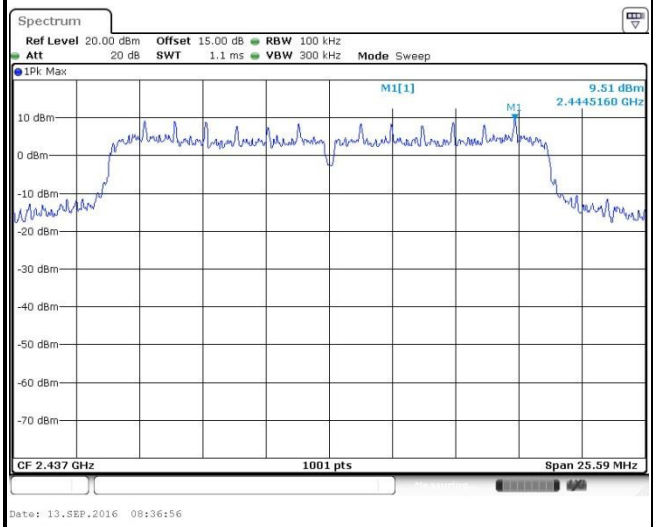
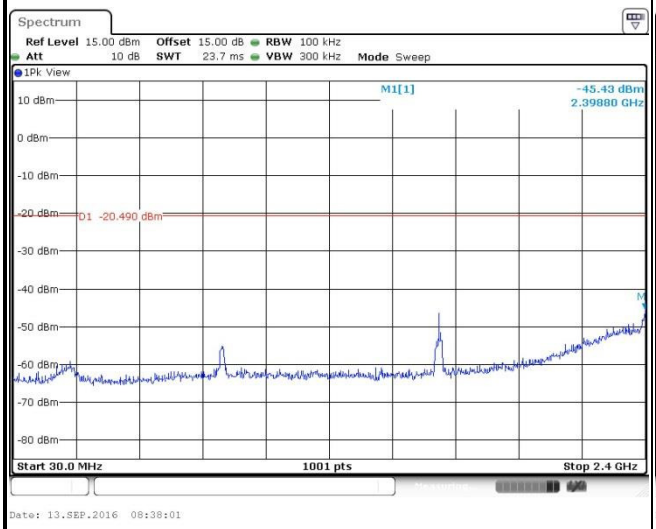
| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Chain Port :** | 2 |
| **Test Mode :** | 802.11n HT20 | **Temperature :** | 24~26℃ |
| **Test Band :** | 2.4GHz Mid | **Relative Humidity :** | 50~53% |
| **Test Channel :** | 06 | **Test Engineer :** | Sam Zheng |

**WLAN 802.11n HT20 Channel 06**

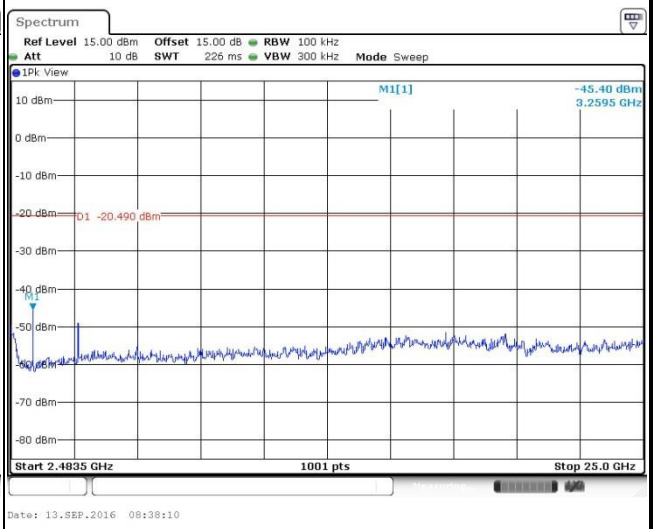
**100kHz PSD reference Level**




**Spurious Emission 30MHz~2.4GHz**



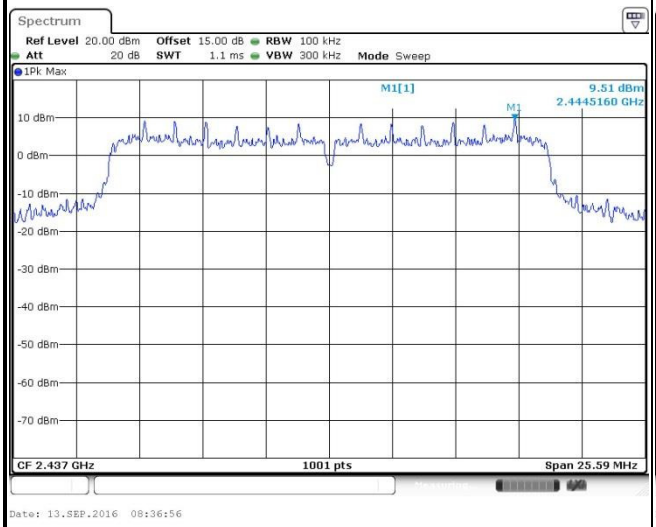

**Spurious Emission 2.4835GHz~25GHz**



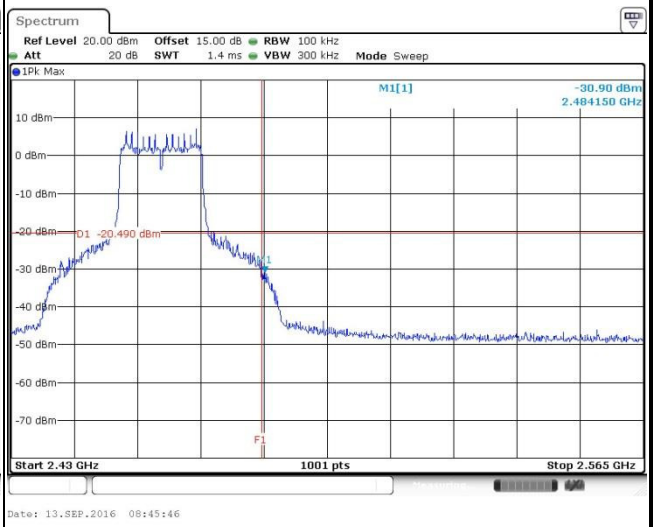
| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Chain Port :** | 2 |
| **Test Mode :** | 802.11n HT20 | **Temperature :** | 24~26℃ |
| **Test Band :** | 2.4GHz High | **Relative Humidity :** | 50~53% |
| **Test Channel :** | 11 | **Test Engineer :** | Sam Zheng |

**WLAN 802.11n HT20 Channel 11**

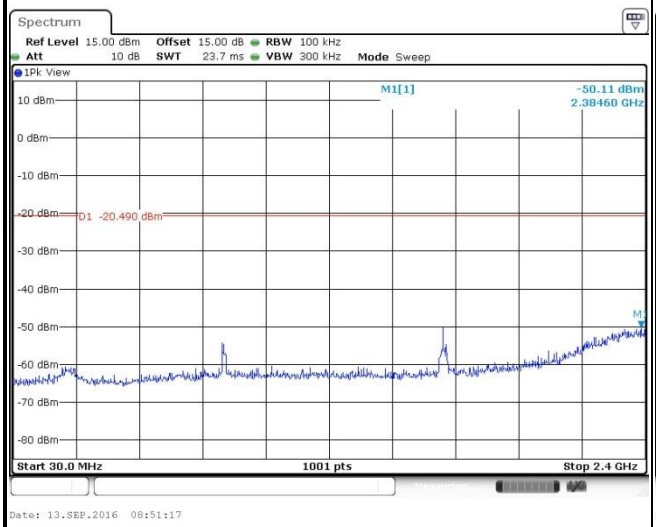
**100kHz PSD reference Level**



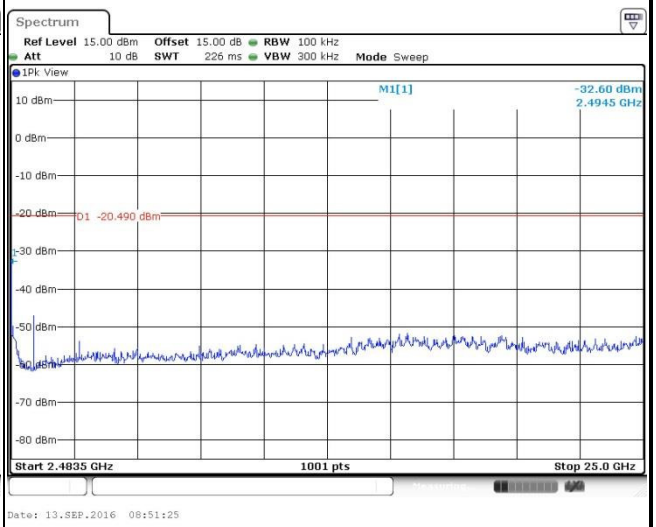

**High Channel Plot**




**Spurious Emission 30MHz~2.4GHz**



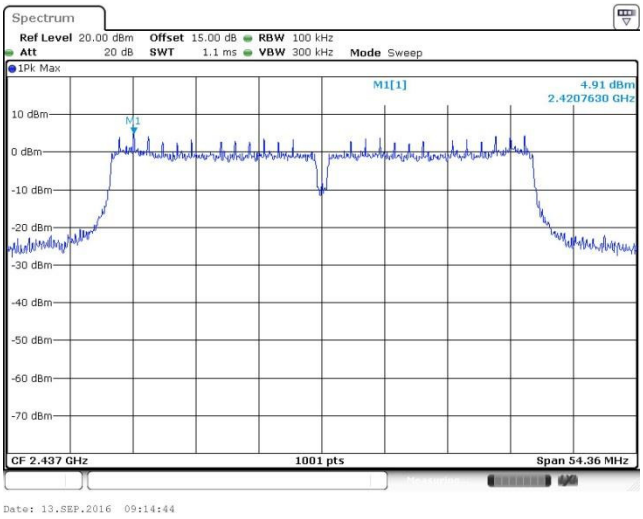

**Spurious Emission 2.4835GHz~25GHz**



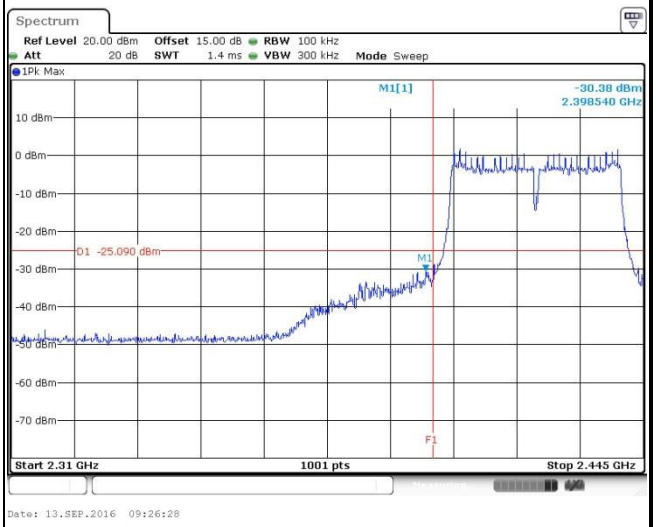
| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Chain Port :** | 2 |
| **Test Mode :** | 802.11n HT40 | **Temperature :** | 24~26℃ |
| **Test Band :** | 2.4GHz Low | **Relative Humidity :** | 50~53% |
| **Test Channel :** | 03 | **Test Engineer :** | Sam Zheng |

