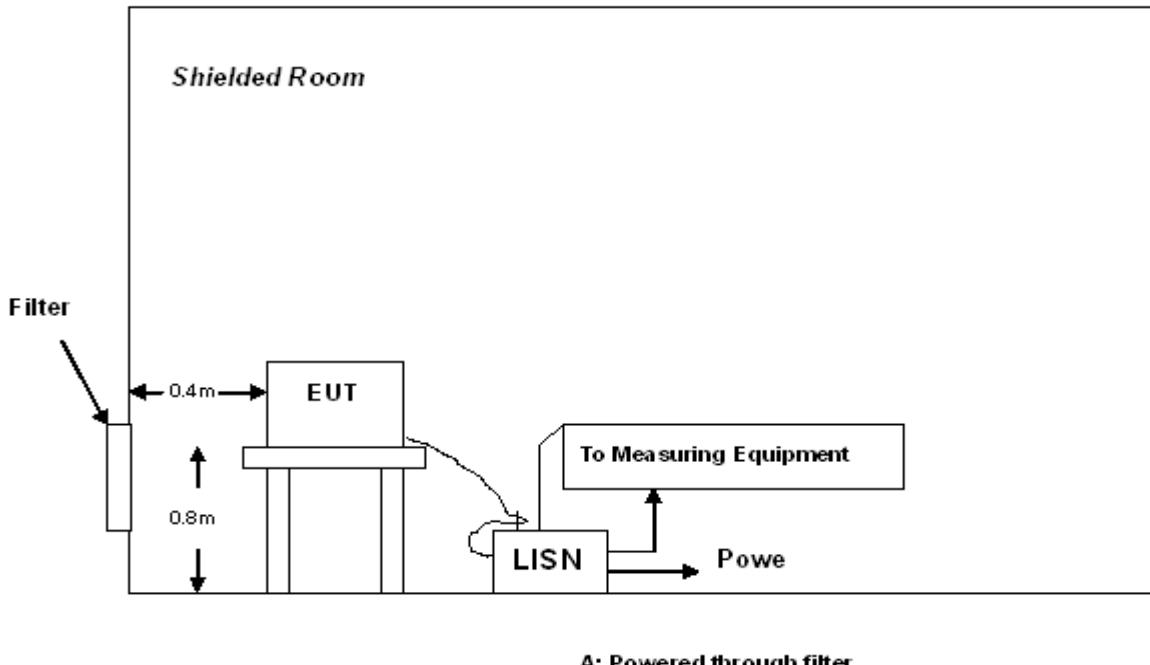
### 10.1 LIMITS OF LINE CONDUCTED EMISSION TEST

| Frequency     | Maximum RF Line Voltage |                |
|---------------|-------------------------|----------------|
|               | Q.P.( dBuV)             | Average( dBuV) |
| 150kHz~500kHz | 66-56                   | 56-46          |
| 500kHz~5MHz   | 56                      | 46             |
| 5MHz~30MHz    | 60                      | 50             |

\*\*Note: 1. The lower limit shall apply at the transition frequency.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

### 10.2 BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



### 10.3 PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.4.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4) All support equipments received AC120V power from a LISN, if any.
- 5) The EUT received power from support PC
- 6) The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8) During the above scans, the emissions were maximized by cable manipulation.
- 9) The following test mode(s) were scanned during the preliminary test:

| Preliminary Line Conducted Emission Test |            |                   |            |                                     |
|--|------------|-------------------|------------|-------------------------------------|
| Frequency Range Investigated             |            | 150 KHz TO 30 MHz |            |                                     |
| Mode of operation                        | Date       | Report No.        | Data#      | Worst Mode                          |
| 802.11b                                  | 02/21/2011 | AGC00M110101-3    | K2-544DW-0 | <input checked="" type="checkbox"/> |
| 802.11g                                  | 02/21/2011 | AGC00M110101-3    | K2-544DW-1 | <input type="checkbox"/>            |
| 802.11n                                  | 02/21/2011 | AGC00M110101-3    | K2-544DW-2 | <input type="checkbox"/>            |

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

### 10.4 FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

- 1) EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3) The test data of the worst case condition(s) was reported on the Summary Data page.

## 10.5 TEST RESULT OF LINE CONDUCTED EMISSION TEST

### TEST RESULT OF L LINE Conducted Emission Measurement



Site: Conduction Phase: **L1** Temperature: 26  
Limit: FCC Class B Conduction(QP) Power: Humidity: 60 %  
EUT: 11N Wireless USB Dongle  
M/N: K2-544DW  
Mode:  
Note:

