

Report No.: FR7D2701-05



FCC RADIO TEST REPORT

FCC ID

: HEDML10G360

Equipment

: MetroLing 10G Tri-band Omni

Brand Name

: IgniteNet

Model Name

: ML-60-10G-360

Applicant

: Accton Technology Corp

No. 1, Creation Rd. III, Science-based Industrial

Park Hsin Chu 30077, Taiwan R.O.C.

Manufacturer

: Accton Technology Corp

No. 1, Creation Rd. III, Science-based Industrial

Park Hsin Chu 30077, Taiwan R.O.C.

Standard

: 47 CFR FCC Part 15.407

The product was received on Aug. 19, 2019, and testing was started from Aug. 23, 2019 and completed on Aug. 26, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

TEL: 886-3-656-9065

FAX: 886-3-656-9085

Report Template No.: CB-A12_1 Ver1.0

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Issued Date

: Nov. 18, 2019

Report Version : 01

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Photographs of EUT v01

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History of this test report

Report No. : FR7D2701-05

| Report No. | Version | Description | Issued Date |
|-------------|---------|-------------------------|---------------|
| FR7D2701-05 | 01 | Initial issue of report | Nov. 18, 2019 |
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Summary of Test Result

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| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|------------------|--------------------|--------------------------------|-----------------------|--------|
| 1.1.2 | 15.203 | Antenna Requirement | PASS | - |
| 3.1 | 15.407(a) | Emission Bandwidth | PASS | - |
| 3.2 | 15.407(a) | Maximum Conducted Output Power | PASS | - |
| 3.3 | 15.407(a) | Peak Power Spectral Density | PASS | - |
| 3.4 | 15.407(b) | Unwanted Emissions | PASS | - |

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen
Report Producer: Emily Chen

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1 General Description

1.1 Information

1.1.1 RF General Information

| Frequency Range (MHz) | IEEE Std. 802.11 | Ch. Frequency (MHz) | Channel Number |
|-----------------------|-------------------------|---------------------|----------------|
| 5250-5350 | a, n (HT20), ac (VHT20) | 5260-5320 | 52-64 [4] |
| 5470-5725 | | 5500-5700 | 100-140 [11] |
| 5250-5350 | n (HT40), ac (VHT40) | 5270-5310 | 54-62 [2] |
| 5470-5725 | | 5510-5670 | 102-134 [5] |
| 5250-5350 | ac (VHT80) | 5290 | 58 [1] |
| 5470-5725 | | 5530-5610 | 106-122 [2] |

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| Band | Mode | BWch (MHz) | Nant |
|---------------|----------------|------------|------|
| 5.25-5.35GHz | 802.11a | 20 | 4TX |
| 5.25-5.35GHz | 802.11n HT20 | 20 | 4TX |
| 5.25-5.35GHz | 802.11ac VHT20 | 20 | 4TX |
| 5.25-5.35GHz | 802.11n HT40 | 40 | 4TX |
| 5.25-5.35GHz | 802.11ac VHT40 | 40 | 4TX |
| 5.25-5.35GHz | 802.11ac VHT80 | 80 | 4TX |
| 5.47-5.725GHz | 802.11a | 20 | 4TX |
| 5.47-5.725GHz | 802.11n HT20 | 20 | 4TX |
| 5.47-5.725GHz | 802.11ac VHT20 | 20 | 4TX |
| 5.47-5.725GHz | 802.11n HT40 | 40 | 4TX |
| 5.47-5.725GHz | 802.11ac VHT40 | 40 | 4TX |
| 5.47-5.725GHz | 802.11ac VHT80 | 80 | 4TX |

Note:

- 11a, HT20 and HT40 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.
- VHT20, VHT40 and VHT80 use a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM, 256QAM modulation.
- BWch is the nominal channel bandwidth.
- Nss-Min is the minimum number of spatial streams.
- Nant is the number of outputs. e.g., 2(2,3) means have 2 outputs for port 2 and port 3. 2 means have 2 outputs for port 1 and port 2.

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1.1.2 Antenna Information

| Ant. | Chain | Brand | Model Name | Antenna Type | Connector | 2.4GHz Gain (dBi) | |
|------|-------|--------|-------------------------------|------------------------|-----------|-------------------|-----|
| 1 | 1 | Accton | OAD0422EA 2AD 0617 ACN | PCB Patch | MMCV | 8.5 | |
| 1 | 2 | Accion | OAP9432FA-3AD-0617-ACN | POD Palcii | MMCX | 8.9 | |
| 2 | 3 | Accton | OAP9432FA-3AD-0617-ACN | PCB Patch | MMCX | 8.9 | |
| 2 | 4 | Accion | OAF 9432FA-3AD-0017-ACN | FCB Fatch | IVIIVICA | 8.5 | |
| 3 | 5 | Acaton | Accton | OAD0422EA 2AD 0617 ACN | PCB Patch | MMCX | 8.5 |
| 3 | 6 | Accion | OAP9432FA-3AD-0617-ACN | PCB Patch | IVIIVICA | 8.9 | |
| 4 | 7 | Accton | Accton OAP9432FA-3AD-0617-ACN | PCB Patch | MMCX | 8.9 | |
| 4 | 8 | ACCION | OAF 9432FA-3AD-0017-ACN | FOD Palcii | IVIIVICA | 8.5 | |

| Ant. | Chain | Brand | Model Name | Antenna Type | Connector | 5GHz Gain (dBi) |
|------|-------|--------|--------------------------|--------------|-----------|-----------------|
| 5 | 1 | Accton | OAP9432FA-3AD-0617-ACN | PCB Patch | MMCX | |
| 3 | 2 | Accion | OAF 94321 A-3AD-0017-ACN | FODFAIGH | IVIIVICX | |
| 6 | 3 | Accton | OAP9432FA-3AD-0617-ACN | PCB Patch | MMCX | |
| 0 | 4 | Accion | 1 OAF9432FA-3AD-0017-ACN | 1 OD 1 atch | WINOX | Note 1 |
| 7 | 5 | Accton | OAP9432FA-3AD-0617-ACN | PCB Patch | MMCX | Note 1 |
| ' | 6 | Accion | OAF9432FA-3AD-0017-ACN | POD Palon | IVIIVICA | |
| 8 | 7 | Accton | OAP9432FA-3AD-0617-ACN | PCB Patch | MMCX | |
| ľ° | 8 | Accion | UAF9432FA-3AD-0017-ACN | FOD Palcin | IVIIVICA | |

Note 1:

| Ant. | Chain | 5GHz Gain (dBi) | | | | |
|-------|---------|-----------------|--------|--------|--------|--|
| Aiit. | Cilaiii | Band 1 | Band 2 | Band 3 | Band 4 | |
| 5 | 1 | 0.7 | 7 | 5 | 5.6 | |
| 5 | 2 | 11.3 | 8.8 | 8.1 | 6.7 | |
| 6 | 3 | 11.3 | 8.8 | 8.1 | 6.7 | |
| 0 | 4 | 0.7 | 7 | 5 | 5.6 | |
| 7 | 5 | 0.7 | 7 | 5 | 5.6 | |
| / | 6 | 11.3 | 8.8 | 8.1 | 6.7 | |
| 8 | 7 | 11.3 | 8.8 | 8.1 | 6.7 | |
| ° | 8 | 0.7 | 7 | 5 | 5.6 | |

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| Ant. | Brand | Model Name | Antenna Type | Connector | 60GHz Gain (dBi) |
|------|--------|---------------|--------------|-----------|------------------|
| 9 | Accton | 120300000225X | Chip Ant. | N/A | 17.2 |

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Note 2:

The EUT has eight antennas for WLAN.

The device contains three 60GHz approval module. (FCC ID: HEDML60PRS4601)

For 2.4GHz function:

Chain 1 ~ Chain 8 can be used as transmitting/receiving functions, but only four antennas can be used as transmitting/receiving functions at one time.

Chain 2 (Port 1), Chain 3 (Port 2), Chain 6 (Port 3) and Chain 7 (Port 4) generated the worst case, so it is tested and recorded in the report.

For 5GHz function:

Chain 1 ~ Chain 8 can be used as transmitting/receiving functions, but only four antennas can be used as transmitting/receiving functions at one time.

Chain 2 (Port 1), Chain 3 (Port 2), Chain 6 (Port 3) and Chain 7 (Port 4) generated the worst case, so it is tested and recorded in the report.

Note 3:

The above information was declared by manufacturer.

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1.1.3 Mode Test Duty Cycle

| Mode | DC | DCF(dB) | T(s) | VBW(Hz) ≥ 1/T |
|----------------|-------|---------|----------------|----------------|
| 802.11a | 0.969 | 0.14 | 2.068m | 1k |
| 802.11ac VHT20 | 0.986 | 0.06 | n/a (DC>=0.98) | n/a (DC>=0.98) |
| 802.11ac VHT40 | 0.972 | 0.12 | 2.44m | 1k |
| 802.11ac VHT80 | 0.944 | 0.25 | 1.149m | 1k |

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| NI | \sim | t | ۵ | • |
|----|--------|---|---|---|
| ľ | v | ι | ᆫ | |

- DC is Duty Cycle.
- DCF is Duty Cycle Factor.

1.1.4 EUT Operational Condition

| EUT Power Type | From PoE or DC 48V | | | | |
|-----------------------|--|-------------------|---------------------|----------------------|--|
| Beamforming Function | ☐ With beamforming ☐ Without beamforming | | Without beamforming | | |
| Weather Band | \boxtimes | With 5600~5650MHz | | Without 5600~5650MHz | |
| Function | \boxtimes | Outdoor P2M | | Indoor P2M | |
| i dilotion | | Fixed P2P | | Client | |
| TPC Function | \boxtimes | With TPC | | Without TPC | |
| Test Software Version | | Version3.0.264.0 | | | |

Note: The above information was declared by manufacturer.

1.1.5 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR7D2701-01AB Below is the table for the change of the product with respect to the original one.

| Modifications | Performance Checking |
|---|------------------------------------|
| | 1. Emission Bandwidth |
| Adding Band 2 and Band 3 | Maximum Conducted Output Power |
| (5250~5350 MHz, 5470~5725 MHz) for this device. | 3. Peak Power Spectral Density |
| | 4. Unwanted Emissions (above 1GHz) |

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1.2 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

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- 47 CFR FCC Part 15
- ANSI C63.10-2013
- FCC KDB 789033 D02 v02r01
- FCC KDB 662911 D01 v02r01
- FCC KDB 412172 D01 v01r01

1.3 Testing Location Information

| | Testing Location | | | | |
|-------------|--|-----|---|--|--|
| | HWA YA ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) | | | | |
| | | TEL | : | 886-3-327-3456 FAX : 886-3-327-0973 | |
| \boxtimes | JHUBEI | ADD | : | No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. | |
| | | TEL | : | 886-3-656-9065 FAX : 886-3-656-9085 | |

| Test Condition | Test Site No. | Test Engineer | Test Environment | Test Date |
|---------------------|---------------|---------------|----------------------|-----------------------------|
| RF Conducted | TH02-CB | Zero Chen | 24.7~25.9°C / 62~68% | Aug. 26, 2019 |
| Radiated above 1GHz | 03CH03-CB | Welson Chen | 24.2~25.7°C / 62~68% | Aug. 23, 2019~Aug. 26, 2019 |

Test site Designation No. TW0006 with FCC

Test site registered number IC 4086D with Industry Canada.

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

| Test Items | Uncertainty | Remark |
|-----------------------------------|-------------|--------------------------|
| Radiated Emission (1GHz ~ 18GHz) | 4.3 dB | Confidence levels of 95% |
| Radiated Emission (18GHz ~ 40GHz) | 5.1 dB | Confidence levels of 95% |
| Conducted Emission | 2.4 dB | Confidence levels of 95% |
| Output Power Measurement | 1.5 dB | Confidence levels of 95% |
| Power Density Measurement | 2.4 dB | Confidence levels of 95% |
| Bandwidth Measurement | 2% | Confidence levels of 95% |

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2 Test Configuration of EUT

2.1 Test Channel Mode

| Mode | Power Setting |
|--------------------------------|---------------|
| 802.11a_Nss1,(6Mbps)_4TX | - |
| 5260MHz | 15.5 |
| 5300MHz | 15 |
| 5320MHz | 15 |
| 5500MHz | 15.5 |
| 5580MHz | 15.5 |
| 5700MHz | 15.5 |
| 802.11ac VHT20_Nss1,(MCS0)_4TX | - |
| 5260MHz | 15.5 |
| 5300MHz | 15.5 |
| 5320MHz | 15.5 |
| 5500MHz | 16 |
| 5580MHz | 16 |
| 5700MHz | 16 |
| 802.11ac VHT40_Nss1,(MCS0)_4TX | - |
| 5270MHz | 14 |
| 5310MHz | 14 |
| 5510MHz | 15 |
| 5550MHz | 15 |
| 5670MHz | 15 |
| 802.11ac VHT80_Nss1,(MCS0)_4TX | - |
| 5290MHz | 15 |
| 5530MHz | 15.5 |
| 5610MHz | 15.5 |

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Note:

 VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.

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2.2 The Worst Case Measurement Configuration

| The Worst Case Mode for Following Conformance Tests | | |
|---|--|--|
| Tests Item Emission Bandwidth Maximum Conducted Output Power Peak Power Spectral Density | | |
| Test Condition | Conducted measurement at transmit chains | |

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| The Worst Case Mode for Following Conformance Tests | | |
|---|--|--|
| Tests Item | Unwanted Emissions | |
| Test Condition | Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type. | |
| Operating Mode > 1GHz | CTX | |

| The Worst Case Mode for Following Conformance Tests | | |
|---|--|--|
| Tests Item Simultaneous Transmission Analysis - Co-location RF Exposure Evaluation | | |
| Operating Mode | | |
| 1 | WLAN 2.4GHz + WLAN 5GHz + 60GHz module 1 + 60GHz module 2 + 60GHz module 3 | |
| Refer to Sporton Test Report No.: FA7D2701-05 for Co-location RF Exposure Evaluation. | | |

Note: 1. The EUT can only be used at Y axis position.

2. The PoE are for measurement only, would not be marketed, and its information as below:

| Equipment | Brand Name | Model Name | FCC ID |
|-----------|------------|-------------------|--------|
| PoE | GME | GME40B-4801135FDA | N/A |

2.3 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

2.4 Accessories

| | Accessories | | |
|-----|---------------------|--|--|
| No. | No. Description | | |
| 1 | Wall-mounted rack*1 | | |

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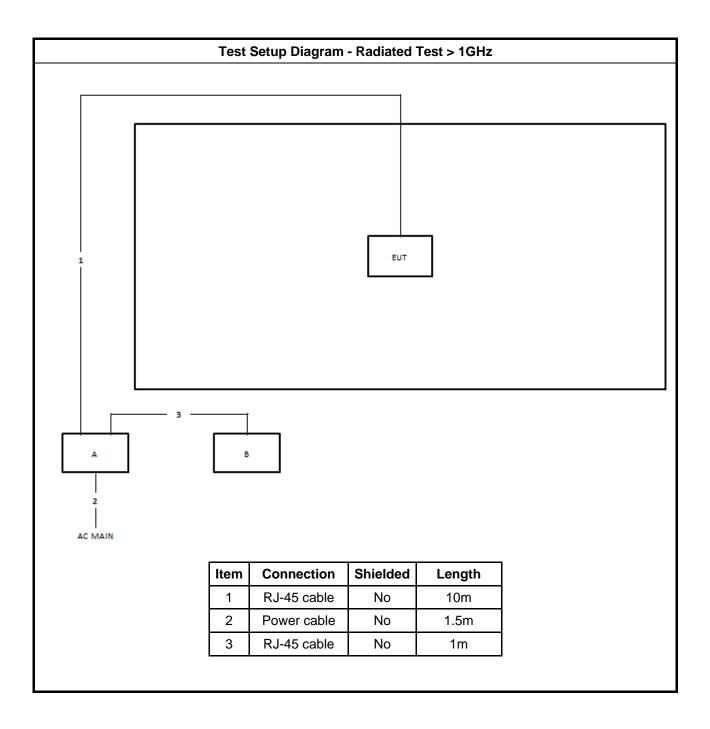
2.5 Support Equipment

| | Support Equipment | | | |
|-----|-------------------|------------|-------------------|--------|
| No. | Equipment | Brand Name | Model Name | FCC ID |
| Α | NB | DELL | E4300 | DoC |
| В | PoE | GME | GME40B-4801135FDA | N/A |

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2.6 Test Setup Diagram



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3 Transmitter Test Result

3.1 Emission Bandwidth

3.1.1 Emission Bandwidth Limit

| | Emission Bandwidth Limit |
|-------------|---|
| UNI | I Devices |
| | For the 5.15-5.25 GHz band, N/A |
| \boxtimes | For the 5.25-5.35 GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. |
| \boxtimes | For the $5.47-5.725$ GHz band, the maximum conducted output power shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. |
| | For the 5.725-5.85 GHz band, 6 dB emission bandwidth ≥ 500kHz. |
| LE- | LAN Devices |
| | For the band 5.15-5.25 GHz, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. |
| | For the 5.25-5.35 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz |
| | For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz |
| | For the 5.725-5.85 GHz band, 6 dB emission bandwidth ≥ 500kHz. |

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3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

| | Test Method | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|
| • | For the emission bandwidth shall be measured using one of the options below: | | | | | | | | |
| | Refer as FCC KDB 789033, clause C for EBW and clause D for OBW measurement. | | | | | | | | |
| | | Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing. | | | | | | | |
| | | Refer as IC RSS-Gen, clause 4.6 for bandwidth testing. | | | | | | | |

3.1.4 Test Setup

| Emission Bandwidth | | | | | | | | |
|----------------------|-----|--|--|--|--|--|--|--|
| | EUT | | | | | | | |
| Spectrum Analyzer | | | | | | | | |

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3.1.5 Test Result of Emission Bandwidth

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Refer as Appendix A

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3.2 Maximum Conducted Output Power

3.2.1 Maximum Conducted Output Power Limit

| | Maximum Conducted Output Power Limit |
|-----|---|
| UNI | I Devices |
| | For the 5.15-5.25 GHz band: |
| | Outdoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If G_{TX} > 6 dBi, then $P_{Out} = 30 - (G_{TX} - 6)$. e.i.r.p. at any elevation angle above 30 degrees \leq 125mW [21dBm] |
| | Indoor AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6) |
| | Point-to-point AP: the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$. |
| | ■ Mobile or Portable Client: the maximum conducted output power (P _{Out}) shall not exceed the lesser of 250 mW. If G _{TX} > 6 dBi, then P _{Out} = 24 - (G _{TX} - 6). |
| | For the 5.25-5.35 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$. |
| | For the 5.47-5.725 GHz band, the maximum conducted output power (P_{Out}) shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz. If G_{TX} > 6 dBi, then P_{Out} = 24 - (G_{TX} - 6). |
| | For the 5.725-5.85 GHz band: |
| | Point-to-multipoint systems (P2M): the maximum conducted output power (P _{Out}) shall not exceed the lesser of 1 W. If G _{TX} > 6 dBi, then P _{Out} = 30 − (G _{TX} − 6). |
| | Point-to-point systems (P2P): the maximum conducted output power (P _{Out}) shall not exceed the lesser of 1 W. |
| LE- | LAN Devices |
| | For the 5.15-5.25 GHz band, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. |
| | For the 5.25-5.35 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz |
| | For the 5.47-5.6 GHz band and 5.65-5.725 GHz band, the maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz |
| | For the 5.725-5.85 GHz band: |
| | Point-to-multipoint systems (P2M): the maximum conducted output power (P _{Out}) shall not exceed the lesser of 1 W. If G _{TX} > 6 dBi, then P _{Out} = 30 − (G _{TX} − 6). |
| | Point-to-point systems (P2P): the maximum conducted output power (P_{Out}) shall not exceed the lesser of 1 W. |
| | = maximum conducted output power in dBm, = the maximum transmitting antenna directional gain in dBi. |

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3.2.2 Measuring Instruments

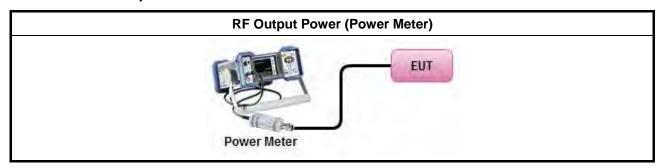
Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

| | Test Method | | | | | | | |
|---|--|--|--|--|--|--|--|--|
| • | Maximum Conducted Output Power | | | | | | | |
| | Average over on/off periods with duty factor | | | | | | | |
| | Refer as FCC KDB 789033, clause E Method SA-2 (spectral trace averaging). | | | | | | | |
| | Refer as FCC KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed) | | | | | | | |
| | Wideband RF power meter and average over on/off periods with duty factor | | | | | | | |
| | Refer as FCC KDB 789033, clause E Method PM-G (using an RF average power meter). | | | | | | | |
| • | For conducted measurement. | | | | | | | |
| | ■ If the EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them. | | | | | | | |
| | If multiple transmit chains, EIRP calculation could be following as methods: P_{total} = P₁ + P₂ + + P_n (calculated in linear unit [mW] and transfer to log unit [dBm]) EIRP_{total} = P_{total} + DG | | | | | | | |

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3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix B

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3.3 Peak Power Spectral Density

3.3.1 Peak Power Spectral Density Limit

| Peak Power Spectral Density Limit | | | | | | | | |
|---|--|--|--|--|--|--|--|--|
| UNII Devices | | | | | | | | |
| For the 5.15-5.25 GHz band: | | | | | | | | |
| Outdoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. G_{TX} > 6 dBi, then P_{Out} = 17 - (G_{TX} - 6). | | | | | | | | |
| Indoor AP: the peak power spectral density (PPSD) shall not exceed the lesser of 17dBm/MHz. $G_{TX} > 6$ dBi, then $P_{Out} = 17 - (G_{TX} - 6)$. | | | | | | | | |
| Point-to-point AP: the peak power spectral density (PPSD) shall not exceed the lesser of $17 dBm/MHz$. If $G_{TX} > 23 dBi$, then $P_{Out} = 17 - (G_{TX} - 23)$. | | | | | | | | |
| • Mobile or Portable Client: the peak power spectral density (PPSD) ≤ 11 dBm/MHz. If G _{TX} > 6 dB then PPSD= 11 – (G _{TX} – 6) | | | | | | | | |
| For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) \leq 11 dBm/MHz. If $G_{TX} > 6$ dB then PPSD= 11 – ($G_{TX} - 6$). | | | | | | | | |
| \boxtimes For the 5.47-5.725 GHz band, the peak power spectral density (PPSD) \leq 11 dBm/MHz. If $G_{TX} > 6$ dB then PPSD= 11 – ($G_{TX} - 6$). | | | | | | | | |
| For the 5.725-5.85 GHz band: | | | | | | | | |
| Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) \leq 30 dBm/500kHz. $G_{TX} > 6$ dBi, then PPSD= $30 - (G_{TX} - 6)$. | | | | | | | | |
| Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. | | | | | | | | |
| LE-LAN Devices | | | | | | | | |
| ☐ For the 5.15-5.25 GHz band, the e.i.r.p. peak power spectral density (PPSD) \leq 10 dBm/MHz. | | | | | | | | |
| ☐ For the 5.25-5.35 GHz band, the peak power spectral density (PPSD) \leq 11 dBm/MHz. | | | | | | | | |
| e.i.r.p. greater than 200 mW shall comply with the following e.i.r.p. at different elevations, where is the angle above the local horizontal plane (of the Earth) as shown below: -13 dBW/MHz for 0° ≤ θ < 8°; -13 − 0.716 (θ-8) dBW/MHz for 8° ≤ θ < 40° -35.9 − 1.22 (θ-40) dBW/MHz for 40° ≤ θ ≤ 45°; -42 dBW/MHz for θ > 45° | | | | | | | | |
| $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $ | | | | | | | | |
| For the 5.725-5.85 GHz band: | | | | | | | | |
| Point-to-multipoint systems (P2M): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. G_{TX} > 6 dBi, then PPSD= 30 - (G_{TX} - 6). | | | | | | | | |
| Point-to-point systems (P2P): the peak power spectral density (PPSD) ≤ 30 dBm/500kHz. | | | | | | | | |
| PPSD = peak power spectral density that he same method as used to determine the conducted outpopower shall be used to determine the power spectral density. And power spectral density in dBm/MHz G_{TX} = the maximum transmitting antenna directional gain in dBi. | | | | | | | | |

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3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

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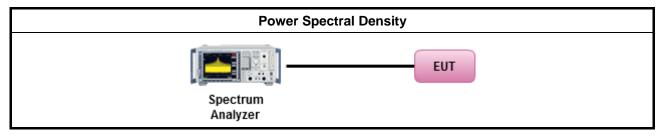
3.3.3 Test Procedures

| | | Test Method |
|---|--------------|--|
| | outp func | k power spectral density procedures that the same method as used to determine the conducted out power shall be used to determine the peak power spectral density and use the peak search tion on the spectrum analyzer to find the peak of the spectrum. For the peak power spectral density I be measured using below options: |
| | | Refer as FCC KDB 789033, F)5) power spectral density can be measured using resolution bandwidths < 1 MHz provided that the results are integrated over 1 MHz bandwidth |
| | [duty | y cycle ≥ 98% or external video / power trigger] |
| | \boxtimes | Refer as FCC KDB 789033, clause E Method SA-1 (spectral trace averaging). |
| | | Refer as FCC KDB 789033, clause E Method SA-1 Alt. (RMS detection with slow sweep speed) |
| | duty | cycle < 98% and average over on/off periods with duty factor |
| | \boxtimes | Refer as FCC KDB 789033, clause E Method SA-2 (spectral trace averaging). |
| | | Refer as FCC KDB 789033, clause E Method SA-2 Alt. (RMS detection with slow sweep speed) |
| • | For | conducted measurement. |
| | | If the EUT supports multiple transmit chains using options given below: |
| | | Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace. |
| | | Option 2: Measure and sum spectral maxima across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs. These operations shall be performed separately over frequency spans that have different out-of-band or spurious emission limits, |
| | | Option 3: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit. |
| | • | If multiple transmit chains, EIRP PPSD calculation could be following as methods: $ PPSD_{total} = PPSD_1 + PPSD_2 + + PPSD_n \\ (calculated in linear unit [mW] and transfer to log unit [dBm]) \\ EIRP_{total} = PPSD_{total} + DG $ |

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3.3.4 Test Setup



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3.3.5 Test Result of Peak Power Spectral Density

Refer as Appendix C

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3.4 Unwanted Emissions

3.4.1 Transmitter Unwanted Emissions Limit

| Unwanted emissions below 1 GHz and restricted band emissions above 1GHz limit | | | | | | | | | | |
|---|-----------------------|-------------------------|----------------------|--|--|--|--|--|--|--|
| Frequency Range (MHz) | Field Strength (uV/m) | Field Strength (dBuV/m) | Measure Distance (m) | | | | | | | |
| 0.009~0.490 | 2400/F(kHz) | 48.5 - 13.8 | 300 | | | | | | | |
| 0.490~1.705 | 24000/F(kHz) | 33.8 - 23 | 30 | | | | | | | |
| 1.705~30.0 | 30 | 29 | 30 | | | | | | | |
| 30~88 | 100 | 40 | 3 | | | | | | | |
| 88~216 | 150 | 43.5 | 3 | | | | | | | |
| 216~960 | 200 | 46 | 3 | | | | | | | |
| Above 960 | 500 | 54 | 3 | | | | | | | |

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- Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
- Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

| | Un-restricted band emissions above 1GHz Limit | | | | | | | | | |
|--------------------|---|--|--|--|--|--|--|--|--|--|
| Operating Band | Limit | | | | | | | | | |
| ☐ 5.15 - 5.25 GHz | e.i.r.p27 dBm [68.2 dBuV/m@3m] | | | | | | | | | |
| ⊠ 5.25 - 5.35 GHz | e.i.r.p27 dBm [68.2 dBuV/m@3m] | | | | | | | | | |
| ☑ 5.47 - 5.725 GHz | e.i.r.p27 dBm [68.2 dBuV/m@3m] | | | | | | | | | |
| ☐ 5.725 - 5.85 GHz | all emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge. | | | | | | | | | |

Note 1: Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of

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linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

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3.4.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

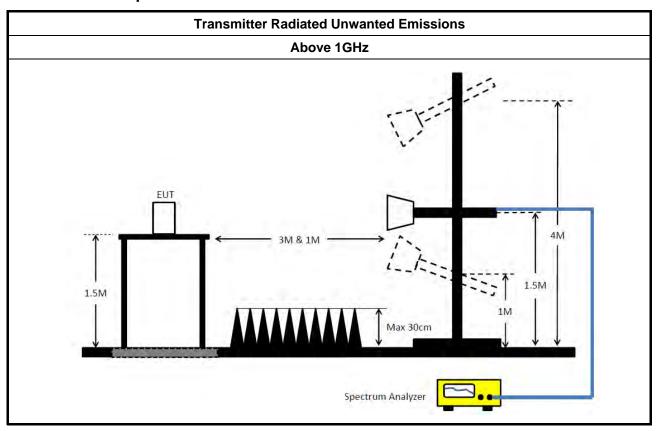
3.4.3 Test Procedures

Test Method

- Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 m for frequencies above 30 MHz, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
- The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].
- For the transmitter unwanted emissions shall be measured using following options below:
 - Refer as FCC KDB 789033, clause G)2) for unwanted emissions into non-restricted bands.
 - Refer as FCC KDB 789033, clause G)1) for unwanted emissions into restricted bands.
 - Refer as FCC KDB 789033, G)6) Method AD (Trace Averaging).
 - Refer as FCC KDB 789033, G)6) Method VB (Reduced VBW).
 - Refer as ANSI C63.10, clause 11.12.2.5.3 (Reduced VBW). VBW ≥ 1/T, where T is pulse time.
 - Refer as ANSI C63.10, clause 7.5 average value of pulsed emissions.
 - Refer as FCC KDB 789033, clause G)5) measurement procedure peak limit.
 - Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit.
- For radiated measurement.
 - Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m.
 - Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m.
 - Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1GHz.
- The any unwanted emissions level shall not exceed the fundamental emission level.
- All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

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3.4.4 Test Setup



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3.4.5 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.4.6 Test Result of Transmitter Unwanted Emissions

Refer as Appendix D

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4 Test Equipment and Calibration Data

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Calibration Due Date | Remark | |
|----------------------|----------------|-------------------|---------------------|------------------|---------------------|-------------------------|--------------------------|--|
| Horn Antenna | ETS · Lindgren | 3115 | 6821 | 750MHz~18GHz | Jan. 24, 2019 | Jan. 23, 2020 | Radiation (03CH03-CB) | |
| Horn Antenna | Schwarzbeck | BBHA 9170 | BBHA91702 52 | 15GHz ~ 40GHz | Jun. 27, 2019 | Jun. 26, 2020 | Radiation (03CH03-CB) | |
| Pre-Amplifier | Agilent | 8449B | 3008A02097 | 1GHz ~ 26.5GHz | Dec. 20, 2018 | Dec. 19, 2019 | Radiation (03CH03-CB) | |
| Pre-Amplifier | MITEQ | TTA1840-35- HG | 1864479 | 18GHz ~ 40GHz | Jul. 03, 2019 | Jul. 02, 2020 | Radiation (03CH03-CB) | |
| Spectrum Analyzer | R&S | FSP40 | 100019 | 9kHz ~ 40GHz | Jun. 19, 2019 | Jun. 18, 2020 | Radiation (03CH03-CB) | |
| RF Cable-high | Woken | RG402 | High Cable-20+27 | 1GHz ~ 18GHz | Oct. 08, 2018 | Oct. 07, 2019 | Radiation (03CH03-CB) | |
| RF Cable-high | Woken | RG402 | High Cable-27 | 1GHz ~ 18GHz | Oct. 08, 2018 | Oct. 07, 2019 | Radiation (03CH03-CB) | |
| RF Cable-high | Woken | RG402 | High Cable-40G#1 | 18GHz ~ 40 GHz | Jul. 24, 2019 | Jul. 23, 2020 | Radiation (03CH03-CB) | |
| RF Cable-high | Woken | RG402 | High Cable-40G#2 | 18GHz ~ 40 GHz | Jul. 24, 2019 | Jul. 23, 2020 | Radiation (03CH03-CB) | |
| Spectrum analyzer | R&S | FSV40 | 101027 | 9kHz~40GHz | Jul. 02, 2019 | Jul. 01, 2020 | Conducted (TH02-CB) | |
| Power Sensor | Anritsu | MA2411B | 1531343 | 300MHz~40GHz | Jul. 31, 2019 | Jul. 30, 2020 | Conducted (TH02-CB) | |
| Power Meter | Anritsu | ML2495A | 1728001 | 300MHz~40GHz | Jul. 31, 2019 | Jul. 30, 2020 | Conducted (TH02-CB) | |
| Power Sensor | Agilent | U2021XA | MY53410001 | 50MHz~18GHz | Nov. 05, 2018 | Nov. 04, 2019 | Conducted (TH02-CB) | |
| RF Cable-high | Woken | RG402 | High Cable-01 | 1 GHz – 26.5 GHz | Oct. 08, 2018 | Oct. 07, 2019 | Conducted (TH02-CB) | |
| RF Cable-high | Woken | RG402 | High Cable-02 | 1 GHz – 26.5 GHz | Oct. 08, 2018 | Oct. 07, 2019 | Conducted (TH02-CB) | |
| RF Cable-high | Woken | RG402 | High Cable-3 | 1 GHz – 26.5 GHz | Oct. 24, 2018 | Oct. 23, 2019 | Conducted (TH02-CB) | |
| RF Cable-high | Woken | RG402 | High Cable-04 | 1 GHz – 26.5 GHz | Oct. 08, 2018 | Oct. 07, 2019 | Conducted (TH02-CB) | |
| RF Cable-high | Woken | RG402 | High Cable-05 | 1 GHz – 26.5 GHz | Oct. 08, 2018 | Oct. 07, 2019 | Conducted (TH02-CB) | |

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Note: Calibration Interval of instruments listed above is one year.