**WLAN 802.11n HT40 Channel 03**

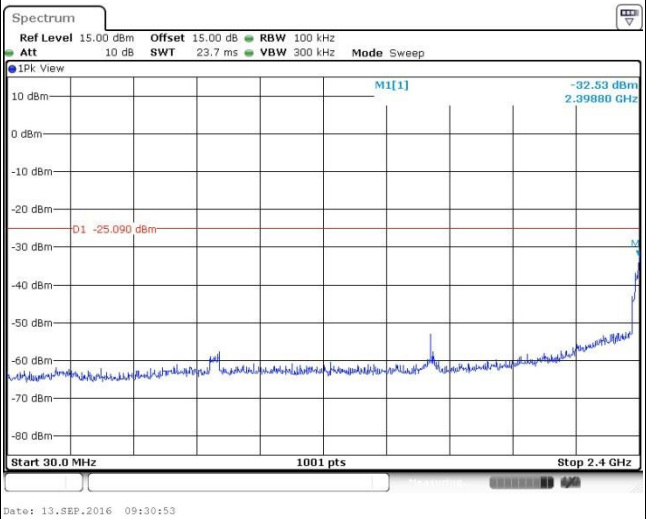
**100kHz PSD reference Level**



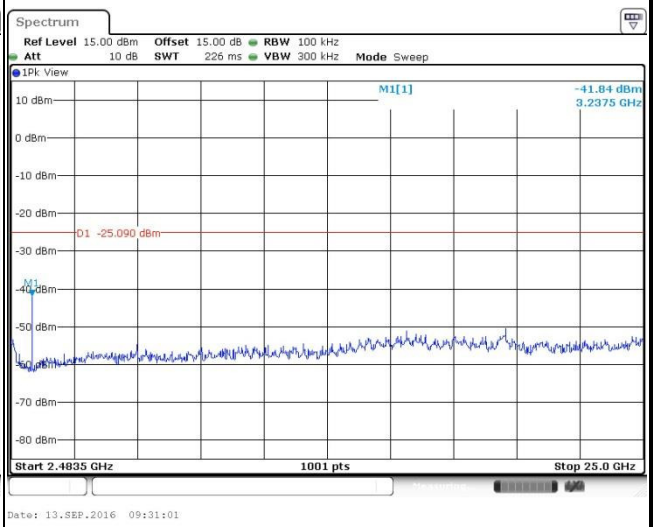

**Low Channel Plot**




**Spurious Emission 30MHz~2.4GHz**



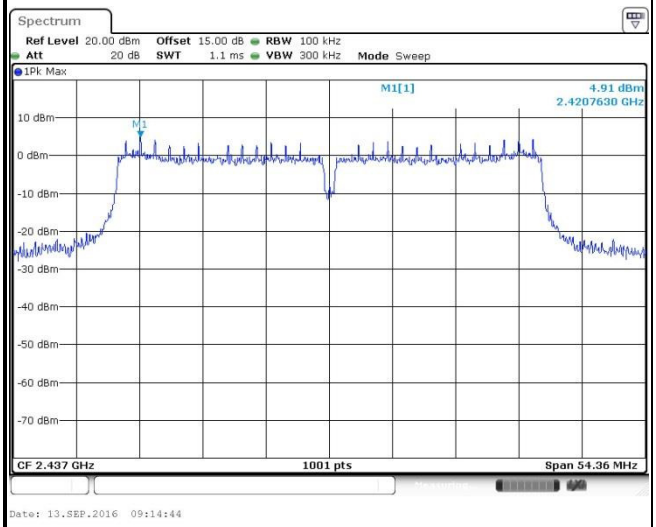

**Spurious Emission 2.4835GHz~25GHz**



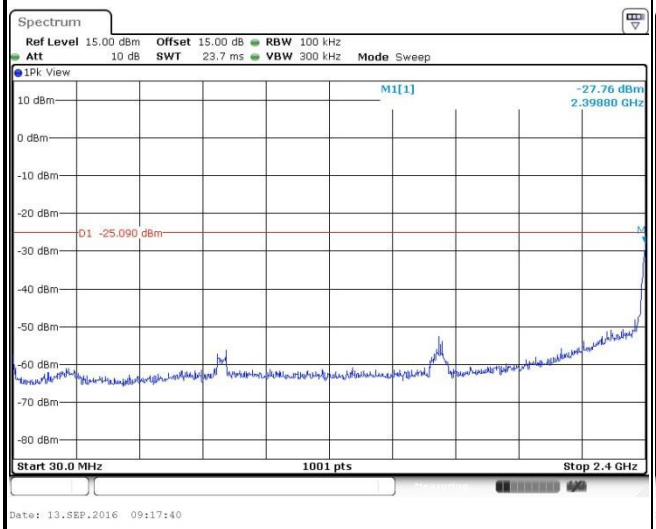
| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Chain Port :** | 2 |
| **Test Mode :** | 802.11n HT40 | **Temperature :** | 24~26℃ |
| **Test Band :** | 2.4GHz Mid | **Relative Humidity :** | 50~53% |
| **Test Channel :** | 06 | **Test Engineer :** | Sam Zheng |

**WLAN 802.11n HT40 Channel 06**

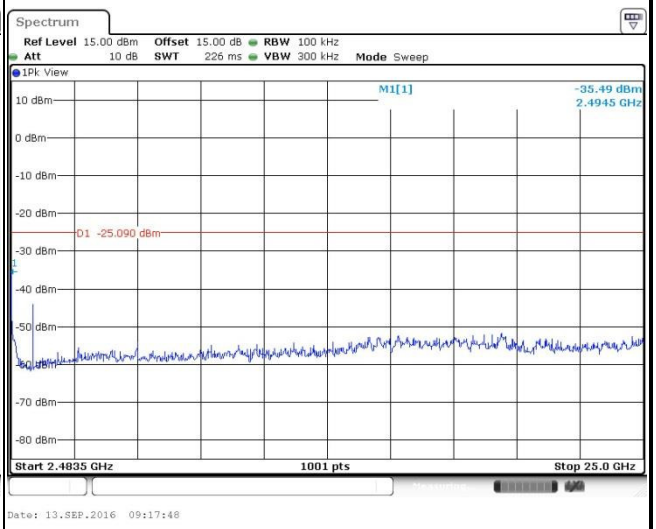
**100kHz PSD reference Level**




**Spurious Emission 30MHz~2.4GHz**



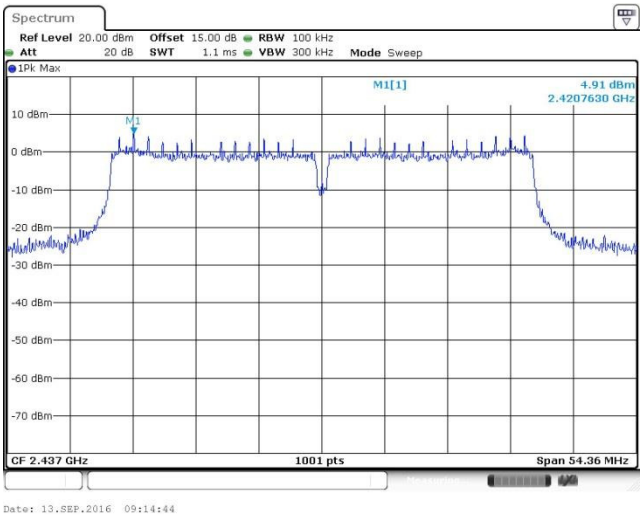

**Spurious Emission 2.4835GHz~25GHz**



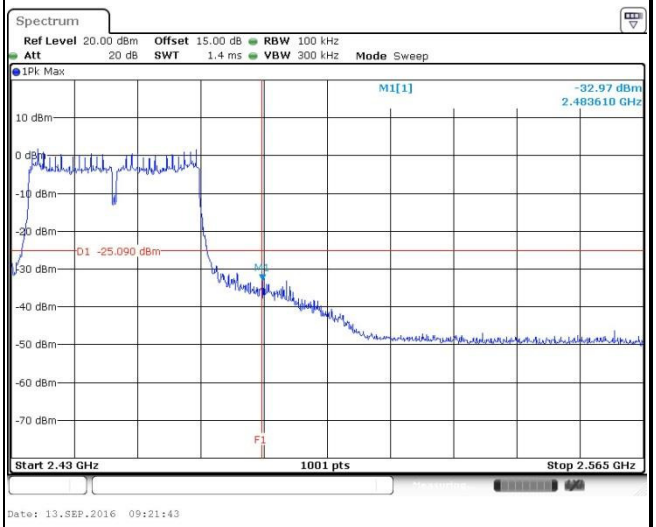
| | | | |
|---|---|---|---|
| **Number of TX :** | 2 | **Chain Port :** | 2 |
| **Test Mode :** | 802.11n HT40 | **Temperature :** | 24~26℃ |
| **Test Band :** | 2.4GHz High | **Relative Humidity :** | 50~53% |
| **Test Channel :** | 09 | **Test Engineer :** | Sam Zheng |

**WLAN 802.11n HT40 Channel 09**

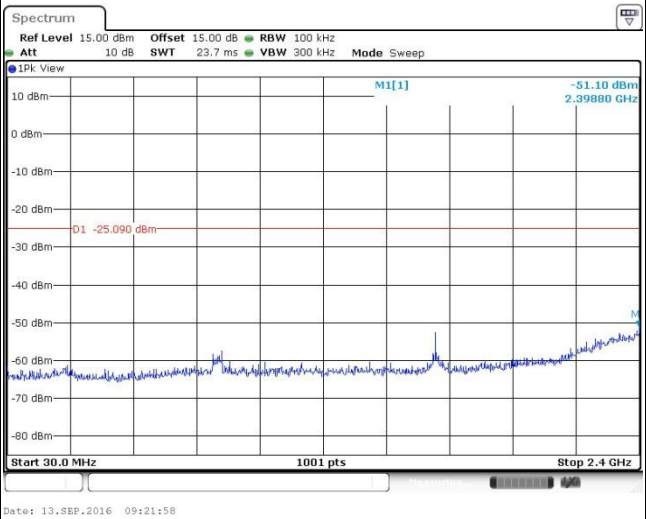
**100kHz PSD reference Level**



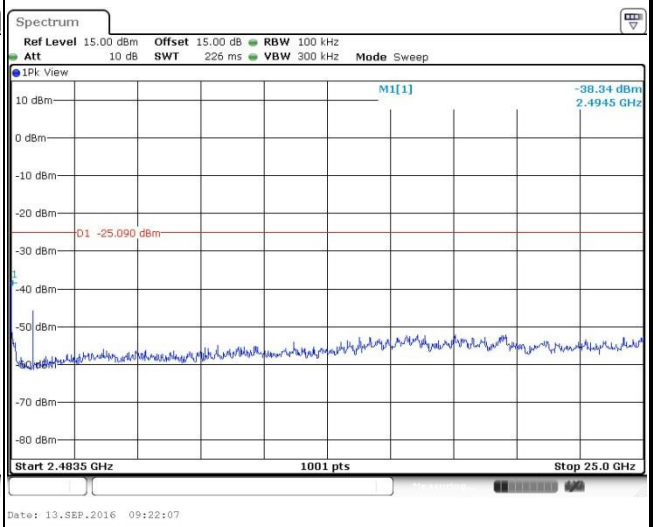

**High Channel Plot**




**Spurious Emission 30MHz~2.4GHz**




**Spurious Emission 2.4835GHz~25GHz**



## 3.5 Radiated Band Edges and Spurious Emission Measurement

### 3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009 – 0.490 | 2400/F(kHz) | 300 |
| 0.490 – 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30.0 | 30 | 30 |
| 30 – 88 | 100 | 3 |
| 88 – 216 | 150 | 3 |
| 216 - 960 | 200 | 3 |
| Above 960 | 500 | 3 |

### 3.5.2 Measuring Instruments

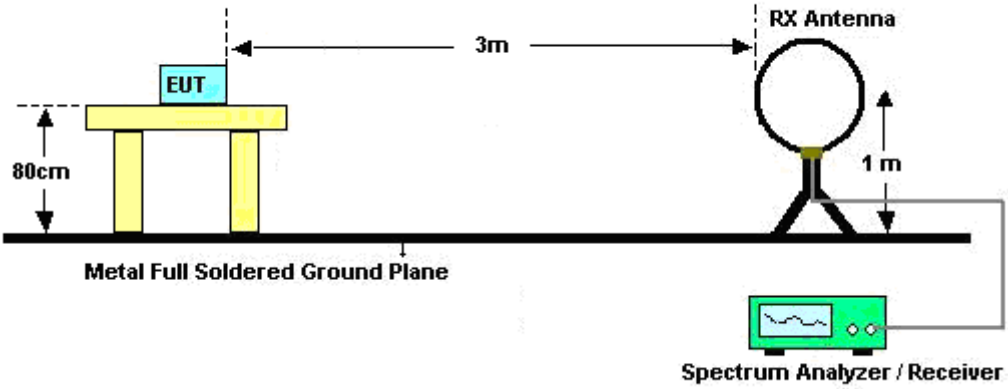
The measuring equipment is listed in the section 4 of this test report.

