# CE Test Report

| | | |
|---|---|---|
| **Equipment** | : | **45 Series Pluggable module** |
| **Model No.** | : | **MSD45N** |
| **Brand Name** | : | **Laird Technologies** |
| **Applicant** | : | **Laird Technologies** |
| **Address** | : | **W66N220 Commerce Court, Cedarburg, Wisconsin 53012, USA** |
| **Standard** | : | **EN 301 893 V2.1.1 (2017-05)** |
| **Received Date** | : | **May 02, 2017** |
| **Tested Date** | : | **Jan. 20 ~ Jan. 25, 2016 (for original test)**<br>**May 17 ~ May 20, 2017(for new test)** |

**We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.**

**Reviewed by:** **Approved by:**

**James Fan / Assistant Manager** **Gary Chang / Manager**

Testing Laboratory 2732

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# Release Record

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| ER371704-03AN | Rev. 01 | Initial issue | Jun. 05, 2017 |

# Summary of Test Result

| Ref. Std. Clause | Test Items | Measured | Result |
|---|---|---|---|
| 4.2.1 | Carrier Frequencies | Meet the requirement of limit. | Pass |
| 4.2.2 | Nominal Channel Bandwidth and Occupied Channel Bandwidth | Meet the requirement of limit. | Pass |
| 4.2.3 | RF Output Power, Transmit Power Control (TPC) | 5.15-5.35GHz: 22.15 dBm<br>5.47-5.725GHz: 22.05 dBm | Pass |
| 4.2.3 | Power Density | Meet the requirement of limit. | Pass |
| 4.2.4 | Transmitter Unwanted Emissions | Meet the requirement of limit. | Pass |
| 4.2.5 | Receiver Spurious Emissions | Meet the requirement of limit. | Pass |
| 4.2.6 | Dynamic Frequency Selection (DFS) | Meet the requirement of limit. | Pass |
| 4.2.7 | Adaptivity (Channel Access Mechanism) | Meet the requirement of limit. | Pass[Note2] |
| 4.2.8 | Receiver Blocking | Meet the requirement of limit. | Pass |
| 4.2.9 | User Access Restrictions | Meet the requirement of limit. | Pass |
| 4.2.10 | Geo-Location Capability | This test is not required since the device does not support this function | N/A |

Note:
1. The DFS measurement was recorded in Report No.: EY371704-03.
2. Channel Access Mechanism and maximum Channel Occupancy Time are declared compliance with requirement by manufacturer. Both items are not evaluated.

# 1 General Description

## 1.1 Information

This report is issued as a supplementary report to original ICC report no. ER371704-02AN. The modification is updating standard version from V1.8.1 to V2.1.1. Therefore, related test items had been performed and presented in the following sections.

### 1.1.1 Specification of the Equipment under Test (EUT)

| RF General Information | | | | | |
|---|---|---|---|---|---|
| **IEEE Std. 802.11** | **Frequency Range (MHz)** | **Ch. Freq. (MHz)** | **Channel Number** | **Transmit Chains ($N_{TX}$)** | **Data Rate / MCS** |
| a | 5150-5250<br>5250-5350<br>5500-5700 | 5180-5240<br>5260-5320<br>5500-5700 | 36-48 [4]<br>52-64 [4]<br>100-140 [11] | 1 | 6-54 Mbps |
| n (HT20) | 5150-5250<br>5250-5350<br>5500-5700 | 5180-5240<br>5260-5320<br>5500-5700 | 36-48 [4]<br>52-64 [4]<br>100-140 [11] | 1 | MCS 0-7 |
| Note 1: 802.11a/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation. | | | | | |

### 1.1.2 Antenna Details

| Ant. No. | Brand / Model | Type | Connector | Operating Frequencies (MHz) / Antenna Gain (dBi) | | | |
|---|---|---|---|---|---|---|---|
| | | | | **2400~2483.5** | **5150~5250** | **5250~5350** | **5470~5725** |
| 1 | MAG.LAYERS EDA-1513-25GR2 -B2-CY | Dipole | SMA Jack Reverse | 2 | 2 | 2 | 2 |
| 2 | MAG.LAYERS PCA-4606-2G4C1 -A13-CY | PCB Dipole | UFL | 2.21 | 2.21 | 2.21 | 2.21 |
| 3 | Larid NanoBlade-IP04 | PCB Dipole | UFL | 2 | 3.9 | 3.9 | 4 |
| 4 | Larid MAF95310 Mini NanoBlade Flex | PCB Dipole | UFL | 2.79 | 3.38 | 3.38 | 3.38 |
| 5 | Laird NanoBlue-IP04 | PCB Dipole | UFL | 2 | --- | --- | --- |
| 6 | Ethertronics WLAN_1000146 | PIFA | UFL | 2.5 | 3.5 | 3.5 | 3.5 |

### 1.1.3 EUT Operational Condition

| | | | |
|---|---|---|---|
| **Power Supply Type** | 3.3Vdc from host | | |
| **SW Version** | 23.3.3.5 | | |
| **Operational Voltage** | ☒ Vnom (3.30 V) | ☒ Vmax (3.40 V) | ☒ Vmin (3.20 V) |
| **Operational Climatic** | ☒ Tnom (20°C) | ☒ Tmax (70°C) | ☒ Tmin (-20°C) |

### 1.1.4 Accessories

N/A

### 1.1.5 Adaptive Equipment

| **Adaptive Equipment** | | |
|---|---|---|
| ☒ | Adaptive Equipment without the possibility to switch to a non-adaptive mode: | |
| | ☐ | The equipment has implemented an LBT based DAA mechanism: |
| | | ☐ The equipment is Frame Based equipment |
| | | ☒ The equipment is Load Based equipment |
| | | ☐ The equipment can switch dynamically between Frame Based and Load Based equipment |
| | ☐ | The equipment has implemented an non-LBT based DAA mechanism |
| | ☐ | The equipment can operate in more than one adaptive mode |
| ☐ | Adaptive Equipment which can also operate in a non-adaptive mode | |

### 1.1.6 Channel List

| Frequency band (MHz) | |
|---|---|
| 802.11 a / n HT20 | |
| Channel | Frequency(MHz) |
| 36 | 5180 |
| 40 | 5200 |
| 44 | 5220 |
| 48 | 5240 |
| 52 | 5260 |
| 56 | 5280 |
| 60 | 5300 |
| 64 | 5320 |
| 100 | 5500 |
| 104 | 5520 |
| 108 | 5540 |
| 112 | 5560 |
| 116 | 5580 |
| 120 | 5600 |
| 124 | 5620 |
| 128 | 5640 |
| 132 | 5660 |
| 136 | 5680 |
| 140 | 5700 |

### 1.1.7 Test Tool and Duty Cycle

| | |
|---|---|
| **Test tool** | ART, version: rev0.2 build#26 |
| **Duty Cycle Of Test Signal (%)** | 99.30% - IEEE 802.11a<br>99.25% - IEEE 802.11n (HT20) |
| **Duty Factor** | 0.03 - IEEE 802.11a<br>0.03 - IEEE 802.11n (HT20) |

### 1.1.8 Power Setting

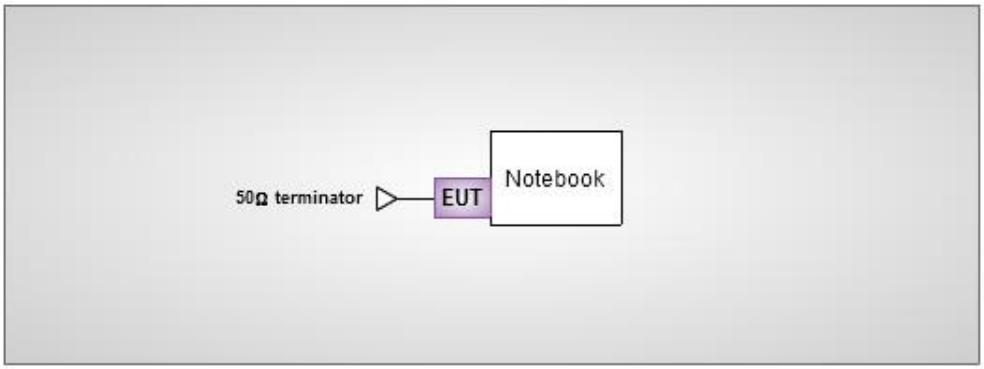
| **Modulation Mode** | **Test Frequency (MHz)** | | | |
|---|---|---|---|---|
| | **a / HT20** | | | |
| | **5180** | **5320** | **5500** | **5700** |
| a | 19.5 | 20.5 | 21.5 | 20.5 |
| n (HT20) | 19.5 | 20.5 | 22 | 20.5 |

## 1.2 Local Support Equipment List

| Support Equipment List | | | | | | |
|---|---|---|---|---|---|---|
| **No.** | **Equipment** | **Brand** | **Model** | **S/N** | **FCC ID** | **Signal cable / Length (m)** |
| 1 | Notebook | DELL | Latitude E6440 | 2ZC4Z52 | DoC | --- |

## 1.3 Test Setup Chart

**Test Setup Diagram (Adapter mode)**



## 1.4 Test Equipment and Calibration Data

| Test Item | Radiated Emissions | | | | |
|---|---|---|---|---|---|
| **Test Site** | Fully-anechoic chamber 1 / (05CH01-WS) | | | | |
| **Tested Date** | Jan. 25, 2016 | | | | |
| **Instrument** | **Manufacturer** | **Model No.** | **Serial No.** | **Calibration Date** | **Calibration Until** |
| Spectrum Analyzer | Agilent | N9010A | MY54200247 | Aug. 24, 2015 | Aug. 23, 2016 |
| Bilog Antenna | SCHWARZBECK | VULB9168 | VULB9168-524 | Oct. 03, 2015 | Oct. 02, 2016 |
| Horn Antenna 1G-18G | SCHWARZBECK | BBHA 9120 D | BBHA 9120 D 1094 | Oct. 20, 2015 | Oct. 19, 2016 |
| Horn Antenna 18G-40G | SCHWARZBECK | BBHA 9170 | BBHA 9170508 | Jan. 04, 2016 | Jan. 03, 2017 |
| Preamplifier | Agilent | 83017A | MY39501310 | Dec. 11, 2015 | Dec. 10, 2016 |
| Preamplifier | EMC | EMC02325 | 980146 | Oct. 14, 2015 | Oct. 13, 2016 |
| Preamplifier | EMC | EMC184045B | 980192 | Sep. 01, 2015 | Aug. 31, 2016 |
| RF Cable | HUBER+SUHNER | SUCOFLEX104 | MY16609/4 | Dec. 04, 2015 | Dec. 03, 2016 |
| RF Cable | HUBER+SUHNER | SUCOFLEX104 | MY16608/4 | Dec. 04, 2015 | Dec. 03, 2016 |
| RF Cable | HUBER+SUHNER | SUCOFLEX104 | MY16617/4 | Dec. 04, 2015 | Dec. 03, 2016 |
| LF cable 3M | Woken | CFD400NL-LW | CFD400NL-005 | Dec. 04, 2015 | Dec. 03, 2016 |
| LF cable 10M | Woken | CFD400NL-LW | CFD400NL-006 | Dec. 04, 2015 | Dec. 03, 2016 |
| Measurement Software | AUDIX | e3 | 6.120210g | NA | NA |
| Note: Calibration Interval of instruments listed above is one year. | | | | | |

| Test Item | RF Conducted | | | | |
|---|---|---|---|---|---|
| **Test Site** | (TH01-WS) | | | | |
| **Tested Date** | Jan. 20, 2016 | | | | |
| **Instrument** | **Manufacturer** | **Model No.** | **Serial No.** | **Calibration Date** | **Calibration Until** |
| Spectrum Analyzer | ROHDE&SCHWARZ | FSV40 | 101486 | Oct. 14, 2015 | Oct. 13, 2016 |
| TEMP&HUMIDITY CHAMBER | GIANT FORCE | GCT-225-40-SP-SD | MAF1212-002 | Nov. 27, 2015 | Nov. 26, 2016 |
| Power Meter | Anritsu | ML2495A | 1241002 | Sep. 21, 2015 | Sep. 20, 2016 |
| Power Sensor | Anritsu | MA2411B | 1207366 | Sep. 21, 2015 | Sep. 20, 2016 |
| DC POWER SOURCE | GW INSTEK | GPC-3060D | EM884797 | Oct. 20, 2015 | Oct. 19, 2016 |
| Measurement Software | Sporton | Sporton_1 | 1.3.30 | NA | NA |
| Measurement Software | Agilent | EN RF test | 1.1501125 | NA | NA |
| Note: Calibration Interval of instruments listed above is one year. | | | | | |

| Test Item | Adaptivity | | | | |
|---|---|---|---|---|---|
| Test Site | (TH01-WS) | | | | |
| Tested Date | May 17, 2017 | | | | |
| **Instrument** | **Manufacturer** | **Model No.** | **Serial No.** | **Calibration Date** | **Calibration Until** |
| Spectrum | Keysight | N9010A | MY54510374 | May 24, 2016 | May 23, 2017 |
| RF cable-4M | HUBER+SUHNER | SUCOFLEX_104 | MY15686/4 | Dec. 16, 2016 | Dec. 15, 2017 |
| RF cable-0.5M | HUBER+SUHNER | SUCOFLEX_104 | 296081/4 | Dec. 16, 2016 | Dec. 15, 2017 |
| RF cable-0.2M | HUBER+SUHNER | SUCOFLEX_104 | 329023/4 | Dec. 16, 2016 | Dec. 15, 2017 |
| RF cable-0.2M | HUBER+SUHNER | SUCOFLEX_104 | 329021/4 | Dec. 16, 2016 | Dec. 15, 2017 |
| MXG-B RF Vector Signal Generator | Agilent | N5182B | MY53050081 | Apr. 15, 2017 | Apr. 14, 2018 |
| Preamplifier | Burgeon | BPA-530 | 100219 | Nov. 02, 2016 | Nov. 01, 2017 |
| Oscilloscope | National Instruments | USB-5133 | F651FF | Jun. 22, 2016 | Jun. 21, 2017 |
| Measurement Software | Sporton | Sporton_3 | 1.0.0.22 | NA | NA |
| Note: Calibration Interval of instruments listed above is one year. | | | | | |

| Test Item | Receiver Blocking | | | | |
|---|---|---|---|---|---|
| Test Site | (05CH01-WS) | | | | |
| Tested Date | May 20, 2017 | | | | |
| **Instrument** | **Manufacturer** | **Model No.** | **Serial No.** | **Calibration Date** | **Calibration Until** |
| Wireless connectivity tester | ROHDE&SCHWARZ | CMW270 | 100856 | Nov. 07, 2016 | Nov. 06, 2017 |
| Signal Generator | R&S | SMB100A | 175727 | Oct. 19, 2016 | Oct. 18, 2017 |
| RF Cable | HUBER+SUHNER | SUCOFLEX_104 | 500202/4 | Dec. 16, 2016 | Dec. 15, 2017 |
| RF Cable | HUBER+SUHNER | SUCOFLEX_104 | 296088/4 | Dec. 16, 2016 | Dec. 15, 2017 |
| RF Cable | HUBER+SUHNER | SUCOFLEX_104 | 329023/4 | Dec. 16, 2016 | Dec. 15, 2017 |
| Note: Calibration Interval of instruments listed above is one year. | | | | | |

## 1.5 Testing Applied Standards

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

EN 301 893 V2.1.1 (2017-05)

## 1.6 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)

| Measurement Uncertainty | | |
|---|---|---|
| **Parameters** | **Uncertainty** | **Limit** |
| Radio Frequency | $\pm 1.4 \times 10^{-9}$ | $\pm 1 \times 10^{-5}$ |
| RF power conducted | ±0.808 dB | ±1,5 dB |
| RF power radiated | ±3.401 dB | ±6 dB |
| Spurious emission, conducted | ±2.994 dB | ±3 dB |
| Spurious emission, radiated | ±3.401 dB | ±6 dB |
| Humidity | ±0.6 $^{o}$C | ±5 % |
| Temperature | ±0.29 % | ±2 °C |
| Time | ±0.1 % | ±10 % |

# 2 Test Configuration

## 2.1 Testing Condition

| Test Item | Test Site | Ambient Condition | Tested By |
|---|---|---|---|
| RF Conducted | TH01-WS | 23°C / 63% | Ryan Lee |
| Radiated Emission | 05CH01-WS | 19°C / 70% | Ryan Lee |
| Adaptivity | TH01-WS | 25°C / 64% | Ryan Lee |
| Receiver Blocking | 05CH01-WS | 22.5°C / 64% | Jack Li |

## 2.2 The Worst Test Modes and Channel Details

| Test item | Modulation Mode | Test Frequency (MHz) | Data Rate | Test Configuration |
|---|---|---|---|---|
| Centre Frequencies<br>RF Output Power<br>Power Spectral Density | 11a<br>HT20 | 5180 / 5320 / 5500 / 5700<br>5180 / 5320 / 5500 / 5700 | 6 Mbps<br>MCS 0 | 1, 2, 3 |
| Occupied Channel Bandwidth | 11a<br>HT20 | 5180 / 5320 / 5500 / 5700<br>5180 / 5320 / 5500 / 5700 | 6 Mbps<br>MCS 0 | 1 |
| Transmitter Unwanted Emissions within the 5 GHz RLAN Band | 11a<br>HT20 | 5180 / 5700<br>5180 / 5700 | 6 Mbps<br>MCS 0 | 1 |
| Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands<br>(below 1GHz test) | 11a<br>HT20 | 5180 / 5320 / 5500 / 5700<br>5180 / 5320 / 5500 / 5700 | 6 Mbps<br>MCS 0 | Note 2 |
| Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands<br>(above 1GHz test) | 11a<br>HT20 | 5180 / 5320 / 5500 / 5700<br>5180 / 5320 / 5500 / 5700 | 6 Mbps<br>MCS 0 | Note 2 |
| Receiver Spurious Emissions | 11a<br>HT20 | 5180 / 5700<br>5180 / 5700 | 6 Mbps<br>MCS 0 | Note 2 |
| Adaptivity | HT20 | 5180 / 5500 | MCS 0 | 2 |
| Receiver Blocking | 11a | 5180 | 6 Mbps | 2 |

**NOTE:**

1. 3 types antenna are used for this device, highest gain antenna of each type is selected to perform radiated emission test as below test configuration.
   1) Configuration 1 : Dipole antenna (Antenna No.1)
   2) Configuration 2 : PCB Dipole antenna (Antenna No.3)
   3) Configuration 3 : PIFA antenna (Antenna No.6)
2. Conducted and radiated emissions are measured. A 50 Ω terminator is connected to antenna port of EUT for radiated emission measurement.