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Summary

| Mode | Max-N dB | Max-OBW | ITU-Code | Min-N dB | Min-OBW | |
|--------------------------------|----------|---------|----------|----------|---------|--|
| | (Hz) | (Hz) | | (Hz) | (Hz) | |
| 5.25-5.35GHz | - | - | - | - | - | |
| 802.11a_Nss1,(6Mbps)_4TX | 19.89M | 16.432M | 16M4D1D | 19.17M | 16.342M | |
| 802.11ac VHT20_Nss1,(MCS0)_4TX | 20.58M | 17.631M | 17M6D1D | 20.28M | 17.571M | |
| 802.11ac VHT40_Nss1,(MCS0)_4TX | 40.08M | 35.982M | 36M0D1D | 39.24M | 35.862M | |
| 802.11ac VHT80_Nss1,(MCS0)_4TX | 85.68M | 75.922M | 75M9D1D | 84.72M | 75.682M | |
| 5.47-5.725GHz | - | - | - | - | - | |
| 802.11a_Nss1,(6Mbps)_4TX | 19.68M | 16.462M | 16M5D1D | 19.05M | 16.342M | |
| 802.11ac VHT20_Nss1,(MCS0)_4TX | 20.76M | 17.631M | 17M6D1D | 20.16M | 17.541M | |
| 802.11ac VHT40_Nss1,(MCS0)_4TX | 39.96M | 35.982M | 36M0D1D | 39.12M | 35.802M | |
| 802.11ac VHT80_Nss1,(MCS0)_4TX | 85.8M | 75.922M | 75M9D1D | 84.36M | 75.562M | |

Max-N dB = Maximum 6dB down bandwidth for 5.725-5.85GHz band / Maximum 26dB down bandwidth for other band;

Max-OBW = Maximum99% occupied bandwidth;

Min-N dB = Minimum 6dB down bandwidth for 5.725-5.85GHz band / Maximum 26dB down bandwidth for other band;

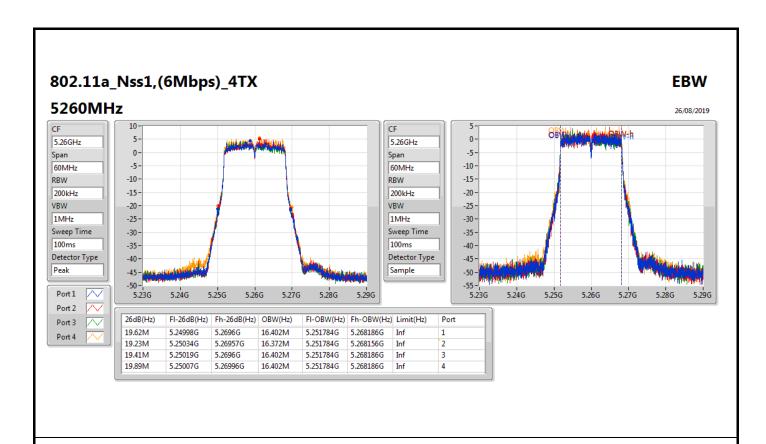
Min-OBW = Minimum 99% occupied bandwidth;

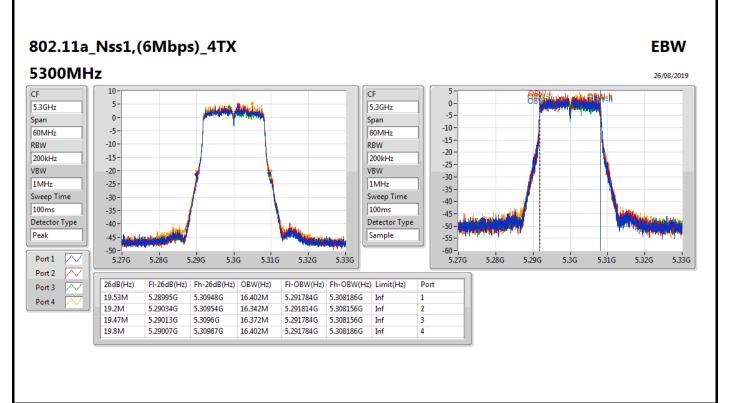


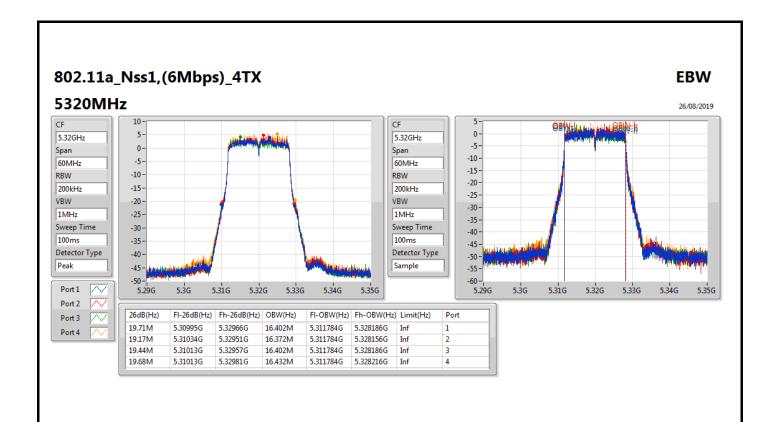
Result

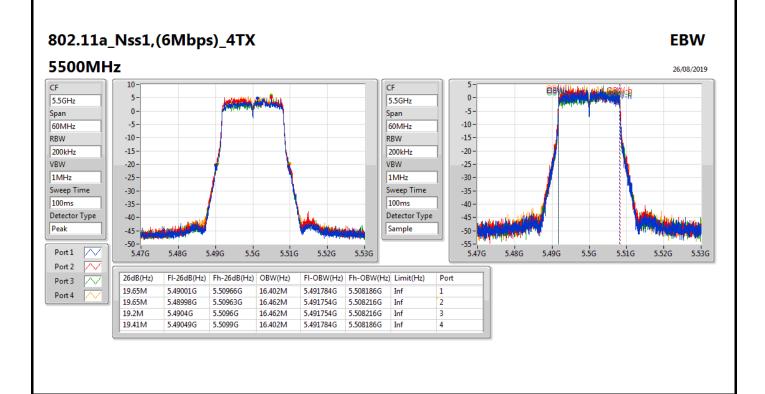
| Mode | Result | Limit | Port 1-N dB | Port 1-OBW | Port 2-N dB | Port 2-OBW | Port 3-N dB | Port 3-OBW | Port 4-N dB | Port 4-OBW |
|--------------------------------|--------|-------|-------------|------------|-------------|------------|-------------|------------|-------------|------------|
| | | (Hz) | (Hz) | (Hz) | (Hz) | (Hz) | (Hz) | (Hz) | (Hz) | (Hz) |
| 802.11a_Nss1,(6Mbps)_4TX | - | - | - | - | - | - | - | - | - | - |
| 5260MHz | Pass | Inf | 19.62M | 16.402M | 19.23M | 16.372M | 19.41M | 16.402M | 19.89M | 16.402M |
| 5300MHz | Pass | Inf | 19.53M | 16.402M | 19.2M | 16.342M | 19.47M | 16.372M | 19.8M | 16.402M |
| 5320MHz | Pass | Inf | 19.71M | 16.402M | 19.17M | 16.372M | 19.44M | 16.402M | 19.68M | 16.432M |
| 5500MHz | Pass | Inf | 19.65M | 16.402M | 19.65M | 16.462M | 19.2M | 16.462M | 19.41M | 16.402M |
| 5580MHz | Pass | Inf | 19.68M | 16.402M | 19.68M | 16.432M | 19.05M | 16.402M | 19.32M | 16.342M |
| 5700MHz | Pass | Inf | 19.65M | 16.402M | 19.59M | 16.432M | 19.11M | 16.342M | 19.53M | 16.372M |
| 802.11ac VHT20_Nss1,(MCS0)_4TX | - | - | - | - | - | - | - | - | - | - |
| 5260MHz | Pass | Inf | 20.37M | 17.601M | 20.28M | 17.571M | 20.43M | 17.601M | 20.58M | 17.601M |
| 5300MHz | Pass | Inf | 20.37M | 17.601M | 20.31M | 17.601M | 20.58M | 17.631M | 20.46M | 17.631M |
| 5320MHz | Pass | Inf | 20.34M | 17.601M | 20.28M | 17.601M | 20.4M | 17.631M | 20.4M | 17.571M |
| 5500MHz | Pass | Inf | 20.52M | 17.601M | 20.46M | 17.631M | 20.64M | 17.631M | 20.28M | 17.571M |
| 5580MHz | Pass | Inf | 20.55M | 17.601M | 20.76M | 17.631M | 20.52M | 17.571M | 20.16M | 17.541M |
| 5700MHz | Pass | Inf | 20.37M | 17.601M | 20.49M | 17.631M | 20.37M | 17.541M | 20.28M | 17.571M |
| 802.11ac VHT40_Nss1,(MCS0)_4TX | - | - | - | - | - | - | - | - | - | - |
| 5270MHz | Pass | Inf | 40.02M | 35.862M | 40.08M | 35.922M | 39.3M | 35.862M | 39.24M | 35.862M |
| 5310MHz | Pass | Inf | 39.9M | 35.922M | 40.08M | 35.982M | 39.24M | 35.862M | 39.24M | 35.922M |
| 5510MHz | Pass | Inf | 39.78M | 35.922M | 39.6M | 35.862M | 39.12M | 35.862M | 39.36M | 35.982M |
| 5550MHz | Pass | Inf | 39.9M | 35.982M | 39.78M | 35.802M | 39.3M | 35.922M | 39.6M | 35.982M |
| 5670MHz | Pass | Inf | 39.96M | 35.922M | 39.54M | 35.862M | 39.78M | 35.982M | 39.36M | 35.982M |
| 802.11ac VHT80_Nss1,(MCS0)_4TX | - | - | - | - | - | - | - | - | - | - |
| 5290MHz | Pass | Inf | 85.08M | 75.802M | 84.72M | 75.802M | 85.44M | 75.922M | 85.68M | 75.682M |
| 5530MHz | Pass | Inf | 84.36M | 75.802M | 84.96M | 75.802M | 85.44M | 75.802M | 85.8M | 75.922M |
| 5610MHz | Pass | Inf | 84.36M | 75.682M | 84.72M | 75.562M | 84.96M | 75.922M | 85.68M | 75.802M |

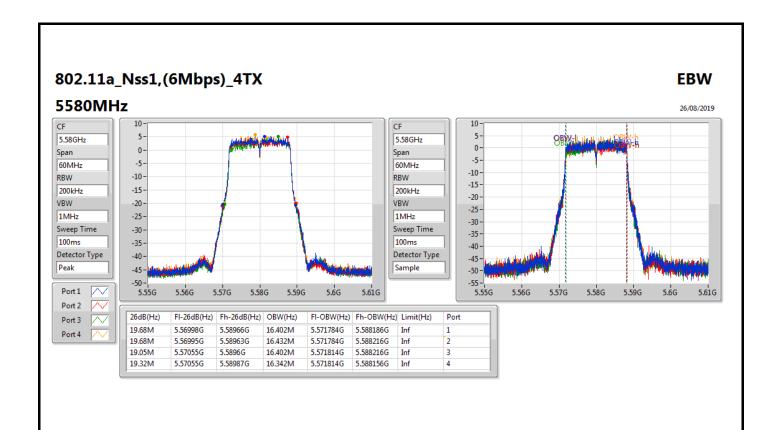
Port X-N dB = Port X 6dB down bandwidth for 5.725-5.85GHz band / 26dB down bandwidth for other band Port X-OBW = Port X 99% occupied bandwidth;

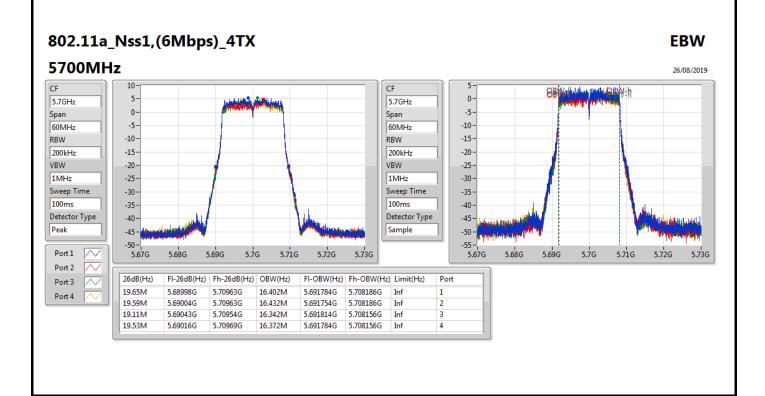


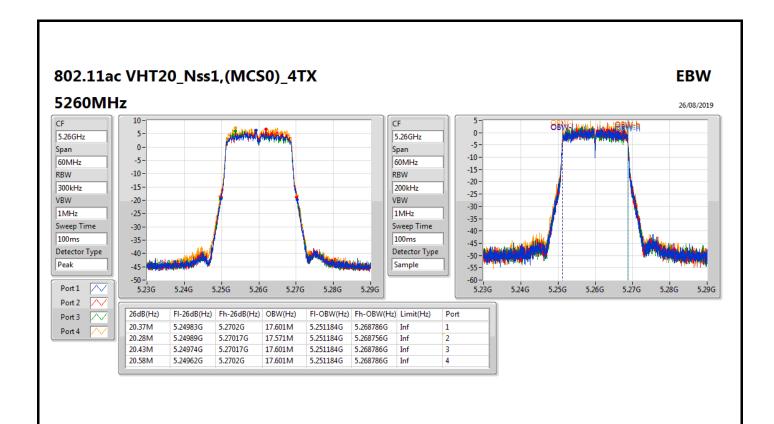


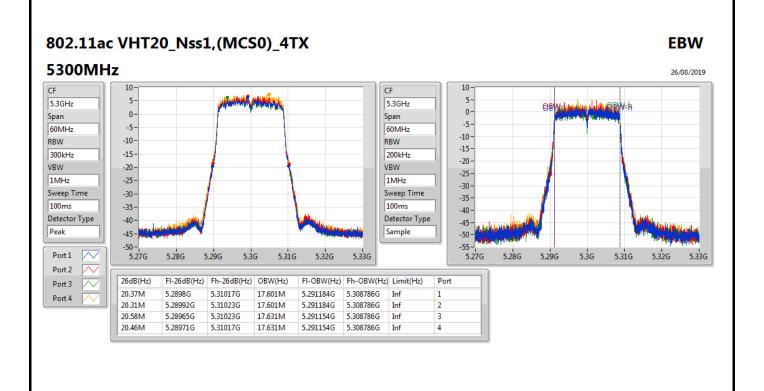


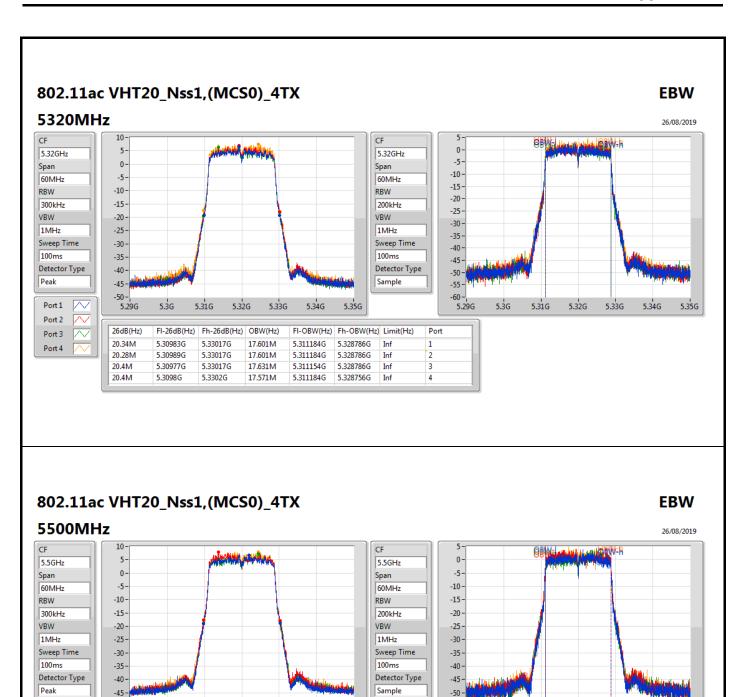








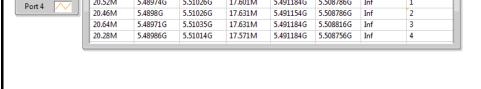




-55 5.47G

5.48G

5.49G



17.601M

5.51G

5.52G

5.491184G

5.53G

FI-OBW(Hz) Fh-OBW(Hz) Limit(Hz)

5.508786G

Inf

5.5G

-50 -5.47G

26dB(Hz)

20.52M

Port 2

Port 3

 $\overline{\sim}$

5.48G

5.48974G

5.49G

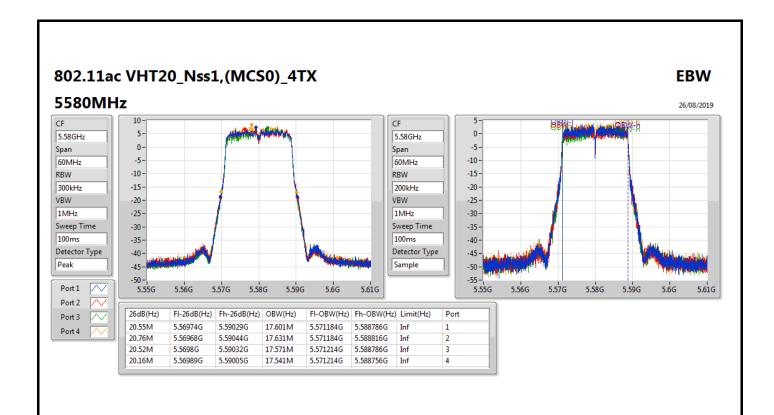
FI-26dB(Hz) Fh-26dB(Hz) OBW(Hz)

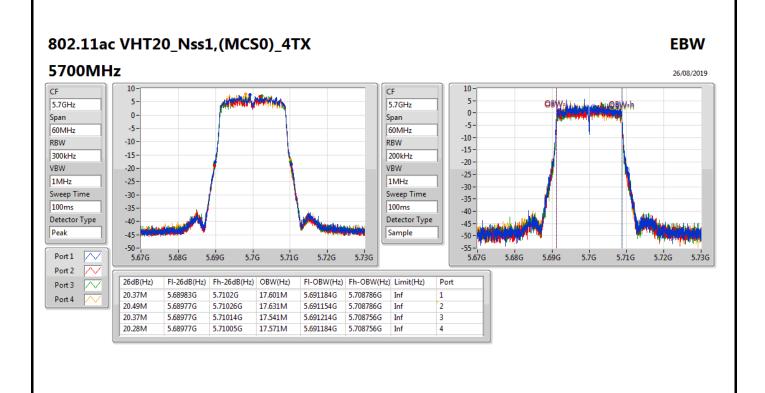
5.51026G

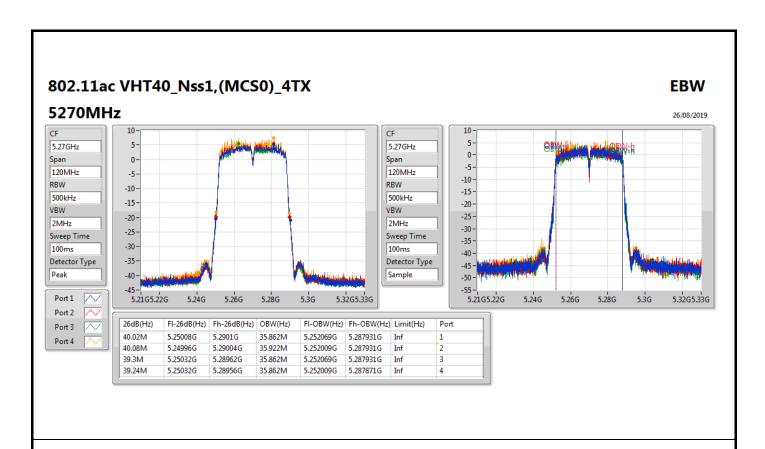
5.5G

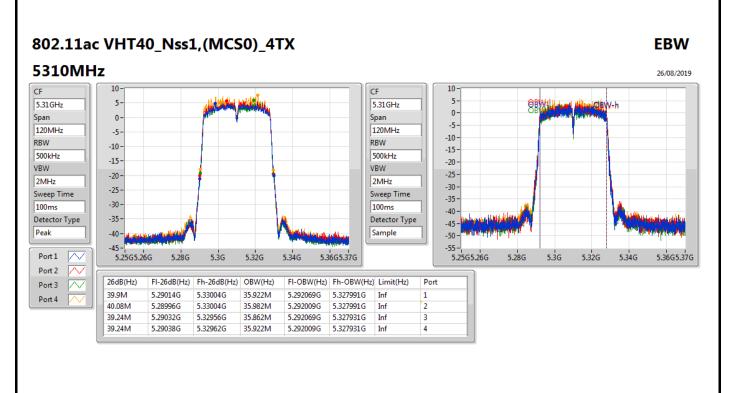
5.51G

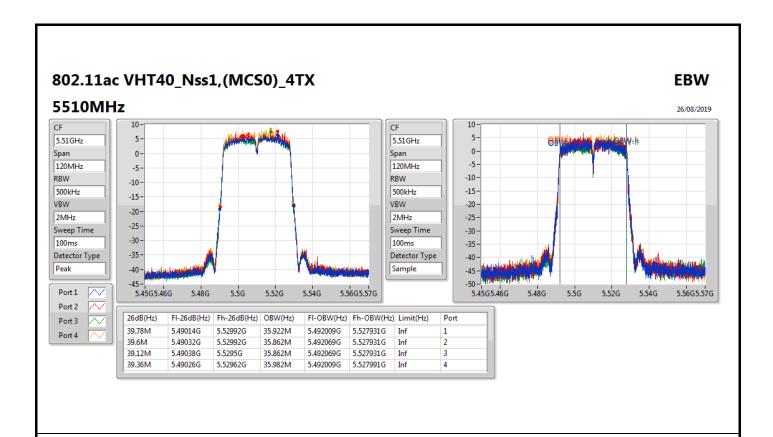
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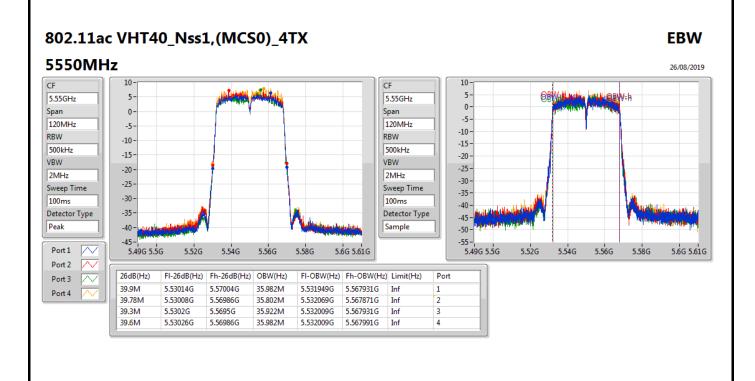


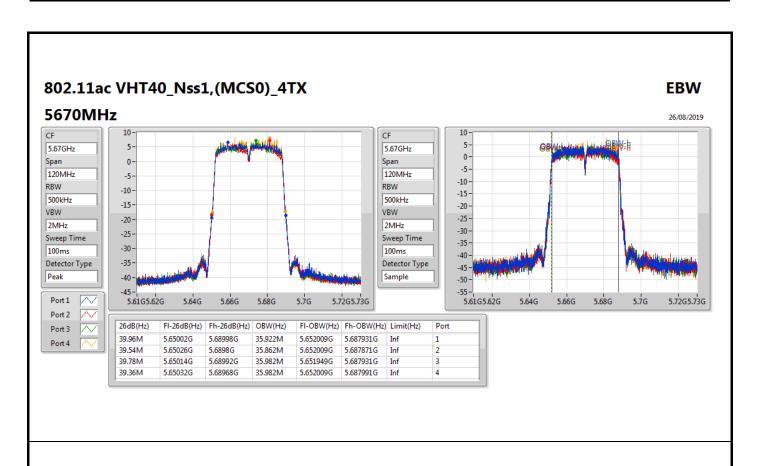


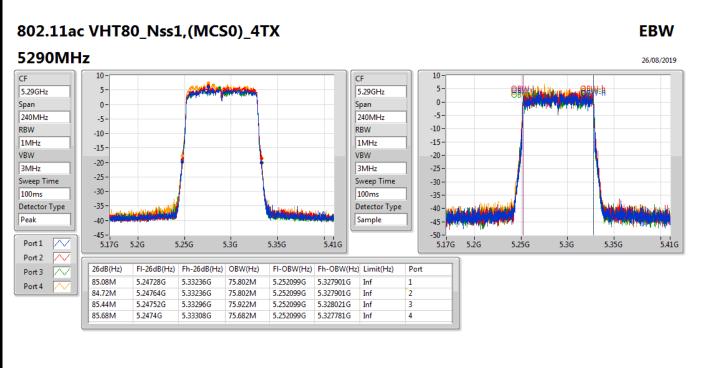


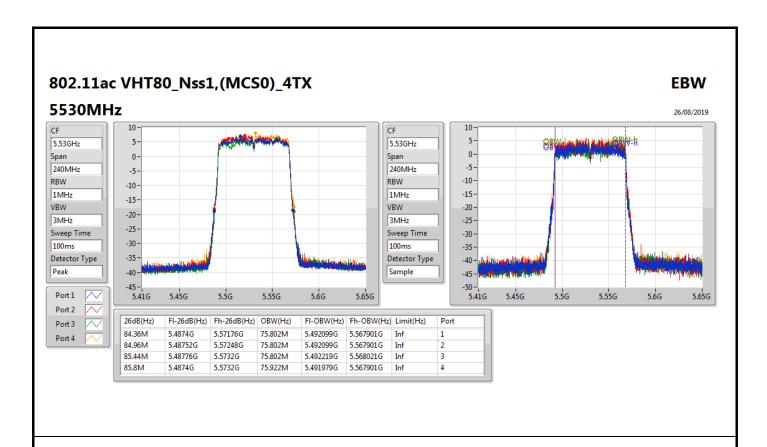


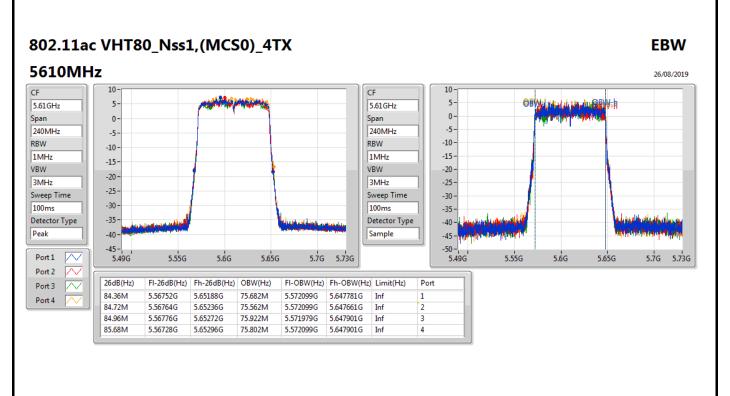












Average Power Appendix B

Summary

| Mode | Total Power | Total Power | | |
|--------------------------------|-------------|-------------|--|--|
| | (dBm) | (W) | | |
| 5.25-5.35GHz | - | - | | |
| 802.11a_Nss1,(6Mbps)_4TX | 20.91 | 0.12331 | | |
| 802.11ac VHT20_Nss1,(MCS0)_4TX | 21.20 | 0.13183 | | |
| 802.11ac VHT40_Nss1,(MCS0)_4TX | 20.90 | 0.12303 | | |
| 802.11ac VHT80_Nss1,(MCS0)_4TX | 21.03 | 0.12677 | | |
| 5.47-5.725GHz | - | - | | |
| 802.11a_Nss1,(6Mbps)_4TX | 21.60 | 0.14454 | | |
| 802.11ac VHT20_Nss1,(MCS0)_4TX | 21.89 | 0.15453 | | |
| 802.11ac VHT40_Nss1,(MCS0)_4TX | 21.89 | 0.15453 | | |
| 802.11ac VHT80_Nss1,(MCS0)_4TX | 21.75 | 0.14962 | | |