### 3.5.3 Test Procedures

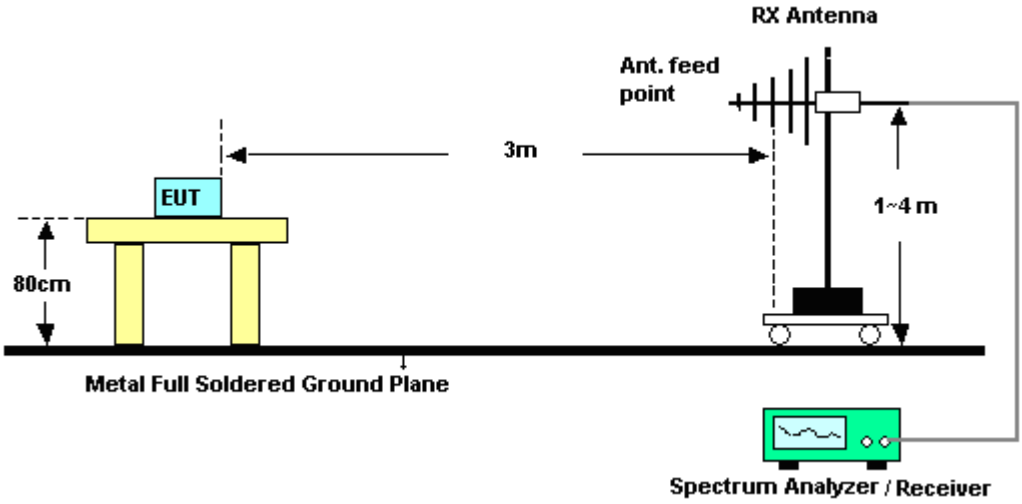
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v03r05.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;
   (3) Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement.
   For average measurement:
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

### 3.5.4 Test Setup

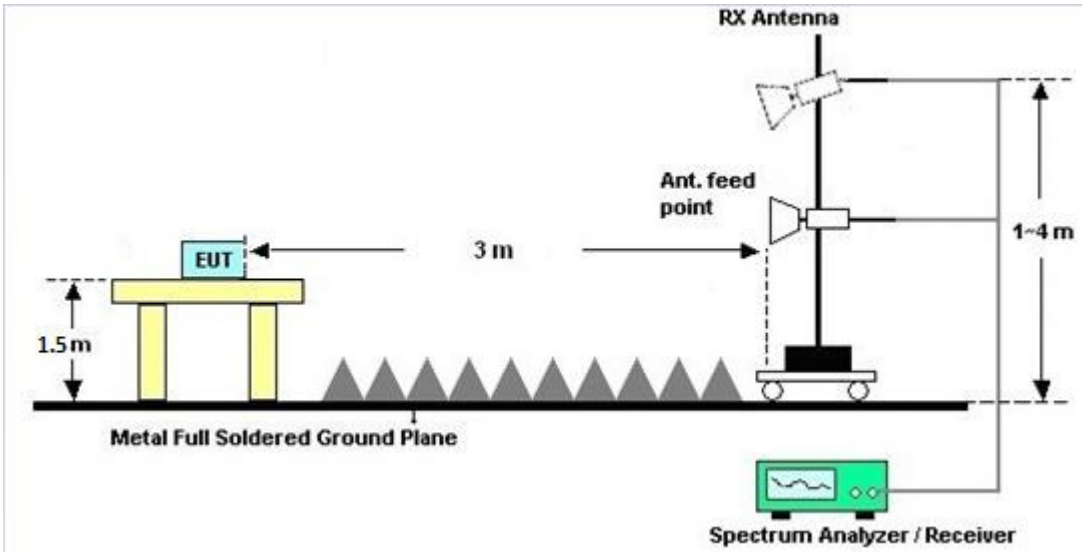
**For radiated emissions below 30MHz**




**For radiated emissions from 30MHz to 1GHz**



**For radiated emissions above 1GHz**




### 3.5.5 Test Results of Radiated Spurious Emissions (9kHz ~ 30MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

### 3.5.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B

### 3.5.7 Duty Cycle

Please refer to Appendix C

### 3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic)

Please refer to Appendix B.

## 3.6 AC Conducted Emission Measurement

### 3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

| 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 |

*Decreases with the logarithm of the frequency.

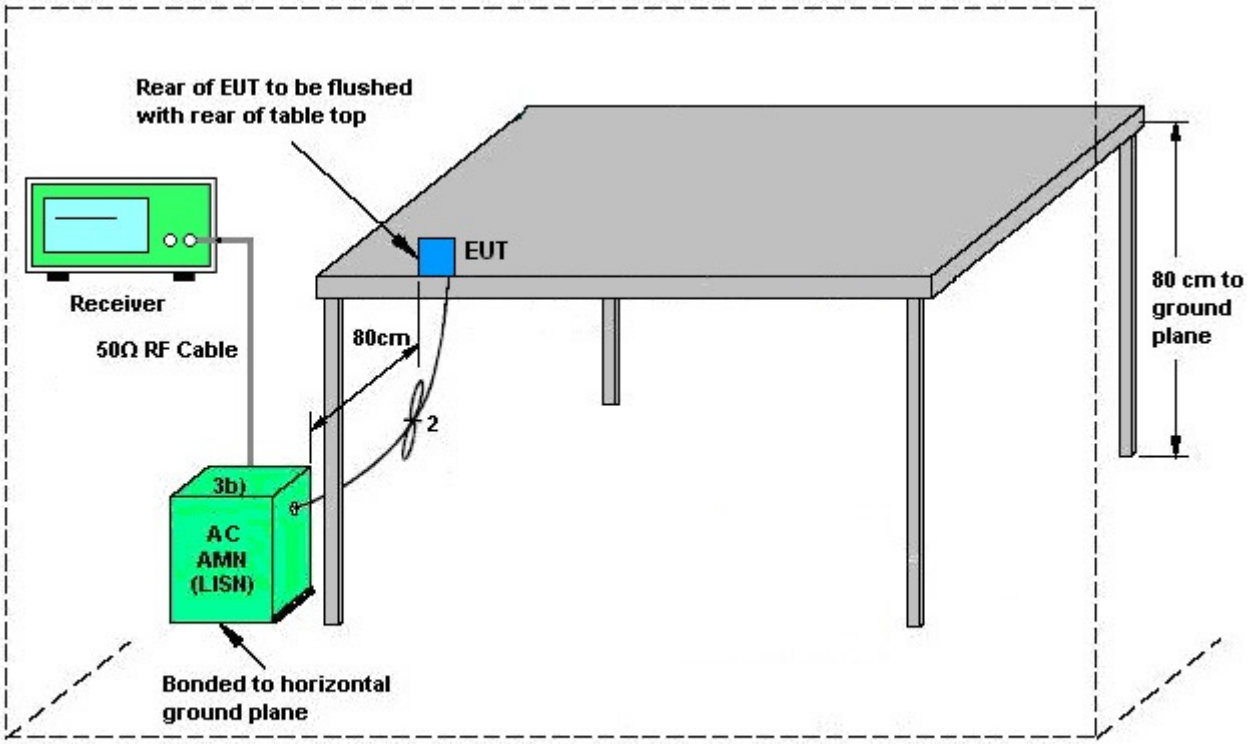
### 3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

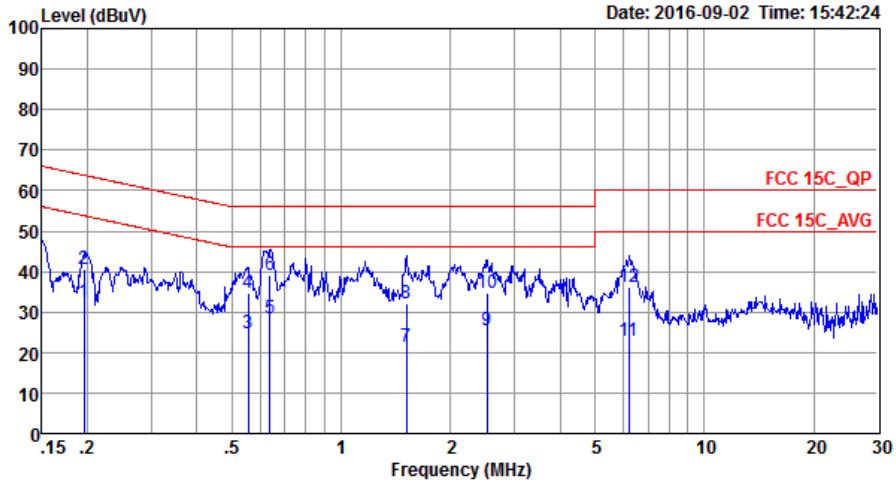
### 3.6.4 Test Setup




AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

### 3.6.5 Test Result of AC Conducted Emission

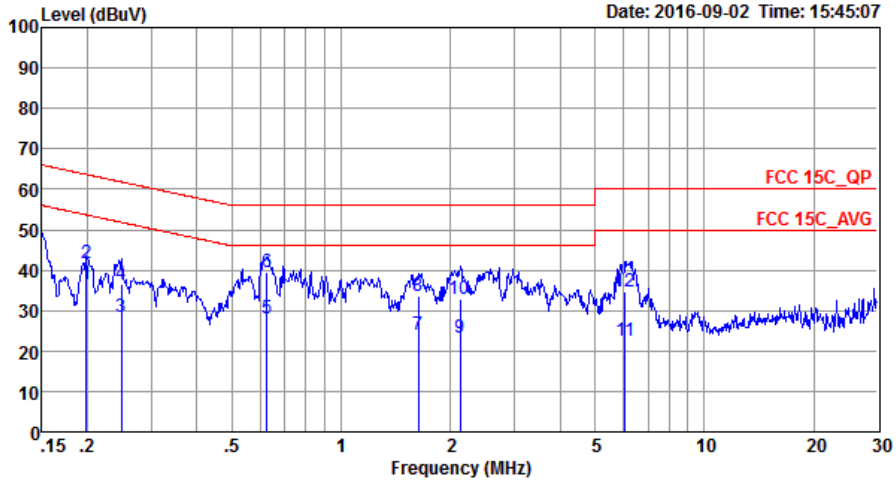
| | | | |
|---|---|---|---|
| **Test Mode :** | Mode 1 | **Temperature :** | 21~23℃ |
| **Test Engineer :** | Tao Cheng | **Relative Humidity :** | 41~42% |
| **Test Voltage :** | 120Vac / 60Hz | **Phase :** | Line |
| **Function Type :** | WLAN 2.4G Link (Client) + WLAN 2.4G Link (Master) + AC Load + RJ45 Link | | |




Site : CO01-SZ
Condition: FCC 15C_QP LISN_20160509 LINE

| | | Freq | Level | Over Limit | Limit Line | Read Level | LISN Factor | Cable Loss | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | dB | |
| 1 | | 0.20 | 32.52 | -21.28 | 53.80 | 21.90 | 0.11 | 10.51 | Average |
| 2 | | 0.20 | 40.52 | -23.28 | 63.80 | 29.90 | 0.11 | 10.51 | QP |
| 3 | | 0.56 | 24.81 | -21.19 | 46.00 | 14.50 | 0.11 | 10.20 | Average |
| 4 | | 0.56 | 34.51 | -21.49 | 56.00 | 24.20 | 0.11 | 10.20 | QP |
| 5 | | 0.64 | 28.59 | -17.41 | 46.00 | 18.30 | 0.11 | 10.18 | Average |
| 6 | * | 0.64 | 38.99 | -17.01 | 56.00 | 28.70 | 0.11 | 10.18 | QP |
| 7 | | 1.51 | 21.58 | -24.42 | 46.00 | 11.30 | 0.11 | 10.17 | Average |
| 8 | | 1.51 | 31.98 | -24.02 | 56.00 | 21.70 | 0.11 | 10.17 | QP |
| 9 | | 2.53 | 25.30 | -20.70 | 46.00 | 14.99 | 0.12 | 10.19 | Average |
| 10 | | 2.53 | 34.80 | -21.20 | 56.00 | 24.49 | 0.12 | 10.19 | QP |
| 11 | | 6.19 | 23.04 | -26.96 | 50.00 | 12.60 | 0.16 | 10.28 | Average |
| 12 | | 6.19 | 36.34 | -23.66 | 60.00 | 25.90 | 0.16 | 10.28 | QP |

| | | | |
|---|---|---|---|
| **Test Mode :** | Mode 1 | **Temperature :** | 21~23℃ |
| **Test Engineer :** | Tao Cheng | **Relative Humidity :** | 41~42% |
| **Test Voltage :** | 120Vac / 60Hz | **Phase :** | Neutral |
| **Function Type :** | WLAN 2.4G Link (Client) + WLAN 2.4G Link (Master) + AC Load + RJ45 Link | | |




