

SparkLAN Communications, Inc.

TEST REPORT

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Jul. 16, 2018

PAGES

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DOCUMENT CONTROL NUMBER

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Radio Spectrum TEST REPORT

| | |
|-------------------------------|--|
| Applicant: | SparkLAN Communications, Inc. 8F., No.257, Sec. 2, Tiding Blvd., Neihu District, Taipei, Taiwan |
| Product: | 802.11ac/b/g/n USB module |
| Model No.: | WUBM-273ACN |
| Brand Name: | SparkLAN |
| FCC ID: | RYK-WUBM273ACN |
| Test Method/ Standard: | 47 CFR FCC Part 15.407 KDB 789033 D02 v01r02 ANSI C63.10 2013 KDB 662911 D01 v02r01 |
| Test By: | Intertek Testing Services Taiwan Ltd., Hsinchu Laboratory No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li, Shiang-Shan District, Hsinchu City, Taiwan |



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Revision History

| Report No. | Issue Date | Revision Summary |
|------------------|---------------|--|
| 180400411TWN-001 | Jul. 16, 2018 | Add antennas and antenna gain is smaller than original device, after engineer judgment and comparing the version, test items were shown in the test summary. |

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Summary of Test Data

| Test Requirement | Applicable Rule (Section 15.407) | Result |
|--|--|--------|
| Maximum Conducted Output Power | 15.407 (a)(1)/(2)/(3) KDB 789033 D02 v01r02 | Pass |
| Emissions In Restricted Frequency Bands (Radiated emission measurements) | 15.407(b), 15.209 | Pass |
| Emission on The Band Edge | 15.407(b), 15.209 | Pass |
| Antenna requirement | 15.203 | Pass |

1. General Information

1.1 Identification of the EUT

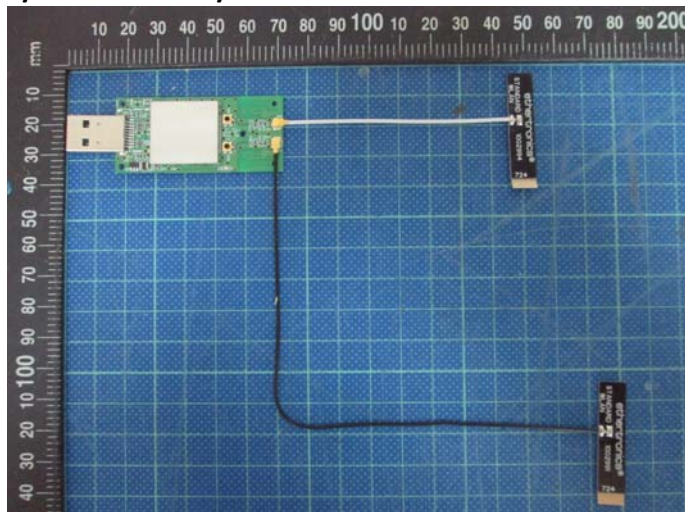
| | | | | |
|--|------------------------------|---------------------------|-----------------------|--------------------|
| Product: | 802.11ac/b/g/n USB module | | | |
| Model No.: | WUBM-273ACN | | | |
| Operating Frequency Range & Number of Channels: | | Mode | Frequency Range (MHz) | Number of Channels |
| | UNII-I | IEEE 802.11a | 5180 - 5240 | 4 Channels |
| | | IEEE 802.11n (HT20) mode | 5180 - 5240 | 4 Channels |
| | | IEEE 802.11n (HT40) mode | 5190 - 5230 | 2 Channels |
| | | IEEE 802.11ac(VHT80) mode | 5210 | 1 Channels |
| | UNII-2A | IEEE 802.11a | 5260 - 5320 | 4 Channels |
| | | IEEE 802.11n (HT20) mode | 5260 - 5320 | 4 Channels |
| | | IEEE 802.11n (HT40) mode | 5270 - 5310 | 2 Channels |
| | | IEEE 802.11ac(VHT80) mode | 5290 | 1 Channels |
| | UNI-2C | IEEE 802.11a | 5500 - 5700 | 11 Channels |
| | | IEEE 802.11n (HT20) mode | 5500 - 5700 | 11 Channels |
| | | IEEE 802.11n (HT40) mode | 5510 - 5670 | 5 Channels |
| | | IEEE 802.11ac(VHT80) mode | 5530 | 1 Channels |
| | UNII Band IV | IEEE 802.11a | 5745 - 5825 | 5 Channels |
| | | IEEE 802.11n (HT20) mode | 5745 - 5825 | 5 Channels |
| | | IEEE 802.11n (HT40) mode | 5755 - 5795 | 2 Channels |
| IEEE 802.11ac(VHT80) mode | | 5775 | 1 Channels | |
| Access scheme: | OFDM | | | |
| Rated Power: | DC 5V | | | |
| Power Cord: | N/A | | | |
| Sample receiving :date: | Apr. 27, 2018 | | | |
| Sample condition: | Workable | | | |
| Test Date(s): | May 09, 2018 ~ Jun. 01, 2018 | | | |

1.2 Description of the EUT

| Modulation mode | Transmit path | |
|-------------------|----------------|---------------|
| | Chain 0 / Main | Chain 1 / AUX |
| 802.11a | V | V |
| 802.11 n (HT20) | V | V |
| 802.11 n (HT40) | V | V |
| 802.11 ac (VHT80) | V | V |

1.3 Antenna description

P/N1002994 + P/N1002991



Antenna 1

(P/N1002994)

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

Antenna Gain : 5 dBi
 Antenna Type : PIFA antenna
 Connector Type : I-Pex

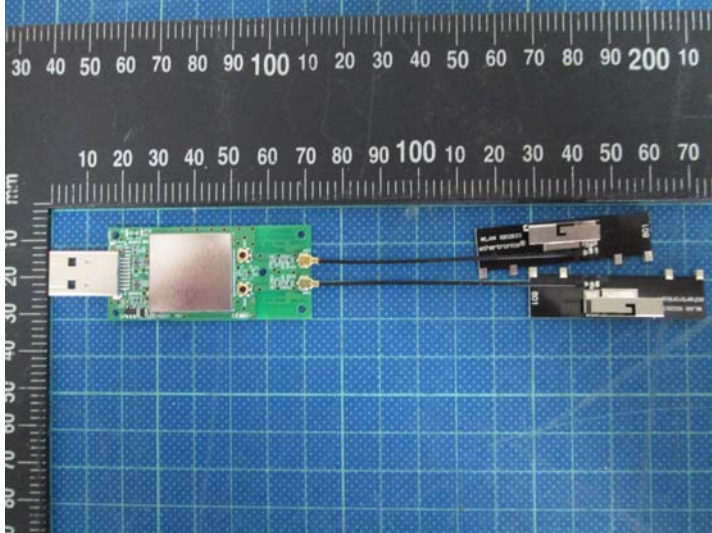
Antenna 2

(P/N1002991)

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

Antenna Gain : 5 dBi
 Antenna Type : PIFA antenna
 Connector Type : I-Pex

P/N1002633 + P/N1002635



Antenna 1

(P/N1002633)

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

Antenna Gain : 5 dBi
Antenna Type : PIFA antenna
Connector Type : I-Pex

Antenna 2

(P/N1002635)

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

Antenna Gain : 5 dBi
Antenna Type : PIFA antenna
Connector Type : I-Pex

1.4 Operation mode

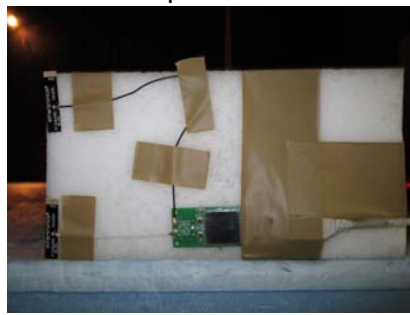
TX mode: EUT use 「AMPAK RFTestTool.apk」 entering test mode , and Touchscreen to change different channel.

P/N1002994 + P/N1002991

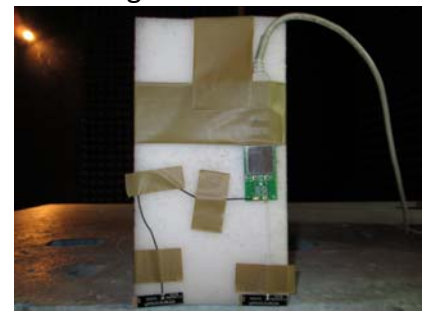
The signal is maximized through rotation and placement in the three orthogonal axes.



X axis



Y axis

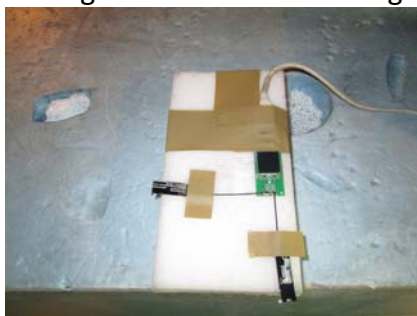


Z axis

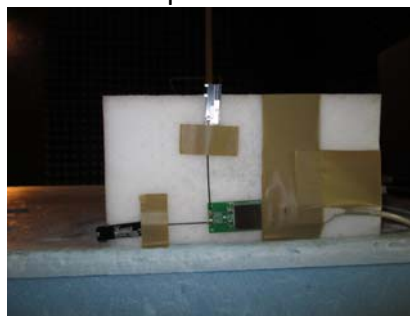
After verifying three axes, we found the maximum electromagnetic field was occurred at Y axis. The final test data was executed under this configuration.

P/N1002633 + P/N1002635

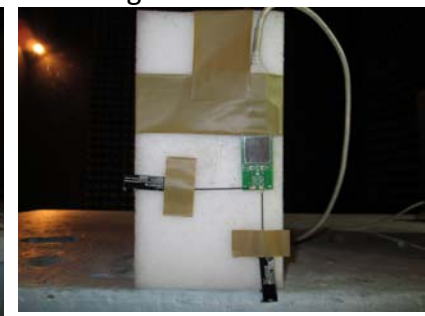
The signal is maximized through rotation and placement in the three orthogonal axes.



X axis



Y axis



Z axis

After verifying three axes, we found the maximum electromagnetic field was occurred at X axis. The final test data was executed under this configuration.

With individual verifying, the maximum output power were found out 6 Mbps data rate for 802.11a mode, 13 Mbps data rate for 802.11ac(VHT20) mode , 27 Mbps data rate for 802.11ac(VHT40) mode , 58.5 Mbps data rate for 802.11ac(VHT80) mode , the final tests were executed under these conditions recorded in this report individually.

1.5 Peripherals equipment

| Peripherals | Brand | Model No. | Serial No. | Data cable |
|-------------|-------|----------------|------------|-------------------------------|
| Notebook PC | HP | ProBook 440 G3 | 5CD8021S9H | USB shielded cable 1 meter× 1 |

2. Maximum Conducted Output Power

2.1 Operating environment

| | | |
|----------------------|------|-----|
| Temperature: | 25 | °C |
| Relative Humidity: | 50 | % |
| Atmospheric Pressure | 1008 | hPa |

2.2 Limit for maximum output power

| Operating Frequency (MHz) | Conducted output power limit |
|---------------------------|------------------------------|
| 5150~5250 | < 0.25 W (24 dBm) |
| 5725~5850 | < 1 W (30 dBm) |

| Operating Frequency (MHz) | Maximum E.I.R.P. limit |
|---------------------------|------------------------|
| 5150~5250 | < 1 W (30 dBm) |
| 5725~5850 | < 4 W (36 dBm) |

2.3 Measuring instrument setting

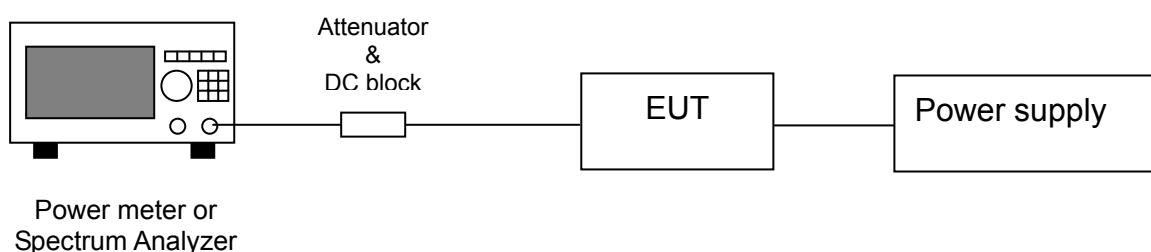
| Power meter for Nominal Bandwidth less than 65MHz | |
|---|--|
| Power meter | Setting |
| Bandwidth | 65MHz bandwidth is greater than the EUT emission bandwidth |
| Detector | Average |

2.4 Test procedure

Test procedures refer to clause E) 3) b) measurement using a gated RF average power meter of KDB 789033 D02 v01r02

Test procedures refer to clause E) 2) b) Method SA-1 of KDB 789033 D02 v01r02

2.5 Test diagram



2.6 Test results

P/N1002994 + P/N1002991

UNII-1

SISO

| Mode | Channel | Frequency (MHz) | Output Power (AV) | | Antenna Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|------------------|---------|-----------------|-------------------|-------|--------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | dBm | mW | | | | | | |
| 802.11a (Chain0) | 36 | 5180 | 11.75 | 14.96 | 5 | 16.75 | 24.00 | -12.25 | 30.00 | -13.25 |
| | 44 | 5220 | 11.87 | 15.38 | 5 | 16.87 | 24.00 | -12.13 | 30.00 | -13.13 |
| | 48 | 5240 | 12.03 | 15.96 | 5 | 17.03 | 24.00 | -11.97 | 30.00 | -12.97 |
| 802.11a (Chain1) | 36 | 5180 | 12.95 | 19.72 | 5 | 17.95 | 24.00 | -11.05 | 30.00 | -12.05 |
| | 44 | 5200 | 12.67 | 18.49 | 5 | 17.67 | 24.00 | -11.33 | 30.00 | -12.33 |
| | 48 | 5240 | 12.59 | 18.16 | 5 | 17.59 | 24.00 | -11.41 | 30.00 | -12.41 |

MIMO

| Mode | Ch | Freq (MHz) | Output Power (AV) | | Total Power (AV) | | Antenna 0 Gain (dBi) | Antenna 1 Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|-----------------|----|------------|-------------------|---------|------------------|-------|----------------------|----------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | Chain 0 | Chain 1 | mW | dBm | | | | | | | |
| | | | dBm | dBm | | | | | | | | | |
| 802.11n (HT 20) | 36 | 5180 | 11.41 | 11.33 | 27.42 | 14.38 | 5 | 5 | 19.38 | 24.00 | -9.62 | 30.00 | -10.62 |
| | 44 | 5220 | 11.34 | 11.23 | 26.89 | 14.30 | 5 | 5 | 19.30 | 24.00 | -9.70 | 30.00 | -10.70 |
| | 48 | 5240 | 11.72 | 11.03 | 27.54 | 14.40 | 5 | 5 | 19.40 | 24.00 | -9.60 | 30.00 | -10.60 |
| 802.11n (HT 40) | 38 | 5190 | 10.01 | 9.61 | 19.16 | 12.82 | 5 | 5 | 17.82 | 24.00 | -11.18 | 30.00 | -12.18 |
| | 46 | 5230 | 10.31 | 10.12 | 21.02 | 13.23 | 5 | 5 | 18.23 | 24.00 | -10.77 | 30.00 | -11.77 |
| 802.11ac (HT80) | 42 | 5210 | 6.722 | 6.683 | 9.36 | 9.71 | 5 | 5 | 14.71 | 24.00 | -14.29 | 30.00 | -15.29 |

