



# FCC Test Report

**Product Name: HUAWEI MediaPad 10 FHD**

**Model Number: S10-101w**

**Report No: SYBH(Z-RF)001072012-2001  
FCC ID: QISS10-101W**

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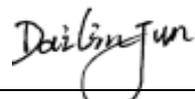


## Notice

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2. The laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements. The site recognition number is 97456.
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|                         |   |
|-------------------------|---|
| <b>REGULATION</b>       | <b>FCC CFR47 Part 2:2011: Subpart J;</b>  |
|                         | <b>FCC CFR47 Part 15:2011: Subpart C;</b> |
|                         | <b>ANSI C63.10</b>                        |
|                         |   |
|                         |   |
|                         |   |
|                         |   |
| <b>START OF TEST</b>    | <b>Jun.27, 2012</b>                       |
| <b>END OF TEST</b>      | <b>Jul.06, 2012</b>                       |
|                         |   |
| <b>Final Judgement:</b> | <b>Pass</b>                               |

Approved By Senior Engineer Jul.10, 2012 Dai Linjun   
 Date Name Signature

Reviewed By Jul.10, 2012 Cousy Xu   
 Date Name Signature

Operator Jul.10, 2012 Huang Qiuliang   
 Date Name Signature



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# 1 Summary

The table below summarizes the measurements and results for the EUT. Detailed results and descriptions are shown in the following pages.

Table 1 Summary of results

| <b>FCC Measurement Specification</b> | <b>Description</b>  | <b>Result</b> |
|--------------------------------------|---|---------------|
| 15.247 (a) (1)                       | Bandwidth measurement   | PASS          |
| 15.247 (a) (1)                       | Carrier frequency separation measurement                          | PASS          |
| 15.247 (a) (1) III                   | Number of hopping channel   | PASS          |
| 15.247 (a) (1) III                   | Time of occupancy   | PASS          |
| 15.247 (b) (1)                       | Peak output power   | PASS          |
| 15.247 (d)                           | Band edge compliance measurement                                  | PASS          |
| 15.247 (d)                           | Conducted RF spurious   | PASS          |
| 15.247 (d) / 15.205 & 15.209         | Radiated spurious emission & Radiated restricted band measurement | PASS          |
| 15.207                               | Conducted emission test for power port                            | PASS          |



## 2 Product Description

### 2.1 Production Information

#### 2.1.1 General Description

HUAWEI MediaPad 10 FHD (MediaPad 10 FHD for short) is a 10.1-inch tablet computer that supports Wi-Fi and BT data services, and has an ultra high definition IPS screen with a resolution of up to 1920 x 1200 pixels. MediaPad 10 FHD incorporates Huawei's own Hislicon quad core 1.5 GHz processor and is based on the Android 4.0.3 (Ice Cream Sandwich) operating system, enjoying both Google Android Play Store and Huawei's unique Cloud+ solutions.

MediaPad 10 FHD has a stylish exterior. It is light, slim, and easy to carry; its ultra-thin 8.8 mm design creating an outstanding hand held user experience. MediaPad 10 FHD comes with up to 2 GB of RAM, a 1.3-megapixel front camera, and an 8-megapixel rear camera that supports high definition video recording as well as an autofocus function. In addition, the Dolby surround sound technology employed by MediaPad 10 FHD produces superb audiovisual effects, making users feel as if they are actually there whether taking photos, playing games, watching high definition films, or listening to music.

**Note: Only the Bluetooth test data is included in this report.**

#### 2.1.2 Supporting Function and Service

The EUT support the Bluetooth's function and service as follows:

Table 2 Service and Test mode List

| Service Name   | Characteristic   | Corresponding Test Mode | Note |
|----------------|------------------|-------------------------|------|
| Data and Voice | Modulation: GFSK | TM1                     | /    |

### 2.2 Modification Information

For original equipment, following table is not application.

Table 3 Modification Information

| Model Number    | Board/Module | Original Version | New Version | Modify Information |
|-----------------|--------------|------------------|-------------|--------------------|
| Not applicable! |              |                  |             |                    |
|                 |              |                  |             |                    |
|                 |              |                  |             |                    |
|                 |              |                  |             |                    |



### **3 Test Site Description**

The test site of:

***Huawei Technologies Co. Ltd.  
P.O. Box 518129  
Huawei base, bantian,  
Longgang District, Shenzhen, China***

### **4 General Setup Description**

The Bluetooth hopping frequency system of EUT can Support 2.4GHz Band. To comply with FCC regulation 47CFR part15 subpart C, we set the EUT as in the following test mode to do all compliance tests.

**Bluetooth MODE:**

**TM1:** GFSK Modulation



## 5 Product Description

### 5.1 Technical Characteristics

#### 5.1.1 Frequency Range

Table 4 Frequency Range

|                        |   |                             |
|------------------------|---|-----------------------------|
| Uplink band:           | 2400 to 2483.5 MHz                      |                             |
| Downlink band:         | 2400 to 2483.5 MHz                      |                             |
| Hop frequency support: | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO |

#### 5.1.2 Channel Spacing / Separation

Table 5 Channel Spacing / Separation

|                     |       |
|---------------------|-------|
| Channel spacing:    | 1 MHz |
| Channel separation: | 1 MHz |

#### 5.1.3 Antenna Information

Table 6 Antenna Information

|                    |                       |
|--------------------|-----------------------|
| Type:              | Integrated / Internal |
| Maximum Gain(dBi): | 2.1                   |



## 5.1.4 Environmental Requirements

Table 7 Environmental Requirements

|                      |         |
|----------------------|---------|
| Minimum temperature: | - 10 °C |
| Maximum temperature: | + 55 °C |
| Relative Humidity:   | 5%-95%  |

## 5.1.5 Power Source

Table 8 Power Source

|                     |            |
|---------------------|------------|
| AC voltage nominal: | ~120V      |
| AC voltage range    | ~100V-240V |

## 5.1.6 Tune-up Procedure

According to CFR (FCC) part 2, subpart 2, section 2.1033(c) (9).

