



# FCC RF Test Report

**Product Name: HUAWEI MediaPad 10 FHD**

**Model Number: S10-101w**

**Report No: SYBH(Z-RF)001072012-2003  
FCC ID: QISS10-101W**

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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) (2)                       | Bandwidth measurement   | PASS          |
| 15.247 (b) (3)                       | Conducted Peak output power                                       | PASS          |
| 15.247 (d)                           | Band edge compliance measurement                                  | PASS          |
| 15.247 (d)                           | Conducted RF spurious   | PASS          |
| 15.247 (e)                           | Power spectral density  | 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 Hisicon 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 WIFI function was considered in this report.

#### 2.1.2 Support function and Service

The EUT support the function and service as follows:

| Characteristics                 | Description  |
|---------------------------------|--|
| TX/RX Operating Band            | 2400 MHz to 2483.5 MHz   |
| IEEE 802.11 WLAN Mode Supported | 802.11b: Supported<br>802.11g: Supported<br>802.11n: Supported |
| Channel Bandwidth               | 802.11b: 20 MHz<br>802.11g: 20 MHz<br>802.11n: 20 MHz,         |
| TX Power Control (TPC)          | Supported  |
| Type of Modulation              | 802.11b: DSSS<br>802.11g: OFDM<br>802.11n: OFDM                |

### 2.2 Modification Information

For original equipment, following table is not application.

Table 2 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***

#### **3.1 Test Modes**

NOTE: Typical working modes for each IEEE 802.11 mode are selected to perform tests.

| Test Mode | Test Modes Description                  |
|-----------|---|
| TM1       | IEEE 802.11b                            |
| TM2       | IEEE 802.11g                            |
| TM3       | IEEE 802.11n of 20 MHz, using SISO mode |

NOTE: All relevant operation modes have been tested, and the worst case data is included in this report.

## 4 Product Description

### 4.1 Technical Characteristics

#### 4.1.1 Frequency Range

Table 3 Frequency Range

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

#### 4.1.2 Channel Spacing / Separation

Table 4 Channel Spacing / raster

|                  |        |
|------------------|--------|
| Channel spacing: | 22 MHz |
| Channel raster:  | 5 MHz  |

#### 4.1.3 Antenna Information

Table 5 Antenna Information

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

#### 4.1.4 Environmental Requirements

Table 6 Environmental Requirements

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

#### 4.1.5 Power Source

Table 7 Power Source

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

#### 4.1.6 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.

## 4.2 EUT Identification List

### 4.2.1 Board Information

Table 8 Board Information

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

### 4.2.2 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 |

### 4.2.3 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 |



#### 4.2.4 FCC Identification

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

## 5 Main Test Instruments

Table 9 Main Test Equipments

| Equipment Description                           | Manufacturer | Model     | Serial Number | Calibrated until |
|---|--------------|-----------|---------------|------------------|
| Power supply                                    | KEITHLEY     | 2303      | 1288003       | Sept., 27, 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   |
| 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)             | SCHWARZB ECK | 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    |

## 6 Transmitter Measurements

### 6.1 Bandwidth measurement

#### 6.1.1 Test Conditions

Table 10 Test Conditions

|                      |                                    |
|----------------------|------------------------------------|
| Preconditioning:     | 0.5 hour                           |
| Measured at:         | Antenna connector                  |
| Ambient temperature: | 25°C                               |
| Relative humidity:   | 55%                                |
| Test Configurations: | TM1/TM2/TM3 at channel No.1, 6, 11 |

#### 6.1.2 Test Specifications and Limits

##### 6.1.2.1 Specification

CFR 47 (FCC) part 15.247 (a) (2) and KDB 558074

##### 6.1.2.2 Supporting Standards

Table 11 Supporting Standards:

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

##### 6.1.2.3 Limits

Systems using digital modulation techniques 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.

Table 12 Limits

|        |          |
|--------|----------|
| Limits | ≥ 500kHz |
|--------|----------|

#### 6.1.3 Test Method and Setup

- (a) Connect test port of EUT to spectrum analyzer.
- (b) Set the EUT to transmit maximum output power at 2.4GHz, then set the measured frequency number and test the bandwidth with spectrum analyzer.