P/N1002994 + P/N1002991

UNII-2A

SISO

| Mode | Channel | Frequency (MHz) | Output Power (AV) | | Antenna Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|------------------|---------|-----------------|-------------------|-------|--------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | dBm | mW | | | | | | |
| 802.11a (Chain0) | 52 | 5260 | 11.96 | 15.70 | 5 | 16.96 | 24.00 | -12.04 | 30.00 | -13.04 |
| | 56 | 5280 | 11.81 | 15.17 | 5 | 16.81 | 24.00 | -12.19 | 30.00 | -13.19 |
| | 64 | 5320 | 11.93 | 15.60 | 5 | 16.93 | 24.00 | -12.07 | 30.00 | -13.07 |
| 802.11a (Chain1) | 52 | 5260 | 12.72 | 18.71 | 5 | 17.72 | 24.00 | -11.28 | 30.00 | -12.28 |
| | 56 | 5280 | 12.71 | 18.66 | 5 | 17.71 | 24.00 | -11.29 | 30.00 | -12.29 |
| | 64 | 5320 | 12.67 | 18.49 | 5 | 17.67 | 24.00 | -11.33 | 30.00 | -12.33 |

MIMO

| Mode | Ch | Freq (MHz) | Output Power (AV) | | Total Power (AV) | | Antenna 0 Gain (dBi) | Antenna 1 Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|-----------------|----|------------|-------------------|---------|------------------|-------|----------------------|----------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | Chain 0 | Chain 1 | mW | dBm | | | | | | | |
| | | | dBm | dBm | | | | | | | | | |
| 802.11n (HT 20) | 52 | 5260 | 8.03 | 8.42 | 13.30 | 11.24 | 5 | 5 | 16.24 | 24.00 | -12.76 | 30.00 | -13.76 |
| | 56 | 5280 | 8.03 | 8.61 | 13.61 | 11.34 | 5 | 5 | 16.34 | 24.00 | -12.66 | 30.00 | -13.66 |
| | 64 | 5320 | 8.54 | 8.76 | 14.66 | 11.66 | 5 | 5 | 16.66 | 24.00 | -12.34 | 30.00 | -13.34 |
| 802.11n (HT 40) | 54 | 5270 | 9.04 | 9.07 | 16.09 | 12.07 | 5 | 5 | 17.07 | 24.00 | -11.93 | 30.00 | -12.93 |
| | 62 | 5310 | 8.79 | 9.03 | 15.57 | 11.92 | 5 | 5 | 16.92 | 24.00 | -12.08 | 30.00 | -13.08 |
| 802.11ac (HT80) | 58 | 5290 | 1.189 | 1.064 | 2.59 | 4.14 | 5 | 5 | 9.14 | 24.00 | -19.86 | 30.00 | -20.86 |

P/N1002994 + P/N1002991

UNII-2C

SISO

| Mode | Channel | Frequency (MHz) | Output Power (AV) | | Antenna Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|------------------|---------|-----------------|-------------------|-------|--------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | dBm | mW | | | | | | |
| 802.11a (Chain0) | 100 | 5500 | 11.71 | 14.83 | 5 | 16.71 | 24.00 | -12.29 | 30.00 | -13.29 |
| | 116 | 5580 | 11.31 | 13.52 | 5 | 16.31 | 24.00 | -12.69 | 30.00 | -13.69 |
| | 140 | 5700 | 11.59 | 14.42 | 5 | 16.59 | 24.00 | -12.41 | 30.00 | -13.41 |
| 802.11a (Chain1) | 100 | 5500 | 12.14 | 16.37 | 5 | 17.14 | 24.00 | -11.86 | 30.00 | -12.86 |
| | 116 | 5580 | 11.59 | 14.42 | 5 | 16.59 | 24.00 | -12.41 | 30.00 | -13.41 |
| | 140 | 5700 | 11.57 | 14.35 | 5 | 16.57 | 24.00 | -12.43 | 30.00 | -13.43 |

MIMO

| Mode | Ch | Freq (MHz) | Output Power (AV) | | Total Power (AV) | | Antenna 0 Gain (dBi) | Antenna 1 Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|-----------------|-----|------------|-------------------|---------|------------------|-------|----------------------|----------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | Chain 0 | Chain 1 | mW | dBm | | | | | | | |
| | | | dBm | dBm | | | | | | | | | |
| 802.11n (HT 20) | 100 | 5500 | 9.07 | 7.25 | 13.38 | 11.26 | 5 | 5 | 16.26 | 24.00 | -12.74 | 30.00 | -13.74 |
| | 116 | 5580 | 8.76 | 6.84 | 12.35 | 10.92 | 5 | 5 | 15.92 | 24.00 | -13.08 | 30.00 | -14.08 |
| | 140 | 5700 | 8.03 | 6.91 | 11.26 | 10.52 | 5 | 5 | 15.52 | 24.00 | -13.48 | 30.00 | -14.48 |
| 802.11n (HT 40) | 102 | 5510 | 7.89 | 7.14 | 11.33 | 10.54 | 5 | 5 | 15.54 | 24.00 | -13.46 | 30.00 | -14.46 |
| | 110 | 5550 | 7.53 | 7.07 | 10.76 | 10.32 | 5 | 5 | 15.32 | 24.00 | -13.68 | 30.00 | -14.68 |
| | 134 | 5670 | 7.52 | 7.01 | 10.67 | 10.28 | 5 | 5 | 15.28 | 24.00 | -13.72 | 30.00 | -14.72 |
| 802.11ac (HT80) | 106 | 5530 | -0.497 | -1.331 | 1.63 | 2.12 | 5 | 5 | 7.12 | 24.00 | -21.88 | 30.00 | -22.88 |

P/N1002994 + P/N1002991

UNII-3

SISO

| Mode | Channel | Frequency (MHz) | Output Power (AV) | | Antenna Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|------------------|---------|-----------------|-------------------|-------|--------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | dBm | mW | | | | | | |
| 802.11a (Chain0) | 149 | 5745 | 11.17 | 13.09 | 5 | 16.17 | 30.00 | -18.83 | 36.00 | -19.83 |
| | 157 | 5785 | 11.42 | 13.87 | 5 | 16.42 | 30.00 | -18.58 | 36.00 | -19.58 |
| | 165 | 5825 | 11.63 | 14.55 | 5 | 16.63 | 30.00 | -18.37 | 36.00 | -19.37 |
| 802.11a (Chain1) | 149 | 5745 | 12.04 | 16.00 | 5 | 17.04 | 30.00 | -17.96 | 36.00 | -18.96 |
| | 157 | 5785 | 11.49 | 14.09 | 5 | 16.49 | 30.00 | -18.51 | 36.00 | -19.51 |
| | 165 | 5825 | 12.01 | 15.89 | 5 | 17.01 | 30.00 | -17.99 | 36.00 | -18.99 |

MIMO

| Mode | Ch | Freq (MHz) | Output Power (AV) | | Total Power (AV) | | Antenna 0 Gain (dBi) | Antenna 1 Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|-----------------|-----|------------|-------------------|---------|------------------|-------|----------------------|----------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | Chain 0 | Chain 1 | mW | dBm | | | | | | | |
| | | | dBm | dBm | | | | | | | | | |
| 802.11n (HT 20) | 149 | 5745 | 10.27 | 9.27 | 19.09 | 12.81 | 5 | 5 | 17.81 | 30.00 | -17.19 | 36.00 | -18.19 |
| | 157 | 5785 | 10.79 | 9.51 | 20.93 | 13.21 | 5 | 5 | 18.21 | 30.00 | -16.79 | 36.00 | -17.79 |
| | 165 | 5825 | 10.61 | 9.63 | 20.69 | 13.16 | 5 | 5 | 18.16 | 30.00 | -16.84 | 36.00 | -17.84 |
| 802.11n (HT 40) | 151 | 5755 | 10 | 9.81 | 19.57 | 12.92 | 5 | 5 | 17.92 | 30.00 | -17.08 | 36.00 | -18.08 |
| | 159 | 5795 | 10.13 | 9.64 | 19.51 | 12.90 | 5 | 5 | 17.90 | 30.00 | -17.10 | 37.00 | -19.10 |
| 802.11ac (HT80) | 155 | 5775 | 6.064 | 5.855 | 7.89 | 8.97 | 5 | 5 | 13.97 | 30.00 | -21.03 | 36.00 | -22.03 |

P/N1002633 + P/N1002635

UNII-1

SISO

| Mode | Channel | Frequency (MHz) | Output Power (AV) | | Antenna Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|------------------|---------|-----------------|-------------------|-------|--------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | dBm | mW | | | | | | |
| 802.11a (Chain0) | 36 | 5180 | 11.75 | 14.96 | 5 | 16.75 | 24.00 | -12.25 | 30.00 | -13.25 |
| | 44 | 5220 | 11.87 | 15.38 | 5 | 16.87 | 24.00 | -12.13 | 30.00 | -13.13 |
| | 48 | 5240 | 12.03 | 15.96 | 5 | 17.03 | 24.00 | -11.97 | 30.00 | -12.97 |
| 802.11a (Chain1) | 36 | 5180 | 12.95 | 19.72 | 5 | 17.95 | 24.00 | -11.05 | 30.00 | -12.05 |
| | 44 | 5200 | 12.67 | 18.49 | 5 | 17.67 | 24.00 | -11.33 | 30.00 | -12.33 |
| | 48 | 5240 | 12.59 | 18.16 | 5 | 17.59 | 24.00 | -11.41 | 30.00 | -12.41 |

MIMO

| Mode | Ch | Freq (MHz) | Output Power (AV) | | Total Power (AV) | | Antenna 0 Gain (dBi) | Antenna 1 Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|-----------------|----|------------|-------------------|---------|------------------|-------|----------------------|----------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | Chain 0 | Chain 1 | mW | dBm | | | | | | | |
| | | | dBm | dBm | | | | | | | | | |
| 802.11n (HT 20) | 36 | 5180 | 11.41 | 11.33 | 27.42 | 14.38 | 5 | 5 | 19.38 | 24.00 | -9.62 | 30.00 | -10.62 |
| | 44 | 5220 | 11.34 | 11.23 | 26.89 | 14.30 | 5 | 5 | 19.30 | 24.00 | -9.70 | 30.00 | -10.70 |
| | 48 | 5240 | 11.72 | 11.03 | 27.54 | 14.40 | 5 | 5 | 19.40 | 24.00 | -9.60 | 30.00 | -10.60 |
| 802.11n (HT 40) | 38 | 5190 | 10.01 | 9.61 | 19.16 | 12.82 | 5 | 5 | 17.82 | 24.00 | -11.18 | 30.00 | -12.18 |
| | 46 | 5230 | 10.31 | 10.12 | 21.02 | 13.23 | 5 | 5 | 18.23 | 24.00 | -10.77 | 30.00 | -11.77 |
| 802.11ac (HT80) | 42 | 5210 | 6.722 | 6.683 | 9.36 | 9.71 | 5 | 5 | 14.71 | 24.00 | -14.29 | 30.00 | -15.29 |

P/N1002633 + P/N1002635

UNII-2A

SISO

| Mode | Channel | Frequency (MHz) | Output Power (AV) | | Antenna Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|------------------|---------|-----------------|-------------------|-------|--------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | dBm | mW | | | | | | |
| 802.11a (Chain0) | 52 | 5260 | 11.96 | 15.70 | 5 | 16.96 | 24.00 | -12.04 | 30.00 | -13.04 |
| | 56 | 5280 | 11.81 | 15.17 | 5 | 16.81 | 24.00 | -12.19 | 30.00 | -13.19 |
| | 64 | 5320 | 11.93 | 15.60 | 5 | 16.93 | 24.00 | -12.07 | 30.00 | -13.07 |
| 802.11a (Chain1) | 52 | 5260 | 12.72 | 18.71 | 5 | 17.72 | 24.00 | -11.28 | 30.00 | -12.28 |
| | 56 | 5280 | 12.71 | 18.66 | 5 | 17.71 | 24.00 | -11.29 | 30.00 | -12.29 |
| | 64 | 5320 | 12.67 | 18.49 | 5 | 17.67 | 24.00 | -11.33 | 30.00 | -12.33 |

MIMO

| Mode | Ch | Freq (MHz) | Output Power (AV) | | Total Power (AV) | | Antenna 0 Gain (dBi) | Antenna 1 Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|-----------------|----|------------|-------------------|---------|------------------|-------|----------------------|----------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | Chain 0 | Chain 1 | mW | dBm | | | | | | | |
| | | | dBm | dBm | | | | | | | | | |
| 802.11n (HT 20) | 52 | 5260 | 8.03 | 8.42 | 13.30 | 11.24 | 5 | 5 | 16.24 | 24.00 | -12.76 | 30.00 | -13.76 |
| | 56 | 5280 | 8.03 | 8.61 | 13.61 | 11.34 | 5 | 5 | 16.34 | 24.00 | -12.66 | 30.00 | -13.66 |
| | 64 | 5320 | 8.54 | 8.76 | 14.66 | 11.66 | 5 | 5 | 16.66 | 24.00 | -12.34 | 30.00 | -13.34 |
| 802.11n (HT 40) | 54 | 5270 | 9.04 | 9.07 | 16.09 | 12.07 | 5 | 5 | 17.07 | 24.00 | -11.93 | 30.00 | -12.93 |
| | 62 | 5310 | 8.79 | 9.03 | 15.57 | 11.92 | 5 | 5 | 16.92 | 24.00 | -12.08 | 30.00 | -13.08 |
| 802.11ac (HT80) | 58 | 5290 | 1.189 | 1.064 | 2.59 | 4.14 | 5 | 5 | 9.14 | 24.00 | -19.86 | 30.00 | -20.86 |

P/N1002633 + P/N1002635

UNII-2C

SISO

| Mode | Channel | Frequency (MHz) | Output Power (AV) | | Antenna Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|------------------|---------|-----------------|-------------------|-------|--------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | dBm | mW | | | | | | |
| 802.11a (Chain0) | 100 | 5500 | 11.71 | 14.83 | 5 | 16.71 | 24.00 | -12.29 | 30.00 | -13.29 |
| | 116 | 5580 | 11.31 | 13.52 | 5 | 16.31 | 24.00 | -12.69 | 30.00 | -13.69 |
| | 140 | 5700 | 11.59 | 14.42 | 5 | 16.59 | 24.00 | -12.41 | 30.00 | -13.41 |
| 802.11a (Chain1) | 100 | 5500 | 12.14 | 16.37 | 5 | 17.14 | 24.00 | -11.86 | 30.00 | -12.86 |
| | 116 | 5580 | 11.59 | 14.42 | 5 | 16.59 | 24.00 | -12.41 | 30.00 | -13.41 |
| | 140 | 5700 | 11.57 | 14.35 | 5 | 16.57 | 24.00 | -12.43 | 30.00 | -13.43 |