Please reference the document Tune-up Procedure in TCF.



## 5.2 EUT Identification List

### 5.2.1 Board Information

Table 9 Board Information

| HUAWEI MediaPad 10 FHD |                  |                  |
|------------------------|------------------|------------------|
| S10-101w               |                  |                  |
| Description            | Software Version | Hardware Version |
| Main Board             | V100R001C001B008 | SH2101UM         |

### 5.2.2 Sub-Assembly

| Name    | Description   |
|---------|---|
| Adapter | Model:HW-050200E3W<br>Input voltage: 100V~240V AC and 50/60 Hz,0.5A<br>Output voltage: +5V $\overline{\text{---}}$ 2A |
| Adapter | Model:HW-050200B3W<br>Input voltage: 100V~240V AC and 50/60 Hz,0.5A<br>Output voltage: +5V $\overline{\text{---}}$ 2A |
| Adapter | Model:HW-050200A3W<br>Input voltage: 100V~240V AC and 50/60 Hz,0.5A<br>Output voltage: +5V $\overline{\text{---}}$ 2A |
| Adapter | Model:HW-050200E3W<br>Input voltage: 100V~240V AC and 50/60 Hz,0.5A<br>Output voltage: +5V $\overline{\text{---}}$ 2A |
| Adapter | Model:HW-050200B3W<br>Input voltage: 100V~240V AC and 50/60 Hz,0.5A<br>Output voltage: +5V $\overline{\text{---}}$ 2A |
| Adapter | Model:HW-050200A3W<br>Input voltage: 100V~240V AC and 50/60 Hz,0.5A<br>Output voltage: +5V $\overline{\text{---}}$ 2A |

### 5.2.3 Battery Technical Data

| Name   | Manufacture                   | Description   |
|--------|-------------------------------|---|
| Li-ion | Huawei Technologies Co., Ltd. | Battery Model: HB3S1<br>Rated capacity: 6400 mAh<br>Nominal Voltage: $\overline{\text{---}}$ +3.7V<br>Charging Voltage: $\overline{\text{---}}$ +4.2V |



## 5.2.4 FCC Identification

**Grantee Code:** QIS  
**Product Code:** S10-101w  
**FCC Identification:** QISS10-101W



## 6 Main Test Instruments

Table 10 Main Test Equipments

| Equipment Description                           | Manufacturer | Model     | Serial Number | Calibrated until |
|---|--------------|-----------|---------------|------------------|
| Power supply                                    | KEITHLEY     | 2303      | 1288003       | Sept., 27, 2012  |
| Wireless Communication Test set                 | Agilent      | N4010A    | MY49081592    | Nov., 26, 2012   |
| Spectrum Analyzer                               | Agilent      | E4440A    | MY48250119    | Jul., 17, 2012   |
| Signal Analyzer                                 | R&S          | FSQ31     | 200021        | Sept., 27, 2012  |
| Spectrum Analyzer                               | Agilent      | N9030A    | MY49431698    | Oct., 16, 2012   |
| Temperature Chamber                             | WEISS        | WKL64     | 24600294      | Feb., 13, 2013   |
| Signal generator                                | Agilent      | E8257D    | MY49281095    | Jul., 09, 2012   |
| Test receiver                                   | R&S          | ESU26     | 100150        | May., 29, 013    |
| Spectrum analyzer                               | R&S          | FSU3      | 200474        | Mar., 05, 2013   |
| Spectrum analyzer                               | R&S          | FSU43     | 100144        | Mar., 05, 2013   |
| Double-Ridged Waveguide Horn Antenna (1G~18GHz) | R&S          | HF907     | 100304        | Apr., 05, 2013   |
| Double-Ridged Waveguide Horn Antenna (1G~18GHz) | R&S          | HF907     | 100391        | Apr., 05, 2013   |
| Trilog Broadband Antenna (30M~3GHz)             | SCHWARZBECK  | VULB 9163 | 9163-521      | Jul., 07, 2013   |
| Pyramidal Horn Antenna(26GHz-40GHz)             | ETS-Lindgren | 3160-10   | 00123940      | Feb., 27, 2013   |
| Pyramidal Horn Antenna(18GHz-26.5GHz)           | ETS-Lindgren | 3160-09   | 00125912      | Feb.,27, 2013    |



## 7 Transmitter Measurements

### 7.1 Bandwidth measurement

#### 7.1.1 Test Conditions

Table 11 Test Conditions

|                      |                             |
|----------------------|-----------------------------|
| Preconditioning:     | 0.5 hour                    |
| Measured at:         | Antenna connector           |
| Ambient temperature: | 25 °C                       |
| Relative humidity:   | 55%                         |
| Test Configurations: | TM1 at channel No.0, 40, 78 |

#### 7.1.2 Test Specifications and Limits

##### 7.1.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (1) and DA 00-705

##### 7.1.2.2 Supporting Standards

Table 12 Supporting Standards:

|                  |  |
|------------------|--|
| ANSI C63.10-2009 | American National Standard for Testing Unlicensed Wireless Devices |
|------------------|--|

##### 7.1.2.3 Limits

Not Applicable.