| No. | Freq.<br>(MHz) | Reading_Level<br>(dBuV) |    |       | Correct<br>Factor | Measurement<br>(dBuV) |      |       | Limit<br>(dBuV) |       | Margin<br>(dB) |        | P/F | Comment |
|-----|----------------|-------------------------|----|-------|-------------------|-----------------------|------|-------|-----------------|-------|----------------|--------|-----|---------|
|     |                | Peak                    | QP | Avg   |                   | dB                    | Peak | QP    | Avg             | QP    | Avg            | QP     | Avg |         |
| 1   | 0.1900         | 37.63                   |    | 22.39 | 10.20             | 47.83                 |      | 32.59 | 64.03           | 54.03 | -16.20         | -21.44 | P   |         |
| 2   | 0.3220         | 21.30                   |    | 9.33  | 10.30             | 31.60                 |      | 19.63 | 59.65           | 49.65 | -28.05         | -30.02 | P   |         |
| 3   | 0.6180         | 20.38                   |    | 19.07 | 10.32             | 30.70                 |      | 29.39 | 56.00           | 46.00 | -25.30         | -16.61 | P   |         |
| 4   | 6.0180         | 27.84                   |    | 24.36 | 10.28             | 38.12                 |      | 34.64 | 60.00           | 50.00 | -21.88         | -15.36 | P   |         |
| 5   | 7.8020         | 24.88                   |    | 23.07 | 10.34             | 35.22                 |      | 33.41 | 60.00           | 50.00 | -24.78         | -16.59 | P   |         |
| 6   | 10.5780        | 20.62                   |    | 17.28 | 10.10             | 30.72                 |      | 27.38 | 60.00           | 50.00 | -29.28         | -22.62 | P   |         |

TEST RESULT OF N LINE  
Conducted Emission Measurement



Site: Conduction Phase: **N** Temperature: 26  
Limit: FCC Class B Conduction(QP) Power: Humidity: 60 %  
EUT: 11N Wireless USB Dongle  
M/N: K2-544DW  
Mode:  
Note:

| No. | Freq.<br>(MHz) | Reading_Level<br>(dBuV) |    |       | Correct<br>Factor | Measurement<br>(dBuV) |    |       | Limit<br>(dBuV) |       | Margin<br>(dB) |        | P/F | Comment |
|-----|----------------|-------------------------|----|-------|-------------------|-----------------------|----|-------|-----------------|-------|----------------|--------|-----|---------|
|     |                | Peak                    | QP | Avg   |                   | Peak                  | QP | Avg   | QP              | Avg   | QP             | Avg    |     |         |
| 1   | 0.1940         | 40.50                   |    | 23.72 | 10.21             | 50.71                 |    | 33.93 | 63.88           | 53.88 | -13.15         | -19.93 | P   |         |
| 2   | 0.3260         | 26.34                   |    | 14.53 | 10.30             | 36.84                 |    | 24.83 | 59.55           | 49.55 | -22.91         | -24.72 | P   |         |
| 3   | 0.6180         | 19.79                   |    | 19.03 | 10.32             | 30.11                 |    | 29.35 | 56.00           | 46.00 | -25.89         | -16.65 | P   |         |
| 4   | 5.6820         | 27.20                   |    | 22.55 | 10.26             | 37.46                 |    | 32.81 | 60.00           | 50.00 | -22.54         | -17.19 | P   |         |
| 5   | 7.8660         | 25.04                   |    | 22.13 | 10.34             | 35.38                 |    | 32.47 | 60.00           | 50.00 | -24.62         | -17.53 | P   |         |
| 6   | 11.0380        | 20.52                   |    | 19.12 | 10.10             | 30.62                 |    | 29.22 | 60.00           | 50.00 | -29.38         | -20.78 | P   |         |