MIMO

| Mode | Ch | Freq (MHz) | Output Power (AV) | | Total Power (AV) | | Antenna 0 Gain (dBi) | Antenna 1 Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|-----------------|-----|------------|-------------------|---------|------------------|-------|----------------------|----------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | Chain 0 | Chain 1 | mW | dBm | | | | | | | |
| | | | dBm | dBm | | | | | | | | | |
| 802.11n (HT 20) | 100 | 5500 | 9.07 | 7.25 | 13.38 | 11.26 | 5 | 5 | 16.26 | 24.00 | -12.74 | 30.00 | -13.74 |
| | 116 | 5580 | 8.76 | 6.84 | 12.35 | 10.92 | 5 | 5 | 15.92 | 24.00 | -13.08 | 30.00 | -14.08 |
| | 140 | 5700 | 8.03 | 6.91 | 11.26 | 10.52 | 5 | 5 | 15.52 | 24.00 | -13.48 | 30.00 | -14.48 |
| 802.11n (HT 40) | 102 | 5510 | 7.89 | 7.14 | 11.33 | 10.54 | 5 | 5 | 15.54 | 24.00 | -13.46 | 30.00 | -14.46 |
| | 110 | 5550 | 7.53 | 7.07 | 10.76 | 10.32 | 5 | 5 | 15.32 | 24.00 | -13.68 | 30.00 | -14.68 |
| | 134 | 5670 | 7.52 | 7.01 | 10.67 | 10.28 | 5 | 5 | 15.28 | 24.00 | -13.72 | 30.00 | -14.72 |
| 802.11ac (HT80) | 106 | 5530 | -0.497 | -1.331 | 1.63 | 2.12 | 5 | 5 | 7.12 | 24.00 | -21.88 | 30.00 | -22.88 |

P/N1002633 + P/N1002635

UNII-3

SISO

| Mode | Channel | Frequency (MHz) | Output Power (AV) | | Antenna Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|------------------|---------|-----------------|-------------------|-------|--------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | dBm | mW | | | | | | |
| 802.11a (Chain0) | 149 | 5745 | 11.17 | 13.09 | 5 | 16.17 | 30.00 | -18.83 | 36.00 | -19.83 |
| | 157 | 5785 | 11.42 | 13.87 | 5 | 16.42 | 30.00 | -18.58 | 36.00 | -19.58 |
| | 165 | 5825 | 11.63 | 14.55 | 5 | 16.63 | 30.00 | -18.37 | 36.00 | -19.37 |
| 802.11a (Chain1) | 149 | 5745 | 12.04 | 16.00 | 5 | 17.04 | 30.00 | -17.96 | 36.00 | -18.96 |
| | 157 | 5785 | 11.49 | 14.09 | 5 | 16.49 | 30.00 | -18.51 | 36.00 | -19.51 |
| | 165 | 5825 | 12.01 | 15.89 | 5 | 17.01 | 30.00 | -17.99 | 36.00 | -18.99 |

MIMO

| Mode | Ch | Freq (MHz) | Output Power (AV) | | Total Power (AV) | | Antenna 0 Gain (dBi) | Antenna 1 Gain (dBi) | E.I.R.P. (dBm) | Limit of Conducted Power (dBm) | Margin (dB) | Limit of E.I.R.P. (dBm) | Margin (dB) |
|-----------------|-----|------------|-------------------|---------|------------------|-------|----------------------|----------------------|----------------|--------------------------------|-------------|-------------------------|-------------|
| | | | Chain 0 | Chain 1 | mW | dBm | | | | | | | |
| | | | dBm | dBm | | | | | | | | | |
| 802.11n (HT 20) | 149 | 5745 | 10.27 | 9.27 | 19.09 | 12.81 | 5 | 5 | 17.81 | 30.00 | -17.19 | 36.00 | -18.19 |
| | 157 | 5785 | 10.79 | 9.51 | 20.93 | 13.21 | 5 | 5 | 18.21 | 30.00 | -16.79 | 36.00 | -17.79 |
| | 165 | 5825 | 10.61 | 9.63 | 20.69 | 13.16 | 5 | 5 | 18.16 | 30.00 | -16.84 | 36.00 | -17.84 |
| 802.11n (HT 40) | 151 | 5755 | 10 | 9.81 | 19.57 | 12.92 | 5 | 5 | 17.92 | 30.00 | -17.08 | 36.00 | -18.08 |
| | 159 | 5795 | 10.13 | 9.64 | 19.51 | 12.90 | 5 | 5 | 17.90 | 30.00 | -17.10 | 37.00 | -19.10 |
| 802.11ac (HT80) | 155 | 5775 | 6.064 | 5.855 | 7.89 | 8.97 | 5 | 5 | 13.97 | 30.00 | -21.03 | 36.00 | -22.03 |

3. Emissions in Restricted Frequency Bands (Radiated emission measurements)

3.1 Operating environment

| | | |
|----------------------|------|-----|
| Temperature: | 25 | °C |
| Relative Humidity: | 55 | % |
| Atmospheric Pressure | 1008 | hPa |

3.2 Limit for emission in restricted frequency bands (Radiated emission measurement)

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

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

As specified in 15.407(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.

(2) 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.

(3) 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.

(4) 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.

However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

3.3 Measuring instrument setting

Below 1GHz measurement

| Receiver settings | |
|-------------------|---|
| Receiver function | Setting |
| Detector | QP |
| RBW | 9-150 kHz ; 200-300 Hz 0.15-30 MHz; 9-10 kHz 30-1000 MHz; 100-120 kHz |
| VBW | $\geq 3 \times$ RBW |
| Sweep | Auto couple |
| Attenuation | Auto |

Above 1GHz measurement

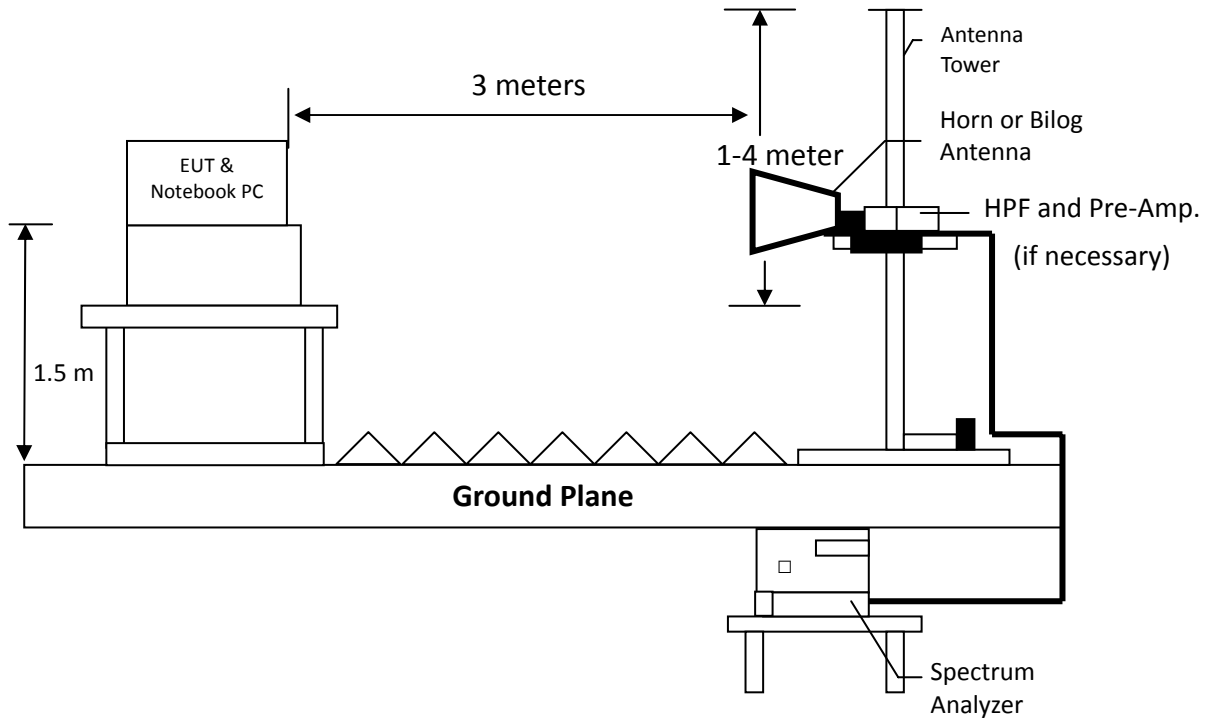
| Spectrum analyzer settings | |
|----------------------------|---------------------------------|
| Spectrum Analyzer function | Setting |
| Detector | Peak |
| RBW | 1MHz |
| VBW | 3MHz for Peak; 10Hz for Average |
| Sweep | Auto couple |
| Start Frequency | 1GHz |
| Stop Frequency | Tenth harmonic |
| Attenuation | Auto |

3.4 Test procedure

1. Configure the EUT according to ANSI C63.10: 2013 The EUT was placed on the top of the turntable 1.5 meter above ground for above 1GHz and placed on the top of the turntable 0.8 meter above ground for below 1GHz. The center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the companion devices. The turntable was rotated by 360 degree to find the position of the maximum emission level.
3. The height of the receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of the both horizontal and vertical polarization
4. If find the frequencies above the limit or below within 3dB, the antenna tower was scan (from 1m to 4m) and then the turntable was rotated to find the maximum reading.
5. Set the test-receiver system to peak or CISPR quasi-peak detector with specified bandwidth under maximum hold mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.
7. If the emissions level of the EUT in peak mode was 3dB lower than the average limit specified then testing will be stopped and peak values of the EUT will be reported. Otherwise, the emissions which do not have 3dB margin will be measured using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, The emissions level of the EUT in peak mode was lower than average limit, then testing will be stopped and peak values of the EUT will be reported, otherwise, the emission will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be quasi-peak measured by receiver.

3.5 Test configuration

Radiated emission above 1GHz using Horn Antenna



3.6 Test results

3.6.1 Measurement results: frequency above 1GHz to 40GHz

P/N1002994 + P/N1002991

| Mode | Frequency (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Preamp. Gain (dB) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) |
|-------------------------|-----------------|----------------------------|-----------------|-------------------|--------------------------|----------------|----------------------------|----------------------|-------------|
| 802.11a , Ch36 , Chain1 | 1990 | PK | V | 37.37 | -1.55 | 54.88 | 53.33 | 68.20 | -14.87 |
| | 2122 | PK | V | 37.37 | -1.61 | 58.07 | 56.46 | 68.20 | -11.74 |
| | 2661 | PK | V | 37.40 | -1.32 | 52.65 | 51.33 | 68.20 | -16.87 |
| | 3563 | PK | V | 37.33 | 1.37 | 58.85 | 60.22 | 68.20 | -7.98 |
| | 4003 | PK | V | 37.25 | 2.93 | 45.80 | 48.73 | 74.00 | -25.27 |
| | 6159 | PK | V | 36.84 | 7.99 | 42.54 | 50.53 | 68.20 | -17.67 |
| | 6478 | PK | V | 36.73 | 9.05 | 40.10 | 49.15 | 68.20 | -19.05 |
| | 15528 | PK | V | 35.36 | 22.39 | 25.22 | 47.61 | 74.00 | -26.39 |
| | 2001 | PK | H | 37.37 | -1.43 | 46.36 | 44.93 | 68.20 | -23.27 |
| | 2661 | PK | H | 37.40 | -1.32 | 45.91 | 44.59 | 68.20 | -23.61 |
| | 3563 | PK | H | 37.33 | 1.37 | 47.55 | 48.92 | 68.20 | -19.28 |
| | 4003 | PK | H | 37.25 | 2.93 | 39.58 | 42.51 | 74.00 | -31.49 |
| | 6159 | PK | H | 36.84 | 7.99 | 39.38 | 47.37 | 68.20 | -20.83 |
| | 6489 | PK | H | 36.72 | 9.09 | 36.35 | 45.44 | 68.20 | -22.76 |
| | 10364 | PK | H | 35.77 | 20.01 | 27.40 | 47.41 | 68.20 | -20.79 |
| | 15539 | PK | H | 35.36 | 22.38 | 26.09 | 48.47 | 74.00 | -25.53 |
| 802.11a , Ch52 , Chain1 | 2001 | PK | V | 37.37 | -1.43 | 55.55 | 54.12 | 68.20 | -14.08 |
| | 2133 | PK | V | 37.37 | -1.63 | 48.72 | 47.09 | 68.20 | -21.11 |
| | 2661 | PK | V | 37.40 | -1.32 | 49.12 | 47.80 | 68.20 | -20.40 |
| | 3684 | PK | V | 37.31 | 1.80 | 53.36 | 55.16 | 74.00 | -18.84 |
| | 3684 | AV | V | 37.31 | 1.80 | 43.09 | 44.89 | 54.00 | -9.11 |
| | 4256 | PK | V | 37.24 | 3.45 | 42.01 | 45.46 | 74.00 | -28.54 |
| | 6324 | PK | V | 36.78 | 8.54 | 46.33 | 54.87 | 68.20 | -13.33 |
| | 10525 | PK | V | 35.70 | 20.96 | 27.04 | 48.00 | 68.20 | -20.20 |
| | 15781 | PK | V | 35.35 | 22.33 | 22.67 | 45.00 | 74.00 | -29.00 |
| | 2001 | PK | H | 37.37 | -1.43 | 45.89 | 44.46 | 68.20 | -23.74 |
| | 2122 | PK | H | 37.37 | -1.61 | 50.96 | 49.35 | 68.20 | -18.85 |
| | 2661 | PK | H | 37.40 | -1.32 | 45.03 | 43.71 | 68.20 | -24.49 |
| | 3695 | PK | H | 37.30 | 1.84 | 42.02 | 43.86 | 74.00 | -30.14 |
| | 6313 | PK | H | 36.79 | 8.50 | 41.70 | 50.20 | 68.20 | -18.00 |
| | 10525 | PK | H | 35.70 | 20.96 | 26.52 | 47.48 | 68.20 | -20.72 |
| | 15781 | PK | H | 35.35 | 22.33 | 23.56 | 45.89 | 74.00 | -28.11 |