Average Power Appendix B

Result

| Mode | Result | DG | Port 1 | Port 2 | Port 3 | Port 4 | Total Power | Power Limit |
|--------------------------------|--------|-------|--------|--------|--------|--------|-------------|-------------|
| | | (dBi) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) | (dBm) |
| 802.11a_Nss1,(6Mbps)_4TX | - | - | - | - | - | - | - | - |
| 5260MHz | Pass | 8.80 | 14.59 | 14.32 | 14.27 | 16.00 | 20.88 | 21.04 |
| 5300MHz | Pass | 8.80 | 14.35 | 14.86 | 14.31 | 15.57 | 20.82 | 21.03 |
| 5320MHz | Pass | 8.80 | 14.46 | 14.91 | 14.40 | 15.68 | 20.91 | 21.03 |
| 5500MHz | Pass | 8.10 | 15.04 | 15.94 | 15.15 | 16.10 | 21.60 | 21.73 |
| 5580MHz | Pass | 8.10 | 15.55 | 15.38 | 14.96 | 15.95 | 21.50 | 21.70 |
| 5700MHz | Pass | 8.10 | 15.93 | 15.25 | 15.38 | 15.51 | 21.55 | 21.71 |
| 802.11ac VHT20_Nss1,(MCS0)_4TX | - | - | - | - | - | - | - | - |
| 5260MHz | Pass | 8.80 | 14.40 | 14.87 | 14.56 | 15.66 | 20.92 | 21.20 |
| 5300MHz | Pass | 8.80 | 14.57 | 15.14 | 14.54 | 15.82 | 21.07 | 21.20 |
| 5320MHz | Pass | 8.80 | 14.71 | 15.31 | 14.60 | 15.95 | 21.20 | 21.20 |
| 5500MHz | Pass | 8.10 | 15.39 | 16.24 | 15.57 | 16.21 | 21.89 | 21.90 |
| 5580MHz | Pass | 8.10 | 15.75 | 15.76 | 15.14 | 16.43 | 21.81 | 21.90 |
| 5700MHz | Pass | 8.10 | 16.14 | 15.43 | 15.68 | 15.87 | 21.81 | 21.90 |
| 802.11ac VHT40_Nss1,(MCS0)_4TX | - | - | - | - | - | - | - | - |
| 5270MHz | Pass | 8.80 | 14.76 | 14.60 | 14.26 | 15.47 | 20.82 | 21.20 |
| 5310MHz | Pass | 8.80 | 14.53 | 15.04 | 14.18 | 15.64 | 20.90 | 21.20 |
| 5510MHz | Pass | 8.10 | 15.60 | 16.28 | 15.26 | 16.19 | 21.87 | 21.90 |
| 5550MHz | Pass | 8.10 | 15.55 | 16.04 | 15.30 | 16.44 | 21.88 | 21.90 |
| 5670MHz | Pass | 8.10 | 15.74 | 15.64 | 15.83 | 16.23 | 21.89 | 21.90 |
| 802.11ac VHT80_Nss1,(MCS0)_4TX | - | - | - | - | - | - | - | - |
| 5290MHz | Pass | 8.80 | 14.53 | 15.19 | 14.37 | 15.80 | 21.03 | 21.20 |
| 5530MHz | Pass | 8.10 | 15.35 | 16.04 | 15.14 | 16.29 | 21.75 | 21.90 |
| 5610MHz | Pass | 8.10 | 15.24 | 15.49 | 15.16 | 16.27 | 21.58 | 21.90 |

DG = Directional Gain; Port X = Port X output power

Summary

| Mode | PD |
|--------------------------------|-----------|
| | (dBm/RBW) |
| 5.25-5.35GHz | - |
| 802.11a_Nss1,(6Mbps)_4TX | 7.97 |
| 802.11ac VHT20_Nss1,(MCS0)_4TX | 7.71 |
| 802.11ac VHT40_Nss1,(MCS0)_4TX | 4.69 |
| 802.11ac VHT80_Nss1,(MCS0)_4TX | 1.68 |
| 5.47-5.725GHz | - |
| 802.11a_Nss1,(6Mbps)_4TX | 8.49 |
| 802.11ac VHT20_Nss1,(MCS0)_4TX | 8.44 |
| 802.11ac VHT40_Nss1,(MCS0)_4TX | 5.87 |
| 802.11ac VHT80_Nss1,(MCS0)_4TX | 2.56 |

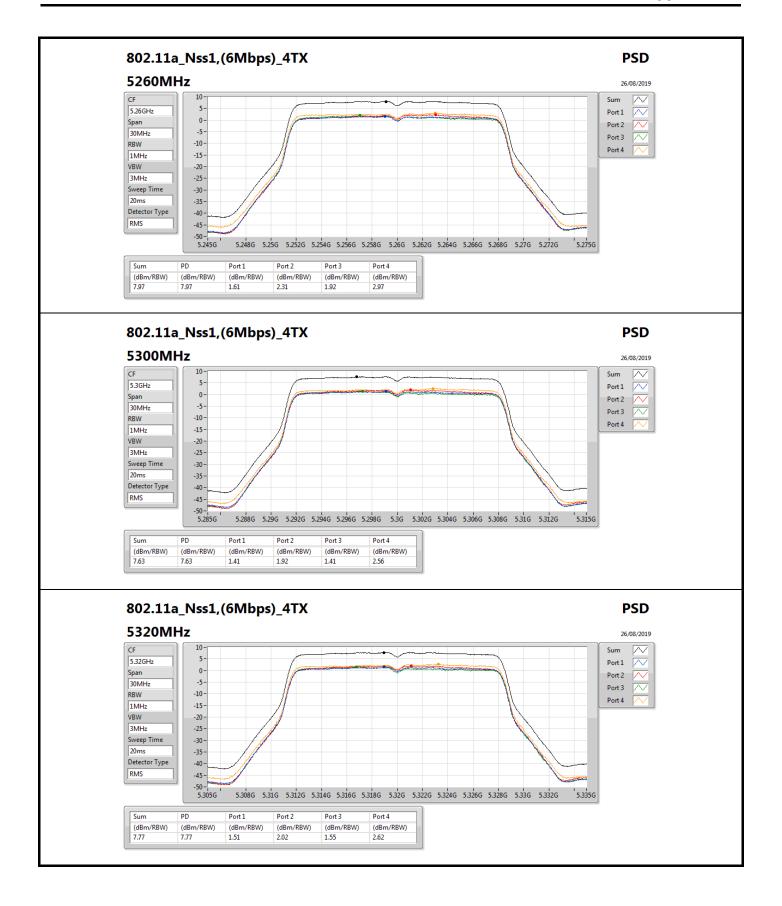
RBW = 500 kHz for 5.725-5.85GHz band / 1MHz for other band;

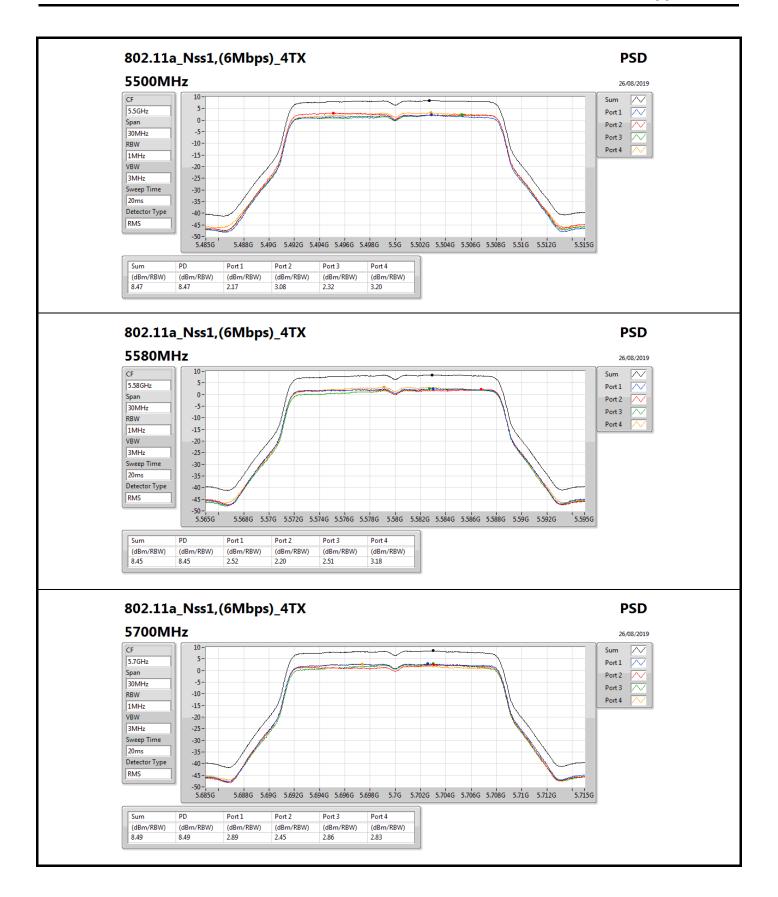
Appendix C **PSD**

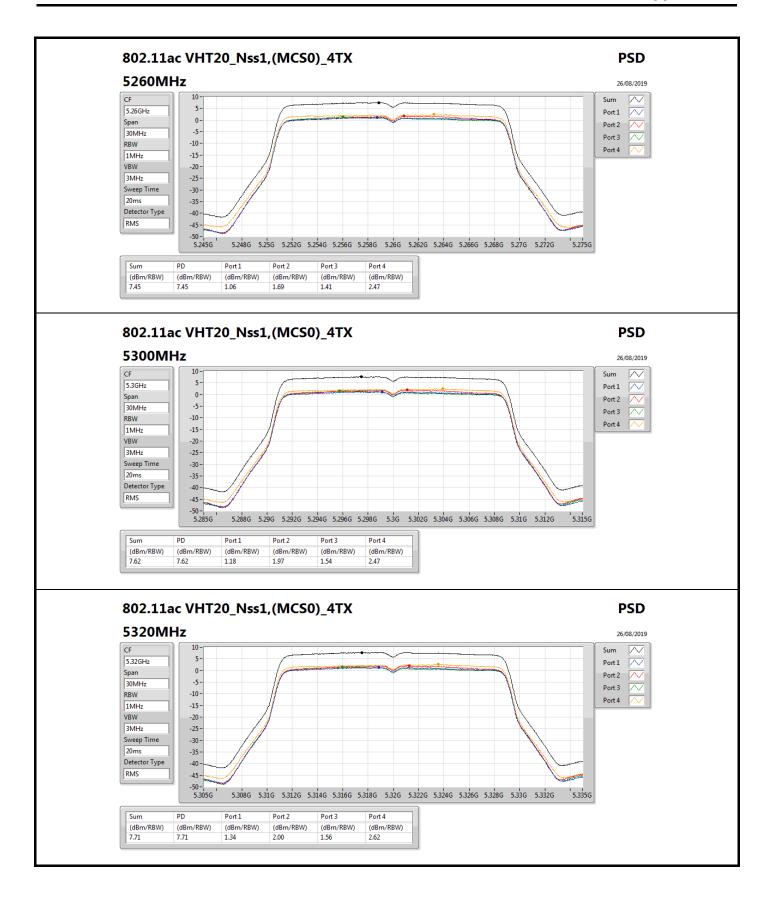
Result

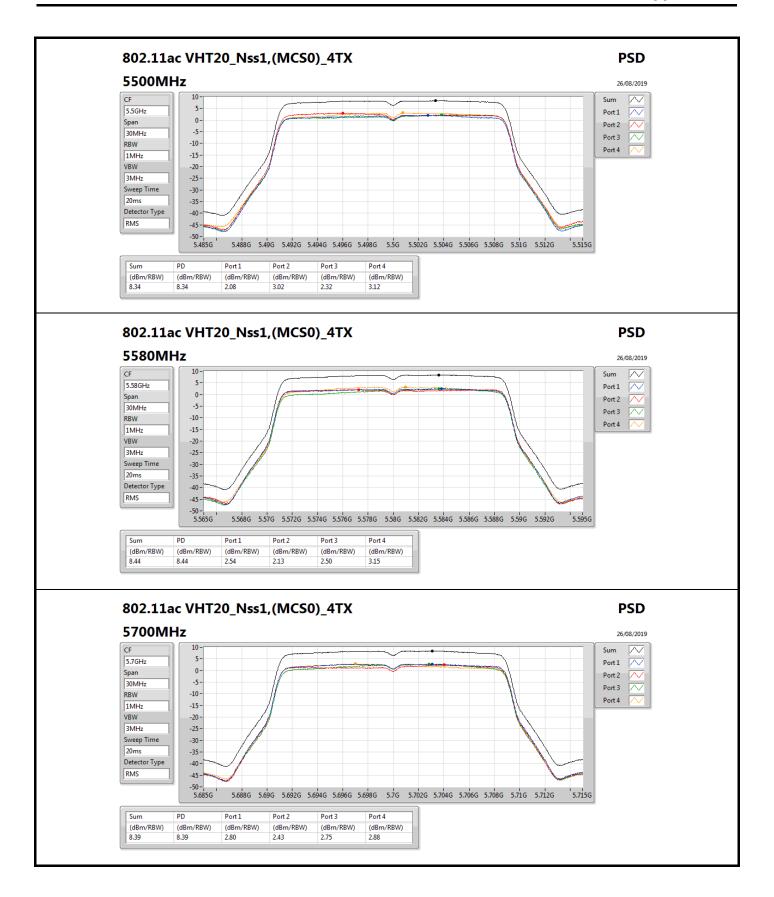
| Mode | Result | DG | Port 1 | Port 2 | Port 3 | Port 4 | PD | PD Limit |
|--------------------------------|--------|-------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | (dBi) | (dBm/RBW) | (dBm/RBW) | (dBm/RBW) | (dBm/RBW) | (dBm/RBW) | (dBm/RBW) |
| 802.11a_Nss1,(6Mbps)_4TX | - | - | - | - | - | - | - | - |
| 5260MHz | Pass | 8.80 | 1.61 | 2.31 | 1.92 | 2.97 | 7.97 | 8.20 |
| 5300MHz | Pass | 8.80 | 1.41 | 1.92 | 1.41 | 2.56 | 7.63 | 8.20 |
| 5320MHz | Pass | 8.80 | 1.51 | 2.02 | 1.55 | 2.62 | 7.77 | 8.20 |
| 5500MHz | Pass | 8.10 | 2.17 | 3.08 | 2.32 | 3.20 | 8.47 | 8.90 |
| 5580MHz | Pass | 8.10 | 2.52 | 2.20 | 2.51 | 3.18 | 8.45 | 8.90 |
| 5700MHz | Pass | 8.10 | 2.89 | 2.45 | 2.86 | 2.83 | 8.49 | 8.90 |
| 802.11ac VHT20_Nss1,(MCS0)_4TX | - | - | - | - | - | - | - | - |
| 5260MHz | Pass | 8.80 | 1.06 | 1.69 | 1.41 | 2.47 | 7.45 | 8.20 |
| 5300MHz | Pass | 8.80 | 1.18 | 1.97 | 1.54 | 2.47 | 7.62 | 8.20 |
| 5320MHz | Pass | 8.80 | 1.34 | 2.00 | 1.56 | 2.62 | 7.71 | 8.20 |
| 5500MHz | Pass | 8.10 | 2.08 | 3.02 | 2.32 | 3.12 | 8.34 | 8.90 |
| 5580MHz | Pass | 8.10 | 2.54 | 2.13 | 2.50 | 3.15 | 8.44 | 8.90 |
| 5700MHz | Pass | 8.10 | 2.80 | 2.43 | 2.75 | 2.88 | 8.39 | 8.90 |
| 802.11ac VHT40_Nss1,(MCS0)_4TX | - | - | - | - | - | - | - | - |
| 5270MHz | Pass | 8.80 | -1.37 | -1.00 | -1.54 | -0.63 | 4.69 | 8.20 |
| 5310MHz | Pass | 8.80 | -1.66 | -0.92 | -1.61 | -0.45 | 4.63 | 8.20 |
| 5510MHz | Pass | 8.10 | -0.32 | 0.44 | -0.11 | 0.58 | 5.87 | 8.90 |
| 5550MHz | Pass | 8.10 | -0.46 | 0.17 | -0.25 | 0.67 | 5.80 | 8.90 |
| 5670MHz | Pass | 8.10 | -0.25 | -0.32 | 0.12 | 0.46 | 5.72 | 8.90 |
| 802.11ac VHT80_Nss1,(MCS0)_4TX | - | - | - | - | - | - | - | - |
| 5290MHz | Pass | 8.80 | -4.69 | -4.19 | -4.40 | -3.47 | 1.68 | 8.20 |
| 5530MHz | Pass | 8.10 | -3.78 | -3.03 | -3.62 | -3.02 | 2.56 | 8.90 |
| 5610MHz | Pass | 8.10 | -3.35 | -3.64 | -3.76 | -2.75 | 2.27 | 8.90 |

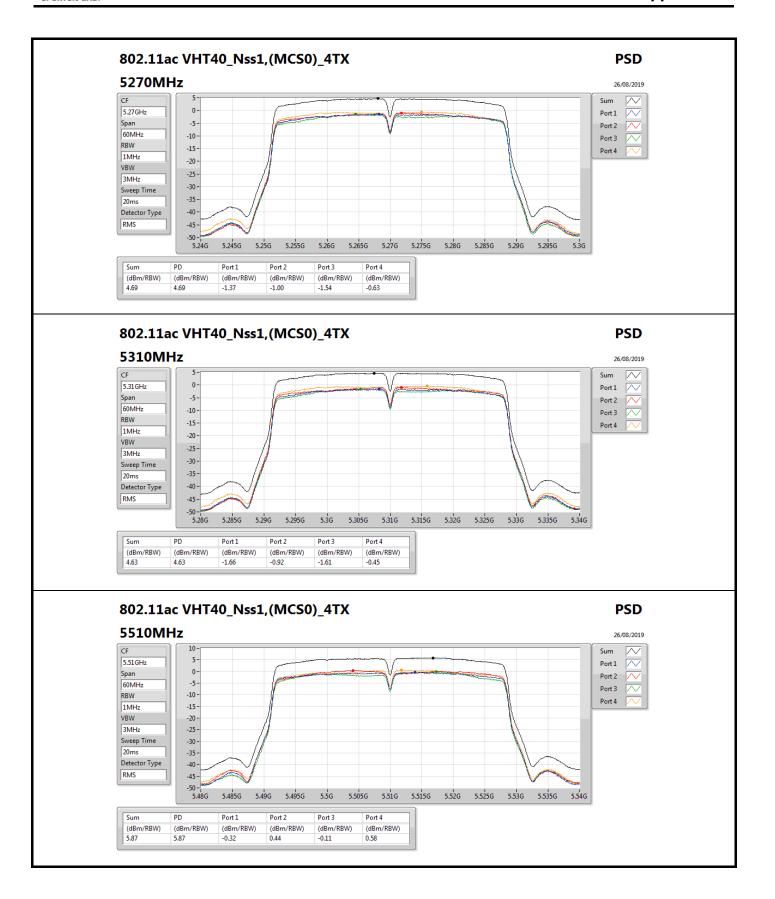
DG = Directional Gain; RBW = 500 kHz for 5.725-5.85GHz band / 1MHz for other band;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X power density;

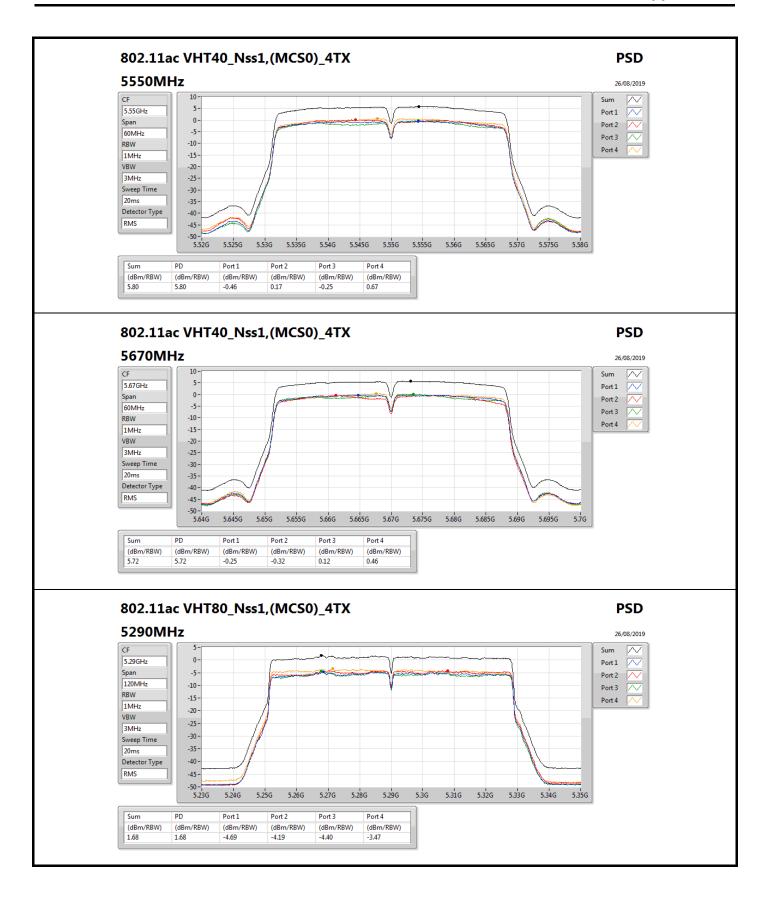


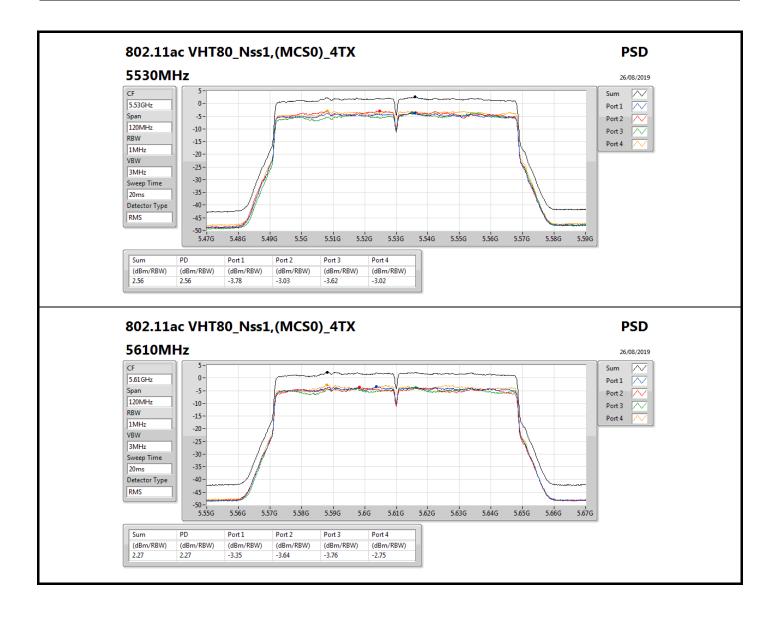














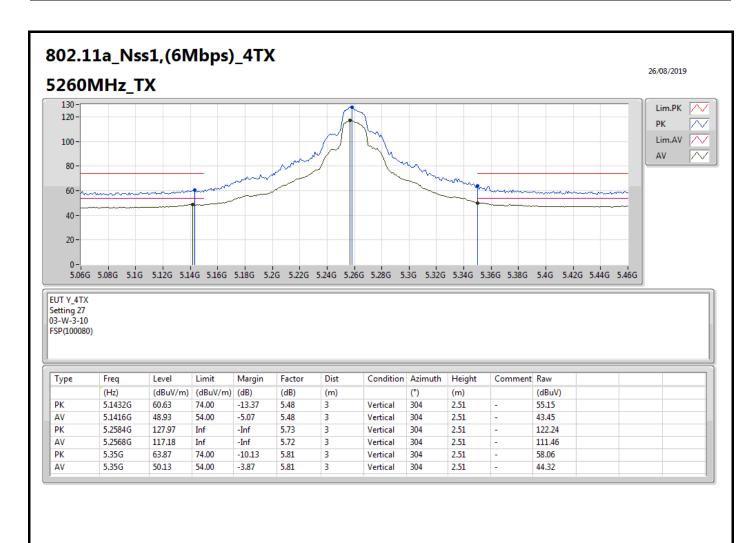
RSE TX above 1GHz Appendix D

Summary

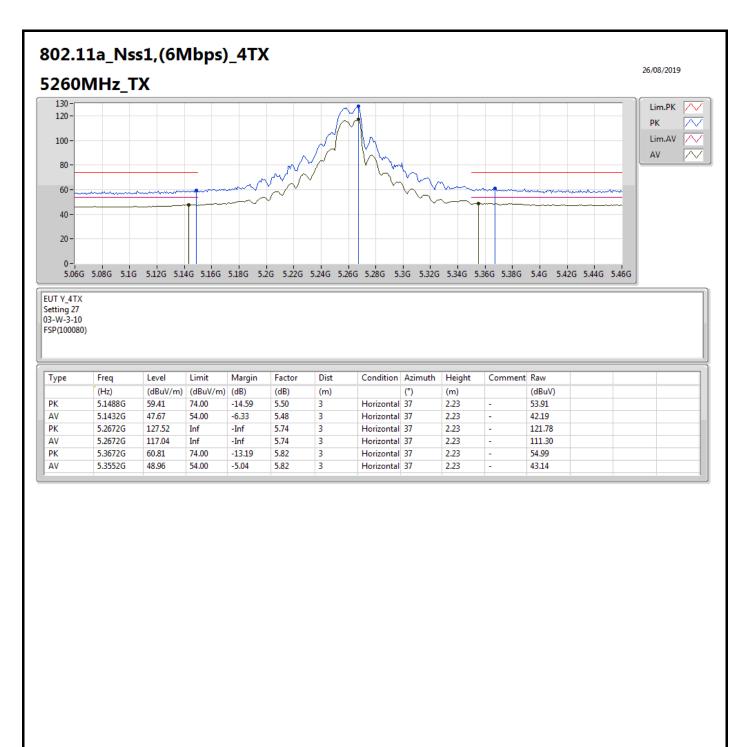
| Mode | Result | Туре | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comments |
|--------------------------------|--------|------|---------|----------|----------|--------|--------|------|-----------|---------|--------|----------|
| | | | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | |
| 5.25-5.35GHz | - | - | - | - | - | - | - | - | - | - | - | - |
| 802.11ac VHT20_Nss1,(MCS0)_4TX | Pass | AV | 5.3524G | 53.96 | 54.00 | -0.04 | 5.81 | 3 | Vertical | 248 | 2.45 | - |

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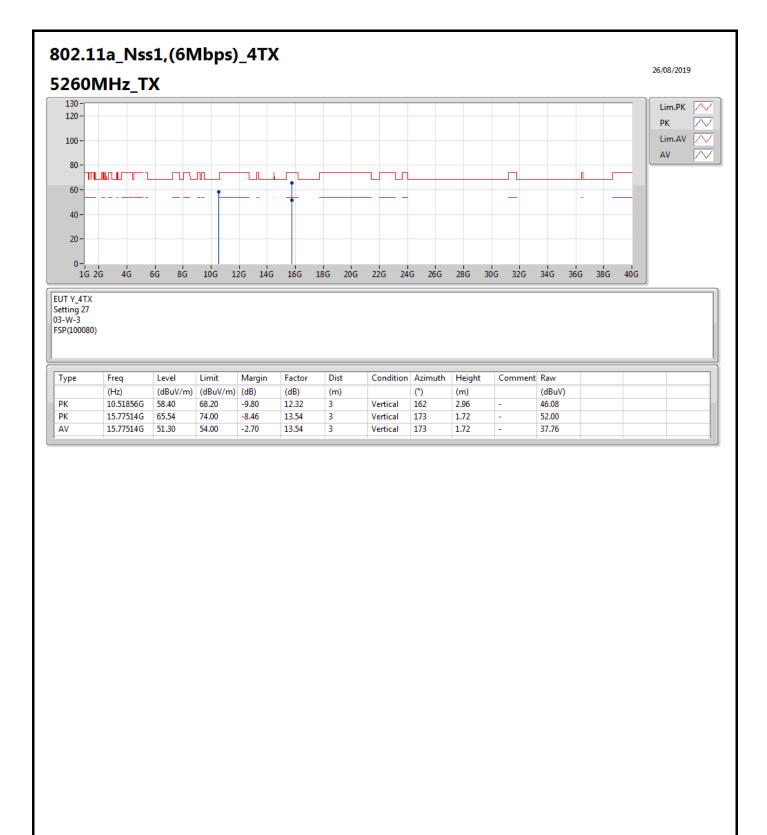






