

## EMC TEST REPORT

### No. SH08010962-001

Applicant : Freescale Semiconductor, Inc.  
8133 Leesburg Pike Suite 700, Vienna, Virginia, 22182,  
United States

Manufacturer : Freescale Semiconductor, Inc.  
8133 Leesburg Pike Suite 700, Vienna, Virginia, 22182,  
United States

Equipment : MX31PDK

Type/Model : MX31PDK

### SUMMARY

The equipment complies with the requirements according to the following standard(s):

**47CFR Part 15 (2007):** Radio Frequency Devices

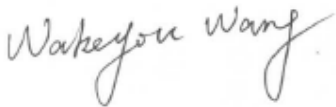
**ANSI C63.4 (2003):** American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

**RSS-210 Issue 7 (June 2007):** Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

**RSS-Gen Issue 2 (June 2007):** General Requirements and Information for the Certification of Radiocommunication Equipment

Date of issue: March 6, 2008

Tested by:



Wakeyou Wang (*Project Engineer*)

Reviewed by:



Jonny Jing (*Reviewer*)



**FCC ID: RUNMCIMX31PDK**  
**Report No: SH08010962-001**

## **Description of Test Facility**

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## **1. General Information**

### **1.1 Applicant Information**

|                       |                                                                                                          |
|-----------------------|----------------------------------------------------------------------------------------------------------|
| Applicant:            | Freescall Semiconductor, Inc.<br>8133 Leesburg Pike Suite 700, Vienna, Virginia, 22182,<br>United States |
| Name of contact:      | Sean Chen                                                                                                |
| Tel:                  | 86 21 2893 7109                                                                                          |
| Fax:                  | 86 21 2893 7030                                                                                          |
| Manufacturer:         | Freescall Semiconductor, Inc.<br>8133 Leesburg Pike Suite 700, Vienna, Virginia, 22182,<br>United States |
| Sample received date: | Jan 19, 2008                                                                                             |
| Date of test          | : Jan 19, 2008 ~ March 2, 2008                                                                           |

### **1.2 Identification of the EUT**

|             |               |
|-------------|---------------|
| Equipment:  | MX31PDK       |
| Type/model: | MX31PDK       |
| FCC ID:     | RUNMCIMX31PDK |

### 1.3 Technical specification

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operation Frequency Band: | 2400-2483.5MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Modulation:               | 802.11b: BPSK, GFSK, CCK;<br>802.11g: OFDM;<br>Bluetooth: GFSK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Antenna Designation:      | Internal antenna, non-user removable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Gain of Antenna:          | 1.2dBi max.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Rating:                   | 5V DC (obtained by an AC/DC adaptor: input AC 110V ~ 240V, 50/60Hz; output DC 5V)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Description of EUT:       | <p>The EUT is used to develop multimedia and connectivity applications which can decrease the time between first development and final product release by providing the system designer with a near-to-final product design. The EUT system consists of three small boards: CPU, Debug, and Personality. A CPU board contains the i.MX31 CPU, memories and the MC13783 Power Management IC (PMIC); A Debug board provides the debug interfaces (like JTAG), and also has a CPLD that implements an external Ethernet and serial controller for debug purposes; The Personality board implements the functionality of the 3-Stack, and contains hardware for WiFi connectivity as well as Bluetooth connectivity.</p> <p>This EUT supports the Bluetooth and 802.11b (or 802.11g) work simultaneously.</p> |
| Channel Description:      | For 802.11b/g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

| Channel | Central frequency (MHz) |
|---------|-------------------------|
| 1       | 2412                    |
| 2       | 2417                    |
| 3       | 2422                    |
| 4       | 2427                    |
| 5       | 2432                    |
| 6       | 2437                    |
| 7       | 2442                    |
| 8       | 2447                    |
| 9       | 2452                    |
| 10      | 2457                    |
| 11      | 2462                    |

For Bluetooth, There are 79 channels named channel 0 to channel 78. Each channel occupies 1MHz. Channel 0 corresponds to carrier frequency 2402MHz and channel 78 corresponds to 2480MHz

#### **1.4 Mode of operation during the test / Test peripherals used**

Within this test report, EUT was tested under 120V/60Hz.

For *802.11 b*, the communication rate is set as 11Mbps to perform test to get worst test data.

For *802.11 g*, the communication rate is 54Mbps which was chosen to perform test.

For *Bluetooth*, while performing “dwell time” test, three packet settings were observed separately, namely DH1, DH3 and DH5. For other tests, if hopping mode is necessary, DH5 with the biggest packet as the client’s description was setting to get the worst test results.

## 2. Test Specification

### 2.1 Instrument list

| Equipment               | Type       | Manu.             | Internal no. | Cal. Date | Due date  |
|-------------------------|------------|-------------------|--------------|-----------|-----------|
| Test Receiver           | ESIB 26    | R&S               | EC 3045      | 2007-6-1  | 2008-5-31 |
| Ultra-broadband antenna | HL 562     | R&S               | EC 3046-1    | 2007-6-1  | 2008-5-31 |
| Horn antenna            | HF 906     | R&S               | EC 3049      | 2007-6-1  | 2008-5-31 |
| Signal generator        | SMR 20     | R&S               | EC 3044-1    | 2007-8-22 | 2008-8-21 |
| Power meter             | PM2002     | AR                | EC3043-7     | 2008-1-23 | 2009-1-22 |
| Power sensor            | PH2000     | AR                | EC3043-8     | 2008-1-23 | 2009-1-22 |
| Semi-anechoic chamber   | -          | Albatross project | EC 3048      | 2007-6-1  | 2008-5-31 |
| Pre-amplifier           | Pre-amp 18 | R&S               | EC 3222      | 2007-6-1  | 2008-5-31 |
| Pre-amplifier           | Pre-amp 40 | Beijing Radio 2   | -            | 2007-3-4  | 2008-3-3  |
| Horn antenna            | K638A      | Beijing Radio 2   | -            | 2007-3-4  | 2008-3-3  |
| A.M.N.                  | ESH2-Z5    | R&S               | EC 3119      | 2008-1-23 | 2009-1-22 |
| Test Receiver           | ESCS 30    | R&S               | EC 2107      | 2008-1-23 | 2009-1-22 |

### 2.2 Test Standard

47CFR Part 15 (2007)  
ANSI C63.4: 2003  
RSS-210 Issue 7 (June 2007)  
RSS-Gen Issue 2 (June 2007)

### 2.3 Test Summary

**This report applies to tested sample only. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.**

| TEST ITEM                                | FCC REFERENCE     | IC REFERENCE                    | RESULT |
|------------------------------------------|-------------------|---------------------------------|--------|
| Minimum 6dB Bandwidth                    | 15.247(a)(2)      | RSS-210 Issue 7<br>Annex 8      | Pass   |
| Maximum peak output power                | 15.247(b)         | RSS-210 Issue 7<br>Annex 8      | Pass   |
| Power spectrum density                   | 15.247(e)         | RSS-210 Issue 7<br>Annex 8      | Pass   |
| Spurious emission                        | 15.209            | RSS-210 Issue 7<br>Clause 2     | Pass   |
| Restrict band radiated emission          | 15.205            | RSS-210 Issue 7<br>Clause 2     | Pass   |
| Emission outside the frequency band      | 15.247(d)         | RSS-210 Issue 7<br>Annex 8      | Pass   |
| Power line conducted emission            | 15.207            | RSS-Gen Issue 2<br>Clause 7.2.2 | Pass   |
| Channel number of hopping system         | 15.247(a)(1)(iii) | RSS-210 Issue 7<br>Annex 8      | Pass   |
| Average time of occupancy in any channel | 15.247(a)(1)(iii) | RSS-210 Issue 7<br>Annex 8      | Pass   |
| Occupied bandwidth                       | -                 | RSS-Gen Issue 2<br>Clause 4.6.1 | Tested |
| Spurious emission for receiver           | -                 | RSS-210 Issue 7<br>Clause 2.3   | Pass   |
| Hopping channel separation               | 15.247(a)(1)      | RSS-210 Issue 7<br>Annex 8      | Pass   |