P/N1002994 + P/N1002991

| Mode | Frequency (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Preamp. Gain (dB) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) |
|----------------------------------|-----------------|----------------------------|-----------------|-------------------|--------------------------|----------------|----------------------------|----------------------|-------------|
| 802.11a , Ch100 , Chain1 | 1990 | PK | V | 37.37 | -1.55 | 51.66 | 50.11 | 68.20 | -18.09 |
| | 2122 | PK | V | 37.37 | -1.61 | 53.45 | 51.84 | 68.20 | -16.36 |
| | 2661 | PK | V | 37.40 | -1.32 | 50.28 | 48.96 | 68.20 | -19.24 |
| | 11169 | PK | V | 35.74 | 22.80 | 25.17 | 47.97 | 74.00 | -26.03 |
| | 16494 | PK | V | 35.46 | 23.85 | 17.45 | 41.30 | 68.20 | -26.90 |
| | 2122 | PK | H | 37.37 | -1.61 | 50.26 | 48.65 | 68.20 | -19.55 |
| | 2661 | PK | H | 37.40 | -1.32 | 46.02 | 44.70 | 68.20 | -23.50 |
| | 10997 | PK | H | 35.73 | 22.70 | 24.82 | 47.52 | 74.00 | -26.48 |
| 802.11a , Ch149 , Chain1 | 1990 | PK | V | 37.37 | -1.55 | 60.78 | 59.23 | 68.20 | -8.97 |
| | 2650 | PK | V | 37.39 | -1.38 | 55.51 | 54.13 | 68.20 | -14.07 |
| | 4267 | PK | V | 37.24 | 3.47 | 42.68 | 46.15 | 74.00 | -27.85 |
| | 4410 | PK | V | 37.24 | 3.76 | 49.66 | 53.42 | 68.20 | -14.78 |
| | 6170 | PK | V | 36.84 | 8.03 | 37.64 | 45.67 | 68.20 | -22.53 |
| | 11135 | PK | V | 35.74 | 22.78 | 25.04 | 47.82 | 74.00 | -26.18 |
| | 2001 | PK | H | 37.37 | -1.43 | 43.88 | 42.45 | 68.20 | -25.75 |
| | 2661 | PK | H | 37.40 | -1.32 | 43.03 | 41.71 | 68.20 | -26.49 |
| | 4410 | PK | H | 37.24 | 3.76 | 40.58 | 44.34 | 68.20 | -23.86 |
| | 10997 | PK | H | 35.73 | 22.70 | 25.49 | 48.19 | 74.00 | -25.81 |
| | 17368 | PK | H | 35.21 | 27.92 | 19.76 | 47.68 | 68.20 | -20.52 |
| 802.11n (HT20) , Ch48 , Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 57.50 | 55.95 | 68.20 | -12.25 |
| | 2122 | PK | V | 37.37 | -1.61 | 54.49 | 52.88 | 68.20 | -15.32 |
| | 2661 | PK | V | 37.40 | -1.32 | 52.75 | 51.43 | 68.20 | -16.77 |
| | 3123 | PK | V | 37.42 | 0.63 | 46.07 | 46.70 | 68.20 | -21.50 |
| | 3662 | PK | V | 37.31 | 1.72 | 59.66 | 61.38 | 74.00 | -12.62 |
| | 3662 | AV | V | 37.31 | 1.72 | 49.16 | 50.88 | 54.00 | -3.12 |
| | 6280 | PK | V | 36.80 | 8.39 | 45.77 | 54.16 | 68.20 | -14.04 |
| | 10491 | PK | V | 35.70 | 20.81 | 27.04 | 47.85 | 68.20 | -20.35 |
| | 15723 | PK | V | 35.36 | 22.34 | 22.60 | 44.94 | 74.00 | -29.06 |
| | 2133 | PK | H | 37.37 | -1.63 | 50.56 | 48.93 | 68.20 | -19.27 |
| | 2661 | PK | H | 37.40 | -1.32 | 49.59 | 48.27 | 68.20 | -19.93 |
| | 3651 | PK | H | 37.31 | 1.68 | 46.48 | 48.16 | 74.00 | -25.84 |
| | 6280 | PK | H | 36.80 | 8.39 | 41.02 | 49.41 | 68.20 | -18.79 |
| | 10479 | PK | H | 35.71 | 20.74 | 28.29 | 49.03 | 68.20 | -19.17 |
| | 15723 | PK | H | 35.36 | 22.34 | 22.00 | 44.34 | 74.00 | -29.66 |

TEST REPORT

P/N1002994 + P/N1002991

| Mode | Frequency (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Preamp. Gain (dB) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) |
|---------------------------------|-----------------|----------------------------|-----------------|-------------------|--------------------------|----------------|----------------------------|----------------------|-------------|
| 802.11n (HT20), Ch64, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 56.17 | 54.62 | 68.20 | -13.58 |
| | 2133 | PK | V | 37.37 | -1.63 | 52.18 | 50.55 | 68.20 | -17.65 |
| | 2650 | PK | V | 37.39 | -1.38 | 47.85 | 46.47 | 68.20 | -21.73 |
| | 3772 | PK | V | 37.29 | 2.12 | 52.03 | 54.15 | 74.00 | -19.85 |
| | 3772 | AV | V | 37.29 | 2.12 | 41.97 | 44.09 | 54.00 | -9.91 |
| | 6445 | PK | V | 36.74 | 8.94 | 46.83 | 55.77 | 68.20 | -12.43 |
| | 10640 | PK | V | 35.71 | 21.39 | 25.77 | 47.16 | 74.00 | -26.84 |
| | 15953 | PK | V | 35.35 | 22.30 | 21.17 | 43.47 | 74.00 | -30.53 |
| | 2001 | PK | H | 37.37 | -1.43 | 47.11 | 45.68 | 68.20 | -22.52 |
| | 2650 | PK | H | 37.39 | -1.38 | 47.95 | 46.57 | 68.20 | -21.63 |
| | 6445 | PK | H | 36.74 | 8.94 | 44.72 | 53.66 | 68.20 | -14.54 |
| | 10629 | PK | H | 35.71 | 21.35 | 26.11 | 47.46 | 74.00 | -26.54 |
| | 15965 | PK | H | 35.35 | 22.29 | 19.74 | 42.03 | 74.00 | -31.97 |
| 802.11n (HT20), Ch100, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 57.25 | 55.70 | 68.20 | -12.50 |
| | 2122 | PK | V | 37.37 | -1.61 | 58.06 | 56.45 | 68.20 | -11.75 |
| | 2661 | PK | V | 37.40 | -1.32 | 50.59 | 49.27 | 68.20 | -18.93 |
| | 3992 | PK | V | 37.25 | 2.90 | 44.73 | 47.63 | 74.00 | -26.37 |
| | 4124 | PK | V | 37.25 | 3.18 | 42.72 | 45.90 | 74.00 | -28.10 |
| | 11031 | PK | V | 35.73 | 22.73 | 25.06 | 47.79 | 74.00 | -26.21 |
| | 1990 | PK | H | 37.37 | -1.55 | 42.94 | 41.39 | 68.20 | -26.81 |
| | 2661 | PK | H | 37.40 | -1.32 | 45.80 | 44.48 | 68.20 | -23.72 |
| 10997 | PK | H | 35.73 | 22.70 | 25.47 | 48.17 | 74.00 | -25.83 | |
| 802.11n (HT20), Ch157, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 57.08 | 55.53 | 68.20 | -12.67 |
| | 2122 | PK | V | 37.37 | -1.61 | 55.23 | 53.62 | 68.20 | -14.58 |
| | 2661 | PK | V | 37.40 | -1.32 | 51.44 | 50.12 | 68.20 | -18.08 |
| | 4476 | PK | V | 37.24 | 3.90 | 53.96 | 57.86 | 68.20 | -10.34 |
| | 6324 | PK | V | 36.78 | 8.54 | 44.96 | 53.50 | 68.20 | -14.70 |
| | 17264 | PK | V | 35.27 | 27.61 | 19.67 | 47.28 | 68.20 | -20.92 |
| | 1990 | PK | H | 37.37 | -1.55 | 47.61 | 46.06 | 68.20 | -22.14 |
| | 2122 | PK | H | 37.37 | -1.61 | 50.99 | 49.38 | 68.20 | -18.82 |
| | 2661 | PK | H | 37.40 | -1.32 | 47.01 | 45.69 | 68.20 | -22.51 |
| | 4476 | PK | H | 37.24 | 3.90 | 43.68 | 47.58 | 68.20 | -20.62 |
| | 11457 | PK | H | 35.76 | 22.95 | 24.49 | 47.44 | 74.00 | -26.56 |
| | 17345 | PK | H | 35.22 | 27.85 | 18.71 | 46.56 | 68.20 | -21.64 |

TEST REPORT

P/N1002994 + P/N1002991

| Mode | Frequency (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Preamp. Gain (dB) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) |
|---------------------------------|-----------------|----------------------------|-----------------|-------------------|--------------------------|----------------|----------------------------|----------------------|-------------|
| 802.11n (HT40), Ch46, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 51.72 | 50.17 | 68.20 | -18.03 |
| | 2661 | PK | V | 37.40 | -1.32 | 50.21 | 48.89 | 68.20 | -19.31 |
| | 3629 | PK | V | 37.32 | 1.61 | 54.79 | 56.40 | 74.00 | -17.60 |
| | 3629 | AV | V | 37.32 | 1.61 | 44.32 | 45.93 | 54.00 | -8.07 |
| | 4773 | PK | V | 37.15 | 4.83 | 40.19 | 45.02 | 74.00 | -28.98 |
| | 6258 | PK | V | 36.81 | 8.32 | 45.17 | 53.49 | 68.20 | -14.71 |
| | 10997 | PK | V | 35.73 | 22.70 | 25.53 | 48.23 | 74.00 | -25.77 |
| | 15689 | PK | V | 35.36 | 22.35 | 20.73 | 43.08 | 74.00 | -30.92 |
| | 1990 | PK | H | 37.37 | -1.55 | 46.30 | 44.75 | 68.20 | -23.45 |
| | 2650 | PK | H | 37.39 | -1.38 | 42.84 | 41.46 | 68.20 | -26.74 |
| | 3640 | PK | H | 37.31 | 1.65 | 44.95 | 46.60 | 74.00 | -27.40 |
| | 5697 | PK | H | 36.95 | 6.51 | 39.15 | 45.66 | 68.20 | -22.54 |
| | 6258 | PK | H | 36.81 | 8.32 | 39.24 | 47.56 | 68.20 | -20.64 |
| | 10997 | PK | H | 35.73 | 22.70 | 26.05 | 48.75 | 74.00 | -25.25 |
| | 15677 | PK | H | 35.36 | 22.35 | 20.68 | 43.03 | 74.00 | -30.97 |
| 802.11n (HT40), Ch54, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 54.86 | 53.31 | 68.20 | -14.89 |
| | 3695 | PK | V | 37.30 | 1.84 | 52.50 | 54.34 | 74.00 | -19.66 |
| | 3695 | AV | V | 37.30 | 1.84 | 42.05 | 43.89 | 54.00 | -10.11 |
| | 6335 | PK | V | 36.78 | 8.58 | 46.78 | 55.36 | 68.20 | -12.84 |
| | 10732 | PK | V | 35.71 | 21.73 | 25.76 | 47.49 | 74.00 | -26.51 |
| | 15792 | PK | V | 35.35 | 22.33 | 19.76 | 42.09 | 74.00 | -31.91 |
| | 2001 | PK | H | 37.37 | -1.43 | 47.71 | 46.28 | 68.20 | -21.92 |
| | 2661 | PK | H | 37.40 | -1.32 | 46.24 | 44.92 | 68.20 | -23.28 |
| | 6335 | PK | H | 36.78 | 8.58 | 36.94 | 45.52 | 68.20 | -22.68 |
| | 11031 | PK | H | 35.73 | 22.73 | 24.71 | 47.44 | 74.00 | -26.56 |
| 802.11n (HT40), Ch102, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 61.52 | 59.97 | 68.20 | -8.23 |
| | 2661 | PK | V | 37.40 | -1.32 | 52.90 | 51.58 | 68.20 | -16.62 |
| | 11031 | PK | V | 35.73 | 22.73 | 25.08 | 47.81 | 74.00 | -26.19 |
| | 2001 | PK | H | 37.37 | -1.43 | 47.71 | 46.28 | 68.20 | -21.92 |
| | 2661 | PK | H | 37.40 | -1.32 | 46.24 | 44.92 | 68.20 | -23.28 |
| | 6335 | PK | H | 36.78 | 8.58 | 36.94 | 45.52 | 68.20 | -22.68 |
| | 11031 | PK | H | 35.73 | 22.73 | 24.39 | 47.12 | 74.00 | -26.88 |

TEST REPORT

P/N1002994 + P/N1002991

| Mode | Frequency (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Preamp. Gain (dB) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) |
|---------------------------------|-----------------|----------------------------|-----------------|-------------------|--------------------------|----------------|----------------------------|----------------------|-------------|
| 802.11n (HT40), Ch151, Chain0+1 | 1946 | PK | V | 37.37 | -2.07 | 51.31 | 49.24 | 68.20 | -18.96 |
| | 2155 | PK | V | 37.37 | -1.66 | 48.78 | 47.12 | 68.20 | -21.08 |
| | 2661 | PK | V | 37.40 | -1.32 | 49.84 | 48.52 | 68.20 | -19.68 |
| | 4432 | PK | V | 37.24 | 3.81 | 47.97 | 51.78 | 68.20 | -16.42 |
| | 6203 | PK | V | 36.83 | 8.14 | 39.35 | 47.49 | 68.20 | -20.71 |
| | 10997 | PK | V | 35.73 | 22.70 | 25.63 | 48.33 | 74.00 | -25.67 |
| | 17115 | PK | V | 35.35 | 27.16 | 19.05 | 46.21 | 68.20 | -21.99 |
| | 1990 | PK | H | 37.37 | -1.55 | 46.53 | 44.98 | 68.20 | -23.22 |
| | 11031 | PK | H | 35.73 | 22.73 | 25.36 | 48.09 | 74.00 | -25.91 |
| | 17115 | PK | H | 35.35 | 27.16 | 19.66 | 46.82 | 68.20 | -21.38 |
| 802.11ac, Ch42, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 51.47 | 49.92 | 68.20 | -18.28 |
| | 2133 | PK | V | 37.37 | -1.63 | 53.39 | 51.76 | 68.20 | -16.44 |
| | 2661 | PK | V | 37.40 | -1.32 | 54.00 | 52.68 | 68.20 | -15.52 |
| | 3596 | PK | V | 37.32 | 1.49 | 55.36 | 56.85 | 68.20 | -11.35 |
| | 4773 | PK | V | 37.15 | 4.83 | 47.79 | 52.62 | 74.00 | -21.38 |
| | 5664 | PK | V | 36.95 | 6.40 | 45.72 | 52.12 | 68.20 | -16.08 |
| | 10928 | PK | V | 35.73 | 22.45 | 25.89 | 48.34 | 74.00 | -25.66 |
| | 15677 | PK | V | 35.36 | 22.35 | 20.10 | 42.45 | 74.00 | -31.55 |
| | 3607 | PK | H | 37.32 | 1.53 | 43.77 | 45.30 | 74.00 | -28.70 |
| | 5653 | PK | H | 36.96 | 6.37 | 42.40 | 48.77 | 68.20 | -19.43 |
| 11031 | PK | H | 35.73 | 22.73 | 26.49 | 49.22 | 74.00 | -24.78 | |
| 802.11ac, Ch58, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 54.65 | 53.10 | 68.20 | -15.10 |
| | 2067 | PK | V | 37.37 | -1.53 | 53.03 | 51.50 | 68.20 | -16.70 |
| | 2166 | PK | V | 37.37 | -1.68 | 48.87 | 47.19 | 68.20 | -21.01 |
| | 3739 | PK | V | 37.30 | 2.00 | 42.22 | 44.22 | 74.00 | -29.78 |
| | 4850 | PK | V | 37.13 | 5.08 | 42.36 | 47.44 | 74.00 | -26.56 |
| | 6379 | PK | V | 36.76 | 8.72 | 37.99 | 46.71 | 68.20 | -21.49 |
| | 11054 | PK | V | 35.73 | 22.74 | 26.14 | 48.88 | 74.00 | -25.12 |
| | 10767 | PK | H | 35.72 | 21.85 | 24.77 | 46.62 | 74.00 | -27.38 |
| 802.11ac, Ch106, Chain0+1 | 2001 | PK | V | 37.37 | -1.43 | 55.34 | 53.91 | 68.20 | -14.29 |
| | 2650 | PK | V | 37.39 | -1.38 | 52.38 | 51.00 | 68.20 | -17.20 |
| | 5081 | PK | V | 37.06 | 5.62 | 40.80 | 46.42 | 74.00 | -27.58 |
| | 5983 | PK | V | 36.90 | 7.40 | 39.14 | 46.54 | 68.20 | -21.66 |
| | 11043 | PK | V | 35.73 | 22.73 | 24.78 | 47.51 | 74.00 | -26.49 |
| | 11020 | PK | H | 35.73 | 22.72 | 25.38 | 48.10 | 74.00 | -25.90 |