Site : CO01-SZ
Condition: FCC 15C_QP LISN_20160509 NEUTRAL

| | | Freq | Level | Over Limit | Limit Line | Read Level | LISN Factor | Cable Loss | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | dB | |
| 1 | | 0.20 | 36.51 | -17.16 | 53.67 | 25.90 | 0.11 | 10.50 | Average |
| 2 | | 0.20 | 41.61 | -22.06 | 63.67 | 31.00 | 0.11 | 10.50 | QP |
| 3 | | 0.25 | 28.37 | -23.45 | 51.82 | 17.80 | 0.11 | 10.46 | Average |
| 4 | | 0.25 | 36.47 | -25.35 | 61.82 | 25.90 | 0.11 | 10.46 | QP |
| 5 | | 0.62 | 28.19 | -17.81 | 46.00 | 17.90 | 0.11 | 10.18 | Average |
| 6 | * | 0.62 | 39.59 | -16.41 | 56.00 | 29.30 | 0.11 | 10.18 | QP |
| 7 | | 1.63 | 24.08 | -21.92 | 46.00 | 13.80 | 0.11 | 10.17 | Average |
| 8 | | 1.63 | 33.48 | -22.52 | 56.00 | 23.20 | 0.11 | 10.17 | QP |
| 9 | | 2.12 | 23.39 | -22.61 | 46.00 | 13.11 | 0.11 | 10.17 | Average |
| 10 | | 2.12 | 32.79 | -23.21 | 56.00 | 22.51 | 0.11 | 10.17 | QP |
| 11 | | 6.06 | 22.64 | -27.36 | 50.00 | 12.20 | 0.16 | 10.28 | Average |
| 12 | | 6.06 | 34.54 | -25.46 | 60.00 | 24.10 | 0.16 | 10.28 | QP |

## 3.7 Antenna Requirements

### 3.7.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the Antenna exceeds 6 dBi. The use of a permanently attached Antenna or of an Antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

### 3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

### 3.7.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For power, the directional gain $G_{ANT}$ is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain “DG” is calculated as following table.

| | Chain Port. 1 (dBi) | Chain Port. 2 (dBi) | DG for Power (dBi) | DG for PSD (dBi) | Power Limit Reduction (dB) | PSD Limit Reduction (dB) |
|---|---|---|---|---|---|---|
| **2.4 GHz** | 1.91 | 1.94 | 1.94 | 4.94 | 0.00 | 0.00 |

*Power Limit Reduction = DG(Power) – 6dBi, ( min = 0 )*

*PSD Limit Reduction = DG(PSD) – 6dBi, ( min = 0 )*

# 4. List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| Spectrum Analyzer | R&S | FSV40 | 101078 | 9kHz~40GHz | May 07, 2016 | Sep. 12, 2016~ Sep. 18, 2016 | May 06, 2017 | Conducted (TH01-SZ) |
| Pulse Power Senor | Anritsu | MA2411B | 1207253 | 30MHz~40GHz | Jan. 12, 2016 | Sep. 12, 2016~ Sep. 18, 2016 | Jan. 11, 2017 | Conducted (TH01-SZ) |
| Power Meter | Anritsu | ML2495A | 1218010 | 50MHz Bandwidth | Jan. 12, 2016 | Sep. 12, 2016~ Sep. 18, 2016 | Jan. 11, 2017 | Conducted (TH01-SZ) |
| EMI Test Receiver&SA | KEYSIGHT | N9038A | MY54450083 | 20Hz~8.4GHz | May 07, 2016 | Sep. 18, 2016 | May 06, 2017 | Radiation (03CH03-SZ) |
| EXA Spectrum Anaiyzer | KEYSIGHT | N9010A | MY55150246 | 10Hz~44GHz | May 07, 2016 | Sep. 18, 2016 | May 06, 2017 | Radiation (03CH03-SZ) |
| Loop Antenna | R&S | HFH2-Z2 | 100354 | 9kHz~30MHz | May 07, 2016 | Sep. 18, 2016 | May 06, 2017 | Radiation (03CH03-SZ) |
| Bilog Antenna | TeseQ | CBL6112D | 35408 | 30MHz~2GHz | May 21, 2016 | Sep. 18, 2016 | May 20, 2017 | Radiation (03CH03-SZ) |
| Double Ridge Horn Antenna | SCHWARZBECK | BBHA9120D | 9120D-1355 | 1GHz~18GHz | May 07, 2016 | Sep. 18, 2016 | May 06, 2017 | Radiation (03CH03-SZ) |
| SHF-EHF Horn | com-power | AH-840 | 101071 | 18GHz~40GHz | Aug. 10, 2016 | Sep. 18, 2016 | Aug. 09, 2017 | Radiation (03CH03-SZ) |
| Amplifier | Burgeon | BPA-530 | 102210 | 0.01Hz ~3000MHz | Oct. 20, 2015 | Sep. 18, 2016 | Oct. 19, 2016 | Radiation (03CH03-SZ) |
| HF Amplifier | MITEQ | AMF-7D-00101800-30-10P-R | 1943528 | 1GHz~18GHz | Oct. 20, 2015 | Sep. 18, 2016 | Oct. 19, 2016 | Radiation (03CH03-SZ) |
| Amplifier | Agilent Technologies | 83017A | MY39501302 | 500MHz~26.5GHz | Jan. 12, 2016 | Sep. 18, 2016 | Jan. 11, 2017 | Radiation (03CH03-SZ) |
| HF Amplifier | MITEQ | TTA1840-35-HG | 1871923 | 18GHz~40GHz | Jul. 16, 2016 | Sep. 18, 2016 | Jul. 15, 2017 | Radiation (03CH03-SZ) |
| AC Power Source | Chroma | 61601 | 616010001985 | N/A | NCR | Sep. 18, 2016 | NCR | Radiation (03CH03-SZ) |
| Turn Table | EM | EM1000 | N/A | 0~360 degree | NCR | Sep. 18, 2016 | NCR | Radiation (03CH03-SZ) |
| Antenna Mast | EM | EM1000 | N/A | 1 m~4 m | NCR | Sep. 18, 2016 | NCR | Radiation (03CH03-SZ) |
| EMI Receiver | R&S | ESCI7 | 100724 | 9kHz~3GHz; | Nov. 23, 2015 | Sep. 02, 2016 | Nov. 22, 2016 | Conduction (CO01-SZ) |
| AC LISN | EMCO | 3816/2SH | 00103892 | 9kHz~30MHz | Jan. 12, 2016 | Sep. 02, 2016 | Jan. 11, 2017 | Conduction (CO01-SZ) |
| AC LISN (for auxiliary equipment) | MessTec | 3816/2SH | 00103912 | 9kHz~30MHz | Jan. 12, 2016 | Sep. 02, 2016 | Jan. 11, 2017 | Conduction (CO01-SZ) |
| AC Power Source | Chroma | 61602 | 616020000891 | 100Vac~250Vac | Jul. 16, 2016 | Sep. 02, 2016 | Jul. 15, 2017 | Conduction (CO01-SZ) |
| Pulse Limiter | COM-POWER | LIT-153 Transient Limiter | 53139 | 150kHz~30MHz | Oct. 20, 2015 | Sep. 02, 2016 | Oct. 19, 2016 | Conduction (CO01-SZ) |

NCR: No Calibration Required

# 5. Uncertainty of Evaluation

**Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)**

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 2.5 dB |

**Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)**

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 5.0dB |

**Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)**

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 4.8dB |

**Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)**

| | |
|---|---|
| Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y)) | 5.0dB |

# Appendix A. Conducted Test Results

| | | | | |
|---|---|---|---|---|
| Test Engineer: | Sam Zheng | Temperature: | 24~26 | °C |
| Test Date: | 2016/9/12~2016/9/18 | Relative Humidity: | 50~53 | % |

## ***TEST RESULTS DATA***
## ***6dB and 99% Occupied Bandwidth***

| 2.4GHz Band | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | 99% Occupied BW (MHz) | | 6dB BW (MHz) | | 6dB BW Limit (MHz) | Pass/Fail |
| | | | | | Chain Port 1 | Chain Port 2 | Chain Port 1 | Chain Port 2 | | |
| 11b | 1Mbps | 2 | 1 | 2412 | 13.59 | 13.89 | 10.03 | 10.07 | 0.50 | Pass |
| 11b | 1Mbps | 2 | 6 | 2437 | 13.49 | 13.89 | 10.05 | 10.03 | 0.50 | Pass |
| 11b | 1Mbps | 2 | 11 | 2462 | 13.39 | 13.89 | 10.05 | 10.05 | 0.50 | Pass |
| 11g | 6Mbps | 2 | 1 | 2412 | 18.43 | 18.43 | 16.30 | 16.32 | 0.50 | Pass |
| 11g | 6Mbps | 2 | 6 | 2437 | 25.32 | 23.43 | 16.32 | 16.32 | 0.50 | Pass |
| 11g | 6Mbps | 2 | 11 | 2462 | 18.38 | 18.48 | 16.32 | 16.32 | 0.50 | Pass |
| HT20 | MCS0 | 2 | 1 | 2412 | 19.03 | 18.83 | 17.08 | 17.04 | 0.50 | Pass |
| HT20 | MCS0 | 2 | 6 | 2437 | 28.17 | 28.42 | 17.02 | 17.06 | 0.50 | Pass |
| HT20 | MCS0 | 2 | 11 | 2462 | 18.98 | 19.18 | 17.06 | 17.04 | 0.50 | Pass |
| HT40 | MCS0 | 2 | 3 | 2422 | 36.96 | 37.16 | 36.28 | 36.24 | 0.50 | Pass |
| HT40 | MCS0 | 2 | 6 | 2437 | 37.76 | 37.66 | 36.24 | 36.24 | 0.50 | Pass |
| HT40 | MCS0 | 2 | 9 | 2452 | 37.16 | 37.16 | 36.24 | 36.24 | 0.50 | Pass |

Report Number : FR683003A

## ***TEST RESULTS DATA***
## ***Peak Output Power***

| 2.4GHz Band | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Peak Conducted Power (dBm) | | | DG (dBi) | | EIRP Power (dBm) | |
| | | | | | Chain Port 1 | Chain Port 2 | SUM | Chain Port 1 | Chain Port 2 | Chain Port 1 | Chain Port 2 |
| 11b | 1Mbps | 2 | 1 | 2412 | 24.02 | 23.17 | 26.63 | 1.94 | | 28.57 | |
| 11b | 1Mbps | 2 | 6 | 2437 | 24.11 | 23.27 | 26.72 | 1.94 | | 28.66 | |
| 11b | 1Mbps | 2 | 11 | 2462 | 24.16 | 23.08 | 26.66 | 1.94 | | 28.60 | |
| 11g | 6Mbps | 2 | 1 | 2412 | 23.55 | 24.00 | 26.79 | 1.94 | | 28.73 | |
| 11g | 6Mbps | 2 | 6 | 2437 | 24.36 | 24.38 | 27.38 | 1.94 | | 29.32 | |
| 11g | 6Mbps | 2 | 11 | 2462 | 23.73 | 24.07 | 26.91 | 1.94 | | 28.85 | |
| HT20 | MCS0 | 2 | 1 | 2412 | 23.78 | 23.81 | 26.81 | 1.94 | | 28.75 | |
| HT20 | MCS0 | 2 | 6 | 2437 | 24.22 | 24.28 | 27.26 | 1.94 | | 29.20 | |
| HT20 | MCS0 | 2 | 11 | 2462 | 23.48 | 23.72 | 26.61 | 1.94 | | 28.55 | |
| HT40 | MCS0 | 2 | 3 | 2422 | 22.55 | 22.66 | 25.62 | 1.94 | | 27.56 | |
| HT40 | MCS0 | 2 | 6 | 2437 | 23.57 | 23.86 | 26.73 | 1.94 | | 28.67 | |
| HT40 | MCS0 | 2 | 9 | 2452 | 22.96 | 23.05 | 26.02 | 1.94 | | 27.96 | |

Note: Measured power (dBm) has offset with cable loss.

