



MEASUREMENT REPORT

EN 301 893 V1.7.1 WLAN 802.11a/n/ac

Applicant: Compex Systems Pte Ltd
Address: 135, Joo Seng Road, #08-01 Singapore 368363
Product: WIRELESS-AC 2X2 27DBM NETWORK MINI PCIE ADAPTER
Model No.: WLE600V5-27ESD
Brand Name: COMPEX
Standards: ETSI EN 301 893 V1.7.1 (2012-06)
Result: Complies
Test Date: Aug. 03 ~ 24, 2014

Reviewed By : Robin Wu
(Robin Wu)
Approved By : Marlin Chen
(Marlin Chen)



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

| Report No. | Version | Description | Issue Date |
|--------------|---------|-----------------------------|------------|
| 1408RSU00103 | Rev. 01 | Initial report | 08-25-2014 |
| 1408RSU00103 | Rev. 02 | Update the Mask test format | 10-28-2014 |
| | | | |

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1.4. Feature of Product

| | |
|--------------------|---|
| Product Name | WIRELESS-AC 2X2 27DBM NETWORK MINI PCIE ADAPTER |
| Model No. | WLE600V5-27ESD |
| Brand Name | COMPEX |
| Frequency Range | 802.11a /n-HT20/ac-VHT20: 5500 ~ 5700MHz 802.11n-HT40/ac-VHT40: 5510 ~ 5670MHz 802.11ac-VHT80: 5530, 5610MHz |
| Channel Number | 802.11a /n-HT20/ac-VHT20: 11 802.11n-HT40/ac-VHT40: 5 802.11ac-VHT80: 2 |
| Type of Modulation | 802.11a/n/ac: OFDM |
| Data Rate | 802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.6Mbps |

1.5. Frequency / Channel Operation

Channel List for 802.11a/n-HT20/ac-VHT20

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|---------|-----------|
| 100 | 5500 MHz | 104 | 5520 MHz | 108 | 5540 MHz |
| 112 | 5560 MHz | 116 | 5580 MHz | 120 | 5600 MHz |
| 124 | 5620 MHz | 128 | 5640 MHz | 132 | 5660 MHz |
| 136 | 5680 MHz | 140 | 5700 MHz | N/A | N/A |

Channel List for 802.11n-HT40MHz/ac-VHT40

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|---------|-----------|
| 102 | 5510 MHz | 110 | 5550 MHz | 118 | 5590 MHz |
| 126 | 5630 MHz | 134 | 5670 MHz | N/A | N/A |

Channel List for 802.11ac-VHT80

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|---------|-----------|
| 106 | 5530 MHz | 122 | 5610 MHz | N/A | N/A |

1.6. Description of Available Antennas

| Antenna Type | Frequency Band (GHz) | Manufacturer | Tx Paths | Max Directional Gain (dBi) |
|-------------------|----------------------|---------------------------------------|----------|----------------------------|
| Panel Antenna 1# | 5.1 ~ 5.8 | Lanbowan Communications Ltd. | 2 | 25 |
| Panel Antenna 2# | 5.1 ~ 5.8 | Lanbowan Communications Ltd. | 2 | 23 |
| Panel Antenna 3# | 5.1 ~ 5.8 | Kenbotong Communication LTD | 2 | 19 |
| Panel Antenna 4# | 5.1 ~ 5.8 | Compex Systems Pte Ltd | 2 | 17 |
| Panel Antenna 5# | 5.1 ~ 5.8 | Compex Systems Pte Ltd | 2 | 16 |
| Panel Antenna 6# | 5.1 ~ 5.8 | Compex Systems Pte Ltd | 2 | 15 |
| Panel Antenna 7# | 5.1 ~ 5.8 | Kenbotong Communication LTD | 2 | 10 |
| Panel Antenna 8# | 5.1 ~ 5.8 | Smart Ant Inc | 2 | 7 |
| Panel Antenna 9# | 5.1 ~ 5.8 | Compex Systems Pte Ltd | 2 | 5 |
| Panel Antenna 10# | 5.1 ~ 5.8 | Compex Systems Pte Ltd | 2 | 5 |
| Dipole Antenna 1# | 5.1 ~ 5.8 | Kunshan Wavelink Electronic Co., Ltd. | 2 | 2 |

Note1: We selected the panel antenna 1# and dipole antenna 1# for all radiated emission testing.

1.7. Standards Applicable for Testing

The EUT complies with the requirements of ETSI EN 301893 V1.7.1.

2. Test Configuration of Equipment under Test

2.1. Description of Test Mode

Pre-Test RF Output Power at various data rates.

| Test Mode | Bandwidth (MHz) | Channel No. | Frequency (MHz) | Data Rate (Mbps) | RF Output Power (dBm) |
|-----------|-----------------|-------------|-----------------|------------------|-----------------------|
| 11a | 20 | 100 | 5500 | 6 | 3.92 |
| | | | | 24 | 3.78 |
| | | | | 54 | 3.52 |
| 11n | 20 | 100 | 5500 | 6.5 | 3.77 |
| | | | | 26 | 3.56 |
| | | | | 65 | 3.27 |
| 11n | 40 | 102 | 5510 | 13.5 | 3.78 |
| | | | | 54 | 3.59 |
| | | | | 135 | 3.22 |
| 11ac | 20 | 100 | 5500 | 6.5 | 3.79 |
| | | | | 39 | 3.57 |
| | | | | 78 | 3.31 |
| 11ac | 40 | 102 | 5510 | 13.5 | 4.02 |
| | | | | 81 | 3.88 |
| | | | | 180. | 3.64 |
| 11ac | 80 | 106 | 5530 | 29.3 | 3.95 |
| | | | | 175.5 | 3.73 |
| | | | | 390 | 3.46 |

Note: All modes of operation and data rates were investigated, so all RF test requirements shall be executed at low data rates.

| Test Mode | Duty Cycle |
|------------|------------|
| 11a | 100% |
| 11n-HT20 | 100% |
| 11n-HT40 | 100% |
| 11ac-VHT20 | 100% |
| 11ac-VHT40 | 100% |
| 11ac-VHT80 | 100% |

2.2. Description of Test Software

The test utility software used during testing was “ART2-GUI Version: 2.3”.

Final Power Parameter Value of the test software.

| Test Mode | Test Frequency | Power Parameter Value | | |
|----------------|----------------|-----------------------|-------|-------------|
| | | Ant 0 | Ant 0 | Ant 0 + 1 |
| 802.11a | 5500 | 4.5 | 4.5 | Not Support |
| | 5700 | 4.0 | 4.5 | |
| 802.11n-HT20 | 5500 | 4.5 | 4.5 | 1.50 |
| | 5700 | 4.5 | 4.5 | 1.50 |
| 802.11n-HT40 | 5510 | 4.5 | 4.5 | 2.50 |
| | 5670 | 4.5 | 5.0 | 2.50 |
| 802.11ac-VHT20 | 5500 | 4.5 | 4.5 | 1.50 |
| | 5700 | 4.5 | 4.5 | 1.50 |
| 802.11ac-VHT40 | 5510 | 5.5 | 5.0 | 2.50 |
| | 5670 | 5.0 | 5.5 | 2.50 |
| 802.11ac-VHT80 | 5530 | 6.0 | 5.5 | 3.00 |
| | 5610 | 5.5 | 6.0 | 3.50 |

3. Test Summary

| Clause EN301893 | Test Parameter | Result (Pass/Fail) | Remark |
|-----------------|---|--------------------|---------------------|
| 4.2 | Carrier Frequencies | Pass | -- |
| 4.3 | Occupied Channel Bandwidth | Pass | -- |
| 4.4 | RF Output Power, Transmit Power Control (TPC) and Power Density | Pass | -- |
| 4.5.1 | Transmitter Unwanted Emissions Outside the 5GHz RLAN Bands | Pass | -- |
| 4.5.2 | Transmitter Unwanted Emissions Within the 5GHz RLAN Bands | Pass | -- |
| 4.6 | Receiver Spurious Emissions | Pass | -- |
| 4.7 | Dynamic Frequency Selection (DFS) | Pass | Refer to DFS report |
| 4.9 | Adaptivity | Pass | -- |

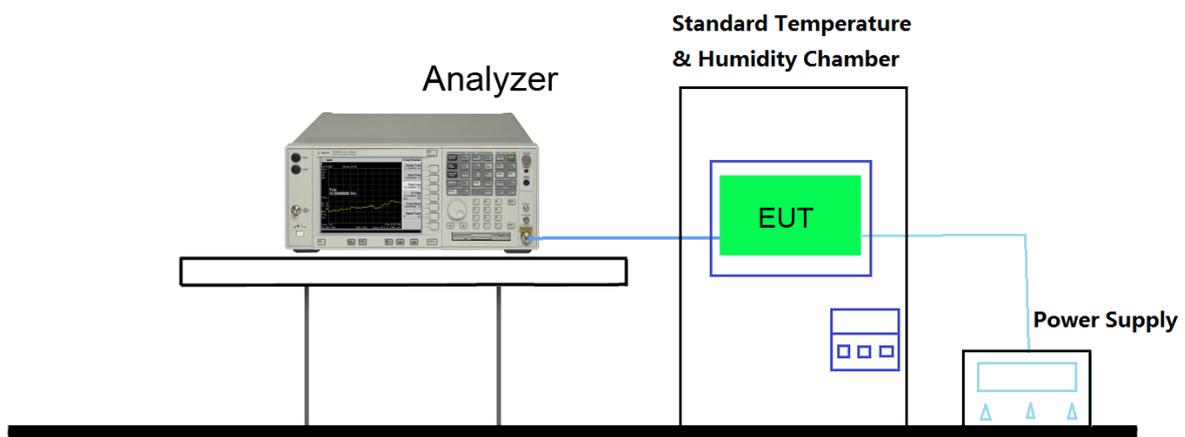
4. Carrier Frequencies

4.1. Limit

The actual centre frequency for any given channel declared by the manufacturer shall be maintained within the range $f_c \pm 20\text{ppm}$.

4.2. Test Setup

For Conducted Measurement



4.3. Test Procedure

Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.2.2.1.

4.4. Test Result

| | | | |
|---------------|------------|-------------------|--------------|
| Test Engineer | Milo Li | Temperature | -20°C ~ 70°C |
| Test Time | 08-20-2014 | Relative Humidity | 60% |

| Test Conditions | | Frequency (MHz) | Measured Frequency (MHz) | Tolerance (ppm) | Limit (ppm) | Result |
|-----------------|----------------|-----------------|--------------------------|-----------------|-------------|--------|
| Tnom (25°C) | Vnom (AC 230V) | 5500 | 5500.026143 | 4.75 | ≤ 20 | Pass |
| Tmin (-20°C) | Vmin (AC 207V) | 5500 | 5500.018016 | 3.28 | ≤ 20 | Pass |
| | Vmax (AC 253V) | 5500 | 5500.018842 | 3.43 | ≤ 20 | Pass |
| Tmax (70°C) | Vmin (AC 207V) | 5500 | 5499.987425 | -2.29 | ≤ 20 | Pass |
| | Vmax (AC 253V) | 5500 | 5499.987251 | -2.32 | ≤ 20 | Pass |

5. Occupied Channel Bandwidth

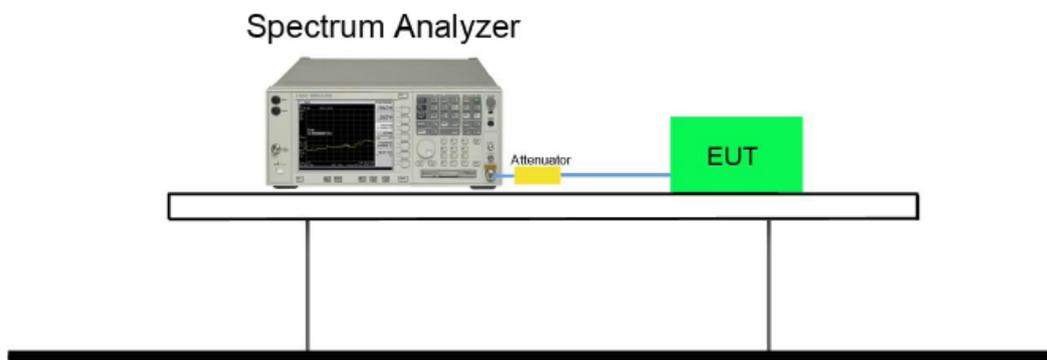
5.1. Limit

The Nominal Channel Bandwidth shall be at least 5 MHz at all times.

The Occupied Channel Bandwidth shall be between 80 % and 100 % of the declared Nominal Channel Bandwidth. In case of smart antenna systems (devices with multiple transmit chains) each of the transmit chains shall meet this requirement.

NOTE: During an established communication, a device is allowed to operate temporarily in a mode where its Occupied Channel Bandwidth may be reduced to as low as 40 % of its Nominal Channel Bandwidth with a minimum of 4 MHz.

5.2. Test Setup



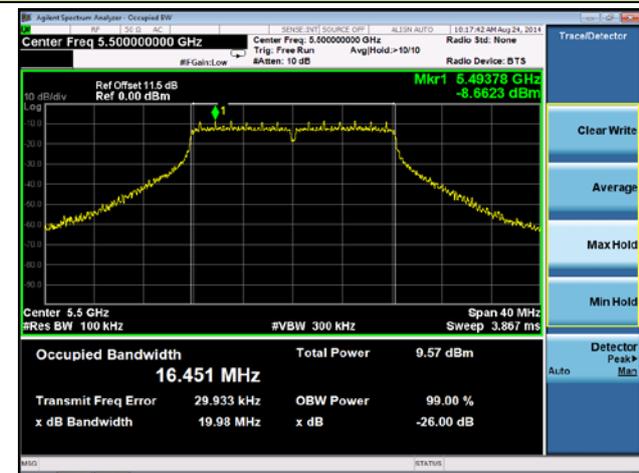
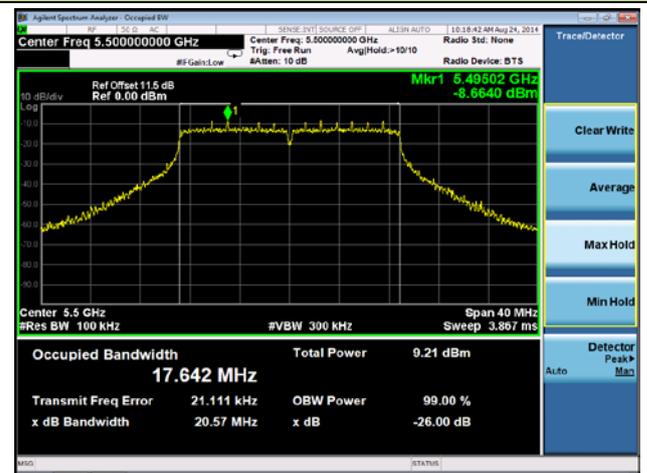
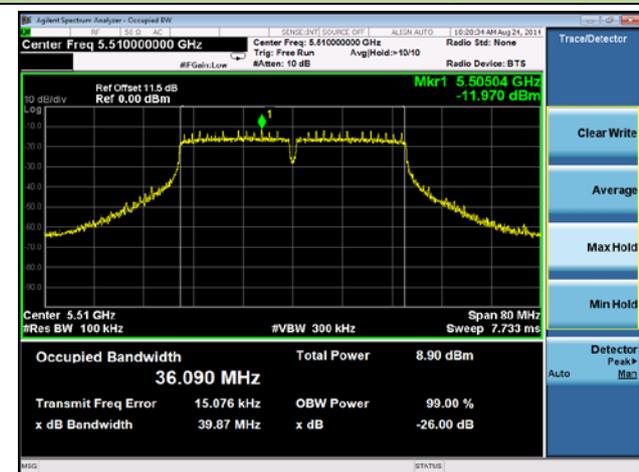
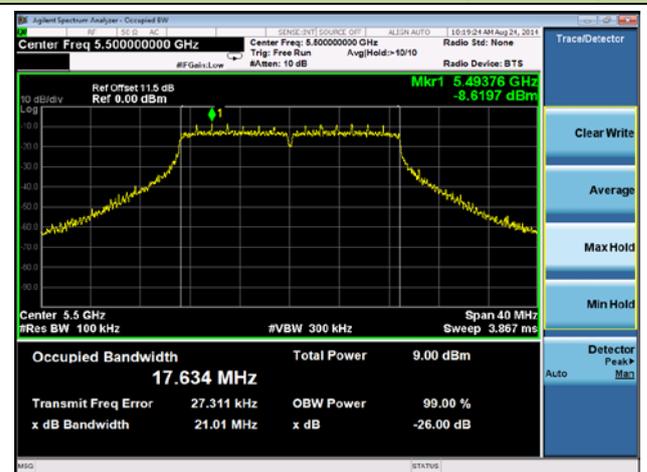
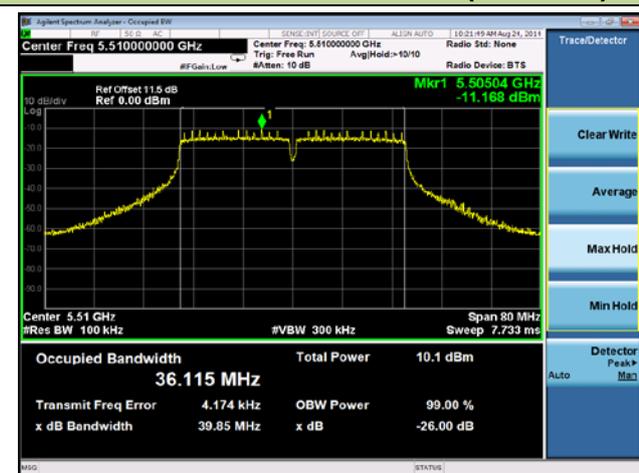
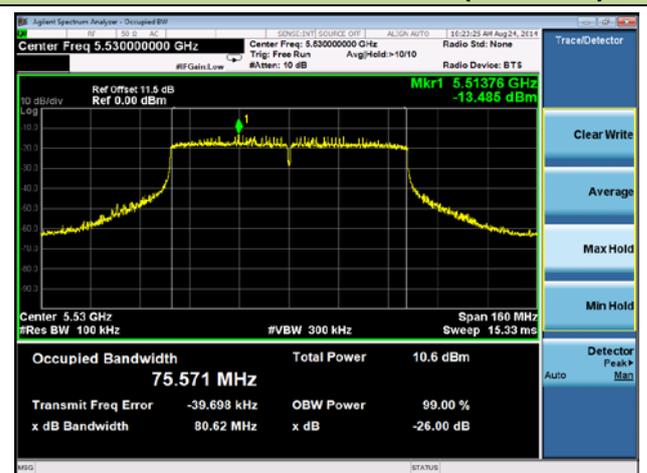
5.3. Test Procedure

Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.3.2.1.

5.4. Test Result

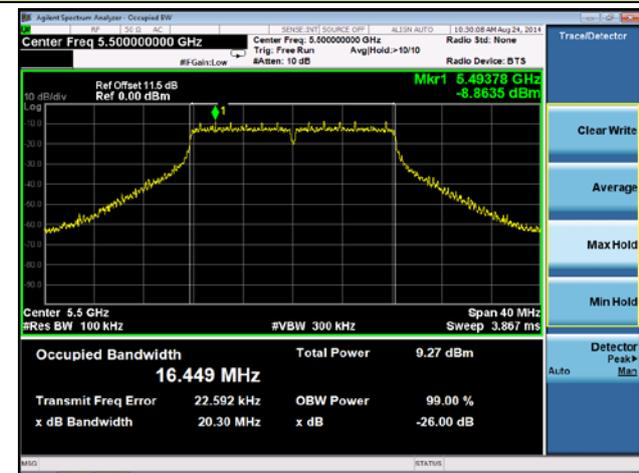
| | | | |
|---------------|------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-24-2014 | Relative Humidity | 62% |

| Test Mode | Channel No. | Frequency (MHz) | 99% Bandwidth (MHz) | Declared Nominal Channel Bandwidth (MHz) | Limit (%) | Result |
|------------------|-------------|-----------------|---------------------|--|-----------|--------|
| Ant 0 | | | | | | |
| 802.11a | 100 | 5500 | 16.451 | 20 | 80 - 100 | Pass |
| 802.11n-HT20 | 100 | 5500 | 17.642 | 20 | 80 - 100 | Pass |
| 802.11n-HT40 | 102 | 5510 | 36.090 | 40 | 80 - 100 | Pass |
| 802.11ac-VHT20 | 100 | 5500 | 17.634 | 20 | 80 - 100 | Pass |
| 802.11ac-VHT40 | 102 | 5510 | 36.115 | 40 | 80 - 100 | Pass |
| 802.11ac-VHT80 | 106 | 5530 | 75.571 | 80 | 80 - 100 | Pass |
| Ant 1 | | | | | | |
| 802.11a | 100 | 5500 | 16.449 | 20 | 80 - 100 | Pass |
| 802.11n-HT20 | 100 | 5500 | 17.645 | 20 | 80 - 100 | Pass |
| 802.11n-HT40 | 102 | 5510 | 36.110 | 40 | 80 - 100 | Pass |
| 802.11ac-VHT20 | 100 | 5500 | 17.648 | 20 | 80 - 100 | Pass |
| 802.11ac-VHT40 | 102 | 5510 | 36.102 | 40 | 80 - 100 | Pass |
| 802.11ac-VHT80 | 106 | 5530 | 75.737 | 80 | 80 - 100 | Pass |
| Ant 0 + 1 | | | | | | |
| 802.11a | 100 | 5500 | 16.466 | 20 | 80 - 100 | Pass |
| 802.11n-HT20 | 100 | 5500 | 17.625 | 20 | 80 - 100 | Pass |
| 802.11n-HT40 | 102 | 5510 | 36.114 | 40 | 80 - 100 | Pass |
| 802.11ac-VHT20 | 100 | 5500 | 17.627 | 20 | 80 - 100 | Pass |
| 802.11ac-VHT40 | 102 | 5510 | 36.110 | 40 | 80 - 100 | Pass |
| 802.11ac-VHT80 | 106 | 5530 | 75.531 | 80 | 80 - 100 | Pass |

Occupied Channel Bandwidth Ant 0
802.11a Channel 100 (5500MHz)

802.11n-HT20 Channel 100 (5500MHz)

802.11n-HT40 Channel 102 (5510MHz)

802.11ac-VHT20 Channel 100 (5500MHz)

802.11ac-VHT40 Channel 102 (5510MHz)

802.11ac-VHT80 Channel 106 (5530MHz)


Occupied Channel Bandwidth Ant 1

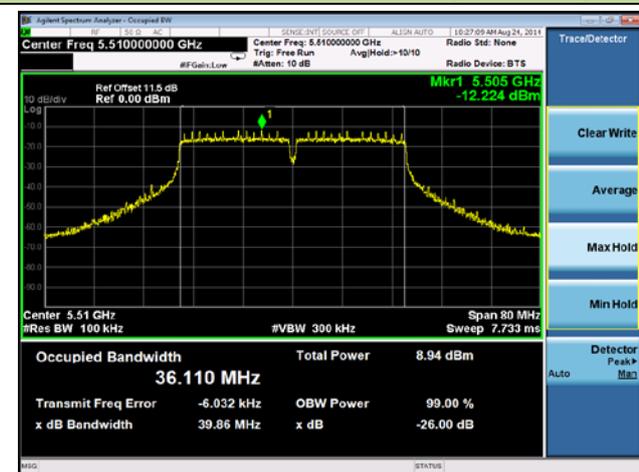
802.11a Channel 100 (5500MHz)



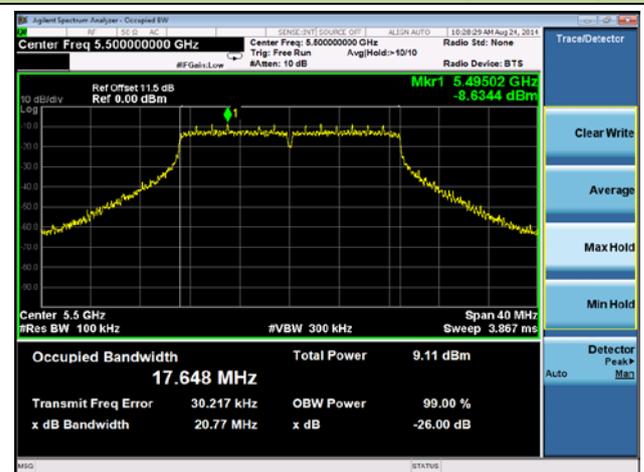
802.11n-HT20 Channel 100 (5500MHz)



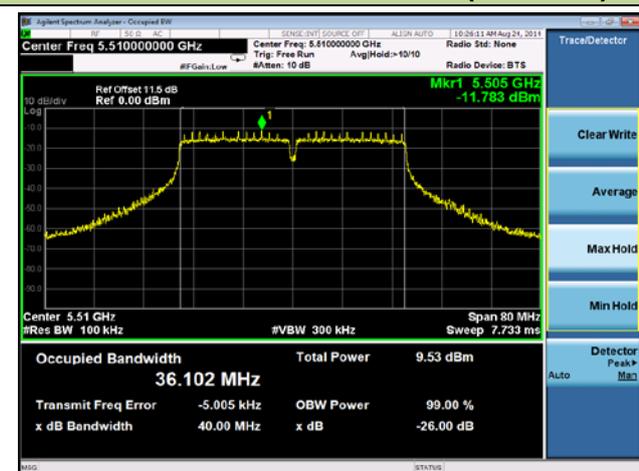
802.11n-HT40 Channel 102 (5510MHz)