P/N1002994 + P/N1002991

| Mode | Frequency (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Preamp. Gain (dB) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) |
|-----------------------------------|-----------------|----------------------------|-----------------|-------------------|--------------------------|----------------|----------------------------|----------------------|-------------|
| 802.11ac , Ch155 , Chain0+1 | 1660 | PK | V | 37.37 | -5.48 | 48.59 | 43.11 | 74.00 | -30.89 |
| | 1990 | PK | V | 37.37 | -1.55 | 57.02 | 55.47 | 68.20 | -12.73 |
| | 2661 | PK | V | 37.40 | -1.32 | 51.87 | 50.55 | 68.20 | -17.65 |
| | 4465 | PK | V | 37.24 | 3.88 | 42.13 | 46.01 | 68.20 | -22.19 |
| | 5334 | PK | V | 37.01 | 5.78 | 46.94 | 52.72 | 68.20 | -15.48 |
| | 6225 | PK | V | 36.82 | 8.21 | 42.61 | 50.82 | 68.20 | -17.38 |
| | 11054 | PK | V | 35.73 | 22.74 | 25.23 | 47.97 | 74.00 | -26.03 |
| | 17368 | PK | V | 35.21 | 27.92 | 18.77 | 46.69 | 68.20 | -21.51 |
| | 5334 | PK | H | 37.01 | 5.78 | 40.20 | 45.98 | 68.20 | -22.22 |
| | 6225 | PK | H | 36.82 | 8.21 | 40.54 | 48.75 | 68.20 | -19.45 |
| | 11572 | PK | H | 35.74 | 22.87 | 25.15 | 48.02 | 74.00 | -25.98 |
| | 17126 | PK | H | 35.34 | 27.19 | 19.32 | 46.51 | 68.20 | -21.69 |

Remark: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

TEST REPORT

P/N1002633 + P/N1002635

| Mode | Frequency (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Preamp. Gain (dB) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) |
|-------------------------------|-----------------|----------------------------|-----------------|-------------------|--------------------------|----------------|----------------------------|----------------------|-------------|
| 802.11a , Ch36 , Chain1 | 1990 | PK | V | 37.37 | -1.55 | 58.66 | 57.11 | 68.20 | -11.09 |
| | 2133 | PK | V | 37.37 | -1.63 | 51.85 | 50.22 | 68.20 | -17.98 |
| | 2661 | PK | V | 37.40 | -1.32 | 51.76 | 50.44 | 68.20 | -17.76 |
| | 3563 | PK | V | 37.33 | 1.37 | 48.40 | 49.77 | 68.20 | -18.43 |
| | 3992 | PK | V | 37.25 | 2.90 | 44.18 | 47.08 | 74.00 | -26.92 |
| | 6159 | PK | V | 36.84 | 7.99 | 40.84 | 48.83 | 68.20 | -19.37 |
| | 10548 | PK | V | 35.70 | 21.05 | 25.67 | 46.72 | 68.20 | -21.48 |
| | 15539 | PK | V | 35.36 | 22.38 | 21.90 | 44.28 | 74.00 | -29.72 |
| | 2122 | PK | H | 37.37 | -1.61 | 50.76 | 49.15 | 68.20 | -19.05 |
| | 2650 | PK | H | 37.39 | -1.38 | 48.36 | 46.98 | 68.20 | -21.22 |
| | 3563 | PK | H | 37.33 | 1.37 | 58.99 | 60.36 | 68.20 | -7.84 |
| | 6159 | PK | H | 36.84 | 7.99 | 43.25 | 51.24 | 68.20 | -16.96 |
| | 6489 | PK | H | 36.72 | 9.09 | 41.53 | 50.62 | 68.20 | -17.58 |
| | 10514 | PK | H | 35.70 | 20.92 | 25.45 | 46.37 | 68.20 | -21.83 |
| | 15539 | PK | H | 35.36 | 22.38 | 21.59 | 43.97 | 74.00 | -30.03 |
| 802.11a , Ch52 , Chain1 | 1990 | PK | V | 37.37 | -1.55 | 55.40 | 53.85 | 68.20 | -14.35 |
| | 2122 | PK | V | 37.37 | -1.61 | 52.17 | 50.56 | 68.20 | -17.64 |
| | 2661 | PK | V | 37.40 | -1.32 | 52.50 | 51.18 | 68.20 | -17.02 |
| | 3684 | PK | V | 37.31 | 1.80 | 47.15 | 48.95 | 74.00 | -25.05 |
| | 6324 | PK | V | 36.78 | 8.54 | 41.99 | 50.53 | 68.20 | -17.67 |
| | 10537 | PK | V | 35.70 | 21.01 | 25.92 | 46.93 | 68.20 | -21.27 |
| | 15769 | PK | V | 35.35 | 22.33 | 19.27 | 41.60 | 74.00 | -32.40 |
| | 1990 | PK | H | 37.37 | -1.55 | 50.48 | 48.93 | 68.20 | -19.27 |
| | 3684 | PK | H | 37.31 | 1.80 | 53.71 | 55.51 | 74.00 | -18.49 |
| | 3684 | AV | H | 37.31 | 1.80 | 43.89 | 45.69 | 54.00 | -8.31 |
| | 6324 | PK | H | 36.78 | 8.54 | 45.78 | 54.32 | 68.20 | -13.88 |
| | 10721 | PK | H | 35.71 | 21.68 | 25.52 | 47.20 | 74.00 | -26.80 |
| | 15769 | PK | H | 35.35 | 22.33 | 19.08 | 41.41 | 74.00 | -32.59 |

TEST REPORT

P/N1002633 + P/N1002635

| Mode | Frequency | Spectrum | Ant. | Preamp. | Correction | Reading | Corrected | Limit | Margin |
|--|-----------|----------------------|---------------|--------------|------------------|---------|---------------------|-------------------|--------|
| | (MHz) | Analyzer Detector | Pol. (H/V) | Gain (dB) | Factor (dB/m) | (dBμV) | Reading (dBμV/m) | @ 3 m (dBμV/m) | (dB) |
| 802.11a , Ch100, Chain1 | 1990 | PK | V | 37.37 | -1.55 | 56.46 | 54.91 | 68.20 | -13.29 |
| | 2133 | PK | V | 37.37 | -1.63 | 55.09 | 53.46 | 68.20 | -14.74 |
| | 2661 | PK | V | 37.40 | -1.32 | 53.92 | 52.60 | 68.20 | -15.60 |
| | 10997 | PK | V | 35.73 | 22.70 | 25.59 | 48.29 | 74.00 | -25.71 |
| | 2001 | PK | H | 37.37 | -1.43 | 47.24 | 45.81 | 68.20 | -22.39 |
| | 2122 | PK | H | 37.37 | -1.61 | 48.48 | 46.87 | 68.20 | -21.33 |
| | 2650 | PK | H | 37.39 | -1.38 | 49.39 | 48.01 | 68.20 | -20.19 |
| | 4047 | PK | H | 37.25 | 3.02 | 41.38 | 44.40 | 74.00 | -29.60 |
| | 11008 | PK | H | 35.73 | 22.72 | 25.65 | 48.37 | 74.00 | -25.63 |
| 802.11a , Ch149, Chain1 | 2001 | PK | V | 37.37 | -1.43 | 54.96 | 53.53 | 68.20 | -14.67 |
| | 2650 | PK | V | 37.39 | -1.38 | 49.77 | 48.39 | 68.20 | -19.81 |
| | 3992 | PK | V | 37.25 | 2.90 | 43.45 | 46.35 | 74.00 | -27.65 |
| | 4267 | PK | V | 37.24 | 3.47 | 43.48 | 46.95 | 74.00 | -27.05 |
| | 17172 | PK | V | 35.32 | 27.33 | 19.64 | 46.97 | 68.20 | -21.23 |
| | 1990 | PK | H | 37.37 | -1.55 | 46.07 | 44.52 | 68.20 | -23.68 |
| | 2122 | PK | H | 37.37 | -1.61 | 46.54 | 44.93 | 68.20 | -23.27 |
| | 4410 | PK | H | 37.24 | 3.76 | 48.89 | 52.65 | 68.20 | -15.55 |
| | 17126 | PK | H | 35.34 | 27.19 | 19.51 | 46.70 | 68.20 | -21.50 |
| 802.11n (HT20) , Ch48, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 53.01 | 51.46 | 68.20 | -16.74 |
| | 2650 | PK | V | 37.39 | -1.38 | 49.24 | 47.86 | 68.20 | -20.34 |
| | 3651 | PK | V | 37.31 | 1.68 | 50.36 | 52.04 | 74.00 | -21.96 |
| | 6280 | PK | V | 36.80 | 8.39 | 43.81 | 52.20 | 68.20 | -16.00 |
| | 10479 | PK | V | 35.71 | 20.74 | 26.84 | 47.58 | 68.20 | -20.62 |
| | 15712 | PK | V | 35.36 | 22.35 | 18.86 | 41.21 | 74.00 | -32.79 |
| | 3662 | PK | H | 37.31 | 1.72 | 56.72 | 58.44 | 74.00 | -15.56 |
| | 3662 | AV | H | 37.31 | 1.72 | 47.51 | 49.23 | 54.00 | -4.77 |
| | 6280 | PK | H | 36.80 | 8.39 | 46.20 | 54.59 | 68.20 | -13.61 |
| | 10502 | PK | H | 35.70 | 20.88 | 25.63 | 46.51 | 68.20 | -21.69 |
| | 15723 | PK | H | 35.36 | 22.34 | 18.76 | 41.10 | 74.00 | -32.90 |

TEST REPORT

P/N1002633 + P/N1002635

| Mode | Frequency (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Preamp. Gain (dB) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) |
|---------------------------------|-----------------|----------------------------|-----------------|-------------------|--------------------------|----------------|----------------------------|----------------------|-------------|
| 802.11n (HT20), Ch64, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 54.69 | 53.14 | 68.20 | -15.06 |
| | 2661 | PK | V | 37.40 | -1.32 | 54.50 | 53.18 | 68.20 | -15.02 |
| | 6445 | PK | V | 36.74 | 8.94 | 44.25 | 53.19 | 68.20 | -15.01 |
| | 10721 | PK | V | 35.71 | 21.68 | 24.96 | 46.64 | 74.00 | -27.36 |
| | 15965 | PK | V | 35.35 | 22.29 | 17.73 | 40.02 | 74.00 | -33.98 |
| | 2122 | PK | H | 37.37 | -1.61 | 50.26 | 48.65 | 68.20 | -19.55 |
| | 3772 | PK | H | 37.29 | 2.12 | 50.88 | 53.00 | 74.00 | -21.00 |
| | 6445 | PK | H | 36.74 | 8.94 | 44.42 | 53.36 | 68.20 | -14.84 |
| | 10709 | PK | H | 35.71 | 21.64 | 25.51 | 47.15 | 74.00 | -26.85 |
| 802.11n (HT20), Ch100, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 58.00 | 56.45 | 68.20 | -11.75 |
| | 2661 | PK | V | 37.40 | -1.32 | 48.03 | 46.71 | 68.20 | -21.49 |
| | 10962 | PK | V | 35.73 | 22.57 | 25.02 | 47.59 | 74.00 | -26.41 |
| | 1990 | PK | H | 37.37 | -1.55 | 46.70 | 45.15 | 68.20 | -23.05 |
| | 2661 | PK | H | 37.40 | -1.32 | 44.62 | 43.30 | 68.20 | -24.90 |
| | 11054 | PK | H | 35.73 | 22.74 | 25.59 | 48.33 | 74.00 | -25.67 |
| 802.11n (HT20), Ch157, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 58.99 | 57.44 | 68.20 | -10.76 |
| | 2133 | PK | V | 37.37 | -1.63 | 48.62 | 46.99 | 68.20 | -21.21 |
| | 2650 | PK | V | 37.39 | -1.38 | 51.44 | 50.06 | 68.20 | -18.14 |
| | 4476 | PK | V | 37.24 | 3.90 | 44.18 | 48.08 | 68.20 | -20.12 |
| | 11756 | PK | V | 35.70 | 22.61 | 24.34 | 46.95 | 74.00 | -27.05 |
| | 17356 | PK | V | 35.22 | 27.89 | 17.56 | 45.45 | 68.20 | -22.75 |
| | 1990 | PK | H | 37.37 | -1.55 | 47.32 | 45.77 | 68.20 | -22.43 |
| | 2111 | PK | H | 37.37 | -1.59 | 45.61 | 44.02 | 68.20 | -24.18 |
| | 2661 | PK | H | 37.40 | -1.32 | 45.85 | 44.53 | 68.20 | -23.67 |
| | 4476 | PK | H | 37.24 | 3.90 | 51.70 | 55.60 | 68.20 | -12.60 |
| | 6324 | PK | H | 36.78 | 8.54 | 39.91 | 48.45 | 68.20 | -19.75 |
| | 11767 | PK | H | 35.70 | 22.60 | 24.75 | 47.35 | 74.00 | -26.65 |
| | 17356 | PK | H | 35.22 | 27.89 | 17.54 | 45.43 | 68.20 | -22.77 |