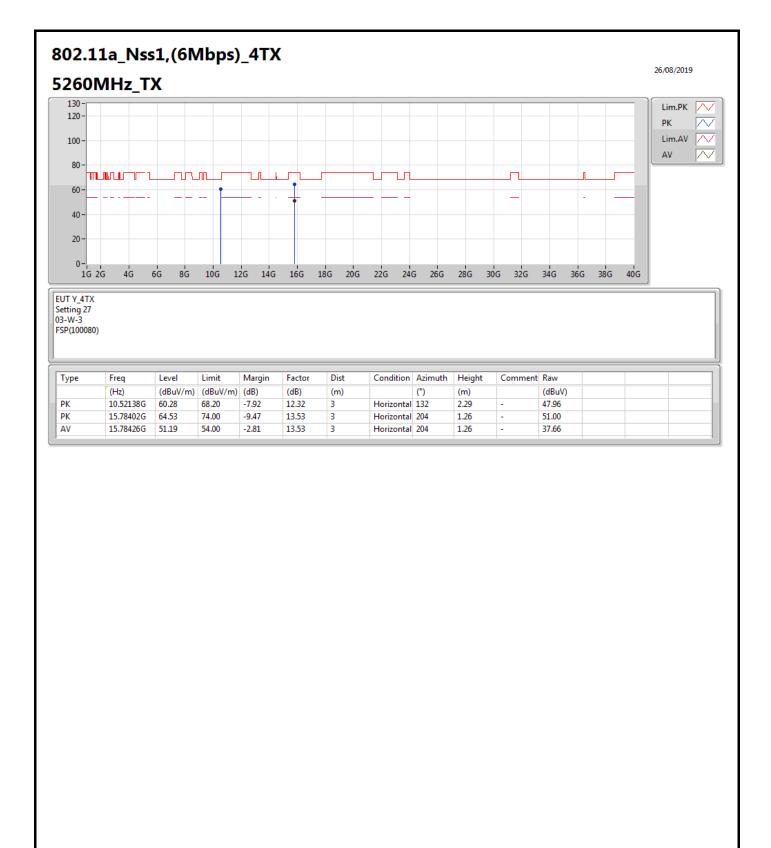
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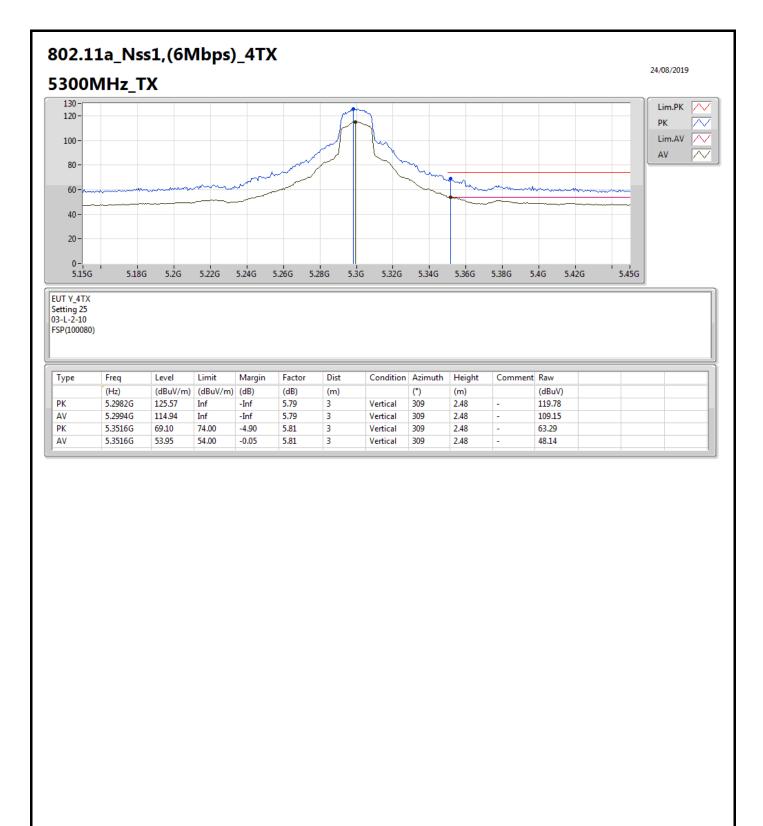
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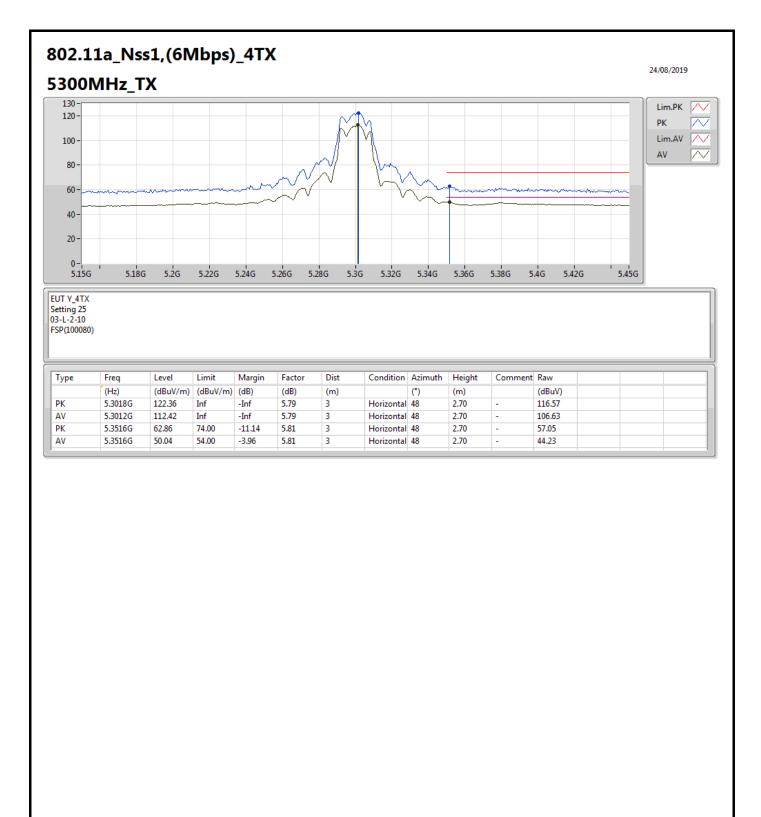


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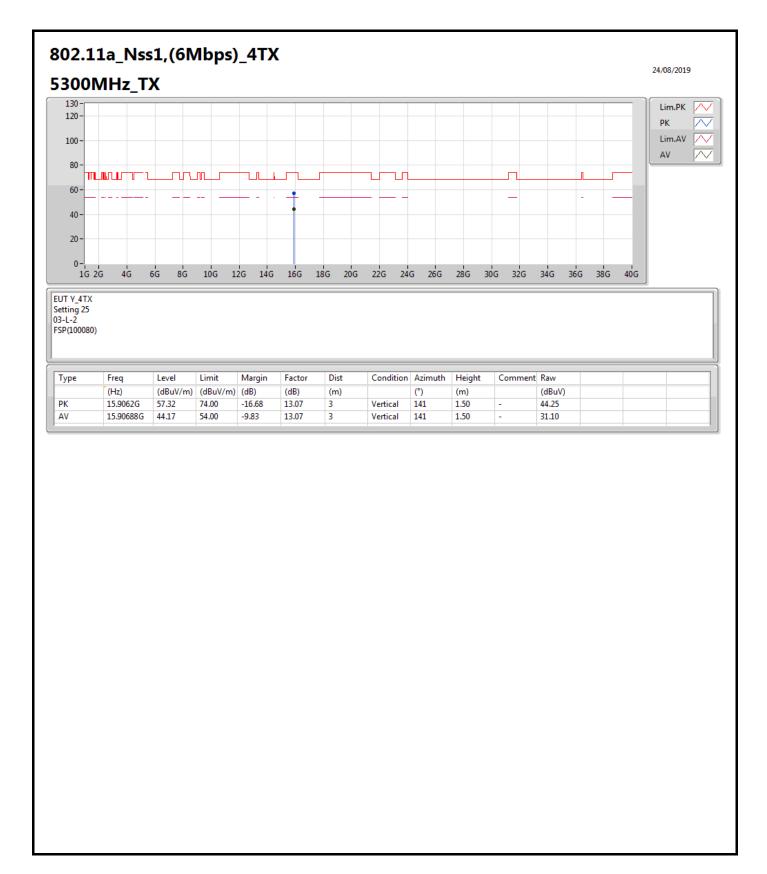






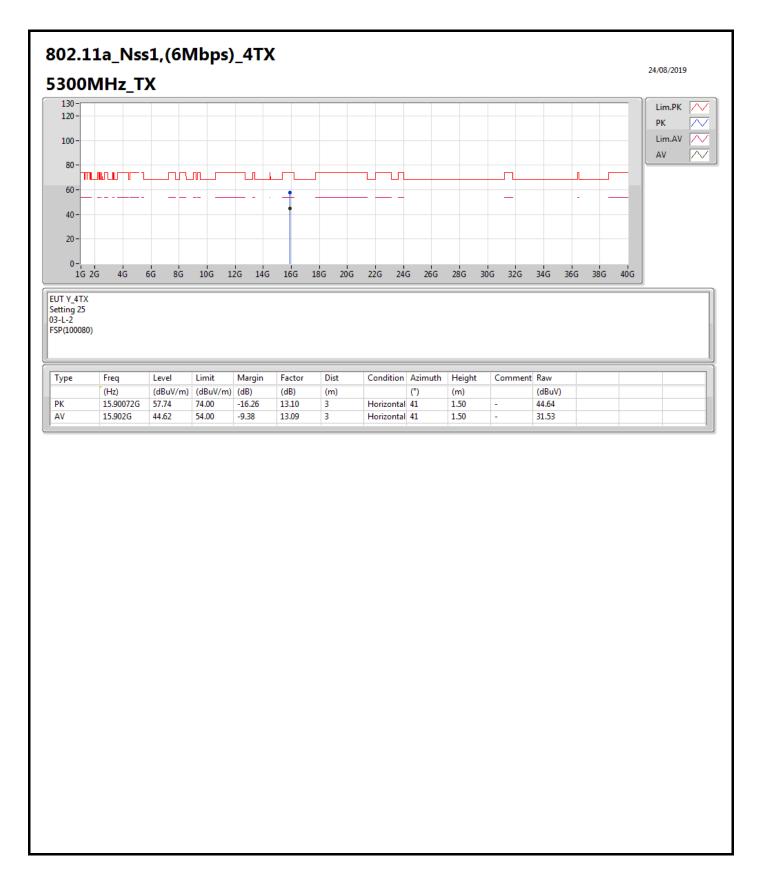
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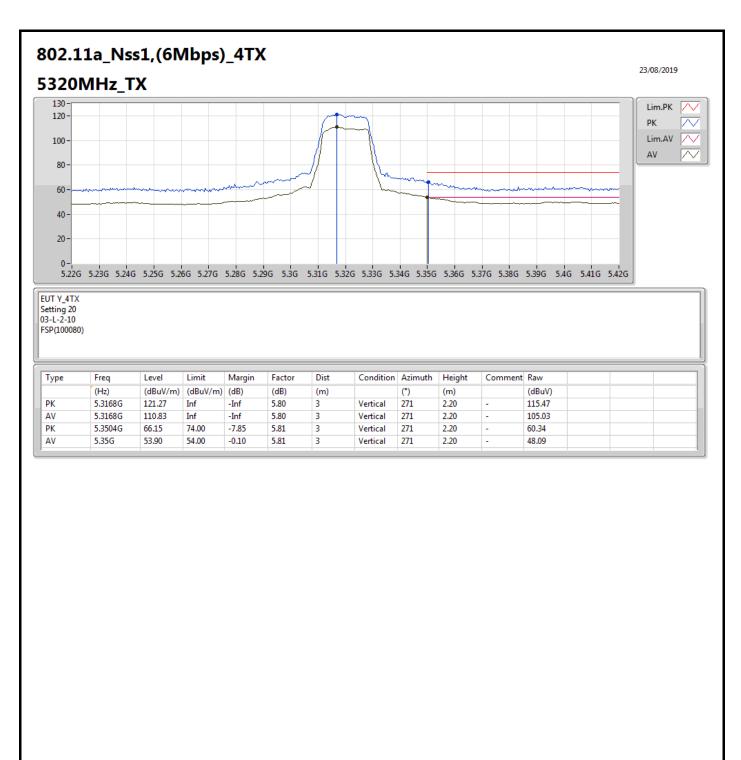
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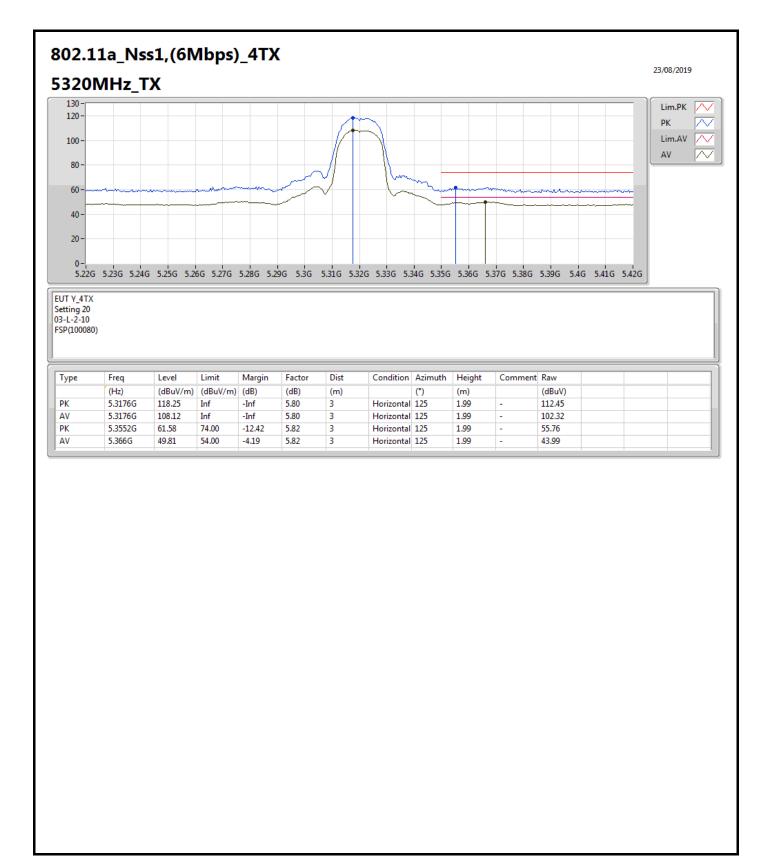
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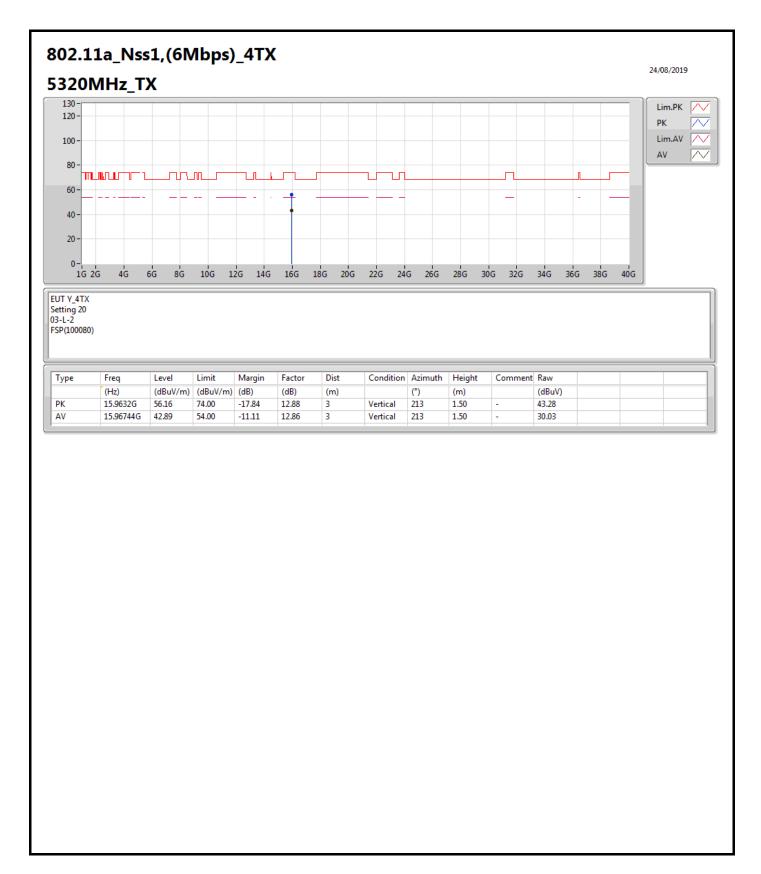
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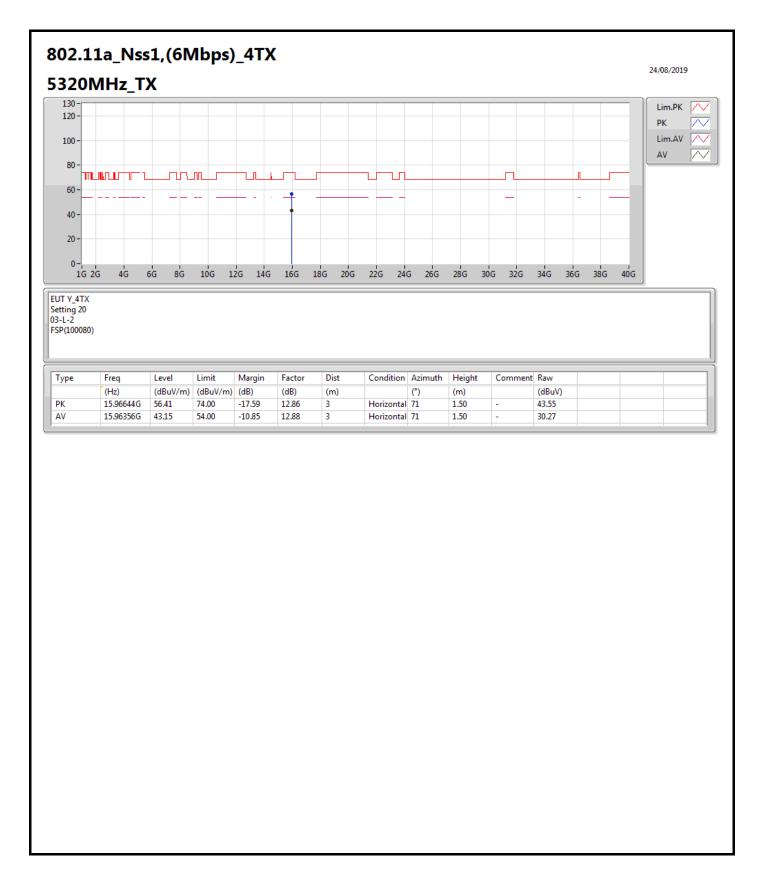
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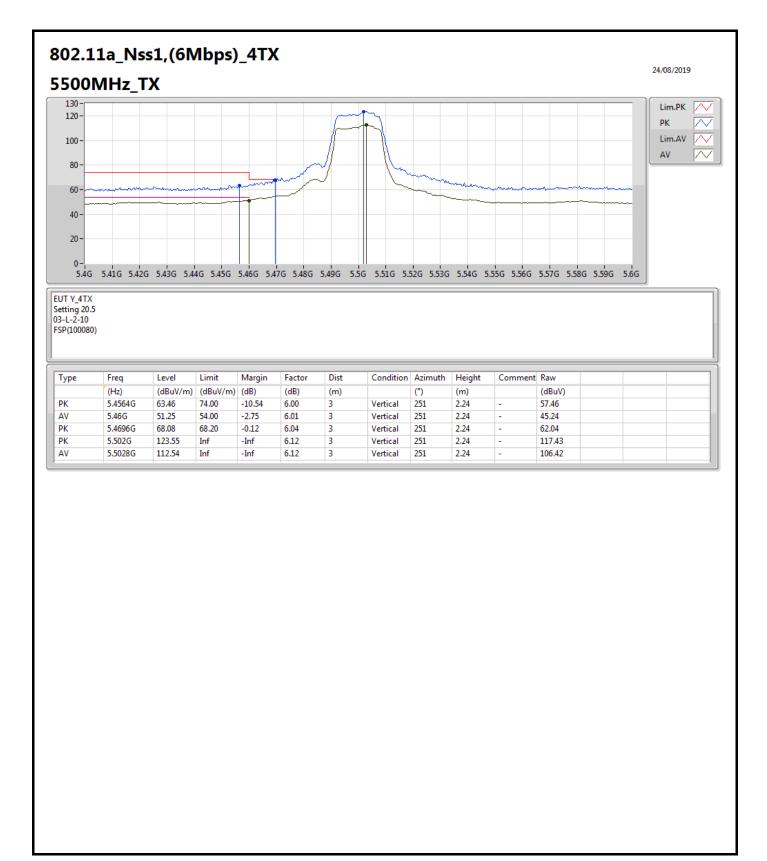
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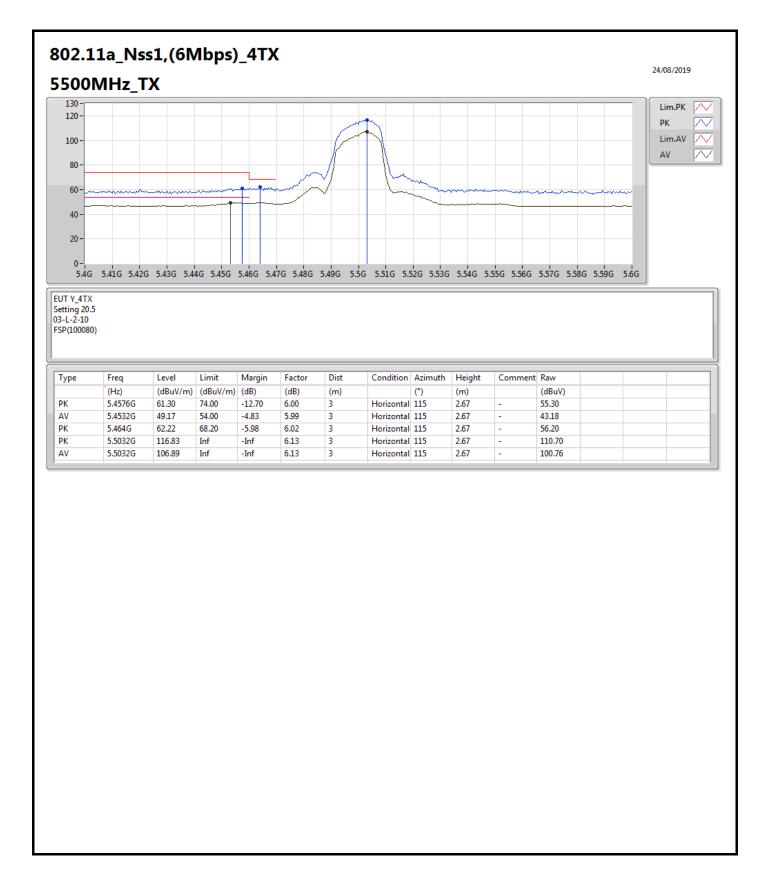
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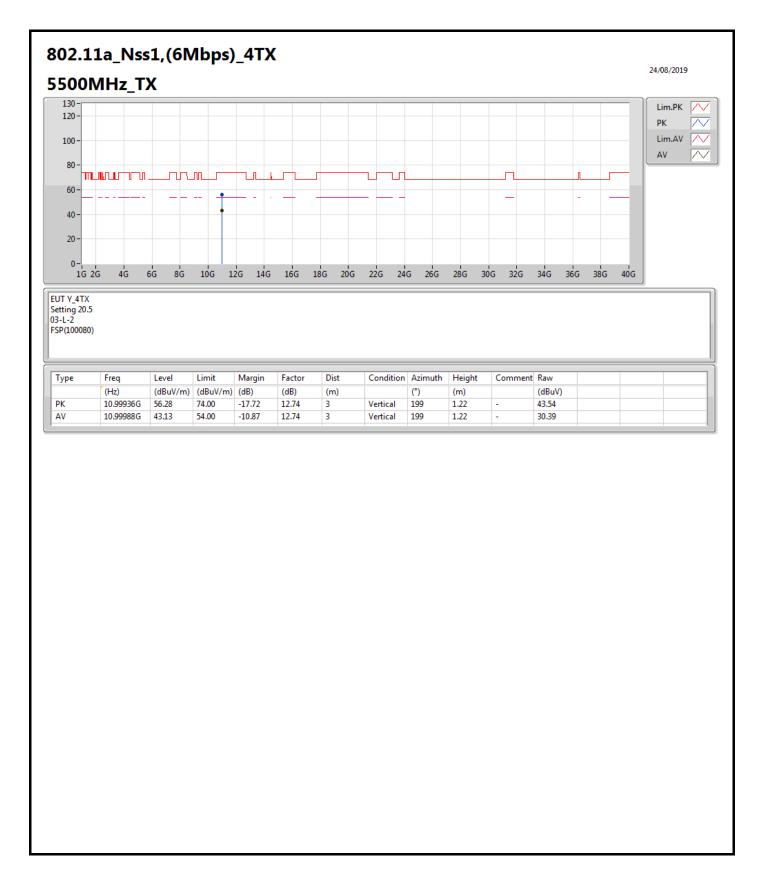
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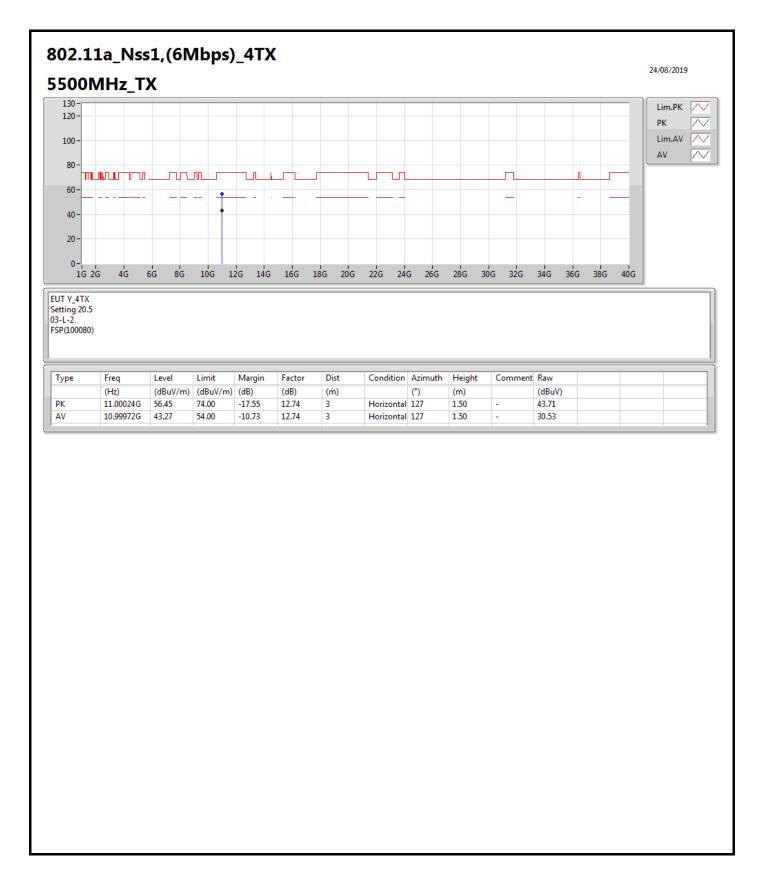
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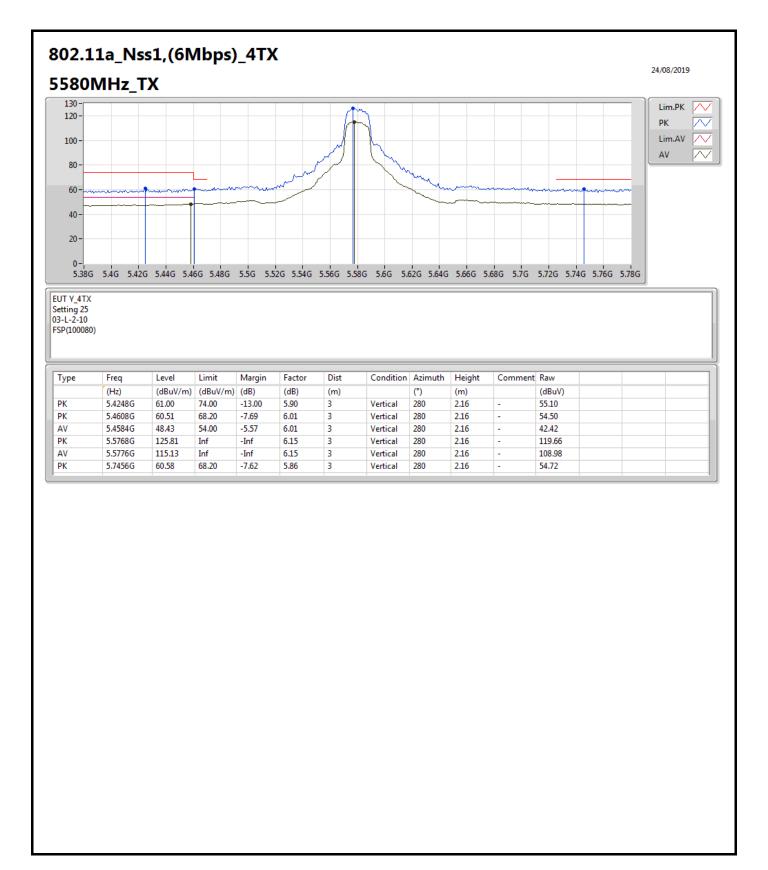
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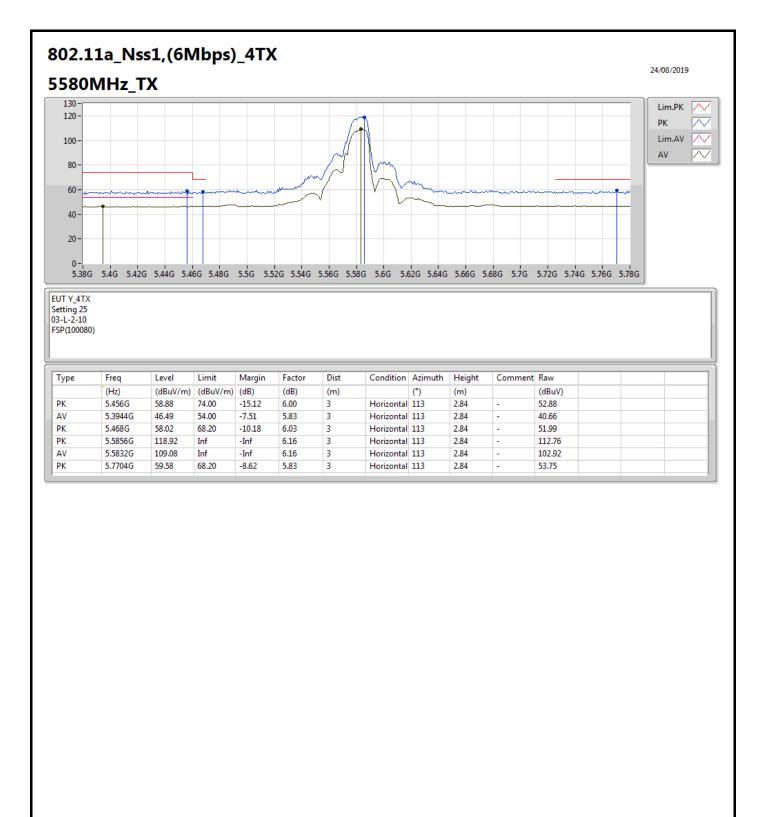
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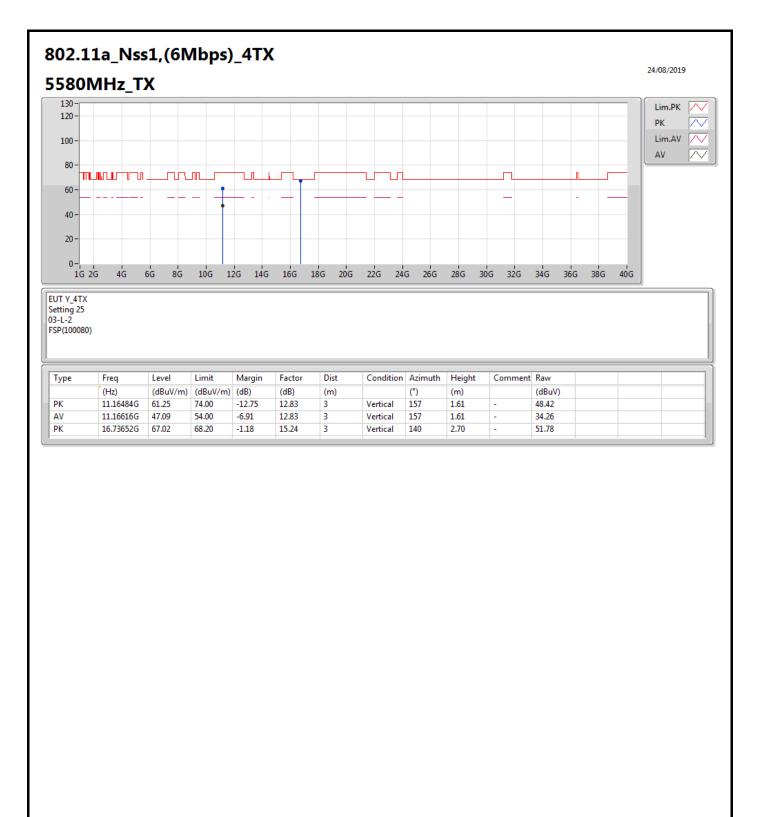
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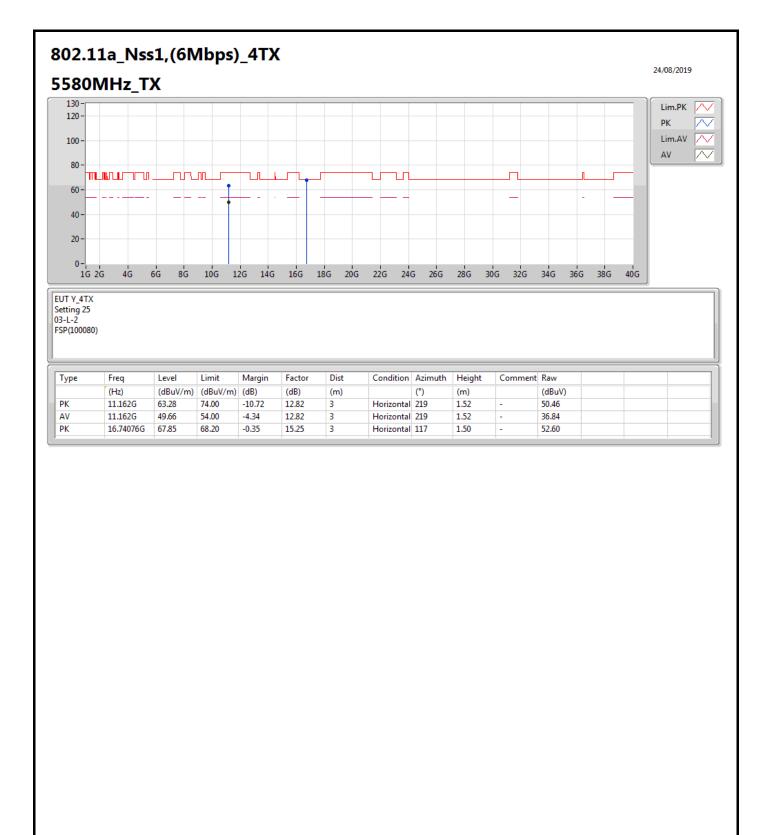
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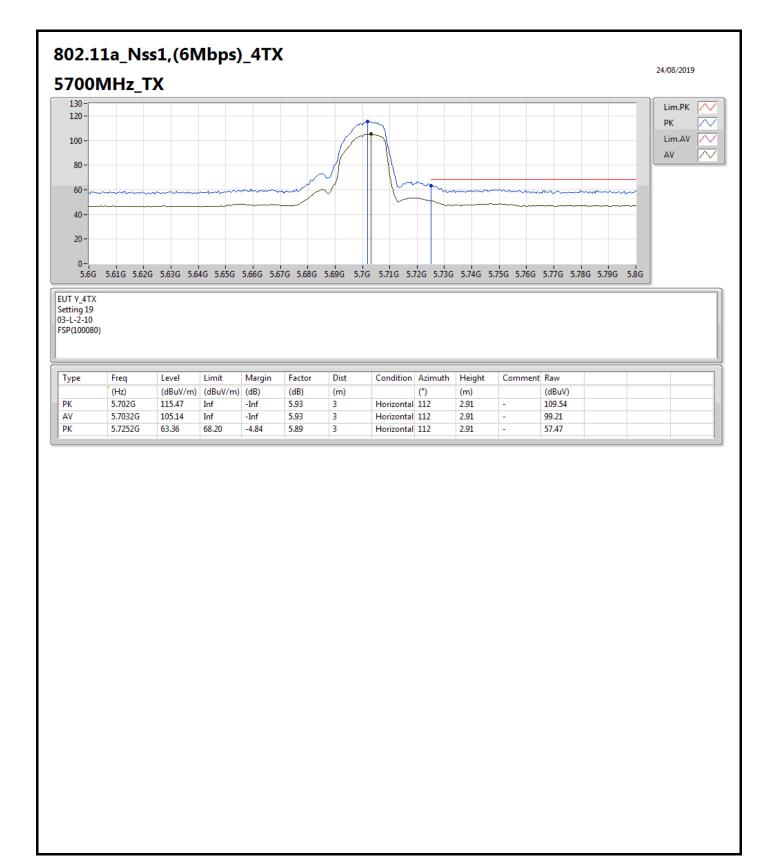
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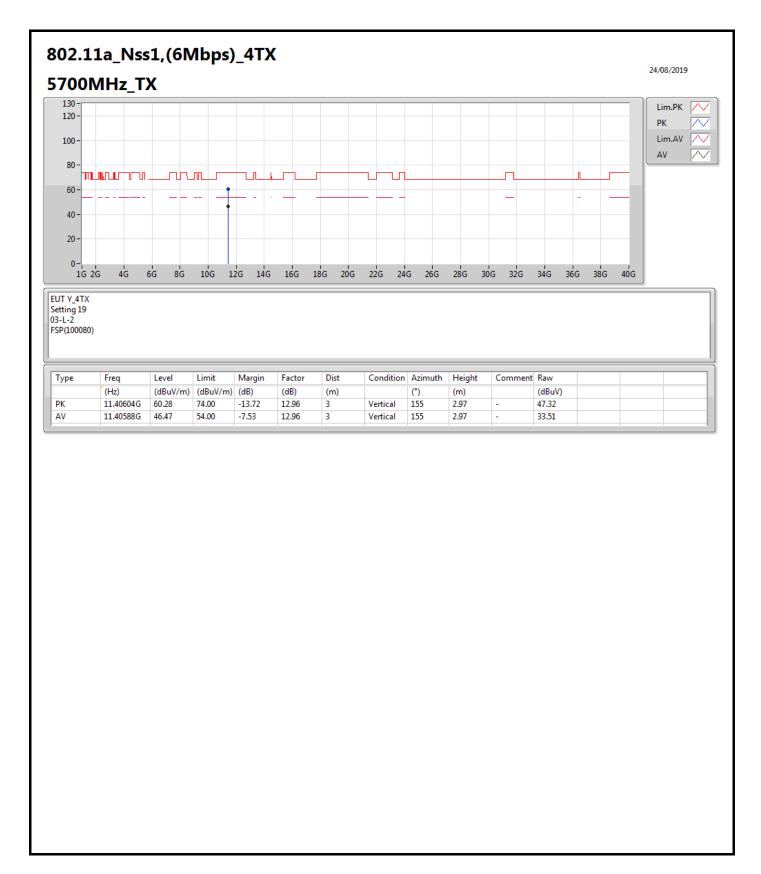
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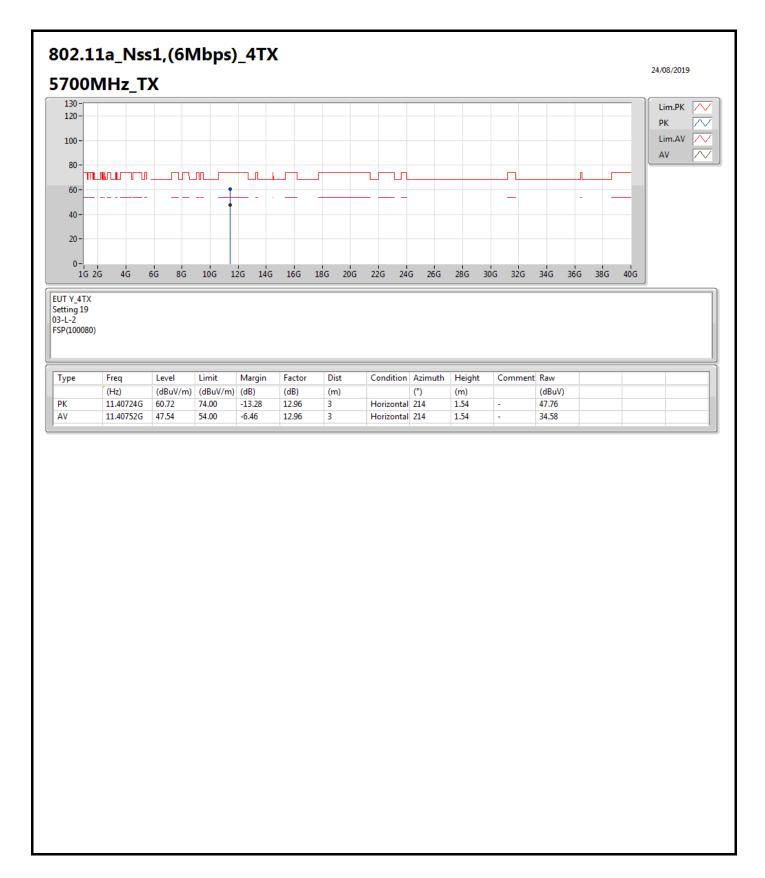
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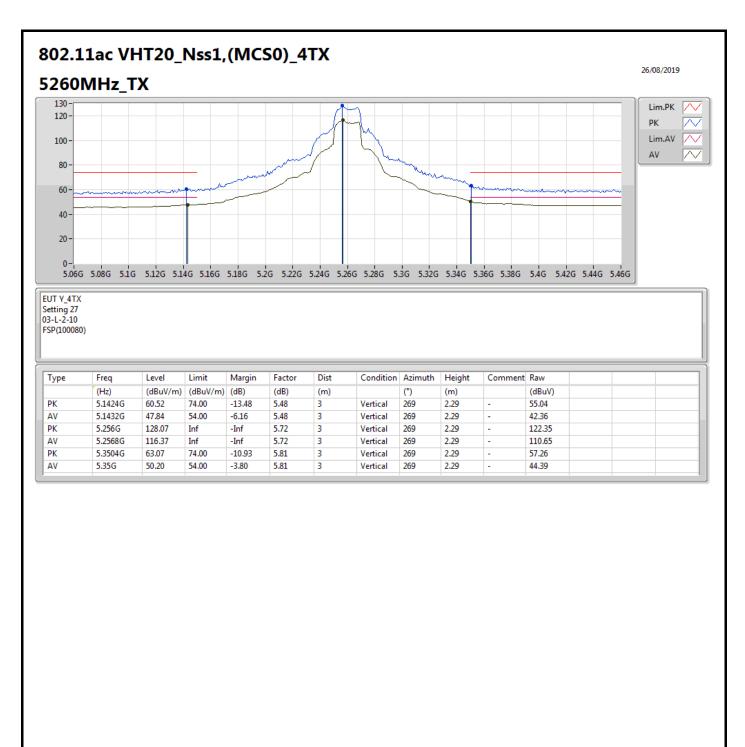
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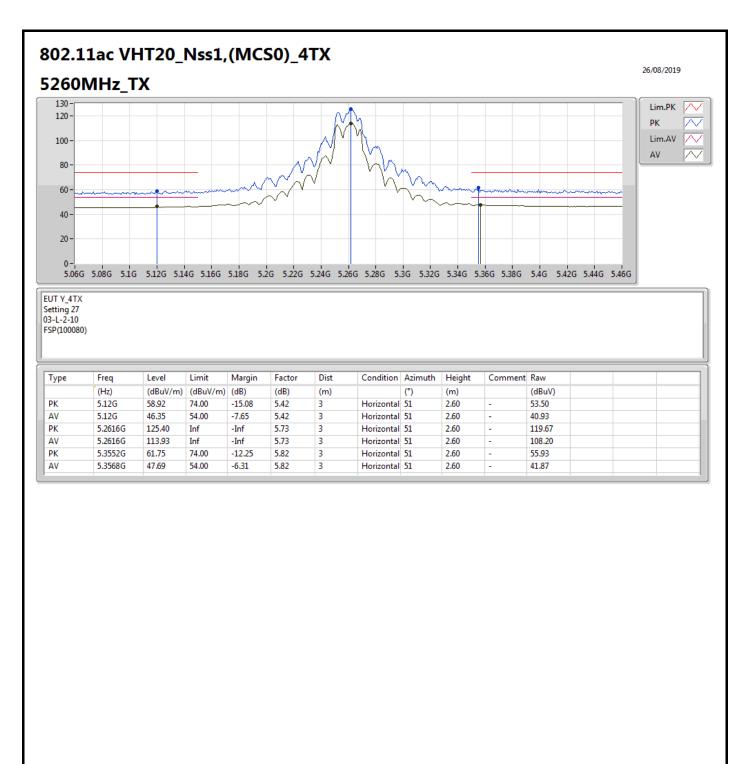
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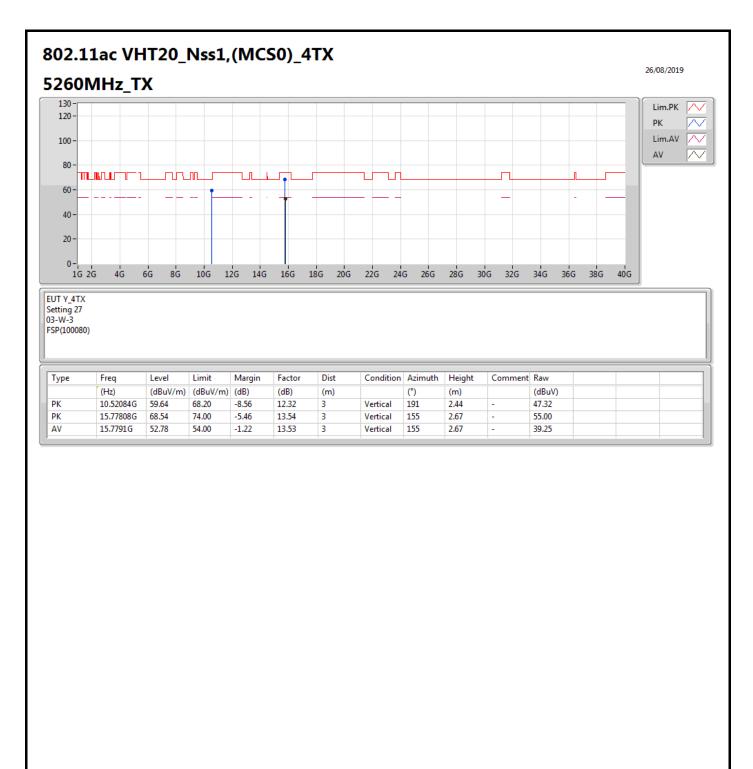