#### 7.1.3 Test Method and Setup

- (a) Connect EUT test port to universal communication tester.
- (b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function, then set the measuring frequency number, finally test the bandwidth with universal communication tester.

## Test setup

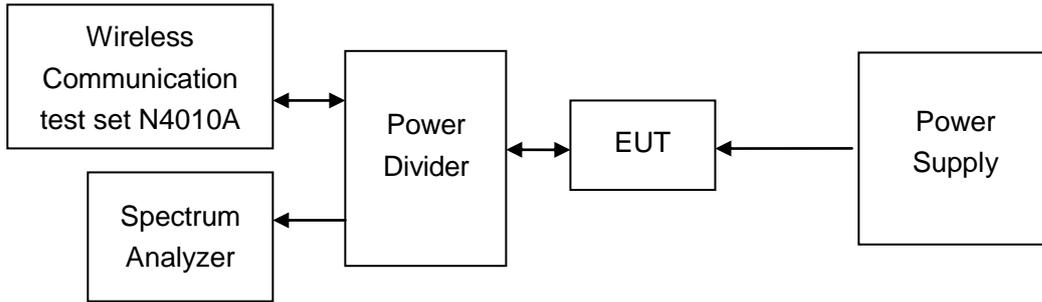


Figure 1. Test Set-up

### 7.1.4 Measurement Results

Table 13 Measurement Results

| Channel Position | Channel Number | Frequency [MHz] | Bandwidth Type | Measured Bandwidth [MHz] | Result |
|------------------|----------------|-----------------|----------------|--------------------------|--------|
| L                | 0              | 2402            | 20dB           | 0.939                    | Pass   |
|                  |                |                 | 99%            | 0.863                    | Pass   |
| M                | 40             | 2442            | 20dB           | 1.022                    | Pass   |
|                  |                |                 | 99%            | 0.878                    | Pass   |
| H                | 78             | 2480            | 20dB           | 1.012                    | Pass   |
|                  |                |                 | 99%            | 0.867                    | Pass   |

### 7.1.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
 For the measurement results refer to appendix A.

## 7.2 Carrier frequency separation measurement

### 7.2.1 Test Conditions

Table 14 Test Conditions

|                      |                              |
|----------------------|------------------------------|
| Preconditioning:     | 0.5 hour                     |
| Measured at:         | Antenna connector            |
| Ambient temperature: | 25 °C                        |
| Relative humidity:   | 55%                          |
| Test Configurations: | TM1 at channel No.39, 40, 41 |

### 7.2.2 Test Specifications and Limits

#### 7.2.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (1) and DA 00-705

#### 7.2.2.2 Supporting Standards

Table 15 Supporting Standards:

|                  |  |
|------------------|--|
| ANSI C63.10-2009 | American National Standard for Testing Unlicensed Wireless Devices |
|------------------|--|

#### 7.2.2.3 Limits

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.

Table 16 Limits

|             |   |
|-------------|---|
| Regulation: | $\geq 0.025$ or $2/3$ of the 20 dB bandwidth      |
| Limit:      | $\geq 2/3 \times 1.022\text{M} = 0.681\text{MHz}$ |

### 7.2.3 Test Method and Setup

- (a) Connect EUT test port to spectrum analyzer and universal communication tester.
- (b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function, then set the measured frequency number to two adjacent channels separately and test the carrier frequency separation with spectrum analyzer.

## Test setup

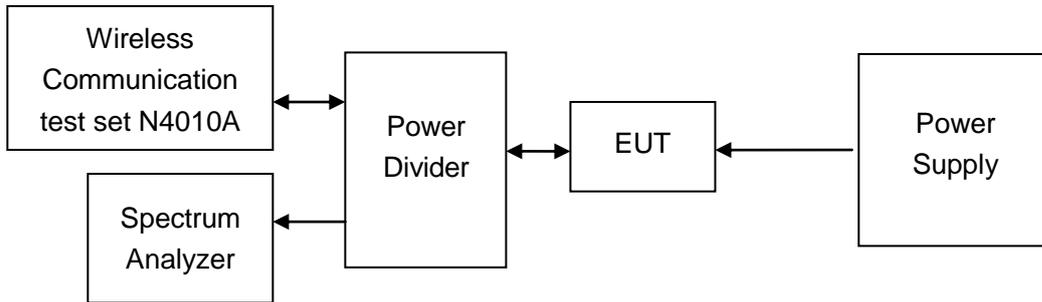


Figure 2. Test Set-up

## 7.2.4 Measurement Results

Table 17 Measurement Results

| Channel No. | Frequency [GHz] | Channel No. | Frequency [GHz] | Measured frequency separation [MHz] | Limit [MHz] | Result |
|-------------|-----------------|-------------|-----------------|-------------------------------------|-------------|--------|
| 40          | 2.442           | 39          | 2.441           | 1.1                                 | ≥0.681      | Pass   |
| 40          | 2.442           | 41          | 2.443           | 1.0                                 | ≥0.681      | Pass   |

## 7.2.5 Conclusion

The equipment **PASSED** the requirement of this clause.

For the measurement results refer to appendix B.