Report Number : FR683003A

## ***TEST RESULTS DATA***
## ***Average Output Power***

| 2.4GHz Band | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Duty Factor (dB) | | Average Conducted Power (dBm) | | | Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power (dBm) | | EIRP Power Limit (dBm) | | Pass /Fail |
| | | | | | Chain Port 1 | Chain Port 2 | Chain Port 1 | Chain Port 2 | SUM | Chain Port 1 | Chain Port 2 | Chain Port 1 | Chain Port 2 | Chain Port 1 | Chain Port 2 | Chain Port 1 | Chain Port 2 | |
| 11b | 1Mbps | 2 | 1 | 2412 | 0.00 | 0.00 | 20.34 | 20.56 | 23.46 | 30.00 | | 1.94 | | 25.40 | | 36.00 | | Pass |
| 11b | 1Mbps | 2 | 6 | 2437 | 0.00 | 0.00 | 20.38 | 20.63 | 23.52 | 30.00 | | 1.94 | | 25.46 | | 36.00 | | Pass |
| 11b | 1Mbps | 2 | 11 | 2462 | 0.00 | 0.00 | 20.40 | 20.38 | 23.40 | 30.00 | | 1.94 | | 25.34 | | 36.00 | | Pass |
| 11g | 6Mbps | 2 | 1 | 2412 | 0.05 | 0.05 | 16.75 | 16.99 | 19.88 | 30.00 | | 1.94 | | 21.82 | | 36.00 | | Pass |
| 11g | 6Mbps | 2 | 6 | 2437 | 0.05 | 0.05 | 19.48 | 19.57 | 22.53 | 30.00 | | 1.94 | | 24.47 | | 36.00 | | Pass |
| 11g | 6Mbps | 2 | 11 | 2462 | 0.05 | 0.05 | 16.53 | 17.17 | 19.87 | 30.00 | | 1.94 | | 21.81 | | 36.00 | | Pass |
| HT20 | MCS0 | 2 | 1 | 2412 | 0.04 | 0.04 | 16.04 | 16.02 | 19.04 | 30.00 | | 1.94 | | 20.98 | | 36.00 | | Pass |
| HT20 | MCS0 | 2 | 6 | 2437 | 0.04 | 0.04 | 19.41 | 19.71 | 22.57 | 30.00 | | 1.94 | | 24.51 | | 36.00 | | Pass |
| HT20 | MCS0 | 2 | 11 | 2462 | 0.04 | 0.04 | 16.04 | 16.37 | 19.22 | 30.00 | | 1.94 | | 21.16 | | 36.00 | | Pass |
| HT40 | MCS0 | 2 | 3 | 2422 | 0.08 | 0.08 | 13.98 | 14.04 | 17.02 | 30.00 | | 1.94 | | 18.96 | | 36.00 | | Pass |
| HT40 | MCS0 | 2 | 6 | 2437 | 0.08 | 0.08 | 17.09 | 17.28 | 20.19 | 30.00 | | 1.94 | | 22.13 | | 36.00 | | Pass |
| HT40 | MCS0 | 2 | 9 | 2452 | 0.08 | 0.08 | 14.80 | 14.96 | 17.89 | 30.00 | | 1.94 | | 19.83 | | 36.00 | | Pass |

Note: Measured power (dBm) has offset with cable loss.

# ***TEST RESULTS DATA***
## ***Average Power Spectral Density***

| 2.4GHz Band | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average PSD (dBm/3kHz) | | | DG (dBi) | | Average PSD Limit (dBm/3kHz) | | Pass/Fail |
| | | | | | Chain Port 1 | Chain Port 2 | Worse + 3.01 | Chain Port 1 | Chain Port 2 | Chain Port 1 | Chain Port 2 | |
| 11b | 1Mbps | 2 | 1 | 2412 | -7.45 | -7.01 | -4.00 | 4.94 | | 8.00 | | Pass |
| 11b | 1Mbps | 2 | 6 | 2437 | -7.02 | -7.51 | -4.01 | 4.94 | | 8.00 | | Pass |
| 11b | 1Mbps | 2 | 11 | 2462 | -6.96 | -6.97 | -3.95 | 4.94 | | 8.00 | | Pass |
| 11g | 6Mbps | 2 | 1 | 2412 | -11.36 | -10.50 | -7.49 | 4.94 | | 8.00 | | Pass |
| 11g | 6Mbps | 2 | 6 | 2437 | -8.20 | -7.83 | -4.82 | 4.94 | | 8.00 | | Pass |
| 11g | 6Mbps | 2 | 11 | 2462 | -11.20 | -10.58 | -7.57 | 4.94 | | 8.00 | | Pass |
| HT20 | MCS0 | 2 | 1 | 2412 | -11.96 | -11.82 | -8.81 | 4.94 | | 8.00 | | Pass |
| HT20 | MCS0 | 2 | 6 | 2437 | -9.27 | -8.63 | -5.62 | 4.94 | | 8.00 | | Pass |
| HT20 | MCS0 | 2 | 11 | 2462 | -12.03 | -11.41 | -8.40 | 4.94 | | 8.00 | | Pass |
| HT40 | MCS0 | 2 | 3 | 2422 | -16.44 | -16.13 | -13.12 | 4.94 | | 8.00 | | Pass |
| HT40 | MCS0 | 2 | 6 | 2437 | -12.75 | -12.57 | -9.56 | 4.94 | | 8.00 | | Pass |
| HT40 | MCS0 | 2 | 9 | 2452 | -16.32 | -15.51 | -12.50 | 4.94 | | 8.00 | | Pass |

Measured power density (dBm) has offset with cable loss.

# Appendix B. Radiated Spurious Emission

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11b (Band Edge @ 3m)**

| WIFI Chain Port | Note | Frequency | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Ant Pos | Table Pos | Peak Avg. | Pol. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1+2 | | ( MHz ) | ( dBµV/m ) | ( dB ) | ( dBµV/m ) | ( dBµV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 802.11b CH 01 2412MHz | | 2389.275 | 57.05 | -16.95 | 74 | 59.92 | 27.29 | 4.86 | 35.02 | 222 | 226 | P | H |
| | | 2389.38 | 39.92 | -14.08 | 54 | 42.79 | 27.29 | 4.86 | 35.02 | 222 | 226 | A | H |
| | | 2412 | 100.03 | - | - | 102.82 | 27.33 | 4.88 | 35 | 222 | 226 | P | H |
| | | 2412 | 97.41 | - | - | 100.2 | 27.33 | 4.88 | 35 | 222 | 226 | A | H |
| | | 2388.015 | 63.52 | -10.48 | 74 | 66.39 | 27.29 | 4.86 | 35.02 | 227 | 360 | P | V |
| | | 2389.275 | 42.52 | -11.48 | 54 | 45.39 | 27.29 | 4.86 | 35.02 | 227 | 360 | A | V |
| | | 2412 | 105.79 | - | - | 108.58 | 27.33 | 4.88 | 35 | 227 | 360 | P | V |
| | | 2412 | 103.47 | - | - | 106.26 | 27.33 | 4.88 | 35 | 227 | 360 | A | V |
| 802.11b CH 06 2437MHz | | 2324 | 50.16 | -23.84 | 74 | 53.28 | 27.16 | 4.79 | 35.07 | 221 | 230 | P | H |
| | | 2336.04 | 37.81 | -16.19 | 54 | 40.87 | 27.19 | 4.82 | 35.07 | 221 | 230 | A | H |
| | | 2437 | 99.24 | - | - | 101.93 | 27.4 | 4.88 | 34.97 | 221 | 230 | P | H |
| | | 2437 | 96.73 | - | - | 99.42 | 27.4 | 4.88 | 34.97 | 221 | 230 | A | H |
| | | 2496.64 | 48.61 | -25.39 | 74 | 51.09 | 27.5 | 4.92 | 34.9 | 221 | 230 | P | H |
| | | 2485.16 | 36.65 | -17.35 | 54 | 39.2 | 27.47 | 4.9 | 34.92 | 221 | 230 | A | H |
| | | 2385.46 | 58.57 | -15.43 | 74 | 61.47 | 27.26 | 4.86 | 35.02 | 224 | 360 | P | V |
| | | 2342.06 | 40.49 | -13.51 | 54 | 43.53 | 27.19 | 4.82 | 35.05 | 224 | 360 | A | V |
| | | 2437 | 106.01 | - | - | 108.7 | 27.4 | 4.88 | 34.97 | 224 | 360 | P | V |
| | | 2437 | 103.74 | - | - | 106.43 | 27.4 | 4.88 | 34.97 | 224 | 360 | A | V |
| | | 2486.21 | 59.07 | -14.93 | 74 | 61.62 | 27.47 | 4.9 | 34.92 | 224 | 360 | P | V |
| | | 2485.93 | 40.51 | -13.49 | 54 | 43.06 | 27.47 | 4.9 | 34.92 | 224 | 360 | A | V |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11b CH 11 2462MHz | | 2462 | 97.78 | - | - | 100.4 | 27.43 | 4.9 | 34.95 | 250 | 228 | P | H |
| | | 2462 | 95.23 | - | - | 97.85 | 27.43 | 4.9 | 34.95 | 250 | 228 | A | H |
| | | 2484.28 | 51.91 | -22.09 | 74 | 54.46 | 27.47 | 4.9 | 34.92 | 250 | 228 | P | H |
| | | 2483.52 | 37.25 | -16.75 | 54 | 39.8 | 27.47 | 4.9 | 34.92 | 250 | 228 | A | H |
| | | 2462 | 106.44 | - | - | 109.06 | 27.43 | 4.9 | 34.95 | 250 | 360 | P | V |
| | | 2462 | 104.1 | - | - | 106.72 | 27.43 | 4.9 | 34.95 | 250 | 360 | A | V |
| | | 2483.56 | 66.37 | -7.63 | 74 | 68.92 | 27.47 | 4.9 | 34.92 | 250 | 360 | P | V |
| | | 2483.52 | 43.31 | -10.69 | 54 | 45.86 | 27.47 | 4.9 | 34.92 | 250 | 360 | A | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11b (Harmonic @ 3m)**

| WIFI Chain Port 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level ( dBμV ) | Antenna Factor ( dB/m ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11b CH 01 2412MHz | | 4824 | 48.55 | -25.45 | 74 | 67.41 | 32.56 | 6.97 | 58.39 | 250 | 0 | P | H |
| | | 4824 | 48.04 | -25.96 | 74 | 66.9 | 32.56 | 6.97 | 58.39 | 150 | 360 | P | V |
| 802.11b CH 06 2437MHz | | 4874 | 50.41 | -23.59 | 74 | 69.42 | 32.66 | 6.99 | 58.66 | 250 | 0 | P | H |
| | | 7311 | 51.11 | -22.89 | 74 | 63.14 | 37.66 | 8.93 | 58.62 | 150 | 0 | P | H |
| | | 7311 | 44.49 | -9.51 | 54 | 56.52 | 37.66 | 8.93 | 58.62 | 150 | 0 | A | H |
| | | 4874 | 46.82 | -27.18 | 74 | 65.83 | 32.66 | 6.99 | 58.66 | 150 | 360 | P | V |
| | | 7311 | 51.53 | -22.47 | 74 | 63.56 | 37.66 | 8.93 | 58.62 | 174 | 100 | P | V |
| | | 7311 | 44.38 | -9.62 | 54 | 56.41 | 37.66 | 8.93 | 58.62 | 174 | 100 | A | V |
| 802.11b CH 11 2462MHz | | 4924 | 50.61 | -23.39 | 74 | 69.37 | 32.76 | 7 | 58.52 | 250 | 0 | P | H |
| | | 7386 | 51.99 | -22.01 | 74 | 63.7 | 37.68 | 9.15 | 58.54 | 150 | 274 | P | H |
| | | 7386 | 44.83 | -9.17 | 54 | 56.54 | 37.68 | 9.15 | 58.54 | 150 | 274 | A | H |
| | | 4924 | 49.15 | -24.85 | 74 | 67.91 | 32.76 | 7 | 58.52 | 150 | 347 | P | V |
| | | 7386 | 53.12 | -20.88 | 74 | 64.83 | 37.68 | 9.15 | 58.54 | 150 | 0 | P | V |
| | | 7386 | 46.83 | -7.17 | 54 | 58.54 | 37.68 | 9.15 | 58.54 | 150 | 0 | A | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11g (Band Edge @ 3m)**