TEST REPORT

P/N1002633 + P/N1002635

| Mode | Frequency (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Preamp. Gain (dB) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) |
|---------------------------------|-----------------|----------------------------|-----------------|-------------------|--------------------------|----------------|----------------------------|----------------------|-------------|
| 802.11n (HT40), Ch46, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 51.11 | 49.56 | 68.20 | -18.64 |
| | 2661 | PK | V | 37.40 | -1.32 | 52.98 | 51.66 | 68.20 | -16.54 |
| | 3629 | PK | V | 37.32 | 1.61 | 50.09 | 51.70 | 74.00 | -22.30 |
| | 6258 | PK | V | 36.81 | 8.32 | 39.87 | 48.19 | 68.20 | -20.01 |
| | 10491 | PK | V | 35.70 | 20.81 | 26.20 | 47.01 | 68.20 | -21.19 |
| | 3640 | PK | H | 37.31 | 1.65 | 54.52 | 56.17 | 74.00 | -17.83 |
| | 3640 | AV | H | 37.31 | 1.65 | 44.87 | 46.52 | 54.00 | -7.48 |
| | 6258 | PK | H | 36.81 | 8.32 | 44.66 | 52.98 | 68.20 | -15.22 |
| | 10502 | PK | H | 35.70 | 20.88 | 25.17 | 46.05 | 68.20 | -22.15 |
| 802.11n (HT40), Ch54, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 51.69 | 50.14 | 68.20 | -18.06 |
| | 3695 | PK | V | 37.30 | 1.84 | 43.33 | 45.17 | 74.00 | -28.83 |
| | 4806 | PK | V | 37.14 | 4.94 | 41.39 | 46.33 | 74.00 | -27.67 |
| | 6335 | PK | V | 36.78 | 8.58 | 43.41 | 51.99 | 68.20 | -16.21 |
| | 10732 | PK | V | 35.71 | 21.73 | 25.77 | 47.50 | 74.00 | -26.50 |
| | 15804 | PK | V | 35.35 | 22.33 | 18.85 | 41.18 | 74.00 | -32.82 |
| | 3695 | PK | H | 37.30 | 1.84 | 50.97 | 52.81 | 74.00 | -21.19 |
| | 4806 | PK | H | 37.14 | 4.94 | 41.18 | 46.12 | 74.00 | -27.88 |
| | 6335 | PK | H | 36.78 | 8.58 | 44.66 | 53.24 | 68.20 | -14.96 |
| | 10525 | PK | H | 35.70 | 20.96 | 25.55 | 46.51 | 68.20 | -21.69 |
| | 15792 | PK | H | 35.35 | 22.33 | 16.78 | 39.11 | 74.00 | -34.89 |
| 802.11n (HT40), Ch102, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 52.92 | 51.37 | 68.20 | -16.83 |
| | 2067 | PK | V | 37.37 | -1.53 | 53.17 | 51.64 | 68.20 | -16.56 |
| | 3992 | PK | V | 37.25 | 2.90 | 43.18 | 46.08 | 74.00 | -27.92 |
| | 11020 | PK | V | 35.73 | 22.72 | 24.79 | 47.51 | 74.00 | -26.49 |
| | 16563 | PK | V | 35.45 | 24.24 | 15.99 | 40.23 | 68.20 | -27.97 |
| | 11008 | PK | H | 35.73 | 22.72 | 25.26 | 47.98 | 74.00 | -26.02 |
| | 16505 | PK | H | 35.46 | 23.90 | 15.67 | 39.57 | 68.20 | -28.63 |

TEST REPORT

P/N1002633 + P/N1002635

| Mode | Frequency (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Preamp. Gain (dB) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) |
|---------------------------------|-----------------|----------------------------|-----------------|-------------------|--------------------------|----------------|----------------------------|----------------------|-------------|
| 802.11n (HT40), Ch151, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 57.29 | 55.74 | 68.20 | -12.46 |
| | 2122 | PK | V | 37.37 | -1.61 | 54.16 | 52.55 | 68.20 | -15.65 |
| | 2650 | PK | V | 37.39 | -1.38 | 49.50 | 48.12 | 68.20 | -20.08 |
| | 11238 | PK | V | 35.74 | 22.84 | 24.74 | 47.58 | 74.00 | -26.42 |
| | 17126 | PK | V | 35.34 | 27.19 | 20.01 | 47.20 | 68.20 | -21.00 |
| | 4432 | PK | H | 37.24 | 3.81 | 46.51 | 50.32 | 68.20 | -17.88 |
| | 11054 | PK | H | 35.73 | 22.74 | 25.69 | 48.43 | 74.00 | -25.57 |
| | 17207 | PK | H | 35.30 | 27.44 | 18.55 | 45.99 | 68.20 | -22.21 |
| 802.11ac, Ch42, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 53.63 | 52.08 | 68.20 | -16.12 |
| | 2661 | PK | V | 37.40 | -1.32 | 54.26 | 52.94 | 68.20 | -15.26 |
| | 3585 | PK | V | 37.32 | 1.45 | 50.02 | 51.47 | 68.20 | -16.73 |
| | 4762 | PK | V | 37.16 | 4.80 | 43.40 | 48.20 | 74.00 | -25.80 |
| | 5653 | PK | V | 36.96 | 6.37 | 40.35 | 46.72 | 68.20 | -21.48 |
| | 10422 | PK | V | 35.74 | 20.37 | 26.59 | 46.96 | 68.20 | -21.24 |
| | 3596 | PK | H | 37.32 | 1.49 | 56.80 | 58.29 | 68.20 | -9.91 |
| | 4773 | PK | H | 37.15 | 4.83 | 46.71 | 51.54 | 74.00 | -22.46 |
| | 5664 | PK | H | 36.95 | 6.40 | 42.39 | 48.79 | 68.20 | -19.41 |
| | 6225 | PK | H | 36.82 | 8.21 | 38.40 | 46.61 | 68.20 | -21.59 |
| | 10479 | PK | H | 35.71 | 20.74 | 25.52 | 46.26 | 68.20 | -21.94 |
| 802.11ac, Ch58, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 60.36 | 58.81 | 68.20 | -9.39 |
| | 2661 | PK | V | 37.40 | -1.32 | 48.57 | 47.25 | 68.20 | -20.95 |
| | 10514 | PK | V | 35.70 | 20.92 | 26.29 | 47.21 | 68.20 | -20.99 |
| | 2661 | PK | H | 37.40 | -1.32 | 46.83 | 45.51 | 68.20 | -22.69 |
| | 3739 | PK | H | 37.30 | 2.00 | 43.31 | 45.31 | 74.00 | -28.69 |
| | 4839 | PK | H | 37.13 | 5.05 | 40.29 | 45.34 | 74.00 | -28.66 |
| | 6401 | PK | H | 36.76 | 8.80 | 38.42 | 47.22 | 68.20 | -20.98 |
| | 10997 | PK | H | 35.73 | 22.70 | 24.82 | 47.52 | 74.00 | -26.48 |
| 802.11ac, Ch106, Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 58.46 | 56.91 | 68.20 | -11.29 |
| | 2661 | PK | V | 37.40 | -1.32 | 50.04 | 48.72 | 68.20 | -19.48 |
| | 11054 | PK | V | 35.73 | 22.74 | 24.92 | 47.66 | 74.00 | -26.34 |
| | 11054 | PK | H | 35.73 | 22.74 | 24.24 | 46.98 | 74.00 | -27.02 |

TEST REPORT

P/N1002633 + P/N1002635

| Mode | Frequency (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Preamp. Gain (dB) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) |
|-----------------------------------|-----------------|----------------------------|-----------------|-------------------|--------------------------|----------------|----------------------------|----------------------|-------------|
| 802.11ac , Ch155 , Chain0+1 | 1990 | PK | V | 37.37 | -1.55 | 53.09 | 51.54 | 68.20 | -16.66 |
| | 2661 | PK | V | 37.40 | -1.32 | 56.20 | 54.88 | 68.20 | -13.32 |
| | 11250 | PK | V | 35.74 | 22.84 | 25.15 | 47.99 | 74.00 | -26.01 |
| | 17161 | PK | V | 35.32 | 27.30 | 18.02 | 45.32 | 68.20 | -22.88 |
| | 2133 | PK | H | 37.37 | -1.63 | 53.54 | 51.91 | 68.20 | -16.29 |
| | 2661 | PK | H | 37.40 | -1.32 | 46.24 | 44.92 | 68.20 | -23.28 |
| | 4454 | PK | H | 37.24 | 3.85 | 46.63 | 50.48 | 68.20 | -17.72 |
| | 5334 | PK | H | 37.01 | 5.78 | 43.49 | 49.27 | 68.20 | -18.93 |
| | 6225 | PK | H | 36.82 | 8.21 | 40.81 | 49.02 | 68.20 | -19.18 |
| | 11146 | PK | H | 35.74 | 22.79 | 24.84 | 47.63 | 74.00 | -26.37 |
| 17333 | PK | H | 35.23 | 27.82 | 18.26 | 46.08 | 68.20 | -22.12 | |

Remark: Correction Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Pre_Amplifier Gain

4. Emission on The Band Edge

4.1 Operating environment

| | | |
|----------------------|-------------------|-----|
| Temperature: | 25 | °C |
| Relative Humidity: | 50 | % |
| Atmospheric Pressure | 1008 | hPa |
| Requirement | 15.407(b), 15.209 | |

4.2 Measuring instrument setting

| Spectrum analyzer settings | |
|----------------------------|---------------------------------|
| Spectrum Analyzer function | Setting |
| Detector | Peak |
| RBW | 1MHz |
| VBW | 3MHz for Peak; 10Hz for Average |
| Sweep | Auto couple |
| Restrict bands | 4500~5150MHz |
| | 5350 ~5460MHz |
| Attenuation | Auto |

| Applicable to | Limit | |
|---------------|------------------|--|
| | EIRP Limit (dBm) | Equivalent Field Strength at 3m (dBμV/m) |
| 5715-5725MHz | PK | PK |
| 5850-5860MHz | -17 | 78.2 |

4.3 Test procedure

The test procedure is the same as clause 3.4

4.4 Test Result

P/N1002994 + P/N1002991

| Mode | Frequency (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Preamp. Gain (dB) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) | Restricted band (MHz) |
|----------------------------|-----------------|----------------------------|-----------------|-------------------|--------------------------|----------------|----------------------------|----------------------|-------------|-----------------------|
| 802.11a Chain0 | 5150.00 | PK | V | 37.05 | 5.97 | 38.06 | 44.03 | 74 | -29.97 | 4500~5150 |
| | 5150.00 | AV | V | 37.05 | 5.97 | 27.01 | 32.98 | 54 | -21.02 | |
| 802.11ac (VHT80) Chain 0+1 | 5150.00 | PK | V | 37.05 | 5.97 | 65.71 | 71.68 | 74 | -2.32 | 5350~5460 |
| | 5146.80 | AV | V | 37.05 | 5.96 | 46.61 | 52.57 | 54 | -1.43 | |
| | 5350.00 | PK | V | 37.01 | 6.25 | 55.70 | 61.95 | 74 | -12.05 | 5350~5460 |
| | 5350.00 | AV | V | 37.01 | 6.25 | 38.57 | 44.82 | 54 | -9.18 | |
| 802.11n (HT20) Chain 0+1 | 5362.99 | PK | V | 37.01 | 6.26 | 35.76 | 42.02 | 74 | -31.98 | 5350~5460 |
| | 5350.00 | AV | V | 37.01 | 6.25 | 23.75 | 30.00 | 54 | -24.00 | |
| 802.11n (HT40) Chain 0+1 | 5353.09 | PK | V | 37.01 | 6.25 | 36.04 | 42.29 | 74 | -31.71 | 4500~5150 |
| | 5350.00 | AV | V | 37.01 | 6.25 | 24.60 | 30.85 | 54 | -23.15 | |

Remark: Correction Factor = Antenna Factor + Cable Loss

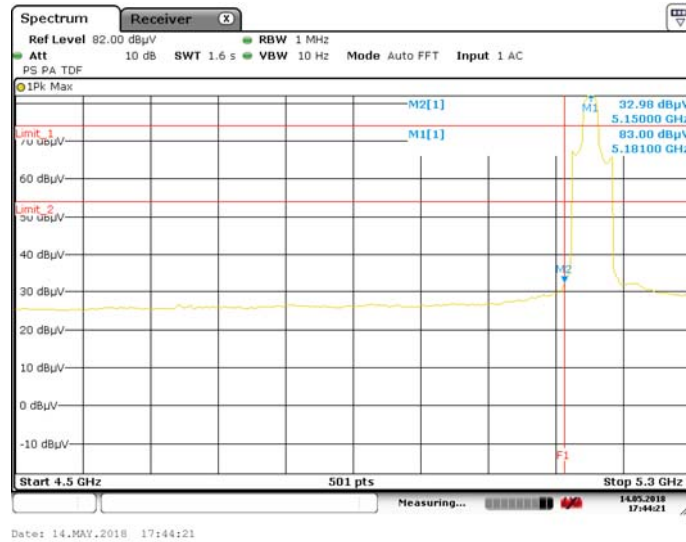
P/N1002633 + P/N1002635

| Mode | Frequency (MHz) | Spectrum Analyzer Detector | Ant. Pol. (H/V) | Preamp. Gain (dB) | Correction Factor (dB/m) | Reading (dBμV) | Corrected Reading (dBμV/m) | Limit @ 3 m (dBμV/m) | Margin (dB) | Restricted band (MHz) |
|----------------------------|-----------------|----------------------------|-----------------|-------------------|--------------------------|----------------|----------------------------|----------------------|-------------|-----------------------|
| 802.11a Chain0 | 5150.00 | PK | V | 37.05 | 5.97 | 65.16 | 71.13 | 74 | -2.87 | 4500~5150 |
| | 5142.00 | AV | V | 37.05 | 5.95 | 48.04 | 53.99 | 54 | -0.01 | |
| 802.11ac (VHT80) Chain 0+1 | 5350.00 | PK | V | 37.01 | 6.25 | 49.76 | 56.01 | 74 | -17.99 | 5350~5460 |
| | 5351.86 | AV | V | 37.01 | 6.25 | 36.64 | 42.89 | 54 | -11.11 | |
| | 5359.28 | PK | V | 37.01 | 6.26 | 36.09 | 42.35 | 74 | -31.65 | 5350~5460 |
| | 5350.00 | AV | V | 37.01 | 6.25 | 23.90 | 30.15 | 54 | -23.85 | |
| 802.11n (HT20) Chain 0+1 | 5358.66 | PK | V | 37.01 | 6.26 | 37.32 | 43.58 | 74 | -30.42 | 5350~5460 |
| | 5350.00 | AV | V | 37.01 | 6.25 | 23.68 | 29.93 | 54 | -24.07 | |
| 802.11n (HT40) Chain 0+1 | 5150.00 | PK | V | 37.05 | 5.97 | 65.16 | 71.13 | 74 | -2.87 | 4500~5150 |
| | 5142.00 | AV | V | 37.05 | 5.95 | 48.04 | 53.99 | 54 | -0.01 | |

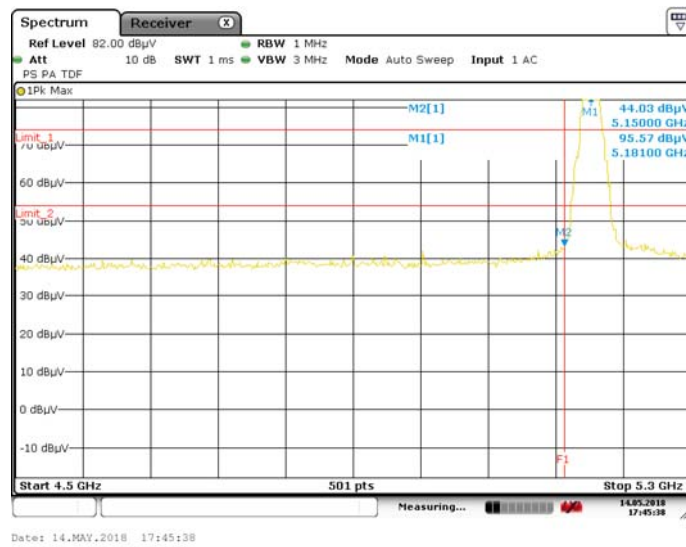
Remark: Correction Factor = Antenna Factor + Cable Loss

