

**Produkte**  
*Products*
**Prüfbericht - Nr.: 14047149 001**
*Test Report No.:*
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**Auftraggeber:** Megabyte Limited  
**Client:** Unit 507, Building 12W, No. 12 Science Park West Avenue  
 Hong Kong Science Park, Shatin, N.T., Hong Kong

**Gegenstand der Prüfung:** UHF Mobile RFID Reader  
*Test Item:*

**Bezeichnung:** T8-01-MB  
*Identification:* T8-01-39, T8-01-PH

**Serien-Nr.:**  
*Serial No.:*

**Engineering sample**

**Wareneingangs-Nr.:** A000386196-002  
*Receipt No.:*

**Eingangsdatum:** 30.06.2016  
*Date of Receipt:*

**Prüfort:** EMTEK (Shenzhen) Co., Ltd.  
*Testing Location:* Bldg. 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

**Zustand des Prüfgegenstandes bei Anlieferung:** Test samples are not damaged and suitable for testing.  
*Condition of test item at delivery:*

**Prüfgrundlage:** FCC Part 15 Subpart E  
*Test Specification:* ANSI C63.10-2013

**Prüfergebnis:** Das vorstehend beschriebene Gerät wurde geprüft und entspricht oben genannter Prüfgrundlage.  
*Test Results:* The above mentioned product was tested and **passed**.

**Prüflaboratorium:** TÜV Rheinland Hong Kong Ltd.  
*Testing Laboratory:* 8 - 10/F., Goldin Financial Global Square, 7 Wang Tai Road, Kowloon Bay, Kowloon, Hong Kong

geprüft/ *tested by:*

kontrolliert/ *reviewed by:*

|                      |                                       |   |                      |                                       |   |
|----------------------|---------------------------------------|---|----------------------|---------------------------------------|---|
| 23.12.2016           | Benny Lau<br>Senior Project Manager   |  | 23.12.2016           | Sharon Li<br>Department Manager       |  |
| Datum<br><i>Date</i> | Name/Stellung<br><i>Name/Position</i> | Unterschrift<br><i>Signature</i>  | Datum<br><i>Date</i> | Name/Stellung<br><i>Name/Position</i> | Unterschrift<br><i>Signature</i>  |

**Sonstiges:** FCC ID: XEK-MTRAYT8  
*Other Aspects* This device is a composite device. This report contains the test result of the 5GHz WIFI transceiver portion.

**Abkürzungen:** P(pass) = entspricht Prüfgrundlage  
 F(fail) = entspricht nicht Prüfgrundlage  
 N/A = nicht anwendbar  
 N/T = nicht getestet

**Abbreviations:** P(pass) = **passed**  
 F(fail) = **failed**  
 N/A = **not applicable**  
 N/T = **not tested**

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.

*This test report relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any safety mark on this or similar products.*

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## Product information

### Manufacturers declarations

|   | <b>Transceiver</b>   |
|---|--|
| Operating frequency range               | 5180 - 5320 MHz<br>5500 - 5700 MHz<br>5745 - 5825 MHz  |
| Operating mode                          | <input type="checkbox"/> Master Device<br><input checked="" type="checkbox"/> Client Device with No Radar Detection<br><input type="checkbox"/> Client Device with Radar Detection |
| Type of modulation                      | 802.11a: OFDM (BPSK/QPSK/16QAM/64QAM)<br>802.11n: OFDM (BPSK/QPSK/16QAM/64QAM)   |
| Number of channels                      | 23   |
| Channel separation                      | 20 MHz   |
| Type of antenna                         | Integral PCB Antenna   |
| Antenna gain (dBi)                      | 2 dBi  |
| Power level                             | fix  |
| Type of equipment                       | stand alone radio device   |
| Connection to public utility power line | Yes  |
| Nominal voltage                         | 100-240VAC/ 3.7VDC   |
| Independent Operation Modes             | Transmitting   |

### Product function and intended use

The equipment under test (EUT) is a mobile RFID reader. It is a compact NFC and UHF RFID reader with Bluetooth and WIFI connectivity.

The manufacturer declared that the model: T8-01-39 and T8-01-PH are identical to the model T8-01-MB except the logo plate.

FCC ID: XEK-MTRAYT8

| <b>Models</b>      | <b>Product description</b> |
|--------------------|----------------------------|
| T8-01-MB           |                            |
| T8-01-39, T8-01-PH | UHF Mobile RFID Reader     |

### Submitted documents

Circuit Diagram  
Block Diagram  
Technical Description  
User manual  
Label

### Independent Operation Modes

The basic operation modes are:

- Transmitting mode.

For further information refer to User Manual

## Related Submittal(s) Grants

This device is a composite device. This is a single application for certification of the 5GHz WIFI transceiver. Refer test report 14047148 001 for DFS test results.

The RFID transmitter portion is authorized under the certification procedure (refer to test report 14045645 001 issued by TÜV Rheinland HK Ltd on 23.12.2016).

The NFC portion is authorized under the certification procedure (refer to test report 14045648 001 issued by TÜV Rheinland HK Ltd on 23.12.2016).

The Bluetooth portion is authorized under the certification procedure (refer to test report 14045646 001 and 14045647 001 and 14047147 001 issued by TÜV Rheinland HK Ltd on 23.12.2016).