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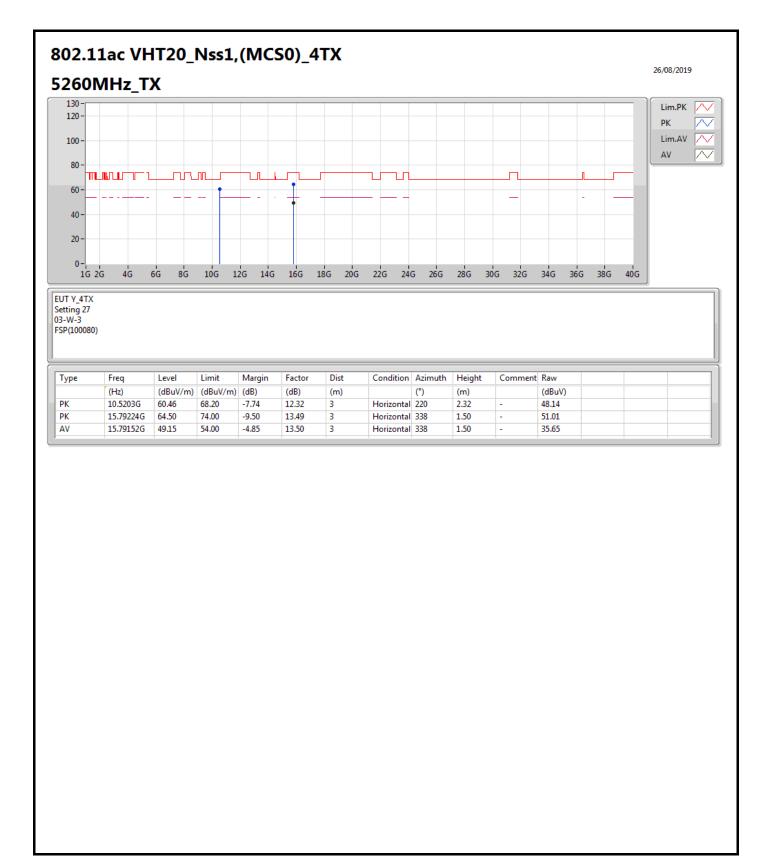