# 3 Transmitter Test Results

## 3.1 Carrier Frequencies

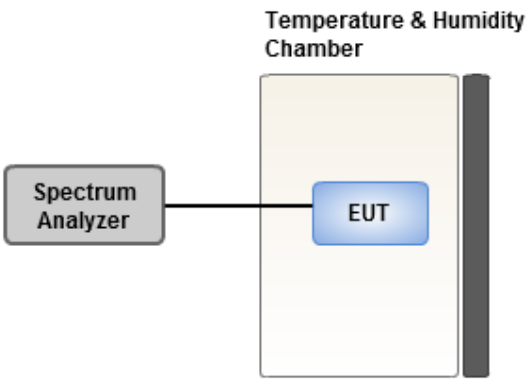
### 3.1.1 Limit of Carrier Frequencies

The actual centre frequency for any given channel declared by the manufacturer shall be maintained within the range $f_c$ ± 20 ppm.

### 3.1.2 Test Procedures

Reference to clause 5.4.2.2 of ETSI EN 301 893 V2.1.1 (2017-05).

### 3.1.3 Test Setup



### 3.1.4 Test Result of Carrier Frequencies

| Test Configuration | | 1 | | | |
|---|---|---|---|---|---|
| Condition | Modulation Mode | Freq. (MHz) | Carrier Centre Frequencies (ppm) | | Limit (ppm) |
| | | | Freqeuncy (MHz) | Carrier Stability | |
| $T_{nom}V_{nom}$ | 802.11a | 5180 | 5180.00470 | 0.91 | 20 |
| $T_{min}V_{max}$ | 802.11a | 5180 | 5180.00670 | 1.29 | 20 |
| $T_{min}V_{min}$ | 802.11a | 5180 | 5180.00670 | 1.29 | 20 |
| $T_{max}V_{max}$ | 802.11a | 5180 | 5180.00470 | 0.91 | 20 |
| $T_{max}V_{min}$ | 802.11a | 5180 | 5180.00470 | 0.91 | 20 |
| $T_{nom}V_{nom}$ | 802.11a | 5320 | 5320.00650 | 1.22 | 20 |
| $T_{min}V_{max}$ | 802.11a | 5320 | 5320.00850 | 1.60 | 20 |
| $T_{min}V_{min}$ | 802.11a | 5320 | 5320.00850 | 1.60 | 20 |
| $T_{max}V_{max}$ | 802.11a | 5320 | 5320.00650 | 1.22 | 20 |
| $T_{max}V_{min}$ | 802.11a | 5320 | 5320.00650 | 1.22 | 20 |
| $T_{nom}V_{nom}$ | 802.11a | 5500 | 5500.00690 | 1.25 | 20 |
| $T_{min}V_{max}$ | 802.11a | 5500 | 5500.00890 | 1.62 | 20 |
| $T_{min}V_{min}$ | 802.11a | 5500 | 5500.00890 | 1.62 | 20 |
| $T_{max}V_{max}$ | 802.11a | 5500 | 5500.00690 | 1.25 | 20 |
| $T_{max}V_{min}$ | 802.11a | 5500 | 5500.00690 | 1.25 | 20 |
| $T_{nom}V_{nom}$ | 802.11a | 5700 | 5700.00620 | 1.09 | 20 |
| $T_{min}V_{max}$ | 802.11a | 5700 | 5700.00820 | 1.44 | 20 |
| $T_{min}V_{min}$ | 802.11a | 5700 | 5700.00820 | 1.44 | 20 |
| $T_{max}V_{max}$ | 802.11a | 5700 | 5700.00620 | 1.09 | 20 |
| $T_{max}V_{min}$ | 802.11a | 5700 | 5700.00620 | 1.09 | 20 |

| Test Configuration | | 1 | | | |
|---|---|---|---|---|---|
| Condition | Modulation Mode | Freq. (MHz) | Carrier Centre Frequencies (ppm) | | Limit (ppm) |
| | | | Freqeuncy (MHz) | Carrier Stability | |
| $T_{nom}V_{nom}$ | 802.11n HT20 | 5180 | 5180.00580 | 1.12 | 20 |
| $T_{min}V_{max}$ | 802.11n HT20 | 5180 | 5180.00780 | 1.51 | 20 |
| $T_{min}V_{min}$ | 802.11n HT20 | 5180 | 5180.00780 | 1.51 | 20 |
| $T_{max}V_{max}$ | 802.11n HT20 | 5180 | 5180.00580 | 1.12 | 20 |
| $T_{max}V_{min}$ | 802.11n HT20 | 5180 | 5180.00580 | 1.12 | 20 |
| $T_{nom}V_{nom}$ | 802.11n HT20 | 5320 | 5320.00620 | 1.17 | 20 |
| $T_{min}V_{max}$ | 802.11n HT20 | 5320 | 5320.00820 | 1.54 | 20 |
| $T_{min}V_{min}$ | 802.11n HT20 | 5320 | 5320.00820 | 1.54 | 20 |
| $T_{max}V_{max}$ | 802.11n HT20 | 5320 | 5320.00620 | 1.17 | 20 |
| $T_{max}V_{min}$ | 802.11n HT20 | 5320 | 5320.00620 | 1.17 | 20 |
| $T_{nom}V_{nom}$ | 802.11n HT20 | 5500 | 5500.00630 | 1.15 | 20 |
| $T_{min}V_{max}$ | 802.11n HT20 | 5500 | 5500.00830 | 1.51 | 20 |
| $T_{min}V_{min}$ | 802.11n HT20 | 5500 | 5500.00830 | 1.51 | 20 |
| $T_{max}V_{max}$ | 802.11n HT20 | 5500 | 5500.00630 | 1.15 | 20 |
| $T_{max}V_{min}$ | 802.11n HT20 | 5500 | 5500.00630 | 1.15 | 20 |
| $T_{nom}V_{nom}$ | 802.11n HT20 | 5700 | 5700.00670 | 1.18 | 20 |
| $T_{min}V_{max}$ | 802.11n HT20 | 5700 | 5700.00870 | 1.53 | 20 |
| $T_{min}V_{min}$ | 802.11n HT20 | 5700 | 5700.00870 | 1.53 | 20 |
| $T_{max}V_{max}$ | 802.11n HT20 | 5700 | 5700.00670 | 1.18 | 20 |
| $T_{max}V_{min}$ | 802.11n HT20 | 5700 | 5700.00670 | 1.18 | 20 |

| Test Configuration | | 2 | | | |
|---|---|---|---|---|---|
| Condition | Modulation Mode | Freq. (MHz) | Carrier Centre Frequencies (ppm) | | Limit (ppm) |
| | | | Freqeuncy (MHz) | Carrier Stability | |
| $T_{nom}V_{nom}$ | 802.11a | 5180 | 5180.00470 | 0.91 | 20 |
| $T_{min}V_{max}$ | 802.11a | 5180 | 5180.00670 | 1.29 | 20 |
| $T_{min}V_{min}$ | 802.11a | 5180 | 5180.00670 | 1.29 | 20 |
| $T_{max}V_{max}$ | 802.11a | 5180 | 5180.00470 | 0.91 | 20 |
| $T_{max}V_{min}$ | 802.11a | 5180 | 5180.00470 | 0.91 | 20 |
| $T_{nom}V_{nom}$ | 802.11a | 5320 | 5320.00650 | 1.22 | 20 |
| $T_{min}V_{max}$ | 802.11a | 5320 | 5320.00850 | 1.60 | 20 |
| $T_{min}V_{min}$ | 802.11a | 5320 | 5320.00850 | 1.60 | 20 |
| $T_{max}V_{max}$ | 802.11a | 5320 | 5320.00650 | 1.22 | 20 |
| $T_{max}V_{min}$ | 802.11a | 5320 | 5320.00650 | 1.22 | 20 |
| $T_{nom}V_{nom}$ | 802.11a | 5500 | 5500.00690 | 1.25 | 20 |
| $T_{min}V_{max}$ | 802.11a | 5500 | 5500.00890 | 1.62 | 20 |
| $T_{min}V_{min}$ | 802.11a | 5500 | 5500.00890 | 1.62 | 20 |
| $T_{max}V_{max}$ | 802.11a | 5500 | 5500.00690 | 1.25 | 20 |
| $T_{max}V_{min}$ | 802.11a | 5500 | 5500.00690 | 1.25 | 20 |
| $T_{nom}V_{nom}$ | 802.11a | 5700 | 5700.00620 | 1.09 | 20 |
| $T_{min}V_{max}$ | 802.11a | 5700 | 5700.00820 | 1.44 | 20 |
| $T_{min}V_{min}$ | 802.11a | 5700 | 5700.00820 | 1.44 | 20 |
| $T_{max}V_{max}$ | 802.11a | 5700 | 5700.00620 | 1.09 | 20 |
| $T_{max}V_{min}$ | 802.11a | 5700 | 5700.00620 | 1.09 | 20 |

| Test Configuration | | 2 | | | |
|---|---|---|---|---|---|
| Condition | Modulation Mode | Freq. (MHz) | Carrier Centre Frequencies (ppm) | | Limit (ppm) |
| | | | Freqeuncy (MHz) | Carrier Stability | |
| $T_{nom}V_{nom}$ | 802.11n HT20 | 5180 | 5180.00580 | 1.12 | 20 |
| $T_{min}V_{max}$ | 802.11n HT20 | 5180 | 5180.00780 | 1.51 | 20 |
| $T_{min}V_{min}$ | 802.11n HT20 | 5180 | 5180.00780 | 1.51 | 20 |
| $T_{max}V_{max}$ | 802.11n HT20 | 5180 | 5180.00580 | 1.12 | 20 |
| $T_{max}V_{min}$ | 802.11n HT20 | 5180 | 5180.00580 | 1.12 | 20 |
| $T_{nom}V_{nom}$ | 802.11n HT20 | 5320 | 5320.00620 | 1.17 | 20 |
| $T_{min}V_{max}$ | 802.11n HT20 | 5320 | 5320.00820 | 1.54 | 20 |
| $T_{min}V_{min}$ | 802.11n HT20 | 5320 | 5320.00820 | 1.54 | 20 |
| $T_{max}V_{max}$ | 802.11n HT20 | 5320 | 5320.00620 | 1.17 | 20 |
| $T_{max}V_{min}$ | 802.11n HT20 | 5320 | 5320.00620 | 1.17 | 20 |
| $T_{nom}V_{nom}$ | 802.11n HT20 | 5500 | 5500.00630 | 1.15 | 20 |
| $T_{min}V_{max}$ | 802.11n HT20 | 5500 | 5500.00830 | 1.51 | 20 |
| $T_{min}V_{min}$ | 802.11n HT20 | 5500 | 5500.00830 | 1.51 | 20 |
| $T_{max}V_{max}$ | 802.11n HT20 | 5500 | 5500.00630 | 1.15 | 20 |
| $T_{max}V_{min}$ | 802.11n HT20 | 5500 | 5500.00630 | 1.15 | 20 |
| $T_{nom}V_{nom}$ | 802.11n HT20 | 5700 | 5700.00670 | 1.18 | 20 |
| $T_{min}V_{max}$ | 802.11n HT20 | 5700 | 5700.00870 | 1.53 | 20 |
| $T_{min}V_{min}$ | 802.11n HT20 | 5700 | 5700.00870 | 1.53 | 20 |
| $T_{max}V_{max}$ | 802.11n HT20 | 5700 | 5700.00670 | 1.18 | 20 |
| $T_{max}V_{min}$ | 802.11n HT20 | 5700 | 5700.00670 | 1.18 | 20 |

| Test Configuration | | 3 | | | |
|---|---|---|---|---|---|
| Condition | Modulation Mode | Freq. (MHz) | Carrier Centre Frequencies (ppm) | | Limit (ppm) |
| | | | Freqeuncy (MHz) | Carrier Stability | |
| $T_{nom}V_{nom}$ | 802.11a | 5180 | 5180.00470 | 0.91 | 20 |
| $T_{min}V_{max}$ | 802.11a | 5180 | 5180.00670 | 1.29 | 20 |
| $T_{min}V_{min}$ | 802.11a | 5180 | 5180.00670 | 1.29 | 20 |
| $T_{max}V_{max}$ | 802.11a | 5180 | 5180.00470 | 0.91 | 20 |
| $T_{max}V_{min}$ | 802.11a | 5180 | 5180.00470 | 0.91 | 20 |
| $T_{nom}V_{nom}$ | 802.11a | 5320 | 5320.00650 | 1.22 | 20 |
| $T_{min}V_{max}$ | 802.11a | 5320 | 5320.00850 | 1.60 | 20 |
| $T_{min}V_{min}$ | 802.11a | 5320 | 5320.00850 | 1.60 | 20 |
| $T_{max}V_{max}$ | 802.11a | 5320 | 5320.00650 | 1.22 | 20 |
| $T_{max}V_{min}$ | 802.11a | 5320 | 5320.00650 | 1.22 | 20 |
| $T_{nom}V_{nom}$ | 802.11a | 5500 | 5500.00690 | 1.25 | 20 |
| $T_{min}V_{max}$ | 802.11a | 5500 | 5500.00890 | 1.62 | 20 |
| $T_{min}V_{min}$ | 802.11a | 5500 | 5500.00890 | 1.62 | 20 |
| $T_{max}V_{max}$ | 802.11a | 5500 | 5500.00690 | 1.25 | 20 |
| $T_{max}V_{min}$ | 802.11a | 5500 | 5500.00690 | 1.25 | 20 |
| $T_{nom}V_{nom}$ | 802.11a | 5700 | 5700.00620 | 1.09 | 20 |
| $T_{min}V_{max}$ | 802.11a | 5700 | 5700.00820 | 1.44 | 20 |
| $T_{min}V_{min}$ | 802.11a | 5700 | 5700.00820 | 1.44 | 20 |
| $T_{max}V_{max}$ | 802.11a | 5700 | 5700.00620 | 1.09 | 20 |
| $T_{max}V_{min}$ | 802.11a | 5700 | 5700.00620 | 1.09 | 20 |

| Test Configuration | | 3 | | | |
|---|---|---|---|---|---|
| Condition | Modulation Mode | Freq. (MHz) | Carrier Centre Frequencies (ppm) | | Limit (ppm) |
| | | | Freqeuncy (MHz) | Carrier Stability | |
| $T_{nom}V_{nom}$ | 802.11n HT20 | 5180 | 5180.00580 | 1.12 | 20 |
| $T_{min}V_{max}$ | 802.11n HT20 | 5180 | 5180.00780 | 1.51 | 20 |
| $T_{min}V_{min}$ | 802.11n HT20 | 5180 | 5180.00780 | 1.51 | 20 |
| $T_{max}V_{max}$ | 802.11n HT20 | 5180 | 5180.00580 | 1.12 | 20 |
| $T_{max}V_{min}$ | 802.11n HT20 | 5180 | 5180.00580 | 1.12 | 20 |
| $T_{nom}V_{nom}$ | 802.11n HT20 | 5320 | 5320.00620 | 1.17 | 20 |
| $T_{min}V_{max}$ | 802.11n HT20 | 5320 | 5320.00820 | 1.54 | 20 |
| $T_{min}V_{min}$ | 802.11n HT20 | 5320 | 5320.00820 | 1.54 | 20 |
| $T_{max}V_{max}$ | 802.11n HT20 | 5320 | 5320.00620 | 1.17 | 20 |
| $T_{max}V_{min}$ | 802.11n HT20 | 5320 | 5320.00620 | 1.17 | 20 |
| $T_{nom}V_{nom}$ | 802.11n HT20 | 5500 | 5500.00630 | 1.15 | 20 |
| $T_{min}V_{max}$ | 802.11n HT20 | 5500 | 5500.00830 | 1.51 | 20 |
| $T_{min}V_{min}$ | 802.11n HT20 | 5500 | 5500.00830 | 1.51 | 20 |
| $T_{max}V_{max}$ | 802.11n HT20 | 5500 | 5500.00630 | 1.15 | 20 |
| $T_{max}V_{min}$ | 802.11n HT20 | 5500 | 5500.00630 | 1.15 | 20 |
| $T_{nom}V_{nom}$ | 802.11n HT20 | 5700 | 5700.00670 | 1.18 | 20 |
| $T_{min}V_{max}$ | 802.11n HT20 | 5700 | 5700.00870 | 1.53 | 20 |
| $T_{min}V_{min}$ | 802.11n HT20 | 5700 | 5700.00870 | 1.53 | 20 |
| $T_{max}V_{max}$ | 802.11n HT20 | 5700 | 5700.00670 | 1.18 | 20 |
| $T_{max}V_{min}$ | 802.11n HT20 | 5700 | 5700.00670 | 1.18 | 20 |

## 3.2 Occupied Channel Bandwidth

### 3.2.1 Limit of Occupied Channel Bandwidth

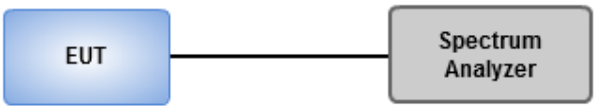
The Nominal Channel Bandwidth for a single Operating Channel shall be 20 MHz

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

### 3.2.2 Test Procedures

Reference to clause 5.4.3.2 of ETSI EN 301 893 V2.1.1 (2017-05).