## 7.3 Number of hopping channel

### 7.3.1 Test Conditions

Table 18 Test Conditions

|                      |                                |
|----------------------|--------------------------------|
| Preconditioning:     | 0.5 hour                       |
| Measured at:         | Antenna connector              |
| Ambient temperature: | 25 °C                          |
| Relative humidity:   | 55%                            |
| Test Configurations: | TM1 at hopping frequency state |

### 7.3.2 Test Specifications and Limits

#### 7.3.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (1) iii and DA 00-705

#### 7.3.2.2 Supporting Standards

Table 19 Supporting Standards:

|                  |  |
|------------------|--|
| ANSI C63.10-2009 | American National Standard for Testing Unlicensed Wireless Devices |
|------------------|--|

#### 7.3.2.3 Limits

Number of hopping channel should be compliance with the requirements in part15.247 (a) (1) iii.

Table 20 Limits

|        |                                     |
|--------|-------------------------------------|
| Limits | $\geq 15$ hopping frequency channel |
|--------|-------------------------------------|

### 7.3.3 Test Method and Setup

- (a) Connect EUT test port to spectrum analyzer and universal communication tester.
- (b) Set the EUT to transmit maximum output power at 2.4GHz and switch on frequency hopping function, then set enough count time (larger than 5000 times) to get all the hopping frequency channel displayed on the screen of spectrum analyzer.
- (c) Count the quantity of peaks to get the number of hopping channels.

## Test setup

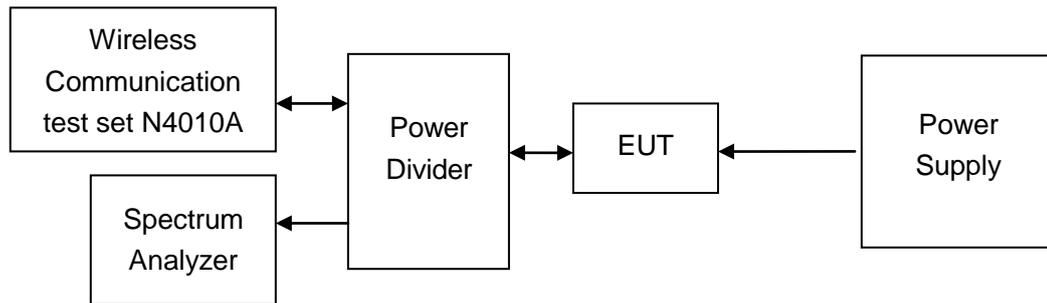


Figure 3. Test Set-up

## 7.3.4 Measurement Results

Table 21 Measurement Results

| Measured frequency range [MHz] | Channel No. range | Measured Channel No. | Limit     | Result |
|--------------------------------|-------------------|----------------------|-----------|--------|
| 2400 to 2483.5                 | 0-78              | 79                   | $\geq 15$ | Pass   |

## 7.3.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
 For the measurement results refer to appendix C.



## 7.4 Time of occupancy

### 7.4.1 Test Conditions

Table 22 Test Conditions

|                      |                                |
|----------------------|--------------------------------|
| Preconditioning:     | 0.5 hour                       |
| Measured at:         | Antenna connector              |
| Ambient temperature: | 25°C                           |
| Relative humidity:   | 55%                            |
| Test Configurations: | TM1 at hopping frequency state |

### 7.4.2 Test Specifications and Limits

#### 7.4.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (1) iii and DA 00-705

#### 7.4.2.2 Supporting Standards

Table 23 Supporting Standards:

|                  |  |
|------------------|--|
| ANSI C63.10-2009 | American National Standard for Testing Unlicensed Wireless Devices |
|------------------|--|

#### 7.4.2.3 Limits

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.

Table 24 Limits

|                              |        |
|------------------------------|--------|
| Limits for time of occupancy | ≤ 0.4s |
|------------------------------|--------|

### 7.4.3 Test Method and Setup

- (a) Connect EUT test port to spectrum analyzer and universal communication tester.
- (b) Set the EUT to transmit maximum output power at 2.4GHz and switch on frequency hopping function.

- (c) Set the span of spectrum analyzer to 0 Hz, and set the resolution bandwidth to 1 MHz and the video bandwidth to 1 MHz, then get the time domain measured diagram. Set sweep time to 2 times of one burst occupancy time, and measure the time of occupancy of one burst.
- (d) Set the resolution bandwidth to 1 MHz and the video bandwidth to 3 MHz, and set the sweep time to a period (0.4 seconds multiplied by the number of hopping channels employed), and count the number of the bursts.
- (e) Calculate the time of occupancy in a period with time occupancy of a burst and quantity of bursts.

**Test setup**

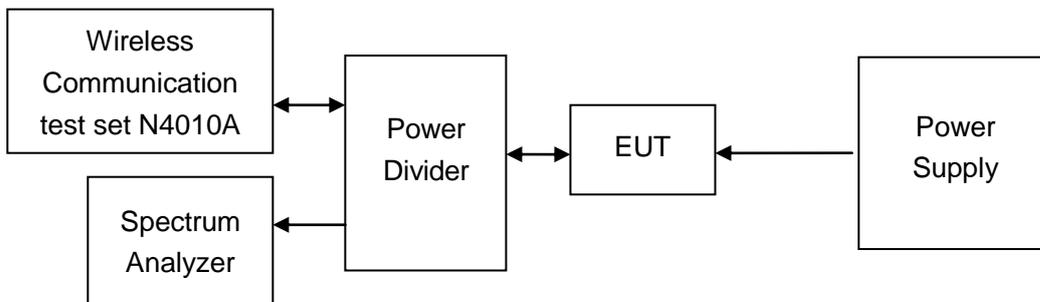


Figure 4. Test Set-up

**7.4.4 Measurement Results**

Table 25 Measurement Results

| 0123Time of Single Slot [ms] | Numbers of slots in a period | Time of occupied in a period [s] | Limit [s] | Result |
|------------------------------|------------------------------|----------------------------------|-----------|--------|
| 2.9                          | 106.7                        | 0.30943                          | ≤ 0.4     | Pass   |

Note: The result is measured at DH5 mode in GFSK modulation, which has the longest time in one transmission burst.