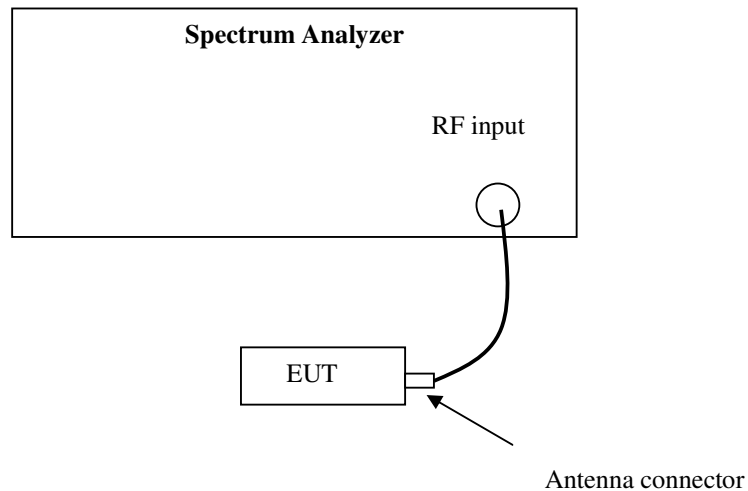
### 3. Minimum 6dB Bandwidth

Test result: PASS

#### 3.1 Limit

For systems using digital modulation techniques that may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz bands, the minimum 6 dB bandwidth shall be at least 500 kHz.

#### 3.2 Test Configuration



#### 3.3 Test Procedure and test setup

The minimum 6dB bandwidth per FCC §15.247(a)(2) is measured using the Spectrum Analyzer with the resolutions bandwidth set at 100kHz, the video bandwidth set at 300kHz, and the SPAN>>RBW. The test was performed at 3 channels (lowest, middle and highest channel).

### 3.4 Test Protocol

Temperature : 22°C  
Relative Humidity : 43%

For 802.11.b

| Channel | Bandwidth (MHz) | Limit (MHz) |
|---------|-----------------|-------------|
| 1       | 10.46           | $\geq 0.5$  |
| 6       | 11.06           | $\geq 0.5$  |
| 11      | 11.06           | $\geq 0.5$  |

**Remark: Margin = Bandwidth - Limit**

For 802.11.g

| Channel | Bandwidth (MHz) | Limit (MHz) |
|---------|-----------------|-------------|
| 1       | 16.07           | $\geq 0.5$  |
| 6       | 16.39           | $\geq 0.5$  |
| 11      | 16.35           | $\geq 0.5$  |

**Remark: Margin = Bandwidth - Limit**

### 3.5 Measurement uncertainty

The measurement uncertainty is  $\pm 100\text{Hz}$ .

## 4. Maximum peak output power

Test result: Pass

### 4.1 Test limit

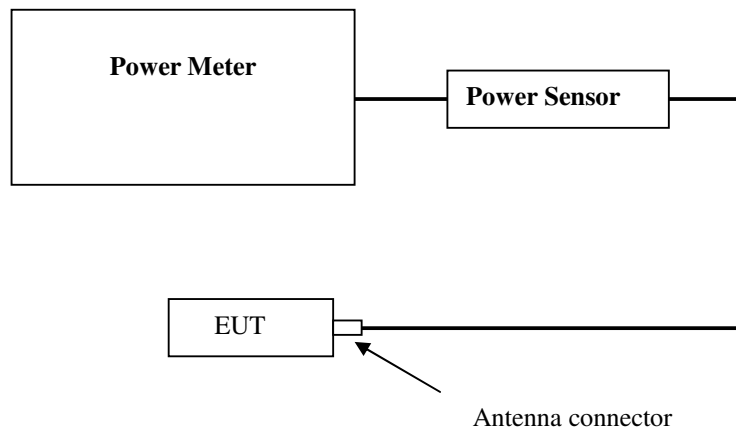
For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt.

For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts

If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

### 4.2 Test Configuration



### 4.3 Test procedure and test setup

The power output per FCC §15.247(b) was measured on the EUT using a power meter via power sensor. The test was performed at 3 channels (lowest, middle and highest channel).

#### 4.4 Test protocol

Temperature : 22 °C  
Relative Humidity : 43 %

For 802.11.b

| Channel | Cable loss (dB) | Reading of Power meter (dBm) | Corrected reading (dBm) | Limit (dBm) |
|---------|-----------------|------------------------------|-------------------------|-------------|
| 1       | 1.2             | 5.66                         | 6.86                    | 30          |
| 6       | 1.2             | 4.84                         | 6.04                    | 30          |
| 11      | 1.2             | 5.09                         | 6.29                    | 30          |

**Remark: Corrected reading = Reading of Power meter + cable loss**

For 802.11.g

| Channel | Cable loss (dB) | Reading of Power meter (dBm) | Corrected reading (dBm) | Limit (dBm) |
|---------|-----------------|------------------------------|-------------------------|-------------|
| 1       | 1.2             | 3.88                         | 5.08                    | 30          |
| 6       | 1.2             | 4.54                         | 5.74                    | 30          |
| 11      | 1.2             | 3.32                         | 4.52                    | 30          |

**Remark: Corrected reading = Reading of Power meter + cable loss**

For Bluetooth

| Channel | Cable loss (dB) | Reading of Power meter (dBm) | Corrected reading (dBm) | Limit (dBm) |
|---------|-----------------|------------------------------|-------------------------|-------------|
| 0       | 1.2             | -1.55                        | -0.35                   | 30          |
| 39      | 1.2             | -2.01                        | -0.81                   | 30          |
| 78      | 1.2             | -2.08                        | -0.88                   | 30          |

**Remark: Corrected reading = Reading of Power meter + cable loss**

For that the EUT supports the Bluetooth and 802.11b (or 802.11g) work simultaneously, the maximum peak output power can be:

**Maximum reading of Bluetooth + Maximum reading of (802.11b or g) = (-0.35dBm) plus (6.86dBm)  
= 0.92mW + 4.85mW = 5.77mW = 7.62dBm**

#### 4.5 Measurement uncertainty

The measurement uncertainty is  $\pm 1$ dB.

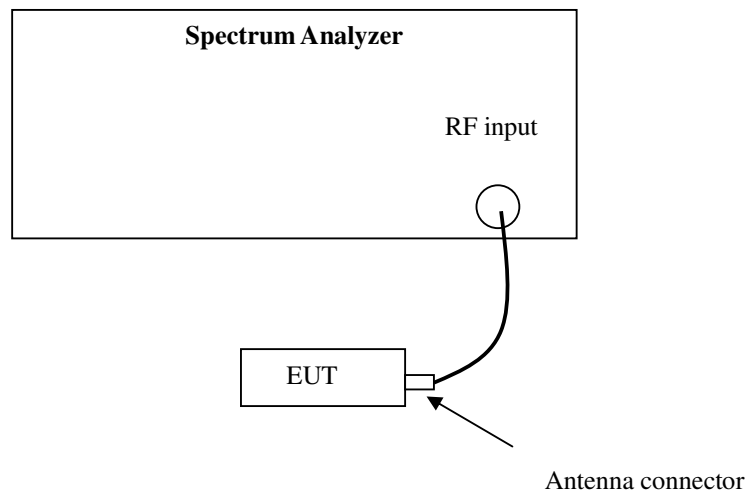
## 5. Power spectrum density

Test result: Pass

### 5.1 Test limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

### 5.2 Test Configuration



### 5.3 Test procedure and test setup

The power output per FCC §15.247(e) was measured using the Spectrum Analyzer with the resolutions bandwidth set at 3kHz, the video bandwidth set at 10kHz. The test was performed at 3 channels (lowest, middle and highest channel).