### 3.2.3 Test Setup




### 3.2.4 Test Result of Occupied Channel Bandwidth

| Test Configuration | 1 | | |
|---|---|---|---|
| **Modulation Mode** | **Frequency (MHz)** | **Occupied Channel Bandwidth (MHz)** | **Occupied Channel Bandwidth Limit (MHz)** |
| 802.11a | 5180 | 16.44 | 16-20 |
| 802.11a | 5320 | 16.44 | 16-20 |
| 802.11a | 5500 | 16.44 | 16-20 |
| 802.11a | 5700 | 16.44 | 16-20 |
| 802.11n HT20 | 5180 | 17.66 | 16-20 |
| 802.11n HT20 | 5320 | 17.60 | 16-20 |
| 802.11n HT20 | 5500 | 17.60 | 16-20 |
| 802.11n HT20 | 5700 | 17.60 | 16-20 |

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

### 3.3.1 Limit of RF Output Power, Transmit Power Control (TPC) and Power Density

**Mean e.i.r.p. limits for RF output power and Power Density at the highest power level ($P_H$)**

| Frequency range (MHz) | Mean e.i.r.p. limit for $P_H$ (dBm) | | Mean e.i.r.p. density limit (dBm/MHz) | |
|---|---|---|---|---|
| | With TPC | Without TPC | With TPC | Without TPC |
| 5 150 to 5 350 | 23 | 20/23 (see note 1) | 10 | 7/10 (see note 2) |
| 5 470 to 5 725 | 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 5 150 MHz to 5 250 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 5 150 MHz to 5 250 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 frequency range 5 250 MHz to 5 350 MHz.

**Mean e.i.r.p. limits for RF Output Power at the lowest power level of the TPC range**

| Frequency range (MHz) | Mean e.i.r.p. (dBm) limit for $P_L$ |
|---|---|
| 5 250 to 5 350 | 17 |
| 5 470 to 5 725 | 24 (see note) |

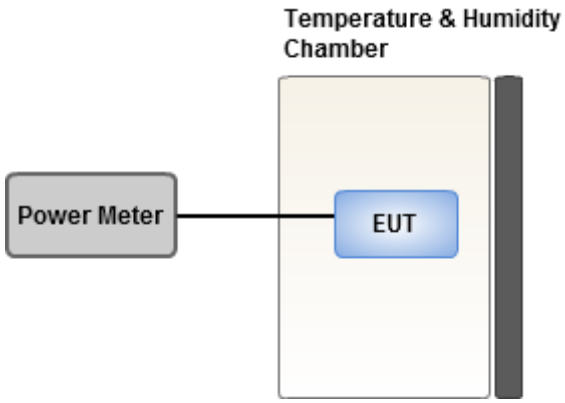
Note: Slave devices without a *Radar Interference Detection* function shall comply with the limits for the band 5 250 MHz to 5 350 MHz.

### 3.3.2 Test Procedures

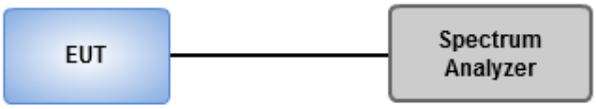
Reference to clause 5.4.4.2 of ETSI EN 301 893 V2.1.1 (2017-05).

### 3.3.3 Test Setup

**For RF Output Power, Transmit Power Control (TPC)**




**For Power Density**



### 3.3.4 Test Result of RF Output Power at the Highest Power

| Test Configuration | 1 | | |
|---|---|---|---|
| Maximum Transmit Power (dBm) | | | |
| Condition | Freq. (MHz) | 802.11a | Limit (dBm) |
| $T_{nom}V_{nom}$ | 5180 | 19.04 | 23 |
| $T_{min}V_{max}$ | 5180 | 18.65 | 23 |
| $T_{min}V_{min}$ | 5180 | 18.67 | 23 |
| $T_{max}V_{max}$ | 5180 | 18.12 | 23 |
| $T_{max}V_{min}$ | 5180 | 18.09 | 23 |
| $T_{nom}V_{nom}$ | 5320 | 19.58 | 23 |
| $T_{min}V_{max}$ | 5320 | 20.10 | 23 |
| $T_{min}V_{min}$ | 5320 | 20.12 | 23 |
| $T_{max}V_{max}$ | 5320 | 19.90 | 23 |
| $T_{max}V_{min}$ | 5320 | 19.88 | 23 |
| $T_{nom}V_{nom}$ | 5500 | 19.46 | 23 |
| $T_{min}V_{max}$ | 5500 | 19.80 | 23 |
| $T_{min}V_{min}$ | 5500 | 19.82 | 23 |
| $T_{max}V_{max}$ | 5500 | 18.82 | 23 |
| $T_{max}V_{min}$ | 5500 | 18.79 | 23 |
| $T_{nom}V_{nom}$ | 5700 | 19.12 | 23 |
| $T_{min}V_{max}$ | 5700 | 18.79 | 23 |
| $T_{min}V_{min}$ | 5700 | 18.82 | 23 |
| $T_{max}V_{max}$ | 5700 | 17.66 | 23 |
| $T_{max}V_{min}$ | 5700 | 17.64 | 23 |

| Test Configuration | 1 | | |
|---|---|---|---|
| Maximum Transmit Power (dBm) | | | |
| Condition | Freq. (MHz) | 802.11n HT20 | Limit (dBm) |
| $T_{nom}V_{nom}$ | 5180 | 19.22 | 23 |
| $T_{min}V_{max}$ | 5180 | 19.02 | 23 |
| $T_{min}V_{min}$ | 5180 | 19.05 | 23 |
| $T_{max}V_{max}$ | 5180 | 18.20 | 23 |
| $T_{max}V_{min}$ | 5180 | 18.18 | 23 |
| $T_{nom}V_{nom}$ | 5320 | 19.76 | 23 |
| $T_{min}V_{max}$ | 5320 | 20.13 | 23 |
| $T_{min}V_{min}$ | 5320 | 20.15 | 23 |
| $T_{max}V_{max}$ | 5320 | 19.97 | 23 |
| $T_{max}V_{min}$ | 5320 | 19.95 | 23 |
| $T_{nom}V_{nom}$ | 5500 | 19.69 | 23 |
| $T_{min}V_{max}$ | 5500 | 20.02 | 23 |
| $T_{min}V_{min}$ | 5500 | 20.05 | 23 |
| $T_{max}V_{max}$ | 5500 | 18.95 | 23 |
| $T_{max}V_{min}$ | 5500 | 18.93 | 23 |
| $T_{nom}V_{nom}$ | 5700 | 18.98 | 23 |
| $T_{min}V_{max}$ | 5700 | 18.54 | 23 |
| $T_{min}V_{min}$ | 5700 | 18.56 | 23 |
| $T_{max}V_{max}$ | 5700 | 17.37 | 23 |
| $T_{max}V_{min}$ | 5700 | 17.35 | 23 |

| Test Configuration | 2 | | |
|---|---|---|---|
| Maximum Transmit Power (dBm) | | | |
| Condition | Freq. (MHz) | 802.11a | Limit (dBm) |
| $T_{nom}V_{nom}$ | 5180 | 21.04 | 23 |
| $T_{min}V_{max}$ | 5180 | 20.65 | 23 |
| $T_{min}V_{min}$ | 5180 | 20.67 | 23 |
| $T_{max}V_{max}$ | 5180 | 20.12 | 23 |
| $T_{max}V_{min}$ | 5180 | 20.09 | 23 |
| $T_{nom}V_{nom}$ | 5320 | 21.58 | 23 |
| $T_{min}V_{max}$ | 5320 | 22.10 | 23 |
| $T_{min}V_{min}$ | 5320 | 22.12 | 23 |
| $T_{max}V_{max}$ | 5320 | 21.90 | 23 |
| $T_{max}V_{min}$ | 5320 | 21.88 | 23 |
| $T_{nom}V_{nom}$ | 5500 | 21.46 | 23 |
| $T_{min}V_{max}$ | 5500 | 21.80 | 23 |
| $T_{min}V_{min}$ | 5500 | 21.82 | 23 |
| $T_{max}V_{max}$ | 5500 | 20.82 | 23 |
| $T_{max}V_{min}$ | 5500 | 20.79 | 23 |
| $T_{nom}V_{nom}$ | 5700 | 21.12 | 23 |
| $T_{min}V_{max}$ | 5700 | 20.79 | 23 |
| $T_{min}V_{min}$ | 5700 | 20.82 | 23 |
| $T_{max}V_{max}$ | 5700 | 19.66 | 23 |
| $T_{max}V_{min}$ | 5700 | 19.64 | 23 |

| Test Configuration | 2 | | |
|---|---|---|---|
| **Maximum Transmit Power (dBm)** | | | |
| **Condition** | **Freq. (MHz)** | **802.11n HT20** | **Limit (dBm)** |
| $T_{nom}V_{nom}$ | 5180 | 21.22 | 23 |
| $T_{min}V_{max}$ | 5180 | 21.02 | 23 |
| $T_{min}V_{min}$ | 5180 | 21.05 | 23 |
| $T_{max}V_{max}$ | 5180 | 20.20 | 23 |
| $T_{max}V_{min}$ | 5180 | 20.18 | 23 |
| $T_{nom}V_{nom}$ | 5320 | 21.76 | 23 |
| $T_{min}V_{max}$ | 5320 | 22.13 | 23 |
| $T_{min}V_{min}$ | 5320 | **22.15** | 23 |
| $T_{max}V_{max}$ | 5320 | 21.97 | 23 |
| $T_{max}V_{min}$ | 5320 | 21.95 | 23 |
| $T_{nom}V_{nom}$ | 5500 | 21.69 | 23 |
| $T_{min}V_{max}$ | 5500 | 22.02 | 23 |
| $T_{min}V_{min}$ | 5500 | **22.05** | 23 |
| $T_{max}V_{max}$ | 5500 | 20.95 | 23 |
| $T_{max}V_{min}$ | 5500 | 20.93 | 23 |
| $T_{nom}V_{nom}$ | 5700 | 20.98 | 23 |
| $T_{min}V_{max}$ | 5700 | 20.54 | 23 |
| $T_{min}V_{min}$ | 5700 | 20.56 | 23 |
| $T_{max}V_{max}$ | 5700 | 19.37 | 23 |
| $T_{max}V_{min}$ | 5700 | 19.35 | 23 |

| Test Configuration | 3 | | |
|---|---|---|---|
| Maximum Transmit Power (dBm) | | | |
| Condition | Freq. (MHz) | 802.11a | Limit (dBm) |
| $T_{nom}V_{nom}$ | 5180 | 20.54 | 23 |
| $T_{min}V_{max}$ | 5180 | 20.15 | 23 |
| $T_{min}V_{min}$ | 5180 | 20.17 | 23 |
| $T_{max}V_{max}$ | 5180 | 19.62 | 23 |
| $T_{max}V_{min}$ | 5180 | 19.59 | 23 |
| $T_{nom}V_{nom}$ | 5320 | 21.08 | 23 |
| $T_{min}V_{max}$ | 5320 | 21.60 | 23 |
| $T_{min}V_{min}$ | 5320 | 21.62 | 23 |
| $T_{max}V_{max}$ | 5320 | 21.40 | 23 |
| $T_{max}V_{min}$ | 5320 | 21.38 | 23 |
| $T_{nom}V_{nom}$ | 5500 | 20.96 | 23 |
| $T_{min}V_{max}$ | 5500 | 21.30 | 23 |
| $T_{min}V_{min}$ | 5500 | 21.32 | 23 |
| $T_{max}V_{max}$ | 5500 | 20.32 | 23 |
| $T_{max}V_{min}$ | 5500 | 20.29 | 23 |
| $T_{nom}V_{nom}$ | 5700 | 20.62 | 23 |
| $T_{min}V_{max}$ | 5700 | 20.29 | 23 |
| $T_{min}V_{min}$ | 5700 | 20.32 | 23 |
| $T_{max}V_{max}$ | 5700 | 19.16 | 23 |
| $T_{max}V_{min}$ | 5700 | 19.14 | 23 |

| Test Configuration | 3 | | |
|---|---|---|---|
| Maximum Transmit Power (dBm) | | | |
| Condition | Freq. (MHz) | 802.11n HT20 | Limit (dBm) |
| $T_{nom}V_{nom}$ | 5180 | 20.72 | 23 |
| $T_{min}V_{max}$ | 5180 | 20.52 | 23 |
| $T_{min}V_{min}$ | 5180 | 20.55 | 23 |
| $T_{max}V_{max}$ | 5180 | 19.70 | 23 |
| $T_{max}V_{min}$ | 5180 | 19.68 | 23 |
| $T_{nom}V_{nom}$ | 5320 | 21.26 | 23 |
| $T_{min}V_{max}$ | 5320 | 21.63 | 23 |
| $T_{min}V_{min}$ | 5320 | 21.65 | 23 |
| $T_{max}V_{max}$ | 5320 | 21.47 | 23 |
| $T_{max}V_{min}$ | 5320 | 21.45 | 23 |
| $T_{nom}V_{nom}$ | 5500 | 21.19 | 23 |
| $T_{min}V_{max}$ | 5500 | 21.52 | 23 |
| $T_{min}V_{min}$ | 5500 | 21.55 | 23 |
| $T_{max}V_{max}$ | 5500 | 20.45 | 23 |
| $T_{max}V_{min}$ | 5500 | 20.43 | 23 |
| $T_{nom}V_{nom}$ | 5700 | 20.48 | 23 |
| $T_{min}V_{max}$ | 5700 | 20.04 | 23 |
| $T_{min}V_{min}$ | 5700 | 20.06 | 23 |
| $T_{max}V_{max}$ | 5700 | 18.87 | 23 |
| $T_{max}V_{min}$ | 5700 | 18.85 | 23 |