**7.4.5 Conclusion**

The equipment **PASSED** the requirement of this clause.  
 For the measurement results refer to appendix D.



## 7.5 Peak output power

### 7.5.1 Test Conditions

Table 26 Test Conditions

|                      |                             |
|----------------------|-----------------------------|
| Preconditioning:     | 0.5 hour                    |
| Measured at:         | Antenna connector           |
| Ambient temperature: | 25 °C                       |
| Relative humidity:   | 55%                         |
| Test Configurations: | TM1 at channel No.0, 40, 78 |

### 7.5.2 Test Specifications and Limits

#### 7.5.2.1 Specification

CFR 47 (FCC) part 15.247 (b) (1) and DA 00-705

#### 7.5.2.2 Supporting Standards

Table 27 Supporting Standards:

|                  |  |
|------------------|--|
| ANSI C63.10-2009 | American National Standard for Testing Unlicensed Wireless Devices |
|------------------|--|

#### 7.5.2.3 Limits

Comply with part 15.247 (b) (1), 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 watt.

Table 28 Limits

|  |                  |
|--|------------------|
| 2.4GHz and 5.8GHz hopping frequency system | 1 Watt (=30 dBm) |
|--|------------------|

### 7.5.3 Test Method and Setup

- (a) Connect EUT test port to universal communication tester.
- (b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
- (c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted output power separately.

## Test setup

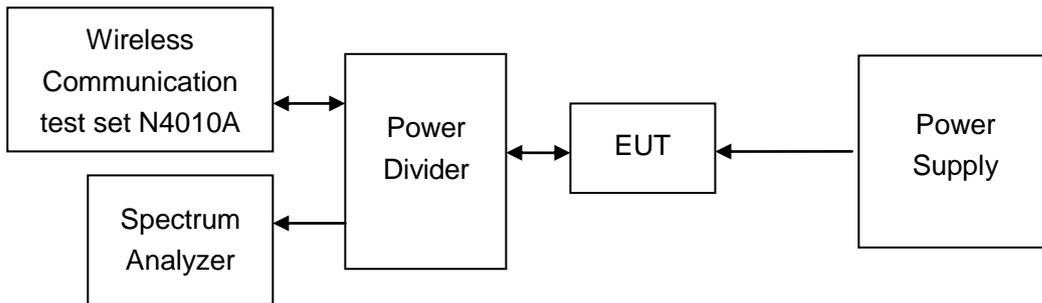


Figure 5. Test Set-up

## 7.5.4 Measurement Results

Table 29 Measurement Results

| Channel | Channel No. | Center Freq.[MHz] | Meas. Level (Cond.) [dBm] | Limit [dBm] | Result |
|---------|-------------|-------------------|---------------------------|-------------|--------|
| L       | 0           | 2402              | 8.02                      | < 30        | Pass   |
| M       | 40          | 2442              | 9.64                      | < 30        | Pass   |
| H       | 78          | 2480              | 9.58                      | < 30        | Pass   |

## 7.5.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
 For the measurement results refer to appendix E.



## 7.6 Band edge spurious emission

### 7.6.1 Test Conditions

Table 30 Test Conditions

|                      |  |
|----------------------|--|
| Preconditioning:     | 0.5 hour   |
| Measured at:         | Antenna connector                                    |
| Ambient temperature: | 25°C   |
| Relative humidity:   | 55%  |
| Test Configurations: | TM1 at channel No. 0, 78 and frequency hopping state |

### 7.6.2 Test Specifications and Limits

#### 7.6.2.1 Specification

CFR 47 (FCC) part 15.247 (d) and DA 00-705

#### 7.6.2.2 Supporting Standards

Table 31 Supporting Standards:

|                  |  |
|------------------|--|
| ANSI C63.10-2009 | American National Standard for Testing Unlicensed Wireless Devices |
|------------------|--|

#### 7.6.2.3 Limits

Comply with part 15.247 (d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

Table 32. Limits

|                     |               |
|---------------------|---------------|
| Band edge spurious: | 20 dBc/100kHz |
|---------------------|---------------|

### 7.6.3 Test Method and Setup

(a) Connect EUT test port to spectrum analyzer and universal communication tester

- (b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
- (c) Then set the EUT to transmit at high, low frequency and measure the conducted band edge spurious separately.
- (d) Switch on the frequency hopping function, and repeat above measurement.