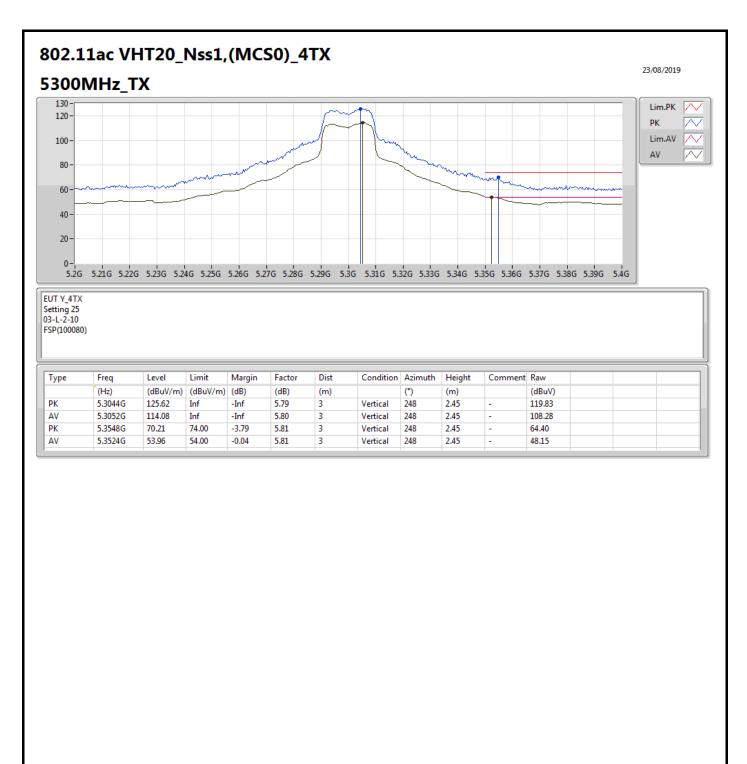
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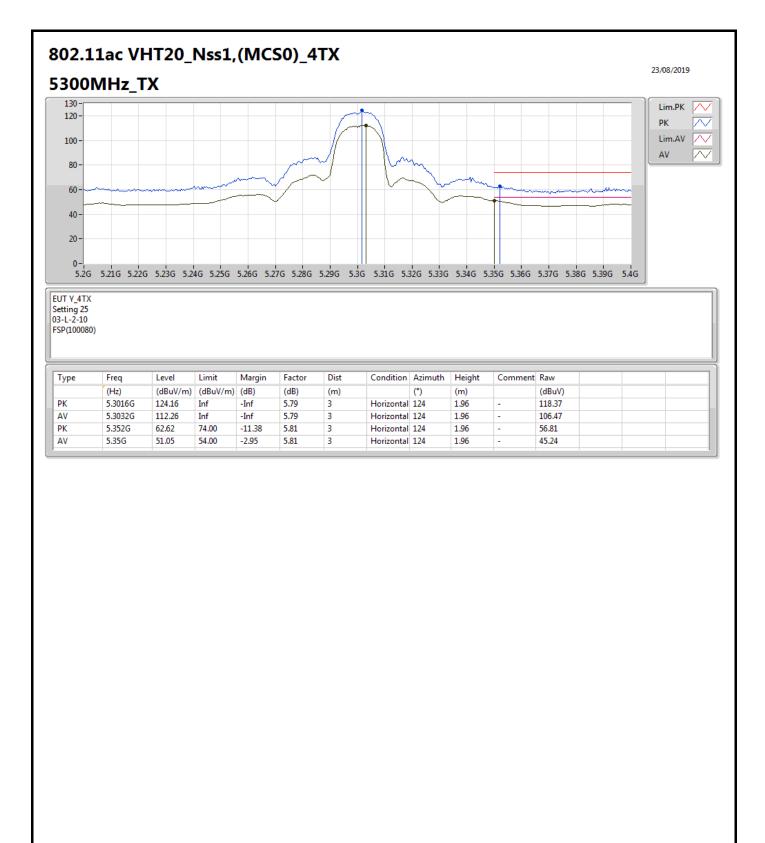
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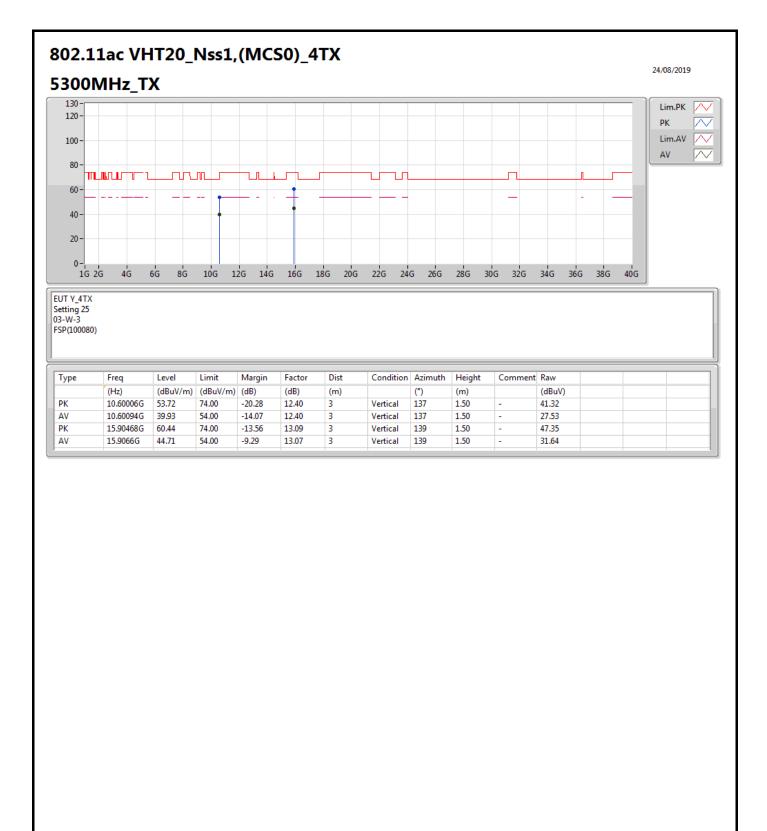
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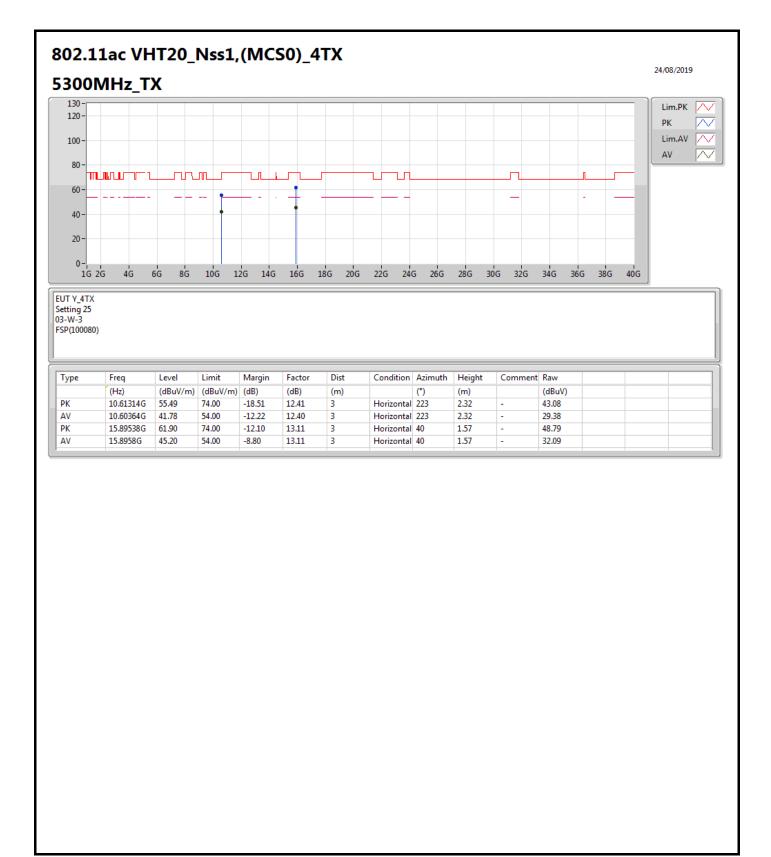
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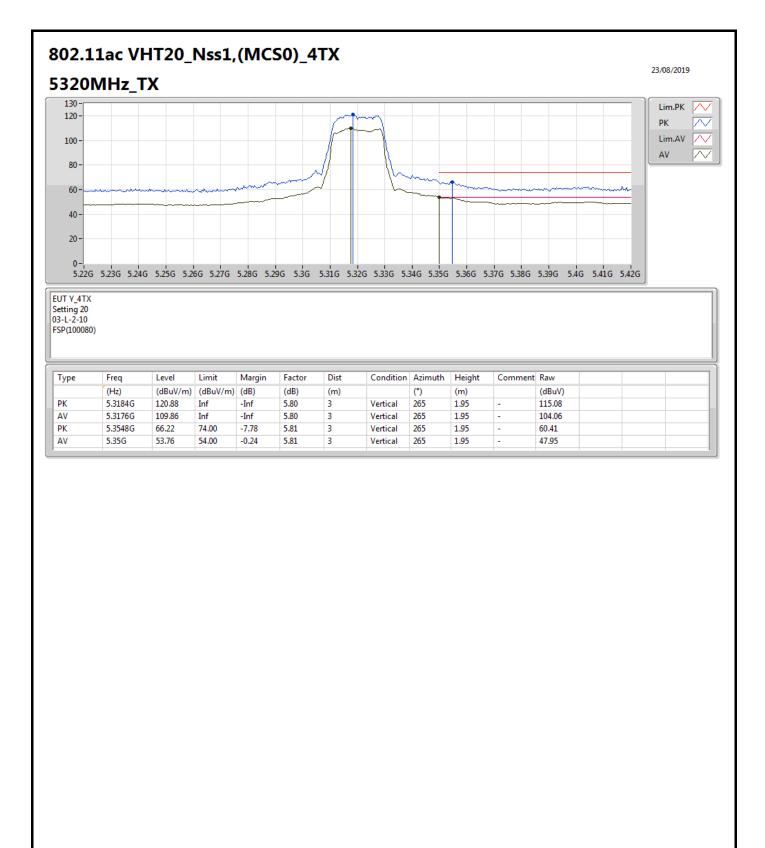
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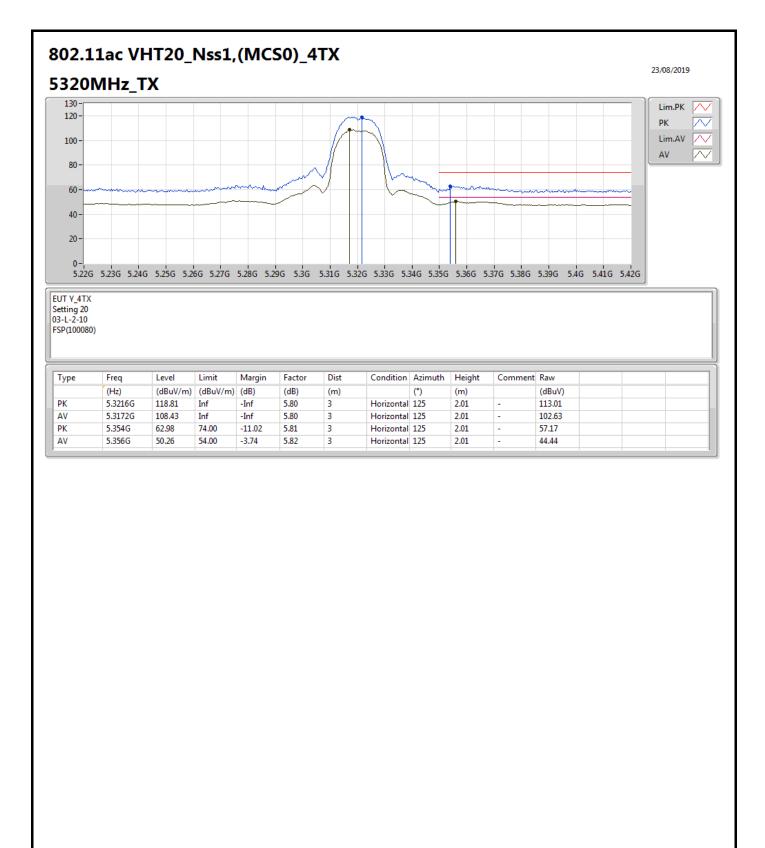
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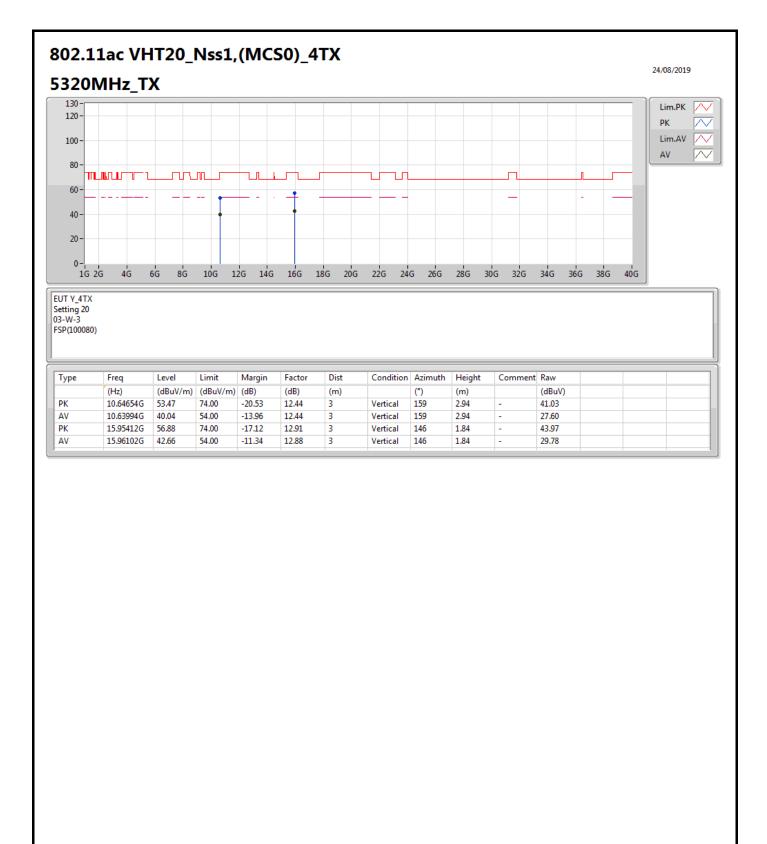
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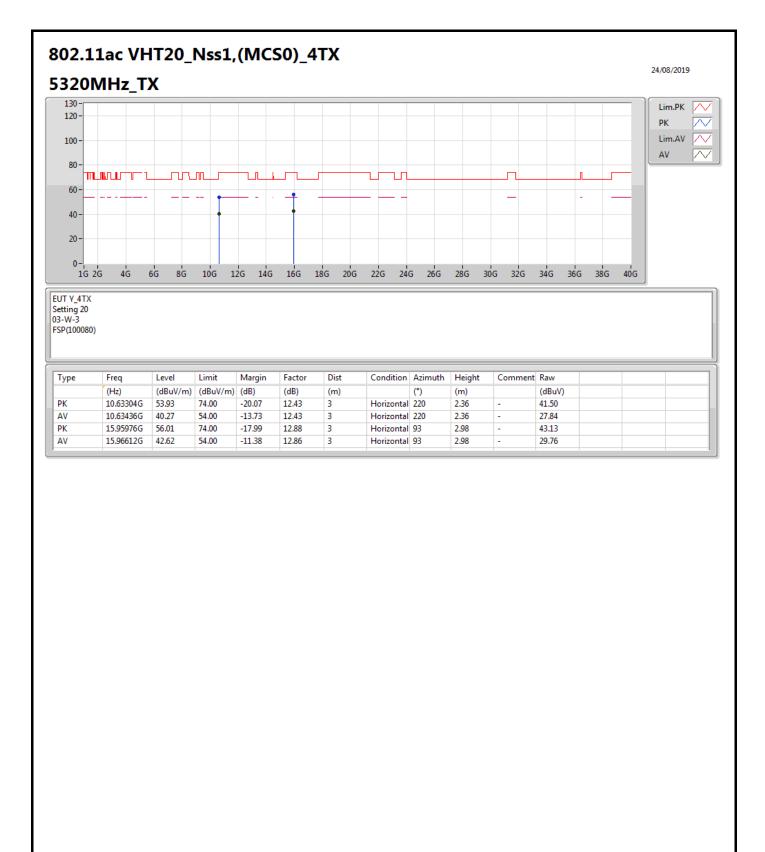
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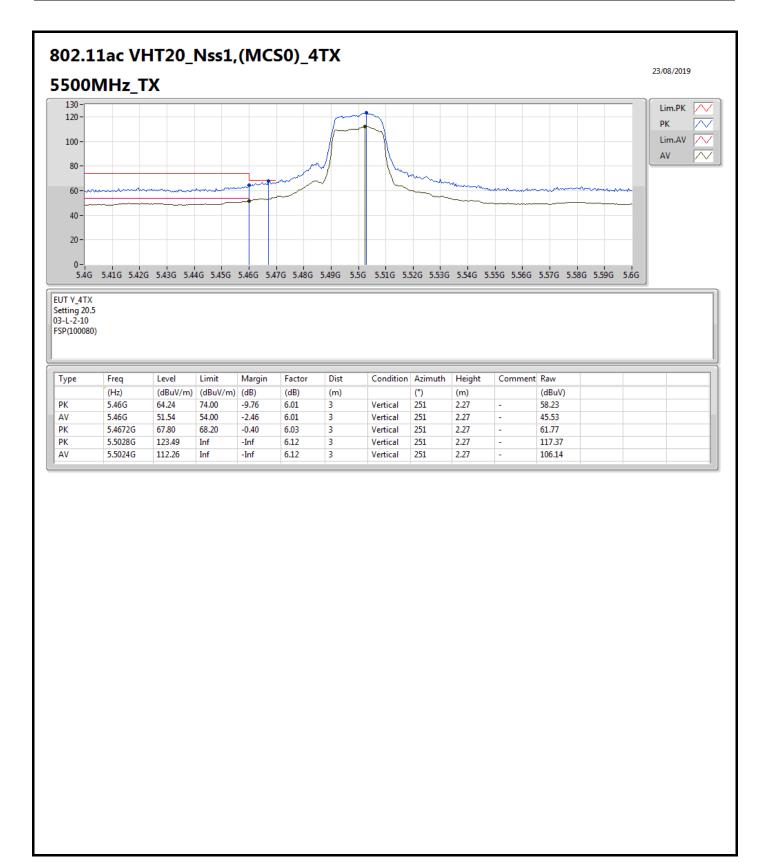
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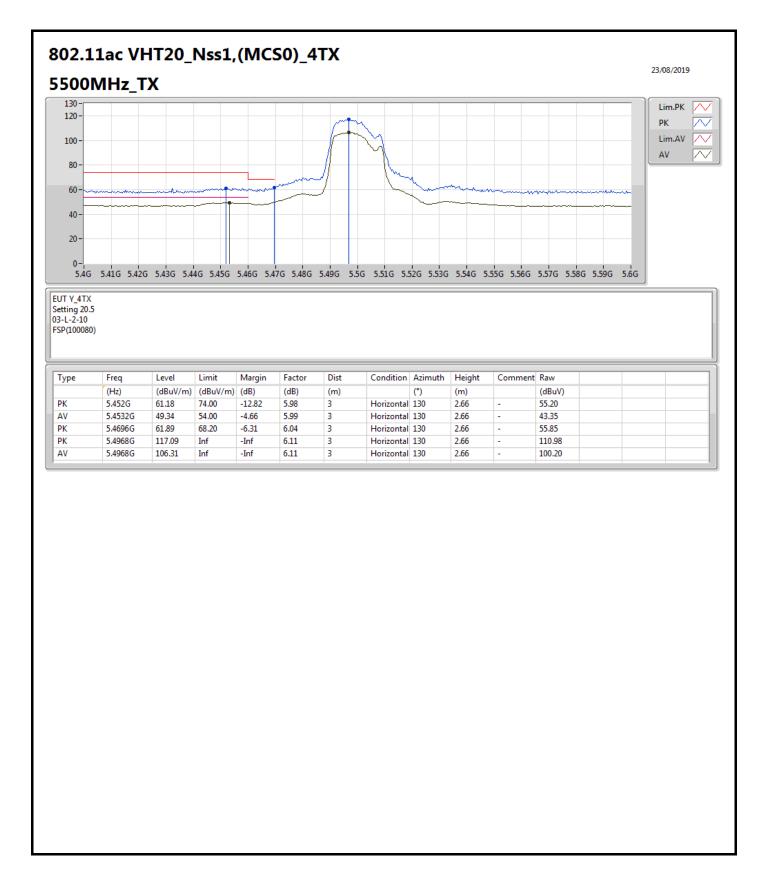
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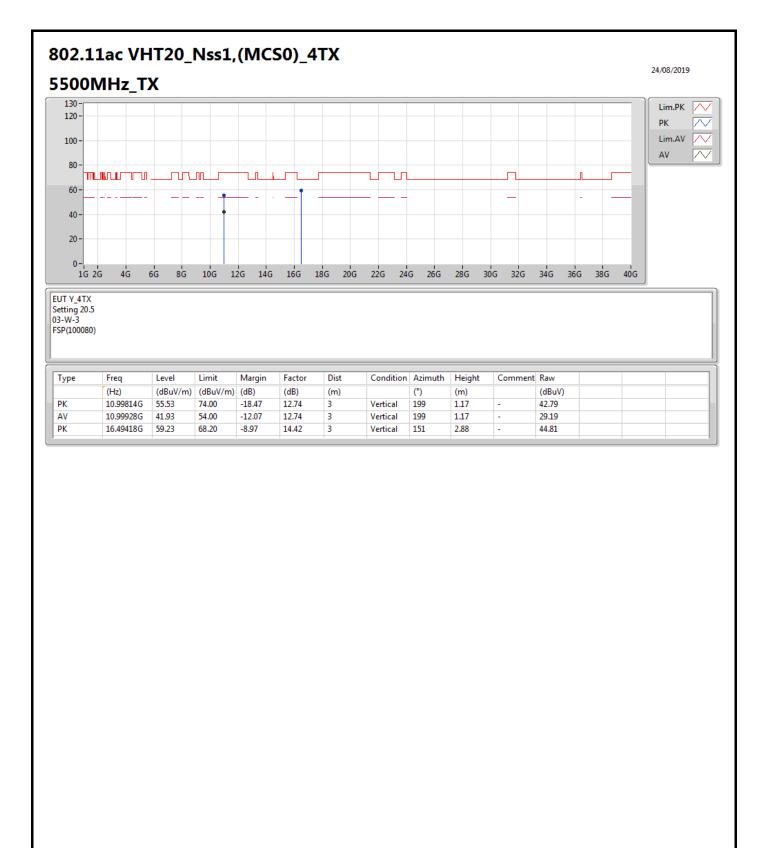
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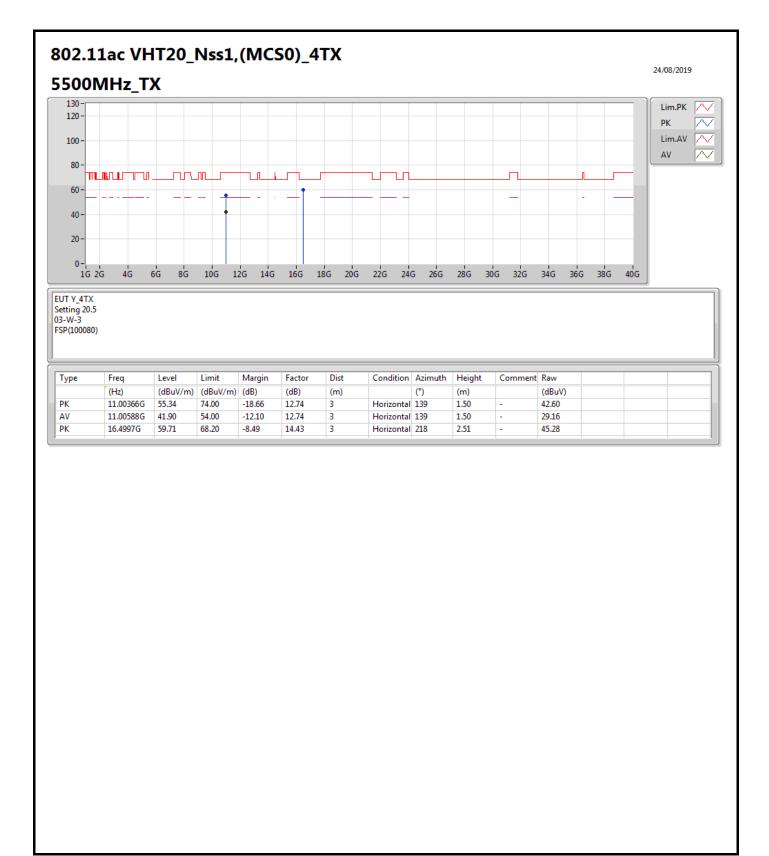
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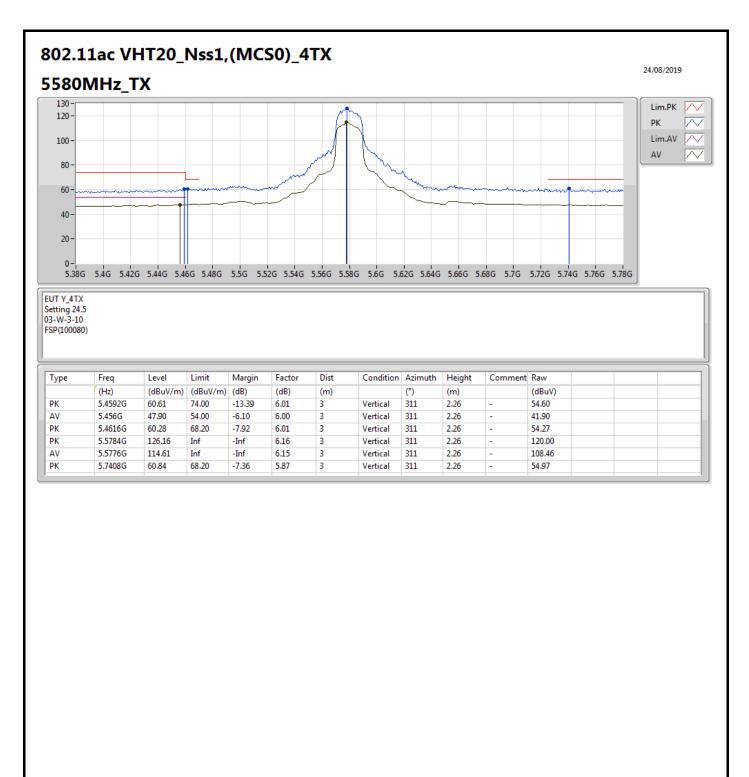
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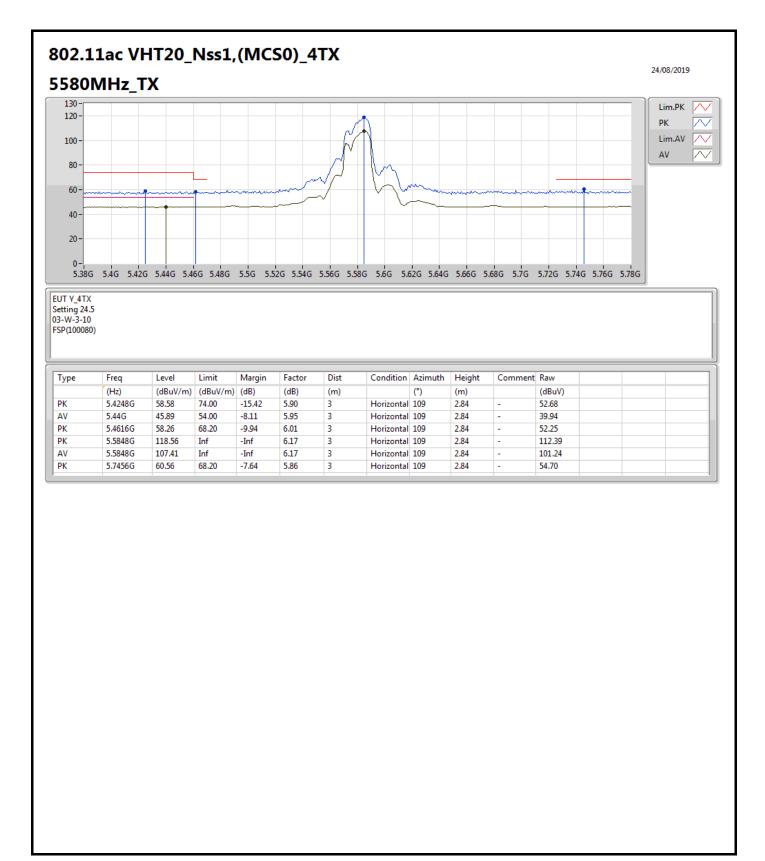


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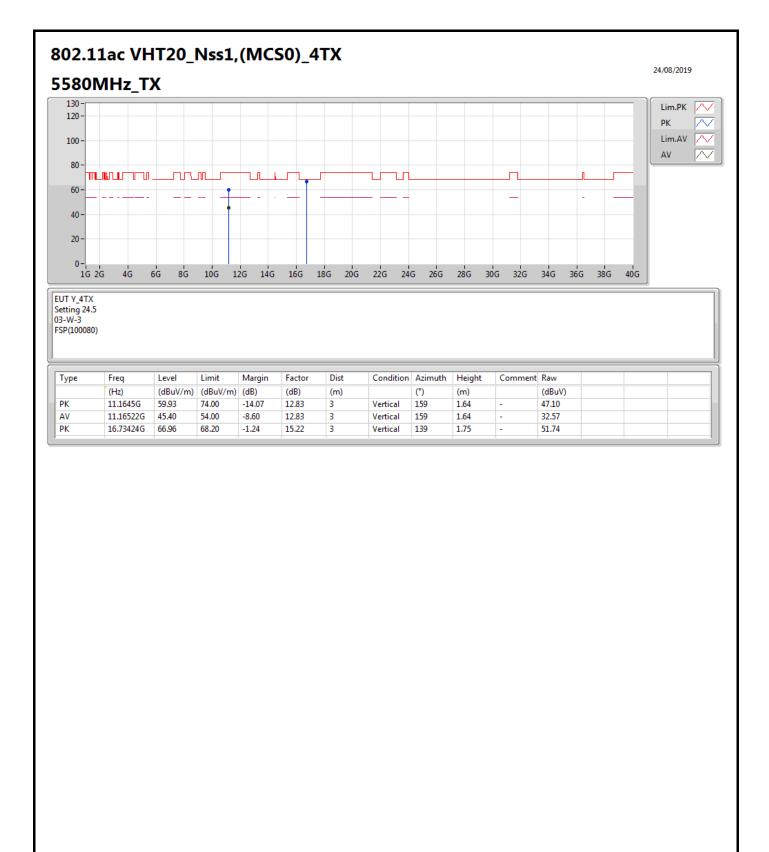