## Test setup

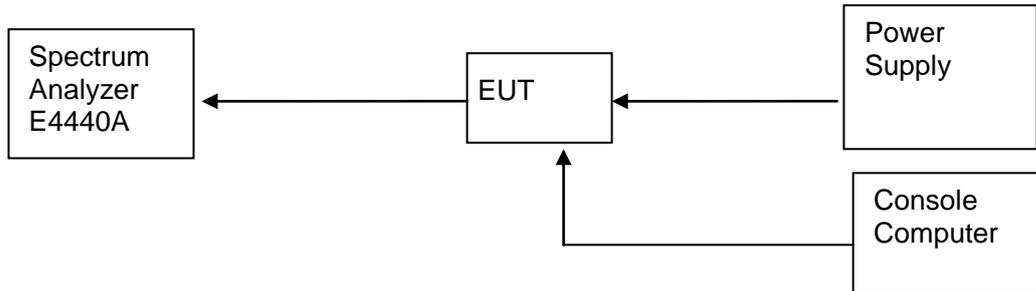


Figure 1. Test Set-up

## 6.1.4 Measurement Results

Table 13 Measurement Results

| Test condition | Channel Position | Channel Number | Frequency [GHz] | Bandwidth Type | Measured Bandwidth [MHz] | Result |
|----------------|------------------|----------------|-----------------|----------------|--------------------------|--------|
| TM1            | B                | 1              | 2.412           | 6dB            | 7.363                    | Pass   |
|                |                  |                |                 | 99%            | 13.831                   | Pass   |
|                | M                | 6              | 2.437           | 6dB            | 7.964                    | Pass   |
|                |                  |                |                 | 99%            | 13.776                   | Pass   |
|                | T                | 11             | 2.462           | 6dB            | 7.557                    | Pass   |
|                |                  |                |                 | 99%            | 13.874                   | Pass   |
| TM2            | B                | 1              | 2.412           | 6dB            | 16.166                   | Pass   |
|                |                  |                |                 | 99%            | 16.370                   | Pass   |
|                | M                | 6              | 2.437           | 6dB            | 16.210                   | Pass   |
|                |                  |                |                 | 99%            | 16.380                   | Pass   |
|                | T                | 11             | 2.462           | 6dB            | 16.254                   | Pass   |
|                |                  |                |                 | 99%            | 16.375                   | Pass   |
| TM3            | B                | 1              | 2.412           | 6dB            | 17.510                   | Pass   |
|                |                  |                |                 | 99%            | 17.493                   | Pass   |
|                | M                | 6              | 2.437           | 6dB            | 17.548                   | Pass   |
|                |                  |                |                 | 99%            | 17.484                   | Pass   |
|                | T                | 11             | 2.462           | 6dB            | 17.446                   | Pass   |
|                |                  |                |                 | 99%            | 17.485                   | Pass   |

## 6.1.5 Conclusion

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

## 6.2 Peak output power

### 6.2.1 Test Conditions

Table 14 Test Conditions

|                      |                                    |
|----------------------|------------------------------------|
| Preconditioning:     | 0.5 hour                           |
| Measured at:         | Antenna connector                  |
| Ambient temperature: | 25°C                               |
| Relative humidity:   | 55%                                |
| Test Configurations: | TM1/TM2/TM3 at channel No.1, 6, 11 |

### 6.2.2 Test Specifications and Limits

#### 6.2.2.1 Specification

CFR 47 (FCC) part 15.247 (b) (3) and KDB 558074

#### 6.2.2.2 Supporting Standards

Table 15 Supporting Standards:

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

#### 6.2.2.3 Limits

Compliance with part 15.247 (b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level.

Table 16 Limits

|   |                 |
|---|-----------------|
| 2.4GHz and 5.8GHz system using digital modulation | 1 Watt / 30 dBm |
|---|-----------------|

### 6.2.3 Test Method and Setup

- (a) Connect test port of EUT to spectrum analyzer.
- (b) Set the EUT to transmit maximum output power.
- (c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted output power separately.