**Test setup**

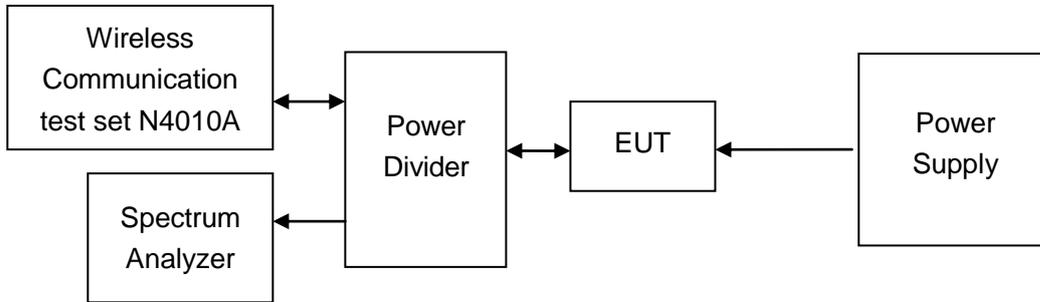


Figure 6. Test Set-up

**7.6.4 Measurement Results**

Table 33 Measurement Results for Band Edge immediately outside the 2.4GHz Band

|           | Channel No. | Carrier Frequency [MHz] | Carrier Power [dBm] | Frequency Hopping | Max. Spurious Level [dBm] | Limit [dBm] | Result |
|-----------|-------------|-------------------------|---------------------|-------------------|---------------------------|-------------|--------|
| Low Edge  | 0           | 2402                    | 7.72                | Off               | -54.24                    | -12.28      | Pass   |
|           | -           | -                       | 7.47                | On                | -54.65                    | -12.53      | Pass   |
| High Edge | 78          | 2480                    | 9.25                | Off               | -52.80                    | -10.75      | Pass   |
|           | -           | -                       | 8.78                | On                | -53.59                    | -11.22      | Pass   |

**7.6.5 Conclusion**

The equipment **PASSED** the requirement of this clause.  
 For the measurement results refer to appendix F.



## 7.7 Conducted RF Spurious

### 7.7.1 Test Conditions

Table 34 Test Conditions

|                      |                             |
|----------------------|-----------------------------|
| Preconditioning:     | 0.5 hour                    |
| Measured at:         | Antenna connector           |
| Ambient temperature: | 25 °C                       |
| Relative humidity:   | 55%                         |
| Test Configurations: | TM1 at channel No.0, 40, 78 |

### 7.7.2 Test Specifications and Limits

#### 7.7.2.1 Specification

CFR 47 (FCC) part 15.247 (d) and DA 00-705

#### 7.7.2.2 Supporting Standards

Table 35 Supporting Standards:

|                  |  |
|------------------|--|
| ANSI C63.10-2009 | American National Standard for Testing Unlicensed Wireless Devices |
|------------------|--|

#### 7.7.2.3 Limits

Comply with part 15.247 (d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required.

Table 36 Limits

|                     |               |
|---------------------|---------------|
| Band edge spurious: | 20 dBc/100kHz |
|---------------------|---------------|

### 7.7.3 Test Method and Setup

(a) Connect EUT test port to spectrum analyzer and universal communication tester

- (b) Set the EUT to transmit maximum output power at 2.4GHz and switch off frequency hopping function.
- (c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted band edge spurious separately.
- (d) Switch on the frequency hopping function, and repeat the above measurement.

### Test setup

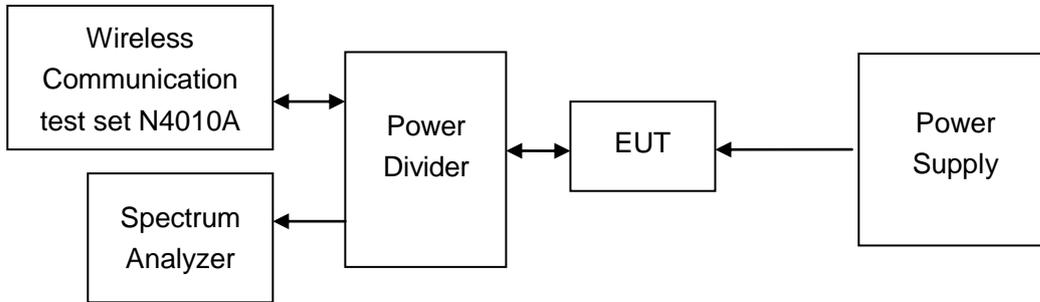


Figure 7. Test Set-up

### 7.7.4 Measurement Results

Table 37 Measurement Results

| Test Frequency Range | Channel No. | Carrier Frequency [MHz] | Carrier Power [dBm] | Frequency Hopping | Max. Spurious Level [dBm] | Limit [dBm] | Result |
|----------------------|-------------|-------------------------|---------------------|-------------------|---------------------------|-------------|--------|
| 9kHz-25GHz           | 0           | 2402                    | 7.22                | Off               | -40.93                    | -12.78      | Pass   |
| 9kHz-25GHz           | 40          | 2442                    | 8.71                | Off               | -45.12                    | -11.29      | Pass   |
| 9kHz-25GHz           | 78          | 2480                    | 8.27                | Off               | -46.47                    | -11.73      | Pass   |

### 7.7.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
For the measurement results refer to appendix G.



## 7.8 Radiated spurious emission & spurious in restricted band

### 7.8.1 Test Conditions

Table 38 Test Conditions

|                      |                             |
|----------------------|-----------------------------|
| Preconditioning:     | 0.5 hour                    |
| Measured at:         | Enclosure                   |
| Ambient temperature: | 25 °C                       |
| Relative humidity:   | 55 %                        |
| Test Configurations: | TM1 at channel No.0, 40, 78 |

### 7.8.2 Test Specifications and Limits

#### 7.8.2.1 Specification

CFR 47 (FCC) part 15.247 (d), 15.205 & 15.209 and DA 00-705

#### 7.8.2.2 Supporting Standards

Table 39 Supporting Standards:

|                  |  |
|------------------|--|
| ANSI C63.10-2009 | American National Standard for Testing Unlicensed Wireless Devices |
|------------------|--|

#### 7.8.2.3 Limits

According to part 15.247 (d) / 15.205 & 15.209, all spurious emission in the frequency range from 30MHz to 10<sup>th</sup> harmonics of carrier frequency should be meet the requirement of following table.