#### 5.4 Test Protocol

Temperature : 22 °C  
Relative Humidity : 43 %

For 802.11.b

| Channel | Cable loss (dB) | Corrected Reading of receiver (dBm/3kHz) | Limit (dBm/3kHz) |
|---------|-----------------|------------------------------------------|------------------|
| 1       | 1.2             | -5.86                                    | $\leq 8$         |
| 6       | 1.2             | -4.61                                    | $\leq 8$         |
| 11      | 1.2             | -2.06                                    | $\leq 8$         |

For 802.11.g

| Channel | Cable loss (dB) | Corrected Reading of receiver (dBm/3kHz) | Limit (dBm/3kHz) |
|---------|-----------------|------------------------------------------|------------------|
| 1       | 1.2             | -20.93                                   | $\leq 8$         |
| 6       | 1.2             | -21.44                                   | $\leq 8$         |
| 11      | 1.2             | -21.21                                   | $\leq 8$         |

#### 5.5 Measurement uncertainty

The measurement uncertainty is  $\pm 1$ dB/3kHz.

## 6. Spurious emission

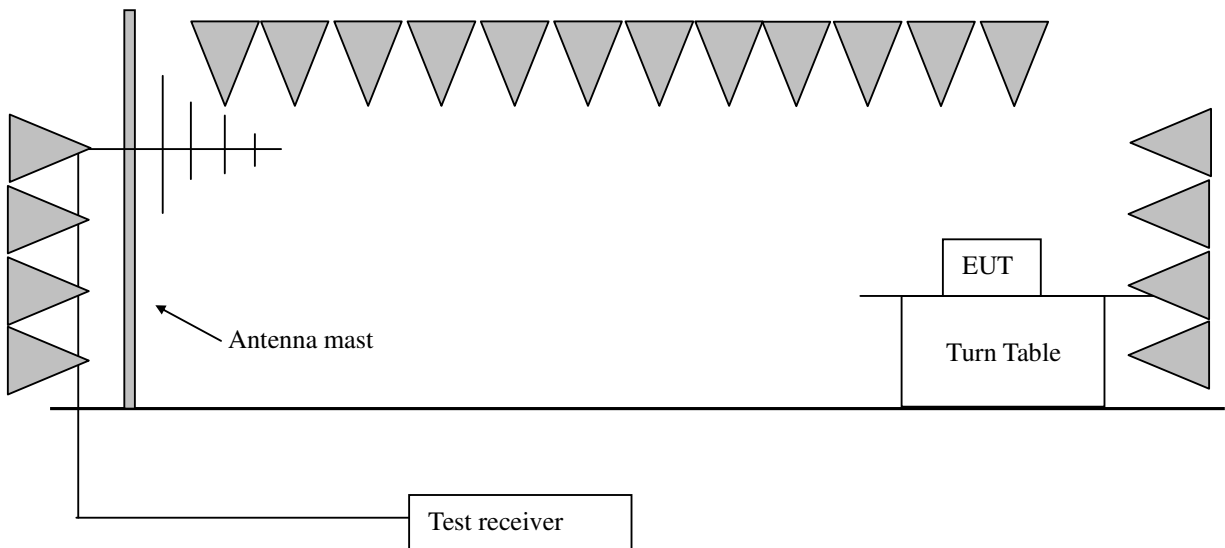
Test result: PASS

### 6.1 Test limit

The spurious emission shall test through the 10th harmonic or to 40GHz, whichever is lower. It must comply with the radiated emission limits specified in §15.209(a) showed as below:

| Frequency (MHz) | Field Strength (dBuV/m) | Measurement Distance (m) |
|-----------------|-------------------------|--------------------------|
| 30 - 88         | 40.0                    | 3                        |
| 88 - 216        | 43.5                    | 3                        |
| 216 - 960       | 46.0                    | 3                        |
| Above 960       | 54.0                    | 3                        |

### 6.2 Test Configuration



### 6.3 Test procedure and test setup

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, the pre-amplifier is equipped just at the output terminal of the antenna.

The EUT and simulators were placed on a 0.8m high wooden turntable above the horizontal metal ground plane. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

## 6.4 Test protocol

### 802.11b

Spurious emission for QP test below 1GHz, highest reading related to the limit

| Antenna | Frequency (MHz) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|---------|-----------------|-----------------------|----------------------------|----------------|-------------|
| H       | 181.62          | 8.00                  | 39.60                      | 43.50          | 3.90        |
| H       | 206.89          | 8.70                  | 37.00                      | 43.50          | 6.50        |
| H       | 265.21          | 11.00                 | 41.80                      | 46.00          | 4.20        |
| V       | 31.94           | 18.90                 | 37.00                      | 40.00          | 3.00        |
| V       | 49.43           | 8.50                  | 35.80                      | 40.00          | 4.20        |
| V       | 620.94          | 19.90                 | 43.40                      | 46.00          | 2.60        |

Remark: 1. Correct Factor = Antenna Factor + Cable Loss  
 2. Corrected Reading = Receiver Reading + Correct Factor  
 3. Margin = limit - Corrected Reading  
 4. For more details, please refer to the test data.

Spurious emission for PK test above 1GHz, highest reading related to the limit

| Channel | Antenna | Frequency (MHz) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|---------|---------|-----------------|-----------------------|----------------------------|----------------|-------------|
| 1       | H       | 2412.08         | -2.10                 | 83.60                      | Fundamental    | /           |
| 1       | H       | 4824.53         | -0.90                 | 50.00                      | 74.00          | 24.00       |
| 1       | V       | 2412.08         | -2.10                 | 93.50                      | Fundamental    | /           |
| 1       | V       | 4824.53         | -0.90                 | 54.20                      | 74.00          | 19.80       |
| 6       | H       | 2437.25         | -2.10                 | 87.80                      | Fundamental    | /           |
| 6       | H       | 4874.73         | -0.90                 | 48.30                      | 74.00          | 25.70       |
| 6       | V       | 2437.25         | -2.10                 | 91.90                      | Fundamental    | /           |
| 6       | V       | 4874.73         | -0.90                 | 51.30                      | 74.00          | 22.70       |
| 11      | H       | 2462.61         | -2.10                 | 88.80                      | Fundamental    | /           |
| 11      | H       | 4924.84         | -0.90                 | 50.10                      | 74.00          | 23.90       |
| 11      | V       | 2462.61         | -2.10                 | 91.00                      | Fundamental    | /           |
| 11      | V       | 4924.84         | -0.90                 | 51.70                      | 74.00          | 22.30       |

Remark: 1. Correct Factor = Antenna Factor + Cable Loss - Gain of Preamplifier  
2. Corrected Reading = Receiver Reading + Correct Factor  
3. Margin = limit - Corrected Reading

Calculating the AV value of spurious emission according to the duty cycle

| Channel | Antenna | Frequency (MHz) | PK Reading (dBuV/m) | Correct Factor (dB) | Corrected Reading (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|---------|---------|-----------------|---------------------|---------------------|----------------------------|----------------|-------------|
| 1       | H       | 4824.53         | 50.00               | -1.51               | 48.49                      | 54.00          | 5.51        |
| 1       | V       | 4824.53         | 54.20               |                     | 52.69                      | 54.00          | 1.31        |
| 6       | H       | 4874.73         | 48.30               |                     | 46.79                      | 54.00          | 7.21        |
| 6       | V       | 4874.73         | 51.30               |                     | 49.79                      | 54.00          | 4.21        |
| 11      | H       | 4924.84         | 50.10               |                     | 48.59                      | 54.00          | 5.41        |
| 11      | V       | 4924.84         | 51.70               |                     | 50.19                      | 54.00          | 3.81        |

Remark: 1. Correct Factor =  $20\lg(\text{duty cycle}) = 20\lg(84\%) = -1.51$   
2. Corrected Reading = PK Reading + Correct Factor  
3. Margin = limit - Corrected Reading

**802.11g**

Spurious emission for QP test below 1GHz, highest reading related to the limit

| Antenna | Frequency (MHz) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|---------|-----------------|-----------------------|----------------------------|----------------|-------------|
| H       | 181.62          | 8.00                  | 41.10                      | 43.50          | 2.40        |
| H       | 265.21          | 11.00                 | 41.50                      | 46.00          | 4.50        |
| H       | 554.85          | 18.70                 | 42.80                      | 46.00          | 3.20        |
| V       | 31.94           | 18.90                 | 36.90                      | 40.00          | 3.10        |
| V       | 49.43           | 8.50                  | 35.70                      | 40.00          | 4.30        |
| V       | 620.94          | 19.90                 | 44.00                      | 46.00          | 2.00        |

Remark: 1. Correct Factor = Antenna Factor + Cable Loss  
 2. Corrected Reading = Receiver Reading + Correct Factor  
 3. Margin = limit - Corrected Reading  
 4. For more details, please refer to the test data.