P/N1002994 + P/N1002991

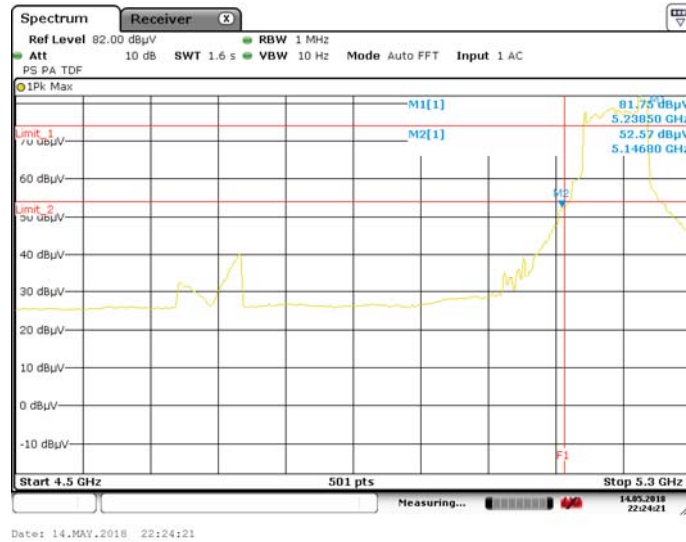
Restricted Band @ 802.11a Mode Ch36 av



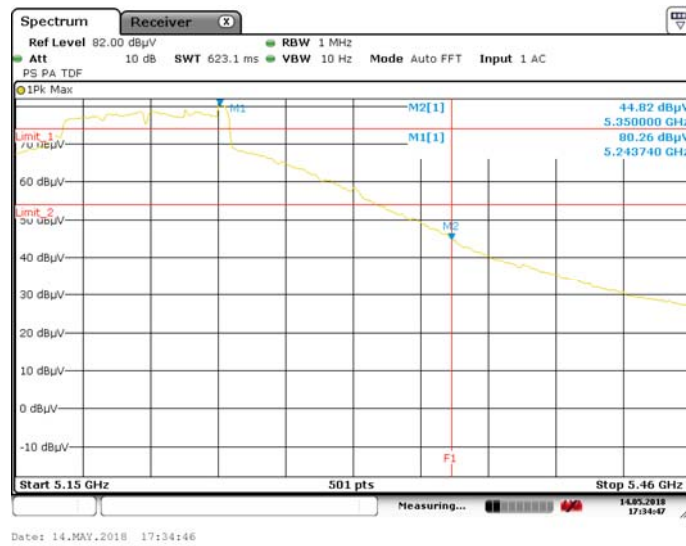
Restricted Band @ 802.11a Mode Ch36 pk



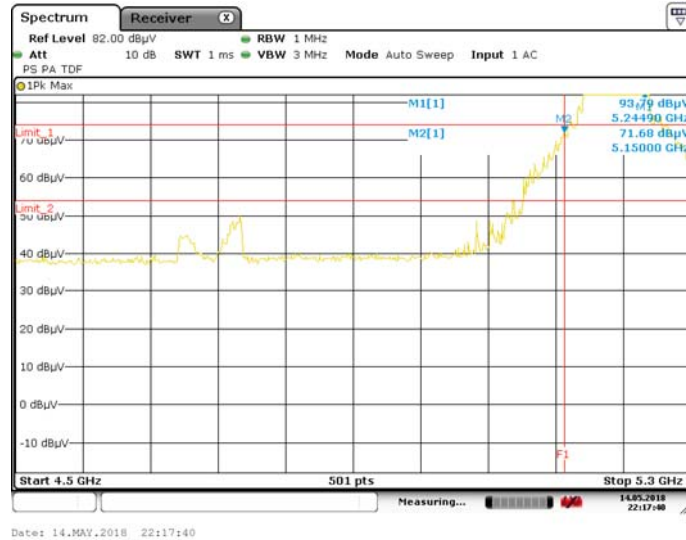
Restricted Band @ 802.11ac Mode Ch42 Lower av



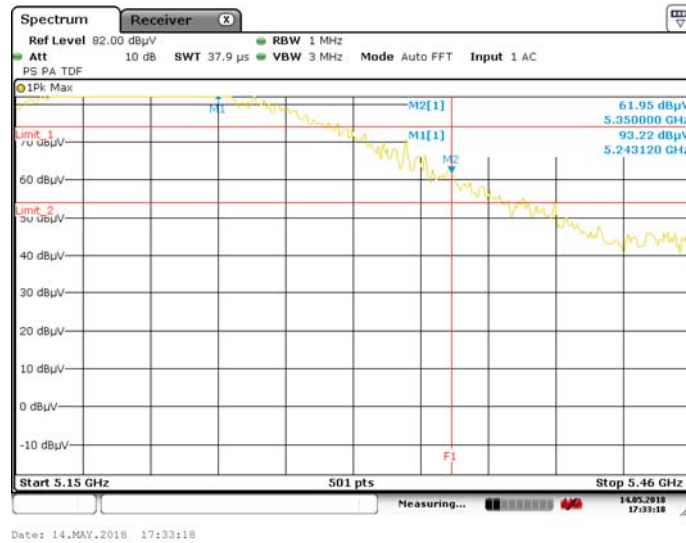
Restricted Band @ 802.11ac Mode Ch42 Upper av



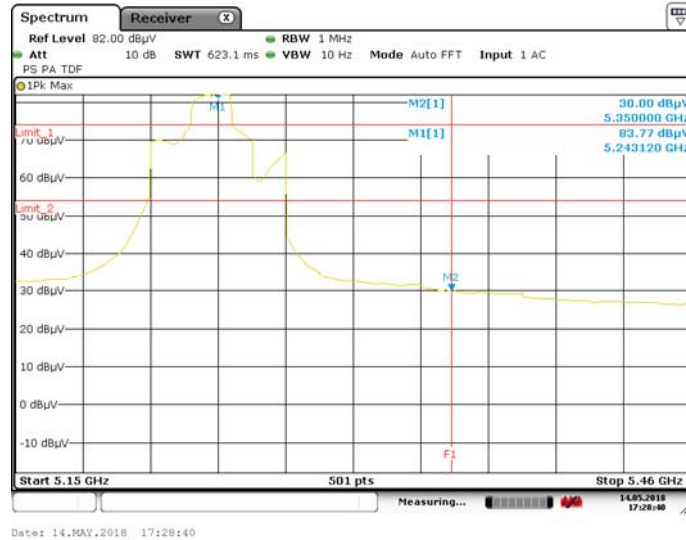
Restricted Band @ 802.11ac Mode Ch42 Lower pk



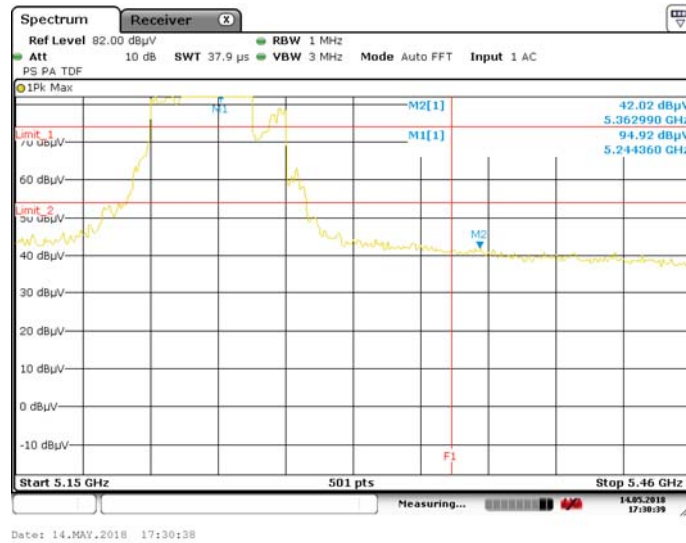
Restricted Band @ 802.11ac Mode Ch42 Upper pk



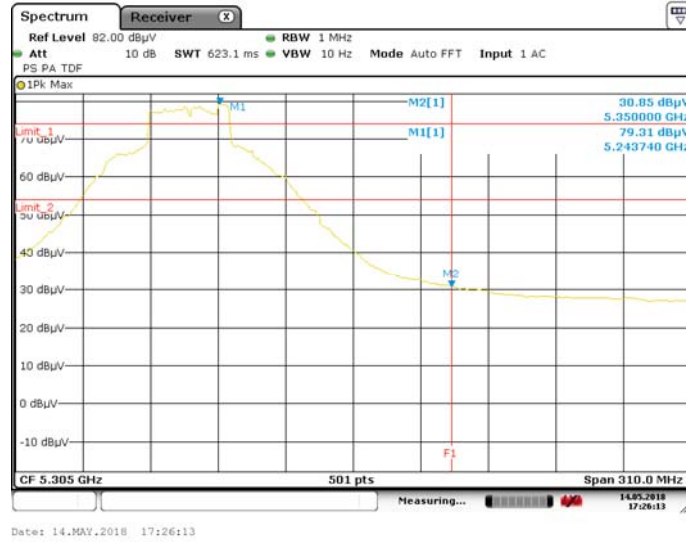
Restricted Band @ 802.11n20 Mode Ch48 av



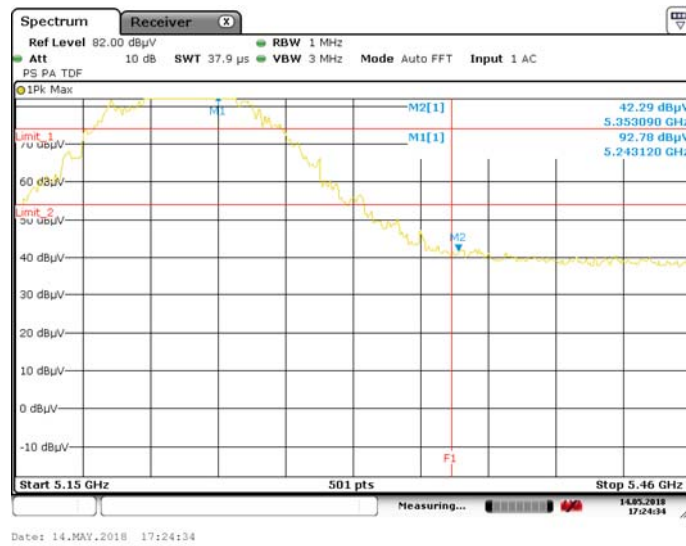
Restricted Band @ 802.11n20 Mode Ch48 pk



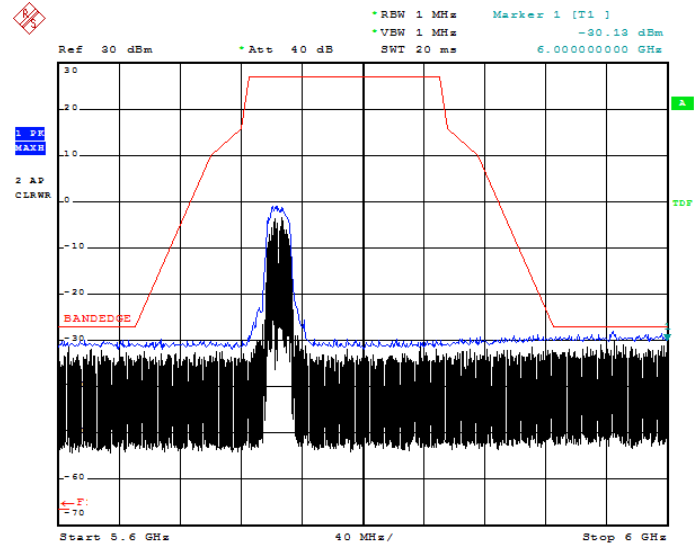
Restricted Band @ 802.11n40 Mode Ch46 av