Table 40 Limits

| Frequency (MHz) | Field Strength (μV/m) | Field Strength (dBμV/m) | Measurement Distance (meters) | Detector |
|-----------------|-----------------------|-------------------------|-------------------------------|----------|
| 30 - 88         | 100                   | 40                      | 3                             | QP       |
| 88 - 216        | 150                   | 43.5                    | 3                             | QP       |
| 216 - 960       | 200                   | 46                      | 3                             | QP       |
| 960 -1000       | 500                   | 54                      | 3                             | QP       |
| Above 1000      | 500                   | 54                      | 3                             | AV       |
| Above 1000      | 500                   | 74                      | 3                             | PK       |

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a) (see above table).

### 7.8.3 Test Method and Setup

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.10 (2009). The EUT was set-up on insulator 80cm above the Ground Plane. The set-up and test methods were according to ANSI C63.10:2009. The Radiated Disturbance measurements were made using a Rohde and Schwarz Test Receiver and control software.

A preliminary scan and a final scan of the emissions were made by using test script of software; the emissions were measured using a Quasi-Peak Detector below 1GHz, Peak Detector and AV detector above 1GHz. The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m, and the azimuth range of turntable was 0° to 360°. The receive antenna has two polarizations V and H.

A portable or small unlicensed wireless device shall be placed on a non-metallic test fixture or other nonmetallic support during testing. The supporting fixture shall permit orientation of the EUT in each of three orthogonal (x, y, z) axis positions such that emissions from the EUT are maximized.

The EUT communicates with the BTS simulator through Air interface. The EUT transmits maximum output power at 2.4GHz and switch off frequency hopping function.

Measurement bandwidth: 30 MHz - 1000 MHz: 120 kHz

Measurement bandwidth: 1000 MHz - 10<sup>th</sup> Carrier Frequency: 1 MHz

#### Test set up

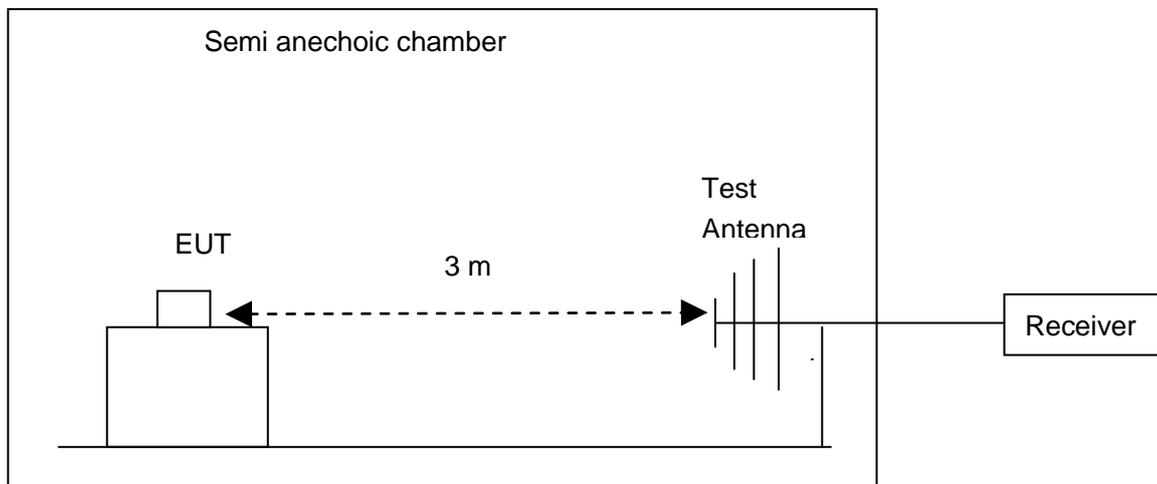


Figure 8. Test Set up

### 7.8.4 Measurement Results

Note 1: The following measurement results exceed the limit line is the carrier frequency.

Note 2: This test was carried out in all test modes, here only shows the worst test result.



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| Test Frequency Range | Channel No. | Carrier Frequency [MHz] | Measured            | Result |
|----------------------|-------------|-------------------------|---------------------|--------|
| 30MHz-26.5GHz        | 0           | 2402                    | Refer to Appendix H | Pass   |
| 30MHz-26.5GHz        | 40          | 2442                    | Refer to Appendix H | Pass   |
| 30MHz-26.5GHz        | 78          | 2480                    | Refer to Appendix H | Pass   |

### 7.8.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
For the measurement results refer to appendix H.



## 7.9 Conducted Emission at Power Port

### 7.9.1 Test Conditions

Table 41 Test Conditions

|                      |                       |
|----------------------|-----------------------|
| Preconditioning:     | 0.5 hour              |
| Measured at:         | Power port            |
| Ambient temperature: | 25°C                  |
| Relative humidity:   | 55 %                  |
| Test Configurations: | TM1 at channel No. 40 |

### 7.9.2 Test Specifications and Limits

#### 7.9.2.1 Specification

CFR 47 (FCC) part 15.207 and DA 00-705

#### 7.9.2.2 Supporting Standards

Table 42 Supporting Standards:

|                  |  |
|------------------|--|
| ANSI C63.10-2009 | American National Standard for Testing Unlicensed Wireless Devices |
|------------------|--|

#### 7.9.2.3 Limits

Compliance with part15.207, conducted emission must meet the requirement of following table.

Table 43 Limits

| Frequency of Emission (MHz) | Conducted Limit (dBµV) |            |
|-----------------------------|------------------------|------------|
|                             | Quasi-peak             | Average    |
| 0.15-0.5                    | 66 to 56 *             | 56 to 46 * |
| 0.5-5                       | 56                     | 46         |
| 5-30                        | 60                     | 50         |

Note: \* Decreases with the logarithm of the frequency.