## Test setup

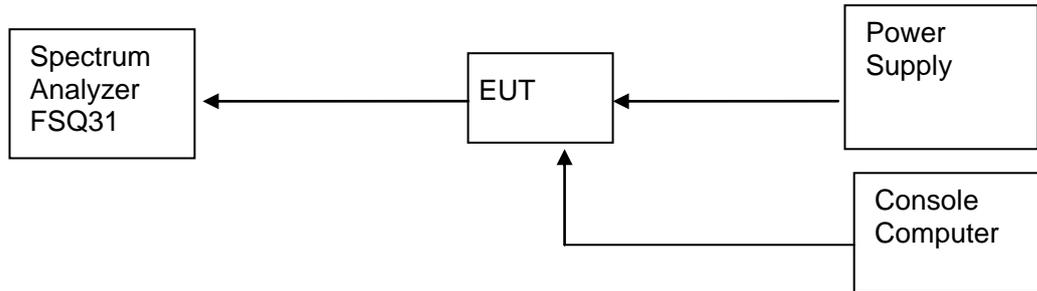


Figure 2. Test Set-up

## 6.2.4 Measurement Results

Table 17 Measurement Results

| Test condition | Channel | Channel No. | Center Freq.[MHz] | Meas. Level (Cond.) [dBm] | Limit [dBm] | Result |
|----------------|---------|-------------|-------------------|---------------------------|-------------|--------|
| TM1            | B       | 1           | 2412              | 20.59                     | < 30        | Pass   |
|                | M       | 6           | 2437              | 20.36                     | < 30        | Pass   |
|                | T       | 11          | 2462              | 20.28                     | < 30        | Pass   |
| TM2            | B       | 1           | 2412              | 22.02                     | < 30        | Pass   |
|                | M       | 6           | 2437              | 22.60                     | < 30        | Pass   |
|                | T       | 11          | 2462              | 22.61                     | < 30        | Pass   |
| TM3            | B       | 1           | 2412              | 21.84                     | < 30        | Pass   |
|                | M       | 6           | 2437              | 22.22                     | < 30        | Pass   |
|                | T       | 11          | 2462              | 22.01                     | < 30        | Pass   |

## 6.2.5 Conclusion

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

## 6.3 Band edge spurious emission

### 6.3.1 Test Conditions

Table 18 Test Conditions

|                      |                                  |
|----------------------|----------------------------------|
| Preconditioning:     | 0.5 hour                         |
| Measured at:         | Antenna connector                |
| Ambient temperature: | 25°C                             |
| Relative humidity:   | 55%                              |
| Test Configurations: | TM1/TM2/TM3 at channel No. 1, 11 |

### 6.3.2 Test Specifications and Limits

#### 6.3.2.1 Specification

CFR 47 (FCC) part 15.247(d) and KDB 558074

#### 6.3.2.2 Supporting Standards

Table 19 Supporting Standards:

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

#### 6.3.2.3 Limits

Compliance 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 20 Limits

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

### 6.3.3 Test Method and Setup

- (a) Connect test port of EUT to spectrum analyzer
- (b) Set the EUT to transmit maximum output power at 2.4GHz
- (c) Then set the EUT to transmit at high, low frequency and measure the conducted band edge spurious separately.