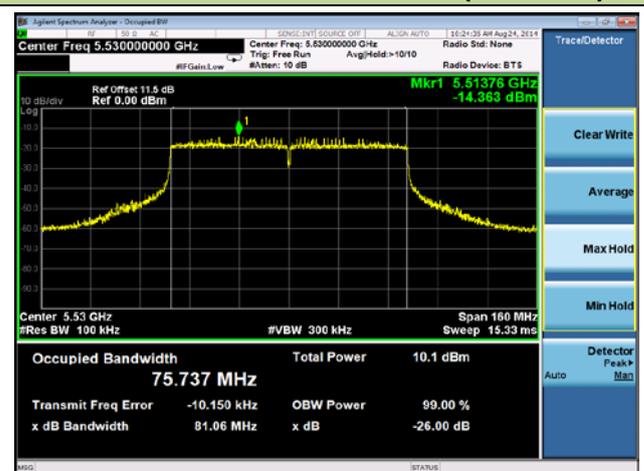
802.11ac-VHT20 Channel 100 (5500MHz)

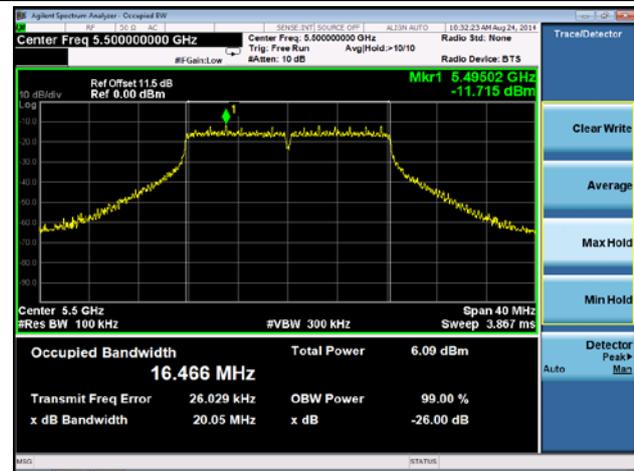
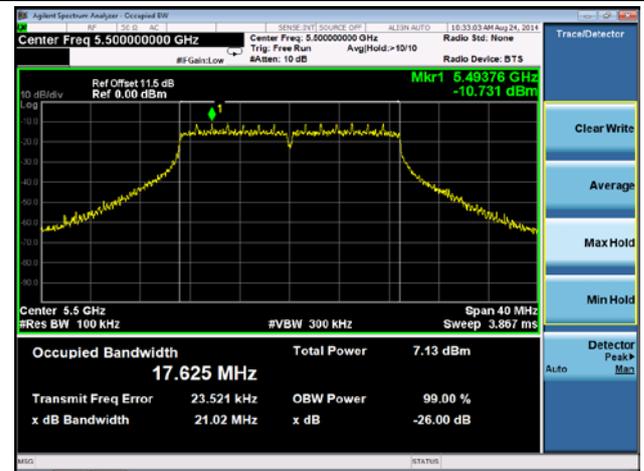
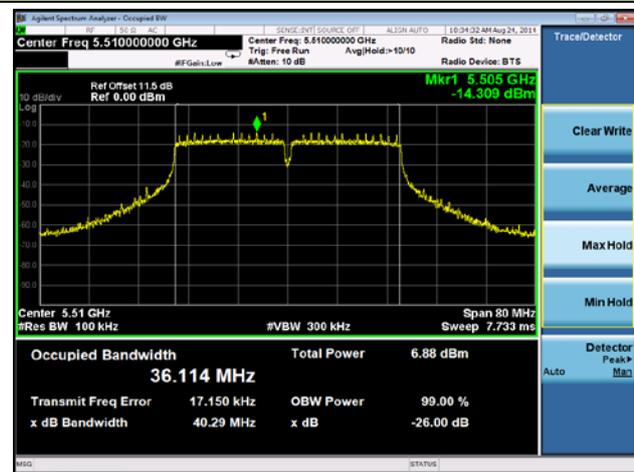


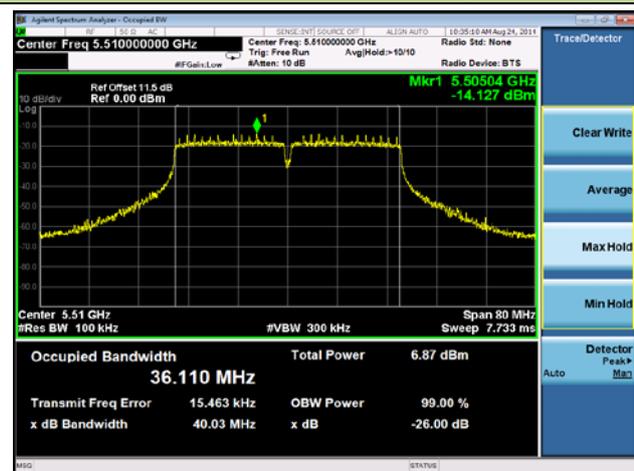
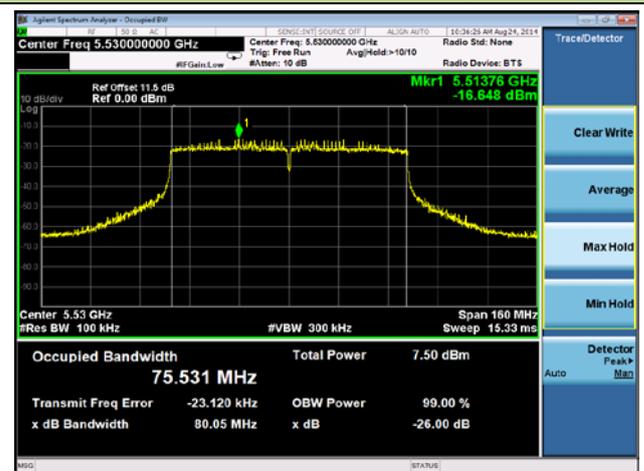
802.11ac-VHT40 Channel 102 (5510MHz)



802.11ac-VHT80 Channel 106 (5530MHz)



Occupied Channel Bandwidth Ant 0 + 1
802.11a Channel 100 (5500MHz)

802.11n-HT20 Channel 100 (5500MHz)

802.11n-HT40 Channel 102 (5510MHz)

802.11ac-VHT20 Channel 100 (5500MHz)

802.11ac-VHT40 Channel 102 (5510MHz)

802.11ac-VHT80 Channel 106 (5530MHz)


6. RF Output Power, Transmit Power Control (TPC) and Power Density

6.1. Limit

RF Output Power and Power density at the Highest Power Level

TPC is not required for channels whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz.

For devices with TPC, the RF output power and the power density when configured to operate at the highest stated power level of the TPC range shall not exceed the levels given in following table.

Devices are allowed to operate without TPC. See table for applicable limits in this case.

| Mean EIRP limits for RF Output Power and Power Density at the Highest Power Level | | | | |
|---|-----------------------|--------------------|-----------------------------------|-------------------|
| Frequency Range | Mean EIRP Limit [dBm] | | Mean EIRP Density Limit [dBm/MHz] | |
| | with TPC | without TPC | with TPC | without TPC |
| 5150 MHz to 5350 MHz | 23 | 20/23 (see note 1) | 10 | 7/10 (see note 2) |
| 5470 MHz to 5725 MHz | 30 (see note 3) | 27 (see note 3) | 17 (see note 3) | 14 (see note 3) |

NOTE 1: The applicable limit is 20 dBm, except for transmissions whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz, in which case the applicable limit is 23 dBm.

NOTE 2: The applicable limit is 7 dBm/MHz, except for transmissions whose nominal bandwidth falls completely within the band 5150 MHz to 5250 MHz, in which case the applicable limit is 10 dBm/MHz.

NOTE 3: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5250 MHz to 5350 MHz.

RF Output Power at the Lowest Power Level of the TPC Range

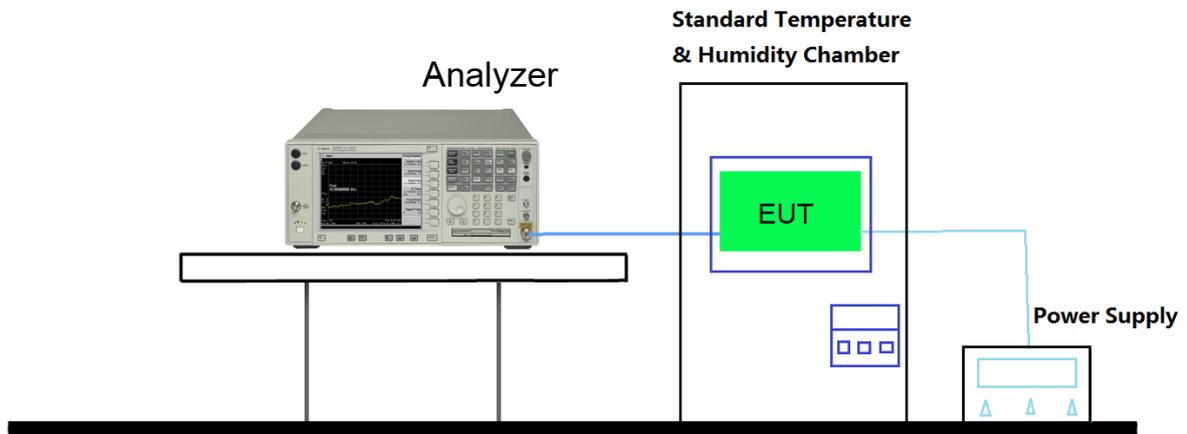
For devices using TPC, the RF output power during a transmission burst when configured to operate at the lowest stated power level of the TPC range shall not exceed the levels given in following table.

For devices without TPC, the limits in table do not apply.

| Mean EIRP Limits for RF Output Power at the Lowest Power Level of the TPC Range | |
|---|-----------------|
| Frequency Range | Mean EIRP [dBm] |
| 5250 MHz to 5350 MHz | 17 |
| 5470 MHz to 5725 MHz | 24 (see note) |

Note: Slave devices without a Radar Interference Detection function shall comply with the limits for the band 5250 MHz to 5350 MHz.

6.2. Test Setup



6.3. Test Procedure

Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.4.2.1.

6.4. Test Result

| | | | |
|---------------|------------|-------------------|------------|
| Test Engineer | Milo Li | Temperature | -20 ~ 70°C |
| Test Time | 08-20-2014 | Relative Humidity | 54% |

RF Output Power

| Mode | Channel | Freq. (MHz) | RF Average Power (dBm) | | | | | Gain (dBi) | Max EIRP Power (dBm) | Limit (dBm) | Result |
|--------------|---------|----------------|------------------------|---------|------|------|------|---------------|-------------------------------|----------------|--------|
| | | | Normal | Extreme | | | | | | | |
| | | | | -20°C | | 70°C | | | | | |
| | | | | 230V | 207V | 253V | 207V | | | | |
| Ant 0 | | | | | | | | | | | |
| 11a | 100 | 5500 | 3.92 | 4.57 | 4.50 | 3.31 | 3.48 | 25 | 29.57 | 30 | Pass |
| 11a | 140 | 5700 | 3.71 | 4.35 | 4.23 | 3.11 | 3.33 | 25 | 29.35 | 30 | Pass |
| n-HT20 | 100 | 5500 | 3.77 | 4.45 | 4.22 | 3.08 | 3.29 | 25 | 29.45 | 30 | Pass |
| n-HT20 | 140 | 5700 | 4.08 | 4.70 | 4.65 | 3.59 | 3.38 | 25 | 29.70 | 30 | Pass |
| n-HT40 | 102 | 5510 | 3.78 | 4.30 | 4.29 | 3.17 | 3.55 | 25 | 29.30 | 30 | Pass |
| n-HT40 | 134 | 5670 | 4.04 | 4.47 | 4.70 | 3.40 | 3.81 | 25 | 29.70 | 30 | Pass |
| ac-VHT20 | 100 | 5500 | 3.79 | 4.50 | 4.20 | 3.42 | 3.47 | 25 | 29.50 | 30 | Pass |
| ac-VHT20 | 140 | 5700 | 4.14 | 4.79 | 4.85 | 3.92 | 3.62 | 25 | 29.85 | 30 | Pass |
| ac-VHT40 | 102 | 5510 | 4.02 | 4.80 | 4.48 | 3.47 | 3.57 | 25 | 29.80 | 30 | Pass |
| ac-VHT40 | 134 | 5670 | 4.06 | 4.52 | 4.76 | 3.62 | 3.74 | 25 | 29.76 | 30 | Pass |
| ac-VHT80 | 106 | 5530 | 3.95 | 4.64 | 4.38 | 3.37 | 3.54 | 25 | 29.64 | 30 | Pass |
| ac-VHT80 | 122 | 5610 | 3.84 | 4.57 | 4.56 | 3.53 | 3.19 | 25 | 29.57 | 30 | Pass |
| Ant 1 | | | | | | | | | | | |
| 11a | 100 | 5500 | 3.90 | 4.45 | 4.42 | 3.38 | 3.64 | 25 | 29.45 | 30 | Pass |
| 11a | 140 | 5700 | 3.93 | 4.58 | 4.59 | 3.38 | 3.47 | 25 | 29.59 | 30 | Pass |
| n-HT20 | 100 | 5500 | 3.72 | 4.32 | 4.52 | 3.27 | 3.12 | 25 | 29.52 | 30 | Pass |
| n-HT20 | 140 | 5700 | 3.76 | 4.24 | 4.26 | 3.37 | 3.17 | 25 | 29.26 | 30 | Pass |
| n-HT40 | 102 | 5510 | 3.76 | 4.25 | 4.20 | 3.04 | 3.26 | 25 | 29.25 | 30 | Pass |
| n-HT40 | 134 | 5670 | 3.82 | 4.27 | 4.34 | 3.34 | 3.27 | 25 | 29.34 | 30 | Pass |
| ac-VHT20 | 100 | 5500 | 3.77 | 4.49 | 4.45 | 3.32 | 3.23 | 25 | 29.49 | 30 | Pass |
| ac-VHT20 | 140 | 5700 | 3.82 | 4.30 | 4.41 | 3.46 | 3.33 | 25 | 29.41 | 30 | Pass |
| ac-VHT40 | 102 | 5510 | 3.78 | 4.47 | 4.40 | 3.52 | 3.41 | 25 | 29.47 | 30 | Pass |
| ac-VHT40 | 134 | 5670 | 4.01 | 4.53 | 4.54 | 3.63 | 3.37 | 25 | 29.54 | 30 | Pass |
| ac-VHT80 | 106 | 5530 | 3.73 | 4.20 | 4.35 | 3.21 | 3.48 | 25 | 29.35 | 30 | Pass |
| ac-VHT80 | 122 | 5610 | 3.74 | 4.32 | 4.54 | 3.30 | 3.21 | 25 | 29.54 | 30 | Pass |

| Ant 0 + 1 | | | | | | | | | | | |
|-----------|-----|------|------|------|------|------|------|----|-------|----|------|
| n-HT20 | 100 | 5500 | 3.76 | 4.43 | 4.41 | 3.15 | 3.27 | 25 | 29.43 | 30 | Pass |
| n-HT20 | 140 | 5700 | 3.83 | 4.37 | 4.49 | 3.15 | 3.32 | 25 | 29.49 | 30 | Pass |
| n-HT40 | 102 | 5510 | 3.89 | 4.60 | 4.45 | 3.28 | 3.20 | 25 | 29.60 | 30 | Pass |
| n-HT40 | 134 | 5670 | 3.81 | 4.37 | 4.49 | 3.28 | 3.35 | 25 | 29.49 | 30 | Pass |
| ac-VHT20 | 100 | 5500 | 3.74 | 4.41 | 4.30 | 3.24 | 3.40 | 25 | 29.41 | 30 | Pass |
| ac-VHT20 | 140 | 5700 | 3.87 | 4.47 | 4.47 | 3.38 | 3.35 | 25 | 29.47 | 30 | Pass |
| ac-VHT40 | 102 | 5510 | 3.94 | 4.48 | 4.47 | 3.64 | 3.47 | 25 | 29.48 | 30 | Pass |
| ac-VHT40 | 134 | 5670 | 3.82 | 4.58 | 4.34 | 3.32 | 3.47 | 25 | 29.58 | 30 | Pass |
| ac-VHT80 | 106 | 5530 | 3.88 | 4.46 | 4.57 | 3.46 | 3.34 | 25 | 29.57 | 30 | Pass |
| ac-VHT80 | 122 | 5610 | 4.11 | 4.75 | 4.76 | 3.52 | 3.80 | 25 | 29.76 | 30 | Pass |

Note: Max EIRP Power(dBm) = RF Average Power (dBm) + Antenna Gain (dBi) + 10*log(1/Duty Cycle).

Antenna Gain = 25 dBi, Duty Cycle = 100%.

Transmit Power Control (TPC)

| Mode | Channel | Freq. (MHz) | RF Average Power (dBm) | | | | | Gain (dBi) | Max EIRP Power (dBm) | Limit (dBm) | Result | |
|--------------|---------|----------------|------------------------|---------|-------|-------|-------|---------------|-------------------------------|----------------|--------|------|
| | | | Normal | Extreme | | | | | | | | |
| | | | | 25°C | -20°C | | 70°C | | | | | |
| | | | | | 230V | 207V | 253V | | | | | 207V |
| Ant 0 | | | | | | | | | | | | |
| 11a | 100 | 5500 | -2.26 | -1.62 | -1.51 | -2.79 | -2.63 | 25 | 23.49 | 24 | Pass | |
| 11a | 140 | 5700 | -2.37 | -1.83 | -1.93 | -2.73 | -2.57 | 25 | 23.17 | 24 | Pass | |
| n-HT20 | 100 | 5500 | -2.41 | -1.57 | -1.98 | -2.92 | -2.69 | 25 | 23.43 | 24 | Pass | |
| n-HT20 | 140 | 5700 | -1.80 | -1.30 | -1.36 | -2.34 | -2.54 | 25 | 23.70 | 24 | Pass | |
| n-HT40 | 102 | 5510 | -2.30 | -1.77 | -1.76 | -2.78 | -2.25 | 25 | 23.24 | 24 | Pass | |
| n-HT40 | 134 | 5670 | -2.01 | -1.41 | -1.26 | -2.60 | -2.29 | 25 | 23.74 | 24 | Pass | |
| ac-VHT20 | 100 | 5500 | -2.26 | -1.40 | -1.98 | -2.49 | -2.40 | 25 | 23.60 | 24 | Pass | |
| ac-VHT20 | 140 | 5700 | -1.77 | -1.13 | -1.11 | -2.19 | -2.28 | 25 | 23.89 | 24 | Pass | |
| ac-VHT40 | 102 | 5510 | -2.11 | -1.16 | -1.44 | -2.67 | -2.36 | 25 | 23.84 | 24 | Pass | |
| ac-VHT40 | 134 | 5670 | -2.05 | -1.65 | -1.19 | -2.47 | -2.26 | 25 | 23.81 | 24 | Pass | |
| ac-VHT80 | 106 | 5530 | -1.96 | -1.37 | -1.64 | -2.76 | -2.45 | 25 | 23.63 | 24 | Pass | |
| ac-VHT80 | 122 | 5610 | -2.31 | -1.31 | -1.47 | -2.55 | -2.75 | 25 | 23.69 | 24 | Pass | |
| Ant 1 | | | | | | | | | | | | |
| 11a | 100 | 5500 | -2.23 | -1.46 | -1.38 | -2.66 | -2.19 | 25 | 23.62 | 24 | Pass | |
| 11a | 140 | 5700 | -2.00 | -1.49 | -1.34 | -2.79 | -2.48 | 25 | 23.66 | 24 | Pass | |
| n-HT20 | 100 | 5500 | -2.17 | -1.76 | -1.53 | -2.78 | -2.83 | 25 | 23.47 | 24 | Pass | |
| n-HT20 | 140 | 5700 | -2.17 | -1.60 | -1.82 | -2.80 | -2.90 | 25 | 23.40 | 24 | Pass | |
| n-HT40 | 102 | 5510 | -2.31 | -1.60 | -1.62 | -2.83 | -2.87 | 25 | 23.40 | 24 | Pass | |
| n-HT40 | 134 | 5670 | -2.10 | -1.81 | -1.52 | -2.65 | -2.65 | 25 | 23.48 | 24 | Pass | |
| ac-VHT20 | 100 | 5500 | -2.17 | -1.40 | -1.57 | -2.72 | -2.87 | 25 | 23.60 | 24 | Pass | |
| ac-VHT20 | 140 | 5700 | -2.21 | -1.82 | -1.43 | -2.72 | -2.79 | 25 | 23.57 | 24 | Pass | |
| ac-VHT40 | 102 | 5510 | -2.21 | -1.63 | -1.69 | -2.54 | -2.41 | 25 | 23.37 | 24 | Pass | |
| ac-VHT40 | 134 | 5670 | -1.99 | -1.65 | -1.53 | -2.30 | -2.79 | 25 | 23.47 | 24 | Pass | |
| ac-VHT80 | 106 | 5530 | -2.24 | -1.78 | -1.54 | -2.83 | -2.34 | 25 | 23.46 | 24 | Pass | |
| ac-VHT80 | 122 | 5610 | -2.26 | -1.63 | -1.55 | -2.65 | -2.93 | 25 | 23.45 | 24 | Pass | |

| Ant 0 + 1 | | | | | | | | | | | |
|-----------|-----|------|-------|-------|-------|-------|-------|----|-------|----|------|
| n-HT20 | 100 | 5500 | -2.36 | -1.51 | -1.66 | -2.91 | -2.88 | 25 | 23.49 | 24 | Pass |
| n-HT20 | 140 | 5700 | -2.27 | -1.50 | -1.57 | -2.86 | -2.63 | 25 | 23.50 | 24 | Pass |
| n-HT40 | 102 | 5510 | -2.02 | -1.35 | -1.56 | -2.69 | -2.71 | 25 | 23.65 | 24 | Pass |
| n-HT40 | 134 | 5670 | -2.21 | -1.61 | -1.45 | -2.56 | -2.65 | 25 | 23.55 | 24 | Pass |
| ac-VHT20 | 100 | 5500 | -2.13 | -1.64 | -1.62 | -2.63 | -2.63 | 25 | 23.38 | 24 | Pass |
| ac-VHT20 | 140 | 5700 | -2.15 | -1.50 | -1.53 | -2.60 | -2.69 | 25 | 23.50 | 24 | Pass |
| ac-VHT40 | 102 | 5510 | -2.02 | -1.47 | -1.56 | -2.34 | -2.43 | 25 | 23.53 | 24 | Pass |
| ac-VHT40 | 134 | 5670 | -2.11 | -1.53 | -1.49 | -2.68 | -2.58 | 25 | 23.51 | 24 | Pass |
| ac-VHT80 | 106 | 5530 | -2.15 | -1.55 | -1.48 | -2.65 | -2.68 | 25 | 23.52 | 24 | Pass |
| ac-VHT80 | 122 | 5610 | -1.96 | -1.31 | -1.24 | -2.47 | -2.08 | 25 | 23.76 | 24 | Pass |

Note: Max EIRP Power (dBm) = RF Average Power (dBm) + Antenna Gain (dBi) + $10 \cdot \log(1/\text{Duty Cycle})$.

Antenna Gain = 25 dBi, Duty Cycle = 100%.