The 2.4GHz WIFI portion is authorized under the certification procedure (refer to test report 14045649 001 issued by TÜV Rheinland HK Ltd on 23.12.2016).

## Remark

The test results in this test report are only relevant to the tested sample and does not involve any assessment in the production.

## Test Set-up and Operation Mode

### Principle of Configuration Selection

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

### Test Operation and Test Software

Test operation should refer to test methodology.

Test operation should refer to test methodology.

- During test, Channel & Power Controlling Software provided by the applicant was used to control the operating channel as well as the maximum output power level. The maximum RF output power and the operating frequencies was selected according to the instruction given by the manufacturer. The setting of the maximum RF output power and the operating frequency range expected by the customer shall be fixed on the firmware of the final end product.

### Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

- AC-DC adaptor Model: EA1024AR-050 Input: 100-240 VAC 50/60 Hz; Output: 5.0VDC 2A  
(Provided by the applicant)

### Countermeasures to achieve EMC Compliance

- Nil

## Test Methodology

### Radiated Emission

The radiated emission measurements of the transmitter part were performed according to the procedures in ANSI C63.10-2013.

For measurement below 1GHz, the equipment under test (EUT) was placed at the middle of the 80 cm height turntable. For measurement above 1GHz, the EUT was placed at the middle of the 1.5 m height turntable and RF absorbing material was placed on ground plane between turntable and measuring antenna. During the testing, the EUT was operated standalone and arranged for maximum emissions. The EUT was tested in three orthogonal planes.

The investigation is performed with the EUT rotated 360 °, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations. Repeat the measurement steps until the maximum emissions were obtained.

All radiated tests were performed at an antenna to EUT with 3 meters distance, unless stated otherwise in particular parts of this test report.

### Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

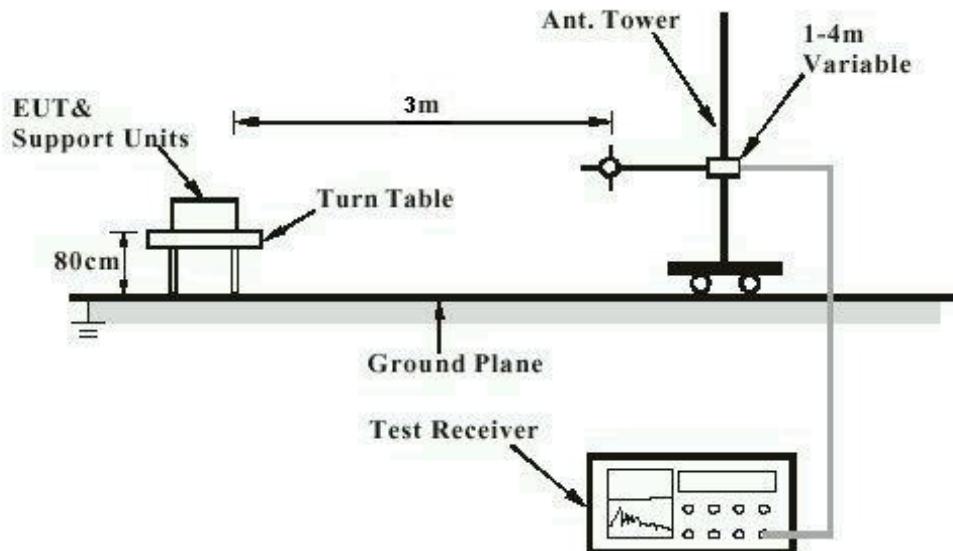
$$FS = R + AF + CF + FA - PA$$

Where FS = Field Strength in dBuV/m at 3 meters.  
R = Reading of Spectrum Analyzer in dBuV.  
AF = Antenna Factor in dB.  
CF = Cable Attenuation Factor in dB.  
FA = Filter Attenuation Factor in dB.  
PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

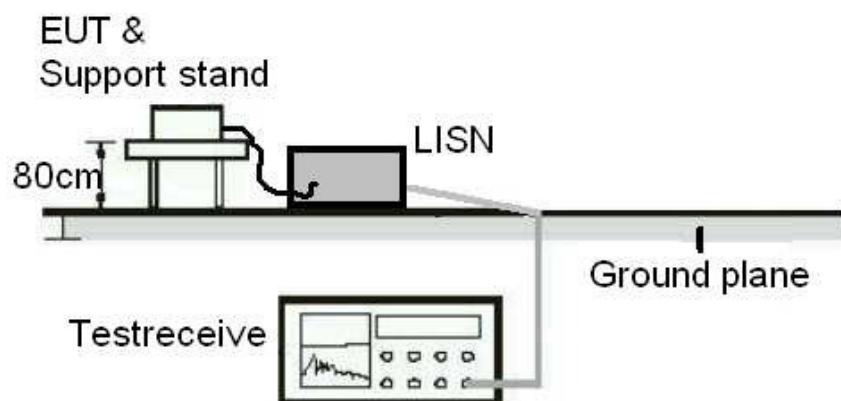
## Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test