Spurious emission for PK test above 1GHz, highest reading related to the limit

| Channel | Antenna | Frequency (MHz) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|---------|---------|-----------------|-----------------------|----------------------------|----------------|-------------|
| 1       | H       | 2412.93         | -2.10                 | 85.20                      | Fundamental    | /           |
| 1       | H       | 4824.56         | -0.90                 | 47.10                      | 74.00          | 26.90       |
| 1       | V       | 2412.93         | -2.10                 | 90.20                      | Fundamental    | /           |
| 1       | V       | 4824.56         | -0.90                 | 48.90                      | 74.00          | 25.10       |
| 6       | H       | 2437.93         | -2.10                 | 83.40                      | Fundamental    | /           |
| 6       | H       | 4875.82         | -0.90                 | 45.80                      | 74.00          | 28.20       |
| 6       | V       | 2437.93         | -2.10                 | 91.30                      | Fundamental    | /           |
| 6       | V       | 4875.82         | -0.90                 | 49.60                      | 74.00          | 24.40       |
| 11      | H       | 2462.09         | -2.10                 | 85.80                      | Fundamental    | /           |
| 11      | H       | 4924.47         | -0.90                 | 44.10                      | 74.00          | 29.90       |
| 11      | V       | 2462.09         | -2.10                 | 89.30                      | Fundamental    | /           |
| 11      | V       | 4924.47         | -0.90                 | 46.80                      | 74.00          | 27.20       |

Remark: 1. Correct Factor = Antenna Factor + Cable Loss - Gain of Preamplifier  
2. Corrected Reading = Receiver Reading + Correct Factor  
3. Margin = limit - Corrected Reading

Calculating the AV value of spurious emission according to the duty cycle

| Channel | Antenna | Frequency (MHz) | PK Reading (dBuV/m) | Correct Factor (dB) | Corrected Reading (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|---------|---------|-----------------|---------------------|---------------------|----------------------------|----------------|-------------|
| 1       | H       | 4824.56         | 47.10               | -6.74               | 40.36                      | 54.00          | 13.64       |
| 1       | V       | 4824.56         | 48.90               |                     | 42.16                      | 54.00          | 11.84       |
| 6       | H       | 4875.82         | 45.80               |                     | 39.06                      | 54.00          | 14.94       |
| 6       | V       | 4875.82         | 49.60               |                     | 42.86                      | 54.00          | 11.14       |
| 11      | H       | 4924.47         | 44.10               |                     | 37.36                      | 54.00          | 16.64       |
| 11      | V       | 4924.47         | 46.80               |                     | 40.06                      | 54.00          | 13.94       |

Remark: 1. Correct Factor =  $20\lg(\text{duty cycle}) = 20\lg(46\%) = -6.74$   
2. Corrected Reading = PK Reading + Correct Factor  
3. Margin = limit - Corrected Reading

***Bluetooth***

Spurious emission for QP test below 1GHz, highest reading related to the limit

| <b>Antenna</b> | <b>Frequency (MHz)</b> | <b>Correct Factor (dB/m)</b> | <b>Corrected Reading (dBuV/m)</b> | <b>Limit (dBuV/m)</b> | <b>Margin (dB)</b> |
|----------------|------------------------|------------------------------|-----------------------------------|-----------------------|--------------------|
| H              | 72.76                  | 8.40                         | 33.70                             | 40.00                 | 6.30               |
| H              | 265.21                 | 11.00                        | 42.60                             | 46.00                 | 3.40               |
| H              | 817.27                 | 23.20                        | 39.50                             | 46.00                 | 6.50               |
| V              | 37.78                  | 15.80                        | 37.80                             | 40.00                 | 2.20               |
| V              | 72.77                  | 8.40                         | 33.40                             | 40.00                 | 6.60               |
| V              | 797.84                 | 22.80                        | 40.80                             | 46.00                 | 5.20               |

Remark: 1. Correct Factor = Antenna Factor + Cable Loss  
 2. Corrected Reading = Receiver Reading + Correct Factor  
 3. Margin = limit - Corrected Reading  
 4. For more details, please refer to the test data.

Spurious emission for PK test above 1GHz, highest reading related to the limit

| Channel | Antenna | Frequency (MHz) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|---------|---------|-----------------|-----------------------|----------------------------|----------------|-------------|
| 0       | H       | 2402.85         | -2.10                 | 88.20                      | Fundamental    | /           |
| 0       | H       | 4806.03         | -0.90                 | 49.12                      | 74.00          | 24.88       |
| 0       | V       | 2402.85         | -2.10                 | 88.60                      | Fundamental    | /           |
| 0       | V       | 4806.03         | -0.90                 | 47.65                      | 74.00          | 26.35       |
| 39      | H       | 2441.98         | -2.10                 | 87.70                      | Fundamental    | /           |
| 39      | H       | 4883.53         | -0.90                 | 49.83                      | 74.00          | 24.17       |
| 39      | V       | 2441.98         | -2.10                 | 86.70                      | Fundamental    | /           |
| 39      | V       | 4883.53         | -0.90                 | 46.78                      | 74.00          | 27.22       |
| 78      | H       | 2480.97         | -2.10                 | 86.10                      | Fundamental    | /           |
| 78      | H       | 4962.59         | -0.90                 | 46.10                      | 74.00          | 27.90       |
| 78      | V       | 2480.97         | -2.10                 | 87.20                      | Fundamental    | /           |
| 78      | V       | 4962.59         | -0.90                 | 48.72                      | 74.00          | 25.28       |

Remark: 1. Correct Factor = Antenna Factor + Cable Loss - Gain of Preamplifier  
2. Corrected Reading = Receiver Reading + Correct Factor  
3. Margin = limit - Corrected Reading

Calculating the AV value of spurious emission according to the duty cycle

| Channel | Antenna | Frequency (MHz) | PK Reading (dBuV/m) | Correct Factor (dB) | Corrected Reading (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
|---------|---------|-----------------|---------------------|---------------------|----------------------------|----------------|-------------|
| 0       | H       | 4806.03         | 49.12               | -1.51               | 47.61                      | 54.00          | 6.39        |
| 0       | V       | 4806.03         | 47.65               |                     | 46.14                      | 54.00          | 7.86        |
| 39      | H       | 4883.53         | 49.83               |                     | 48.32                      | 54.00          | 5.68        |
| 39      | V       | 4883.53         | 46.78               |                     | 45.27                      | 54.00          | 8.73        |
| 78      | H       | 4962.59         | 46.10               |                     | 44.59                      | 54.00          | 9.41        |
| 78      | V       | 4962.59         | 48.72               |                     | 47.21                      | 54.00          | 6.79        |

Remark: 1. Correct Factor =  $20\lg(\text{duty cycle}) = 20\lg(84\%) = -1.51$   
2. Corrected Reading = PK Reading + Correct Factor  
3. Margin = limit - Corrected Reading

## **6.5 Measurement uncertainty**

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.

Measurement uncertainty of radiated emission is:  $\pm 5.31\text{dB}$

The measurement uncertainty is given with a confidence of 95%,  $k=2$ .

The measurement uncertainty is traceable to internal procedure TI-036.