### 3.3.5 Test Result of RF Output Power at the Lowest Power

| Test Configuration | 1 | | |
|---|---|---|---|
| Maximum Transmit Power (dBm) | | | |
| Condition | Freq. (MHz) | 802.11a | Limit (dBm) |
| $T_{nom}V_{nom}$ | 5320 | 13.58 | 17 |
| $T_{min}V_{max}$ | 5320 | 14.10 | 17 |
| $T_{min}V_{min}$ | 5320 | 14.12 | 17 |
| $T_{max}V_{max}$ | 5320 | 13.90 | 17 |
| $T_{max}V_{min}$ | 5320 | 13.88 | 17 |
| $T_{nom}V_{nom}$ | 5500 | 13.46 | 17 |
| $T_{min}V_{max}$ | 5500 | 13.80 | 17 |
| $T_{min}V_{min}$ | 5500 | 13.82 | 17 |
| $T_{max}V_{max}$ | 5500 | 12.82 | 17 |
| $T_{max}V_{min}$ | 5500 | 12.79 | 17 |
| $T_{nom}V_{nom}$ | 5700 | 13.12 | 17 |
| $T_{min}V_{max}$ | 5700 | 12.79 | 17 |
| $T_{min}V_{min}$ | 5700 | 12.82 | 17 |
| $T_{max}V_{max}$ | 5700 | 11.66 | 17 |
| $T_{max}V_{min}$ | 5700 | 11.64 | 17 |

| Test Configuration | 1 | | |
|---|---|---|---|
| Maximum Transmit Power (dBm) | | | |
| Condition | Freq. (MHz) | 802.11n HT20 | Limit (dBm) |
| $T_{nom}V_{nom}$ | 5320 | 13.76 | 17 |
| $T_{min}V_{max}$ | 5320 | 14.13 | 17 |
| $T_{min}V_{min}$ | 5320 | 14.15 | 17 |
| $T_{max}V_{max}$ | 5320 | 13.97 | 17 |
| $T_{max}V_{min}$ | 5320 | 13.95 | 17 |
| $T_{nom}V_{nom}$ | 5500 | 13.69 | 17 |
| $T_{min}V_{max}$ | 5500 | 14.02 | 17 |
| $T_{min}V_{min}$ | 5500 | 14.05 | 17 |
| $T_{max}V_{max}$ | 5500 | 12.95 | 17 |
| $T_{max}V_{min}$ | 5500 | 12.93 | 17 |
| $T_{nom}V_{nom}$ | 5700 | 12.98 | 17 |
| $T_{min}V_{max}$ | 5700 | 12.54 | 17 |
| $T_{min}V_{min}$ | 5700 | 12.56 | 17 |
| $T_{max}V_{max}$ | 5700 | 11.37 | 17 |
| $T_{max}V_{min}$ | 5700 | 11.35 | 17 |

| Test Configuration | 2 | | |
|---|---|---|---|
| Maximum Transmit Power (dBm) | | | |
| Condition | Freq. (MHz) | 802.11a | Limit (dBm) |
| $T_{nom}V_{nom}$ | 5320 | 15.58 | 17 |
| $T_{min}V_{max}$ | 5320 | 16.10 | 17 |
| $T_{min}V_{min}$ | 5320 | 16.12 | 17 |
| $T_{max}V_{max}$ | 5320 | 15.90 | 17 |
| $T_{max}V_{min}$ | 5320 | 15.88 | 17 |
| $T_{nom}V_{nom}$ | 5500 | 15.46 | 17 |
| $T_{min}V_{max}$ | 5500 | 15.80 | 17 |
| $T_{min}V_{min}$ | 5500 | 15.82 | 17 |
| $T_{max}V_{max}$ | 5500 | 14.82 | 17 |
| $T_{max}V_{min}$ | 5500 | 14.79 | 17 |
| $T_{nom}V_{nom}$ | 5700 | 15.12 | 17 |
| $T_{min}V_{max}$ | 5700 | 14.79 | 17 |
| $T_{min}V_{min}$ | 5700 | 14.82 | 17 |
| $T_{max}V_{max}$ | 5700 | 13.66 | 17 |
| $T_{max}V_{min}$ | 5700 | 13.64 | 17 |

| Test Configuration | 2 | | |
|---|---|---|---|
| Maximum Transmit Power (dBm) | | | |
| Condition | Freq. (MHz) | 802.11n HT20 | Limit (dBm) |
| $T_{nom}V_{nom}$ | 5320 | 15.76 | 17 |
| $T_{min}V_{max}$ | 5320 | 16.13 | 17 |
| $T_{min}V_{min}$ | 5320 | 16.15 | 17 |
| $T_{max}V_{max}$ | 5320 | 15.97 | 17 |
| $T_{max}V_{min}$ | 5320 | 15.95 | 17 |
| $T_{nom}V_{nom}$ | 5500 | 15.69 | 17 |
| $T_{min}V_{max}$ | 5500 | 16.02 | 17 |
| $T_{min}V_{min}$ | 5500 | 16.05 | 17 |
| $T_{max}V_{max}$ | 5500 | 14.95 | 17 |
| $T_{max}V_{min}$ | 5500 | 14.93 | 17 |
| $T_{nom}V_{nom}$ | 5700 | 14.98 | 17 |
| $T_{min}V_{max}$ | 5700 | 14.54 | 17 |
| $T_{min}V_{min}$ | 5700 | 14.56 | 17 |
| $T_{max}V_{max}$ | 5700 | 13.37 | 17 |
| $T_{max}V_{min}$ | 5700 | 13.35 | 17 |

| Test Configuration | 3 | | |
|---|---|---|---|
| Maximum Transmit Power (dBm) | | | |
| Condition | Freq. (MHz) | 802.11a | Limit (dBm) |
| $T_{nom}V_{nom}$ | 5320 | 15.08 | 17 |
| $T_{min}V_{max}$ | 5320 | 15.60 | 17 |
| $T_{min}V_{min}$ | 5320 | 15.62 | 17 |
| $T_{max}V_{max}$ | 5320 | 15.40 | 17 |
| $T_{max}V_{min}$ | 5320 | 15.38 | 17 |
| $T_{nom}V_{nom}$ | 5500 | 14.96 | 17 |
| $T_{min}V_{max}$ | 5500 | 15.30 | 17 |
| $T_{min}V_{min}$ | 5500 | 15.32 | 17 |
| $T_{max}V_{max}$ | 5500 | 14.32 | 17 |
| $T_{max}V_{min}$ | 5500 | 14.29 | 17 |
| $T_{nom}V_{nom}$ | 5700 | 14.62 | 17 |
| $T_{min}V_{max}$ | 5700 | 14.29 | 17 |
| $T_{min}V_{min}$ | 5700 | 14.32 | 17 |
| $T_{max}V_{max}$ | 5700 | 13.16 | 17 |
| $T_{max}V_{min}$ | 5700 | 13.14 | 17 |

| Test Configuration | 3 | | |
|---|---|---|---|
| Maximum Transmit Power (dBm) | | | |
| Condition | Freq. (MHz) | 802.11n HT20 | Limit (dBm) |
| $T_{nom}V_{nom}$ | 5320 | 15.26 | 17 |
| $T_{min}V_{max}$ | 5320 | 15.63 | 17 |
| $T_{min}V_{min}$ | 5320 | 15.65 | 17 |
| $T_{max}V_{max}$ | 5320 | 15.47 | 17 |
| $T_{max}V_{min}$ | 5320 | 15.45 | 17 |
| $T_{nom}V_{nom}$ | 5500 | 15.19 | 17 |
| $T_{min}V_{max}$ | 5500 | 15.52 | 17 |
| $T_{min}V_{min}$ | 5500 | 15.55 | 17 |
| $T_{max}V_{max}$ | 5500 | 14.45 | 17 |
| $T_{max}V_{min}$ | 5500 | 14.43 | 17 |
| $T_{nom}V_{nom}$ | 5700 | 14.48 | 17 |
| $T_{min}V_{max}$ | 5700 | 14.04 | 17 |
| $T_{min}V_{min}$ | 5700 | 14.06 | 17 |
| $T_{max}V_{max}$ | 5700 | 12.87 | 17 |
| $T_{max}V_{min}$ | 5700 | 12.85 | 17 |

### 3.3.6 Test Result of Power Density

| Test Configuration | 1 | | | |
|---|---|---|---|---|
| **Modulation Mode** | **Freq. (MHz)** | **Power Density (dBm/1MHz) e.i.r.p.** | **Limit (dBm/1MHz) e.i.r.p.** | **Results** |
| 802.11a | 5180 | 7.81 | 10 | Pass |
| 802.11a | 5320 | 8.01 | 10 | Pass |
| 802.11a | 5500 | 7.91 | 10 | Pass |
| 802.11a | 5700 | 7.81 | 10 | Pass |
| 802.11n HT20 | 5180 | 7.71 | 10 | Pass |
| 802.11n HT20 | 5320 | 7.83 | 10 | Pass |
| 802.11n HT20 | 5500 | 7.82 | 10 | Pass |
| 802.11n HT20 | 5700 | 7.75 | 10 | Pass |

| Test Configuration | 2 | | | |
|---|---|---|---|---|
| **Modulation Mode** | **Freq. (MHz)** | **Power Density (dBm/1MHz) e.i.r.p.** | **Limit (dBm/1MHz) e.i.r.p.** | **Results** |
| 802.11a | 5180 | 9.79 | 10 | Pass |
| 802.11a | 5320 | 9.91 | 10 | Pass |
| 802.11a | 5500 | 9.82 | 10 | Pass |
| 802.11a | 5700 | 9.89 | 10 | Pass |
| 802.11n HT20 | 5180 | 9.73 | 10 | Pass |
| 802.11n HT20 | 5320 | 9.88 | 10 | Pass |
| 802.11n HT20 | 5500 | 9.77 | 10 | Pass |
| 802.11n HT20 | 5700 | 9.84 | 10 | Pass |

| Test Configuration | 3 | | | |
|---|---|---|---|---|
| **Modulation Mode** | **Freq. (MHz)** | **Power Density (dBm/1MHz) e.i.r.p.** | **Limit (dBm/1MHz) e.i.r.p.** | **Results** |
| 802.11a | 5180 | 9.32 | 10 | Pass |
| 802.11a | 5320 | 9.42 | 10 | Pass |
| 802.11a | 5500 | 9.33 | 10 | Pass |
| 802.11a | 5700 | 9.37 | 10 | Pass |
| 802.11n HT20 | 5180 | 9.25 | 10 | Pass |
| 802.11n HT20 | 5320 | 9.36 | 10 | Pass |
| 802.11n HT20 | 5500 | 9.28 | 10 | Pass |
| 802.11n HT20 | 5700 | 9.31 | 10 | Pass |

## 3.4 Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands

### 3.4.1 Limit of Transmitter Unwanted Emissions outside the 5 GHz RLAN Bands

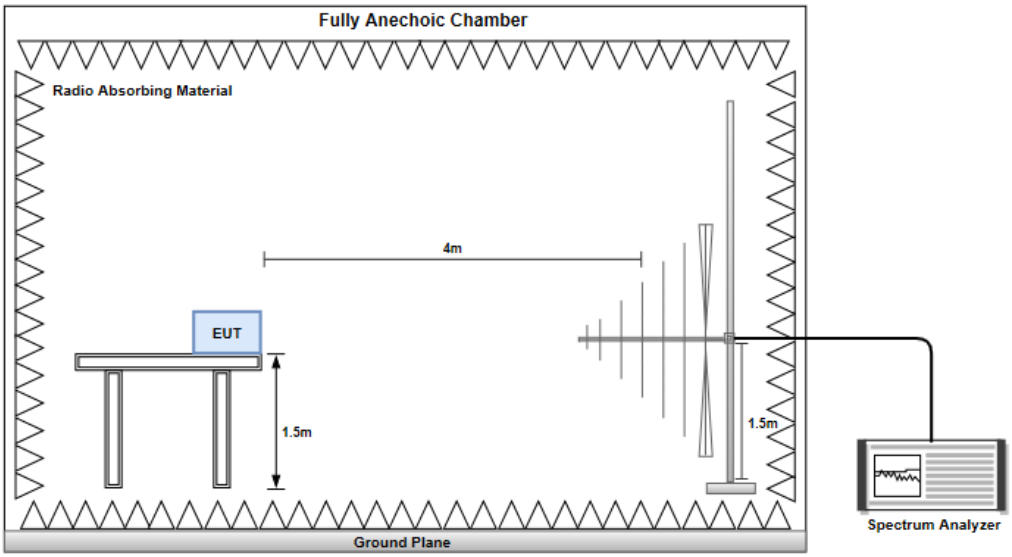
| Frequency Range | Maximum Power | Bandwidth |
|---|---|---|
| 30 MHz to 47 MHz | -36 dBm | 100 kHz |
| 47 MHz to 74 MHz | -54 dBm | 100 kHz |
| 74 MHz to 87,5 MHz | -36 dBm | 100 kHz |
| 87,5 MHz to 118 MHz | -54 dBm | 100 kHz |
| 118 MHz to 174 MHz | -36 dBm | 100 kHz |
| 174 MHz to 230 MHz | -54 dBm | 100 kHz |
| 230 MHz to 470 MHz | -36 dBm | 100 kHz |
| 470 MHz to 862 MHz | -54 dBm | 100 kHz |
| 862 MHz to 1 GHz | -36 dBm | 100 kHz |
| 1 GHz to 5,15 GHz | -30 dBm | 1 MHz |
| 5,35 GHz to 5,47 GHz | -30 dBm | 1 MHz |
| 5,725 GHz to 26 GHz | -30 dBm | 1 MHz |

### 3.4.2 Test Procedures

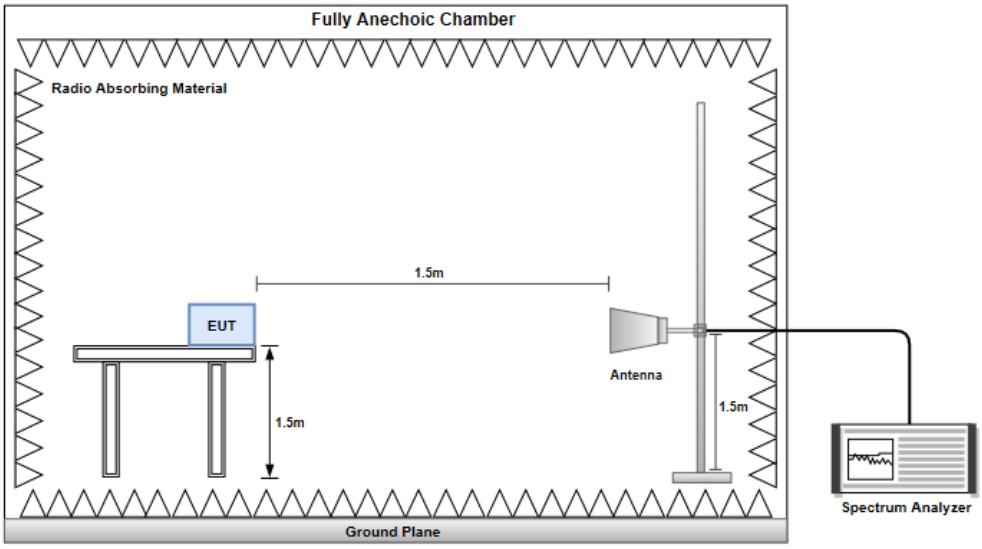
Reference to clause 5.4.5.2 of ETSI EN 301 893 V2.1.1 (2017-05).