Power Density

| Mode | Channel | Freq. (MHz) | Reading Power Density (dBm/MHz) | Measured Power Density (dBm/MHz) | Max. Power Density Limit (dBm/MHz) | Result |
|--------------|---------|----------------|---------------------------------------|---|---|--------|
| Ant 0 | | | | | | |
| 11a | 100 | 5500 | -8.06 | 16.94 | 17 | Pass |
| 11a | 140 | 5700 | -8.12 | 16.88 | 17 | Pass |
| n-HT20 | 100 | 5500 | -8.38 | 16.62 | 17 | Pass |
| n-HT20 | 140 | 5700 | -8.08 | 16.92 | 17 | Pass |
| n-HT40 | 102 | 5510 | -12.25 | 12.75 | 17 | Pass |
| n-HT40 | 134 | 5670 | -11.33 | 13.67 | 17 | Pass |
| ac-VHT20 | 100 | 5500 | -8.44 | 16.56 | 17 | Pass |
| ac-VHT20 | 140 | 5700 | -8.18 | 16.82 | 17 | Pass |
| ac-VHT40 | 102 | 5510 | -11.61 | 13.39 | 17 | Pass |
| ac-VHT40 | 134 | 5670 | -10.82 | 14.18 | 17 | Pass |
| ac-VHT80 | 106 | 5530 | -14.29 | 10.71 | 17 | Pass |
| ac-VHT80 | 122 | 5610 | -13.90 | 11.10 | 17 | Pass |
| Ant 1 | | | | | | |
| 11a | 100 | 5500 | -8.16 | 16.84 | 17 | Pass |
| 11a | 140 | 5700 | -8.41 | 16.59 | 17 | Pass |
| n-HT20 | 100 | 5500 | -8.49 | 16.51 | 17 | Pass |
| n-HT20 | 140 | 5700 | -8.59 | 16.41 | 17 | Pass |
| n-HT40 | 102 | 5510 | -12.40 | 12.60 | 17 | Pass |
| n-HT40 | 134 | 5670 | -12.38 | 12.62 | 17 | Pass |
| ac-VHT20 | 100 | 5500 | -8.63 | 16.37 | 17 | Pass |
| ac-VHT20 | 140 | 5700 | -8.88 | 16.12 | 17 | Pass |
| ac-VHT40 | 102 | 5510 | -11.62 | 13.38 | 17 | Pass |
| ac-VHT40 | 134 | 5670 | -11.45 | 13.55 | 17 | Pass |
| ac-VHT80 | 106 | 5530 | -15.16 | 9.84 | 17 | Pass |
| ac-VHT80 | 122 | 5610 | -15.37 | 9.63 | 17 | Pass |

| Ant 0 + 1 | | | | | | |
|-----------|-----|------|--------|-------|----|------|
| n-HT20 | 100 | 5500 | -11.65 | 16.52 | 17 | Pass |
| n-HT20 | 140 | 5700 | -11.52 | 16.52 | 17 | Pass |
| n-HT40 | 102 | 5510 | -13.99 | 14.13 | 17 | Pass |
| n-HT40 | 134 | 5670 | -14.10 | 13.62 | 17 | Pass |
| ac-VHT20 | 100 | 5500 | -11.41 | 16.73 | 17 | Pass |
| ac-VHT20 | 140 | 5700 | -11.58 | 16.71 | 17 | Pass |
| ac-VHT40 | 102 | 5510 | -13.91 | 14.15 | 17 | Pass |
| ac-VHT40 | 134 | 5670 | -14.31 | 13.68 | 17 | Pass |
| ac-VHT80 | 106 | 5530 | -17.06 | 11.05 | 17 | Pass |
| ac-VHT80 | 122 | 5610 | -16.33 | 11.22 | 17 | Pass |

Note: Measured Power Density (dBm/MHz) = Reading Power Density (dBm/MHz) + Antenna Gain (dBi) + 10 log (1/Duty Cycle). Antenna Gain = 25 dBi, Duty Cycle = 100%.

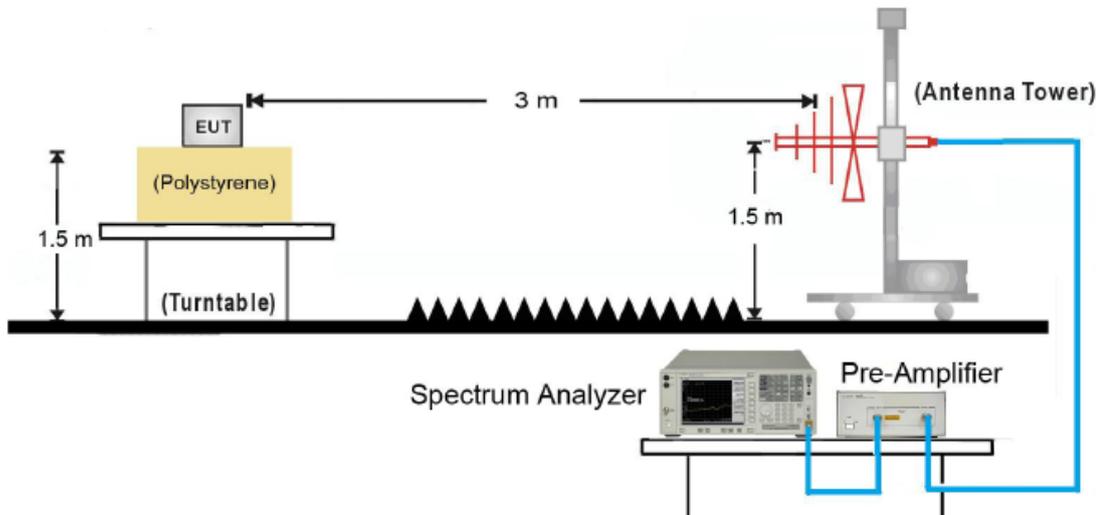
7. Transmitter Unwanted Emissions Outside the 5GHz RLAN Bands

7.1. Limit

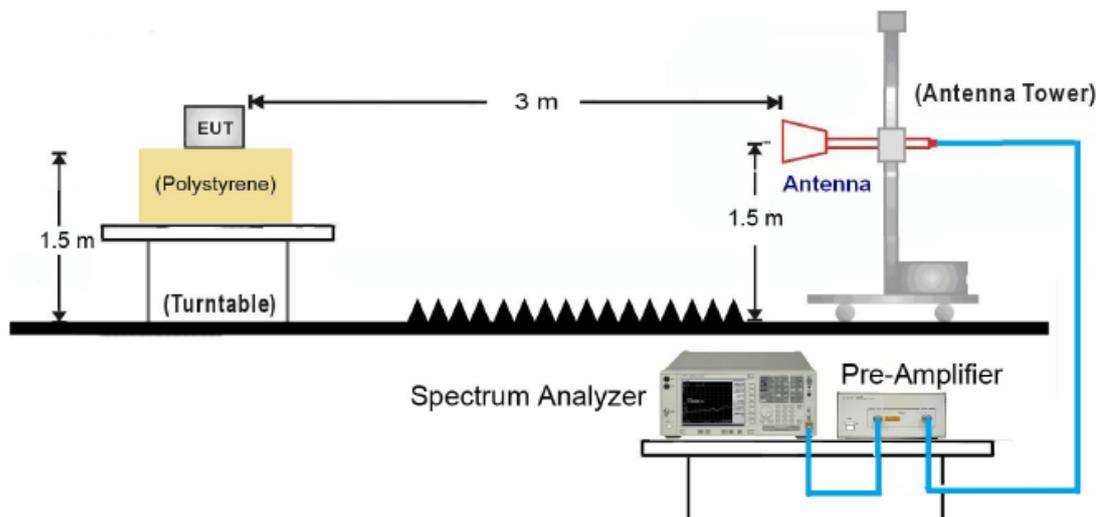
| Frequency Range | Maximum Power | Bandwidth |
|-----------------------|---------------|-----------|
| 30 MHz to 47 MHz | -36dBm | 100 kHz |
| 47 MHz to 74 MHz | -54dBm | 100 kHz |
| 74 MHz to 87.5 MHz | -36dBm | 100 kHz |
| 87.5 MHz to 118 MHz | -54dBm | 100 kHz |
| 118 MHz to 174 MHz | -36dBm | 100 kHz |
| 174 MHz to 230 MHz | -54dBm | 100 kHz |
| 230 MHz to 470 MHz | -36dBm | 100 kHz |
| 470 MHz to 862 MHz | -54dBm | 100 kHz |
| 862 MHz to 1 GHz | -36dBm | 100 kHz |
| 1 GHz to 5.15 GHz | -30dBm | 1 MHz |
| 5.35 GHz to 5.47 GHz | -30dBm | 1 MHz |
| 5.725 GHz to 26.5 GHz | -30dBm | 1 MHz |

7.2. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



7.3. Test Procedure

Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.5.2.2.

7.4. Test Result

Test by Panel Antenna – 25dBi

| | | | |
|---------------|------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11a | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|---------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 100 | 154.2 | -70.48 | -36 | -34.48 | Peak | Horizontal |
| | 99.7 | -72.66 | -54 | -18.66 | Peak | Vertical |
| | 853.0 | -73.71 | -54 | -19.71 | Peak | Horizontal |
| | 157.6 | -67.00 | -36 | -31.00 | Peak | Vertical |
| | 11000.0 | -42.28 | -30 | -12.28 | Peak | Horizontal |
| | 11000.0 | -44.12 | -30 | -14.12 | Peak | Vertical |
| | 16500.0 | -37.81 | -30 | -7.81 | Peak | Horizontal |
| | 16500.0 | -42.38 | -30 | -12.38 | Peak | Vertical |
| Ant 1 | | | | | | |
| 100 | 577.6 | -63.17 | -54 | -9.17 | Peak | Horizontal |
| | 666.6 | -61.93 | -54 | -7.93 | Peak | Vertical |
| | 670.2 | -69.85 | -54 | -15.85 | Peak | Horizontal |
| | 806.4 | -63.72 | -54 | -9.72 | Peak | Vertical |
| | 11000.0 | -33.10 | -30 | -3.10 | Peak | Horizontal |
| | 11000.0 | -34.15 | -30 | -4.15 | Peak | Vertical |
| | 16500.0 | -41.87 | -30 | -11.87 | Peak | Horizontal |
| | 16500.0 | -37.73 | -30 | -7.73 | Peak | Vertical |

| | | | |
|---------------|--------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11n-HT20 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 100 | 554.1 | -71.71 | -54 | -17.71 | Peak | Horizontal |
| | 76.4 | -64.13 | -36 | -28.13 | Peak | Vertical |
| | 681.9 | -67.08 | -54 | -13.08 | Peak | Horizontal |
| | 805.7 | -58.66 | -54 | -4.66 | Peak | Vertical |
| | 11000.0 | -36.50 | -30 | -6.50 | Peak | Horizontal |
| | 11000.0 | -35.44 | -30 | -5.44 | Peak | Vertical |
| | 16500.0 | -39.56 | -30 | -9.56 | Peak | Horizontal |
| | 16500.0 | -39.47 | -30 | -9.47 | Peak | Vertical |
| Ant 1 | | | | | | |
| 100 | 535.0 | -65.40 | -54 | -11.40 | Peak | Horizontal |
| | 164.1 | -53.70 | -36 | -17.70 | Peak | Vertical |
| | 747.4 | -64.73 | -54 | -10.73 | Peak | Horizontal |
| | 794.0 | -62.31 | -54 | -8.31 | Peak | Vertical |
| | 11000.0 | -39.91 | -30 | -9.91 | Peak | Horizontal |
| | 11000.0 | -35.43 | -30 | -5.43 | Peak | Vertical |
| | 16500.0 | -35.10 | -30 | -5.10 | Peak | Horizontal |
| | 16500.0 | -38.25 | -30 | -8.25 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 100 | 562.5 | -66.76 | -54 | -12.76 | Peak | Horizontal |
| | 164.9 | -58.26 | -36 | -22.26 | Peak | Vertical |
| | 743.2 | -69.06 | -54 | -15.06 | Peak | Horizontal |
| | 769.8 | -61.63 | -54 | -7.63 | Peak | Vertical |
| | 11000.0 | -36.59 | -30 | -6.59 | Peak | Horizontal |
| | 11000.0 | -35.53 | -30 | -5.53 | Peak | Vertical |
| | 16500.0 | -38.29 | -30 | -8.29 | Peak | Horizontal |
| | 16500.0 | -37.96 | -30 | -7.96 | Peak | Vertical |

| | | | |
|---------------|--------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11n-HT40 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 102 | 92.6 | -64.06 | -54 | -10.06 | Peak | Horizontal |
| | 609.8 | -61.39 | -54 | -7.39 | Peak | Vertical |
| | 128.0 | -66.05 | -36 | -30.05 | Peak | Horizontal |
| | 851.5 | -70.58 | -54 | -16.58 | Peak | Vertical |
| | 11020.0 | -36.49 | -30 | -6.49 | Peak | Horizontal |
| | 11020.0 | -38.82 | -30 | -8.82 | Peak | Vertical |
| | 16530.0 | -40.78 | -30 | -10.78 | Peak | Horizontal |
| | 16530.0 | -34.86 | -30 | -4.86 | Peak | Vertical |
| Ant 1 | | | | | | |
| 102 | 577.5 | -81.57 | -54 | -27.57 | Peak | Horizontal |
| | 118.3 | -63.32 | -36 | -27.32 | Peak | Vertical |
| | 764.9 | -67.44 | -54 | -13.44 | Peak | Horizontal |
| | 616.2 | -59.36 | -54 | -5.36 | Peak | Vertical |
| | 11020.0 | -36.57 | -30 | -6.57 | Peak | Horizontal |
| | 11020.0 | -43.55 | -30 | -13.55 | Peak | Vertical |
| | 16530.0 | -34.12 | -30 | -4.12 | Peak | Horizontal |
| | 16530.0 | -37.80 | -30 | -7.80 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 102 | 674.0 | -71.49 | -54 | -17.49 | Peak | Horizontal |
| | 180.2 | -62.50 | -54 | -8.50 | Peak | Vertical |
| | 739.0 | -71.83 | -54 | -17.83 | Peak | Horizontal |
| | 586.3 | -61.78 | -54 | -7.78 | Peak | Vertical |
| | 11020.0 | -36.24 | -30 | -6.24 | Peak | Horizontal |
| | 11020.0 | -37.67 | -30 | -7.67 | Peak | Vertical |
| | 16530.0 | -36.92 | -30 | -6.92 | Peak | Horizontal |
| | 16530.0 | -36.02 | -30 | -6.02 | Peak | Vertical |

| | | | |
|---------------|----------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11ac-VHT20 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 100 | 514.4 | -71.74 | -54 | -17.74 | Peak | Horizontal |
| | 79.8 | -65.34 | -36 | -29.34 | Peak | Vertical |
| | 672.2 | -67.12 | -54 | -13.12 | Peak | Horizontal |
| | 723.4 | -60.42 | -54 | -6.42 | Peak | Vertical |
| | 11000.0 | -35.20 | -30 | -5.20 | Peak | Horizontal |
| | 11000.0 | -43.68 | -30 | -13.68 | Peak | Vertical |
| | 16500.0 | -35.38 | -30 | -5.38 | Peak | Horizontal |
| | 16500.0 | -38.33 | -30 | -8.33 | Peak | Vertical |
| Ant 1 | | | | | | |
| 100 | 516.7 | -72.05 | -54 | -18.05 | Peak | Horizontal |
| | 85.4 | -63.27 | -36 | -27.27 | Peak | Vertical |
| | 681.3 | -63.73 | -54 | -9.73 | Peak | Horizontal |
| | 813.3 | -63.95 | -54 | -9.95 | Peak | Vertical |
| | 11000.0 | -42.79 | -30 | -12.79 | Peak | Horizontal |
| | 11000.0 | -36.65 | -30 | -6.65 | Peak | Vertical |
| | 16500.0 | -39.18 | -30 | -9.18 | Peak | Horizontal |
| | 16500.0 | -40.15 | -30 | -10.15 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 100 | 620.3 | -72.22 | -54 | -18.22 | Peak | Horizontal |
| | 172.6 | -65.02 | -36 | -29.02 | Peak | Vertical |
| | 897.4 | -59.91 | -36 | -23.91 | Peak | Horizontal |
| | 763.3 | -63.73 | -54 | -9.73 | Peak | Vertical |
| | 11000.0 | -38.18 | -30 | -8.18 | Peak | Horizontal |
| | 11000.0 | -41.09 | -30 | -11.09 | Peak | Vertical |
| | 16500.0 | -36.83 | -30 | -6.83 | Peak | Horizontal |
| | 16500.0 | -37.63 | -30 | -7.63 | Peak | Vertical |

| | | | |
|---------------|----------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11ac-VHT40 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 102 | 176.7 | -64.57 | -54 | -10.57 | Peak | Horizontal |
| | 716.0 | -63.57 | -54 | -9.57 | Peak | Vertical |
| | 263.3 | -63.26 | -36 | -27.26 | Peak | Horizontal |
| | 815.4 | -61.65 | -54 | -7.65 | Peak | Vertical |
| | 11020.0 | -38.81 | -30 | -8.81 | Peak | Horizontal |
| | 11020.0 | -39.53 | -30 | -9.53 | Peak | Vertical |
| | 16530.0 | -36.77 | -30 | -6.77 | Peak | Horizontal |
| | 16530.0 | -37.54 | -30 | -7.54 | Peak | Vertical |
| Ant 1 | | | | | | |
| 102 | 592.3 | -76.17 | -54 | -22.17 | Peak | Horizontal |
| | 124.2 | -60.57 | -36 | -24.57 | Peak | Vertical |
| | 676.0 | -68.03 | -54 | -14.03 | Peak | Horizontal |
| | 639.5 | -64.26 | -54 | -10.26 | Peak | Vertical |
| | 11020.0 | -37.33 | -30 | -7.33 | Peak | Horizontal |
| | 11020.0 | -43.42 | -30 | -13.42 | Peak | Vertical |
| | 16530.0 | -42.29 | -30 | -12.29 | Peak | Horizontal |
| | 16530.0 | -35.43 | -30 | -5.43 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 102 | 638.7 | -80.84 | -54 | -26.84 | Peak | Horizontal |
| | 160.0 | -60.17 | -36 | -24.17 | Peak | Vertical |
| | 748.8 | -65.52 | -54 | -11.52 | Peak | Horizontal |
| | 593.5 | -63.81 | -54 | -9.81 | Peak | Vertical |
| | 11020.0 | -36.67 | -30 | -6.67 | Peak | Horizontal |
| | 11020.0 | -44.66 | -30 | -14.66 | Peak | Vertical |
| | 16530.0 | -39.05 | -30 | -9.05 | Peak | Horizontal |
| | 16530.0 | -35.51 | -30 | -5.51 | Peak | Vertical |

| | | | |
|---------------|----------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11ac-VHT80 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 106 | 166.5 | -76.62 | -36 | -40.62 | Peak | Horizontal |
| | 121.7 | -72.63 | -36 | -36.63 | Peak | Vertical |
| | 883.2 | -69.25 | -36 | -33.25 | Peak | Horizontal |
| | 134.3 | -64.72 | -36 | -28.72 | Peak | Vertical |
| | 11060.0 | -35.88 | -30 | -5.88 | Peak | Horizontal |
| | 11060.0 | -44.33 | -30 | -14.33 | Peak | Vertical |
| | 16590.0 | -39.87 | -30 | -9.87 | Peak | Horizontal |
| | 16590.0 | -39.66 | -30 | -9.66 | Peak | Vertical |
| Ant 1 | | | | | | |
| 106 | 463.5 | -63.81 | -36 | -27.81 | Peak | Horizontal |
| | 668.5 | -62.63 | -54 | -8.63 | Peak | Vertical |
| | 703.4 | -75.81 | -54 | -21.81 | Peak | Horizontal |
| | 858.6 | -67.10 | -54 | -13.10 | Peak | Vertical |
| | 11060.0 | -37.46 | -30 | -7.46 | Peak | Horizontal |
| | 11060.0 | -35.55 | -30 | -5.55 | Peak | Vertical |
| | 16590.0 | -35.60 | -30 | -5.60 | Peak | Horizontal |
| | 16590.0 | -36.71 | -30 | -6.71 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 106 | 597.4 | -64.49 | -54 | -10.49 | Peak | Horizontal |
| | 638.5 | -67.58 | -54 | -13.58 | Peak | Vertical |
| | 738.6 | -68.23 | -54 | -14.23 | Peak | Horizontal |
| | 751.2 | -68.32 | -54 | -14.32 | Peak | Vertical |
| | 11060.0 | -35.18 | -30 | -5.18 | Peak | Horizontal |
| | 11060.0 | -45.22 | -30 | -15.22 | Peak | Vertical |
| | 16590.0 | -35.17 | -30 | -5.17 | Peak | Horizontal |
| | 16590.0 | -42.42 | -30 | -12.42 | Peak | Vertical |

Test by Dipole Antenna – 2dBi

| | | | |
|---------------|------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11a | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|--------------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 100 | 79.7 | -76.04 | -36 | -40.04 | Peak | Horizontal |
| | 122.8 | -73.16 | -36 | -37.16 | Peak | Vertical |
| | 842.1 | -77.78 | -54 | -23.78 | Peak | Horizontal |
| | 228.4 | -70.52 | -54 | -16.52 | Peak | Vertical |
| | 11000.0 | -42.83 | -30 | -12.83 | Peak | Horizontal |
| | 11000.0 | -44.63 | -30 | -14.63 | Peak | Vertical |
| | 16500.0 | -38.30 | -30 | -8.30 | Peak | Horizontal |
| | 16500.0 | -38.39 | -30 | -8.39 | Peak | Vertical |
| Ant 1 | | | | | | |
| 100 | 463.0 | -73.34 | -36 | -37.34 | Peak | Horizontal |
| | 602.9 | -68.79 | -54 | -14.79 | Peak | Vertical |
| | 742.6 | -69.08 | -54 | -15.08 | Peak | Horizontal |
| | 899.7 | -62.51 | -36 | -26.51 | Peak | Vertical |
| | 11000.0 | -32.70 | -30 | -2.70 | Peak | Horizontal |
| | 11000.0 | -39.09 | -30 | -9.09 | Peak | Vertical |
| | 16500.0 | -36.19 | -30 | -6.19 | Peak | Horizontal |
| | 16500.0 | -35.02 | -30 | -5.02 | Peak | Vertical |

| | | | |
|---------------|--------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11n-HT20 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 100 | 567.9 | -64.92 | -54 | -10.92 | Peak | Horizontal |
| | 140.8 | -65.26 | -36 | -29.26 | Peak | Vertical |
| | 748.0 | -64.11 | -54 | -10.11 | Peak | Horizontal |
| | 722.0 | -64.34 | -54 | -10.34 | Peak | Vertical |
| | 11000.0 | -43.24 | -30 | -13.24 | Peak | Horizontal |
| | 11000.0 | -40.01 | -30 | -10.01 | Peak | Vertical |
| | 16500.0 | -37.07 | -30 | -7.07 | Peak | Horizontal |
| | 16500.0 | -36.52 | -30 | -6.52 | Peak | Vertical |
| Ant 1 | | | | | | |
| 100 | 553.5 | -72.49 | -54 | -18.49 | Peak | Horizontal |
| | 140.4 | -64.49 | -36 | -28.49 | Peak | Vertical |
| | 767.1 | -60.79 | -54 | -6.79 | Peak | Horizontal |
| | 757.4 | -63.37 | -54 | -9.37 | Peak | Vertical |
| | 11000.0 | -38.94 | -30 | -8.94 | Peak | Horizontal |
| | 11000.0 | -37.64 | -30 | -7.64 | Peak | Vertical |
| | 16500.0 | -37.63 | -30 | -7.63 | Peak | Horizontal |
| | 16500.0 | -34.28 | -30 | -4.28 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 100 | 557.5 | -70.95 | -54 | -16.95 | Peak | Horizontal |
| | 120.7 | -61.99 | -36 | -25.99 | Peak | Vertical |
| | 715.1 | -69.33 | -54 | -15.33 | Peak | Horizontal |
| | 714.3 | -62.05 | -54 | -8.05 | Peak | Vertical |
| | 11000.0 | -35.58 | -30 | -5.58 | Peak | Horizontal |
| | 11000.0 | -45.99 | -30 | -15.99 | Peak | Vertical |
| | 16500.0 | -34.77 | -30 | -4.77 | Peak | Horizontal |
| | 16500.0 | -35.89 | -30 | -5.89 | Peak | Vertical |

| | | | |
|---------------|--------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11n-HT40 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 102 | 111.6 | -70.04 | -54 | -16.04 | Peak | Horizontal |
| | 617.2 | -65.24 | -54 | -11.24 | Peak | Vertical |
| | 255.1 | -65.68 | -36 | -29.68 | Peak | Horizontal |
| | 791.6 | -65.18 | -54 | -11.18 | Peak | Vertical |
| | 11020.0 | -37.82 | -30 | -7.82 | Peak | Horizontal |
| | 11020.0 | -45.50 | -30 | -15.50 | Peak | Vertical |
| | 16530.0 | -35.18 | -30 | -5.18 | Peak | Horizontal |
| | 16530.0 | -40.80 | -30 | -10.80 | Peak | Vertical |
| Ant 1 | | | | | | |
| 102 | 575.9 | -75.03 | -54 | -21.03 | Peak | Horizontal |
| | 93.0 | -59.22 | -54 | -5.22 | Peak | Vertical |
| | 632.4 | -64.29 | -54 | -10.29 | Peak | Horizontal |
| | 586.7 | -67.85 | -54 | -13.85 | Peak | Vertical |
| | 11020.0 | -33.21 | -30 | -3.21 | Peak | Horizontal |
| | 11020.0 | -38.12 | -30 | -8.12 | Peak | Vertical |
| | 16530.0 | -37.16 | -30 | -7.16 | Peak | Horizontal |
| | 16530.0 | -36.46 | -30 | -6.46 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 102 | 619.7 | -74.59 | -54 | -20.59 | Peak | Horizontal |
| | 175.4 | -56.66 | -54 | -2.66 | Peak | Vertical |
| | 705.0 | -68.57 | -54 | -14.57 | Peak | Horizontal |
| | 680.9 | -62.15 | -54 | -8.15 | Peak | Vertical |
| | 11020.0 | -37.97 | -30 | -7.97 | Peak | Horizontal |
| | 11020.0 | -44.90 | -30 | -14.90 | Peak | Vertical |
| | 16530.0 | -35.45 | -30 | -5.45 | Peak | Horizontal |
| | 16530.0 | -43.20 | -30 | -13.20 | Peak | Vertical |

| | | | |
|---------------|----------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11ac-VHT20 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 100 | 577.4 | -66.91 | -54 | -12.91 | Peak | Horizontal |
| | 130.7 | -59.51 | -36 | -23.51 | Peak | Vertical |
| | 778.5 | -59.61 | -54 | -5.61 | Peak | Horizontal |
| | 796.4 | -59.90 | -54 | -5.90 | Peak | Vertical |
| | 11054.7 | -37.60 | -30 | -7.60 | Peak | Horizontal |
| | 11031.7 | -42.89 | -30 | -12.89 | Peak | Vertical |
| | 16553.8 | -37.41 | -30 | -7.41 | Peak | Horizontal |
| | 16567.6 | -43.27 | -30 | -13.27 | Peak | Vertical |
| Ant 1 | | | | | | |
| 100 | 483.1 | -66.10 | -54 | -12.10 | Peak | Horizontal |
| | 156.0 | -60.77 | -36 | -24.77 | Peak | Vertical |
| | 678.0 | -66.19 | -54 | -12.19 | Peak | Horizontal |
| | 832.1 | -61.92 | -54 | -7.92 | Peak | Vertical |
| | 11005.7 | -43.86 | -30 | -13.86 | Peak | Horizontal |
| | 11014.4 | -41.48 | -30 | -11.48 | Peak | Vertical |
| | 16490.6 | -37.55 | -30 | -7.55 | Peak | Horizontal |
| | 16507.5 | -36.35 | -30 | -6.35 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 100 | 578.3 | -70.99 | -54 | -16.99 | Peak | Horizontal |
| | 90.4 | -56.71 | -54 | -2.71 | Peak | Vertical |
| | 690.2 | -61.62 | -54 | -7.62 | Peak | Horizontal |
| | 826.9 | -59.46 | -54 | -5.46 | Peak | Vertical |
| | 11065.9 | -38.64 | -30 | -8.64 | Peak | Horizontal |
| | 11049.9 | -40.73 | -30 | -10.73 | Peak | Vertical |
| | 16478.6 | -36.18 | -30 | -6.18 | Peak | Horizontal |
| | 16528.6 | -39.15 | -30 | -9.15 | Peak | Vertical |

| | | | |
|---------------|----------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11ac-VHT40 | Test Site | AC1 |