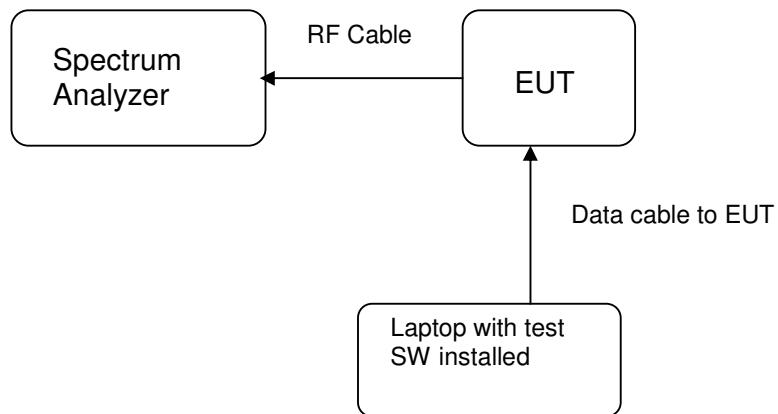


Note: Measurements above 1 GHz are done with a table height of 1.5m. In addition, there is RF absorbing material on the floor of the test site for above 1GHz measurement.

Diagram of Measurement Equipment Configuration for Mains Conduction Measurement (if applicable)



**Diagram of Equipment Configuration for Antenna-port Conducted Measurement (if applicable)**



## List of Test and Measurement Instruments

**EMTEK (Shenzhen) Co., Ltd. (Registration number: 406365)**

**For 3m Radiated Emission Measurement 9K-30M (3m chamber )**

| Equipment         | Manufacturer    | Model No.     | Serial No. | Last Cal.    | Cal. Interval |
|-------------------|-----------------|---------------|------------|--------------|---------------|
| EMI Test Receiver | Rohde & Schwarz | ESCI          | 101414     | May 28, 2016 | 1 Year        |
| Loop Antenna      | Schwarzbeck     | FMZB 1519     | 1519-012   | May 28, 2016 | 1 Year        |
| Cable             | H+B             | NmSm-2-C15201 |            | May 29, 2016 | 1 Year        |
| Cable             | H+B             | NmNm-7-C15702 |            | May 29, 2016 | 1 Year        |

**For 3m Radiated Emission Measurement 30M-1G (3m chamber )**

| Equipment         | Manufacturer    | Model No.      | Serial No.   | Last Cal.    | Cal. Interval |
|-------------------|-----------------|----------------|--------------|--------------|---------------|
| EMI Test Receiver | Rohde & Schwarz | ESCI           | 101414       | May 28, 2016 | 1 Year        |
| Pre-Amplifier     | LUNAR-EM        | LNA30M3G-25    | J10100000071 | May 28, 2016 | 1 Year        |
| Bilog Antenna     | Schwarzbeck     | VULB9163       | 660          | May 29, 2016 | 1 Year        |
| Cable             | H+B             | NmSm-05-C15052 |              | May 29, 2016 | 1 Year        |
| Cable             | H+B             | NmSm-2-C15201  |              | May 29, 2016 | 1 Year        |
| Cable             | H+B             | NmNm-7-C15702  |              | May 29, 2016 | 1 Year        |

**For 3m Radiated Emission Measurement 1G-18G(3m chamber )**

| Equipment         | Manufacturer    | Model No.        | Serial No.              | Last Cal.    | Cal. Interval |
|-------------------|-----------------|------------------|-------------------------|--------------|---------------|
| EMI Test Receiver | Rohde & Schwarz | FSV40            | 132.1-3008K39-100967-AP | May 28, 2016 | 1 Year        |
| Pre-Amplifier     | Lunar EM        | LNA1G18-48       | J1011131010001          | May 28, 2016 | 1 Year        |
| Horn Antenna      | Schwarzbeck     | BBHA 9120        | 1178                    | May 29, 2016 | 1 Year        |
| Cable             | H+B             | SAC-40G-1        | 414                     | May 29, 2016 | 1 Year        |
| Cable             | H+B             | SUCOFLEX104      | MY14871/4               | May 29, 2016 | 1 Year        |
| Cable             | H+B             | BLU18A-NmSm-6500 | D8501                   | May 29, 2016 | 1 Year        |

**For 3m Radiated Emission Measurement 18G-26.5G (3m chamber )**

| Equipment         | Manufacturer    | Model No.   | Serial No.              | Last Cal.    | Cal. Interval |
|-------------------|-----------------|-------------|-------------------------|--------------|---------------|
| EMI Test Receiver | Rohde & Schwarz | FSV40       | 132.1-3008K39-100967-AP | May 28, 2016 | 1 Year        |
| Pre-Amplifier     | Lunar EM        | LNA18G26-40 | J1012131010001          | May 28, 2016 | 1 Year        |
| Horn Antenna      | Schwarzbeck     | BBHA 9170   | RS1307229170547         | May 29, 2016 | 1 Year        |
| Cable             | A.H             | SAC-40G-1   | 414                     | May 29, 2016 | 1 Year        |
| Cable             | A.H             | SAC-40G-1   | 413                     | May 29, 2016 | 1 Year        |