## 7. Restrict band radiated emission

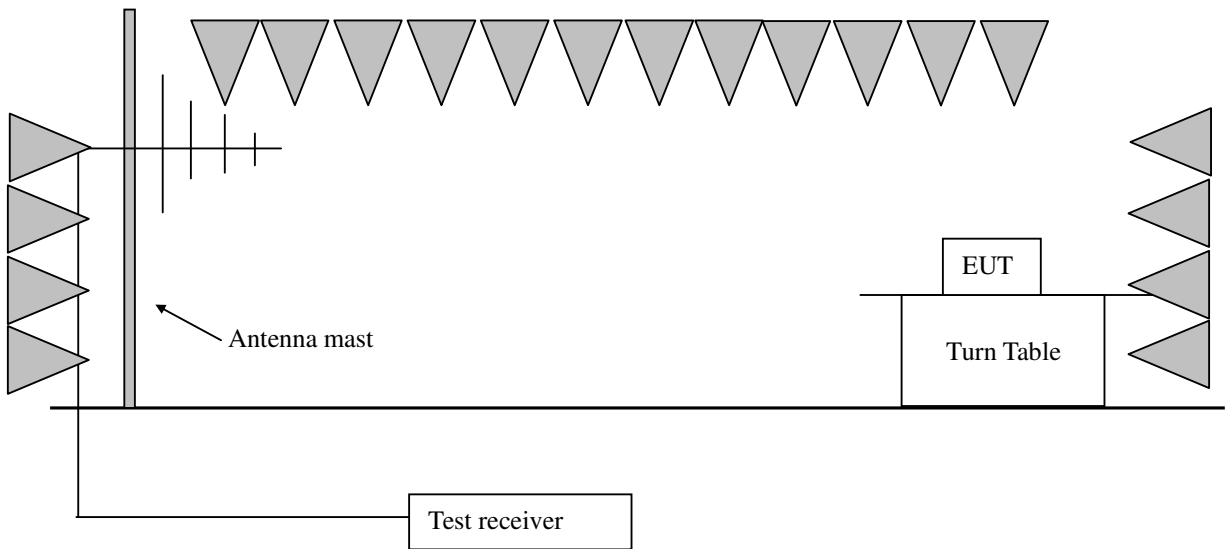
Test result: PASS

### 7.1 Test limit

The radiated 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) showed as below:

| Frequency<br>(MHz) | Field Strength<br>(dBuV/m) | Measurement Distance<br>(m) |
|--------------------|----------------------------|-----------------------------|
| 30 - 88            | 40.0                       | 3                           |
| 88 - 216           | 43.5                       | 3                           |
| 216 - 960          | 46.0                       | 3                           |
| Above 960          | 54.0                       | 3                           |

### 7.2 Test Configuration



### **7.3 Test procedure and test setup**

1. Perform an in-band field strength measurement of the fundamental emission using the RBW and detector function as the Spurious Radiated Emissions test procedure.
2. Choose a spectrum analyzer span that encompasses both the peak of the fundamental emission and the band-edge emission under investigation. Set the analyzer RBW to 1% of the total span (but never less than 30 kHz) with a video bandwidth equal to or greater than the RBW. Record the peak levels of the fundamental emission and the relevant band-edge emission (i.e., run several sweeps in peak hold mode). Observe the stored trace and measure the amplitude delta between the peak of the fundamental and the peak of the band-edge emission. This is not a field strength measurement; it is only a relative measurement to determine the amount by which the emission drops at the band-edge relative to the highest fundamental emission level.
3. Subtract the delta measured in step (2) from the field strengths measured in step (1). The resultant field strengths (CISPR QP, average, or peak, as appropriate) are then used to determine band-edge compliance as required by Section 15.205.
4. The above "delta" measurement technique may be used for measuring emissions that are up to two "standard" bandwidths away from the band-edge, where a "standard" bandwidth is the bandwidth specified by C63.4 for the frequency being measured. For example, for band-edge measurements in the restricted band that begins at 2483.5 MHz, C63.4 specifies a measurement bandwidth of at least 1 MHz. Therefore you may use the "delta" technique for measuring emissions up to 2 MHz removed from the band-edge.
5. Radiated emissions that are removed by more than two "standard" bandwidths must be measured as the above Spurious Radiated Emissions test procedure.

## 7.4 Test protocol

### 802.11b

Highest reading on restrict band 2310MHz ~ 2390MHz, test on the lowest channel

| Detector | Frequency (MHz) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit (dBuV/m) |
|----------|-----------------|-----------------------|----------------------------|----------------|
| PK       | 2350.37         | -2.10                 | 45.73                      | 74             |
| AV       | 2348.00         | -2.10                 | 30.14                      | 54             |

**Remark: Correct Factor = Antenna Factor + Cable Loss - Gain of Preamplifier**

Highest reading on restrict band 2483.5MHz ~ 2500MHz, test on the highest channel

| Detector | Frequency (MHz) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit (dBuV/m) |
|----------|-----------------|-----------------------|----------------------------|----------------|
| PK       | 2494.63         | -2.10                 | 44.34                      | 74             |
| AV       | 2498.11         | -2.10                 | 29.46                      | 54             |

**Remark: Correct Factor = Antenna Factor + Cable Loss - Gain of Preamplifier**

### 802.11g

Highest reading on restrict band 2310MHz ~ 2390MHz, test on the lowest channel

| Detector | Frequency (MHz) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit (dBuV/m) |
|----------|-----------------|-----------------------|----------------------------|----------------|
| PK       | 2348.24         | -2.10                 | 45.50                      | 74             |
| AV       | 2348.24         | -2.10                 | 29.38                      | 54             |

**Remark: Correct Factor = Antenna Factor + Cable Loss - Gain of Preamplifier**

Highest reading on restrict band 2483.5MHz ~ 2500MHz, test on the highest channel

| Detector | Frequency (MHz) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit (dBuV/m) |
|----------|-----------------|-----------------------|----------------------------|----------------|
| PK       | 2484.29         | -2.10                 | 44.86                      | 74             |
| AV       | 2483.57         | -2.10                 | 28.50                      | 54             |

**Remark: Correct Factor = Antenna Factor + Cable Loss - Gain of Preamplifier**

### Bluetooth

Highest reading on restrict band 2310MHz ~ 2390MHz, test on the lowest channel

| Detector | Frequency (MHz) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit (dBuV/m) |
|----------|-----------------|-----------------------|----------------------------|----------------|
| PK       | 2381.50         | -2.10                 | 49.84                      | 74             |
| AV       | 2382.14         | -2.10                 | 28.16                      | 54             |

**Remark: Correct Factor = Antenna Factor + Cable Loss - Gain of Preamplifier**

Highest reading on restrict band 2483.5MHz ~ 2500MHz, test on the highest channel

| Detector | Frequency (MHz) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit (dBuV/m) |
|----------|-----------------|-----------------------|----------------------------|----------------|
| PK       | 2483.57         | -2.10                 | 50.18                      | 74             |
| AV       | 2484.14         | -2.10                 | 30.44                      | 54             |

**Remark: Correct Factor = Antenna Factor + Cable Loss - Gain of Preamplifier**

### 7.5 Measurement uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.

Measurement uncertainty of radiated emission is:  $\pm 5.31$ dB

The measurement uncertainty is given with a confidence of 95%, k=2.

The measurement uncertainty is traceable to internal procedure TI-036.