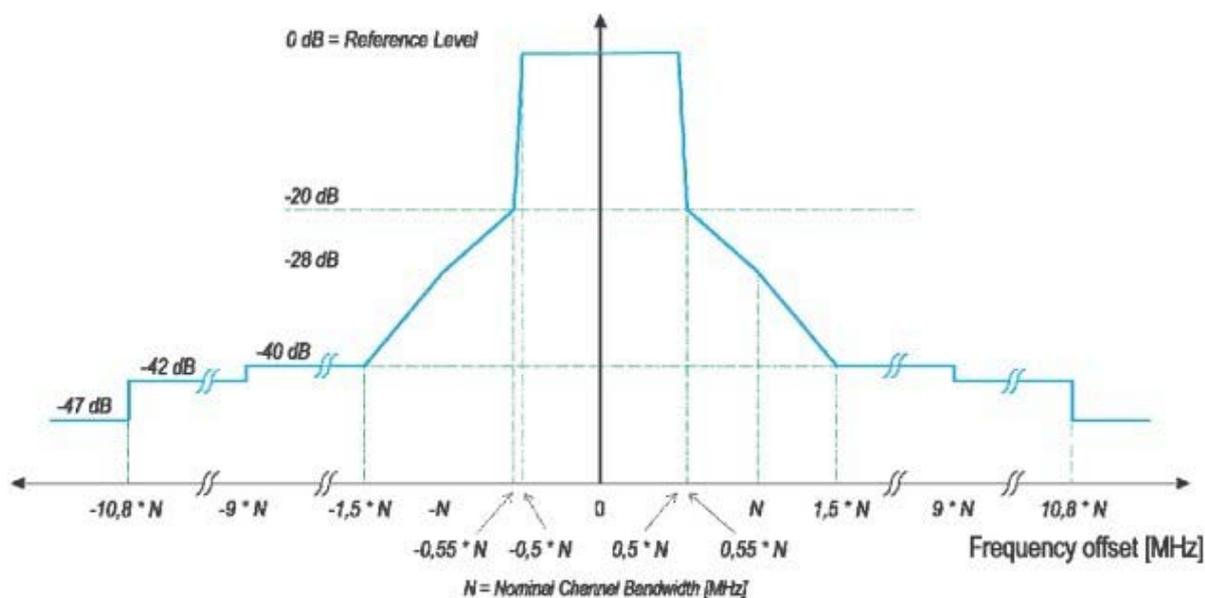
| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 102 | 123.3 | -68.62 | -36 | -32.62 | Peak | Horizontal |
| | 620.6 | -60.60 | -54 | -6.60 | Peak | Vertical |
| | 256.1 | -61.28 | -36 | -25.28 | Peak | Horizontal |
| | 751.7 | -61.80 | -54 | -7.80 | Peak | Vertical |
| | 11020.0 | -39.49 | -30 | -9.49 | Peak | Horizontal |
| | 11020.0 | -36.75 | -30 | -6.75 | Peak | Vertical |
| | 16530.0 | -35.90 | -30 | -5.90 | Peak | Horizontal |
| | 16530.0 | -34.08 | -30 | -4.08 | Peak | Vertical |
| Ant 1 | | | | | | |
| 102 | 676.6 | -77.25 | -54 | -23.25 | Peak | Horizontal |
| | 73.9 | -63.25 | -54 | -9.25 | Peak | Vertical |
| | 773.7 | -63.05 | -54 | -9.05 | Peak | Horizontal |
| | 568.0 | -68.21 | -54 | -14.21 | Peak | Vertical |
| | 11020.0 | -35.51 | -30 | -5.51 | Peak | Horizontal |
| | 11020.0 | -38.01 | -30 | -8.01 | Peak | Vertical |
| | 16530.0 | -37.84 | -30 | -7.84 | Peak | Horizontal |
| | 16530.0 | -40.51 | -30 | -10.51 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 102 | 565.8 | -74.87 | -54 | -20.87 | Peak | Horizontal |
| | 150.9 | -63.88 | -36 | -27.88 | Peak | Vertical |
| | 783.0 | -68.18 | -54 | -14.18 | Peak | Horizontal |
| | 620.9 | -62.48 | -54 | -8.48 | Peak | Vertical |
| | 11020.0 | -38.64 | -30 | -8.64 | Peak | Horizontal |
| | 11020.0 | -37.62 | -30 | -7.62 | Peak | Vertical |
| | 16530.0 | -37.67 | -30 | -7.67 | Peak | Horizontal |
| | 16530.0 | -36.44 | -30 | -6.44 | Peak | Vertical |

| | | | |
|---------------|----------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11ac-VHT80 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 106 | 186.4 | -79.91 | -54 | -25.91 | Peak | Horizontal |
| | 170.8 | -67.91 | -36 | -31.91 | Peak | Vertical |
| | 811.7 | -70.04 | -54 | -16.04 | Peak | Horizontal |
| | 377.5 | -64.75 | -36 | -28.75 | Peak | Vertical |
| | 11060.0 | -41.12 | -30 | -11.12 | Peak | Horizontal |
| | 11060.0 | -38.92 | -30 | -8.92 | Peak | Vertical |
| | 16590.0 | -38.43 | -30 | -8.43 | Peak | Horizontal |
| | 16590.0 | -37.95 | -30 | -7.95 | Peak | Vertical |
| Ant 1 | | | | | | |
| 106 | 575.0 | -63.06 | -54 | -9.06 | Peak | Horizontal |
| | 672.5 | -64.87 | -54 | -10.87 | Peak | Vertical |
| | 749.1 | -74.11 | -54 | -20.11 | Peak | Horizontal |
| | 743.1 | -68.35 | -54 | -14.35 | Peak | Vertical |
| | 11060.0 | -36.87 | -30 | -6.87 | Peak | Horizontal |
| | 11060.0 | -36.99 | -30 | -6.99 | Peak | Vertical |
| | 16590.0 | -35.54 | -30 | -5.54 | Peak | Horizontal |
| | 16590.0 | -36.36 | -30 | -6.36 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 106 | 541.2 | -62.71 | -54 | -8.71 | Peak | Horizontal |
| | 604.8 | -64.73 | -54 | -10.73 | Peak | Vertical |
| | 700.3 | -70.73 | -54 | -16.73 | Peak | Horizontal |
| | 807.2 | -62.63 | -54 | -8.63 | Peak | Vertical |
| | 11060.0 | -37.46 | -30 | -7.46 | Peak | Horizontal |
| | 11060.0 | -44.81 | -30 | -14.81 | Peak | Vertical |
| | 16590.0 | -38.87 | -30 | -8.87 | Peak | Horizontal |
| | 16590.0 | -37.81 | -30 | -7.81 | Peak | Vertical |

8. Transmitter Unwanted Emissions Within the 5GHz RLAN Bands

8.1. Limit

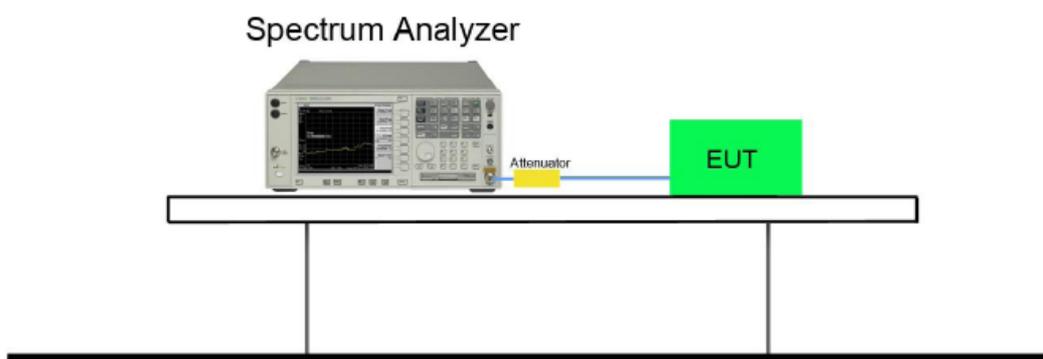


NOTE: dBc is the spectral density relative to the maximum spectral power density of the transmitted signal.

Figure 1: Transmit spectral power mask

8.2. Test Setup

Conducted measurements



8.3. Test Procedure

Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.6.2.1.

8.4. Test Result

| | | | |
|---------------|------------|-------------------|------|
| Product | Milo Li | Temperature | 26°C |
| Test Engineer | 08-24-2014 | Relative Humidity | 54% |

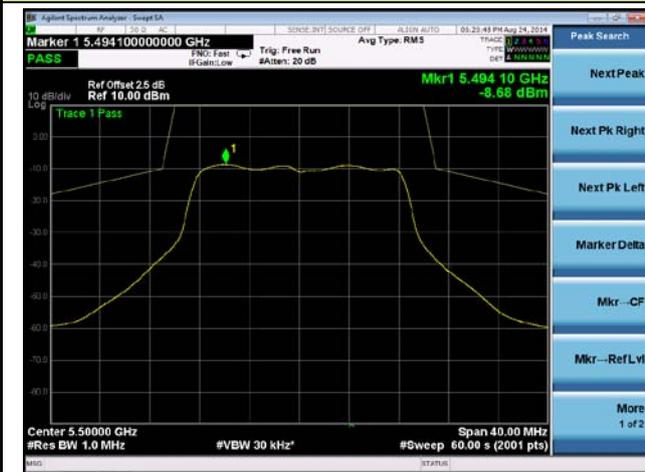
| Test Mode | Channel No. | Frequency (MHz) | Result |
|----------------|-------------|-----------------|--------|
| Ant 0 | | | |
| 802.11a | 100 | 5500 | Pass |
| 802.11a | 140 | 5700 | Pass |
| 802.11n-HT20 | 100 | 5500 | Pass |
| 802.11n-HT20 | 140 | 5700 | Pass |
| 802.11n-HT40 | 102 | 5510 | Pass |
| 802.11n-HT40 | 134 | 5670 | Pass |
| 802.11ac-VHT20 | 100 | 5500 | Pass |
| 802.11ac-VHT20 | 140 | 5700 | Pass |
| 802.11ac-VHT40 | 102 | 5510 | Pass |
| 802.11ac-VHT40 | 134 | 5670 | Pass |
| 802.11ac-VHT80 | 106 | 5530 | Pass |
| 802.11ac-VHT80 | 122 | 5610 | Pass |
| Ant 1 | | | |
| 802.11a | 100 | 5500 | Pass |
| 802.11a | 140 | 5700 | Pass |
| 802.11n-HT20 | 100 | 5500 | Pass |
| 802.11n-HT20 | 140 | 5700 | Pass |
| 802.11n-HT40 | 102 | 5510 | Pass |
| 802.11n-HT40 | 134 | 5670 | Pass |
| 802.11ac-VHT20 | 100 | 5500 | Pass |
| 802.11ac-VHT20 | 140 | 5700 | Pass |
| 802.11ac-VHT40 | 102 | 5510 | Pass |
| 802.11ac-VHT40 | 134 | 5670 | Pass |
| 802.11ac-VHT80 | 106 | 5530 | Pass |
| 802.11ac-VHT80 | 122 | 5610 | Pass |

| Ant 0 + 1 | | | | |
|----------------|-----|--|------|------|
| 802.11n-HT20 | 100 | | 5500 | Pass |
| 802.11n-HT20 | 140 | | 5700 | Pass |
| 802.11n-HT40 | 102 | | 5510 | Pass |
| 802.11n-HT40 | 134 | | 5670 | Pass |
| 802.11ac-VHT20 | 100 | | 5500 | Pass |
| 802.11ac-VHT20 | 140 | | 5700 | Pass |
| 802.11ac-VHT40 | 102 | | 5510 | Pass |
| 802.11ac-VHT40 | 134 | | 5670 | Pass |
| 802.11ac-VHT80 | 106 | | 5530 | Pass |
| 802.11ac-VHT80 | 122 | | 5610 | Pass |

802.11a Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0

Channel 100 (5500MHz)

The Reference Level



The Mask Data



Channel 140 (5700MHz)

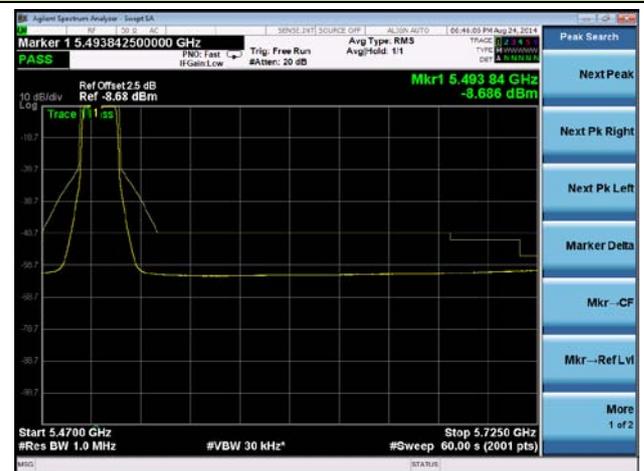
The Reference Level

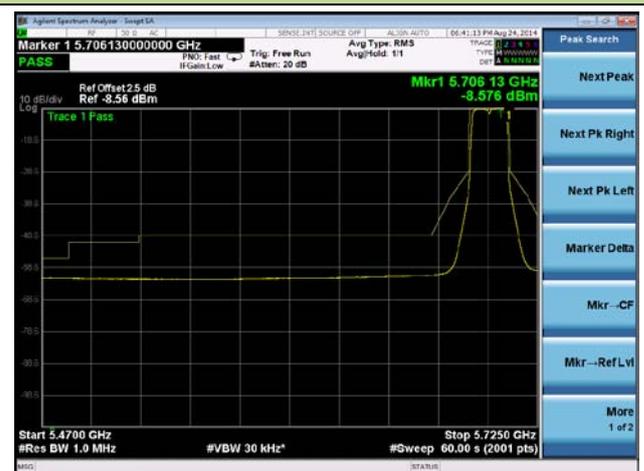
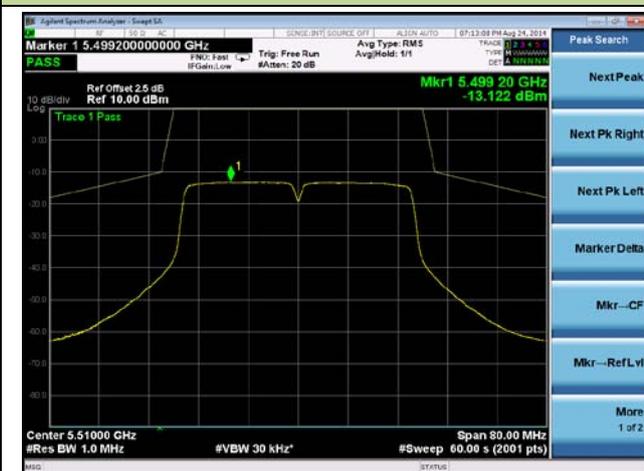
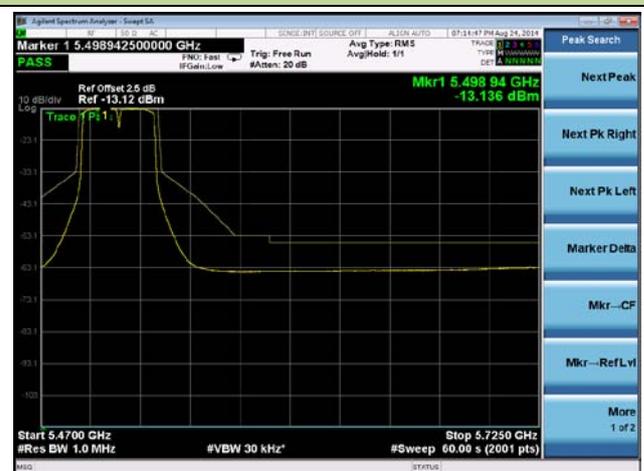


The Mask Data



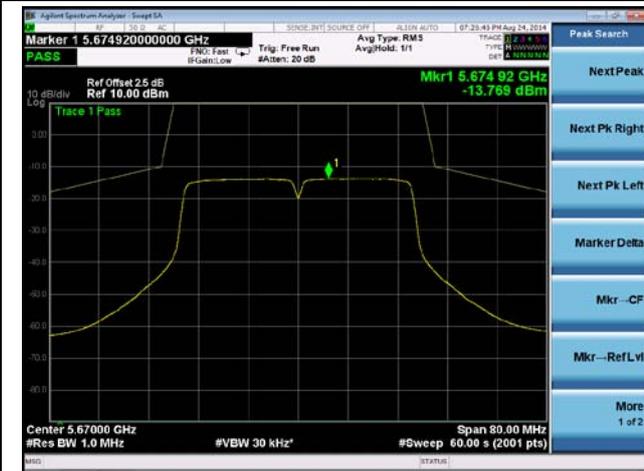
802.11n-HT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0
Channel 100 (5500MHz)
The Reference Level

The Mask Data

Channel 140 (5700MHz)
The Reference Level

The Mask Data

802.11n-HT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0
Channel 102 (5510MHz)
The Reference Level

The Mask Data


Channel 134 (5670MHz)

The Reference Level



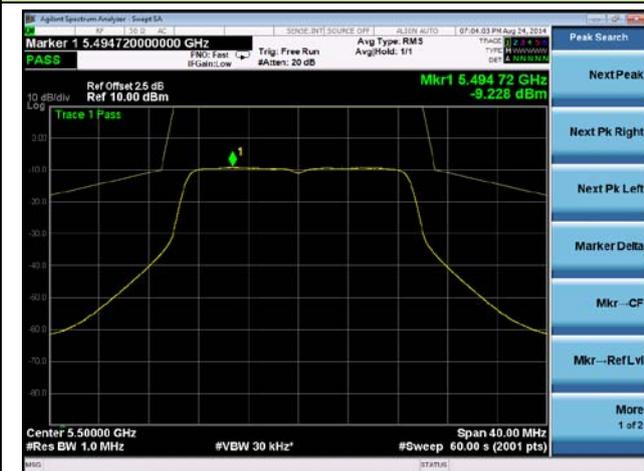
The Mask Data



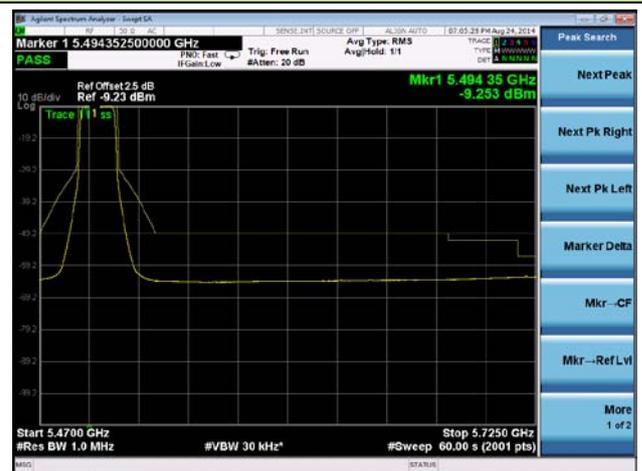
802.11ac-VHT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0

Channel 100 (5500MHz)

The Reference Level

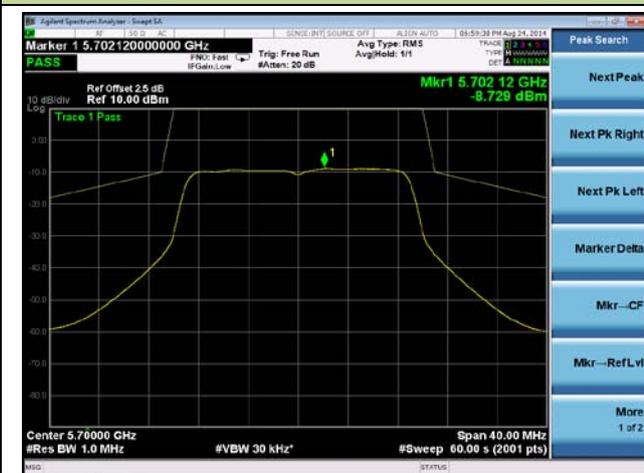


The Mask Data



Channel 140 (5700MHz)

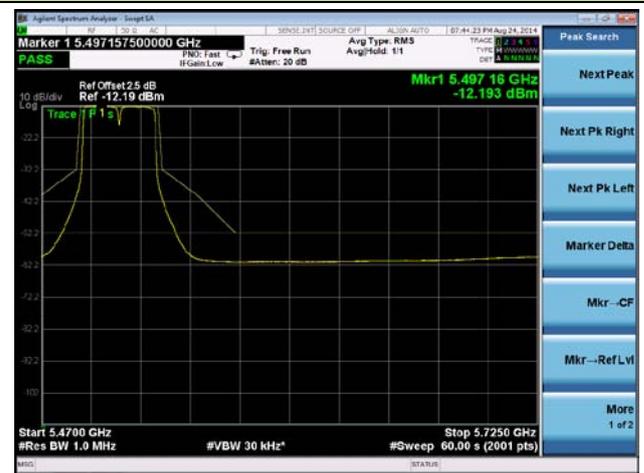
The Reference Level



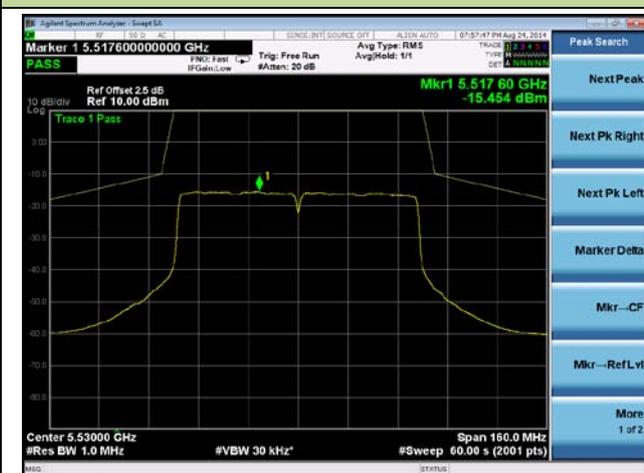
The Mask Data



802.11ac-VHT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0
Channel 102 (5510MHz)
The Reference Level

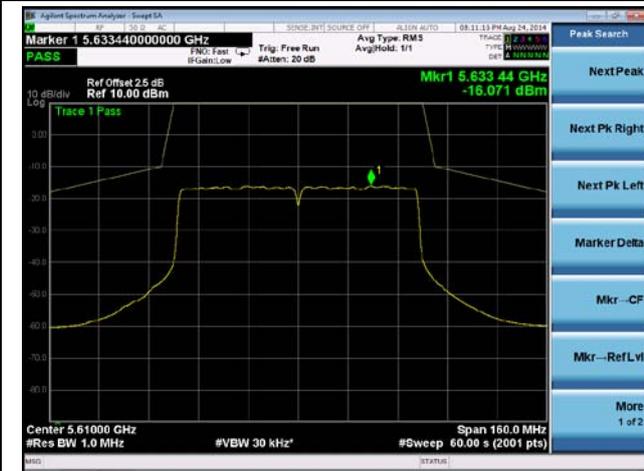
The Mask Data

Channel 134 (5670MHz)
The Reference Level

The Mask Data

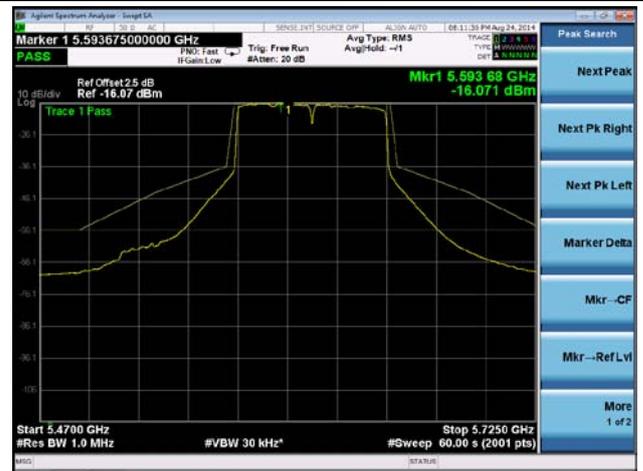
802.11ac-VHT80 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0
Channel 106 (5530MHz)
The Reference Level