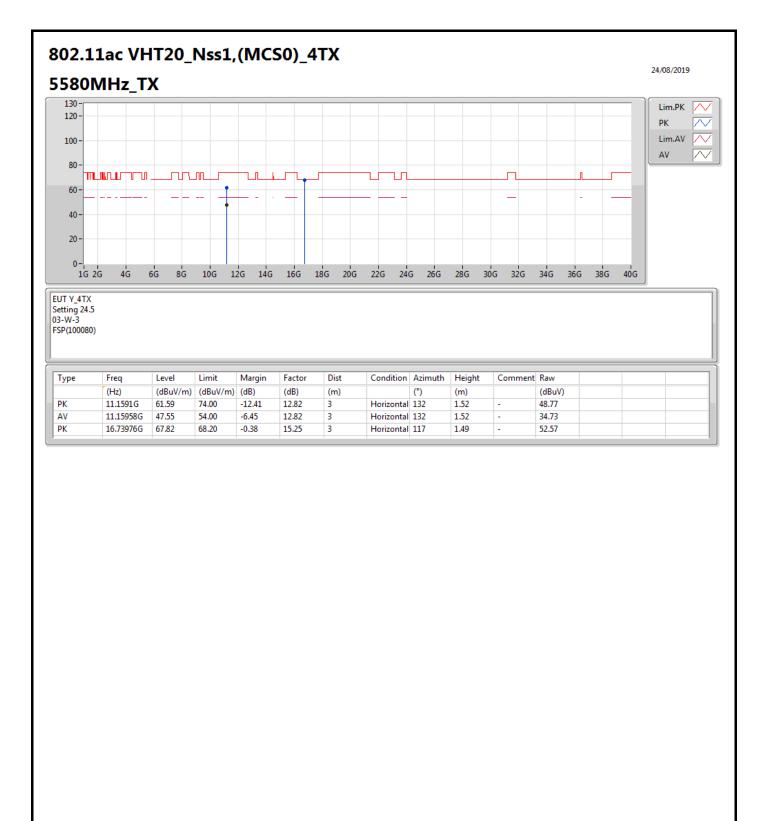
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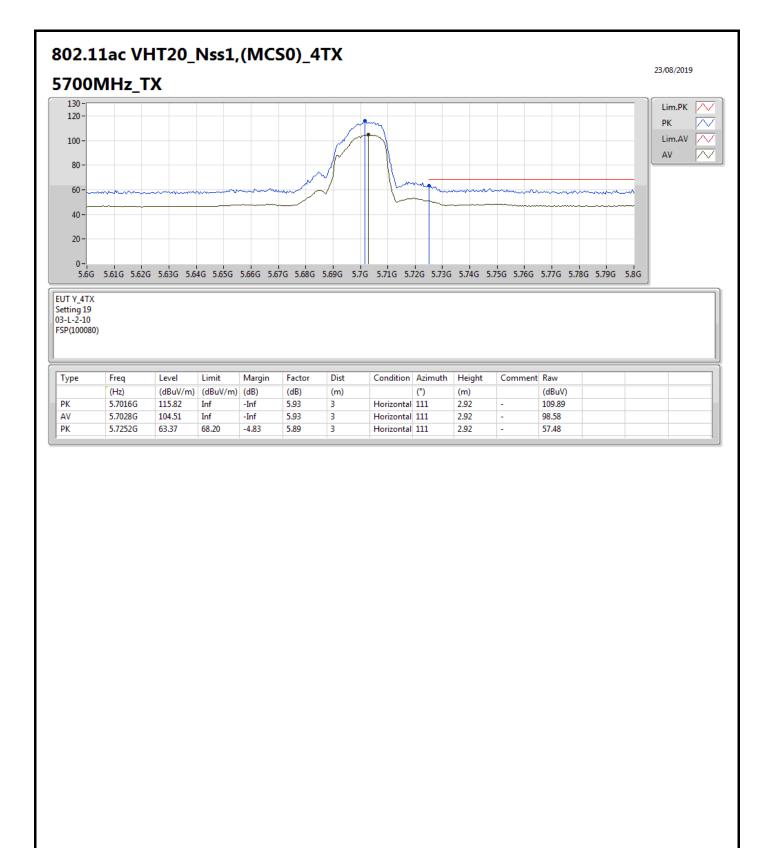
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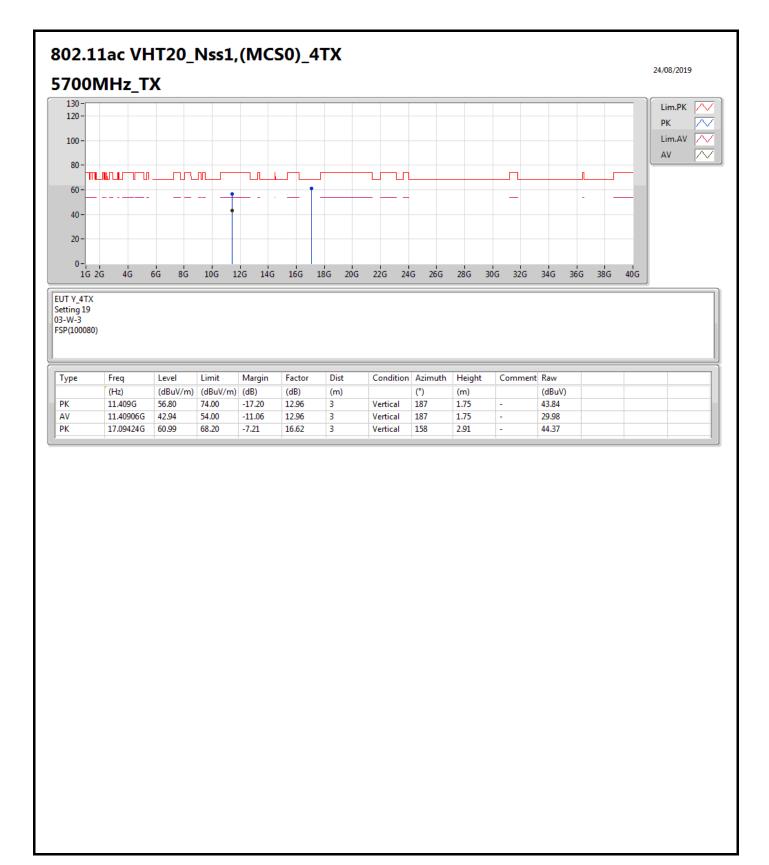
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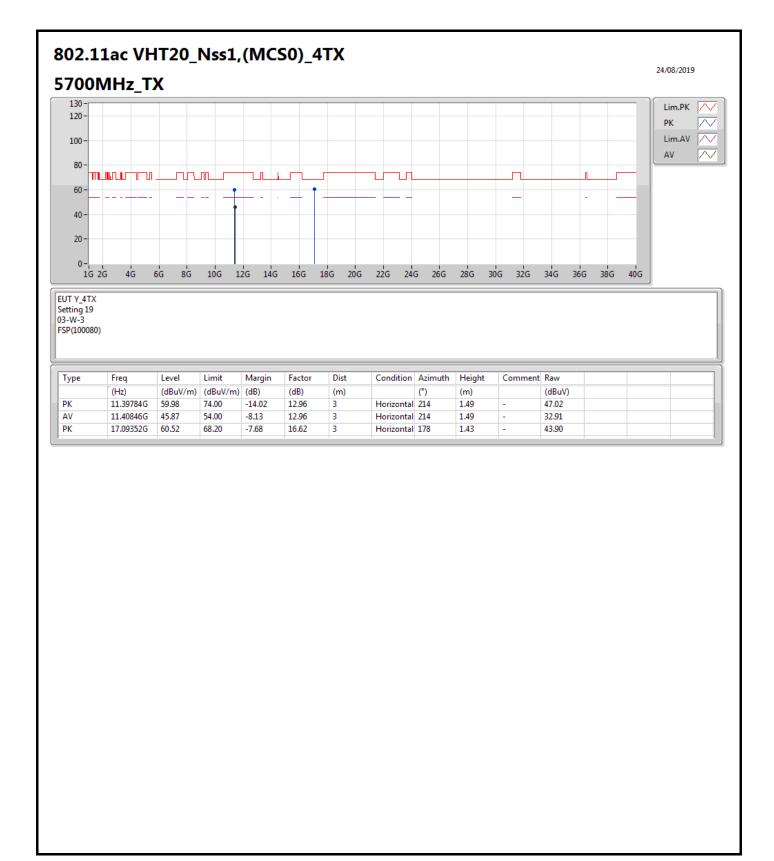
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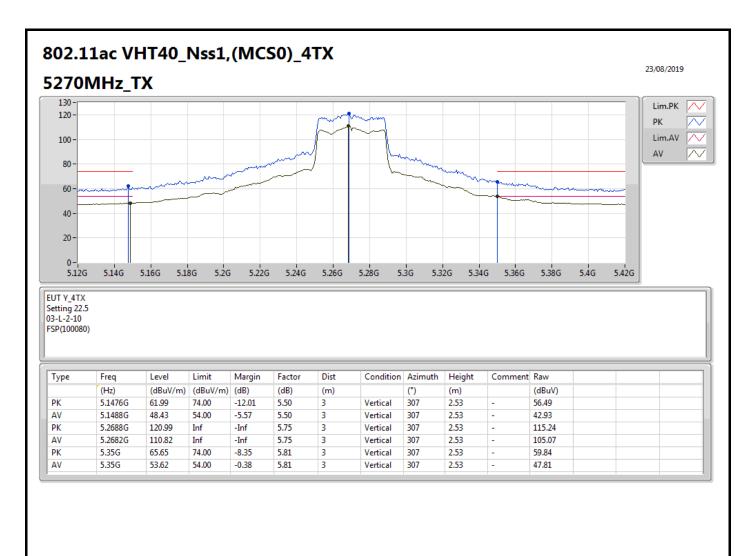
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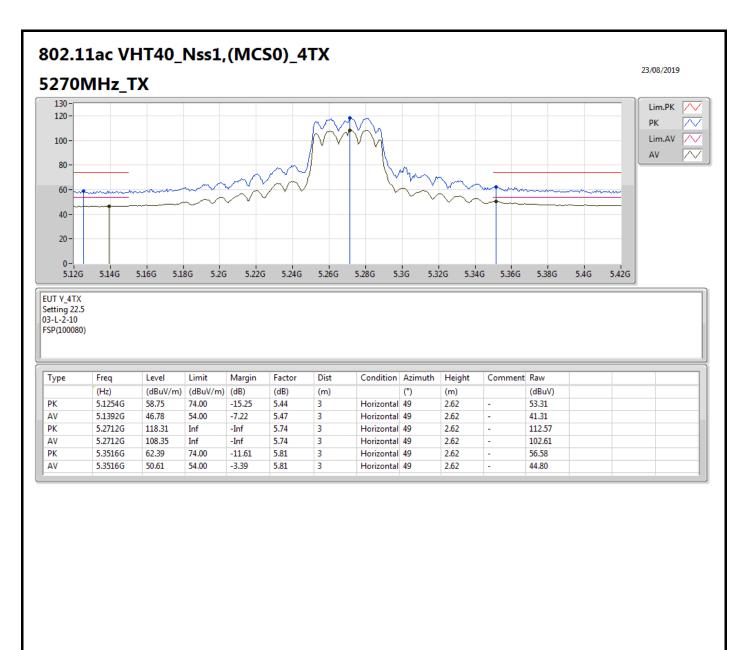
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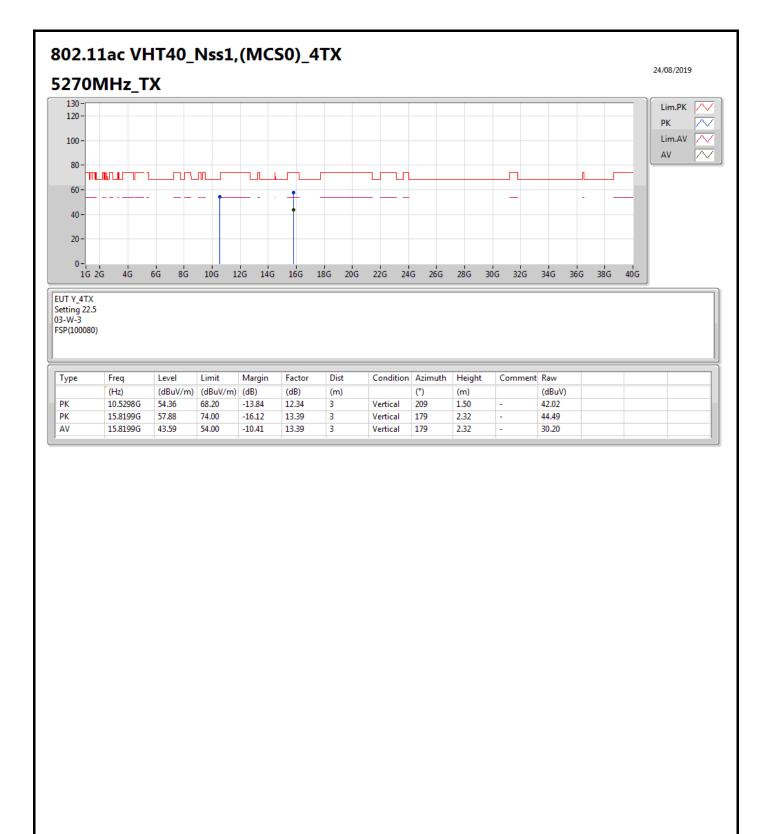
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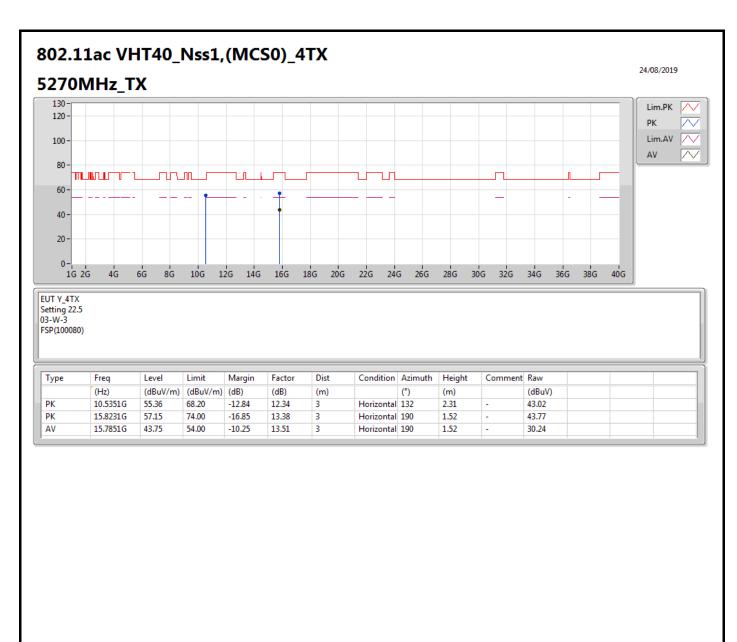
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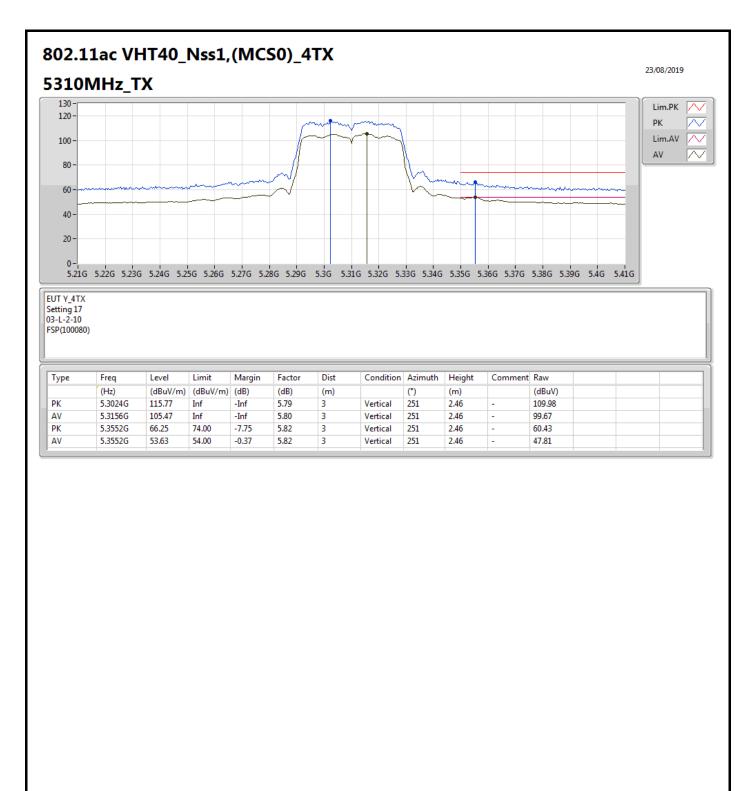
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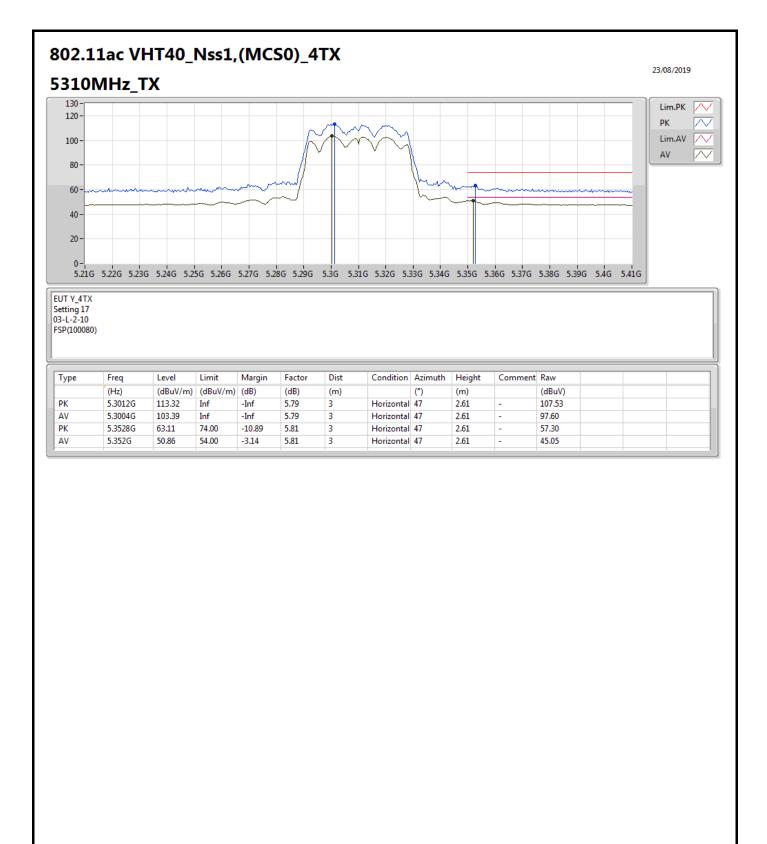
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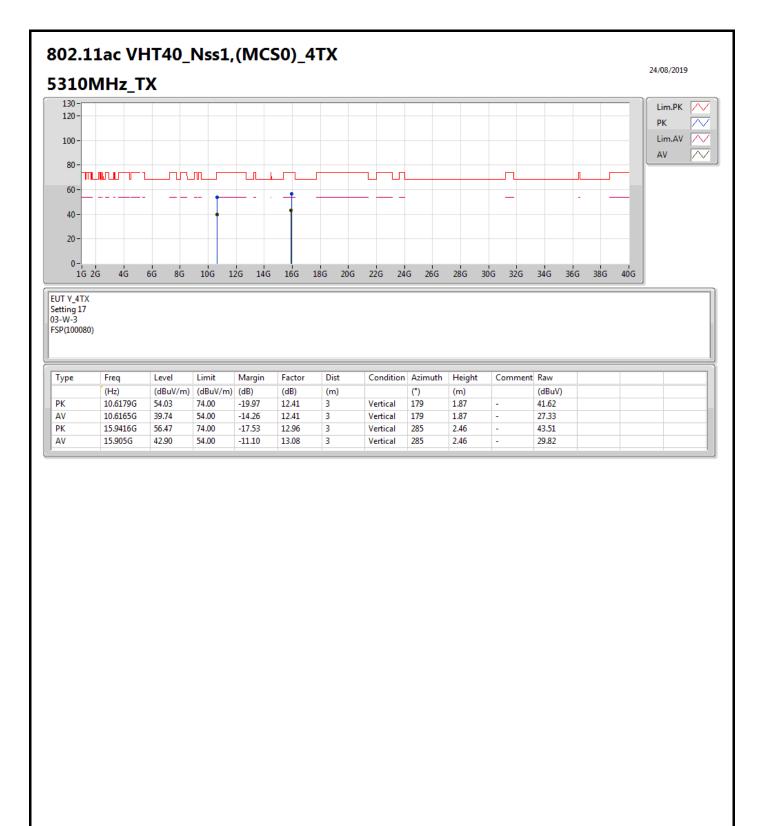
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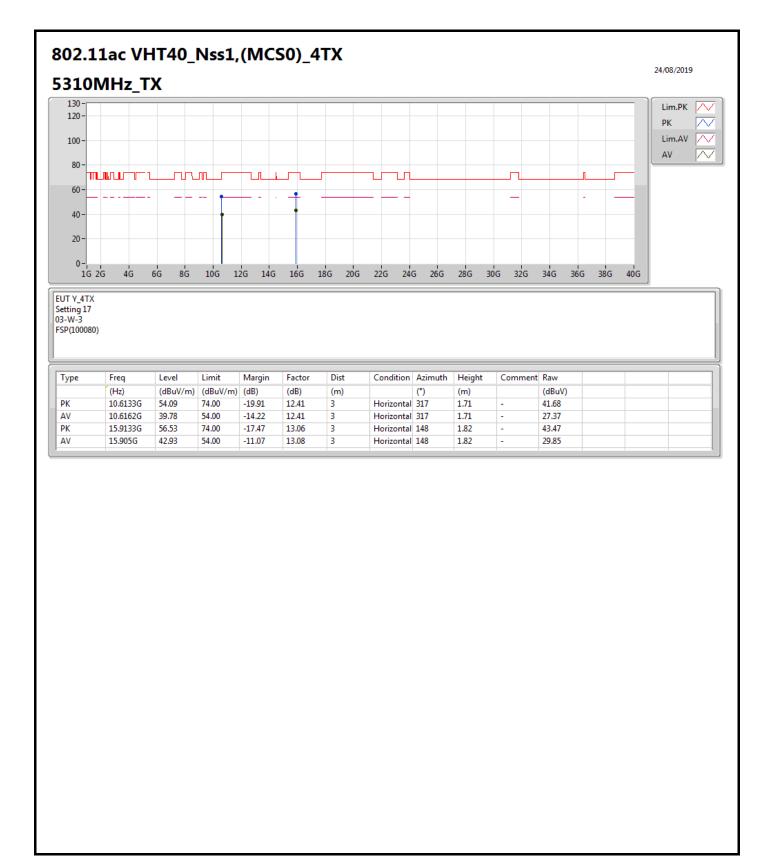
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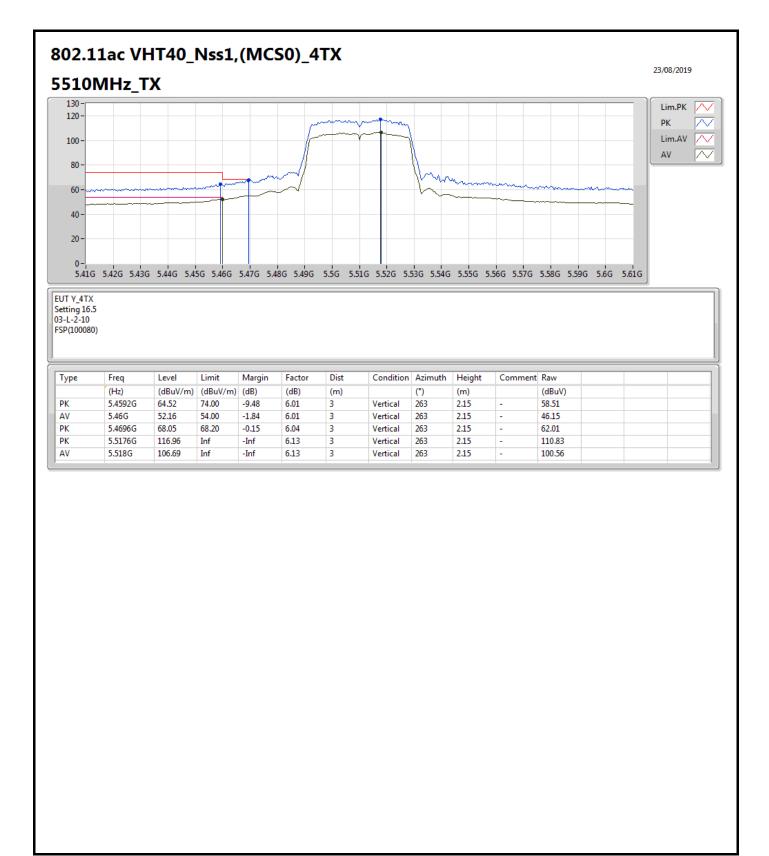
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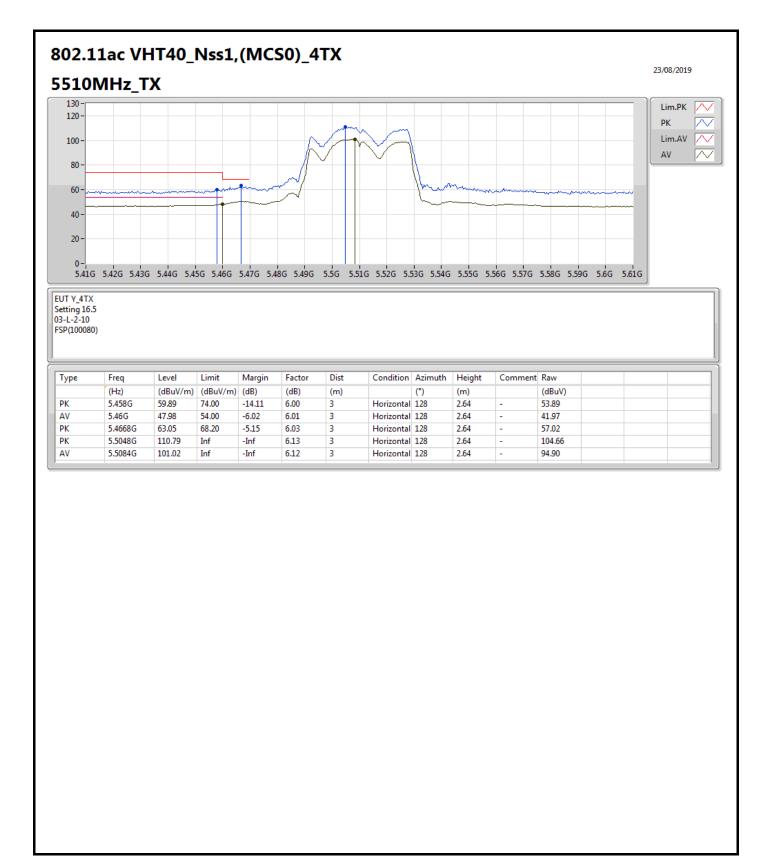
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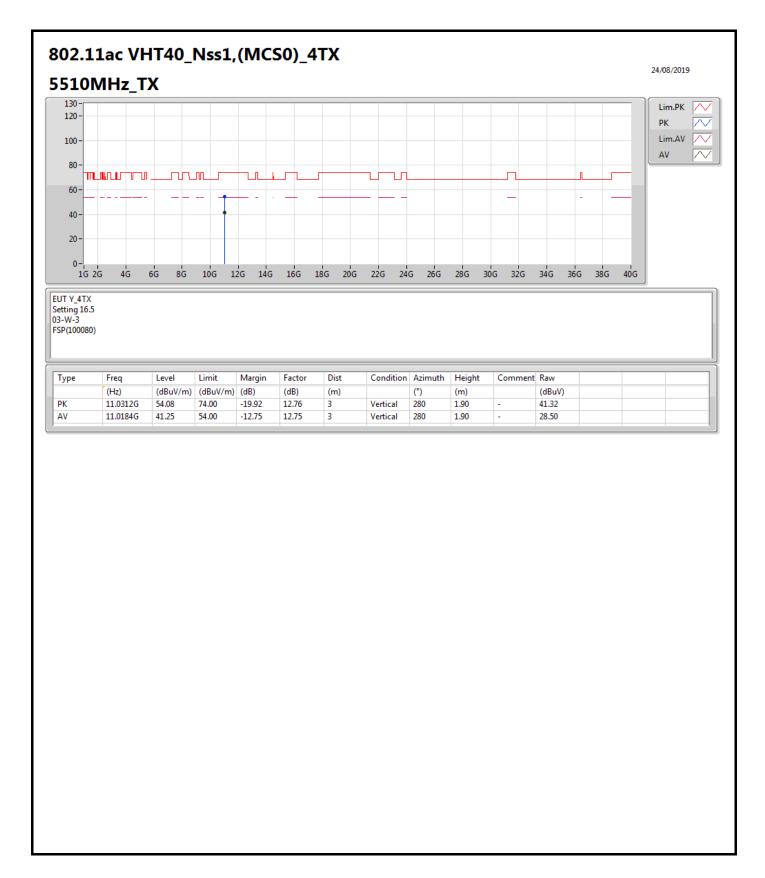
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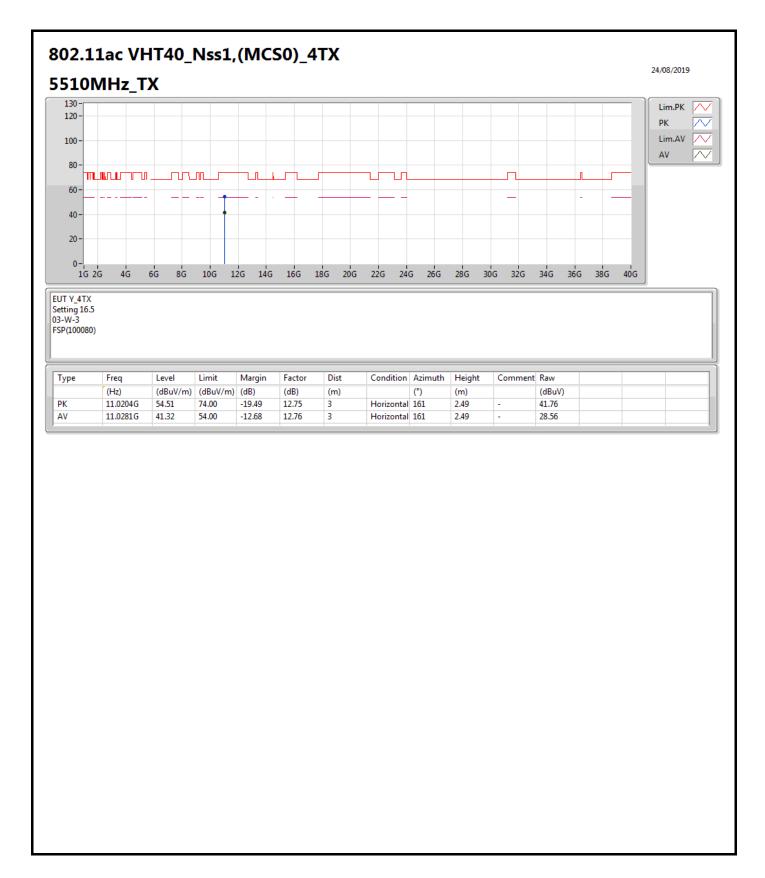
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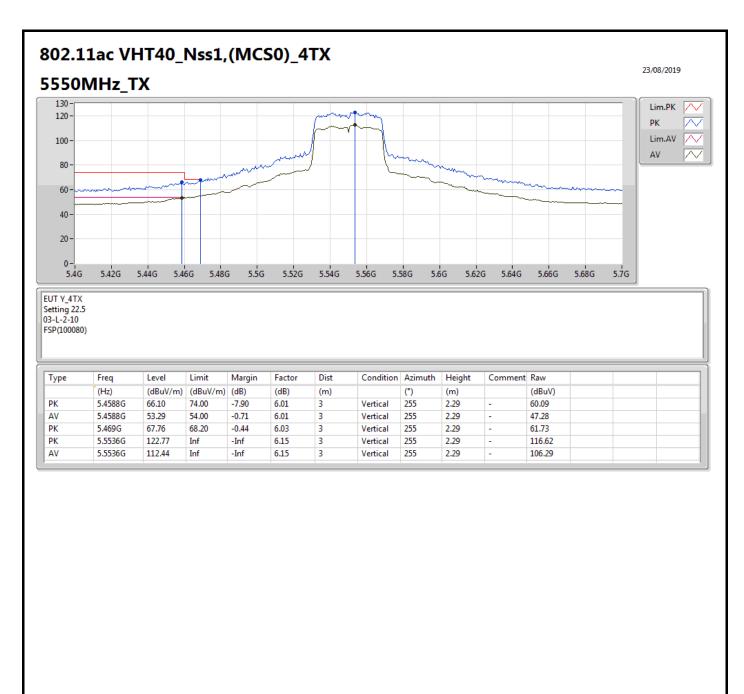
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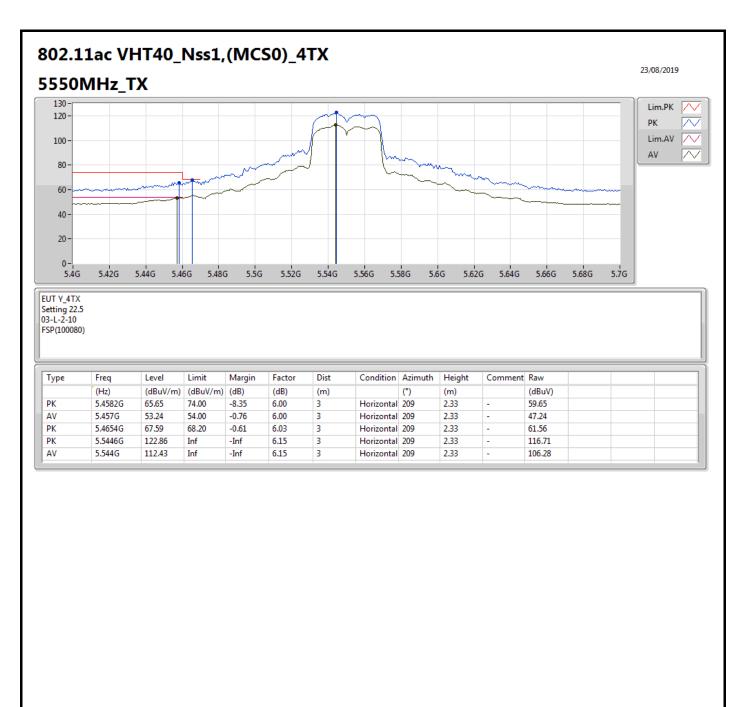
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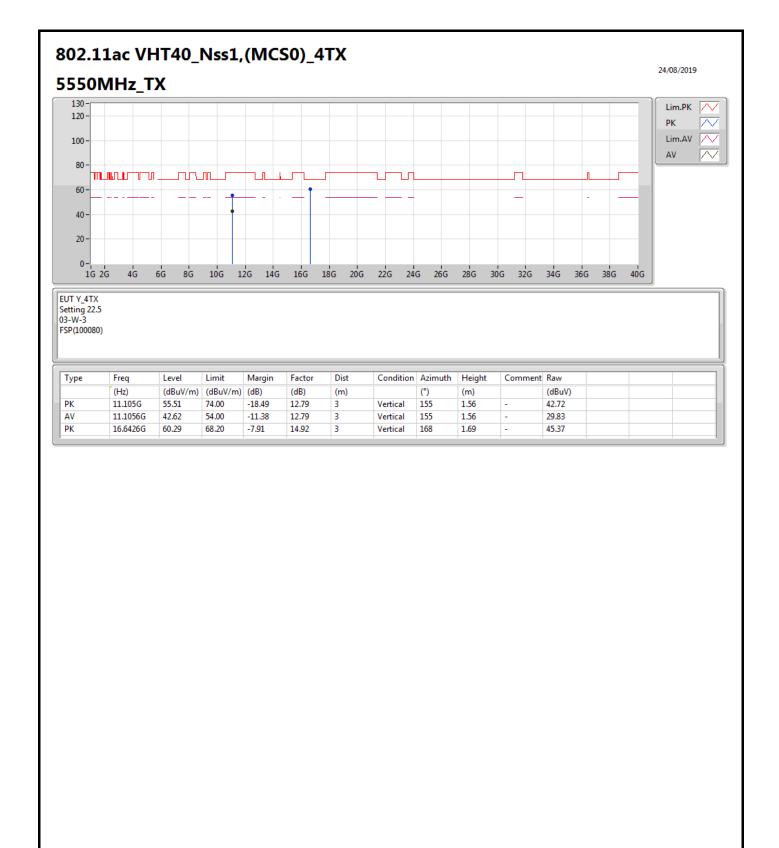
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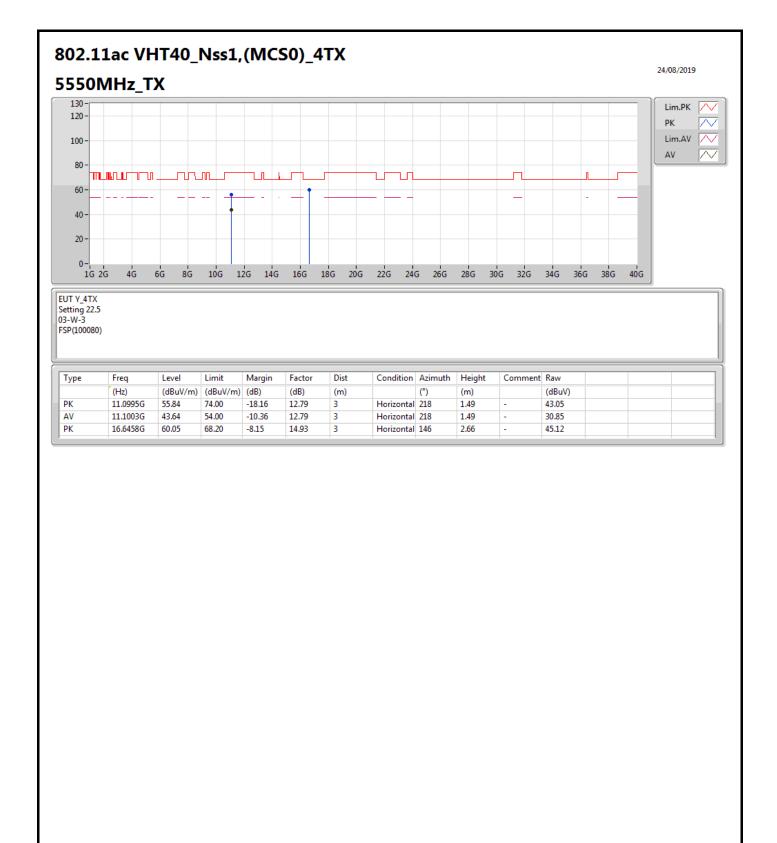
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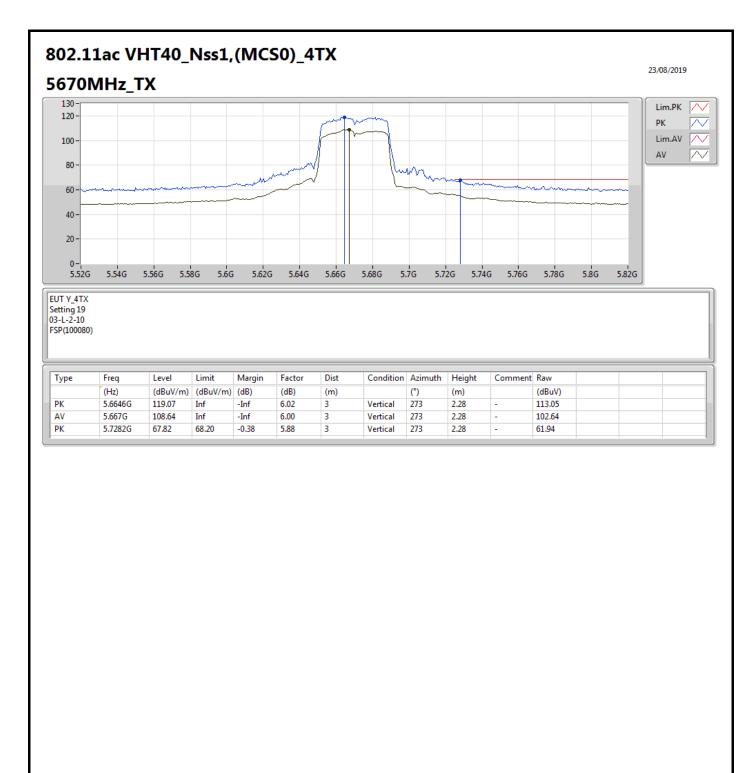
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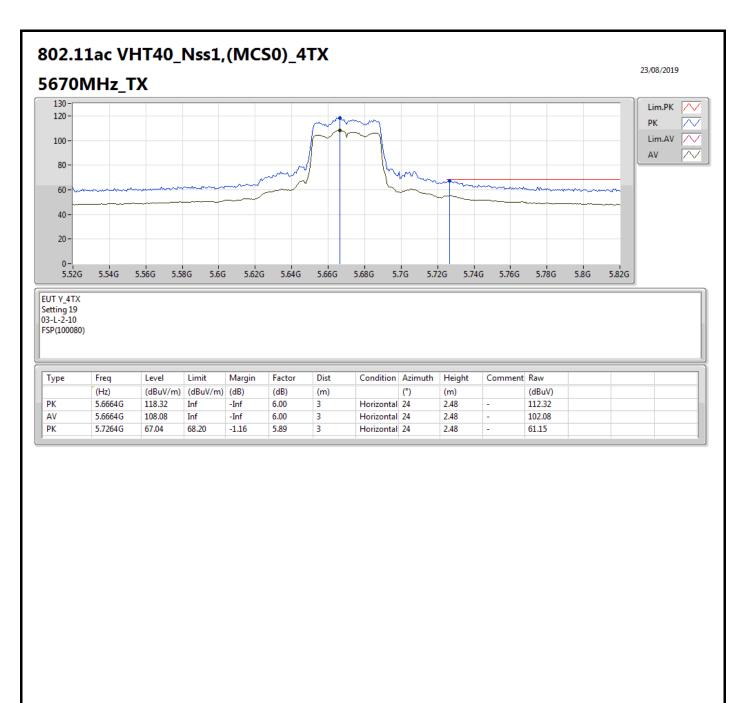
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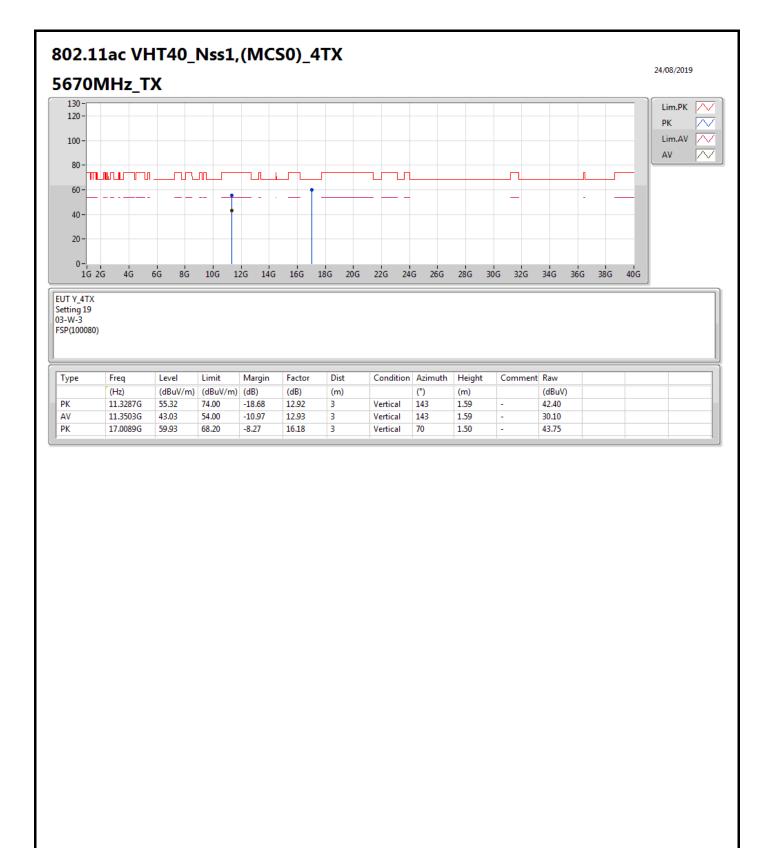
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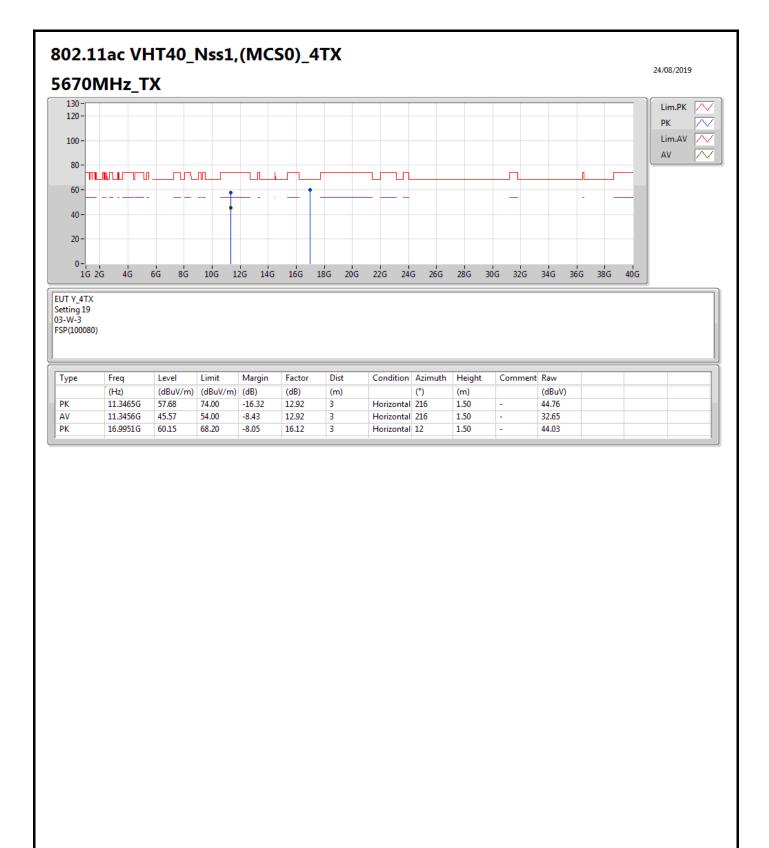
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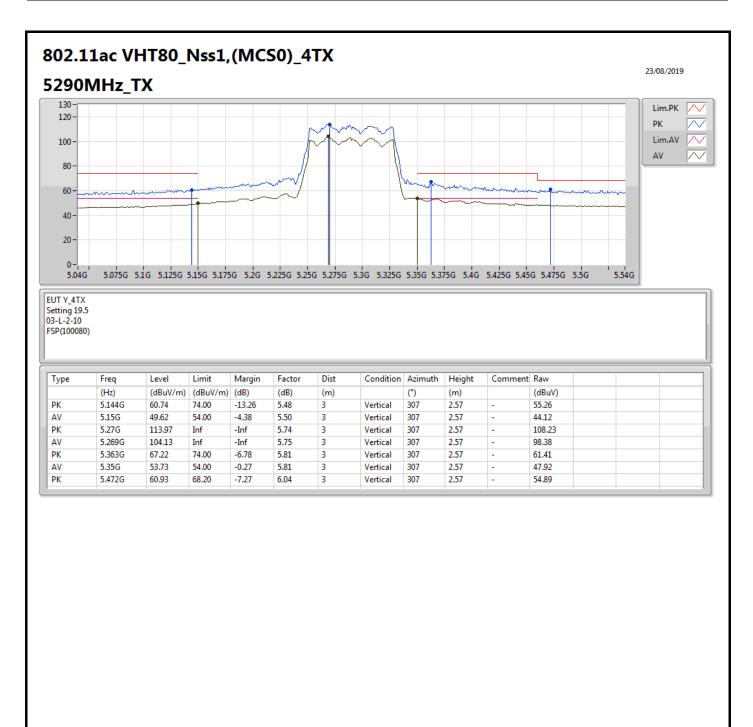
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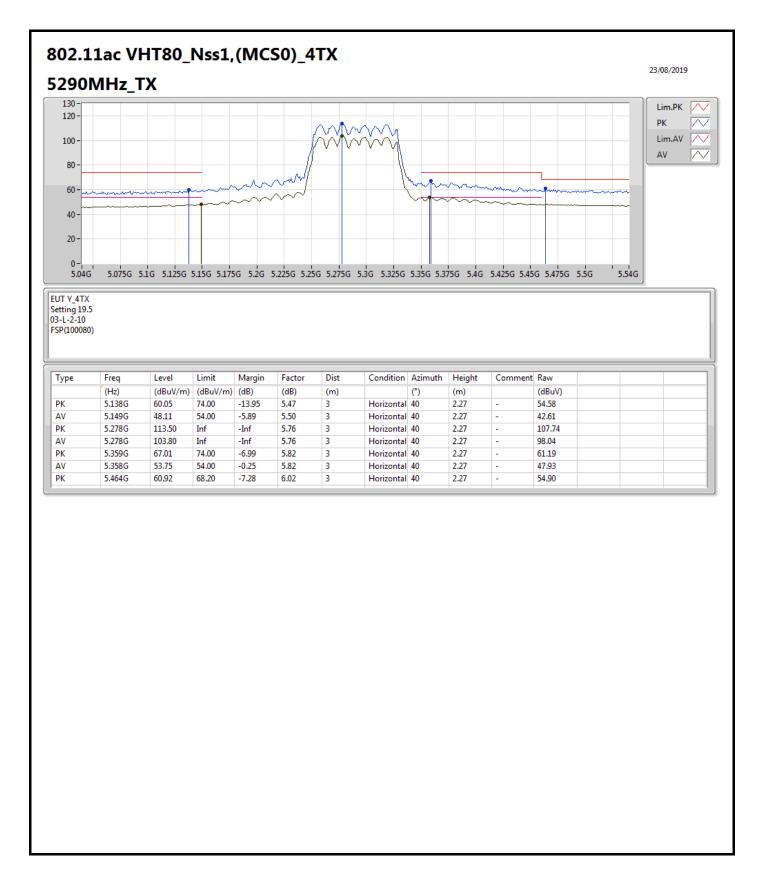