**For 3m Radiated Emission Measurement 26.5G-40G (3m chamber )**

| Equipment         | Manufacturer    | Model No.   | Serial No.              | Last Cal.    | Cal. Interval |
|-------------------|-----------------|-------------|-------------------------|--------------|---------------|
| EMI Test Receiver | Rohde & Schwarz | FSV40       | 132.1-3008K39-100967-AP | May 28, 2016 | 1 Year        |
| Pre-Amplifier     | Lunar EM        | LNA26G40-40 | J10131310280 01         | May 28, 2016 | 1 Year        |
| Horn Antenna      | AHS/USA         | SAS-573     | 184                     | May 29, 2016 | 1 Year        |
| Cable             | A.H             | SAC-40G-1   | 414                     | May 29, 2016 | 1 Year        |
| Cable             | A.H             | SAC-40G-1   | 413                     | May 29, 2016 | 1 Year        |

**For Power Line Conducted Emission (site 1)**

| Equipment          | Manufacturer    | Model No. | Serial No.     | Last Cal.    | Cal. Interval |
|--------------------|-----------------|-----------|----------------|--------------|---------------|
| Test Receiver      | Rohde & Schwarz | ESCI      | 26115-010-0027 | May 28, 2016 | 1 Year        |
| L.I.S.N.           | Rohde & Schwarz | ENV216    | 101161         | May 28, 2016 | 1 Year        |
| 50Ω Coaxial Switch | Anritsu         | MP59B     | 6100175589     | May 29, 2016 | 1 Year        |
| Voltage Probe      | Rohde & Schwarz | ESH2-Z3   | 100122         | May 29, 2016 | 1 Year        |

**For Power Measurement**

| Equipment      | Manufacturer | Model No.  | Serial No. | Last Cal.  | Cal. Interval |
|----------------|--------------|------------|------------|------------|---------------|
| Power Analyzer | Agilent      | PS-X10-200 | N/A        | 05/28/2016 | 1 Year        |

## Measurement Uncertainty

The estimated combined standard uncertainty for power-line conducted emissions measurements is  $\pm 2.74\text{dB}$ .

The estimated combined standard uncertainty for radiated emissions measurements is  $\pm 3.78\text{dB}$  (30MHz to 200MHz) and  $\pm 4.27\text{dB}$  (200MHz to 1000MHz) and is  $\pm 4.46\text{dB}$  (1GHz to 6GHz) and  $\pm 4.96\text{dB}$  (6GHz to 18GHz).

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of  $k=2$ , which for the level of confidence is approximately 95%.

## Results FCC Part 15 – Subpart E

| FCC 15.203 – Antenna Requirement 1  |  | Pass                                  |
|---|--|---------------------------------------|
| <b>FCC Requirement:</b> No antenna other than that furnished by the responsible party shall be used with the device |  |                                       |
| <b>Results:</b>   | a) Antenna type:<br>b) Manufacturer and model no:<br>c) Peak Gain: | Integral PCB antenna<br>QCOM<br>2 dBi |
| <b>Verdict:</b>   | Pass   |                                       |

| FCC 15.204 – Antenna Requirement 2   |  | N/A |
|--|--|-----|
| <b>FCC Requirement:</b> An intentional radiator may be operated only with the antenna with which it is authorized. If an antenna is marketed with the intentional radiator, it shall be of a type which is authorized with the intentional radiator. |  |     |
| <b>Results:</b>  | Only one integral antenna can be used. |     |
| <b>Verdict:</b>  | N/A                                    |     |

| FCC 15.207 – Conducted Emission on AC Mains           |                 | Pass                  |                    |                       |                       |         |
|---|-----------------|-----------------------|--------------------|-----------------------|-----------------------|---------|
| Test Specification : ANSI C63.10 – 2013               |                 |                       |                    |                       |                       |         |
| Mode of operation : TX mode                           |                 |                       |                    |                       |                       |         |
| Port of testing : AC Mains input port of power supply |                 |                       |                    |                       |                       |         |
| Supply voltage : 120Vac 60Hz                          |                 |                       |                    |                       |                       |         |
| Temperature : 23°C                                    |                 |                       |                    |                       |                       |         |
| Humidity : 50%  |                 |                       |                    |                       |                       |         |
| Requirement: 15.207(a)                                |                 |                       |                    |                       |                       |         |
| <b>Results:</b>                                       | Pass            |                       |                    |                       |                       |         |
| <b>Live measurement</b>                               |                 |                       |                    |                       |                       |         |
| Frequency range (MHz)                                 | Frequency (MHz) | Quasi-peak dB $\mu$ V | Average dB $\mu$ V | Limit QP (dB $\mu$ V) | Limit AV (dB $\mu$ V) | Verdict |
| 0,15 – 0,5  | 0.155           | 58.36                 | 45.95              | 66 - 56               | 56 - 46               | Pass    |
| > 0,5 - 5   | No peak found   | ---                   | ---                | 56                    | 46                    | Pass    |
| > 5 - 30  | No peak found   | ---                   | ---                | 60                    | 50                    | Pass    |
| <b>Neutral measurement</b>                            |                 |                       |                    |                       |                       |         |
| Frequency range (MHz)                                 | Frequency (MHz) | Quasi-peak dB $\mu$ V | Average dB $\mu$ V | Limit QP (dB $\mu$ V) | Limit AV (dB $\mu$ V) | Verdict |
| 0,15 – 0,5  | 0.155           | 59.62                 | 44.81              | 66 - 56               | 56 - 46               | Pass    |
| > 0,5 - 5   | No peak found   | ---                   | ---                | 56                    | 46                    | Pass    |
| > 5 - 30  | No peak found   | ---                   | ---                | 60                    | 50                    | Pass    |