The Mask Data


Channel 122 (5610MHz)

The Reference Level



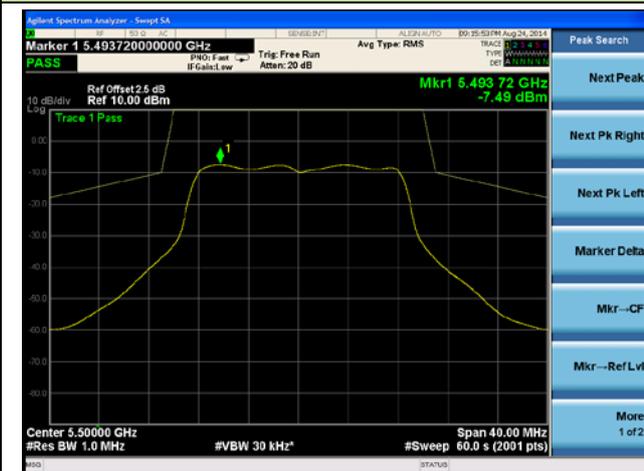
The Mask Data



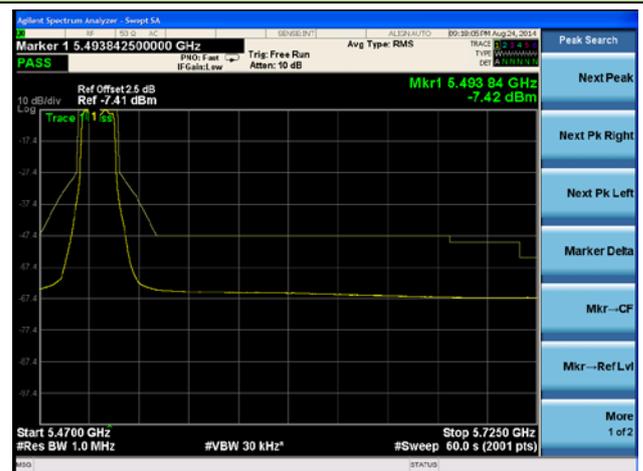
802.11a Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1

Channel 100 (5500MHz)

The Reference Level

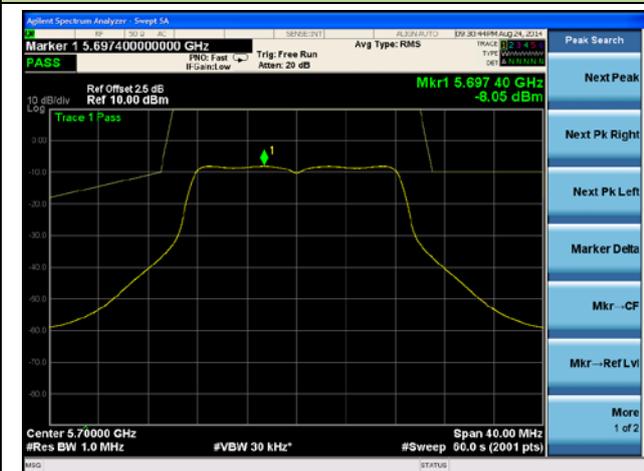


The Mask Data

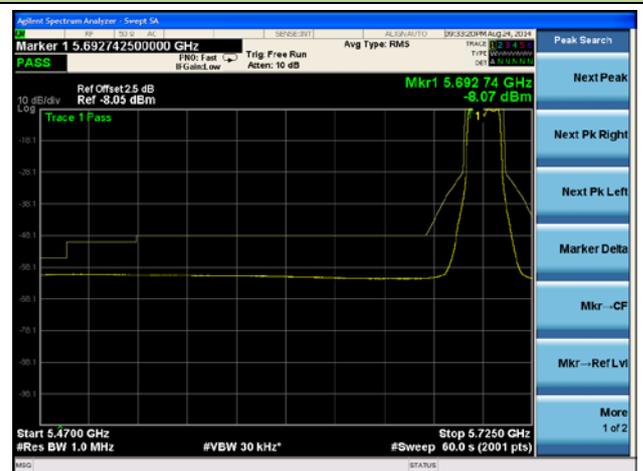


Channel 140 (5700MHz)

The Reference Level



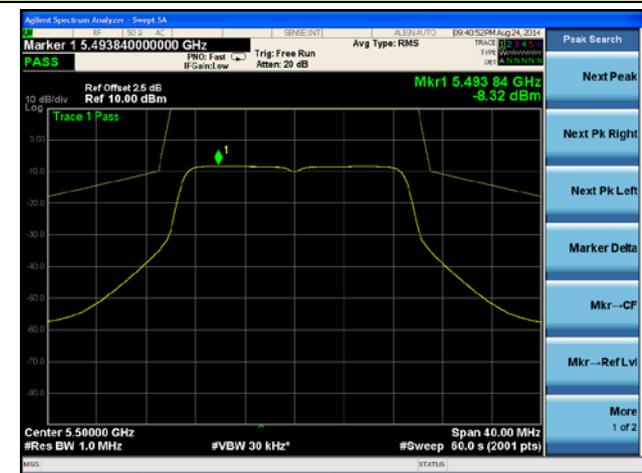
The Mask Data



802.11n-HT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1

Channel 100 (5500MHz)

The Reference Level

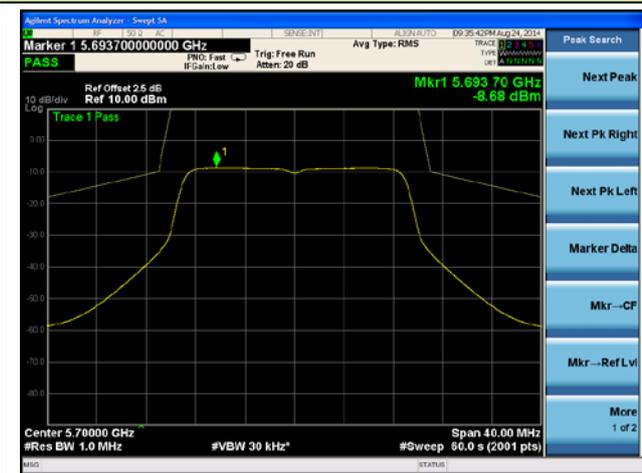


The Mask Data



Channel 140 (5700MHz)

The Reference Level



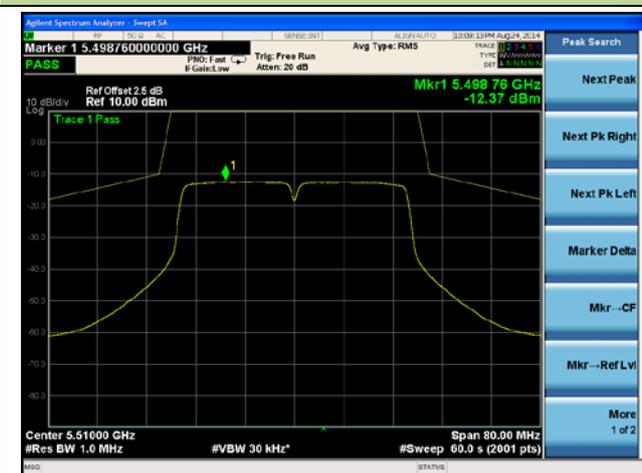
The Mask Data



802.11n-HT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1

Channel 102 (5510MHz)

The Reference Level



The Mask Data



Channel 134 (5670MHz)

The Reference Level



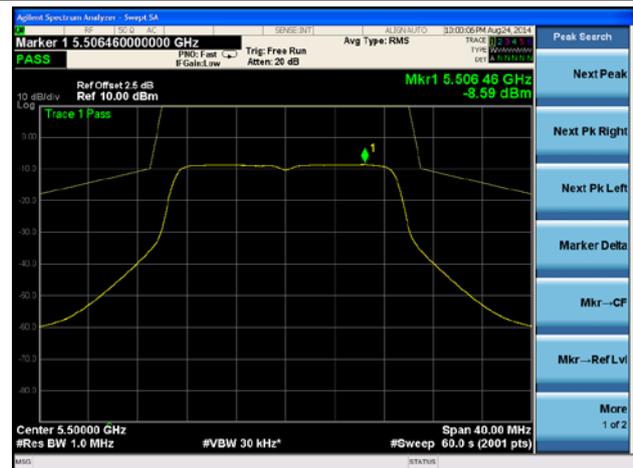
The Mask Data



802.11ac-VHT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1

Channel 100 (5500MHz)

The Reference Level

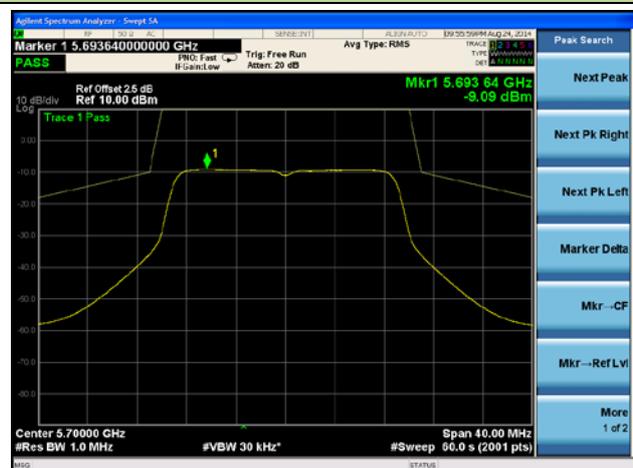


The Mask Data



Channel 140 (5700MHz)

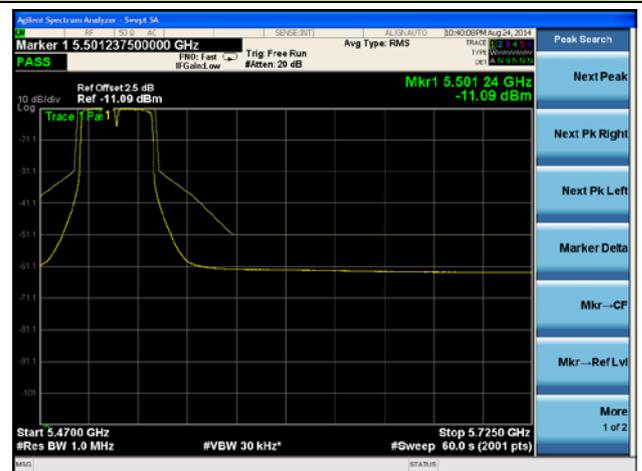
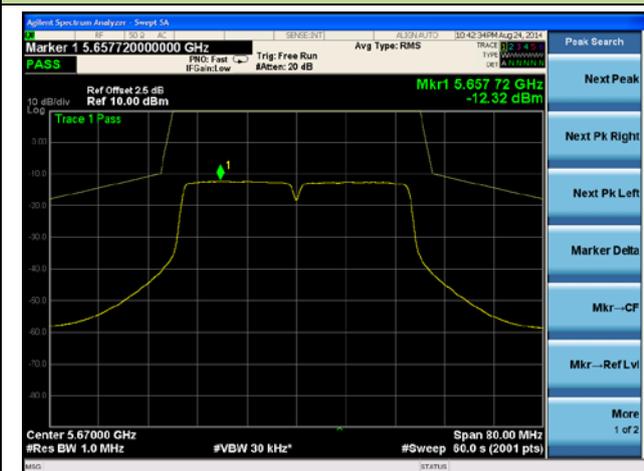
The Reference Level

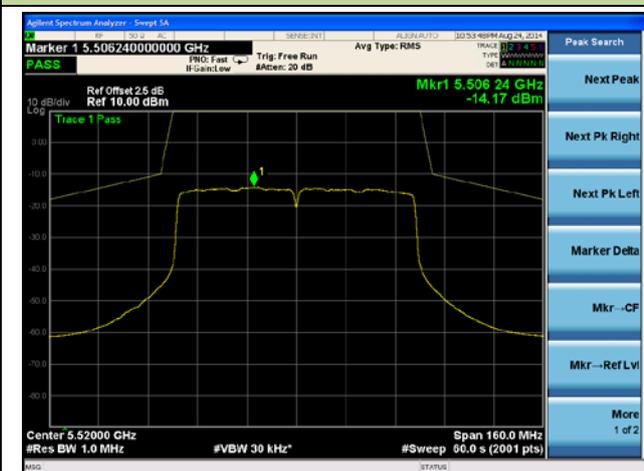


The Mask Data



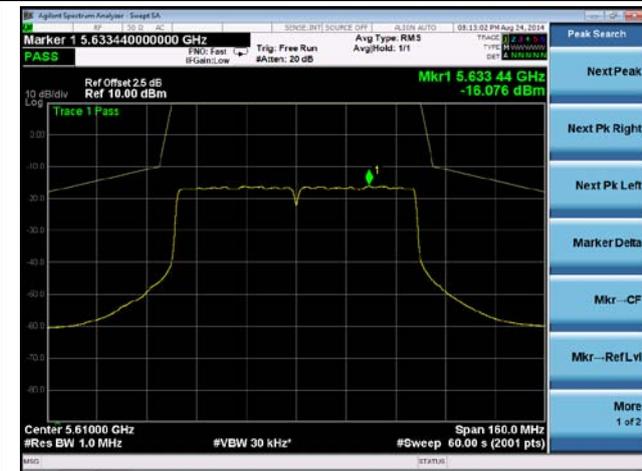
802.11ac-VHT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1
Channel 102 (5510MHz)
The Reference Level

The Mask Data

Channel 134 (5670MHz)
The Reference Level

The Mask Data

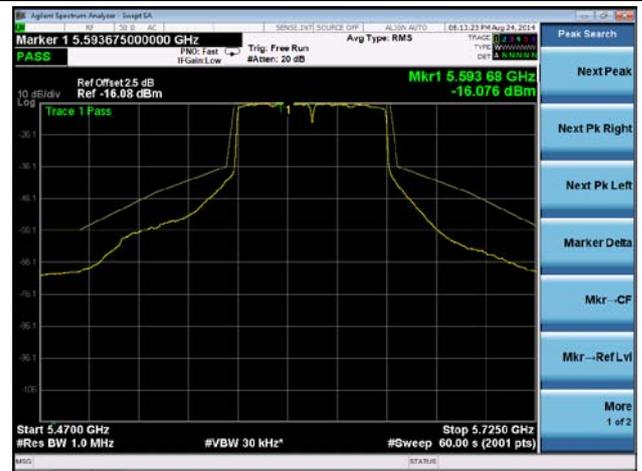
802.11ac-VHT80 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 1
Channel 106 (5530MHz)
The Reference Level

The Mask Data


Channel 122 (5610MHz)

The Reference Level



The Mask Data



802.11n-HT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0 + 1

Channel 100 (5500MHz)

The Reference Level

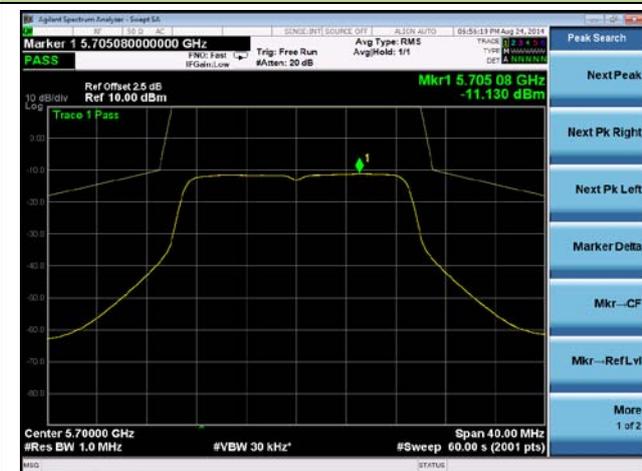


The Mask Data



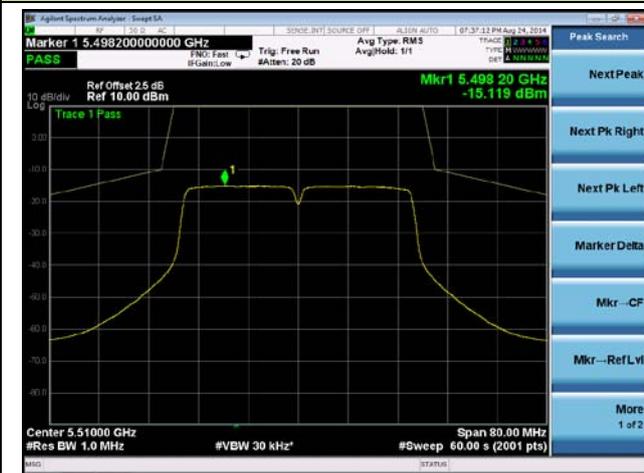
Channel 140 (5700MHz)

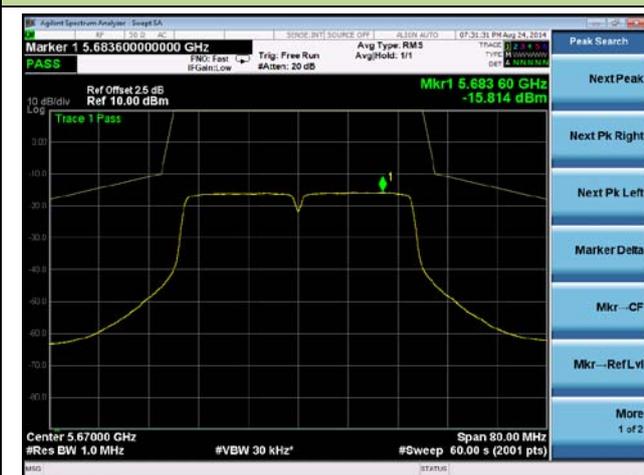
The Reference Level

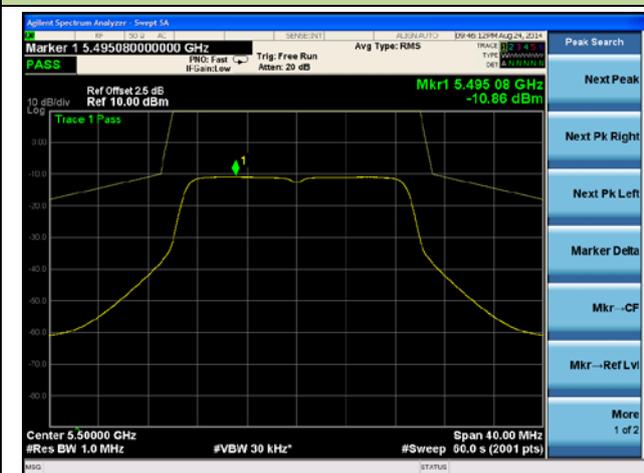


The Mask Data



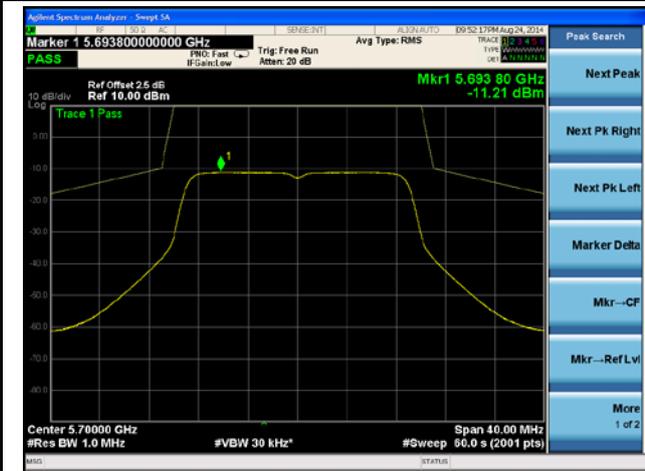
802.11n-HT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0 + 1
Channel 102 (5510MHz)
The Reference Level

The Mask Data

Channel 134 (5670MHz)
The Reference Level

The Mask Data

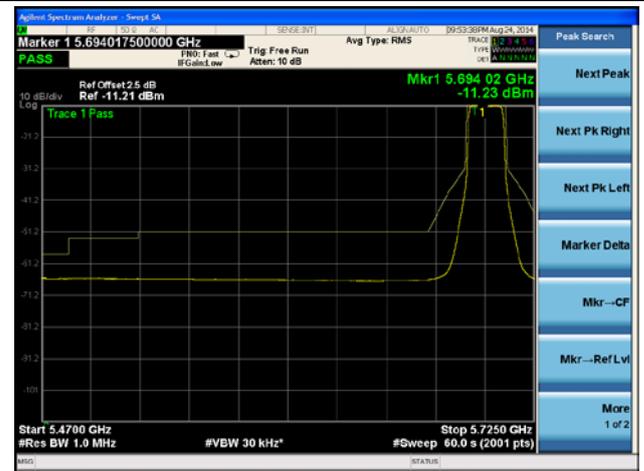
802.11ac-VHT20 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0 + 1
Channel 100 (5500MHz)
The Reference Level

The Mask Data


Channel 140 (5700MHz)

The Reference Level



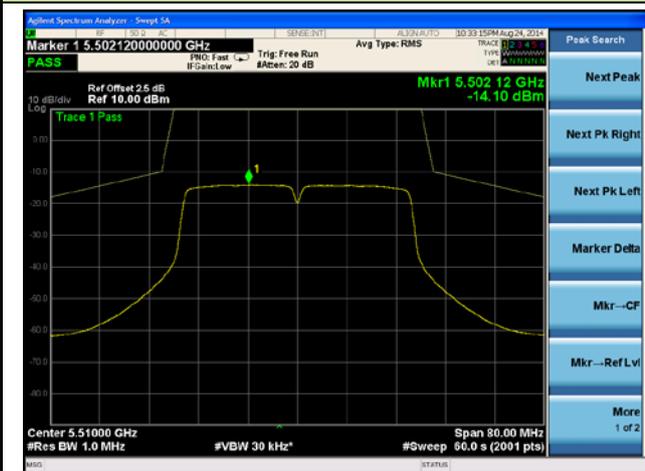
The Mask Data



802.11ac-VHT40 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0 + 1

Channel 102 (5510MHz)

The Reference Level

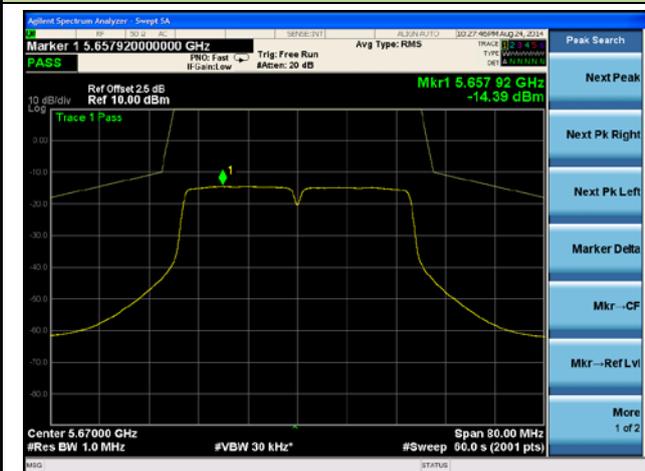


The Mask Data



Channel 134 (5670MHz)

The Reference Level



The Mask Data



802.11ac-VHT80 Transmitter Unwanted Emissions Within the 5GHz RLAN Bands Ant 0 + 1

Channel 106 (5530MHz)

The Reference Level

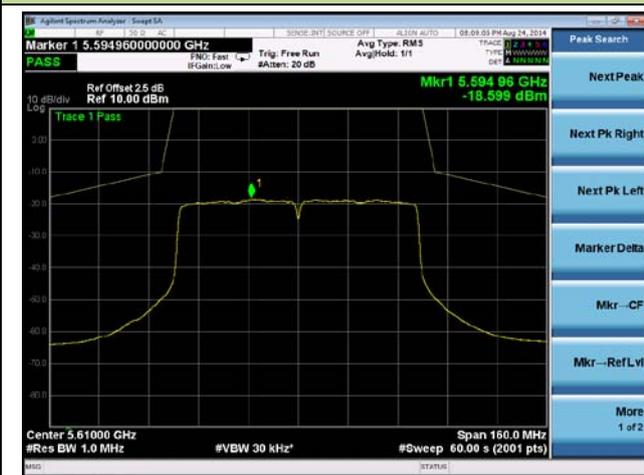


The Mask Data

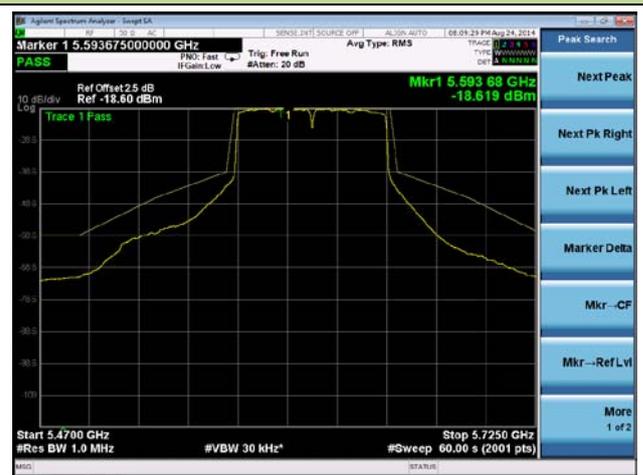


Channel 122 (5610MHz)