### 7.9.3 Test Method and Setup

The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10: 2009.

Conducted Disturbance at AC Port measurements were undertaken on the L and N Lines. The emissions were measured using a Quasi-Peak Detector and Average Detector.

The EUT communicates with the BTS simulator through Air interface, the BTS simulator controls the EUT to transmitter the maximum power which defined in specification of product. The EUT operated on the typical channel.

Measurement bandwidth (RBW) for 150kHz to 30 MHz: 9 kHz;

### Test Set-up

The EUT was set in the screened chamber and operated under nominal conditions.

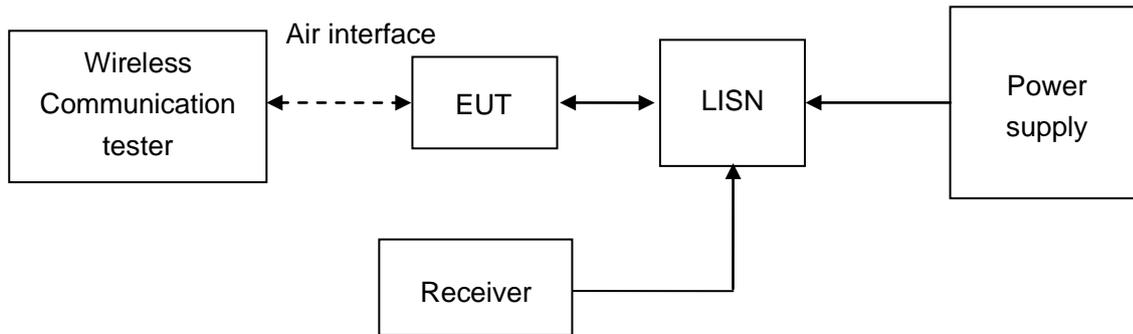


Figure 9. Test Set-up

### 7.9.4 Measurement Results

Table 44 MEASUREMENT RESULT:QP DECTER

| Frequency MHz | Level dB $\mu$ V | Transd dB | Limit dB $\mu$ V | Margin dB | Line | PE  |
|---------------|------------------|-----------|------------------|-----------|------|-----|
| 0.182368      | 49.8             | 9.7       | 64.4             | 14.6      | N    | FLO |
| 0.935501      | 41.3             | 9.7       | 56.0             | 14.7      | L1   | FLO |
| 1.172261      | 42.0             | 9.7       | 56.0             | 14.0      | L1   | FLO |
| 3.168832      | 46.5             | 9.7       | 56.0             | 9.5       | N    | FLO |
| 4.077709      | 47.6             | 9.8       | 56.0             | 8.4       | N    | FLO |
| 4.164315      | 46.9             | 9.8       | 56.0             | 9.1       | N    | FLO |

Table 45 MEASUREMENT RESULT:AV DECTER

| Frequency MHz | Level dB $\mu$ V | Transd dB | Limit dB $\mu$ V | Margin dB | Line | PE  |
|---------------|------------------|-----------|------------------|-----------|------|-----|
| 0.178195      | 41.9             | 9.7       | 54.6             | 12.7      | N    | FLO |
| 0.179528      | 41.8             | 9.7       | 54.5             | 12.7      | N    | FLO |
| 0.926632      | 28.4             | 9.7       | 46.0             | 17.6      | N    | FLO |
| 1.159796      | 28.8             | 9.7       | 46.0             | 17.2      | N    | FLO |
| 4.125589      | 34.5             | 9.8       | 46.0             | 11.5      | N    | FLO |
| 16.126294     | 29.5             | 10.1      | 50.0             | 20.5      | N    | FLO |



## 7.9.5 Conclusion

The equipment **PASSED** the requirement of this clause.  
For the measurement results refer to appendix I.



## 8 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 as following:

Table 46 System Measurement Uncertainty

| Items   |                                 | Extended Uncertainty       |
|---|---------------------------------|----------------------------|
| Bandwidth measurement   | Magnitude (%)                   | U= 0.2%; k=2               |
| Carrier frequency separation measurement                          | Magnitude (%)                   | U= 0.2%; k=2               |
| Time of occupancy   | Magnitude (%)                   | U= 0.2%; k=2               |
| Peak output power   | Power(dBm)                      | U=0.39dB; k=2              |
| Band edge compliance measurement                                  | Disturbance Power(dBm)          | U= 2.0dB; k=2              |
| Conducted RF spurious   | Disturbance Power(dBm)          | U= 2.0dB; k=2              |
| Radiated spurious emission & Radiated restricted band measurement | Field strength (dB $\mu$ V/m)   | U=2.2dB; k=2<br>U=5dB; k=2 |
| Conducted emission test for power port                            | Disturbance Voltage(dB $\mu$ V) | U=4dB; k=2                 |



## 9 Appendices List

|            |  |
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| Appendix A | Measurement Results Bandwidth measurement                    |
| Appendix B | Measurement Results Carrier frequency separation measurement |
| Appendix C | Measurement Results Number of hopping channel                |
| Appendix D | Measurement Results Time of occupancy                        |
| Appendix E | Measurement Results Peak output power                        |
| Appendix F | Measurement Results Band edge compliance measurement         |
| Appendix G | Measurement Results Conducted RF spurious                    |
| Appendix H | Measurement Results Radiated spurious emission               |
| Appendix I | Measurement Results Conducted emission test for power port   |
| Appendix J | Photos of Test Setup   |

----- End of Report -----