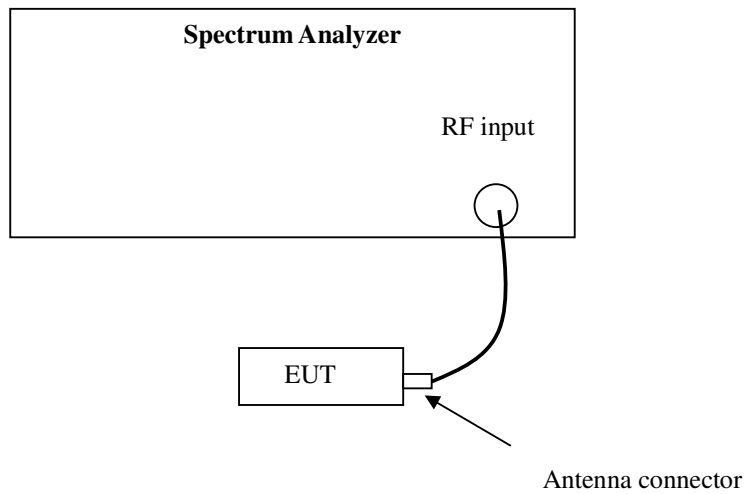
## 8. Emission outside the frequency Band

Test result: PASS

### 8.1 Limit

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 the 100 kHz bandwidth within the band that contains the highest level of the desired power.

### 8.2 Test Configuration



### 8.3 Test procedure and test setup

The Emission outside the frequency Band per FCC §15.247(d) is measured using the Spectrum Analyzer with the resolutions bandwidth set at 100kHz, the video bandwidth set at 300kHz, and the SPAN>>RBW.

## 8.4 Test protocol

### 802.11b

| Highest level outside the band edge (dBm)   | Highest emission within the band edge (dBm) | Delta (dBm) | Limit              |
|---------------------------------------------|---------------------------------------------|-------------|--------------------|
| -35.96<br>(frequency lower than 2.4GHz)     | -2.36                                       | 33.60       | $\geq 20\text{dB}$ |
| -36.53<br>(frequency higher than 2.4835GHz) | -1.71                                       | 34.82       | $\geq 20\text{dB}$ |

### 802.11g

| Highest level outside the band edge (dBm)   | Highest emission within the band edge (dBm) | Delta (dBm) | Limit              |
|---------------------------------------------|---------------------------------------------|-------------|--------------------|
| -36.64<br>(frequency lower than 2.4GHz)     | -5.54                                       | 31.10       | $\geq 20\text{dB}$ |
| -35.42<br>(frequency higher than 2.4835GHz) | -4.83                                       | 30.59       | $\geq 20\text{dB}$ |

### Bluetooth

| Highest level outside the band edge (dBm)   | Highest emission within the band edge (dBm) | Delta (dBm) | Limit              |
|---------------------------------------------|---------------------------------------------|-------------|--------------------|
| -42.41<br>(frequency lower than 2.4GHz)     | -3.03                                       | 39.38       | $\geq 20\text{dB}$ |
| -44.57<br>(frequency higher than 2.4835GHz) | -3.67                                       | 40.90       | $\geq 20\text{dB}$ |

## 8.5 Measurement uncertainty

The measurement uncertainty is  $\pm 1\text{dB}$ .

## 9. Power line conducted emission

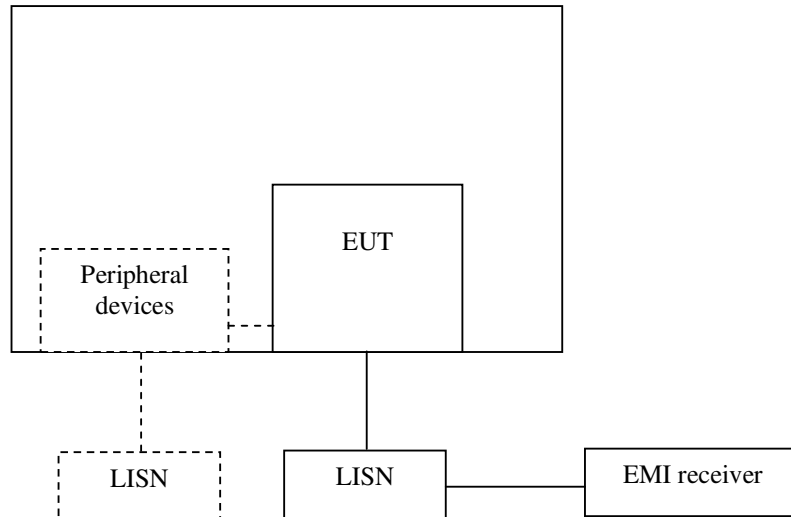
Test result: Pass

### 9.1 Limit

| Frequency of Emission (MHz) | Conducted Limit (dBuV) |            |
|-----------------------------|------------------------|------------|
|                             | QP                     | AV         |
| 0.15-0.5                    | 66 to 56*              | 56 to 46 * |
| 0.5-5                       | 56                     | 46         |
| 5-30                        | 60                     | 50         |

\* Decreases with the logarithm of the frequency.

### 9.2 Test configuration



☒ For table top equipment, wooden support is 0.8m height table

☐ For floor standing equipment, wooden support is 0.1m height rack.

### **9.3 Test procedure and test set up**

The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a  $50\Omega/50\mu\text{H}$  coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a  $50\Omega/50\mu\text{H}$  coupling impedance with  $50\Omega$  termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4 on conducted measurement.

The bandwidth of the test receiver is set at 9 kHz.

## 9.4 Test protocol

### 802.11 b/g

Power line: L

| Frequency                                                                                                              | Correct Factor<br>(dB) | Corrected Reading<br>(dBuV) |       | Limit<br>(dBuV) |       | Margin<br>(dB) |       |
|------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------|-------|-----------------|-------|----------------|-------|
|                                                                                                                        |                        | QP                          | AV    | QP              | AV    | QP             | AV    |
| 0.42                                                                                                                   | 3.00                   | 37.54                       | 24.35 | 57.40           | 47.40 | 19.86          | 23.05 |
| 0.72                                                                                                                   | 3.00                   | 33.62                       | 21.57 | 56.00           | 46.00 | 22.38          | 24.43 |
| 1.15                                                                                                                   | 3.00                   | 32.49                       | 18.82 | 56.00           | 46.00 | 23.51          | 27.18 |
| 6.87                                                                                                                   | 3.00                   | 29.71                       | 21.84 | 60.00           | 50.00 | 30.29          | 28.16 |
| 15.49                                                                                                                  | 3.00                   | 39.65                       | 31.25 | 60.00           | 50.00 | 20.35          | 18.75 |
| 22.89                                                                                                                  | 3.00                   | 38.27                       | 30.61 | 60.00           | 50.00 | 21.73          | 19.39 |
| Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB).<br>2. Margin (dB) = Limit - Corrected Reading. |                        |                             |       |                 |       |                |       |

Power line: N

| Frequency                                                                                                              | Correct Factor<br>(dB) | Corrected Reading<br>(dBuV) |       | Limit<br>(dBuV) |       | Margin<br>(dB) |       |
|------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------|-------|-----------------|-------|----------------|-------|
|                                                                                                                        |                        | QP                          | AV    | QP              | AV    | QP             | AV    |
| 0.42                                                                                                                   | 3.00                   | 39.18                       | 25.10 | 57.40           | 47.40 | 18.22          | 22.30 |
| 0.72                                                                                                                   | 3.00                   | 34.54                       | 20.58 | 56.00           | 46.00 | 21.46          | 25.42 |
| 1.15                                                                                                                   | 3.00                   | 32.69                       | 17.15 | 56.00           | 46.00 | 23.31          | 28.85 |
| 6.87                                                                                                                   | 3.00                   | 30.53                       | 21.92 | 60.00           | 50.00 | 29.47          | 28.08 |
| 15.49                                                                                                                  | 3.00                   | 40.81                       | 32.18 | 60.00           | 50.00 | 19.19          | 17.82 |
| 19.21                                                                                                                  | 3.00                   | 40.88                       | 33.11 | 60.00           | 50.00 | 19.12          | 16.89 |
| Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB).<br>2. Margin (dB) = Limit - Corrected Reading. |                        |                             |       |                 |       |                |       |