## Test setup

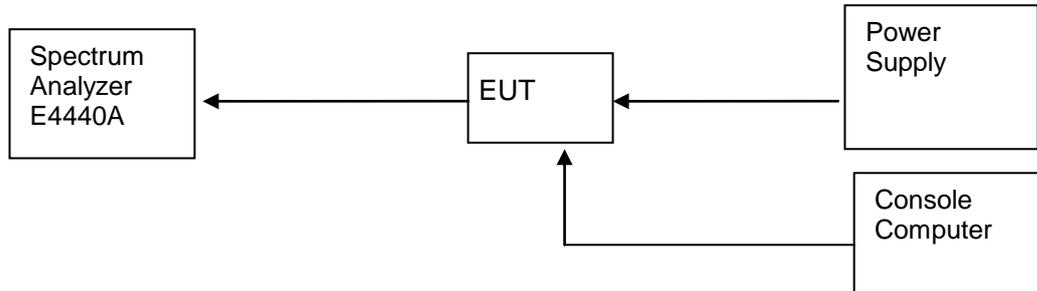


Figure 3. Test Set-up

## 6.3.4 Measurement Results

Table 21 Measurement Results

| Test condition |           | Channel No. | Carrier Frequency [MHz] | Carrier Power [dBm] | Max. Spurious Level [dBm] | Limit [dBm] | Result |
|----------------|-----------|-------------|-------------------------|---------------------|---------------------------|-------------|--------|
| TM1            | Low Edge  | 1           | 2412                    | 6.41                | -32.00                    | -13.59      | Pass   |
|                | High Edge | 11          | 2462                    | 6.36                | -30.05                    | -13.64      | Pass   |
| TM2            | Low Edge  | 1           | 2412                    | 2.98                | -36.24                    | -17.02      | Pass   |
|                | High Edge | 11          | 2462                    | 2.90                | -34.77                    | -17.10      | Pass   |
| TM3            | Low Edge  | 1           | 2412                    | 2.88                | -35.13                    | -17.12      | Pass   |
|                | High Edge | 11          | 2462                    | 2.84                | -32.78                    | -17.16      | Pass   |

## 6.3.5 Conclusion

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

## 6.4 Conducted RF spurious

### 6.4.1 Test Conditions

Table 22 Test Conditions

|                      |                                    |
|----------------------|------------------------------------|
| Preconditioning:     | 0.5 hour                           |
| Measured at:         | Antenna connector                  |
| Ambient temperature: | 25°C                               |
| Relative humidity:   | 55%                                |
| Test Configurations: | TM1/TM2/TM3 at channel No.1, 6, 11 |

### 6.4.2 Test Specifications and Limits

#### 6.4.2.1 Specification

CFR 47 (FCC) part 15.247 (d) and KDB 558074

#### 6.4.2.2 Supporting Standards

Table 23 Supporting Standards:

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

#### 6.4.2.3 Limits

Compliance 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 24 Limits

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

### 6.4.3 Test Method and Setup

- (a) Connect test port of EUT to spectrum analyzer
- (b) Set the EUT to transmit maximum output power at 2.4GHz and.
- (c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted band edge spurious separately.

## Test setup

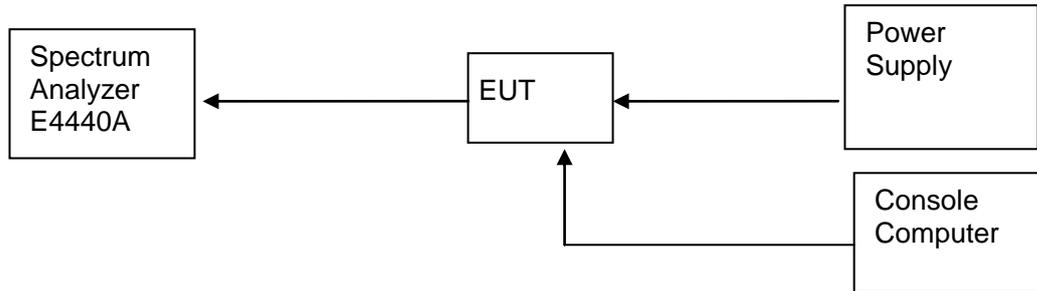


Figure 4. Test Set-up

## 6.4.4 Measurement Results

Table 25 Measurement Results

| Test condition | Test Frequency Range | Channel No. | Carrier Frequency [MHz] | Carrier Power [dBm] | Max. Spurious Level [dBm] | Limit [dBm] | Result |
|----------------|----------------------|-------------|-------------------------|---------------------|---------------------------|-------------|--------|
| TM1            | 9KHz-26GHz           | 1           | 2412                    | 11.74               | -42.83                    | -8.26       | Pass   |
|                | 9KHz-26GHz           | 6           | 2437                    | 11.71               | -41.28                    | -8.29       | Pass   |
|                | 9KHz-26GHz           | 11          | 2462                    | 12.35               | -43.00                    | -7.65       | Pass   |
| TM2            | 9KHz-26GHz           | 1           | 2412                    | 10.41               | -42.74                    | -9.59       | Pass   |
|                | 9KHz-26GHz           | 6           | 2437                    | 10.04               | -41.95                    | -9.96       | Pass   |
|                | 9KHz-26GHz           | 11          | 2462                    | 10.45               | -42.07                    | -9.55       | Pass   |
| TM3            | 9KHz-26GHz           | 1           | 2412                    | 9.69                | -42.04                    | -10.31      | Pass   |
|                | 9KHz-26GHz           | 6           | 2437                    | 10.24               | -42.65                    | -9.76       | Pass   |
|                | 9KHz-26GHz           | 11          | 2462                    | 10.16               | -42.77                    | -9.84       | Pass   |