Restricted Band @ 802.11n40 Mode Ch46 pk

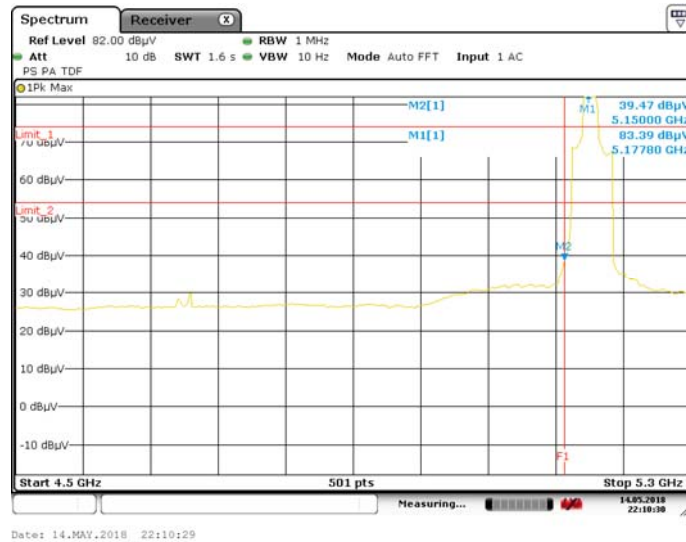


Out-of-band emission limits for U-NII-3 @ 11a chain1 ch149 Lower Mode

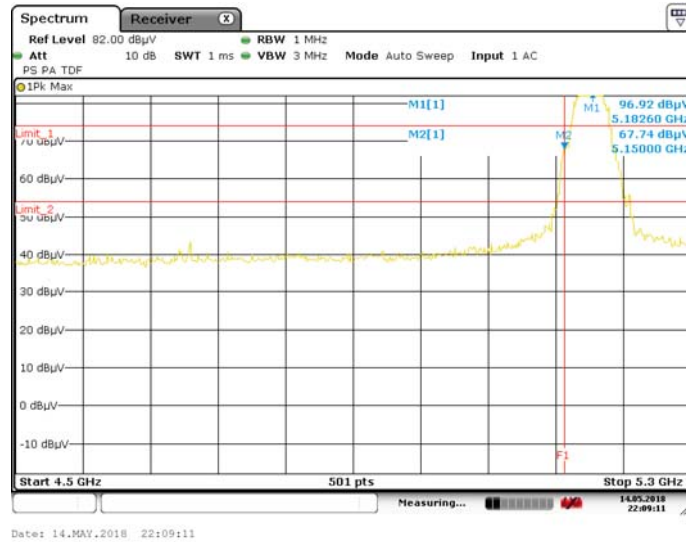


P/N1002633 + P/N1002635

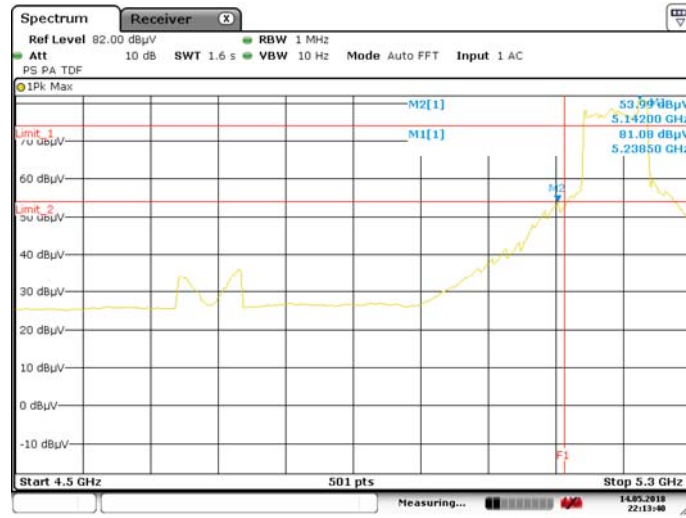
Restricted Band @ 802.11a Mode Ch36 av



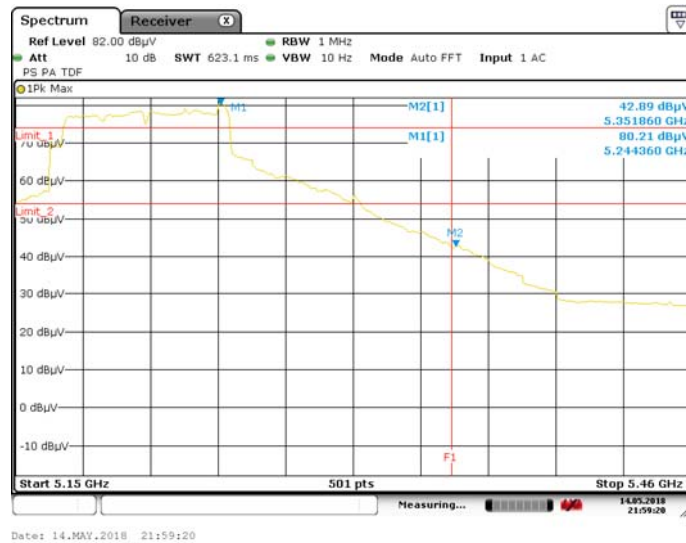
Restricted Band @ 802.11a Mode Ch36 pk



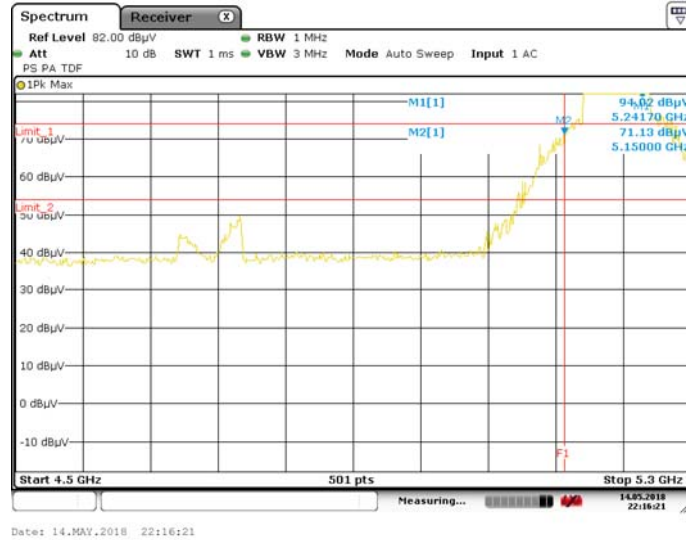
Restricted Band @ 802.11ac Mode Ch42 Lower av



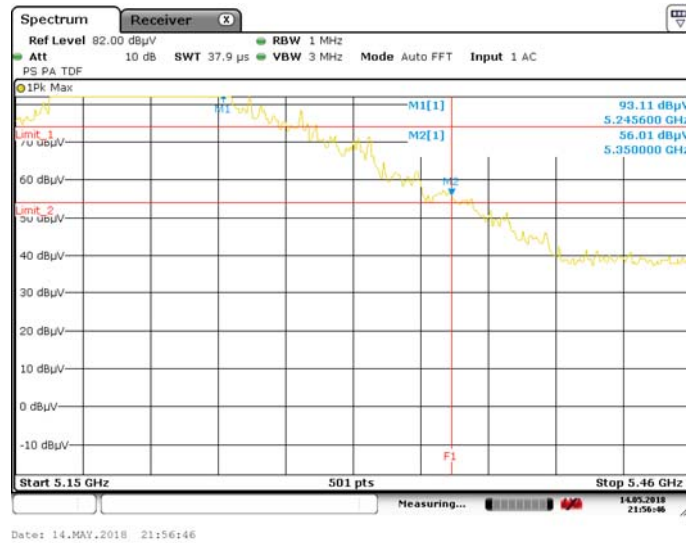
Restricted Band @ 802.11ac Mode Ch42 Upper av



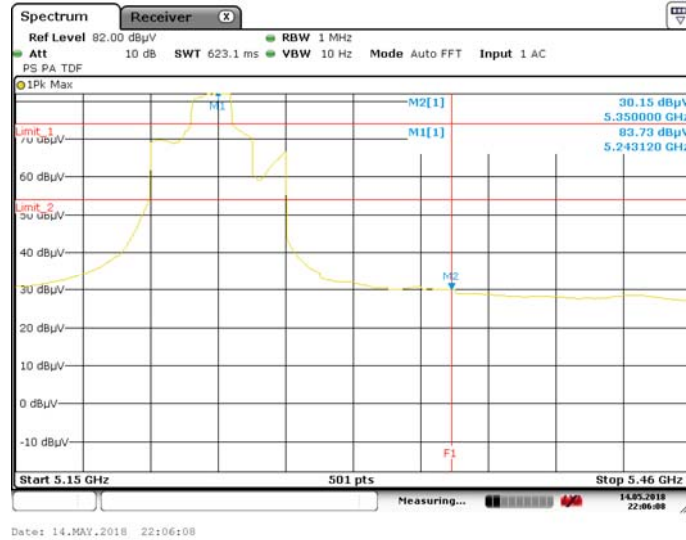
Restricted Band @ 802.11ac Mode Ch42 Lower pk



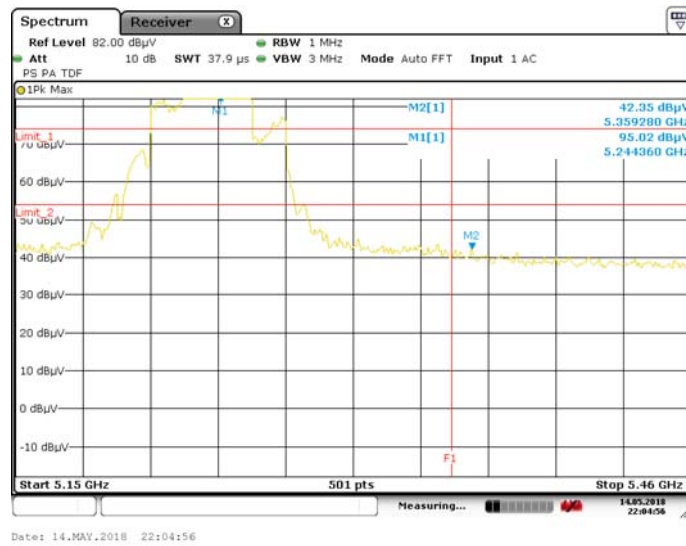
Restricted Band @ 802.11ac Mode Ch42 Upper pk



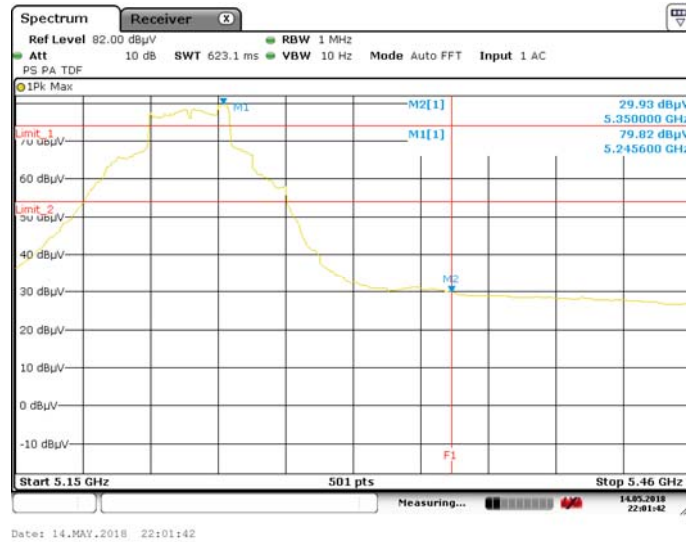
Restricted Band @ 802.11n20 Mode Ch48 av



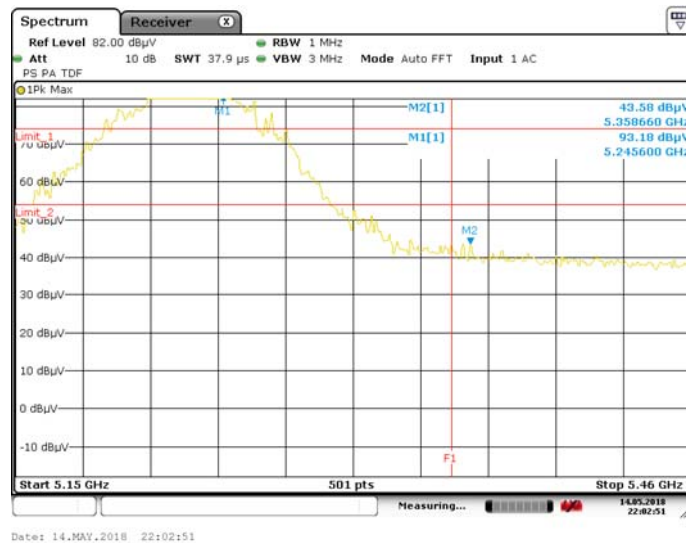
Restricted Band @ 802.11n20 Mode Ch48 pk



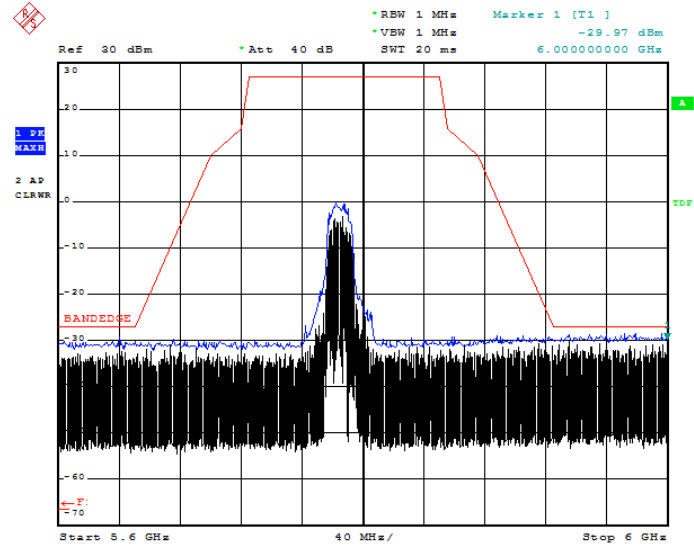
Restricted Band @ 802.11n40 Mode Ch46 av



Restricted Band @ 802.11n40 Mode Ch46 pk



Out-of-band emission limits for U-NII-3 @ 11n20 chain0+1 ch157 Mid. Mode



Appendix A: Test equipment list

| Test Equipment/ Test site | Brand | Model No. | Serial No. | Calibration Date | Next Calibration Date |
|--------------------------------|--------------------------------|---------------------|-------------|---------------------|-----------------------------|
| ESCI EMI Test Receiver | Rohde & Schwarz | ESCI | 100018 | 2017/11/21 | 2018/11/20 |
| Spectrum Analyzer | Rohde & Schwarz | FSP30 | 100245 | 2018/02/23 | 2019/02/22 |
| Horn Antenna (1-18G) | SHWARZBECK | BBHA 9120 D | 9120D-456 | 2018/01/23 | 2019/01/22 |
| Horn Antenna (14-42G) | SHWARZBECK | BBHA 9170 | BBHA9170159 | 2017/09/04 | 2020/09/02 |
| Broadband Antenna | SHWARZBECK | VULB 9168 | 9168-172 | 2018/04/23 | 2019/04/22 |
| Pre-Amplifier | EMC Co. | EMC12635SE | 980205 | 2017/11/28 | 2018/11/27 |
| Pre-Amplifier | MITEQ | JS4-26004000--27-8A | 828825 | 2017/08/23 | 2018/08/22 |
| Power Meter | Anritsu | ML2495A | 0844001 | 2017/10/18 | 2018/10/17 |
| Power Sensor | Anritsu | MA2411B | 0738452 | 2017/05/23 | 2018/05/22 |
| Signal Analyzer | Agilent | N9030A | MY51380492 | 2017/08/29 | 2018/08/28 |
| 966-2(A) Cable 9kHz~26.5GHz | SUHNER | SMA / EX 100 | N/A | 2017/08/15 | 2018/08/14 |
| 966-2(B) Cable 9kHz~26.5GHz | SUHNER | SUCOFLEX 104P | CB0005 | 2017/08/15 | 2018/08/14 |
| RF Cable 9kHz~26.5GHz | SUHNER | SUCOFLEX 102 | CB0006 | 2017/05/04 | 2018/05/03 |
| 966-2_3m Semi-Anechoic Chamber | 966_2 | CEM-966_2 | N/A | 2017/03/29 | 2018/03/28 |
| 966-2_3m Semi-Anechoic Chamber | 966_2 | CEM-966_2 | N/A | 2018/03/28 | 2019/03/27 |
| High Pass Filter | Wainwright | WHKX3.0/18G-12SS | N/A | 2017/06/02 | 2018/06/01 |
| Active Loop Antenna | SCHWARZBECK MESS-ELEKTRONIC | FMZB1519 | 1519-067 | 2018/04/17 | 2019/04/16 |

Note: No Calibration Required (NCR).

Appendix B: Measurement Uncertainty

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of $k=2$.

| Item | Uncertainty |
|--|-------------|
| Vertically polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m | 5.14 dB |
| Horizontally polarized radiated disturbances from 30MHz~1GHz in a semi-anechoic chamber at a distance of 3m | 5.22 dB |
| Vertically polarized Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m | 3.64 dB |
| Horizontally polarized Radiated disturbances from 1GHz~18GHz in a semi-anechoic chamber at a distance of 3m | 3.64 dB |
| Vertically polarized Radiated disturbances from 18GHz~40GHz in a semi-anechoic chamber at a distance of 3m | 2.68 dB |
| Horizontally polarized Radiated disturbances from 18GHz~40GHz in a semi-anechoic chamber at a distance of 3m | 2.68 dB |
| Radiated disturbances from 9kHz~30MHz in a semi-anechoic chamber at a distance of 3m | 3.54 dB |
| Emission on the Band Edge Test | 3.64 dB |
| Maximum Conducted Output Power | 0.42 dB |