### Bluetooth

Power line: L

| Frequency                                                                                                              | Correct Factor (dB) | Corrected Reading (dBuV) |       | Limit (dBuV) |       | Margin (dB) |       |
|------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------------|-------|--------------|-------|-------------|-------|
|                                                                                                                        |                     | QP                       | AV    | QP           | AV    | QP          | AV    |
| 0.28                                                                                                                   | 3.00                | 36.22                    | 23.43 | 60.71        | 50.71 | 24.49       | 27.28 |
| 0.43                                                                                                                   | 3.00                | 40.91                    | 26.99 | 57.33        | 47.33 | 16.42       | 20.34 |
| 0.77                                                                                                                   | 3.00                | 31.09                    | 14.76 | 56.00        | 46.00 | 24.91       | 31.24 |
| 15.37                                                                                                                  | 3.00                | 40.72                    | 32.25 | 60.00        | 50.00 | 19.28       | 17.75 |
| 19.21                                                                                                                  | 3.00                | 40.76                    | 32.88 | 60.00        | 50.00 | 19.24       | 17.12 |
| 22.89                                                                                                                  | 3.00                | 38.98                    | 31.94 | 60.00        | 50.00 | 21.02       | 18.06 |
| Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB).<br>2. Margin (dB) = Limit - Corrected Reading. |                     |                          |       |              |       |             |       |

Power line: N

| Frequency                                                                                                              | Correct Factor (dB) | Corrected Reading (dBuV) |       | Limit (dBuV) |       | Margin (dB) |       |
|------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------------|-------|--------------|-------|-------------|-------|
|                                                                                                                        |                     | QP                       | AV    | QP           | AV    | QP          | AV    |
| 0.28                                                                                                                   | 3.00                | 32.88                    | 20.82 | 60.71        | 50.71 | 27.83       | 29.89 |
| 0.43                                                                                                                   | 3.00                | 39.49                    | 26.23 | 57.33        | 47.33 | 17.84       | 21.10 |
| 0.77                                                                                                                   | 3.00                | 30.70                    | 15.38 | 56.00        | 46.00 | 25.30       | 30.62 |
| 15.37                                                                                                                  | 3.00                | 39.66                    | 31.20 | 60.00        | 50.00 | 20.34       | 18.80 |
| 19.21                                                                                                                  | 3.00                | 39.38                    | 31.44 | 60.00        | 50.00 | 20.62       | 18.56 |
| 22.89                                                                                                                  | 3.00                | 37.90                    | 30.21 | 60.00        | 50.00 | 22.10       | 19.79 |
| Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB).<br>2. Margin (dB) = Limit - Corrected Reading. |                     |                          |       |              |       |             |       |

## 9.5 Measurement Uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.

Measurement uncertainty at mains terminal:  $\pm 1.99\text{dB}$

The measurement uncertainty is given with a confidence of 95%,  $k=2$ .

The measurement uncertainty is traceable to internal procedure TI-036.

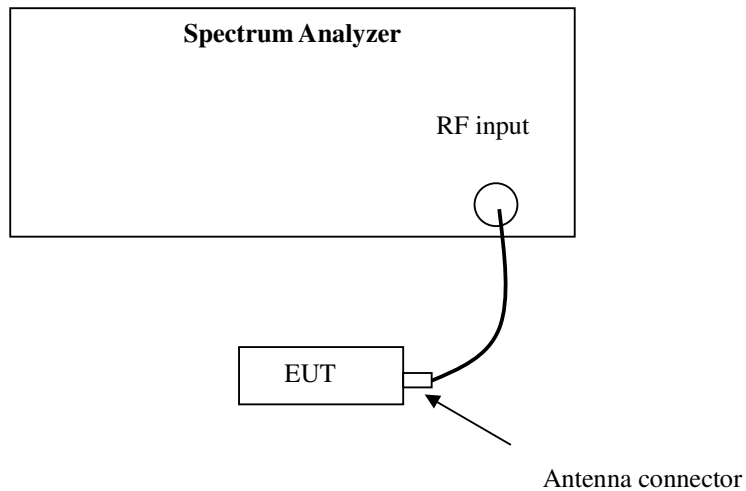
## 10. Channel Number of hopping system

Test result: Pass

### 10.1 Limit

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

### 10.2 Test Configuration



### 10.3 Test procedure and test setup

The channel number per FCC §15.247(a)(1)(iii) is measured using the Spectrum Analyzer with the resolutions bandwidth set at 1MHz, the video bandwidth set at 3MHz, and the SPAN>>RBW. The RF passband of the EUT was divided into 3 appropriate bands to test.

#### 10.4 Test protocol

| Channel Number | Limit     |
|----------------|-----------|
| 79             | $\geq 15$ |

#### 10.5 Measurement uncertainty

The measurement uncertainty is  $\pm 1\text{dB}$ .

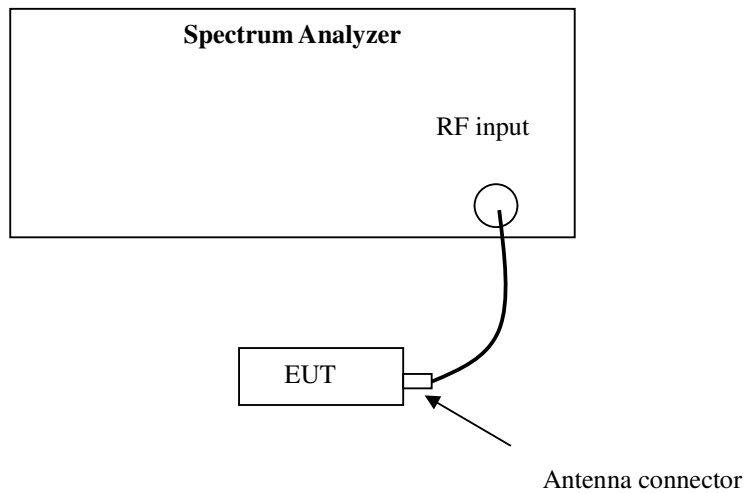
## 11. Average time of occupancy in any channel

Test result: Pass

### 11.1 Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### 11.2 Test Configuration



### 11.3 Test procedure and test setup

Average time of occupancy in any channel per FCC § 15.247(a)(1)(iii) is measured using the Spectrum Analyzer with the resolutions bandwidth set at 1MHz, the video bandwidth set at 3MHz, and the SPAN set to be 0Hz to test in time domain. The test is performed at a random channel.

#### 11.4 Test protocol

The system makes worst case 1600 hops per second or 1 time slot has a length of 625µs with 79 channels.  
**(Remark: there are 79 channels in all. So the observed period  $P = 0.4 * 79 = 31.6$  s.)**

Time of occupancy (dwell time) for DH1

Dwell time =  $0.42 \text{ ms} * 1600 * 1/2 * 1/s / 79 * 31.6\text{s} = 134 \text{ ms}$  (in a 31.6s period)

Time of occupancy (dwell time) for DH3

Dwell time =  $1.70 \text{ ms} * 1600 * 1/4 * 1/s / 79 * 31.6\text{s} = 272 \text{ ms}$  (in a 31.6s period)

Time of occupancy (dwell time) for DH5

Dwell time =  $2.85 \text{ ms} * 1600 * 1/6 * 1/s / 79 * 31.6\text{s} = 304 \text{ ms}$  (in a 31.6s period)

**Conclusion: All the dwell time is less than 0.4s.**

#### 11.5 Measurement uncertainty

The measurement uncertainty is  $\pm 10\mu\text{s}$ .