**Results:** Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and data rate.

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150kHz to 30MHz does not exceed the limits. For test Results plots refer to Appendix 1-A.

| <b>FCC 15.407(e) - Emission Bandwidth Measurement</b>  |                     |                      | <b>Pass</b> |
|--|---------------------|----------------------|-------------|
| <b>FCC Requirement:</b> Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.   |                     |                      |             |
| Test Specification : ANSI C63.10 – 2013<br>Port of testing : Temporary antenna port<br>Mode of operation : TX mode<br>Supply voltage : 120VAC and/ or 3.7VDC<br>Temperature : 23°C<br>Humidity : 50% |                     |                      |             |
| <b>Results:</b> For test protocols please refer to Appendix 1-A  |                     |                      |             |
| <b>802.11a Band U-NII-1 (5150 – 5250 MHz)</b>  |                     |                      |             |
| Channel frequency (MHz)  | 6dB bandwidth (MHz) | 26dB bandwidth (MHz) |             |
| 5180   | 15.14               | 18.86                |             |
| 5200   | 15.10               | 18.74                |             |
| 5240   | 15.14               | 18.77                |             |
| <b>802.11a Band U-NII-2A (5250 – 5350 MHz)</b>   |                     |                      |             |
| Channel frequency (MHz)  | 6dB bandwidth (MHz) | 26dB bandwidth (MHz) |             |
| 5260   | 15.15               | 18.60                |             |
| 5280   | 15.10               | 18.88                |             |
| 5320   | 15.13               | 18.65                |             |
| <b>802.11a Band U-NII-2C (5470 – 5725 MHz)</b>   |                     |                      |             |
| Channel frequency (MHz)  | 6dB bandwidth (MHz) | 26dB bandwidth (MHz) |             |
| 5500   | 14.73               | 18.87                |             |
| 5600   | 15.16               | 19.86                |             |
| 5700   | 15.11               | 19.17                |             |
| <b>802.11a Band U-NII-3 (5725 – 5850 MHz)</b>  |                     |                      |             |
| Channel frequency (MHz)  | 6dB bandwidth (MHz) | 26dB bandwidth (MHz) |             |
| 5745   | 15.15               | 18.68                |             |
| 5785   | 15.02               | 18.77                |             |
| 5825   | 15.11               | 18.74                |             |
| <b>802.11n20 Band U-NII-1 (5150 – 5250 MHz)</b>  |                     |                      |             |
| Channel frequency (MHz)  | 6dB bandwidth (MHz) | 26dB bandwidth (MHz) |             |
| 5180   | 15.10               | 19.17                |             |

| 5200   | 15.07               | 19.10                |
|--|---------------------|----------------------|
| 5240   | 15.11               | 19.06                |
| <b>802.11n20 Band U-NII-2A (5250 – 5350 MHz)</b> |                     |                      |
| Channel frequency (MHz)                          | 6dB bandwidth (MHz) | 26dB bandwidth (MHz) |
| 5260   | 15.09               | 19.16                |
| 5280   | 15.07               | 19.14                |
| 5320   | 15.15               | 19.19                |
| <b>802.11n20 Band U-NII-2C (5470 – 5725 MHz)</b> |                     |                      |
| Channel frequency (MHz)                          | 6dB bandwidth (MHz) | 26dB bandwidth (MHz) |
| 5500   | 15.17               | 19.23                |
| 5600   | 15.12               | 20.20                |
| 5700   | 15.05               | 21.51                |
| <b>802.11n20 Band U-NII-3 (5725 – 5850 MHz)</b>  |                     |                      |
| Channel frequency (MHz)                          | 6dB bandwidth (MHz) | 26dB bandwidth (MHz) |
| 5745   | 14.25               | 19.57                |
| 5785   | 15.14               | 19.01                |
| 5825   | 15.15               | 19.21                |
| <b>802.11n40 Band U-NII-1 (5150 – 5250 MHz)</b>  |                     |                      |
| Channel frequency (MHz)                          | 6dB bandwidth (MHz) | 26dB bandwidth (MHz) |
| 5190   | 35.15               | 39.70                |
| 5230   | 35.19               | 39.22                |
| <b>802.11n40 Band U-NII-2A (5250 – 5350 MHz)</b> |                     |                      |
| Channel frequency (MHz)                          | 6dB bandwidth (MHz) | 26dB bandwidth (MHz) |
| 5270   | 35.17               | 39.54                |
| 5310   | 35.19               | 39.50                |
| <b>802.11n40 Band U-NII-2C (5470 – 5725 MHz)</b> |                     |                      |
| Channel frequency (MHz)                          | 6dB bandwidth (MHz) | 26dB bandwidth (MHz) |
| 5510   | 35.18               | 39.61                |
| 5590   | 35.18               | 41.49                |
| 5670   | 35.20               | 51.29                |
| <b>802.11n40 Band U-NII-3 (5725 – 5850 MHz)</b>  |                     |                      |
| Channel frequency (MHz)                          | 6dB bandwidth (MHz) | 26dB bandwidth (MHz) |
| 5755   | 33.88               | 39.75                |
| 5795   | 35.20               | 49.22                |