| WIFI Chain Port 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level ( dBμV ) | Antenna Factor ( dB/m ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11g CH 01 2412MHz | | 2389.17 | 61.55 | -12.45 | 74 | 64.42 | 27.29 | 4.86 | 35.02 | 162 | 348 | P | H |
| | | 2389.91 | 46.71 | -7.29 | 54 | 49.56 | 27.29 | 4.86 | 35 | 162 | 348 | A | H |
| | | 2412 | 99.73 | - | - | 102.52 | 27.33 | 4.88 | 35 | 162 | 348 | P | H |
| | | 2412 | 91.81 | - | - | 94.6 | 27.33 | 4.88 | 35 | 162 | 348 | A | H |
| | | 2389.17 | 69.53 | -4.47 | 74 | 72.4 | 27.29 | 4.86 | 35.02 | 196 | 360 | P | V |
| | | 2390 | 53.76 | -0.24 | 54 | 56.61 | 27.29 | 4.86 | 35 | 196 | 360 | A | V |
| | | 2412 | 108.25 | - | - | 111.04 | 27.33 | 4.88 | 35 | 196 | 360 | P | V |
| | | 2412 | 101.28 | - | - | 104.07 | 27.33 | 4.88 | 35 | 196 | 360 | A | V |
| 802.11g CH 06 2437MHz | | 2380.42 | 49.33 | -24.67 | 74 | 52.23 | 27.26 | 4.86 | 35.02 | 160 | 352 | P | H |
| | | 2389.94 | 38 | -16 | 54 | 40.85 | 27.29 | 4.86 | 35 | 160 | 352 | A | H |
| | | 2437 | 103.58 | - | - | 106.27 | 27.4 | 4.88 | 34.97 | 160 | 352 | P | H |
| | | 2437 | 96.08 | - | - | 98.77 | 27.4 | 4.88 | 34.97 | 160 | 352 | A | H |
| | | 2484.39 | 50.47 | -23.53 | 74 | 53.02 | 27.47 | 4.9 | 34.92 | 160 | 352 | P | H |
| | | 2483.9 | 38.76 | -15.24 | 54 | 41.31 | 27.47 | 4.9 | 34.92 | 160 | 352 | A | H |
| | | 2387.14 | 54.16 | -19.84 | 74 | 57.03 | 27.29 | 4.86 | 35.02 | 200 | 0 | P | V |
| | | 2384.9 | 42.45 | -11.55 | 54 | 45.35 | 27.26 | 4.86 | 35.02 | 200 | 0 | A | V |
| | | 2437 | 110.06 | - | - | 112.75 | 27.4 | 4.88 | 34.97 | 200 | 0 | P | V |
| | | 2437 | 102.91 | - | - | 105.6 | 27.4 | 4.88 | 34.97 | 200 | 0 | A | V |
| | | 2485.65 | 54.79 | -19.21 | 74 | 57.34 | 27.47 | 4.9 | 34.92 | 200 | 0 | P | V |
| | | 2489.29 | 42.46 | -11.54 | 54 | 44.96 | 27.5 | 4.92 | 34.92 | 200 | 0 | A | V |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11g CH 11 2462MHz | | 2462 | 101.64 | - | - | 104.26 | 27.43 | 4.9 | 34.95 | 159 | 350 | P | H |
| | | 2462 | 93.95 | - | - | 96.57 | 27.43 | 4.9 | 34.95 | 159 | 350 | A | H |
| | | 2483.68 | 64.87 | -9.13 | 74 | 67.42 | 27.47 | 4.9 | 34.92 | 159 | 350 | P | H |
| | | 2483.64 | 47.26 | -6.74 | 54 | 49.81 | 27.47 | 4.9 | 34.92 | 159 | 350 | A | H |
| | | 2462 | 108.27 | - | - | 110.89 | 27.43 | 4.9 | 34.95 | 250 | 360 | P | V |
| | | 2462 | 100.23 | - | - | 102.85 | 27.43 | 4.9 | 34.95 | 250 | 360 | A | V |
| | | 2484.04 | 70.56 | -3.44 | 74 | 73.11 | 27.47 | 4.9 | 34.92 | 250 | 360 | P | V |
| | | 2483.52 | 53.36 | -0.64 | 54 | 55.91 | 27.47 | 4.9 | 34.92 | 250 | 360 | A | V |
| Remark | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11g (Harmonic @ 3m)**

| WIFI Chain Port 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level ( dBμV ) | Antenna Factor ( dB/m ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11g CH 01 2412MHz | | 4824 | 56.28 | -17.72 | 74 | 75.14 | 32.56 | 6.97 | 58.39 | 150 | 214 | P | H |
| | | 4824 | 45.66 | -8.34 | 54 | 64.52 | 32.56 | 6.97 | 58.39 | 150 | 214 | A | H |
| | | 4824 | 48.45 | -25.55 | 74 | 67.31 | 32.56 | 6.97 | 58.39 | 150 | 360 | P | V |
| 802.11g CH 06 2437MHz | | 4874 | 56.01 | -17.99 | 74 | 75.02 | 32.66 | 6.99 | 58.66 | 165 | 213 | P | H |
| | | 4874 | 45.44 | -8.56 | 54 | 64.45 | 32.66 | 6.99 | 58.66 | 165 | 213 | A | H |
| | | 7311 | 53.36 | -20.64 | 74 | 65.39 | 37.66 | 8.93 | 58.62 | 241 | 21 | P | H |
| | | 7311 | 42.49 | -11.51 | 54 | 54.52 | 37.66 | 8.93 | 58.62 | 241 | 21 | A | H |
| | | 4874 | 48.93 | -25.07 | 74 | 67.94 | 32.66 | 6.99 | 58.66 | 150 | 360 | P | V |
| | | 7311 | 55.68 | -18.32 | 74 | 67.71 | 37.66 | 8.93 | 58.62 | 174 | 100 | P | V |
| | | 7311 | 45.49 | -8.51 | 54 | 57.52 | 37.66 | 8.93 | 58.62 | 174 | 100 | A | V |
| 802.11g CH 11 2462MHz | | 4924 | 53.75 | -20.25 | 74 | 72.51 | 32.76 | 7 | 58.52 | 150 | 347 | P | H |
| | | 4924 | 44.26 | -9.74 | 54 | 63.02 | 32.76 | 7 | 58.52 | 150 | 347 | A | H |
| | | 7386 | 50.68 | -23.32 | 74 | 62.39 | 37.68 | 9.15 | 58.54 | 150 | 274 | P | H |
| | | 4924 | 48.87 | -25.13 | 74 | 67.63 | 32.76 | 7 | 58.52 | 150 | 347 | P | V |
| | | 7386 | 56.43 | -17.57 | 74 | 68.14 | 37.68 | 9.15 | 58.54 | 150 | 274 | P | V |
| | | 7386 | 45.97 | -8.03 | 54 | 57.68 | 37.68 | 9.15 | 58.54 | 150 | 274 | A | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11n HT20 (Band Edge @ 3m)**

| WIFI Chain Port 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level ( dBμV ) | Antenna Factor ( dB/m ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11n HT20 CH 01 2412MHz | | 2389.28 | 64.53 | -9.47 | 74 | 67.4 | 27.29 | 4.86 | 35.02 | 150 | 231 | P | H |
| | | 2390 | 48.89 | -5.11 | 54 | 51.74 | 27.29 | 4.86 | 35 | 150 | 231 | A | H |
| | | 2412 | 98.03 | - | - | 100.82 | 27.33 | 4.88 | 35 | 150 | 231 | P | H |
| | | 2412 | 92.04 | - | - | 94.83 | 27.33 | 4.88 | 35 | 150 | 231 | A | H |
| | | 2388.54 | 69.24 | -4.76 | 74 | 72.11 | 27.29 | 4.86 | 35.02 | 150 | 3 | P | V |
| | | 2390 | 53.12 | -0.88 | 54 | 55.97 | 27.29 | 4.86 | 35 | 150 | 3 | A | V |
| | | 2412 | 105.79 | - | - | 108.58 | 27.33 | 4.88 | 35 | 150 | 3 | P | V |
| | | 2412 | 98.39 | - | - | 101.18 | 27.33 | 4.88 | 35 | 150 | 3 | A | V |
| 802.11n HT20 CH 06 2437MHz | | 2364.04 | 51.33 | -22.67 | 74 | 54.34 | 27.22 | 4.82 | 35.05 | 247 | 222 | P | H |
| | | 2333.66 | 38.99 | -15.01 | 54 | 42.08 | 27.16 | 4.82 | 35.07 | 247 | 222 | A | H |
| | | 2437 | 101.87 | - | - | 104.56 | 27.4 | 4.88 | 34.97 | 247 | 222 | P | H |
| | | 2437 | 93.45 | - | - | 96.14 | 27.4 | 4.88 | 34.97 | 247 | 222 | A | H |
| | | 2488.1 | 51.84 | -22.16 | 74 | 54.36 | 27.5 | 4.9 | 34.92 | 247 | 222 | P | H |
| | | 2488.59 | 38.55 | -15.45 | 54 | 41.05 | 27.5 | 4.92 | 34.92 | 247 | 222 | A | H |
| | | 2380.98 | 54.64 | -19.36 | 74 | 57.54 | 27.26 | 4.86 | 35.02 | 150 | 351 | P | V |
| | | 2385.18 | 42.09 | -11.91 | 54 | 44.99 | 27.26 | 4.86 | 35.02 | 150 | 351 | A | V |
| | | 2437 | 109.12 | - | - | 111.81 | 27.4 | 4.88 | 34.97 | 150 | 351 | P | V |
| | | 2437 | 103.42 | - | - | 106.11 | 27.4 | 4.88 | 34.97 | 150 | 351 | A | V |
| | | 2487.68 | 57.1 | -16.9 | 74 | 59.62 | 27.5 | 4.9 | 34.92 | 150 | 351 | P | V |
| | | 2483.62 | 42.6 | -11.4 | 54 | 45.15 | 27.47 | 4.9 | 34.92 | 150 | 351 | A | V |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11n HT20 CH 11 2462MHz | | 2462 | 98.56 | - | - | 101.18 | 27.43 | 4.9 | 34.95 | 236 | 227 | P | H |
| | | 2462 | 93 | - | - | 95.62 | 27.43 | 4.9 | 34.95 | 236 | 227 | A | H |
| | | 2483.72 | 61.39 | -12.61 | 74 | 63.94 | 27.47 | 4.9 | 34.92 | 236 | 227 | P | H |
| | | 2483.68 | 45.13 | -8.87 | 54 | 47.68 | 27.47 | 4.9 | 34.92 | 236 | 227 | A | H |
| | | 2462 | 106.45 | - | - | 109.07 | 27.43 | 4.9 | 34.95 | 150 | 354 | P | V |
| | | 2462 | 98.68 | - | - | 101.3 | 27.43 | 4.9 | 34.95 | 150 | 354 | A | V |
| | | 2483.52 | 69.42 | -4.58 | 74 | 71.97 | 27.47 | 4.9 | 34.92 | 150 | 354 | P | V |
| | | 2483.52 | 53.24 | -0.76 | 54 | 55.79 | 27.47 | 4.9 | 34.92 | 150 | 354 | A | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11n HT20 (Harmonic @ 3m)**