The Reference Level



The Mask Data



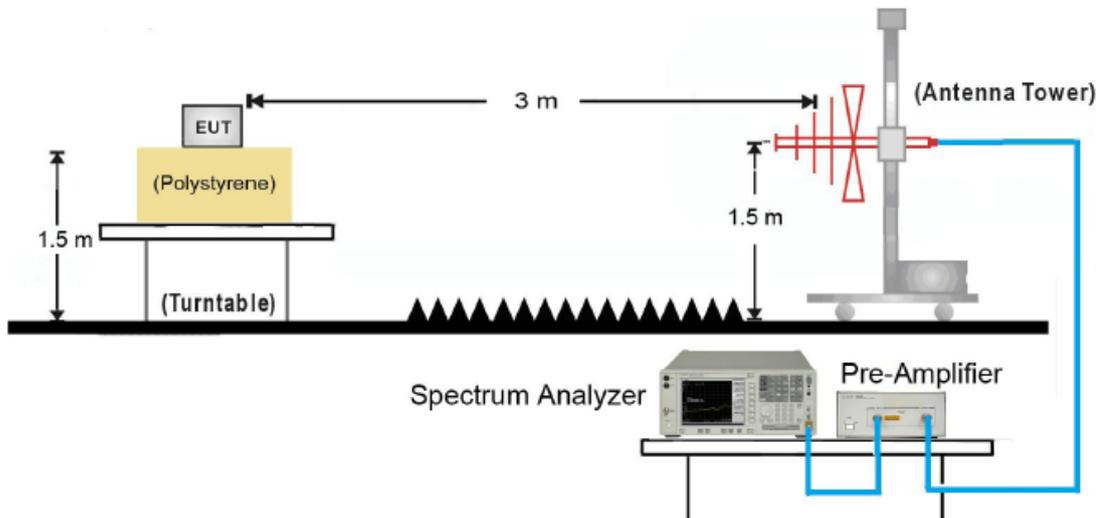
9. Receiver Spurious Emissions

9.1. Limit

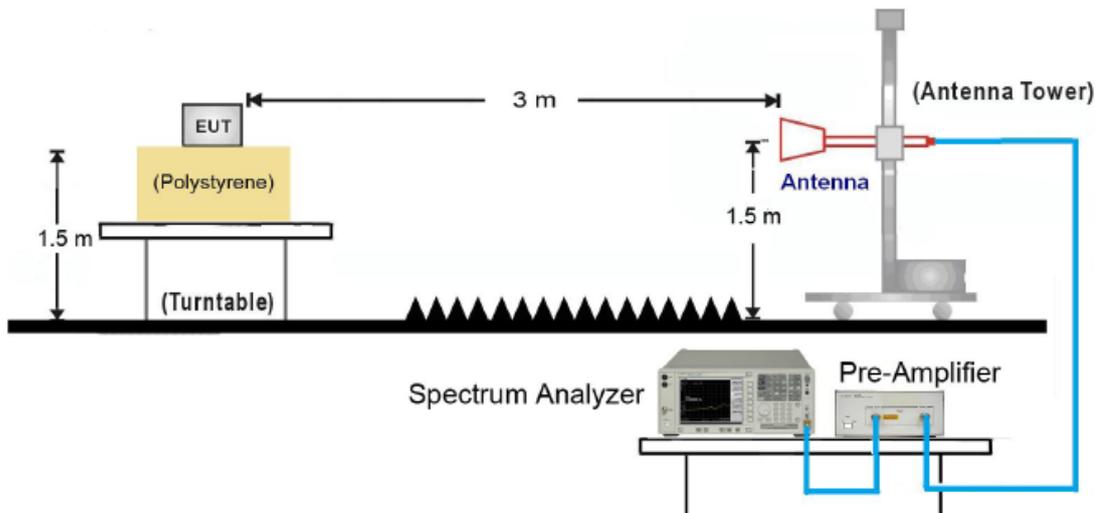
| Frequency Range | Maximum Power | Bandwidth |
|-----------------|---------------|-----------|
| 30 MHz to 1GHz | -57dBm | 100 kHz |
| 1 GHz to 26 GHz | -47dBm | 1 MHz |

9.2. Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



9.3. Test Procedure

Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.7.2.2.

9.4. Test Result

Test by Panel Antenna – 25dBi

| | | | |
|---------------|------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11a | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|---------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 100 | 545.2 | -67.35 | -57 | -10.35 | Peak | Horizontal |
| | 382.4 | -67.39 | -57 | -10.39 | Peak | Vertical |
| | 706.2 | -68.21 | -57 | -11.21 | Peak | Horizontal |
| | 568.3 | -67.94 | -57 | -10.94 | Peak | Vertical |
| | 2202.8 | -52.53 | -47 | -5.53 | Peak | Horizontal |
| | 2311.0 | -53.55 | -47 | -6.55 | Peak | Vertical |
| | 3896.8 | -52.38 | -47 | -5.38 | Peak | Horizontal |
| | 2761.9 | -56.03 | -47 | -9.03 | Peak | Vertical |
| Ant 1 | | | | | | |
| 100 | 451.7 | -68.52 | -57 | -11.52 | Peak | Horizontal |
| | 362.9 | -62.42 | -57 | -5.42 | Peak | Vertical |
| | 740.2 | -69.76 | -57 | -12.76 | Peak | Horizontal |
| | 570.6 | -68.56 | -57 | -11.56 | Peak | Vertical |
| | 2112.5 | -55.55 | -47 | -8.55 | Peak | Horizontal |
| | 1625.9 | -53.22 | -47 | -6.22 | Peak | Vertical |
| | 3068.6 | -56.82 | -47 | -9.82 | Peak | Horizontal |
| | 2122.1 | -55.14 | -47 | -8.14 | Peak | Vertical |

| | | | |
|---------------|--------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11n-HT20 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 100 | 417.5 | -70.53 | -57 | -13.53 | Peak | Horizontal |
| | 284.6 | -62.00 | -57 | -5.00 | Peak | Vertical |
| | 759.1 | -68.05 | -57 | -11.05 | Peak | Horizontal |
| | 579.1 | -66.87 | -57 | -9.87 | Peak | Vertical |
| | 1176.7 | -56.11 | -47 | -9.11 | Peak | Horizontal |
| | 1537.0 | -52.81 | -47 | -5.81 | Peak | Vertical |
| | 2173.1 | -52.69 | -47 | -5.69 | Peak | Horizontal |
| | 2138.7 | -54.33 | -47 | -7.33 | Peak | Vertical |
| Ant 1 | | | | | | |
| 100 | 460.0 | -69.93 | -57 | -12.93 | Peak | Horizontal |
| | 426.2 | -62.41 | -57 | -5.41 | Peak | Vertical |
| | 676.3 | -69.26 | -57 | -12.26 | Peak | Horizontal |
| | 639.5 | -67.08 | -57 | -10.08 | Peak | Vertical |
| | 1170.6 | -55.51 | -47 | -8.51 | Peak | Horizontal |
| | 1518.0 | -56.79 | -47 | -9.79 | Peak | Vertical |
| | 2115.6 | -54.48 | -47 | -7.48 | Peak | Horizontal |
| | 2119.8 | -55.35 | -47 | -8.35 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 100 | 525.2 | -73.51 | -57 | -16.51 | Peak | Horizontal |
| | 386.5 | -61.50 | -57 | -4.50 | Peak | Vertical |
| | 708.2 | -68.53 | -57 | -11.53 | Peak | Horizontal |
| | 609.0 | -62.86 | -57 | -5.86 | Peak | Vertical |
| | 1268.9 | -51.50 | -47 | -4.50 | Peak | Horizontal |
| | 1551.3 | -56.05 | -47 | -9.05 | Peak | Vertical |
| | 2210.6 | -57.82 | -47 | -10.82 | Peak | Horizontal |
| | 2046.0 | -52.67 | -47 | -5.67 | Peak | Vertical |

| | | | |
|---------------|--------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11n-HT40 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 102 | 419.3 | -71.02 | -57 | -14.02 | Peak | Horizontal |
| | 359.9 | -64.39 | -57 | -7.39 | Peak | Vertical |
| | 744.9 | -74.97 | -57 | -17.97 | Peak | Horizontal |
| | 633.1 | -67.81 | -57 | -10.81 | Peak | Vertical |
| | 1483.5 | -58.85 | -47 | -11.85 | Peak | Horizontal |
| | 1321.5 | -58.49 | -47 | -11.49 | Peak | Vertical |
| | 2199.8 | -52.97 | -47 | -5.97 | Peak | Horizontal |
| | 2571.9 | -53.03 | -47 | -6.03 | Peak | Vertical |
| Ant 1 | | | | | | |
| 102 | 149.9 | -70.36 | -57 | -13.36 | Peak | Horizontal |
| | 101.4 | -69.74 | -57 | -12.74 | Peak | Vertical |
| | 530.3 | -66.86 | -57 | -9.86 | Peak | Horizontal |
| | 383.2 | -60.34 | -57 | -3.34 | Peak | Vertical |
| | 1514.6 | -59.53 | -47 | -12.53 | Peak | Horizontal |
| | 1366.6 | -54.16 | -47 | -7.16 | Peak | Vertical |
| | 2217.9 | -55.17 | -47 | -8.17 | Peak | Horizontal |
| | 2648.1 | -53.32 | -47 | -6.32 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 102 | 232.2 | -70.51 | -57 | -13.51 | Peak | Horizontal |
| | 169.8 | -69.66 | -57 | -12.66 | Peak | Vertical |
| | 445.6 | -69.38 | -57 | -12.38 | Peak | Horizontal |
| | 317.9 | -66.92 | -57 | -9.92 | Peak | Vertical |
| | 1528.2 | -57.04 | -47 | -10.04 | Peak | Horizontal |
| | 1308.3 | -55.46 | -47 | -8.46 | Peak | Vertical |
| | 2176.9 | -57.43 | -47 | -10.43 | Peak | Horizontal |
| | 2650.1 | -52.47 | -47 | -5.47 | Peak | Vertical |

| | | | |
|---------------|----------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11ac-VHT20 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 100 | 465.4 | -71.84 | -57 | -14.84 | Peak | Horizontal |
| | 380.1 | -63.10 | -57 | -6.10 | Peak | Vertical |
| | 687.8 | -68.94 | -57 | -11.94 | Peak | Horizontal |
| | 630.5 | -64.98 | -57 | -7.98 | Peak | Vertical |
| | 1233.9 | -53.86 | -47 | -6.86 | Peak | Horizontal |
| | 1628.3 | -50.28 | -47 | -3.28 | Peak | Vertical |
| | 2149.2 | -55.07 | -47 | -8.07 | Peak | Horizontal |
| | 2049.6 | -58.86 | -47 | -11.86 | Peak | Vertical |
| Ant 1 | | | | | | |
| 100 | 514.0 | -67.59 | -57 | -10.59 | Peak | Horizontal |
| | 347.0 | -62.62 | -57 | -5.62 | Peak | Vertical |
| | 637.0 | -72.23 | -57 | -15.23 | Peak | Horizontal |
| | 562.8 | -67.66 | -57 | -10.66 | Peak | Vertical |
| | 1203.4 | -54.02 | -47 | -7.02 | Peak | Horizontal |
| | 1527.6 | -57.91 | -47 | -10.91 | Peak | Vertical |
| | 2119.4 | -55.59 | -47 | -8.59 | Peak | Horizontal |
| | 2069.3 | -54.65 | -47 | -7.65 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 100 | 450.0 | -71.20 | -57 | -14.20 | Peak | Horizontal |
| | 292.1 | -63.23 | -57 | -6.23 | Peak | Vertical |
| | 670.6 | -72.28 | -57 | -15.28 | Peak | Horizontal |
| | 594.3 | -63.42 | -57 | -6.42 | Peak | Vertical |
| | 1220.9 | -54.92 | -47 | -7.92 | Peak | Horizontal |
| | 1607.8 | -54.22 | -47 | -7.22 | Peak | Vertical |
| | 2176.2 | -54.04 | -47 | -7.04 | Peak | Horizontal |
| | 2094.5 | -51.62 | -47 | -4.62 | Peak | Vertical |

| | | | |
|---------------|----------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11ac-VHT40 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 102 | 519.2 | -73.07 | -57 | -16.07 | Peak | Horizontal |
| | 414.3 | -67.94 | -57 | -10.94 | Peak | Vertical |
| | 740.1 | -75.26 | -57 | -18.26 | Peak | Horizontal |
| | 581.7 | -70.28 | -57 | -13.28 | Peak | Vertical |
| | 1479.3 | -60.09 | -47 | -13.09 | Peak | Horizontal |
| | 1304.7 | -57.80 | -47 | -10.80 | Peak | Vertical |
| | 2182.7 | -57.21 | -47 | -10.21 | Peak | Horizontal |
| | 2661.8 | -52.18 | -47 | -5.18 | Peak | Vertical |
| Ant 1 | | | | | | |
| 102 | 220.7 | -68.89 | -57 | -11.89 | Peak | Horizontal |
| | 209.2 | -71.25 | -57 | -14.25 | Peak | Vertical |
| | 515.4 | -66.67 | -57 | -9.67 | Peak | Horizontal |
| | 331.8 | -61.38 | -57 | -4.38 | Peak | Vertical |
| | 1526.9 | -53.07 | -47 | -6.07 | Peak | Horizontal |
| | 1289.2 | -56.84 | -47 | -9.84 | Peak | Vertical |
| | 2233.6 | -52.34 | -47 | -5.34 | Peak | Horizontal |
| | 2646.9 | -56.65 | -47 | -9.65 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 102 | 220.6 | -75.92 | -57 | -18.92 | Peak | Horizontal |
| | 207.5 | -64.71 | -57 | -7.71 | Peak | Vertical |
| | 472.0 | -72.42 | -57 | -15.42 | Peak | Horizontal |
| | 347.6 | -64.43 | -57 | -7.43 | Peak | Vertical |
| | 1455.0 | -59.12 | -47 | -12.12 | Peak | Horizontal |
| | 1254.9 | -60.73 | -47 | -13.73 | Peak | Vertical |
| | 2218.9 | -55.53 | -47 | -8.53 | Peak | Horizontal |
| | 2599.3 | -53.03 | -47 | -6.03 | Peak | Vertical |

| | | | |
|---------------|----------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11ac-VHT80 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 106 | 449.2 | -70.92 | -57 | -13.92 | Peak | Horizontal |
| | 356.3 | -64.74 | -57 | -7.74 | Peak | Vertical |
| | 671.5 | -67.40 | -57 | -10.40 | Peak | Horizontal |
| | 545.1 | -62.89 | -57 | -5.89 | Peak | Vertical |
| | 2190.5 | -57.15 | -47 | -10.15 | Peak | Horizontal |
| | 2407.1 | -53.89 | -47 | -6.89 | Peak | Vertical |
| | 3873.1 | -52.29 | -47 | -5.29 | Peak | Horizontal |
| | 2770.2 | -52.88 | -47 | -5.88 | Peak | Vertical |
| Ant 1 | | | | | | |
| 106 | 409.2 | -70.81 | -57 | -13.81 | Peak | Horizontal |
| | 339.1 | -62.64 | -57 | -5.64 | Peak | Vertical |
| | 695.3 | -67.44 | -57 | -10.44 | Peak | Horizontal |
| | 552.3 | -63.24 | -57 | -6.24 | Peak | Vertical |
| | 2191.5 | -51.67 | -47 | -4.67 | Peak | Horizontal |
| | 1538.9 | -53.45 | -47 | -6.45 | Peak | Vertical |
| | 3064.5 | -52.80 | -47 | -5.80 | Peak | Horizontal |
| | 2229.4 | -58.84 | -47 | -11.84 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 106 | 416.7 | -66.44 | -57 | -9.44 | Peak | Horizontal |
| | 411.8 | -66.22 | -57 | -9.22 | Peak | Vertical |
| | 724.4 | -72.09 | -57 | -15.09 | Peak | Horizontal |
| | 626.1 | -62.14 | -57 | -5.14 | Peak | Vertical |
| | 2168.5 | -59.63 | -47 | -12.63 | Peak | Horizontal |
| | 1587.0 | -58.14 | -47 | -11.14 | Peak | Vertical |
| | 3055.1 | -57.59 | -47 | -10.59 | Peak | Horizontal |
| | 2167.3 | -59.66 | -47 | -12.66 | Peak | Vertical |

Test by Dipole Antenna – 2dBi

| | | | |
|---------------|------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11a | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|--------------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 100 | 428.6 | -72.90 | -57 | -15.90 | Peak | Horizontal |
| | 384.9 | -63.74 | -57 | -6.74 | Peak | Vertical |
| | 773.3 | -71.13 | -57 | -14.13 | Peak | Horizontal |
| | 625.2 | -67.46 | -57 | -10.46 | Peak | Vertical |
| | 2134.6 | -54.56 | -47 | -7.56 | Peak | Horizontal |
| | 2413.4 | -54.19 | -47 | -7.19 | Peak | Vertical |
| | 3933.1 | -51.70 | -47 | -4.70 | Peak | Horizontal |
| | 2785.4 | -51.88 | -47 | -4.88 | Peak | Vertical |
| Ant 1 | | | | | | |
| 100 | 545.4 | -73.42 | -57 | -16.42 | Peak | Horizontal |
| | 363.6 | -66.47 | -57 | -9.47 | Peak | Vertical |
| | 758.9 | -71.94 | -57 | -14.94 | Peak | Horizontal |
| | 602.4 | -62.98 | -57 | -5.98 | Peak | Vertical |
| | 2181.8 | -59.35 | -47 | -12.35 | Peak | Horizontal |
| | 1546.1 | -53.78 | -47 | -6.78 | Peak | Vertical |
| | 3057.0 | -52.05 | -47 | -5.05 | Peak | Horizontal |
| | 2165.1 | -53.35 | -47 | -6.35 | Peak | Vertical |

| | | | |
|---------------|--------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11n-HT20 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 100 | 428.0 | -68.93 | -57 | -11.93 | Peak | Horizontal |
| | 328.3 | -68.13 | -57 | -11.13 | Peak | Vertical |
| | 680.5 | -70.89 | -57 | -13.89 | Peak | Horizontal |
| | 582.4 | -69.17 | -57 | -12.17 | Peak | Vertical |
| | 1238.5 | -59.01 | -47 | -12.01 | Peak | Horizontal |
| | 1626.6 | -51.99 | -47 | -4.99 | Peak | Vertical |
| | 2177.6 | -55.12 | -47 | -8.12 | Peak | Horizontal |
| | 2115.9 | -52.41 | -47 | -5.41 | Peak | Vertical |
| Ant 1 | | | | | | |
| 100 | 434.0 | -72.86 | -57 | -15.86 | Peak | Horizontal |
| | 300.9 | -62.80 | -57 | -5.80 | Peak | Vertical |
| | 651.6 | -67.19 | -57 | -10.19 | Peak | Horizontal |
| | 603.0 | -64.75 | -57 | -7.75 | Peak | Vertical |
| | 1240.6 | -55.51 | -47 | -8.51 | Peak | Horizontal |
| | 1520.5 | -55.40 | -47 | -8.40 | Peak | Vertical |
| | 2111.0 | -52.66 | -47 | -5.66 | Peak | Horizontal |
| | 2082.4 | -56.71 | -47 | -9.71 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 100 | 460.8 | -67.86 | -57 | -10.86 | Peak | Horizontal |
| | 411.2 | -66.78 | -57 | -9.78 | Peak | Vertical |
| | 797.3 | -67.00 | -57 | -10.00 | Peak | Horizontal |
| | 601.1 | -64.48 | -57 | -7.48 | Peak | Vertical |
| | 1141.4 | -57.57 | -47 | -10.57 | Peak | Horizontal |
| | 1572.0 | -57.75 | -47 | -10.75 | Peak | Vertical |
| | 2144.9 | -52.07 | -47 | -5.07 | Peak | Horizontal |
| | 2116.8 | -57.32 | -47 | -10.32 | Peak | Vertical |

| | | | |
|---------------|--------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11n-HT40 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 102 | 532.3 | -73.14 | -57 | -16.14 | Peak | Horizontal |
| | 409.8 | -63.84 | -57 | -6.84 | Peak | Vertical |
| | 768.6 | -74.93 | -57 | -17.93 | Peak | Horizontal |
| | 562.5 | -66.64 | -57 | -9.64 | Peak | Vertical |
| | 1516.3 | -59.76 | -47 | -12.76 | Peak | Horizontal |
| | 1334.2 | -54.97 | -47 | -7.97 | Peak | Vertical |
| | 2205.8 | -52.02 | -47 | -5.02 | Peak | Horizontal |
| | 2617.5 | -52.16 | -47 | -5.16 | Peak | Vertical |
| Ant 1 | | | | | | |
| 102 | 128.8 | -70.71 | -57 | -13.71 | Peak | Horizontal |
| | 117.2 | -70.85 | -57 | -13.85 | Peak | Vertical |
| | 470.4 | -71.80 | -57 | -14.80 | Peak | Horizontal |
| | 316.4 | -63.11 | -57 | -6.11 | Peak | Vertical |
| | 1483.4 | -57.20 | -47 | -10.20 | Peak | Horizontal |
| | 1286.1 | -61.03 | -47 | -14.03 | Peak | Vertical |
| | 2134.7 | -57.36 | -47 | -10.36 | Peak | Horizontal |
| | 2613.9 | -53.98 | -47 | -6.98 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 102 | 168.2 | -72.24 | -57 | -15.24 | Peak | Horizontal |
| | 153.8 | -66.90 | -57 | -9.90 | Peak | Vertical |
| | 500.0 | -73.55 | -57 | -16.55 | Peak | Horizontal |
| | 301.9 | -63.20 | -57 | -6.20 | Peak | Vertical |
| | 1445.3 | -52.76 | -47 | -5.76 | Peak | Horizontal |
| | 1317.3 | -56.68 | -47 | -9.68 | Peak | Vertical |
| | 2125.4 | -54.93 | -47 | -7.93 | Peak | Horizontal |
| | 2654.3 | -54.08 | -47 | -7.08 | Peak | Vertical |

| | | | |
|---------------|----------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11ac-VHT20 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 100 | 423.9 | -67.46 | -57 | -10.46 | Peak | Horizontal |
| | 402.8 | -62.07 | -57 | -5.07 | Peak | Vertical |
| | 700.1 | -65.47 | -57 | -8.47 | Peak | Horizontal |
| | 620.5 | -64.97 | -57 | -7.97 | Peak | Vertical |
| | 1265.2 | -52.46 | -47 | -5.46 | Peak | Horizontal |
| | 1516.8 | -55.27 | -47 | -8.27 | Peak | Vertical |
| | 2150.4 | -55.76 | -47 | -8.76 | Peak | Horizontal |
| | 2137.1 | -55.02 | -47 | -8.02 | Peak | Vertical |
| Ant 1 | | | | | | |
| 100 | 433.7 | -66.45 | -57 | -9.45 | Peak | Horizontal |
| | 318.0 | -66.95 | -57 | -9.95 | Peak | Vertical |
| | 770.2 | -69.21 | -57 | -12.21 | Peak | Horizontal |
| | 625.2 | -62.73 | -57 | -5.73 | Peak | Vertical |
| | 1222.4 | -52.03 | -47 | -5.03 | Peak | Horizontal |
| | 1601.0 | -52.93 | -47 | -5.93 | Peak | Vertical |
| | 2160.5 | -56.63 | -47 | -9.63 | Peak | Horizontal |
| | 2058.3 | -53.22 | -47 | -6.22 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 100 | 530.2 | -72.36 | -57 | -15.36 | Peak | Horizontal |
| | 383.1 | -66.64 | -57 | -9.64 | Peak | Vertical |
| | 720.7 | -70.63 | -57 | -13.63 | Peak | Horizontal |
| | 642.2 | -65.02 | -57 | -8.02 | Peak | Vertical |
| | 1228.7 | -52.66 | -47 | -5.66 | Peak | Horizontal |
| | 1504.1 | -56.95 | -47 | -9.95 | Peak | Vertical |
| | 2228.7 | -52.55 | -47 | -5.55 | Peak | Horizontal |
| | 2062.0 | -52.14 | -47 | -5.14 | Peak | Vertical |