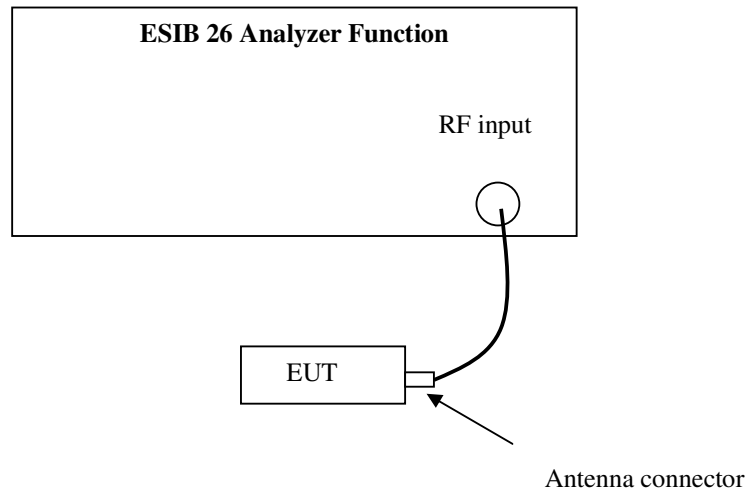
## 12. Hopping channel separation

Test result: PASS

### 12.1 Limit

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

### 12.2 Test Configuration



### 12.3 Test Procedure and test setup

Hopping Channel separation per FCC § 15.247(a)(1) is measured using the ESIB 26 analyzer function with the resolutions bandwidth set at 100kHz, the video bandwidth set at 300kHz, and the SPAN>>RBW. The test was performed at 3 channels (lowest, middle and highest channel).

#### 12.4 Test Protocol

Temperature : 22°C  
Relative Humidity : 43%

| Channel | Channel Frequency (GHz) | 20 dB Bandwidth (kHz) | Max. two-thirds of the 20 dB bandwidth (kHz) |
|---------|-------------------------|-----------------------|----------------------------------------------|
| 0       | 2.402                   | 1152                  | 768                                          |
| 39      | 2.441                   | 1152                  |                                              |
| 78      | 2.480                   | 1152                  |                                              |

| Channel | Channel Separation (kHz) | Max. two-thirds of the 20 dB bandwidth (kHz) | Margin (kHz) |
|---------|--------------------------|----------------------------------------------|--------------|
| 0       | 1002                     | 768                                          | 234          |
| 1       |                          |                                              |              |
| 39      | 1012                     | 768                                          | 244          |
| 40      |                          |                                              |              |
| 77      | 1002                     | 768                                          | 234          |
| 78      |                          |                                              |              |

**Remark: Margin = Max. 20 dB Bandwidth - Channel Separation**

#### 12.5 Measurement uncertainty

The measurement uncertainty is  $\pm 100\text{Hz}$ .

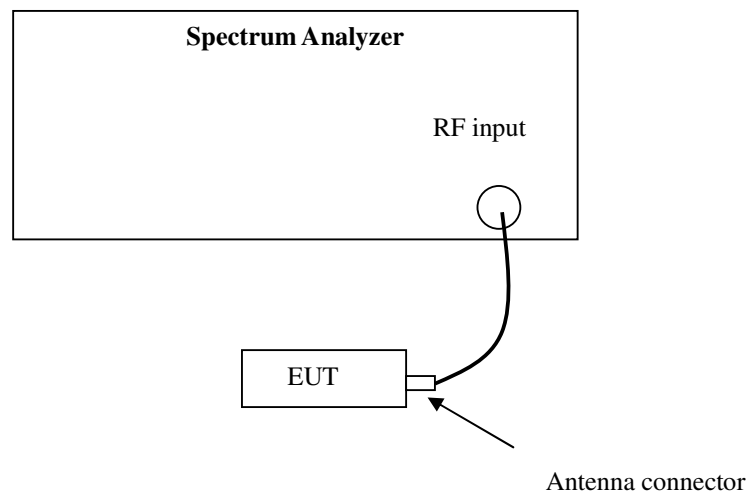
## 13. Occupied Bandwidth

Test Status: Tested

### 13.1 Test limit

None

### 13.2 Test Configuration



### 13.3 Test procedure and test setup

The occupied bandwidth per RSS-Gen Issue 2 Clause 4.6.1 was measured using the Spectrum Analyzer with the resolutions bandwidth set at 1MHz, the video bandwidth set at 3MHz. The test was performed at 3 channels (lowest, middle and highest channel).

### 13.4 Test protocol

Temperature : 22 °C  
Relative Humidity : 43 %

#### 802.11b

| Channel | Occupied Bandwidth (MHz) | Max. Value (MHz) |
|---------|--------------------------|------------------|
| 1       | 15.07                    | 15.15            |
| 6       | 15.07                    |                  |
| 11      | 15.15                    |                  |

Remark: "Max. Value" is the maximum test result of the three measured occupied bandwidth.

#### 802.11g

| Channel | Occupied Bandwidth (MHz) | Max. Value (MHz) |
|---------|--------------------------|------------------|
| 1       | 16.91                    | 16.91            |
| 6       | 16.91                    |                  |
| 11      | 16.91                    |                  |

Remark: "Max. Value" is the maximum test result of the three measured occupied bandwidth.

#### Bluetooth

| Channel | Occupied Bandwidth (MHz) | Max. Value (MHz) |
|---------|--------------------------|------------------|
| 0       | 3.23                     | 3.35             |
| 39      | 3.23                     |                  |
| 78      | 3.35                     |                  |

Remark: "Max. Value" is the maximum test result of the three measured occupied bandwidth.

### 13.5 Measurement uncertainty

The measurement uncertainty is  $\pm 1$ dB.

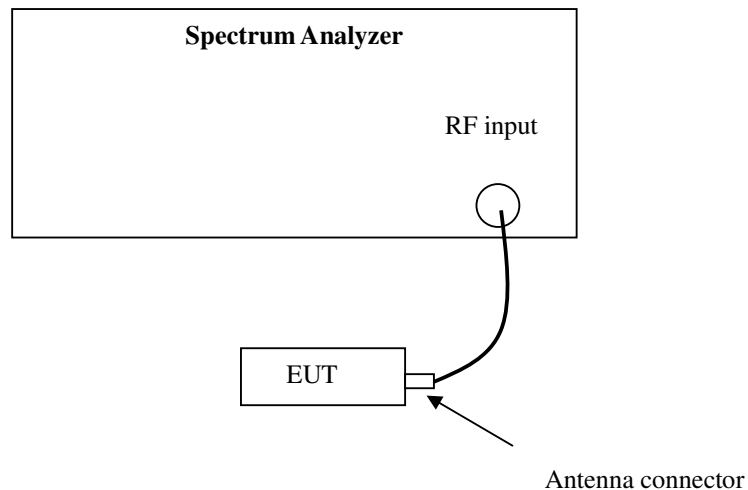
## **14. Spurious emission for receiver**

**Test result: PASS**

### **14.1 Test limit**

The spurious emission shall test through 3 times tuneable or local oscillator frequency whichever is the higher, without exceeding 40 GHz. If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2nW per any 4 kHz spurious frequency in the band 30-1000 MHz, or 5nW above 1 GHz.

### **14.2 Test Configuration**



### **14.3 Test procedure and test setup**

The receiver spurious emission per RSS-210 Issue 7 Clause 2.3 is measured using the Spectrum Analyzer with the resolution bandwidth / video bandwidth set at 5kHz for 30MHz ~ 1GHz and with the resolution bandwidth / video bandwidth set at 1MHz for higher than 1GHz.

#### 14.4 Test protocol

802.11b/g, highest reading related to the limit

| Detector | Frequency (MHz)    | Corrected Receiver Reading (dBm) | Limit (dBm) |
|----------|--------------------|----------------------------------|-------------|
| PK       | $\leq 1\text{GHz}$ | <70                              | -57         |
| PK       | >1GHz              | <60                              | -53         |

Note: For frequency higher than 1GHz, the PK detector is employed while the limit is AV limit.

Bluetooth, highest reading related to the limit

| Detector | Frequency (MHz)    | Corrected Receiver Reading (dBm) | Limit (dBm) |
|----------|--------------------|----------------------------------|-------------|
| PK       | $\leq 1\text{GHz}$ | <70                              | -57         |
| PK       | >1GHz              | <60                              | -53         |

Note: For frequency higher than 1GHz, the PK detector is employed while the limit is AV limit.

#### 14.5 Measurement uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.

Measurement uncertainty of radiated emission is:  $\pm 5.31\text{dB}$

The measurement uncertainty is given with a confidence of 95%,  $k=2$ .

The measurement uncertainty is traceable to internal procedure TI-036.