| WIFI Chain Port 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level ( dBμV ) | Antenna Factor ( dB/m ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11n HT20 CH 01 2412MHz | | 4824 | 52.55 | -21.45 | 74 | 71.41 | 32.56 | 6.97 | 58.39 | 150 | 360 | P | H |
| | | 4824 | 45.6 | -8.4 | 54 | 64.46 | 32.56 | 6.97 | 58.39 | 150 | 360 | A | H |
| | | 4824 | 48.05 | -25.95 | 74 | 66.91 | 32.56 | 6.97 | 58.39 | 150 | 360 | P | V |
| 802.11n HT20 CH 06 2437MHz | | 4874 | 55 | -19 | 74 | 74.01 | 32.66 | 6.99 | 58.66 | 150 | 360 | P | H |
| | | 4874 | 46.4 | -7.6 | 54 | 65.41 | 32.66 | 6.99 | 58.66 | 150 | 360 | A | H |
| | | 7311 | 52.31 | -21.69 | 74 | 64.34 | 37.66 | 8.93 | 58.62 | 174 | 100 | P | H |
| | | 7311 | 42.78 | -11.22 | 54 | 54.81 | 37.66 | 8.93 | 58.62 | 174 | 100 | A | H |
| | | 4874 | 48.2 | -25.8 | 74 | 67.21 | 32.66 | 6.99 | 58.66 | 150 | 360 | P | V |
| | | 7311 | 53.79 | -20.21 | 74 | 65.82 | 37.66 | 8.93 | 58.62 | 174 | 100 | P | V |
| | | 7311 | 42.23 | -11.77 | 54 | 54.26 | 37.66 | 8.93 | 58.62 | 174 | 100 | A | V |
| 802.11n HT20 CH 11 2462MHz | | 4924 | 52.53 | -21.47 | 74 | 71.29 | 32.76 | 7 | 58.52 | 150 | 347 | P | H |
| | | 4924 | 45.45 | -8.55 | 54 | 64.21 | 32.76 | 7 | 58.52 | 150 | 347 | A | H |
| | | 7386 | 49.73 | -24.27 | 74 | 61.44 | 37.68 | 9.15 | 58.54 | 150 | 274 | P | H |
| | | 4924 | 47.71 | -26.29 | 74 | 66.47 | 32.76 | 7 | 58.52 | 150 | 347 | P | V |
| | | 7386 | 50.74 | -23.26 | 74 | 62.45 | 37.68 | 9.15 | 58.54 | 150 | 274 | P | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11n HT40 (Band Edge @ 3m)**

| WIFI Chain Port 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level ( dBμV ) | Antenna Factor ( dB/m ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11n HT40 CH 03 2422MHz | | 2389.94 | 61.33 | -12.67 | 74 | 64.18 | 27.29 | 4.86 | 35 | 150 | 57 | P | H |
| | | 2389.94 | 46.15 | -7.85 | 54 | 49 | 27.29 | 4.86 | 35 | 150 | 57 | A | H |
| | | 2422 | 92.26 | - | - | 94.99 | 27.36 | 4.88 | 34.97 | 150 | 57 | P | H |
| | | 2422 | 87.61 | - | - | 90.34 | 27.36 | 4.88 | 34.97 | 150 | 57 | A | H |
| | | 2496.43 | 48.76 | -25.24 | 74 | 51.24 | 27.5 | 4.92 | 34.9 | 150 | 57 | P | H |
| | | 2497.76 | 36.93 | -17.07 | 54 | 39.41 | 27.5 | 4.92 | 34.9 | 150 | 57 | A | H |
| | | 2386.58 | 65.9 | -8.1 | 74 | 68.77 | 27.29 | 4.86 | 35.02 | 201 | 6 | P | V |
| | | 2389.94 | 51.74 | -2.26 | 54 | 54.59 | 27.29 | 4.86 | 35 | 201 | 6 | A | V |
| | | 2422 | 101.74 | - | - | 104.47 | 27.36 | 4.88 | 34.97 | 201 | 6 | P | V |
| | | 2422 | 96.85 | - | - | 99.58 | 27.36 | 4.88 | 34.97 | 201 | 6 | A | V |
| | | 2483.97 | 51.72 | -22.28 | 74 | 54.27 | 27.47 | 4.9 | 34.92 | 201 | 6 | P | V |
| | | 2489.29 | 40.24 | -13.76 | 54 | 42.74 | 27.5 | 4.92 | 34.92 | 201 | 6 | A | V |
| 802.11n HT40 CH 06 2437MHz | | 2388.12 | 61.36 | -12.64 | 74 | 64.23 | 27.29 | 4.86 | 35.02 | 230 | 233 | P | H |
| | | 2389.38 | 47.83 | -6.17 | 54 | 50.7 | 27.29 | 4.86 | 35.02 | 230 | 233 | A | H |
| | | 2437 | 97.07 | - | - | 99.76 | 27.4 | 4.88 | 34.97 | 230 | 233 | P | H |
| | | 2437 | 91.93 | - | - | 94.62 | 27.4 | 4.88 | 34.97 | 230 | 233 | A | H |
| | | 2485.58 | 59.17 | -14.83 | 74 | 61.72 | 27.47 | 4.9 | 34.92 | 230 | 233 | P | H |
| | | 2483.5 | 44.31 | -9.69 | 54 | 46.86 | 27.47 | 4.9 | 34.92 | 230 | 233 | A | H |
| | | 2388.4 | 68.02 | -5.98 | 74 | 70.89 | 27.29 | 4.86 | 35.02 | 229 | 359 | P | V |
| | | 2389.94 | 53.53 | -0.47 | 54 | 56.38 | 27.29 | 4.86 | 35 | 229 | 359 | A | V |
| | | 2437 | 105.93 | - | - | 108.62 | 27.4 | 4.88 | 34.97 | 229 | 359 | P | V |
| | | 2437 | 98.3 | - | - | 100.99 | 27.4 | 4.88 | 34.97 | 229 | 359 | A | V |
| | | 2484.18 | 68.14 | -5.86 | 74 | 70.69 | 27.47 | 4.9 | 34.92 | 229 | 359 | P | V |
| | | 2483.5 | 52.14 | -1.86 | 54 | 54.69 | 27.47 | 4.9 | 34.92 | 229 | 359 | A | V |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11n HT40 CH 09 2452MHz | | 2341.78 | 49.76 | -24.24 | 74 | 52.8 | 27.19 | 4.82 | 35.05 | 161 | 223 | P | H |
| | | 2336.74 | 37.73 | -16.27 | 54 | 40.79 | 27.19 | 4.82 | 35.07 | 161 | 223 | A | H |
| | | 2452 | 94.58 | - | - | 97.23 | 27.4 | 4.9 | 34.95 | 161 | 223 | P | H |
| | | 2452 | 91.73 | - | - | 94.38 | 27.4 | 4.9 | 34.95 | 161 | 223 | A | H |
| | | 2484.53 | 62.69 | -11.31 | 74 | 65.24 | 27.47 | 4.9 | 34.92 | 161 | 223 | P | H |
| | | 2483.62 | 46.76 | -7.24 | 54 | 49.31 | 27.47 | 4.9 | 34.92 | 161 | 223 | A | H |
| | | 2383.92 | 52.28 | -21.72 | 74 | 55.18 | 27.26 | 4.86 | 35.02 | 150 | 358 | P | V |
| | | 2389.66 | 39.91 | -14.09 | 54 | 42.78 | 27.29 | 4.86 | 35.02 | 150 | 358 | A | V |
| | | 2452 | 102.52 | - | - | 105.17 | 27.4 | 4.9 | 34.95 | 150 | 358 | P | V |
| | | 2452 | 95.95 | - | - | 98.6 | 27.4 | 4.9 | 34.95 | 150 | 358 | A | V |
| | | 2484.32 | 69.04 | -4.96 | 74 | 71.59 | 27.47 | 4.9 | 34.92 | 150 | 358 | P | V |
| | | 2483.5 | 52.75 | -1.25 | 54 | 55.3 | 27.47 | 4.9 | 34.92 | 150 | 358 | A | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

**2.4GHz 2400~2483.5MHz**

**WIFI 802.11n HT40 (Harmonic @ 3m)**

| WIFI Chain Port 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level ( dBμV ) | Antenna Factor ( dB/m ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 802.11n HT40 CH 03 2422MHz | | 4844 | 46.99 | -27.01 | 74 | 65.91 | 32.59 | 6.97 | 58.48 | 150 | 360 | P | H |
| | | 7266 | 48.48 | -25.52 | 74 | 60.4 | 37.66 | 8.95 | 58.53 | 150 | 0 | P | H |
| | | 4844 | 42.49 | -31.51 | 74 | 61.41 | 32.59 | 6.97 | 58.48 | 150 | 360 | P | V |
| | | 7266 | 48.41 | -25.59 | 74 | 60.33 | 37.66 | 8.95 | 58.53 | 200 | 360 | P | V |
| 802.11n HT40 CH 06 2437MHz | | 4874 | 50.52 | -23.48 | 74 | 69.53 | 32.66 | 6.99 | 58.66 | 221 | 0 | P | H |
| | | 7311 | 48.35 | -25.65 | 74 | 60.38 | 37.66 | 8.93 | 58.62 | 150 | 0 | P | H |
| | | 4874 | 45.21 | -28.79 | 74 | 64.22 | 32.66 | 6.99 | 58.66 | 231 | 357 | P | V |
| | | 7311 | 49.59 | -24.41 | 74 | 61.62 | 37.66 | 8.93 | 58.62 | 150 | 0 | P | V |
| 802.11n HT40 CH 09 2452MHz | | 4904 | 49.12 | -24.88 | 74 | 68.03 | 32.73 | 7 | 58.64 | 150 | 360 | P | H |
| | | 7356 | 48.21 | -25.79 | 74 | 60.07 | 37.67 | 9.04 | 58.57 | 150 | 320 | P | H |
| | | 4904 | 43.03 | -30.97 | 74 | 61.94 | 32.73 | 7 | 58.64 | 150 | 360 | P | V |
| | | 7356 | 49.09 | -24.91 | 74 | 60.95 | 37.67 | 9.04 | 58.57 | 150 | 320 | P | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

**Emission below 1GHz**

**2.4GHz WIFI 802.11g (LF)**

| WIFI Chain Port 1+2 | Note | Frequency ( MHz ) | Level ( dBμV/m ) | Over Limit ( dB ) | Limit Line ( dBμV/m ) | Read Level (dBμV) | Antenna Factor ( dB/m ) | Cable Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.4GHz 802.11g LF | | 30.97 | 26.85 | -13.15 | 40 | 31.73 | 26.28 | 0.62 | 31.78 | 100 | 0 | P | H |
| | | 159.01 | 19.61 | -23.89 | 43.5 | 32.43 | 17.41 | 1.15 | 31.38 | - | - | P | H |
| | | 397.63 | 28.86 | -17.14 | 46 | 32.5 | 25.78 | 1.82 | 31.24 | - | - | P | H |
| | | 482.99 | 27.87 | -18.13 | 46 | 33.59 | 23.46 | 1.99 | 31.17 | - | - | P | H |
| | | 749.74 | 31.39 | -14.61 | 46 | 32.8 | 27.3 | 2.52 | 31.23 | - | - | P | H |
| | | 946.65 | 32.16 | -13.84 | 46 | 31.2 | 29.35 | 2.88 | 31.27 | - | - | P | H |
| | | 32.91 | 25.53 | -14.47 | 40 | 31.25 | 25.44 | 0.62 | 31.78 | 100 | 200 | P | V |
| | | 103.72 | 19.47 | -24.03 | 43.5 | 31.33 | 18.72 | 0.99 | 31.57 | - | - | P | V |
| | | 405.39 | 27.42 | -18.58 | 46 | 30.96 | 25.87 | 1.82 | 31.23 | - | - | P | V |
| | | 596.48 | 27.13 | -18.87 | 46 | 31.03 | 25.09 | 2.25 | 31.24 | - | - | P | V |
| | | 671.17 | 28.95 | -17.05 | 46 | 31.49 | 26.32 | 2.37 | 31.23 | - | - | P | V |
| | | 875.84 | 31.28 | -14.72 | 46 | 31.53 | 28.31 | 2.71 | 31.27 | - | - | P | V |
| **Remark** | 1. No other spurious found.<br>2. All results are PASS against limit line. | | | | | | | | | | | | |

**Note symbol**

| | |
|---|---|
| | Fundamental Frequency which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency. |
| | Test result is over limit line. |
| P/A | Peak or Average |
| H/V | Horizontal or Vertical |

**A calculation example for radiated spurious emission is shown as below:**

| WIFI | Note | Frequency | Level | Over | Limit | Read | Antenna | Cable | Preamp | Ant | Table | Peak | Pol. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chain Port | | | | Limit | Line | Level | Factor | Loss | Factor | Pos | Pos | Avg. | |
| 1+2 | | ( MHz ) | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 802.11b CH 01 2412MHz | | 2390 | 55.45 | -18.55 | 74 | 54.51 | 32.22 | 4.58 | 35.86 | 103 | 308 | P | H |
| | | 2390 | 43.54 | -10.46 | 54 | 42.6 | 32.22 | 4.58 | 35.86 | 103 | 308 | A | H |