| FCC 15.407(a)(1)(2)(3) – Maximum Conducted Output Power  |                    | Pass        |         |
|--|--------------------|-------------|---------|
| <b>FCC Requirement:</b> For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.             |                    |             |         |
| For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. |                    |             |         |
| For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.   |                    |             |         |
| Test Specification : ANSI C63.10 – 2013<br>Port of testing : Temporary antenna port<br>Mode of operation : TX mode<br>Supply voltage : 120VAC and/ or 3.7VDC<br>Temperature : 23°C<br>Humidity : 50%                                       |                    |             |         |
| <b>Results:</b> The worst cases is found in 6Mbps, 6.5Mbps and 13.5Mbps respectively.  |                    |             |         |
| <b>802.11a Band U-NII-1 (5150 – 5250 MHz)</b>  |                    |             |         |
| Frequency (MHz)  | Output Power (dBm) | Limit (dBm) | Verdict |
| 5180   | 10.34              | 23.98       | Pass    |
| 5200   | 12.82              | 23.98       | Pass    |
| 5240   | 11.79              | 23.98       | Pass    |
| <b>802.11a Band U-NII-2A (5250 – 5350 MHz)</b>   |                    |             |         |
| Frequency (MHz)  | Output Power (dBm) | Limit (dBm) | Verdict |
| 5260   | 12.00              | 23.70       | Pass    |
| 5280   | 12.50              | 23.76       | Pass    |
| 5320   | 9.83               | 23.71       | Pass    |
| <b>802.11a Band U-NII-2C (5470 – 5725 MHz)</b>   |                    |             |         |
| Frequency (MHz)  | Output Power (dBm) | Limit (dBm) | Verdict |
| 5500   | 9.77               | 23.76       | Pass    |
| 5600   | 10.76              | 23.98       | Pass    |
| 5700   | 10.17              | 23.83       | Pass    |
| <b>802.11a Band U-NII-3 (5725 – 5850 MHz)</b>  |                    |             |         |
| Frequency (MHz)  | Output Power (dBm) | Limit (dBm) | Verdict |
| 5745   | 10.42              | 30.00       | Pass    |
| 5785   | 10.41              | 30.00       | Pass    |
| 5825   | 10.04              | 30.00       | Pass    |
| <b>802.11n20 Band U-NII-1 (5150 – 5250 MHz)</b>  |                    |             |         |

| Frequency (MHz)                                  | Output Power (dBm) | Limit (dBm) | Verdict |
|--|--------------------|-------------|---------|
| 5180   | 10.28              | 23.98       | Pass    |
| 5200   | 12.48              | 23.98       | Pass    |
| 5240   | 12.21              | 23.98       | Pass    |
| <b>802.11n20 Band U-NII-2A (5250 – 5350 MHz)</b> |                    |             |         |
| Frequency (MHz)                                  | Output Power (dBm) | Limit (dBm) | Verdict |
| 5260   | 12.42              | 23.82       | Pass    |
| 5280   | 12.47              | 23.82       | Pass    |
| 5320   | 9.75               | 23.83       | Pass    |
| <b>802.11n20 Band U-NII-2C (5470 – 5725 MHz)</b> |                    |             |         |
| Frequency (MHz)                                  | Output Power (dBm) | Limit (dBm) | Verdict |
| 5500   | 9.60               | 23.84       | Pass    |
| 5600   | 10.67              | 23.98       | Pass    |
| 5700   | 10.10              | 23.98       | Pass    |
| <b>802.11n20 Band U-NII-3 (5725 – 5850 MHz)</b>  |                    |             |         |
| Frequency (MHz)                                  | Output Power (dBm) | Limit (dBm) | Verdict |
| 5745   | 10.32              | 30.00       | Pass    |
| 5785   | 10.24              | 30.00       | Pass    |
| 5825   | 9.93               | 30.00       | Pass    |
| <b>802.11n40 Band U-NII-1 (5150 – 5250 MHz)</b>  |                    |             |         |
| Frequency (MHz)                                  | Output Power (dBm) | Limit (dBm) | Verdict |
| 5190   | 6.75               | 23.98       | Pass    |
| 5230   | 11.67              | 23.98       | Pass    |
| <b>802.11n40 Band U-NII-2A (5250 – 5350 MHz)</b> |                    |             |         |
| Frequency (MHz)                                  | Output Power (dBm) | Limit (dBm) | Verdict |
| 5270   | 11.85              | 23.98       | Pass    |
| 5310   | 6.19               | 23.98       | Pass    |
| <b>802.11n40 Band U-NII-2C (5470 – 5725 MHz)</b> |                    |             |         |
| Frequency (MHz)                                  | Output Power (dBm) | Limit (dBm) | Verdict |
| 5510   | 3.26               | 23.98       | Pass    |
| 5590   | 11.30              | 23.98       | Pass    |
| 5670   | 8.73               | 23.98       | Pass    |
| <b>802.11n40 Band U-NII-3 (5725 – 5850 MHz)</b>  |                    |             |         |
| Frequency (MHz)                                  | Output Power (dBm) | Limit (dBm) | Verdict |
| 5755   | 9.99               | 30.00       | Pass    |
| 5795   | 10.04              | 30.00       | Pass    |