## 6.4.5 Conclusion

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

## 6.5 Power spectral density

### 6.5.1 Test Conditions

Table 26 Test Conditions

|                      |                                    |
|----------------------|------------------------------------|
| Preconditioning:     | 0.5 hour                           |
| Measured at:         | Antenna connector                  |
| Ambient temperature: | 25°C                               |
| Relative humidity:   | 55%                                |
| Test Configurations: | TM1/TM2/TM3 at channel No.1, 6, 11 |

### 6.5.2 Test Specifications and Limits

#### 6.5.2.1 Specification

CFR 47 (FCC) part 15.247 (e) and KDB 558074

#### 6.5.2.2 Supporting Standards

Table 27 Supporting Standards:

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

#### 6.5.2.3 Limits

Compliance with part 15.247 (e), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. The same method of determining the conducted output power shall be used to determine the power spectral density.

Table 28 Limits

|                     |            |
|---------------------|------------|
| Band edge spurious: | 8 dBm/3kHz |
|---------------------|------------|

### 6.5.3 Test Method and Setup

- (a) Connect test port of EUT to spectrum analyzer
- (b) Set the EUT to transmit maximum output power at 2.4GHz and.
- (c) Then set the EUT to transmit at high, middle and low frequency and measure the conducted band edge spurious separately.

## Test setup

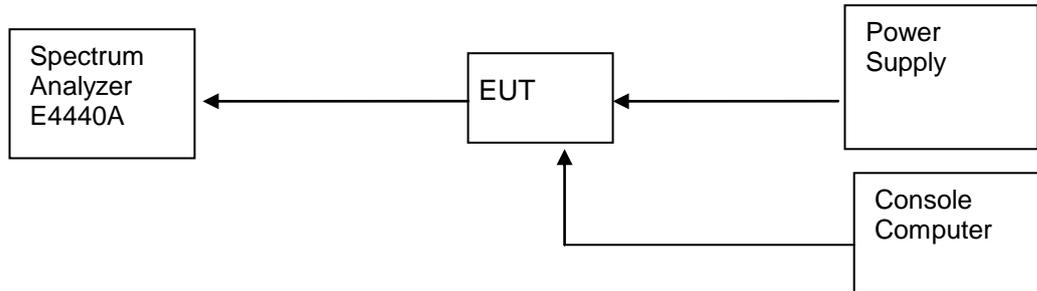


Figure 5. Test Set-up

## 6.5.4 Measurement Results

Table 29 Measurement Results

| Test condition | Channel No. | Carrier Frequency [MHz] | Measured Power spectral density [dBm] | Limit [dBm] | Result |
|----------------|-------------|-------------------------|---------------------------------------|-------------|--------|
| TM1            | 1           | 2412                    | -7.16                                 | <8          | Pass   |
|                | 6           | 2437                    | -7.20                                 | <8          | Pass   |
|                | 11          | 2462                    | -7.89                                 | <8          | Pass   |
| TM2            | 1           | 2412                    | -10.00                                | <8          | Pass   |
|                | 6           | 2437                    | -10.08                                | <8          | Pass   |
|                | 11          | 2462                    | -10.10                                | <8          | Pass   |
| TM3            | 1           | 2412                    | -12.00                                | <8          | Pass   |
|                | 6           | 2437                    | -11.93                                | <8          | Pass   |
|                | 11          | 2462                    | -12.02                                | <8          | Pass   |