### 3.4.3 Test Setup

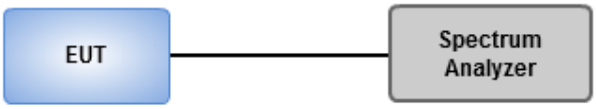
**Below 1GHz**




**Above 1 GHz**

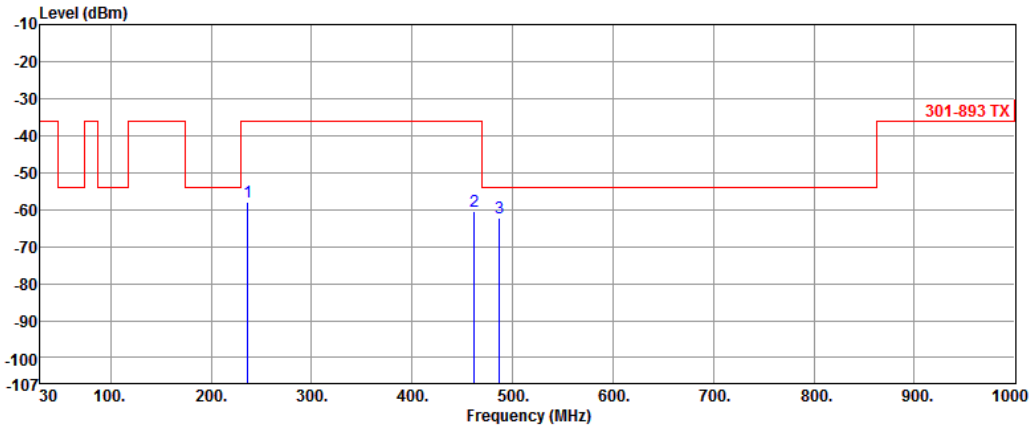



**For Conducted Test**



### 3.4.4 Radiated Results of Transmitter Spurious Emissions (Below 1GHz)

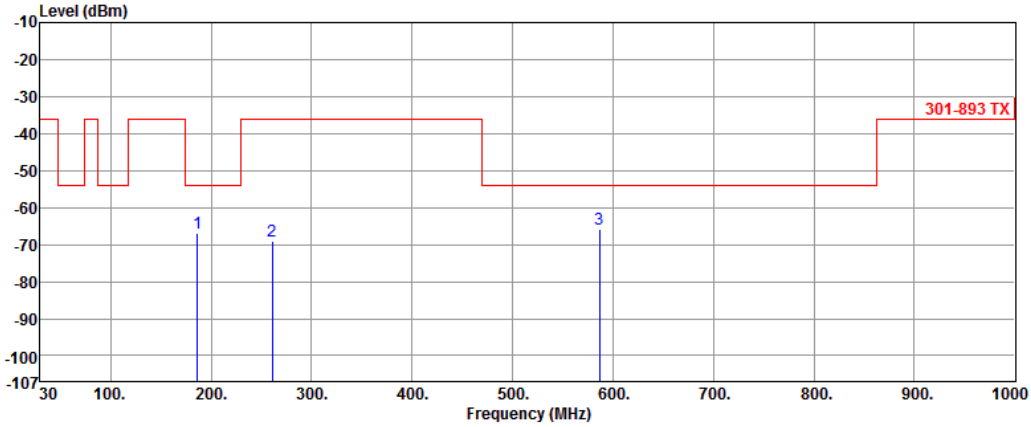
| **Modulation** | 11a | **Test Freq. (MHz)** | 5180 |
|---|---|---|---|
| **Polarization** | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 236.61 | -58.03 | -36.00 | -22.03 | -1.92 | -56.11 |
| 2 | 461.65 | -60.59 | -36.00 | -24.59 | 2.49 | -63.08 |
| 3 | 486.87 | -62.37 | -54.00 | -8.37 | 2.78 | -65.15 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

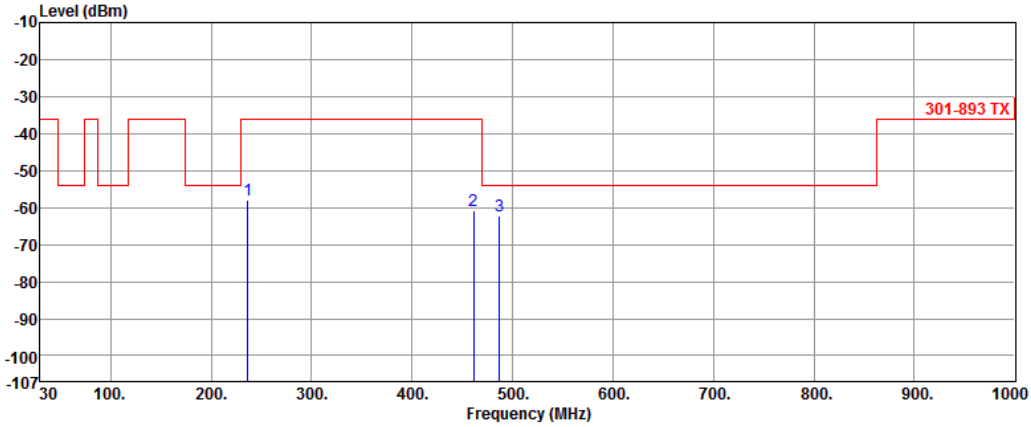
| Modulation | 11a | Test Freq. (MHz) | 5180 |
|---|---|---|---|
| Polarization | Vertical | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 186.17 | -66.74 | -54.00 | -12.74 | -3.55 | -63.19 |
| 2 | 260.86 | -69.10 | -36.00 | -33.10 | -2.97 | -66.13 |
| 3 | 586.78 | -65.91 | -54.00 | -11.91 | 5.35 | -71.26 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

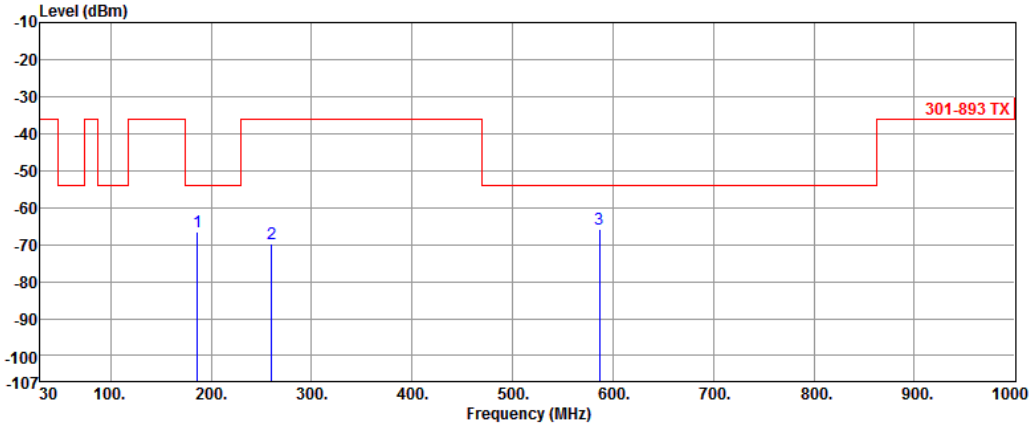
| Modulation | 11a | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 236.50 | -58.11 | -36.00 | -22.11 | -1.92 | -56.19 |
| 2 | 461.45 | -60.85 | -36.00 | -24.85 | 2.48 | -63.33 |
| 3 | 486.74 | -62.24 | -54.00 | -8.24 | 2.78 | -65.02 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

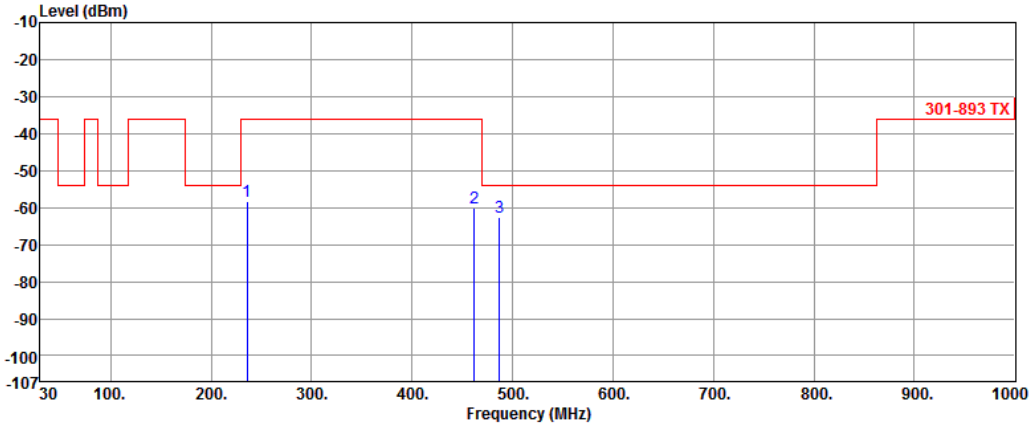
| Modulation | 11a | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Vertical | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 186.20 | -66.65 | -54.00 | -12.65 | -3.55 | -63.10 |
| 2 | 260.20 | -69.87 | -36.00 | -33.87 | -3.01 | -66.86 |
| 3 | 586.74 | -65.85 | -54.00 | -11.85 | 5.35 | -71.20 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

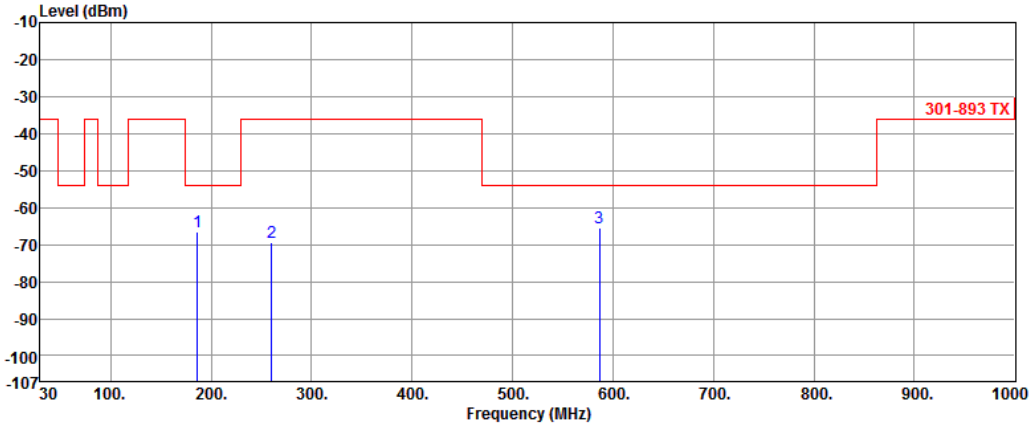
| Modulation | HT20 | Test Freq. (MHz) | 5180 |
|---|---|---|---|
| Polarization | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 236.07 | -58.46 | -36.00 | -22.46 | -1.95 | -56.51 |
| 2 | 461.78 | -60.07 | -36.00 | -24.07 | 2.50 | -62.57 |
| 3 | 486.86 | -62.68 | -54.00 | -8.68 | 2.78 | -65.46 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

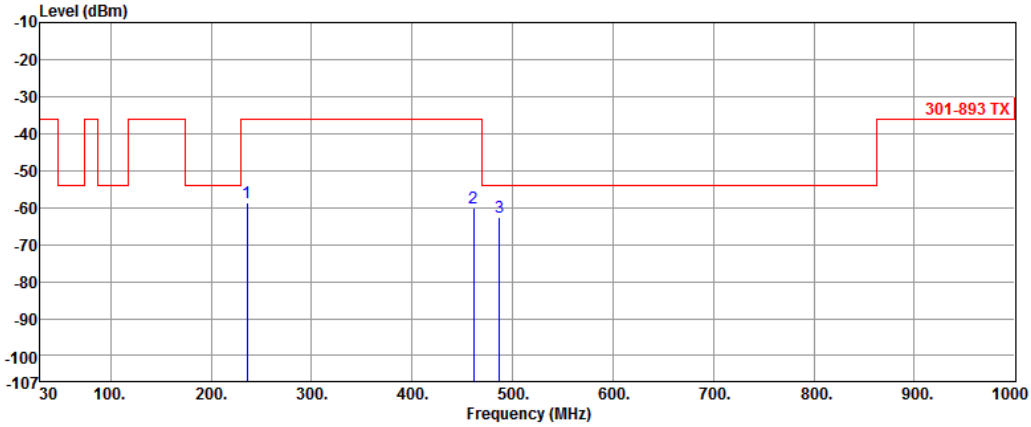
| Modulation | HT20 | Test Freq. (MHz) | 5180 |
|---|---|---|---|
| Polarization | Vertical | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 186.04 | -66.49 | -54.00 | -12.49 | -3.53 | -62.96 |
| 2 | 260.41 | -69.58 | -36.00 | -33.58 | -3.00 | -66.58 |
| 3 | 586.74 | -65.50 | -54.00 | -11.50 | 5.35 | -70.85 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

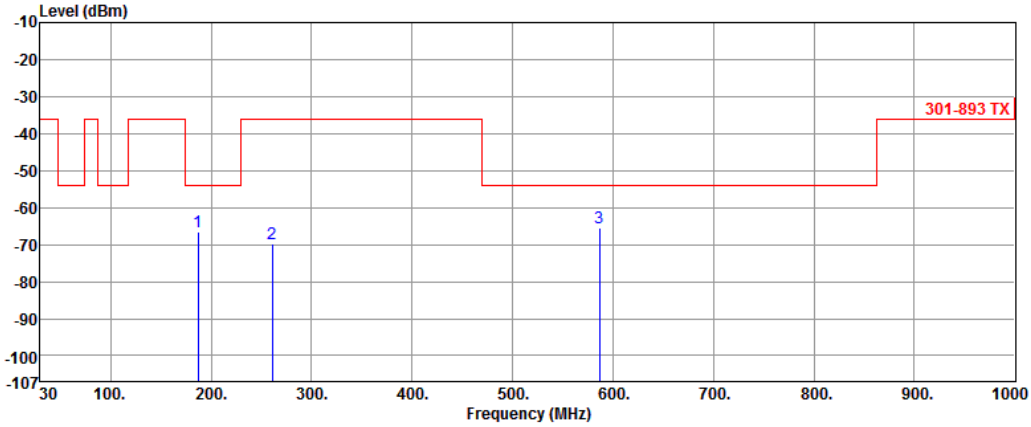
| Modulation | HT20 | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 236.05 | -58.54 | -36.00 | -22.54 | -1.95 | -56.59 |
| 2 | 461.40 | -60.05 | -36.00 | -24.05 | 2.48 | -62.53 |
| 3 | 486.75 | -62.54 | -54.00 | -8.54 | 2.78 | -65.32 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

| Modulation | HT20 | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Vertical | | |

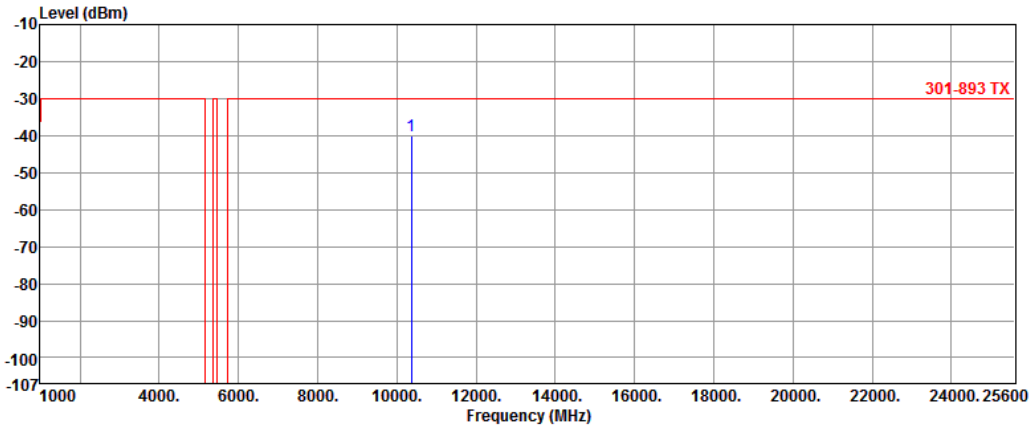



| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 186.70 | -66.45 | -54.00 | -12.45 | -3.60 | -62.85 |
| 2 | 260.80 | -69.75 | -36.00 | -33.75 | -2.97 | -66.78 |
| 3 | 586.75 | -65.54 | -54.00 | -11.54 | 5.35 | -70.89 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

### 3.4.5 Radiated Results of Transmitter Radiated Unwanted Emissions (Above 1GHz)

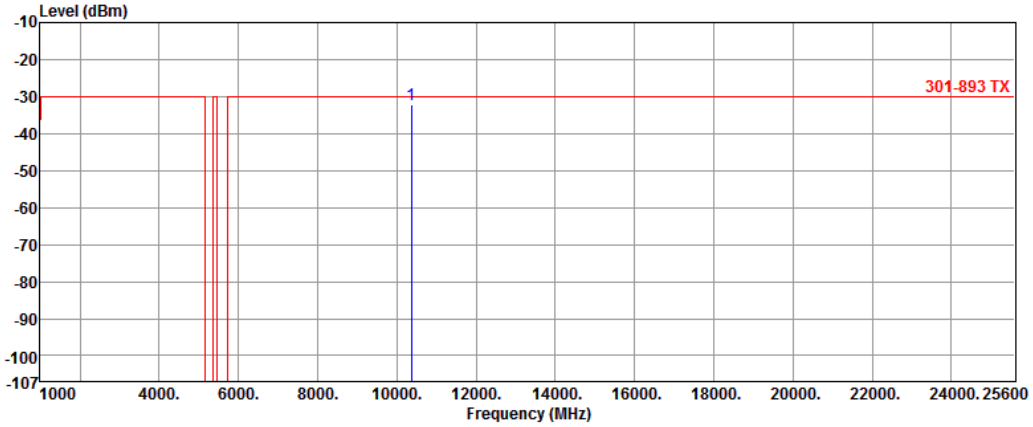
| **Modulation** | 11a | **Test Freq. (MHz)** | 5180 |
|---|---|---|---|
| **Polarization** | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 10361.30 | -40.11 | -30.00 | -10.11 | 21.82 | -61.93 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