| | | | |
|---------------|----------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11ac-VHT40 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 102 | 484.8 | -65.14 | -57 | -8.14 | Peak | Horizontal |
| | 421.0 | -66.84 | -57 | -9.84 | Peak | Vertical |
| | 719.4 | -69.42 | -57 | -12.42 | Peak | Horizontal |
| | 600.2 | -67.13 | -57 | -10.13 | Peak | Vertical |
| | 1432.2 | -55.03 | -47 | -8.03 | Peak | Horizontal |
| | 1301.3 | -59.93 | -47 | -12.93 | Peak | Vertical |
| | 2207.4 | -52.44 | -47 | -5.44 | Peak | Horizontal |
| | 2572.5 | -52.11 | -47 | -5.11 | Peak | Vertical |
| Ant 1 | | | | | | |
| 102 | 124.2 | -75.06 | -57 | -18.06 | Peak | Horizontal |
| | 187.9 | -66.53 | -57 | -9.53 | Peak | Vertical |
| | 459.8 | -72.14 | -57 | -15.14 | Peak | Horizontal |
| | 382.8 | -64.83 | -57 | -7.83 | Peak | Vertical |
| | 1490.0 | -56.30 | -47 | -9.30 | Peak | Horizontal |
| | 1274.8 | -57.22 | -47 | -10.22 | Peak | Vertical |
| | 2236.9 | -57.60 | -47 | -10.60 | Peak | Horizontal |
| | 2617.3 | -52.65 | -47 | -5.65 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 102 | 196.0 | -72.16 | -57 | -15.16 | Peak | Horizontal |
| | 163.8 | -66.03 | -57 | -9.03 | Peak | Vertical |
| | 535.3 | -67.80 | -57 | -10.80 | Peak | Horizontal |
| | 302.5 | -64.88 | -57 | -7.88 | Peak | Vertical |
| | 1501.0 | -57.12 | -47 | -10.12 | Peak | Horizontal |
| | 1302.9 | -57.68 | -47 | -10.68 | Peak | Vertical |
| | 2187.4 | -56.98 | -47 | -9.98 | Peak | Horizontal |
| | 2558.2 | -55.73 | -47 | -8.73 | Peak | Vertical |

| | | | |
|---------------|----------------|-------------------|------|
| Test Engineer | Milo Li | Temperature | 26°C |
| Test Time | 08-22-2014 | Relative Humidity | 54% |
| Test Mode | 802.11ac-VHT80 | Test Site | AC1 |

| Channel | Frequency (MHz) | Measure Level (dBm) | Limit (dBm) | Margin (dB) | Detector | Polarization |
|-----------|-----------------|---------------------|-------------|-------------|----------|--------------|
| Ant 0 | | | | | | |
| 106 | 487.4 | -67.06 | -57 | -10.06 | Peak | Horizontal |
| | 343.7 | -62.43 | -57 | -5.43 | Peak | Vertical |
| | 767.0 | -70.11 | -57 | -13.11 | Peak | Horizontal |
| | 651.1 | -68.77 | -57 | -11.77 | Peak | Vertical |
| | 2185.0 | -52.87 | -47 | -5.87 | Peak | Horizontal |
| | 2385.3 | -53.48 | -47 | -6.48 | Peak | Vertical |
| | 3952.9 | -52.01 | -47 | -5.01 | Peak | Horizontal |
| | 2727.9 | -55.91 | -47 | -8.91 | Peak | Vertical |
| Ant 1 | | | | | | |
| 106 | 514.9 | -65.68 | -57 | -8.68 | Peak | Horizontal |
| | 349.7 | -60.30 | -57 | -3.30 | Peak | Vertical |
| | 779.9 | -73.38 | -57 | -16.38 | Peak | Horizontal |
| | 613.3 | -68.10 | -57 | -11.10 | Peak | Vertical |
| | 2212.5 | -54.09 | -47 | -7.09 | Peak | Horizontal |
| | 1559.2 | -58.44 | -47 | -11.44 | Peak | Vertical |
| | 3032.3 | -55.47 | -47 | -8.47 | Peak | Horizontal |
| | 2131.3 | -56.51 | -47 | -9.51 | Peak | Vertical |
| Ant 0 + 1 | | | | | | |
| 106 | 420.5 | -70.05 | -57 | -13.05 | Peak | Horizontal |
| | 288.3 | -67.46 | -57 | -10.46 | Peak | Vertical |
| | 671.5 | -67.59 | -57 | -10.59 | Peak | Horizontal |
| | 586.2 | -62.13 | -57 | -5.13 | Peak | Vertical |
| | 2159.9 | -52.04 | -47 | -5.04 | Peak | Horizontal |
| | 1563.4 | -55.46 | -47 | -8.46 | Peak | Vertical |
| | 3028.3 | -52.90 | -47 | -5.90 | Peak | Horizontal |
| | 2133.3 | -52.95 | -47 | -5.95 | Peak | Vertical |

10. Adaptivity (Channel Access Mechanism)

10.1. Limit

LBT based Detect and Avoid (Load based Equipment may implement an LBT based spectrum sharing mechanism as described in IEEE 802.11-2007, clauses 9 and 17, in IEEE 802.11n-2009, clauses 9, 11 and 20)

Adaptivity Limit

The CCA observation time shall be not less than 20 us, and the CCA time used by the equipment shall be declared by the supplier.

The Channel Occupancy Time shall be less than $(13 / 32) * q$ ms, $q = [4 \sim 32]$.

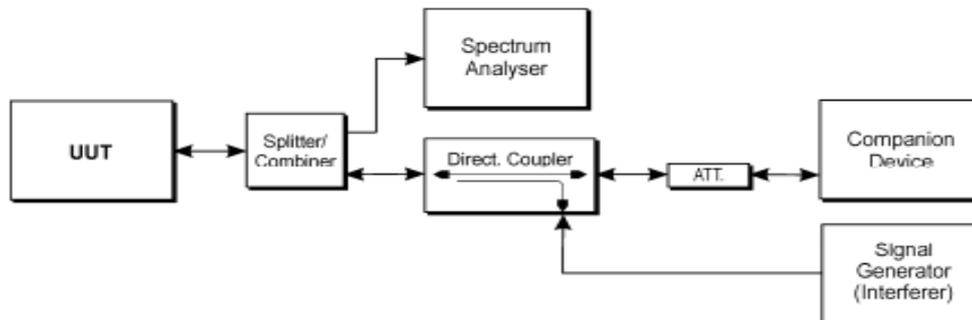
The minimum idle period varied between CCA and $q * CCA$.

When adding the interference signal, the EUT shall stop transmissions on the current operating channel.

Short Control Signalling Transmissions Limit

Short Control Signalling Transmissions shall have a maximum duty cycle of 5% within an observation period of 50ms.

10.2. Test Setup



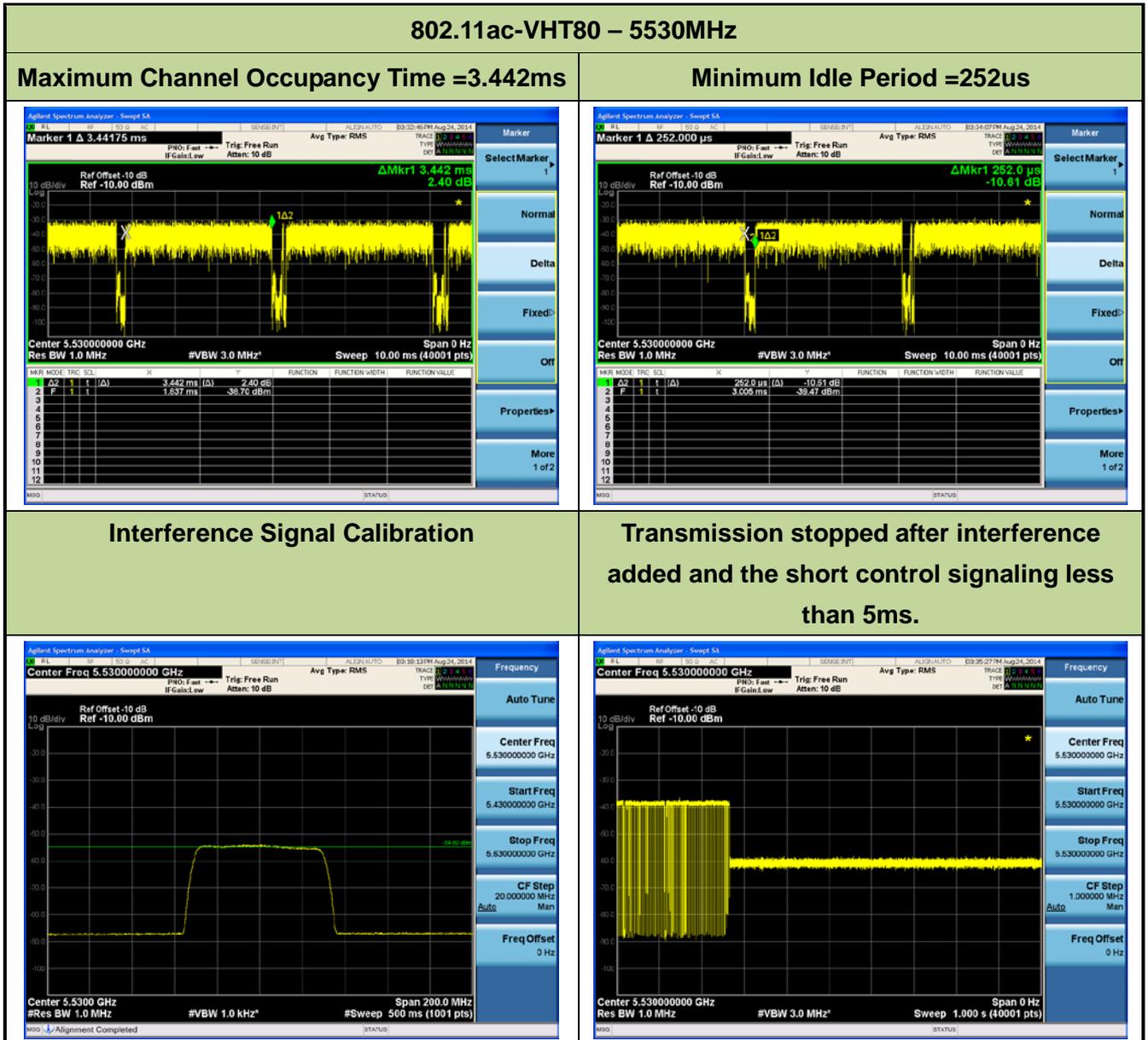
10.3. Test Procedure

Refer to ETSI EN 301 893 V1.7.1 (2012-06) Clause 5.3.9.2.1.

10.4. Test Result

| | | | |
|---------------|------------|-------------------|------|
| Test Engineer | Andy Zhu | Temperature | 26°C |
| Test Time | 08-24-2014 | Relative Humidity | 54% |

The CCA observation time was 20 us, and the maximum factor of $q = 25$ which were declared by the supplier. So the idle period varied between 20 us and 500 us and the channel occupancy time shall less than $(13 / 32) * 25 = 10.16$ ms.



Note: The Worst Detection Level = $-73 \text{ dBm/MHz} + 23 - \text{the max conducted power (dBm)} = -73 \text{ dBm/MHz} + 23 - 4.80 \text{ dBm} = -54.80 \text{ dBm/MHz}$.

| | |
|--------------|------|
| Test Result: | Pass |
|--------------|------|

11. User Access Restrictions

11.1. Requirement

DFS controls (hardware or software) related to radar detection shall not be accessible to the user so that the DFS requirements described in clauses 4.7.2.1 to 4.7.2.6 can neither be disabled nor altered.

11.2. Test Result

In the hardware, there is no switch or button to modify the DFS function or parameter for the user.

In the software, there is no options to modify the DFS function or parameter for the user.

The user access restrictions mechanism shall be implemented by the equipment which was declared by the manufacturer.

12. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

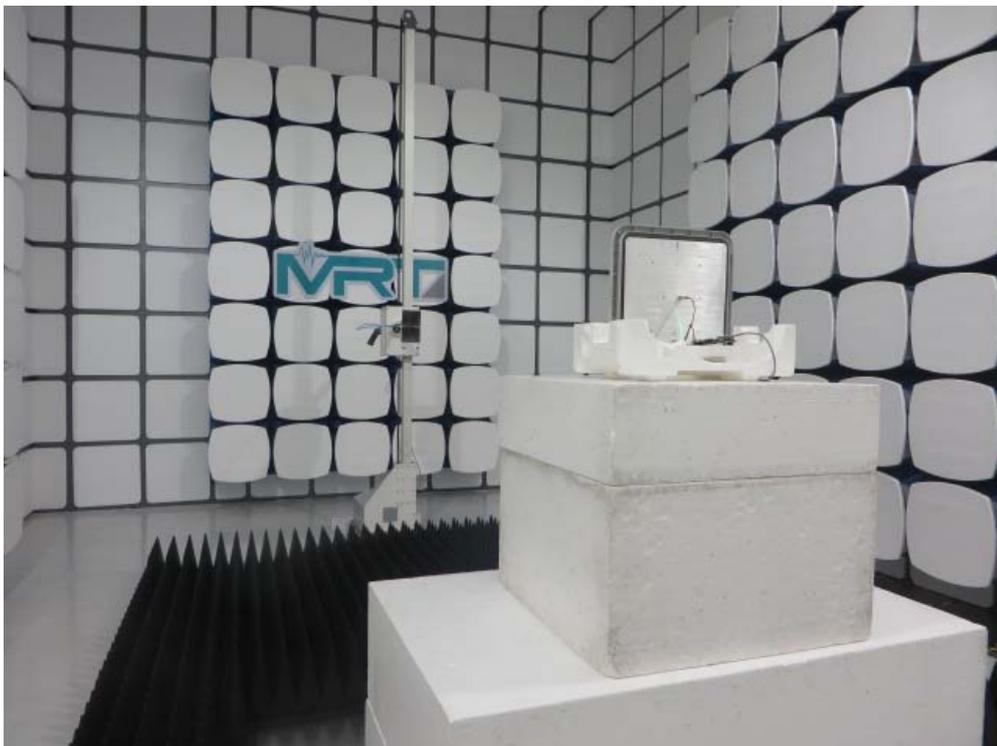
| Parameter | Uncertainty |
|-------------------------------|------------------------|
| Radio Frequency | $\pm 1 \times 10^{-5}$ |
| RF Power Conducted | $\pm 1.5\text{dB}$ |
| RF Power Radiated | $\pm 6\text{dB}$ |
| Spurious Emissions, Conducted | $\pm 3\text{dB}$ |
| Spurious Emissions, Radiated | $\pm 6\text{dB}$ |
| Humidity | $\pm 5\%$ |
| Temperature | $\pm 1^\circ\text{C}$ |
| Time | $\pm 10\%$ |

13. Test Photograph

Description: Radiated Spurious Emissions Test Setup for Below 1GHz
(Panel Antenna 25dBi)



Description: Radiated Spurious Emissions Test Setup for Above 1GHz
(Panel Antenna 25dBi)



Description: Radiated Spurious Emissions Test Setup for 18 - 40GHz
(Panel Antenna 25dBi)



Description: Radiated Spurious Emissions Test Setup for Below 1GHz
(Dipole Antenna 2dBi)



Description: Radiated Spurious Emissions Test Setup for Above 1 GHz
(Dipole Antenna 2dBi)



Description: Radiated Spurious Emissions Test Setup for 18 - 40GHz
(Dipole Antenna 2dBi)



14. List of Measuring Instrument

Carrier Frequencies

| Instrument | Manufacturer | Type No. | Cali. Interval | Cali. Due Date |
|---|--------------|-----------|----------------|----------------|
| Spectrum Analyzer | Agilent | E4447A | 1 year | 2014/11/08 |
| DC Power Supply | GWINSTEK | GPS-3030D | 1 year | 2014/11/14 |
| Programmable Temperature & Humidity Chamber | BAOYT | BYH-1500L | 1 year | 2014/11/20 |
| Temperature/Humidity Meter | Anymetre | TH101B | 1 year | 2014/11/15 |

Occupied Channel Bandwidth

| Instrument | Manufacturer | Type No. | Cali. Interval | Cali. Due Date |
|----------------------------|--------------|----------|----------------|----------------|
| Spectrum Analyzer | Agilent | N9010A | 1 year | 2015/01/04 |
| Temperature/Humidity Meter | Anymetre | TH101B | 1 year | 2014/11/15 |

RF Output Power, Transmit Power Control (TPC) and Power Density

| Instrument | Manufacturer | Type No. | Cali. Interval | Cali. Due Date |
|---|--------------|-----------|----------------|----------------|
| Power Meter | Agilent | U2021XA | 1 year | 2014/12/14 |
| DC Power Supply | GWINSTEK | GPS-3030D | 1 year | 2014/11/14 |
| Programmable Temperature & Humidity Chamber | BAOYT | BYH-1500L | 1 year | 2014/11/20 |
| Temperature/Humidity Meter | Anymetre | TH101B | 1 year | 2014/11/15 |

Transmitter Unwanted Emissions Within the 5GHz RLAN Bands

| Instrument | Manufacturer | Type No. | Cali. Interval | Cali. Due Date |
|----------------------------|--------------|----------|----------------|----------------|
| Spectrum Analyzer | Agilent | N9010A | 1 year | 2015/01/04 |
| Temperature/Humidity Meter | Anymetre | TH101B | 1 year | 2014/11/15 |

Transmitter Spurious Emissions and Receiver Spurious Emissions

| Instrument | Manufacturer | Type No. | Cali. Interval | Cal. Due Date |
|----------------------------|--------------|-----------|----------------|---------------|
| Spectrum Analyzer | Agilent | E4447A | 1 year | 2014/11/08 |
| Preamplifier | MRT | AP25M01 | 1 year | 2015/10/06 |
| Preamplifier | MRT | AP01G18 | 1 year | 2015/10/06 |
| Bilog Period Antenna | Schwarzbeck | VULB 9162 | 1 year | 2014/11/24 |
| Horn Antenna | Schwarzbeck | BBHA9120D | 1 year | 2014/11/24 |
| Broadband Horn Antenna | Schwarzbeck | BBHA9170 | 1 year | 2014/12/11 |
| Temperature/Humidity Meter | Anymetre | TH101B | 1 year | 2014/11/15 |

Adaptivity (Channel Access Mechanism)

| Instrument | Manufacturer | Type No. | Cali. Interval | Cal. Due Date |
|----------------------------|---------------|-----------------------------|----------------|---------------|
| Spectrum Analyzer | Agilent | N9010A | 1 year | 2015/01/04 |
| Vector Signal Generator | Agilent | E4438C | 1 year | 2014/12/14 |
| Directional Coupler | Narda | 4216-20 | 1 year | 2015/02/15 |
| Combiner | Mini-Circuits | ZFRSC-123-S+ DC-12000MHz | 1 year | 2014/11/20 |
| Temperature/Humidity Meter | Anymetre | TH101B | 1 year | 2014/11/15 |

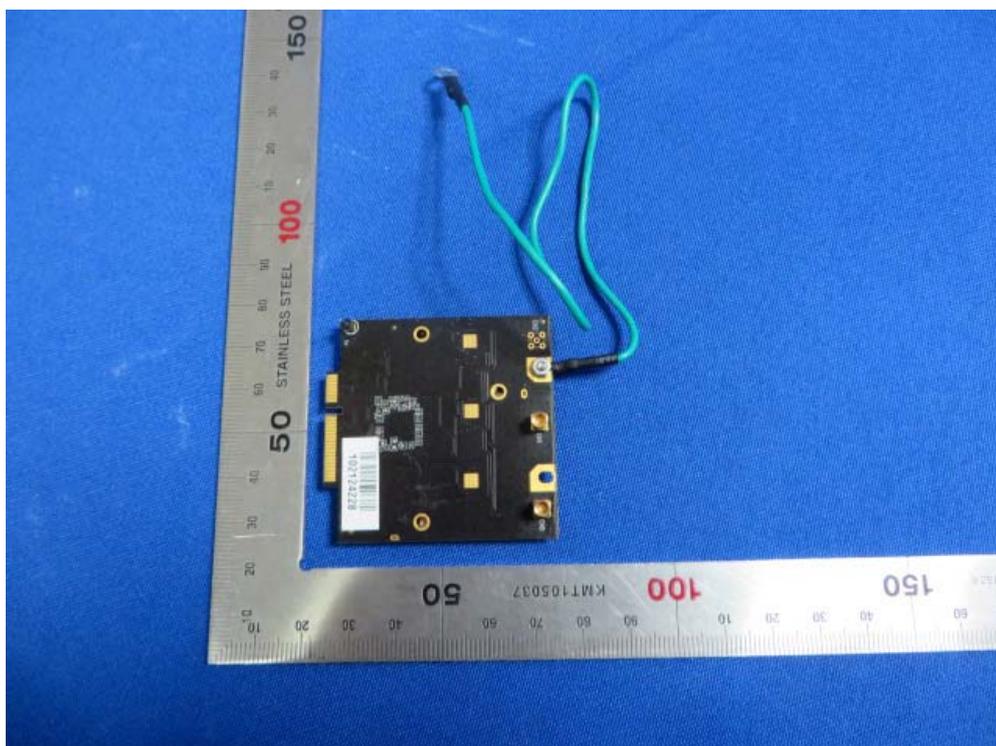
Appendix

EUT Photograph

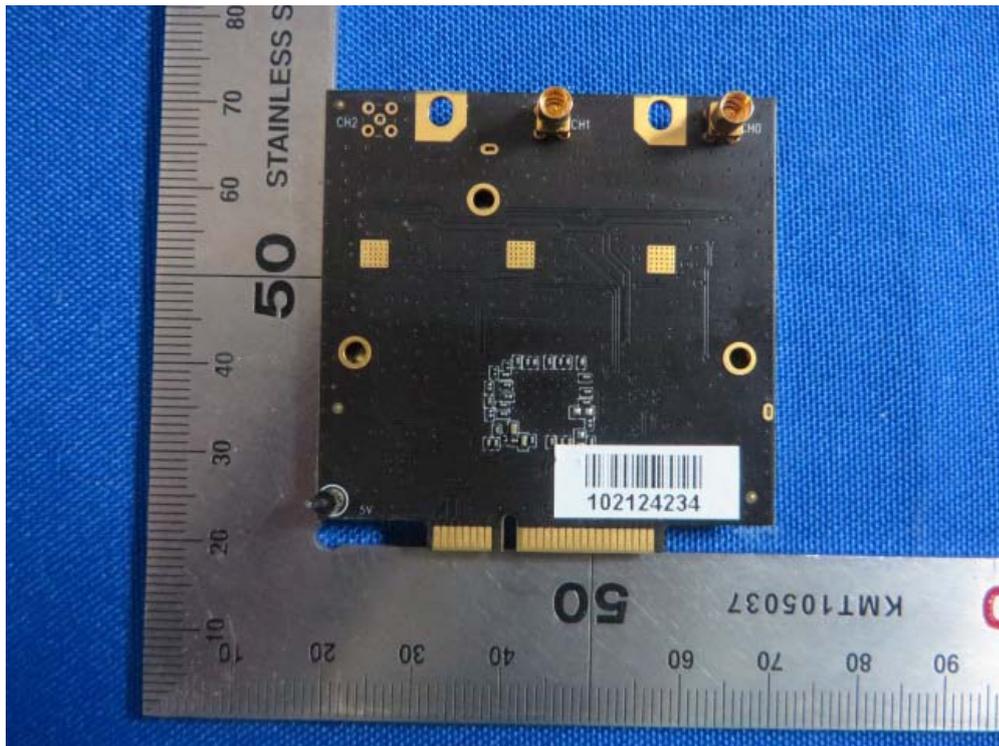
(1) EUT Photo



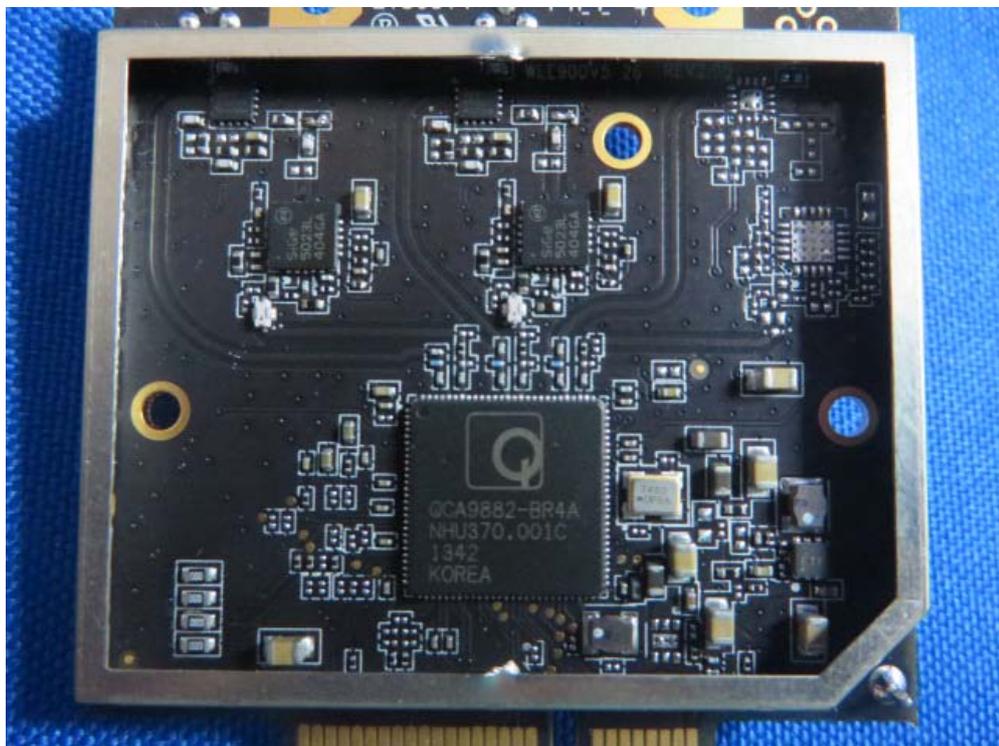
(2) EUT Photo



(3) EUT Photo



(4) EUT Photo



(5) EUT Photo (Dipole Antenna 2dBi)