## 6.5.5 Conclusion

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

## 6.6 Radiated spurious emission & spurious in restricted band

### 6.6.1 Test Conditions

Table 30 Test Conditions

|                      |                                    |
|----------------------|------------------------------------|
| Preconditioning:     | 0.5 hour                           |
| Measured at:         | enclosure                          |
| Ambient temperature: | 25 °C                              |
| Relative humidity:   | 55%                                |
| Test Configurations: | TM1/TM2/TM3 at channel No.1, 6, 11 |

### 6.6.2 Test Specifications and Limits

#### 6.6.2.1 Specification

CFR 47 (FCC) part 15.247 (d), 15.205 & 15.209 and KDB 558074

#### 6.6.2.2 Supporting Standards

Table 31 Supporting Standards:

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

#### 6.6.2.3 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 32 Limits

| Frequency (MHz) | Field Strength (μV/m) | Field Strength (dBμV/m) | Measurement Distance (meters) | Detector |
|-----------------|-----------------------|-------------------------|-------------------------------|----------|
| 0.009 - 0.490   | 2400/F(kHz)           | 20*lg(2400/F(kHz))      | 300                           | QP       |
| 0.490 - 1.705   | 24000/F(kHz)          | 20*lg(24000/F(kHz))     | 30                            | QP       |
| 1.705 - 30      | 30                    | 29.5                    | 30                            | QP       |
| 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)(above table 42).

### 6.6.3 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, 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 axes) axis positions such that emissions from the EUT are maximized.

The EUT was communicated with the BTS simulator through Air interface. The EUT operated on the typical channel.

Measurement bandwidth: 30 MHz – 1000 MHz: 120 kHz  
Measurement bandwidth: 1000 MHz – 10<sup>th</sup> Carrier Frequency: 1 MHz

### Test set up

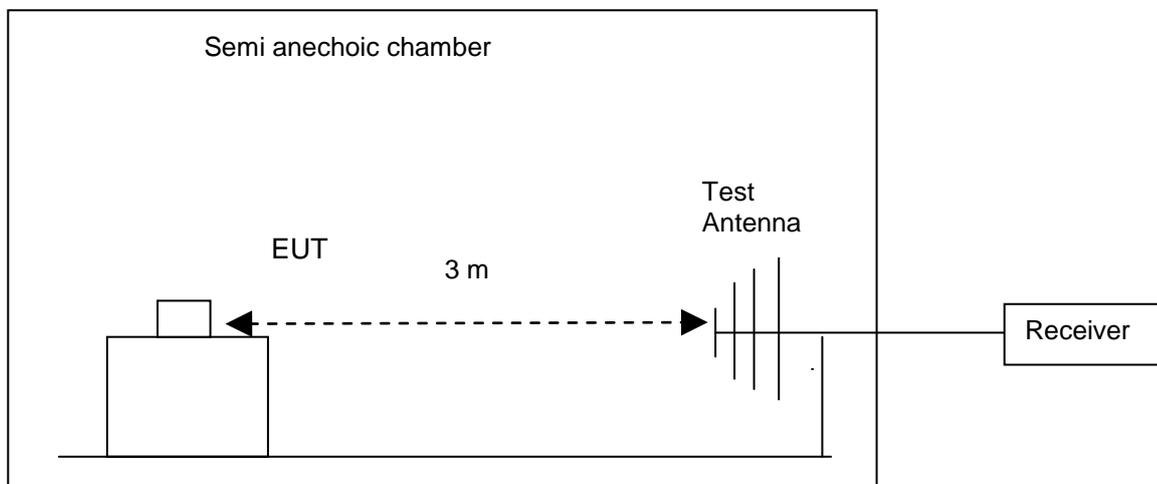


Figure 6. Test Set up

### 6.6.4 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 the test modes, here only the worst test result was shown.