| FCC 15.407(a)(1)(2)(3) – Maximum Power Spectral Density  |               |                    | Pass    |
|--|---------------|--------------------|---------|
| <b>FCC Requirement:</b> For client devices in the 5.15-5.25 GHz band the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.   |               |                    |         |
| For the 5.25-5.35 GHz and 5.47-5.725 GHz bands the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.   |               |                    |         |
| For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.   |               |                    |         |
| Test Specification : ANSI C63.10 – 2013<br>Port of testing : Temporary antenna port<br>Mode of operation : TX mode<br>Supply voltage : 120VAC and/ or 3.7VDC<br>Temperature : 23°C<br>Humidity : 50% |               |                    |         |
| <b>Results:</b> The worst cases is found in 6Mbps, 6.5Mbps and 13.5Mbps respectively. For test protocols please refer to Appendix 1-A.   |               |                    |         |
| <b>802.11a Band U-NII-1 (5150 – 5250 MHz)</b>  |               |                    |         |
| Frequency (MHz)  | PSD (dBm/MHz) | Limit (dBm/MHz)    | Verdict |
| 5180   | 0.658         | 11                 | Pass    |
| 5200   | 3.239         | 11                 | Pass    |
| 5240   | 3.588         | 11                 | Pass    |
| <b>802.11a Band U-NII-2A (5250 – 5350 MHz)</b>   |               |                    |         |
| Frequency (MHz)  | PSD (dBm/MHz) | Limit (dBm/MHz)    | Verdict |
| 5260   | 3.348         | 11                 | Pass    |
| 5280   | 3.662         | 11                 | Pass    |
| 5320   | 1.333         | 11                 | Pass    |
| <b>802.11a Band U-NII-2C (5470 – 5725 MHz)</b>   |               |                    |         |
| Frequency (MHz)  | PSD (dBm/MHz) | Limit (dBm/MHz)    | Verdict |
| 5500   | 0.627         | 11                 | Pass    |
| 5600   | 1.868         | 11                 | Pass    |
| 5700   | 0.855         | 11                 | Pass    |
| <b>802.11a Band U-NII-3 (5725 – 5850 MHz)</b>  |               |                    |         |
| Frequency (MHz)  | PSD (dBm/MHz) | Limit (dBm/500kHz) | Verdict |
| 5745   | -2.115        | 30                 | Pass    |
| 5785   | -2.079        | 30                 | Pass    |
| 5825   | -1.708        | 30                 | Pass    |
| <b>802.11n20 Band U-NII-1 (5150 – 5250 MHz)</b>  |               |                    |         |

| Frequency (MHz)                                  | PSD (dBm/MHz) | Limit (dBm/MHz)    | Verdict |
|--|---------------|--------------------|---------|
| 5180   | 0.636         | 11                 | Pass    |
| 5200   | 2.913         | 11                 | Pass    |
| 5240   | 2.825         | 11                 | Pass    |
| <b>802.11n20 Band U-NII-2A (5250 – 5350 MHz)</b> |               |                    |         |
| Frequency (MHz)                                  | PSD (dBm/MHz) | Limit (dBm/MHz)    | Verdict |
| 5260   | 2.956         | 11                 | Pass    |
| 5280   | 3.369         | 11                 | Pass    |
| 5320   | 1.173         | 11                 | Pass    |
| <b>802.11n20 Band U-NII-2C (5470 – 5725 MHz)</b> |               |                    |         |
| Frequency (MHz)                                  | PSD (dBm/MHz) | Limit (dBm/MHz)    | Verdict |
| 5500   | 0.121         | 11                 | Pass    |
| 5600   | 1.378         | 11                 | Pass    |
| 5700   | 0.583         | 11                 | Pass    |
| <b>802.11n20 Band U-NII-3 (5725 – 5850 MHz)</b>  |               |                    |         |
| Frequency (MHz)                                  | PSD (dBm/MHz) | Limit (dBm/500kHz) | Verdict |
| 5745   | -2.584        | 30                 | Pass    |
| 5785   | -2.615        | 30                 | Pass    |
| 5825   | -1.965        | 30                 | Pass    |
| <b>802.11n40 Band U-NII-1 (5150 – 5250 MHz)</b>  |               |                    |         |
| Frequency (MHz)                                  | PSD (dBm/MHz) | Limit (dBm/MHz)    | Verdict |
| 5190   | -5.319        | 11                 | Pass    |
| 5230   | -5.154        | 11                 | Pass    |
| <b>802.11n40 Band U-NII-2A (5250 – 5350 MHz)</b> |               |                    |         |
| Frequency (MHz)                                  | PSD (dBm/MHz) | Limit (dBm/MHz)    | Verdict |
| 5270   | 0.867         | 11                 | Pass    |
| 5310   | -4.977        | 11                 | Pass    |
| <b>802.11n40 Band U-NII-2C (5470 – 5725 MHz)</b> |               |                    |         |
| Frequency (MHz)                                  | PSD (dBm/MHz) | Limit (dBm/MHz)    | Verdict |
| 5510   | -8.116        | 11                 | Pass    |
| 5590   | -0.945        | 11                 | Pass    |
| 5670   | -4.077        | 11                 | Pass    |
| <b>802.11n40 Band U-NII-3 (5725 – 5850 MHz)</b>  |               |                    |         |
| Frequency (MHz)                                  | PSD (dBm/MHz) | Limit (dBm/500kHz) | Verdict |
| 5755   | -6.840        | 30                 | Pass    |
| 5795   | -6.843        | 30                 | Pass    |