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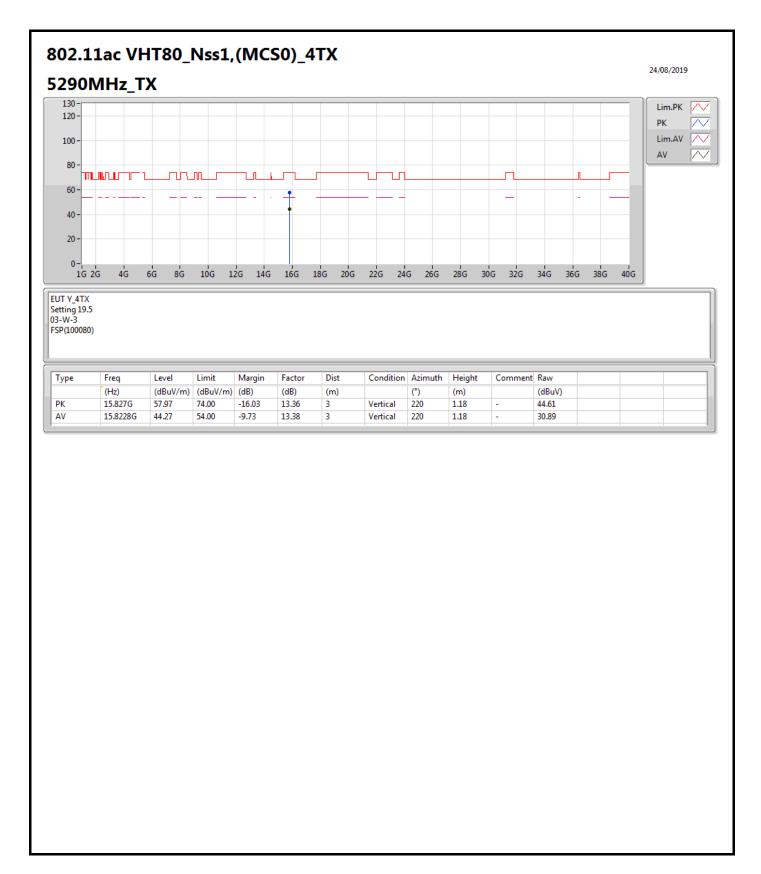






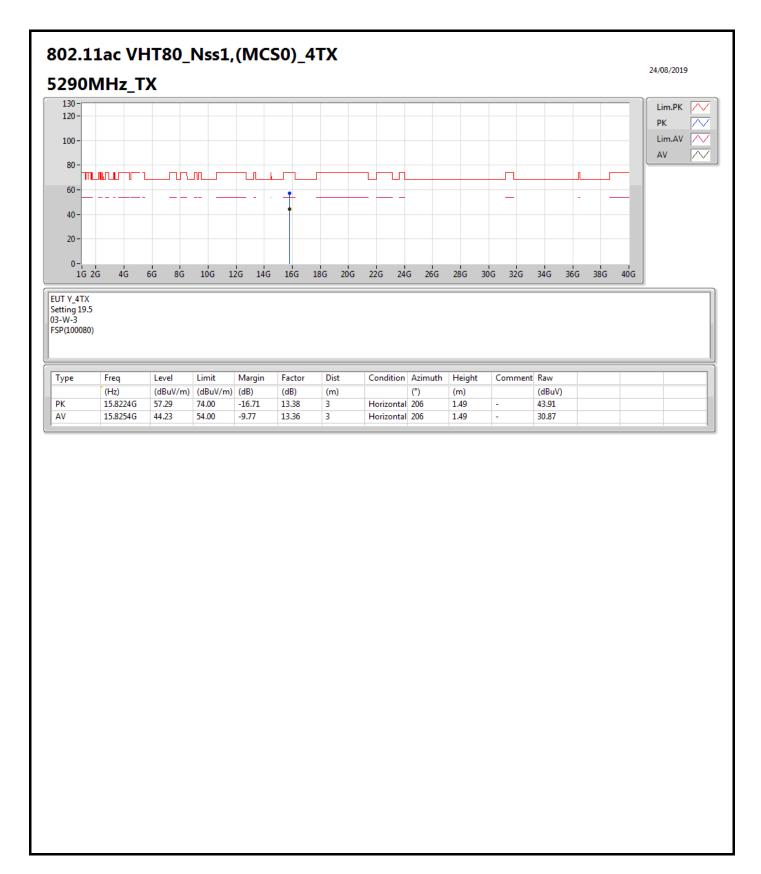
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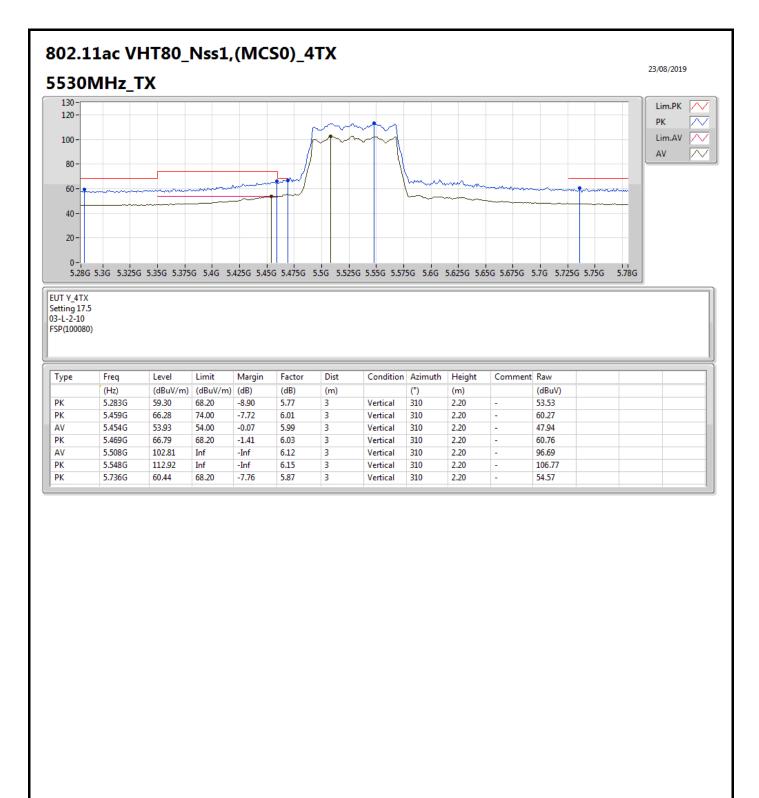
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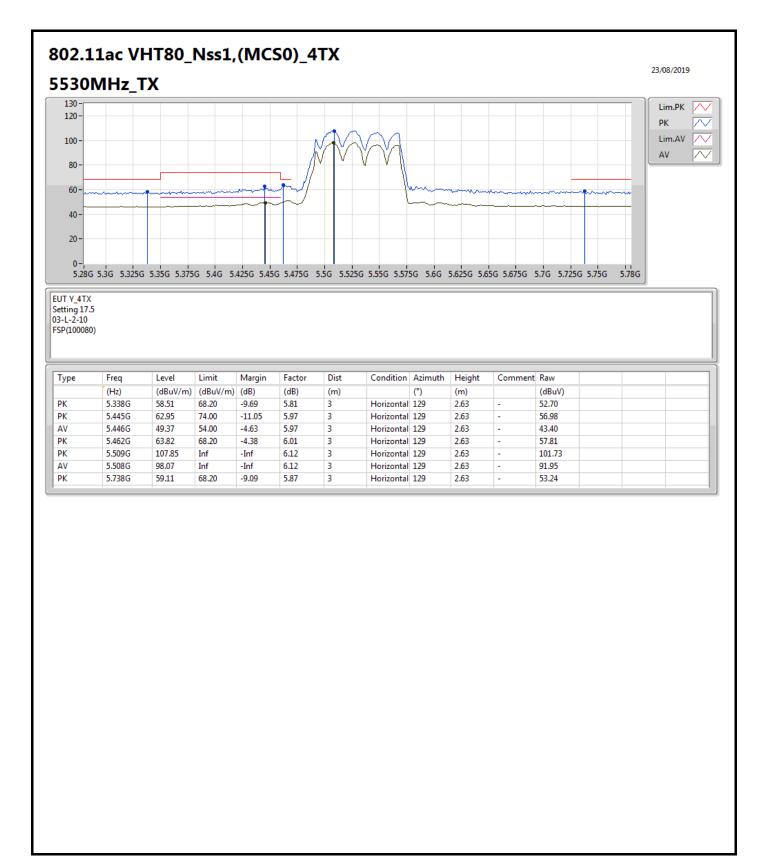
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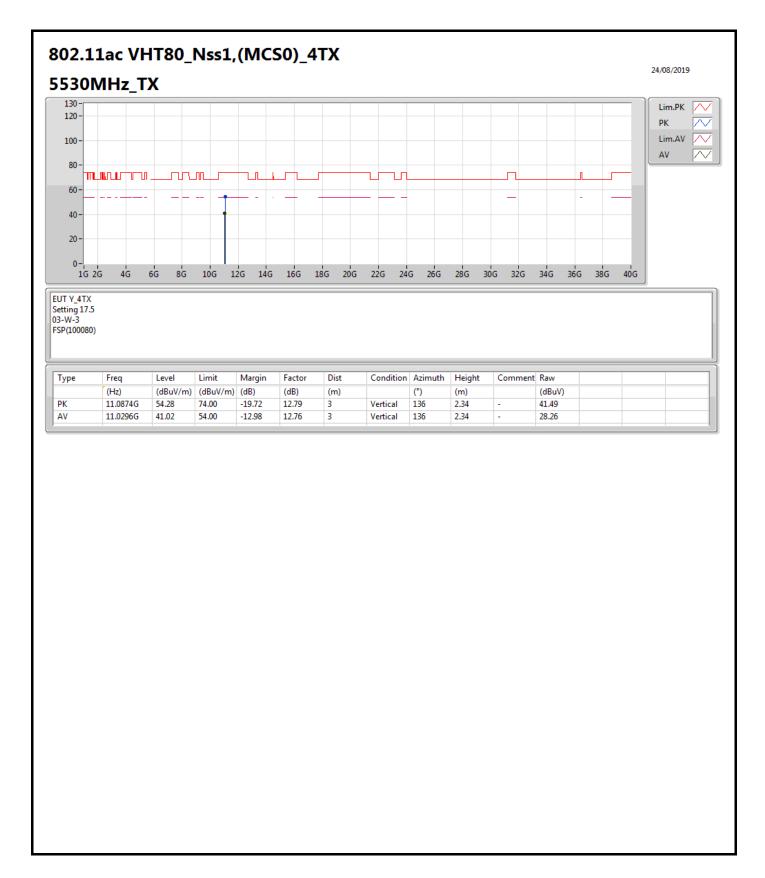


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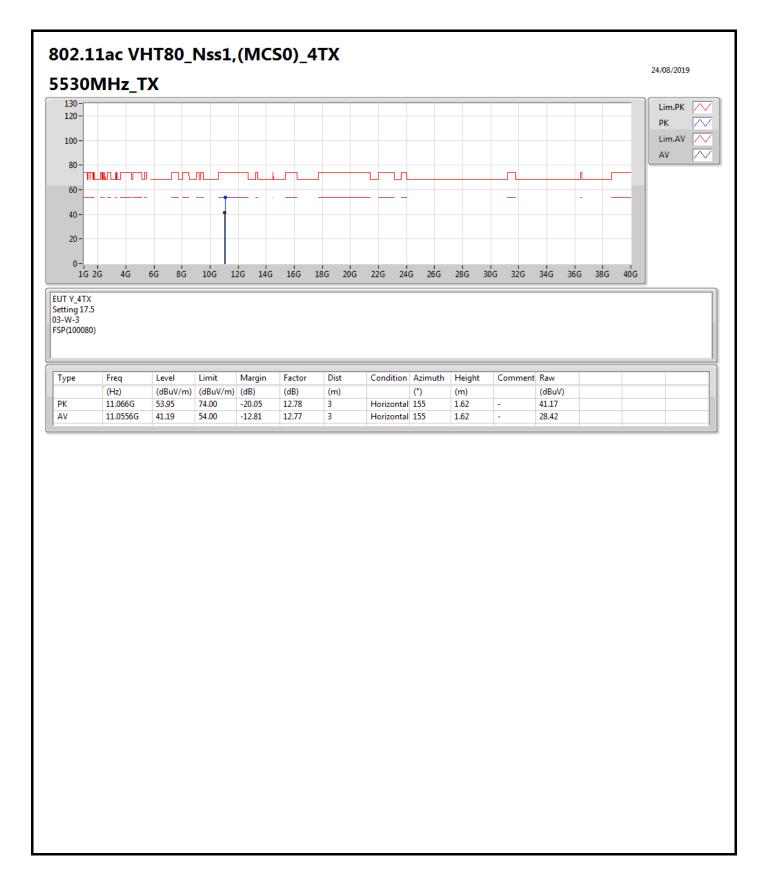






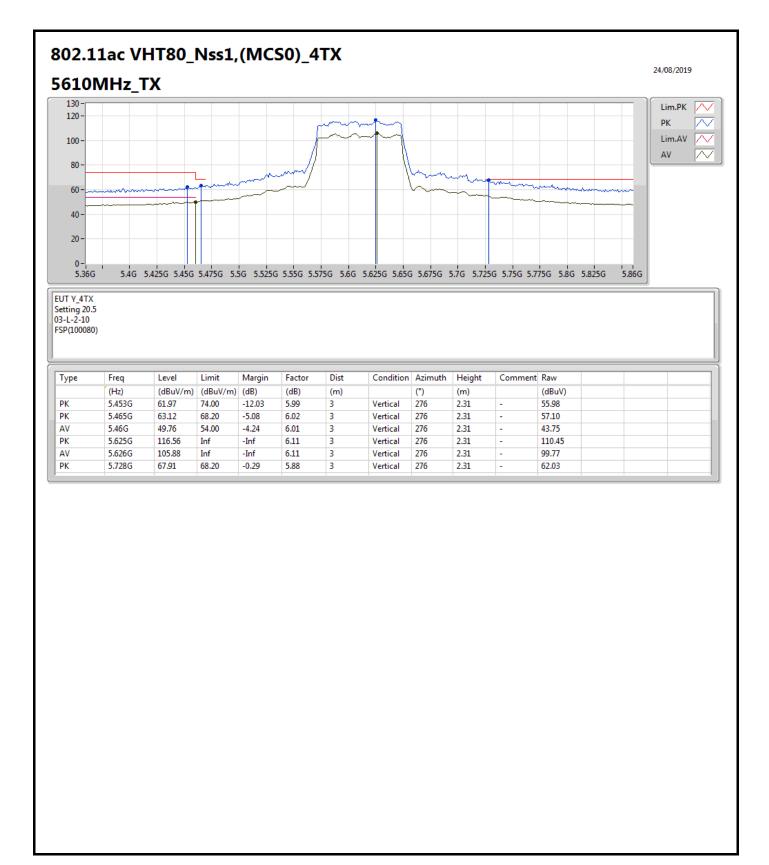
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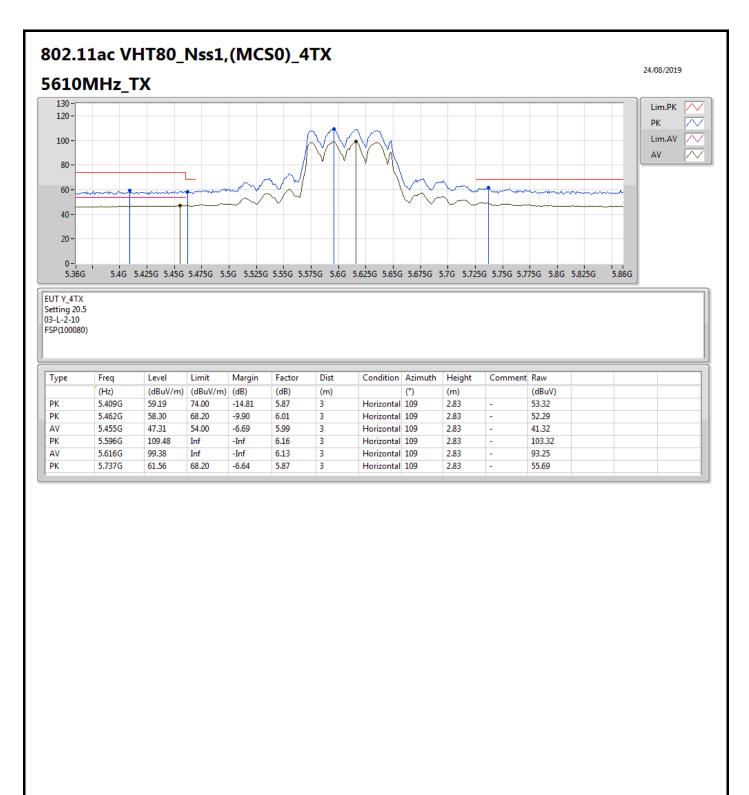
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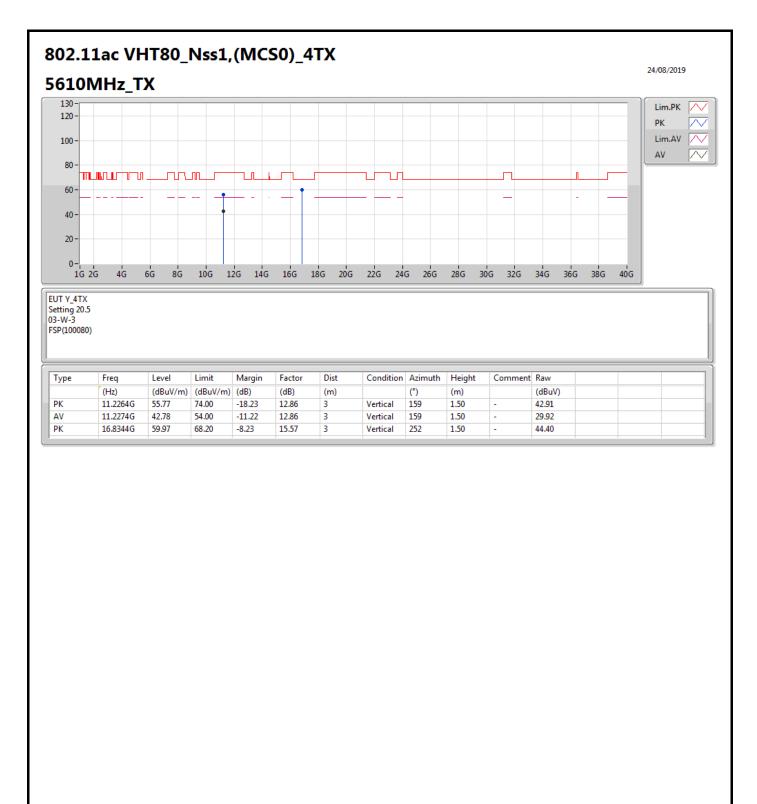


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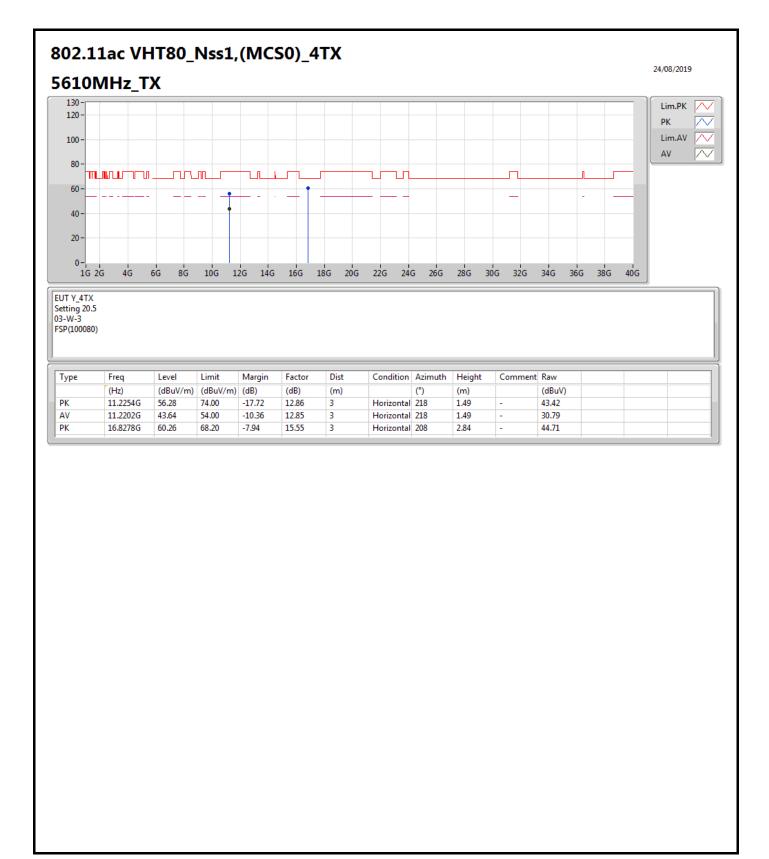






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