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

**For Peak Limit @ 2390MHz:**

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

**For Average Limit @ 2390MHz:**

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

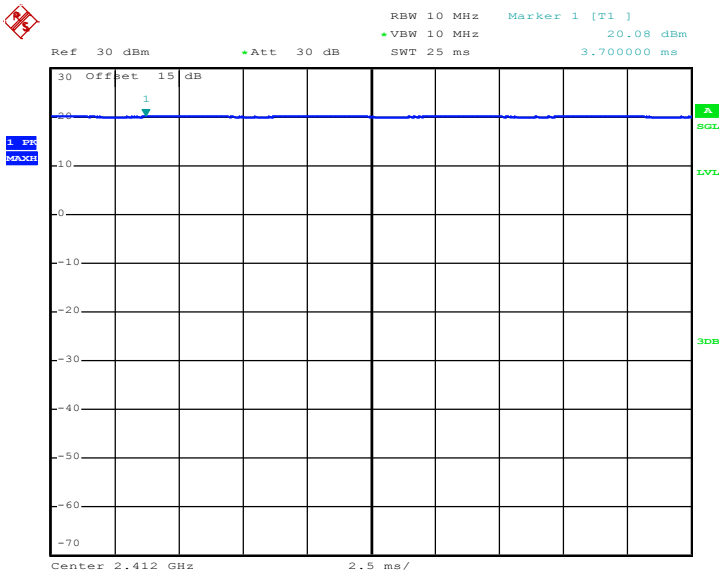
**Both peak and average measured complies with the limit line, so test result is "PASS".**

# Appendix C. Duty Cycle Plots

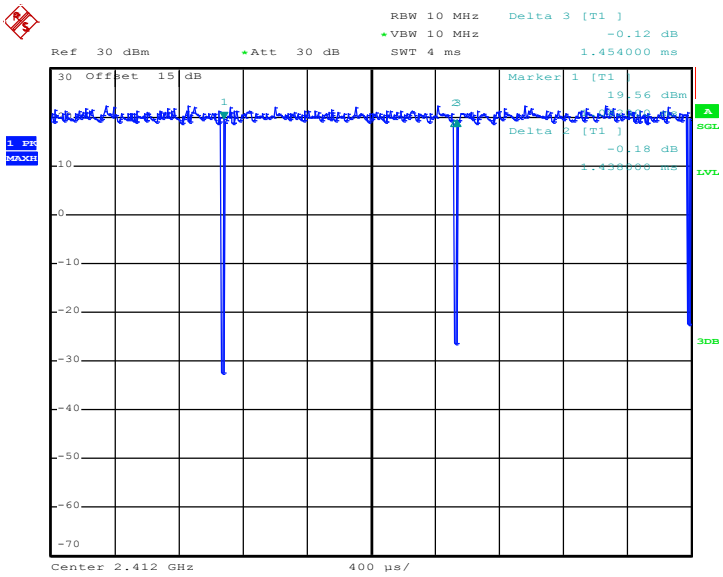
| Chain Port | Band | Duty Cycle(%) | T(ms) | 1/T(kHz) | VBW Setting |
|---|---|---|---|---|---|
| 1+2(1) | 802.11b | 100 | - | - | 10Hz |
| 1+2(1) | 802.11g | 98.90 | - | - | 10Hz |
| 1+2(1) | 2.4GHz 802.11n HT20 | 99.12 | - | - | 10Hz |
| 1+2(1) | 2.4GHz 802.11n HT40 | 98.25 | - | - | 10Hz |
| 1+2(2) | 802.11b | 100 | - | - | 10Hz |
| 1+2(2) | 802.11g | 98.90 | - | - | 10Hz |
| 1+2(2) | 2.4GHz 802.11n HT20 | 99.12 | - | - | 10Hz |
| 1+2(2) | 2.4GHz 802.11n HT40 | 98.27 | - | - | 10Hz |

**<Chain Port 1+2(1)>**

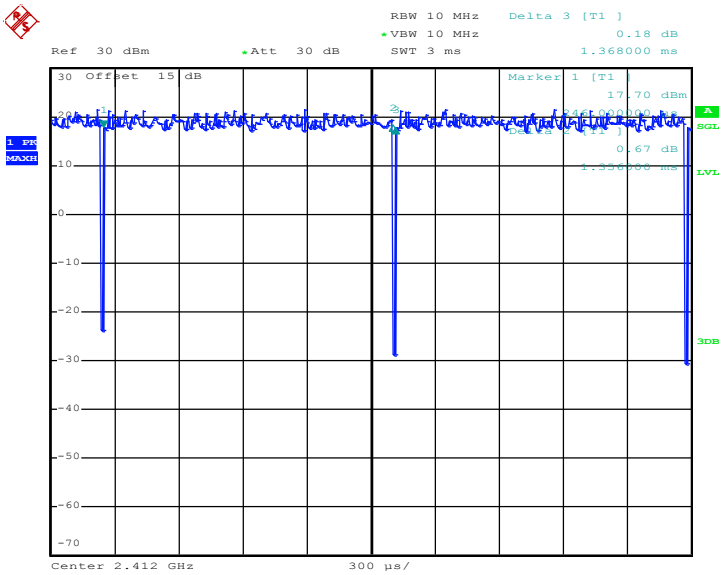
**802.11b**



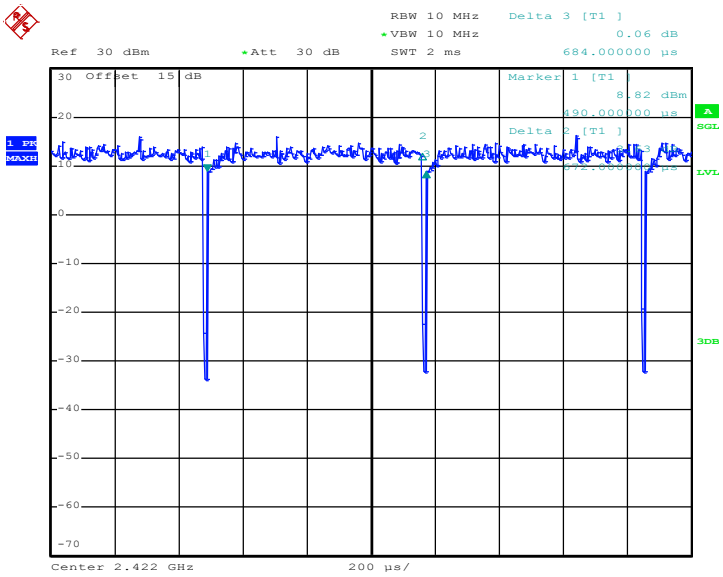

**802.11g**



## 802.11n HT20

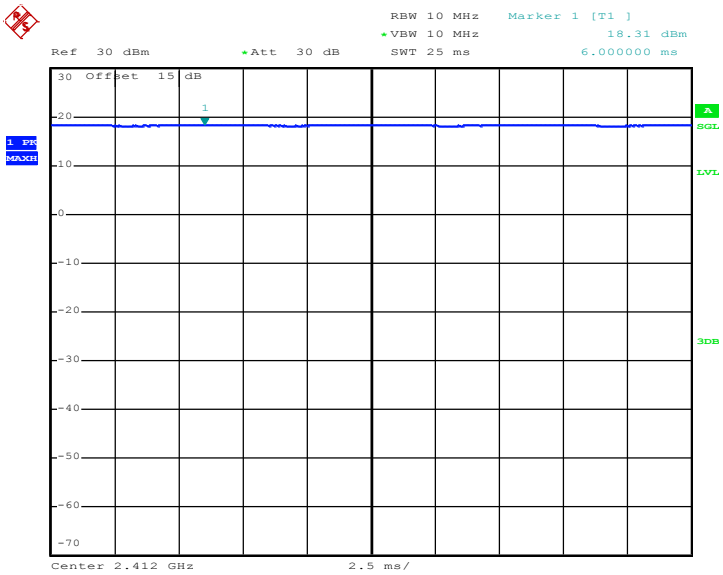



## 802.11n HT40

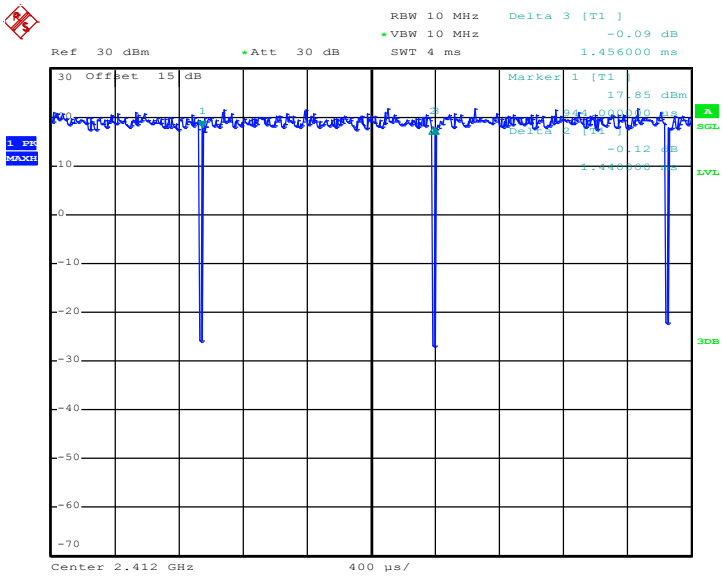


**<Chain Port 1+2(2)>**

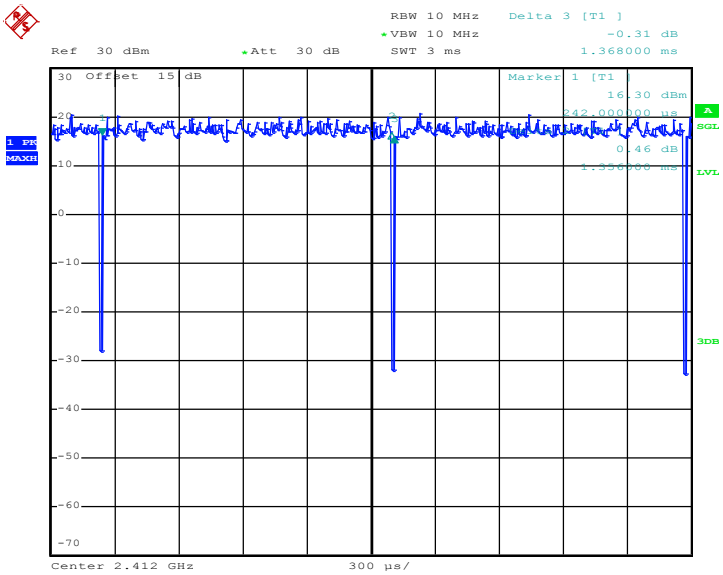
**802.11b**

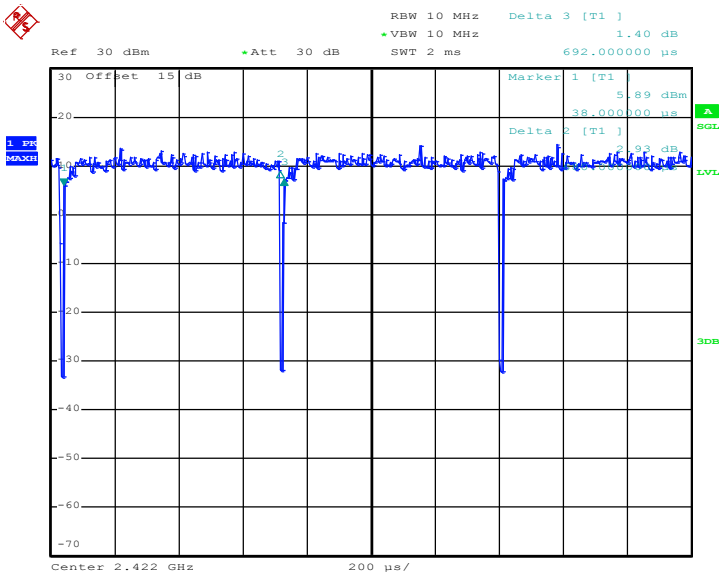



**802.11g**



## 802.11n HT20




## 802.11n HT40