|  |  |
|--|--|
| <b>FCC 15.407(h)(1) – Transmit Power Control</b>   | <b>N/A</b>   |
| <p><b>FCC Requirement:</b> U-NII devices operating in the 5.25-5.35 GHz band and the 5.47-5.725 GHz band shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm.</p> |  |
| <b>Results:</b>  | A TPC mechanism is not required for systems with an e.i.r.p. of less than 500 mW |

|  |             |
|--|-------------|
| <b>FCC 15.407(b) – Undesirable Emissions</b>   | <b>Pass</b> |
| Test Specification : ANSI C63.10 – 2013<br>Mode of operation : TX mode<br>Port of testing : Enclosure<br>Supply voltage : 120VAC and/ or 3.7VDC<br>Temperature : 23 °C<br>Humidity : 50 %  |             |
| <p><b>FCC Requirement:</b> For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.</p> <p>For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.</p> <p>For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.</p> <p>For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</p> <p>Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.</p> <p>The provisions of §15.205 apply to intentional radiators operating under this section.</p> |             |
| <p><b>Results:</b> Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and data rate. The worst cases is found in 6Mbps, 6.5Mbps and 13.5Mbps respectively.</p> <p>Simultaneous transmission was investigated and no new emissions were found.</p> <p>Only the worst cases is shown. There is no spurious found below 30MHz. For radiated emission test results please refer to Appendix 1-B.</p>  |             |

| FCC 15.407(g) – Frequency Stability  |                      | Pass            |                 |
|--|----------------------|-----------------|-----------------|
| <b>FCC Requirement:</b> An emission is maintained within the band of operation under all conditions of normal operation as specified in the user manual.   |                      |                 |                 |
| Test Specification : ANSI C63.10 – 2013<br>Port of testing : Temporary antenna port<br>Mode of operation : TX mode<br>Supply voltage : 120VAC<br>Temperature : 23°C<br>Humidity : 50%  |                      |                 |                 |
| <b>Results:</b> The operating temperature range specified in user manual is 0°C to +40°C.<br><br>Test result shown that by varying the operating temperature and supply voltage the carrier frequency will drift to the negative side. So the worst case is at the lower band-edge and only the worst cases is reported.<br><br>The largest 26dB bandwidth of the lowest channel in each frequency band are found 19.57MHz (802.11n20 mode) and 39.75MHz (802.11n40 mode). Therefore, deviation less than 125kHz is required for the emission bandwidth to be maintained within the band of operation. |                      |                 |                 |
| Operating Frequency: 5180 MHz  |                      |                 |                 |
| Temp. (°C)   | Supply Voltage (VAC) | Frequency (MHz) | Deviation (kHz) |
| 0  | 120                  | 5179.987645     | -12.355         |
| 10   | 120                  | 5179.979520     | -20.480         |
| 20   | 120                  | 5179.984635     | -15.365         |
| 30   | 120                  | 5179.981975     | -18.025         |
| 40   | 120                  | 5179.970745     | -29.255         |
| 20   | 102                  | 5179.986720     | -13.280         |
| 20   | 138                  | 5179.983715     | -16.285         |
| Operating Frequency: 5260 MHz  |                      |                 |                 |
| Temp. (°C)   | Supply Voltage (VAC) | Frequency (MHz) | Deviation (kHz) |
| 0  | 120                  | 5259.976415     | -23.585         |
| 10   | 120                  | 5259.978965     | -21.035         |
| 20   | 120                  | 5259.985635     | -14.365         |
| 30   | 120                  | 5259.983750     | -16.250         |
| 40   | 120                  | 5259.981575     | -18.425         |
| 20   | 102                  | 5259.969550     | -30.450         |
| 20   | 138                  | 5259.991405     | -8.595          |
| Operating Frequency: 5500 MHz  |                      |                 |                 |
| Temp. (°C)   | Supply Voltage (VAC) | Frequency (MHz) | Deviation (kHz) |
| 0  | 120                  | 5499.967850     | -32.150         |
| 10   | 120                  | 5499.974835     | -25.165         |
| 20   | 120                  | 5499.989705     | -10.295         |
| 30   | 120                  | 5499.984525     | -15.475         |
| 40   | 120                  | 5499.976345     | -23.655         |
| 20   | 102                  | 5499.981455     | -18.545         |
| 20   | 138                  | 5499.990365     | -9.635          |

| <b>Operating Frequency: 5745 MHz</b> |                                 |                            |                            |
|--------------------------------------|---------------------------------|----------------------------|----------------------------|
| <b>Temp.<br/>(°C)</b>                | <b>Supply Voltage<br/>(VAC)</b> | <b>Frequency<br/>(MHz)</b> | <b>Deviation<br/>(kHz)</b> |
| 0                                    | 120                             | 5744.964375                | -35.625                    |
| 10                                   | 120                             | 5744.969735                | -30.265                    |
| 20                                   | 120                             | 5744.991655                | -8.345                     |
| 30                                   | 120                             | 5744.984125                | -15.875                    |
| 40                                   | 120                             | 5744.972375                | -27.625                    |
| 20                                   | 102                             | 5744.988415                | -11.585                    |
| 20                                   | 138                             | 5744.991865                | -8.135                     |