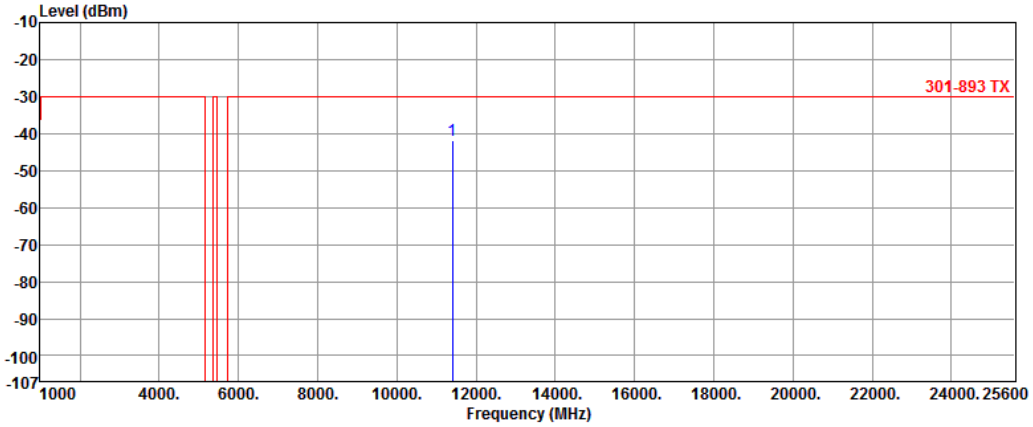
| Modulation | 11a | Test Freq. (MHz) | 5180 |
|---|---|---|---|
| Polarization | Vertical | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 10363.25 | -32.15 | -30.00 | -2.15 | 22.31 | -54.46 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

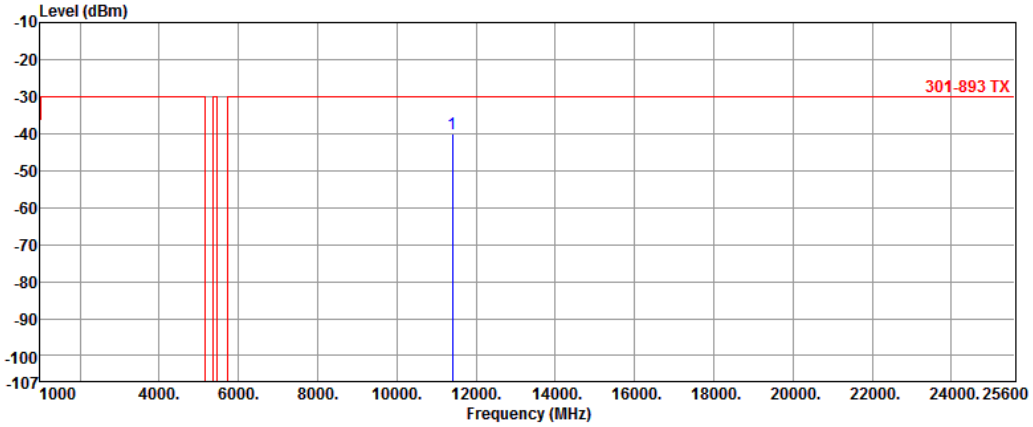
| Modulation | 11a | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 11399.60 | -41.78 | -30.00 | -11.78 | 20.98 | -62.76 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

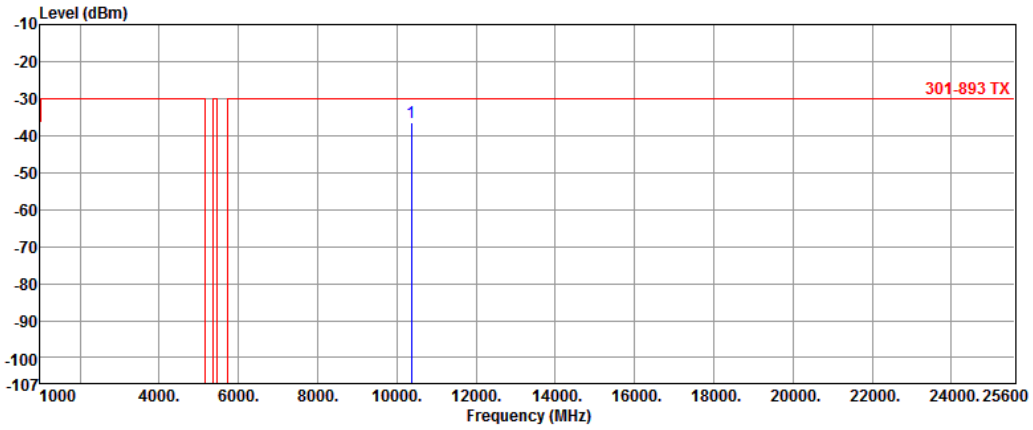
| Modulation | 11a | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Vertical | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 11397.35 | -40.13 | -30.00 | -10.13 | 21.07 | -61.20 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

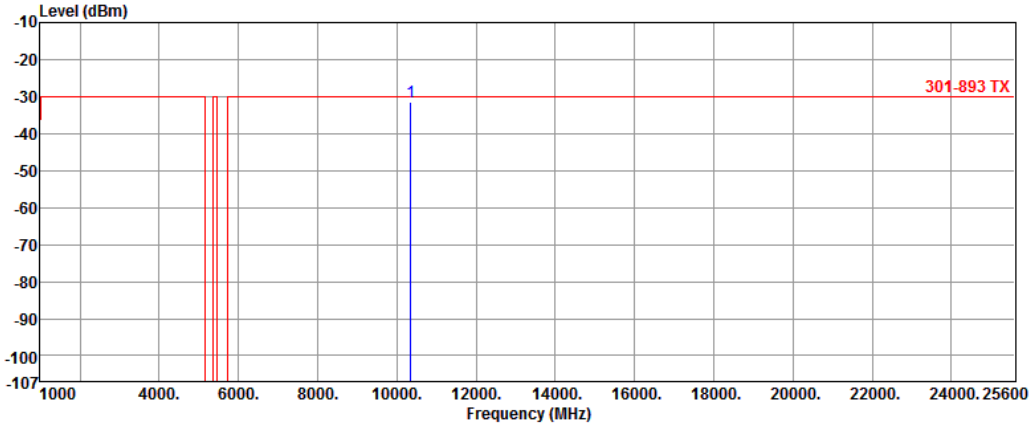
| Modulation | HT20 | Test Freq. (MHz) | 5180 |
|---|---|---|---|
| Polarization | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 10365.80 | -36.53 | -30.00 | -6.53 | 21.83 | -58.36 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

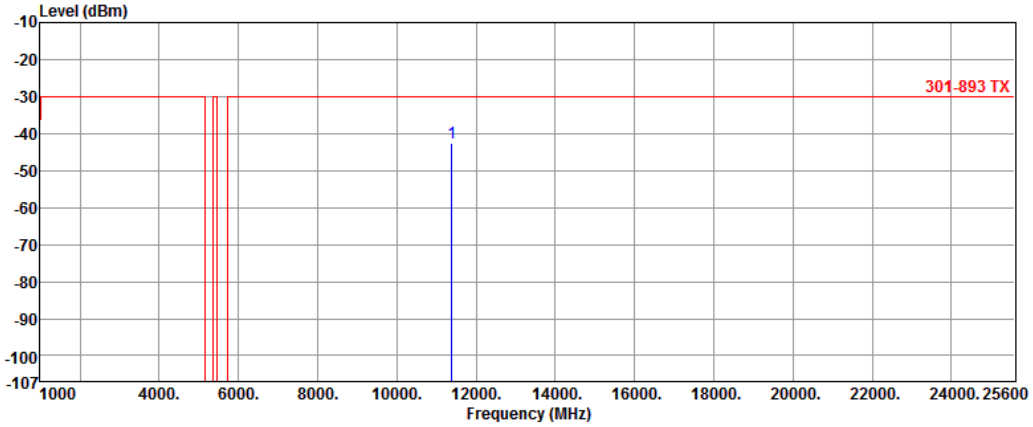
| Modulation | HT20 | Test Freq. (MHz) | 5180 |
|---|---|---|---|
| Polarization | Vertical | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 10352.40 | -31.54 | -30.00 | -1.54 | 22.32 | -53.86 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

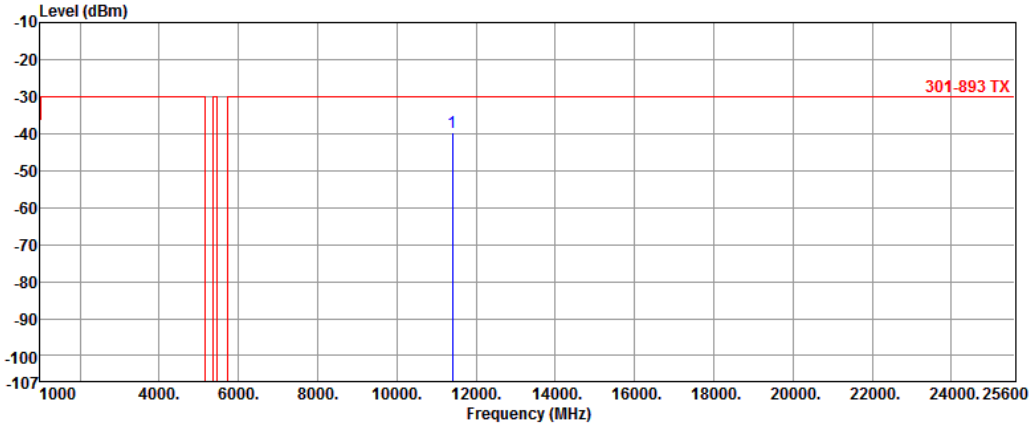
| Modulation | HT20 | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 11393.55 | -42.43 | -30.00 | -12.43 | 21.02 | -63.45 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

| Modulation | HT20 | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Vertical | | |

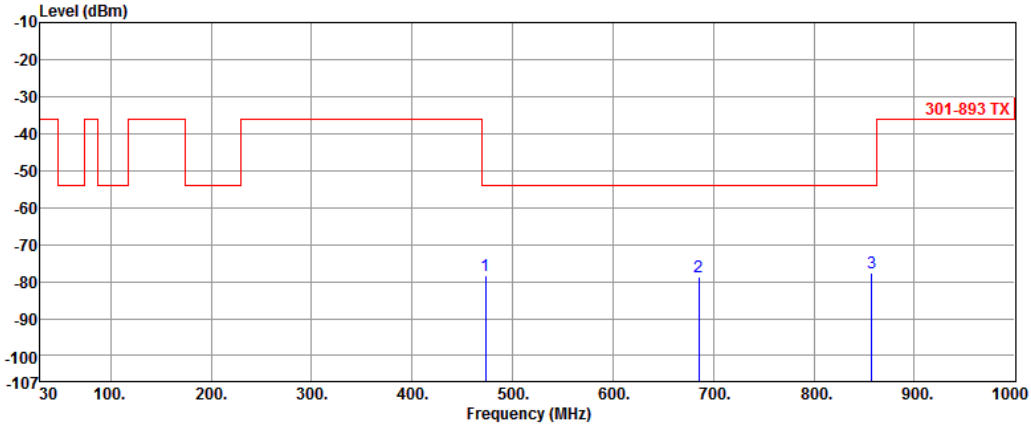



| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 11406.45 | -39.79 | -30.00 | -9.79 | 21.07 | -60.86 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

### 3.4.6 Conducted Results of Transmitter Spurious Emissions (Below 1GHz)

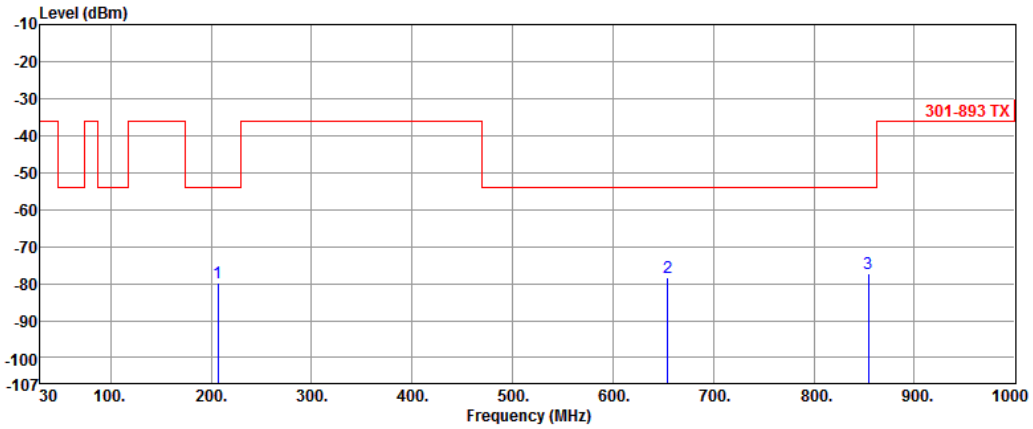
| Modulation | 11a | Test Freq. (MHz) | 5180 |
|---|---|---|---|




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 473.29 | -78.25 | -54.00 | -24.25 | 0.00 | -78.25 |
| 2 | 685.72 | -78.74 | -54.00 | -24.74 | 0.00 | -78.74 |
| 3 | 857.41 | -77.73 | -54.00 | -23.73 | 0.00 | -77.73 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

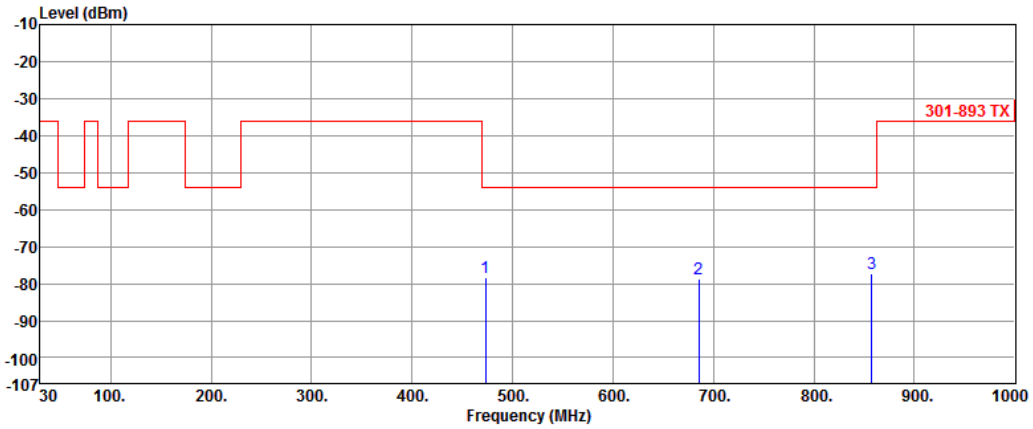
| Modulation | 11a | Test Freq. (MHz) | 5700 |
|---|---|---|---|




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 206.54 | -79.79 | -54.00 | -25.79 | 0.00 | -79.79 |
| 2 | 654.68 | -78.22 | -54.00 | -24.22 | 0.00 | -78.22 |
| 3 | 854.50 | -77.29 | -54.00 | -23.29 | 0.00 | -77.29 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

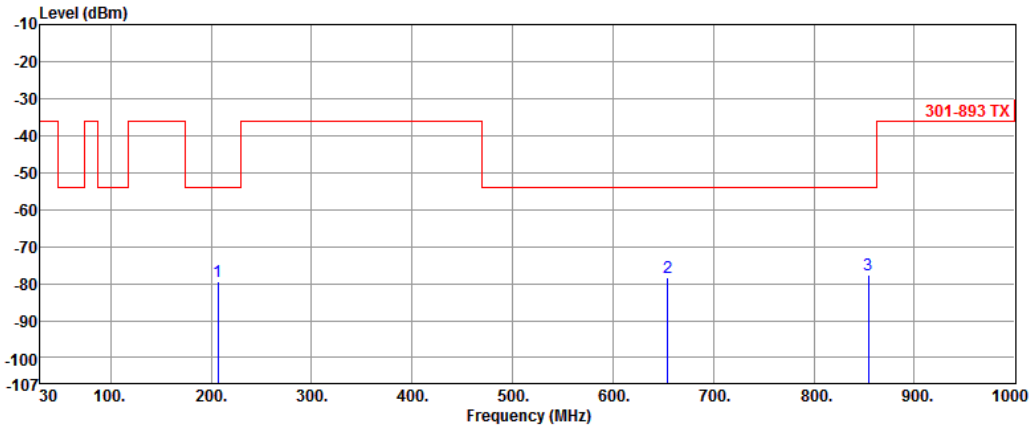
| Modulation | HT20 | Test Freq. (MHz) | 5180 |
|---|---|---|---|