| Test condition | Channel No. | Carrier Frequency [MHz] | Measured            | Result |
|----------------|-------------|-------------------------|---------------------|--------|
| TM1            | 1           | 2412                    | Refer to Appendix F | Pass   |
|                | 6           | 2437                    | Refer to Appendix F | Pass   |
|                | 11          | 2462                    | Refer to Appendix F | Pass   |
| TM2            | 1           | 2412                    | Refer to Appendix F | Pass   |
|                | 6           | 2437                    | Refer to Appendix F | Pass   |
|                | 11          | 2462                    | Refer to Appendix F | Pass   |
| TM3            | 1           | 2412                    | Refer to Appendix F | Pass   |
|                | 6           | 2437                    | Refer to Appendix F | Pass   |
|                | 11          | 2462                    | Refer to Appendix F | Pass   |



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## 6.6.5 Conclusion

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

## 6.7 Conducted Emission at Power Port

### 6.7.1 Test Conditions

Table 33 Test Conditions

|                      |                      |
|----------------------|----------------------|
| Preconditioning:     | 0.5 hour             |
| Measured at:         | Power port           |
| Ambient temperature: | 25°C                 |
| Relative humidity:   | 55%                  |
| Test Configurations: | TM1 at channel No. 6 |

### 6.7.2 Test Specifications and Limits

#### 6.7.2.1 Specification

CFR 47 (FCC) part 15.207 and KDB 558074

#### 6.7.2.2 Supporting Standards

Table 34 Supporting Standards:

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

#### 6.7.2.3 Limits

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

Table 35 Limits

| Frequency of Emission (MHz) | Conducted Limit (dB $\mu$ V) |            |
|-----------------------------|------------------------------|------------|
|                             | 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.

### 6.7.3 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 was communicated with the BTS simulator through Air interface, the BTS simulator controls the Wireless Modem to transmitter the maximum power which defined in specification of product. The Wireless Modem operated on the typical channel.

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

### Test Set-up

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

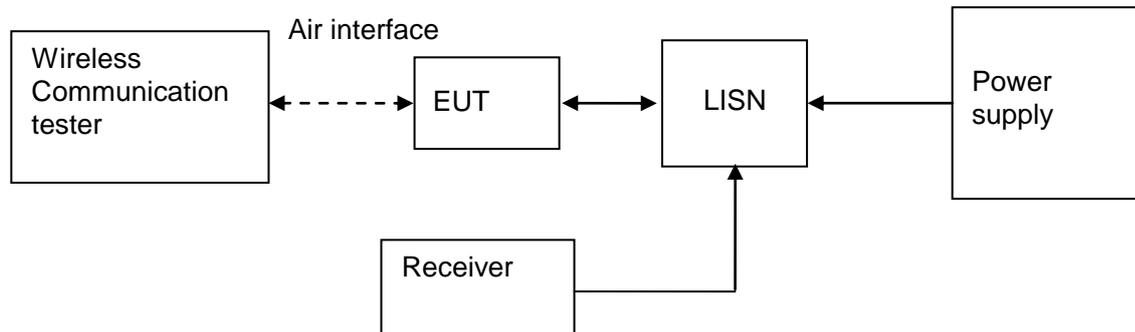


Figure 7. Test Set-up

### 6.7.4 Measurement Results

Table 36 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 37 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 |

### 6.7.5 Conclusion

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

## 7 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 38 System Measurement Uncertainty

| Items   |                                 | Extended Uncertainty         |
|---|---------------------------------|------------------------------|
| 20dB bandwidth measurement  | 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=0.4dB; k=2                 |
| Power spectral density  | Disturbance Power(dBm)          | U=0.4dB; k=2                 |
| Radiated spurious emission & Radiated restricted band measurement | Field strength (dB $\mu$ V/m)   | U=4.1dB; k=2<br>U=4.1dB; k=2 |
| Conducted emission test for power port                            | Disturbance Voltage(dB $\mu$ V) | U=3.4dB; k=2                 |



## 8 Appendices

|            |  |
|------------|--|
| Appendix A | Measurement Results Bandwidth measurement                  |
| Appendix B | Measurement Results Peak output power                      |
| Appendix C | Measurement Results Band edge compliance measurement       |
| Appendix D | Measurement Results Conducted RF spurious                  |
| Appendix E | Measurement Results Power spectral density                 |
| Appendix F | Measurement Results Radiated spurious emission             |
| Appendix G | Measurement Results Conducted emission test for power port |
| Appendix H | Photos of Test Setup                                       |

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