**APPENDIX I**  
**PHOTOGRAPHS OF THE EUT**

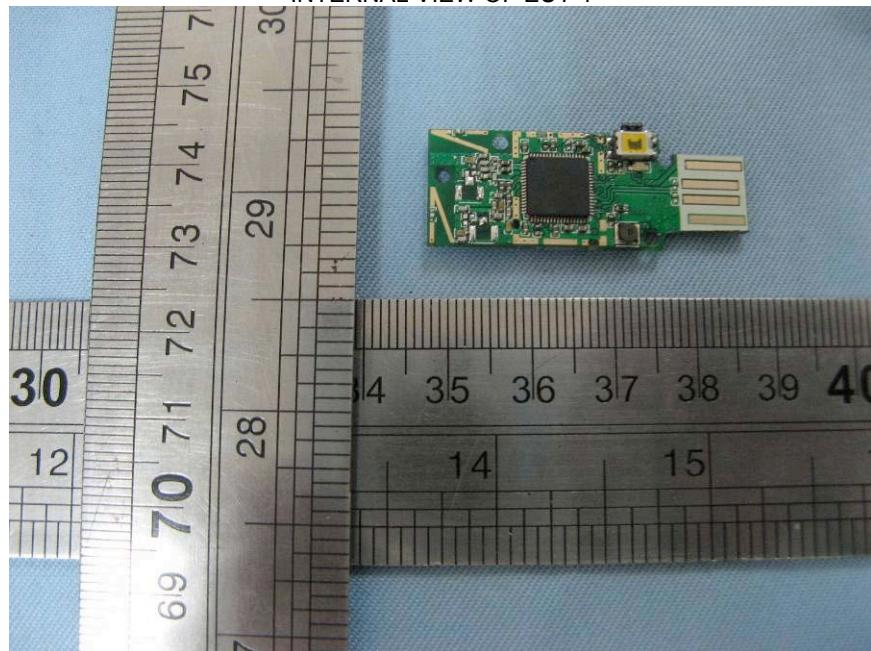
TOP VIEW OF EUT



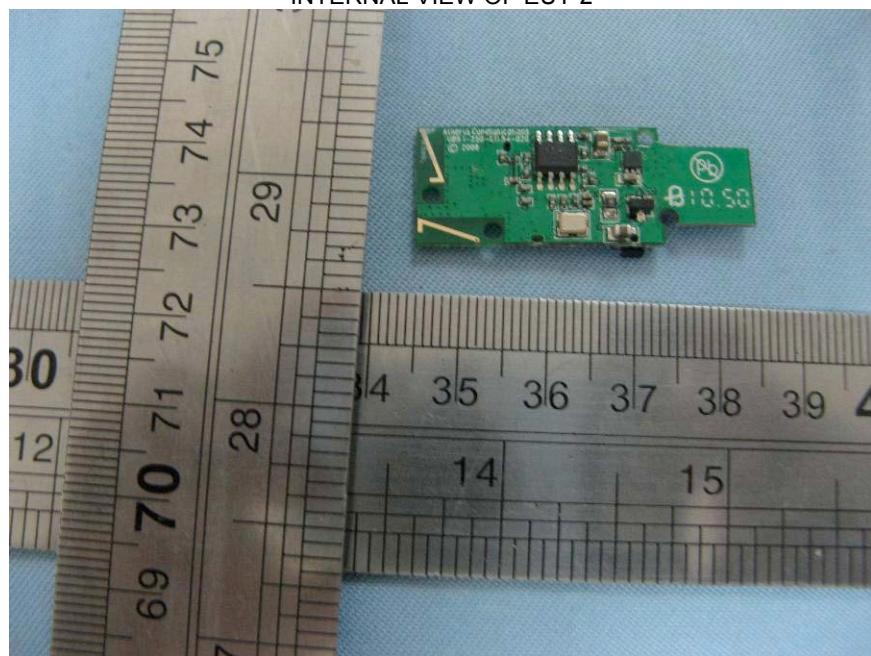
BOTTOM VIEW OF EUT



INTERNAL VIEW OF EUT-1

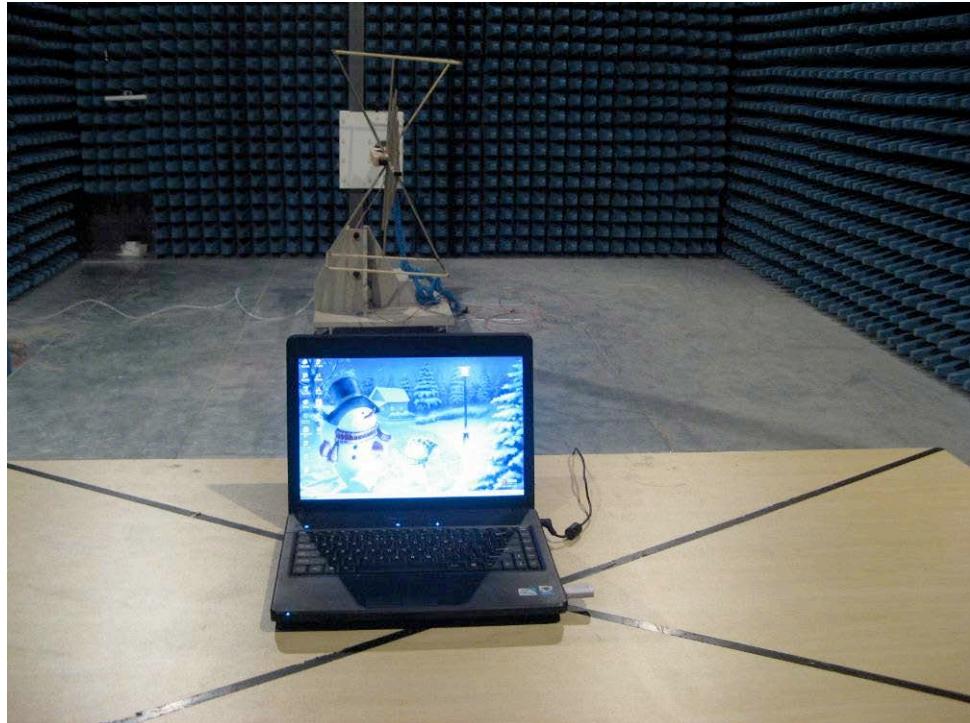


INTERNAL VIEW OF EUT-2



**APPENDIX II**  
**PHOTOGRAPHS OF THE TEST SETUP**

RADIATED EMISSION TEST SETUP



CONDUCTED EMISSION TEST SETUP



----END OF REPORT----