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 473.04 | -78.45 | -54.00 | -24.45 | 0.00 | -78.45 |
| 2 | 685.54 | -78.70 | -54.00 | -24.70 | 0.00 | -78.70 |
| 3 | 857.45 | -77.42 | -54.00 | -23.42 | 0.00 | -77.42 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

| Modulation | HT20 | Test Freq. (MHz) | 5700 |
|---|---|---|---|

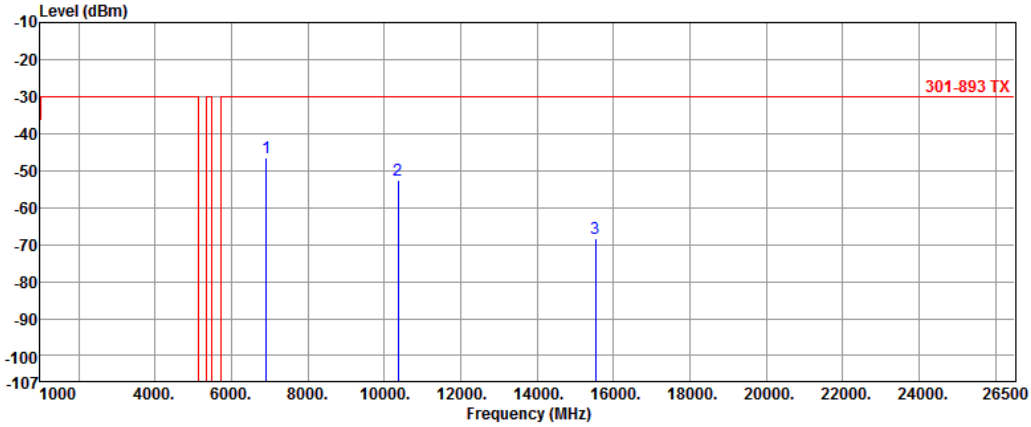



| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 206.57 | -79.54 | -54.00 | -25.54 | 0.00 | -79.54 |
| 2 | 654.75 | -78.54 | -54.00 | -24.54 | 0.00 | -78.54 |
| 3 | 854.40 | -77.54 | -54.00 | -23.54 | 0.00 | -77.54 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

### 3.4.7 Conducted Results of Transmitter Spurious Emissions (Above 1GHz)

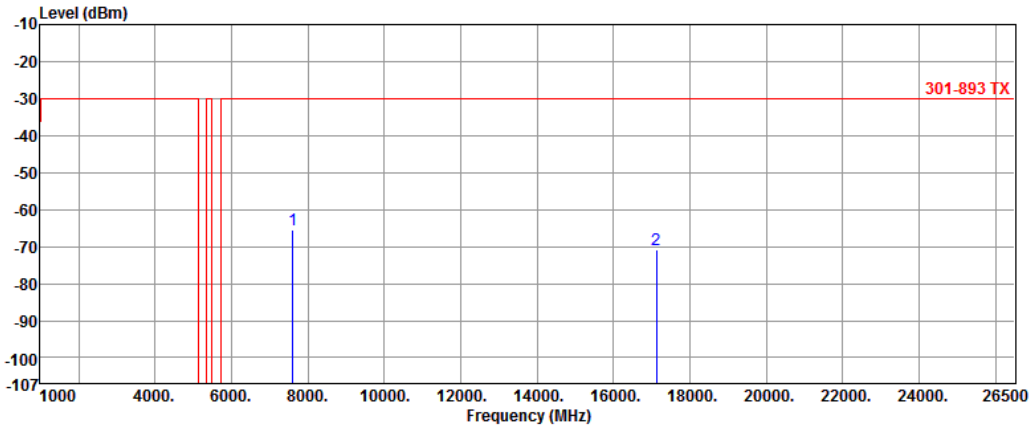
| Modulation | 11a | Test Freq. (MHz) | 5180 |
|---|---|---|---|




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 6916.00 | -46.65 | -30.00 | -16.65 | 0.00 | -46.65 |
| 2 | 10358.50 | -52.53 | -30.00 | -22.53 | 0.00 | -52.53 |
| 3 | 15535.00 | -68.33 | -30.00 | -38.33 | 0.00 | -68.33 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

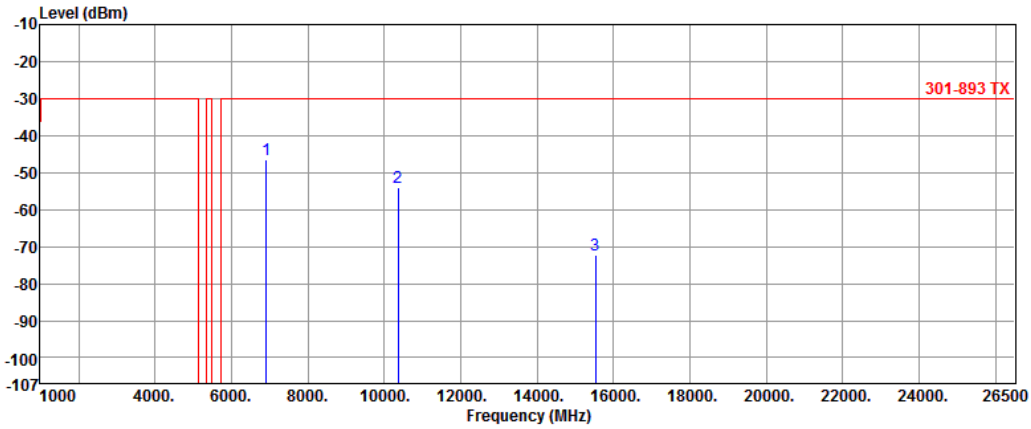
| Modulation | 11a | Test Freq. (MHz) | 5700 |
|---|---|---|---|




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 7604.50 | -65.43 | -30.00 | -35.43 | 0.00 | -65.43 |
| 2 | 17116.00 | -70.78 | -30.00 | -40.78 | 0.00 | -70.78 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

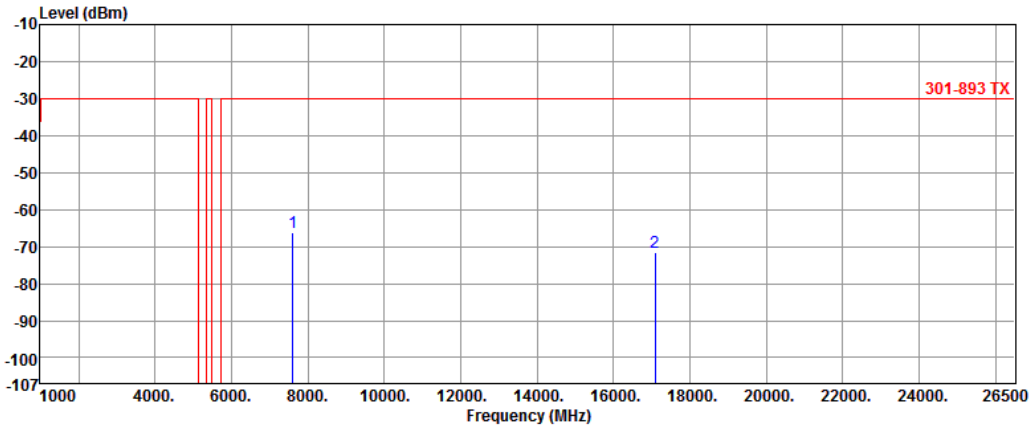
| Modulation | HT20 | Test Freq. (MHz) | 5180 |
|---|---|---|---|




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 6916.00 | -46.57 | -30.00 | -16.57 | 0.00 | -46.57 |
| 2 | 10358.50 | -53.95 | -30.00 | -23.95 | 0.00 | -53.95 |
| 3 | 15535.00 | -72.41 | -30.00 | -42.41 | 0.00 | -72.41 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

| Modulation | HT20 | Test Freq. (MHz) | 5700 |
|---|---|---|---|

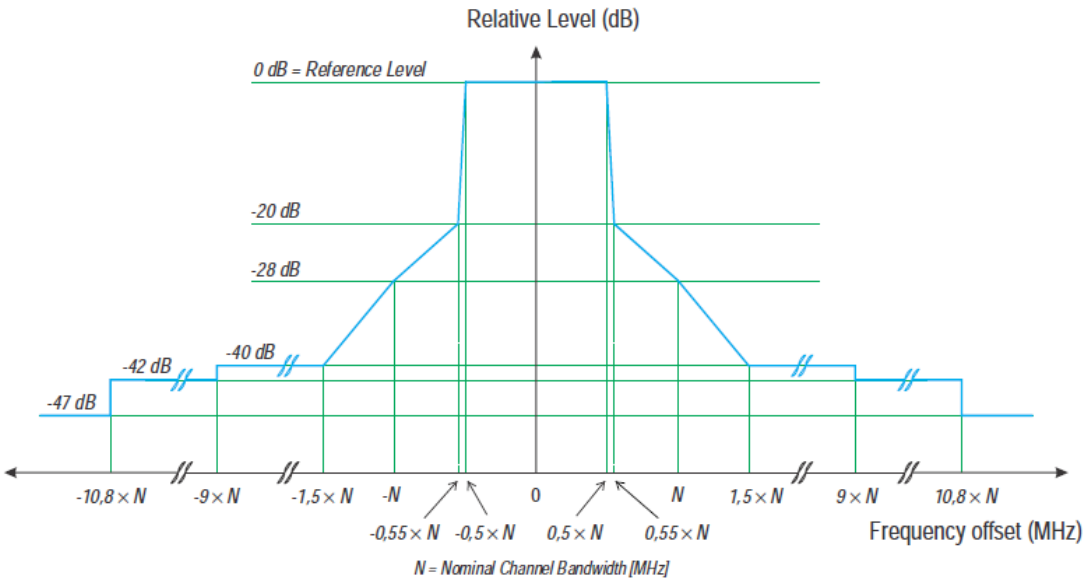



| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 7604.50 | -66.03 | -30.00 | -36.03 | 0.00 | -66.03 |
| 2 | 17090.50 | -71.64 | -30.00 | -41.64 | 0.00 | -71.64 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

## 3.5 Transmitter Unwanted Emissions within the 5 GHz RLAN Band

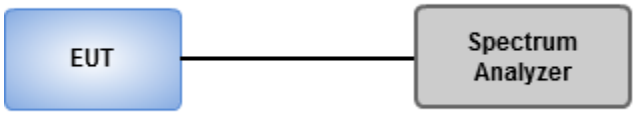
### 3.5.1 Limit of Transmitter Unwanted Emissions within the 5 GHz RLAN Band



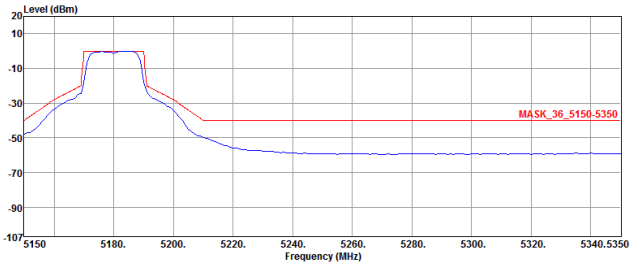
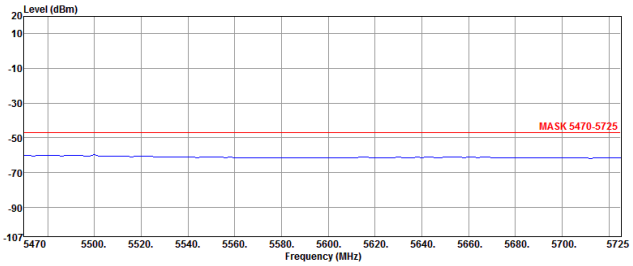
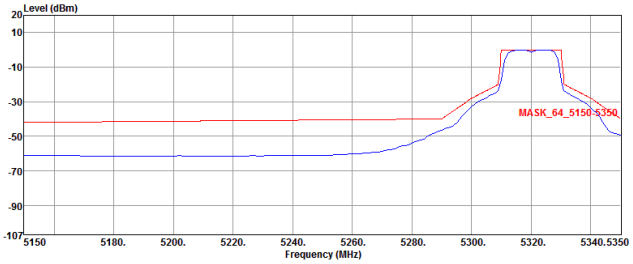
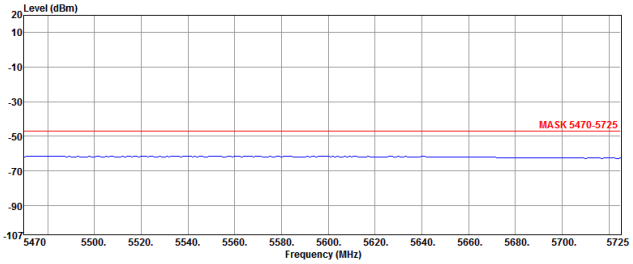
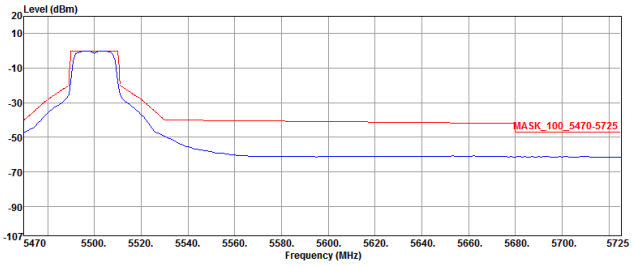
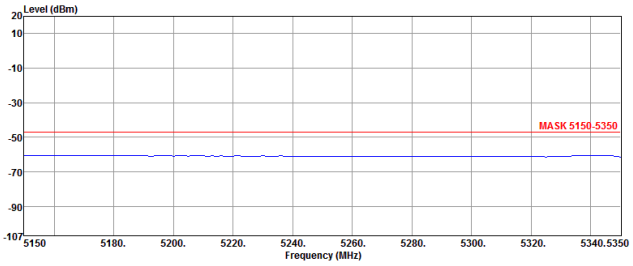
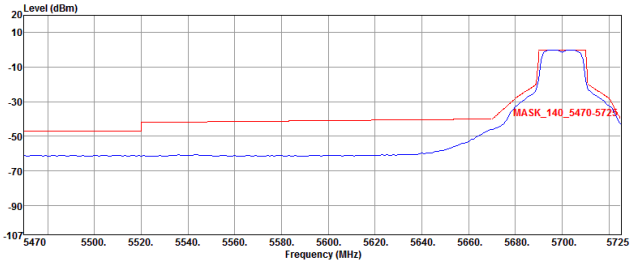
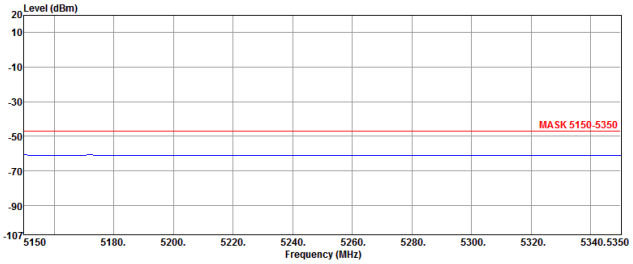

### 3.5.2 Test Procedures

Reference to clause 5.4.6.2 of ETSI EN 301 893 V2.1.1 (2017-05).