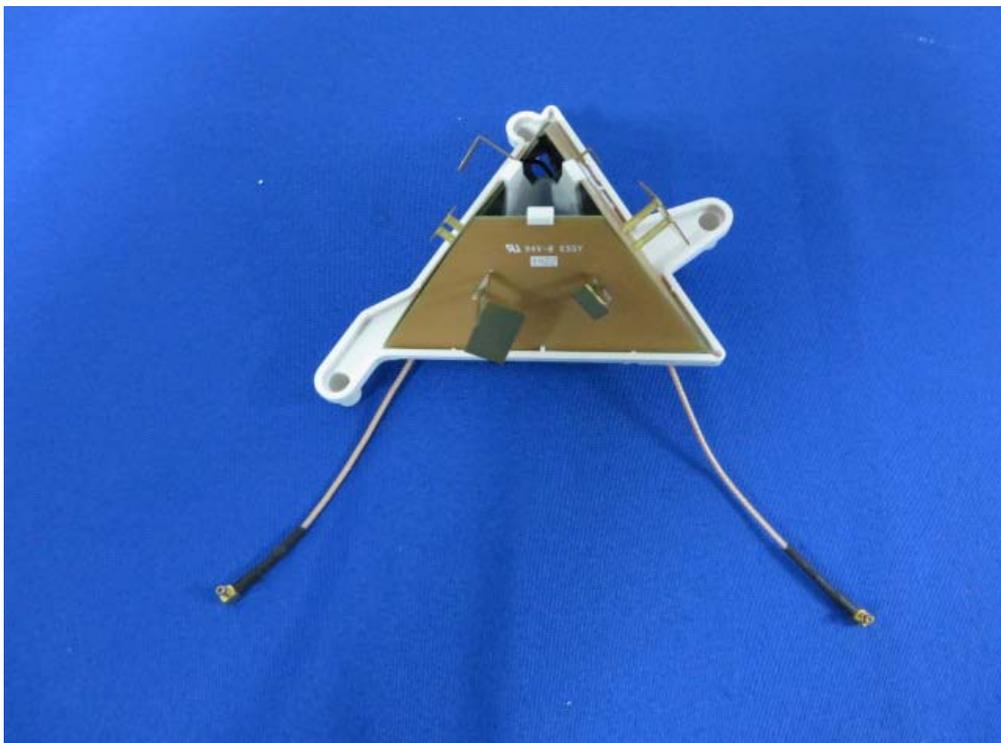
(6) EUT Photo (Panel Antenna 7dBi)



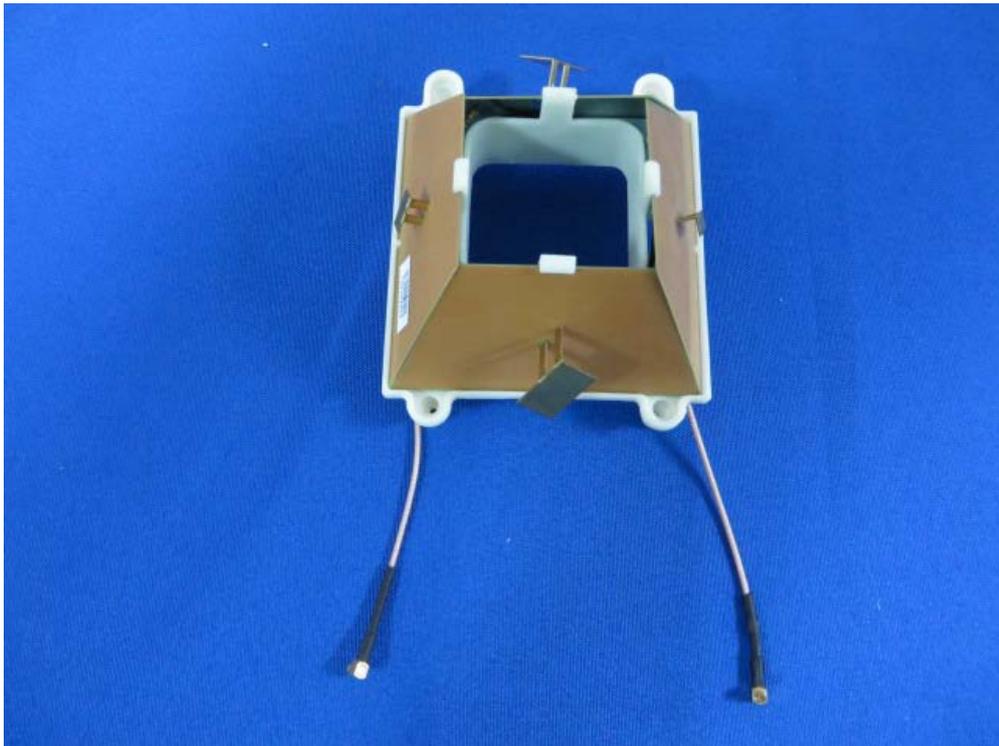
(7) EUT Photo (Panel Antenna 10dBi)



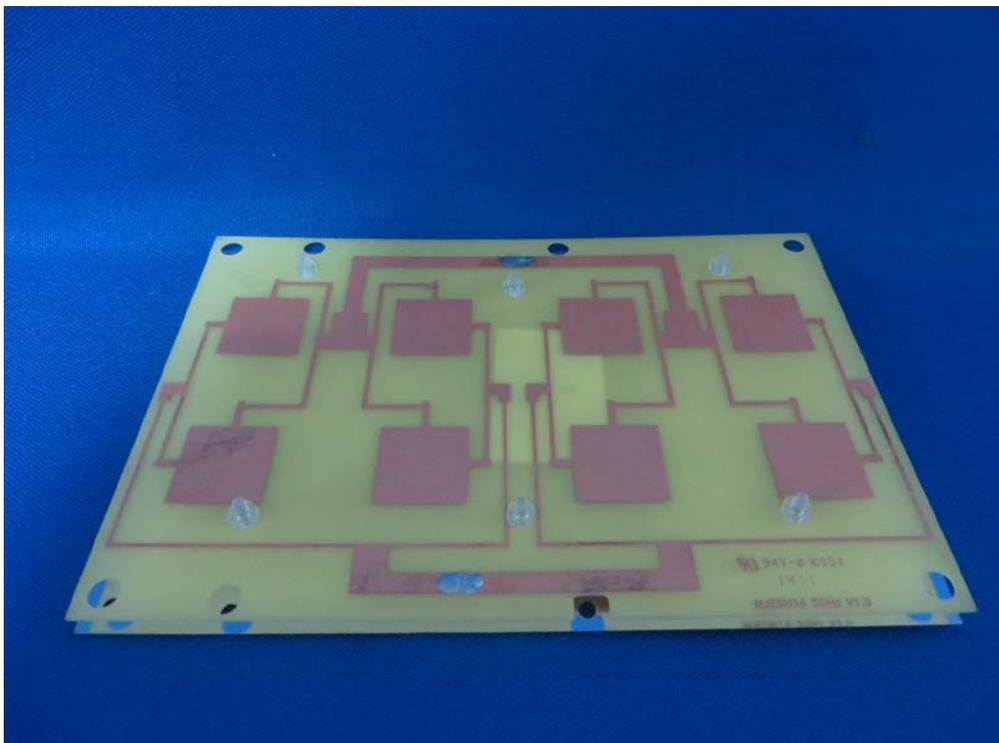
(8) EUT Photo (Panel Antenna 5dBi)



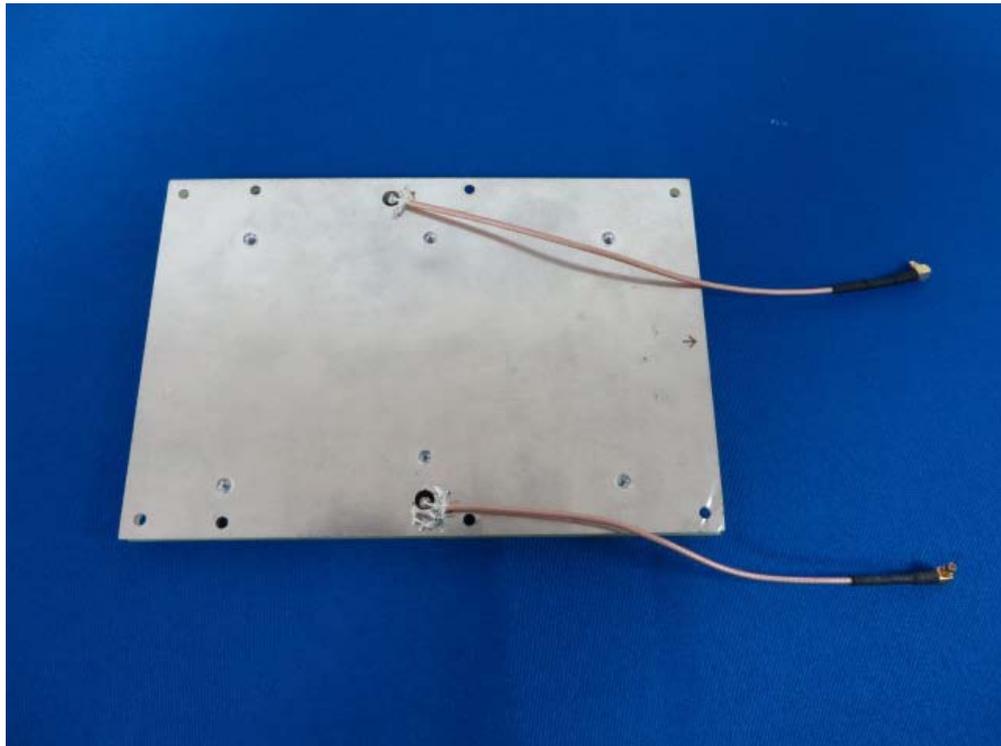
(9) EUT Photo (Panel Antenna 5dBi)



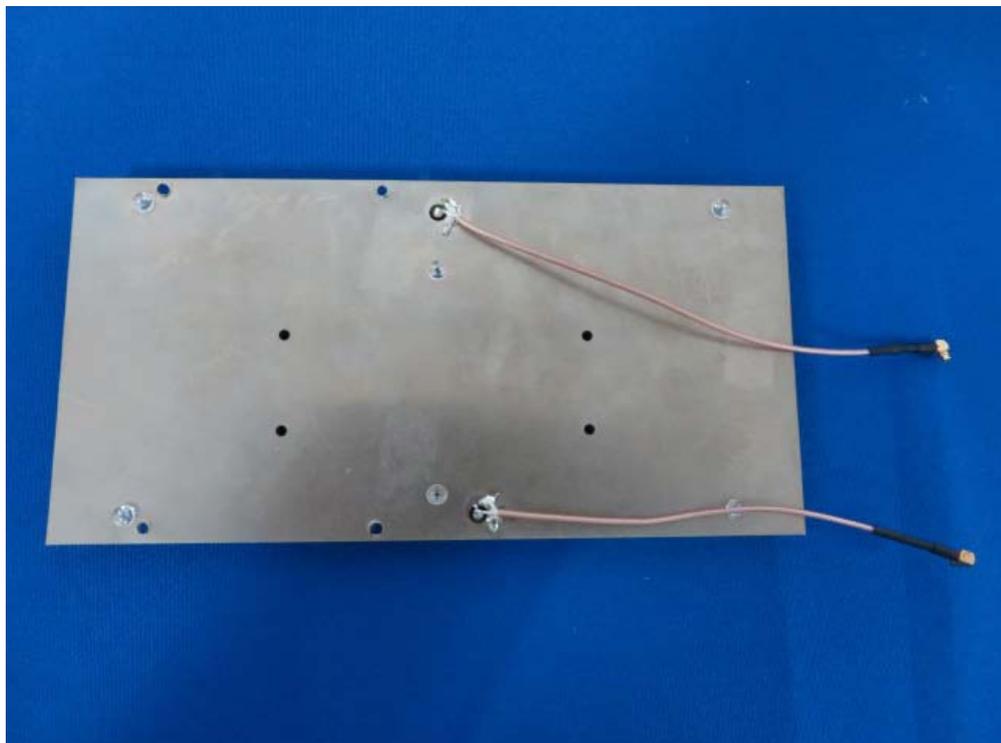
(10) EUT Photo (Panel Antenna 15dBi)



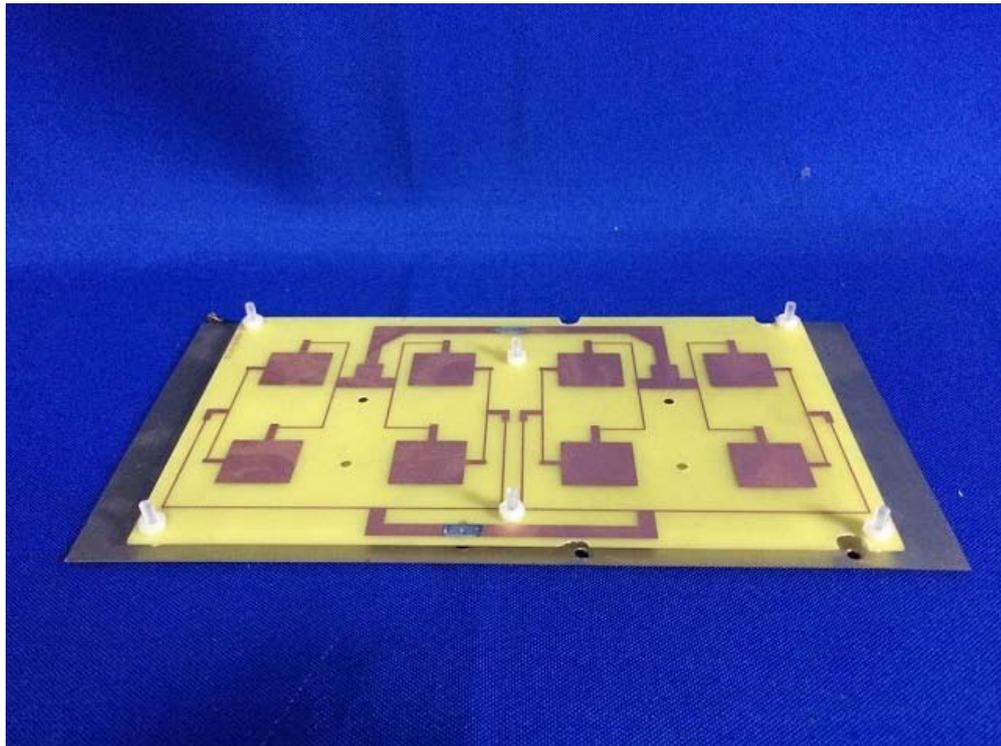
(11) EUT Photo (Panel Antenna 15dBi)



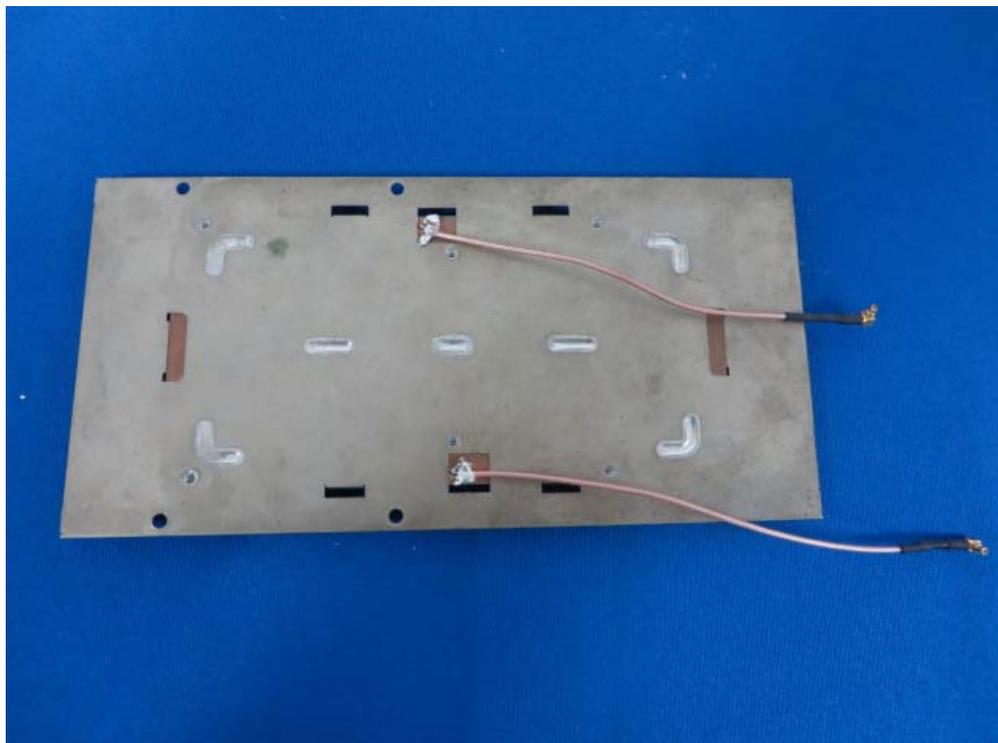
(12) EUT Photo (Panel Antenna 16dBi)



(13) EUT Photo (Panel Antenna 16dBi)



(14) EUT Photo (Panel Antenna 17dBi)



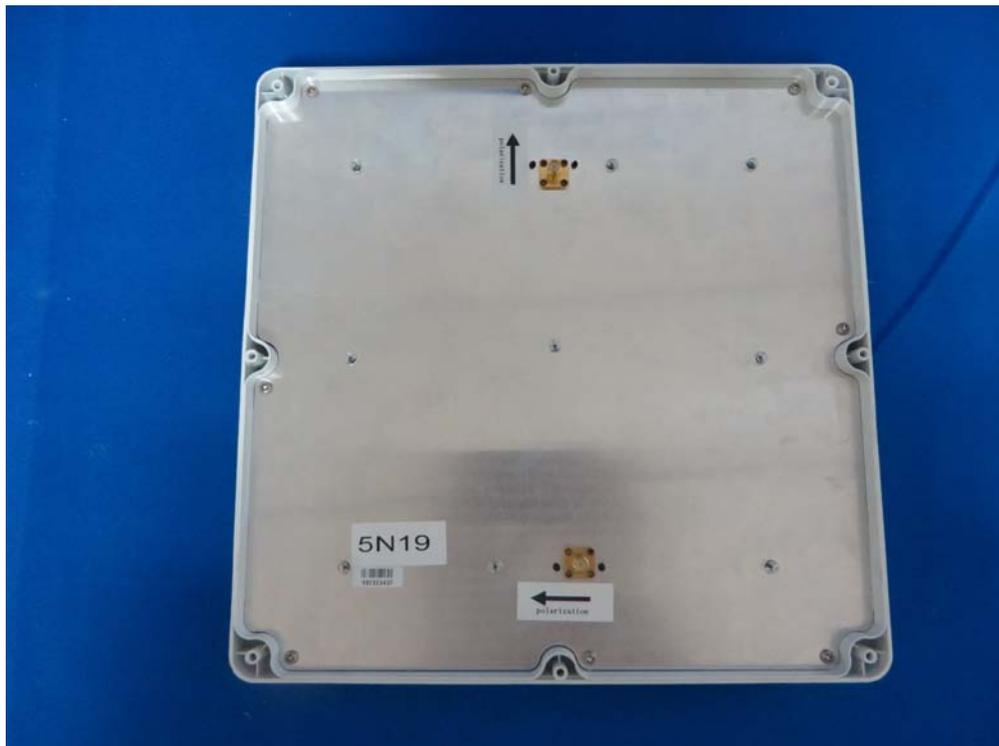
(15) EUT Photo (Panel Antenna 17dBi)



(16) EUT Photo (Panel Antenna 19dBi)



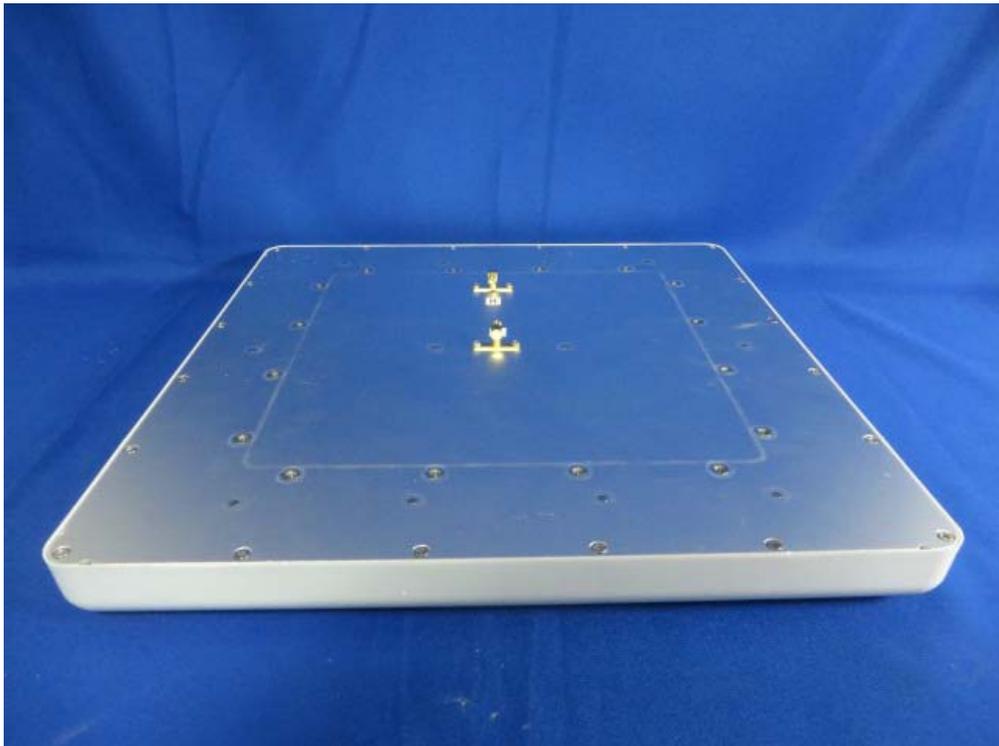
(17) EUT Photo (Panel Antenna 19dBi)



(18) EUT Photo (Panel Antenna 23dBi)



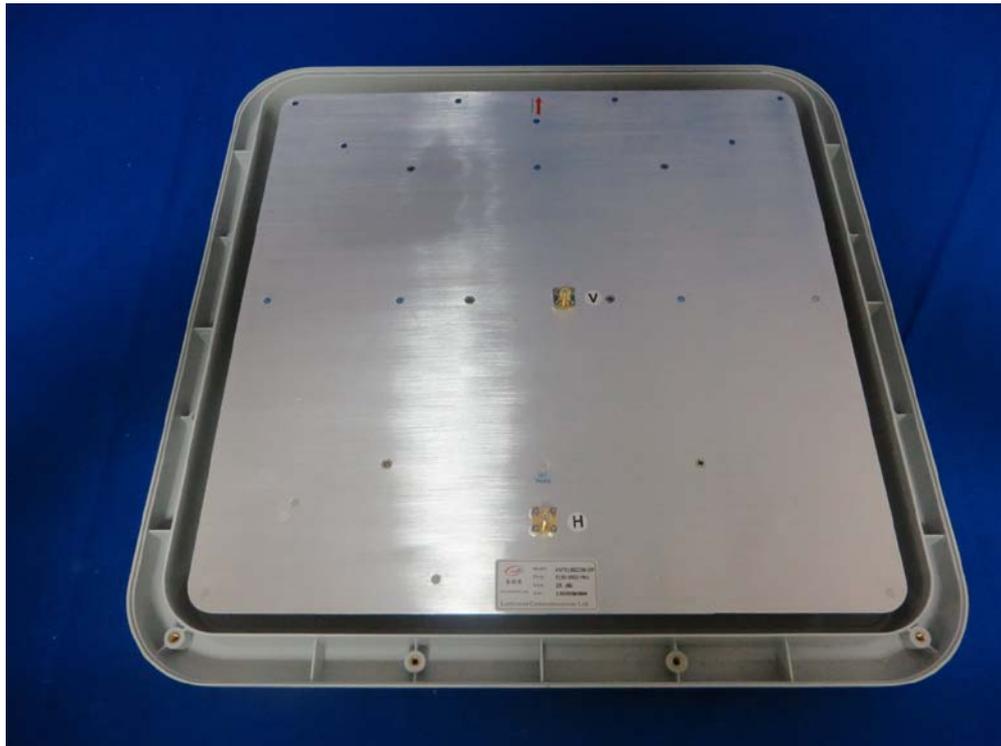
(19) EUT Photo (Panel Antenna 23dBi)



(20) EUT Photo (Panel Antenna 25dBi)



(21) EUT Photo (Panel Antenna 25dBi)



The End