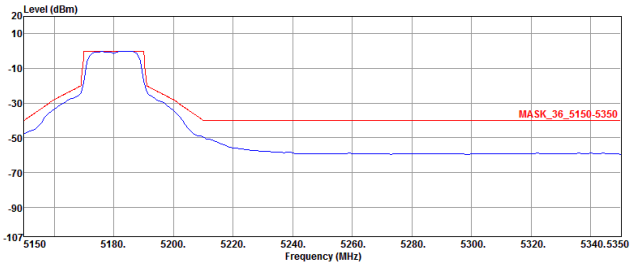
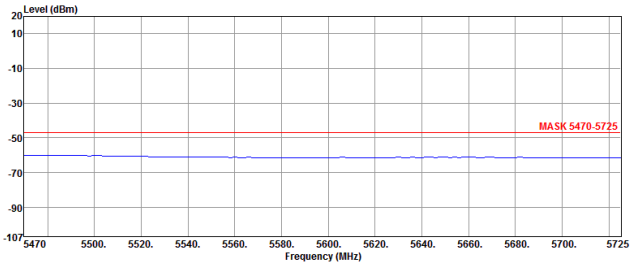
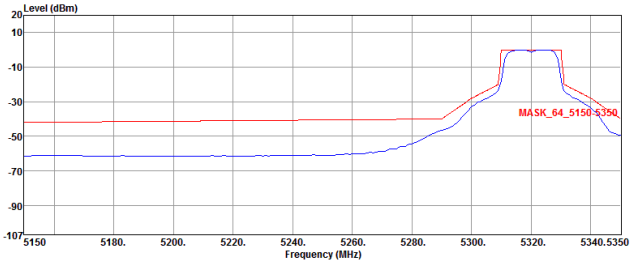
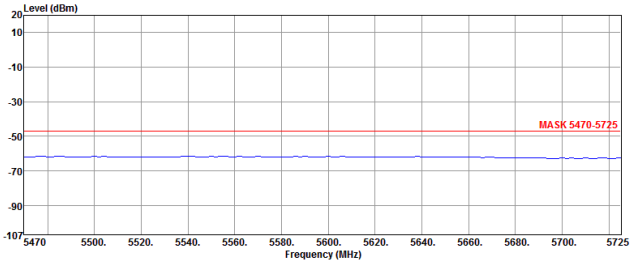
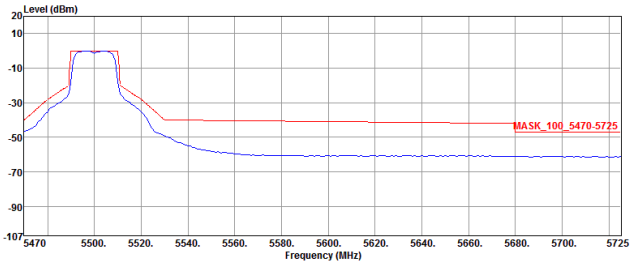
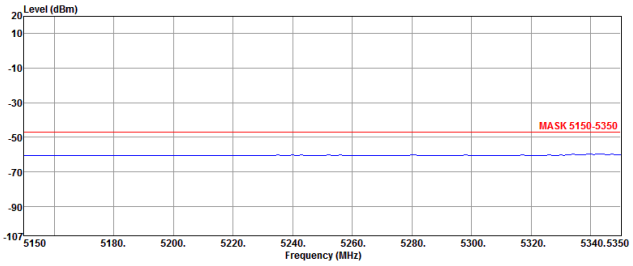
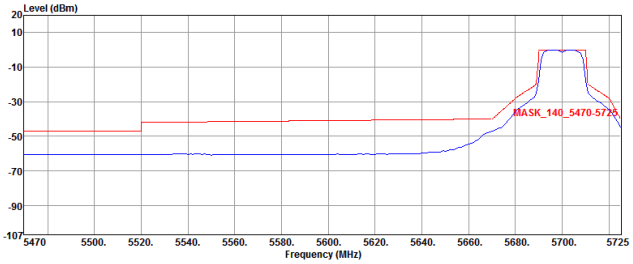
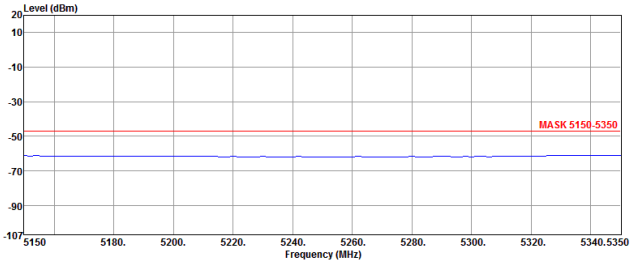
### 3.5.3 Test Setup



### 3.5.4 Test Result of Transmitter Unwanted Emissions within the 5 GHz RLAN Band for 802.11a

| 5180MHz | 5180MHz |
|---|---|
|   |   |
| **5320MHz** | **5320MHz** |
|   |   |
| **5500MHz** | **5500MHz** |
|   |   |
| **5700MHz** | **5700MHz** |
|   |   |

### 3.5.5 Test Result of Transmitter Unwanted Emissions within the 5 GHz RLAN Band for 802.11n HT20

| 5180MHz | 5180MHz |
|---|---|
|   |   |
| **5320MHz** | **5320MHz** |
|   |   |
| **5500MHz** | **5500MHz** |
|   |   |
| **5700MHz** | **5700MHz** |
|   |   |

# 4 Receiver Test Results

## 4.1 Receiver Spurious Emissions

### 4.1.1 Limit of Receiver Spurious Emissions

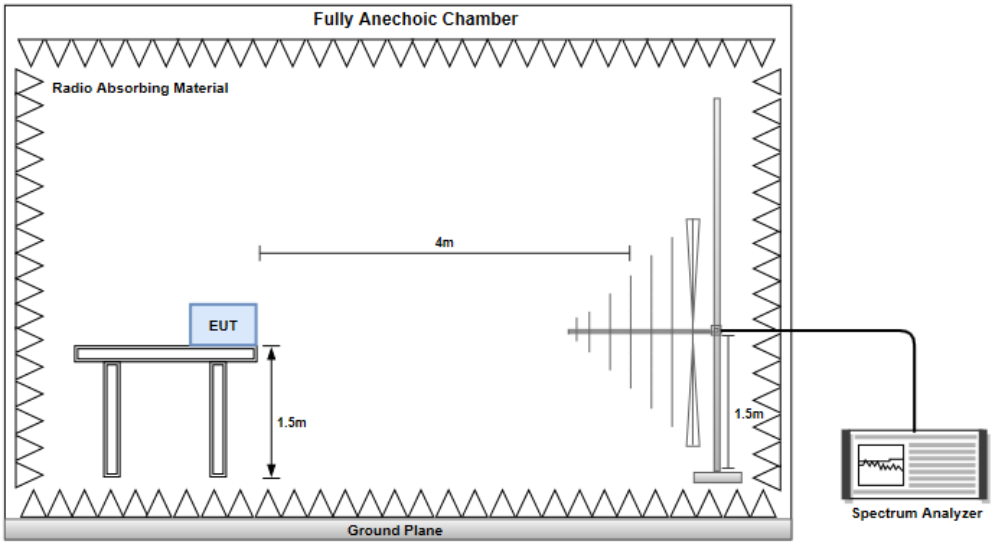
| Frequency Range | Maximum Power | Measurement Bandwidth |
|---|---|---|
| 30 MHz to 1 GHz | -57 dBm | 100 kHz |
| 1 GHz to 26 GHz | -47 dBm | 1 MHz |

### 4.1.2 Test Procedures

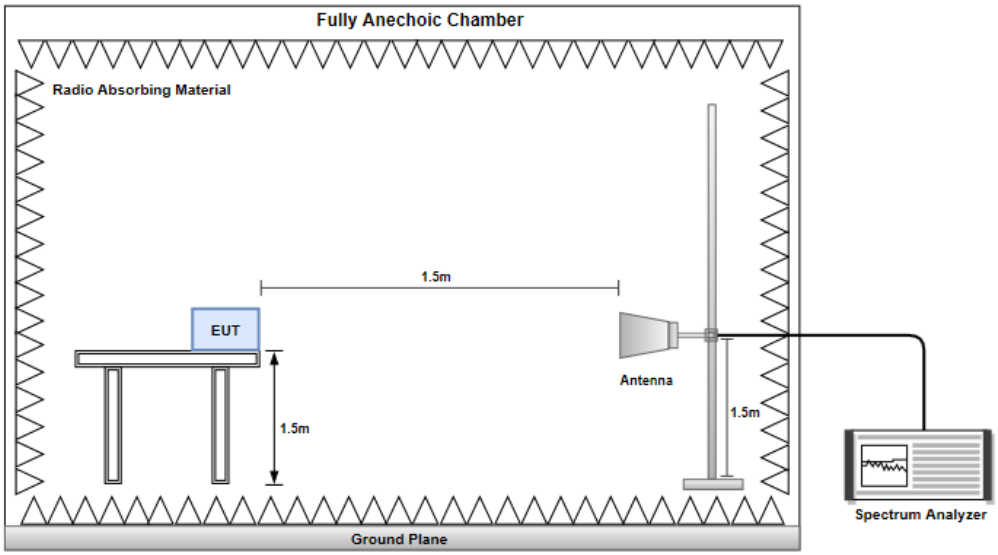
Reference to clause 5.4.7.2 of ETSI EN 301 893 V2.1.1 (2017-05).

### 4.1.3 Test Setup

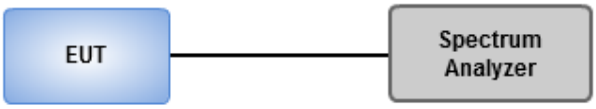
**Below 1GHz**




**Above 1 GHz**

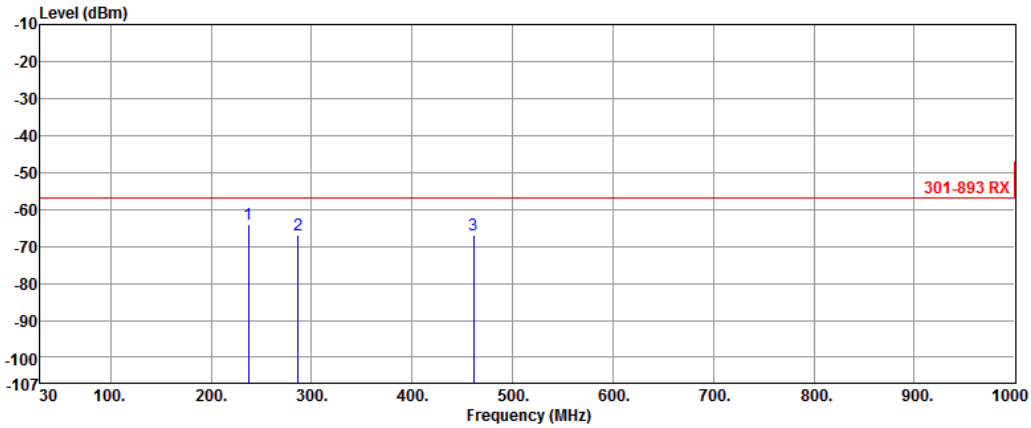



**For Conducted Test**



### 4.1.4 Radiated Results of Receiver Spurious Emissions (Below 1GHz)

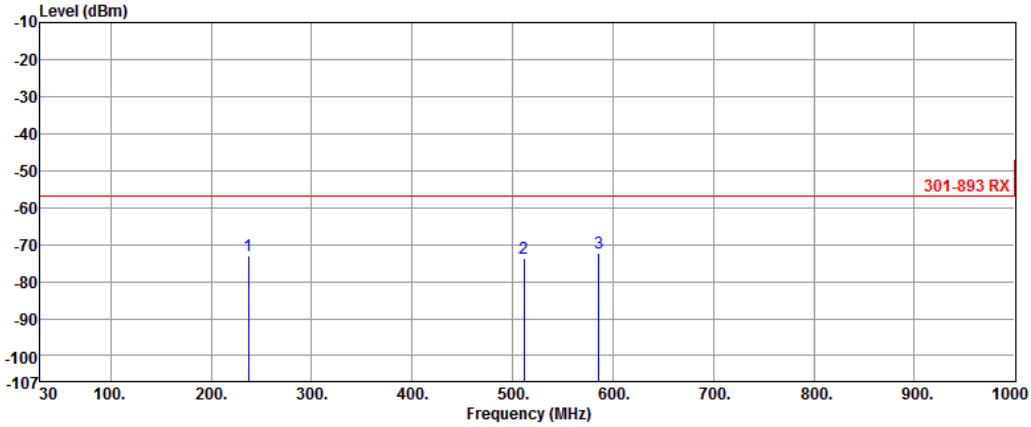
| **Modulation** | 11a | **Test Freq. (MHz)** | 5180 |
|---|---|---|---|
| **Polarization** | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 236.93 | -63.97 | -57.00 | -6.97 | -1.90 | -62.07 |
| 2 | 286.32 | -66.86 | -57.00 | -9.86 | 0.38 | -67.24 |
| 3 | 461.46 | -66.94 | -57.00 | -9.94 | 2.48 | -69.42 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

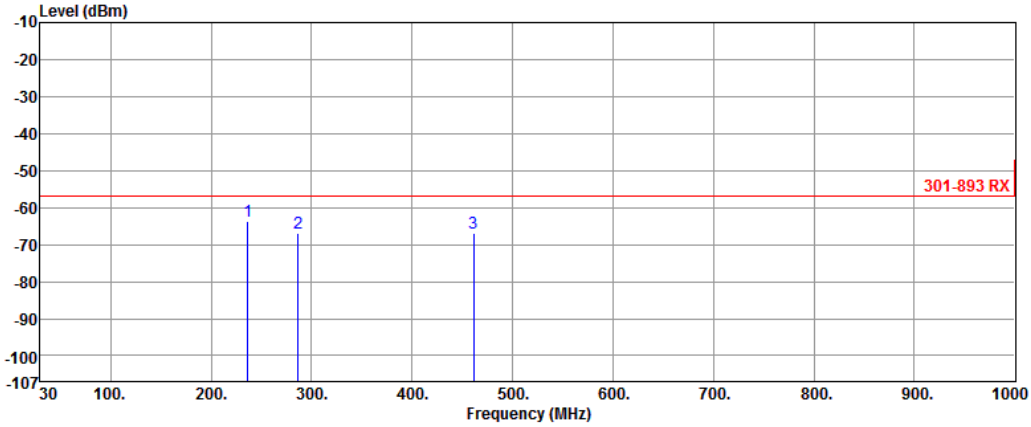
| Modulation | 11a | Test Freq. (MHz) | 5180 |
|---|---|---|---|
| Polarization | Vertical | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 236.94 | -72.99 | -57.00 | -15.99 | -2.79 | -70.20 |
| 2 | 511.32 | -73.73 | -57.00 | -16.73 | 3.05 | -76.78 |
| 3 | 586.18 | -72.36 | -57.00 | -15.36 | 5.33 | -77.69 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

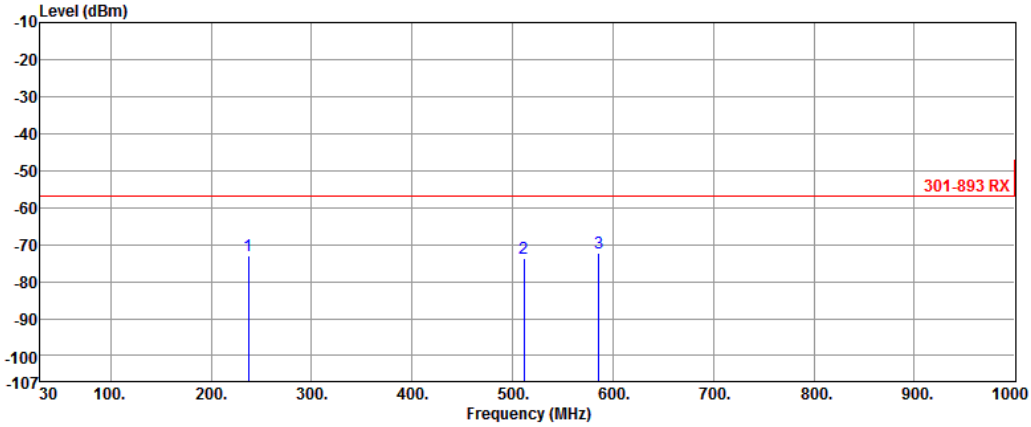
| Modulation | 11a | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 236.54 | -63.65 | -57.00 | -6.65 | -1.92 | -61.73 |
| 2 | 286.30 | -66.79 | -57.00 | -9.79 | 0.38 | -67.17 |
| 3 | 461.40 | -66.90 | -57.00 | -9.90 | 2.48 | -69.38 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

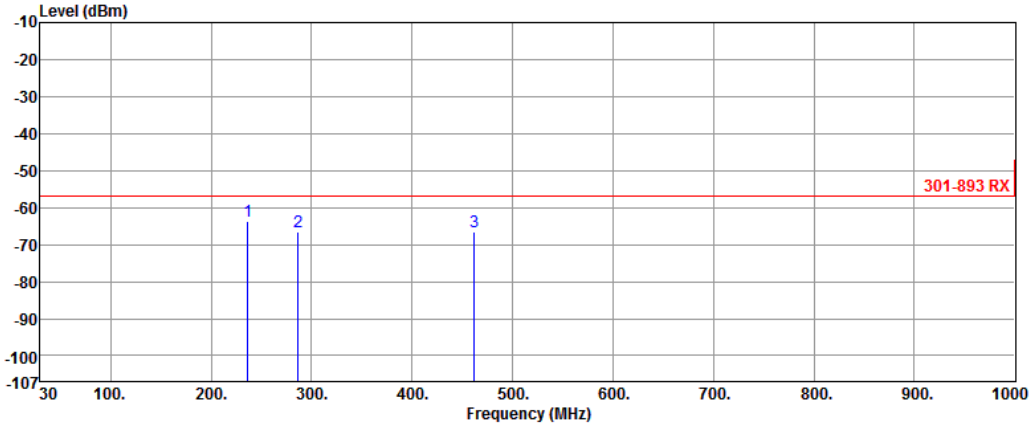
| Modulation | 11a | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Vertical | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 236.84 | -72.87 | -57.00 | -15.87 | -2.79 | -70.08 |
| 2 | 511.56 | -73.65 | -57.00 | -16.65 | 3.05 | -76.70 |
| 3 | 586.11 | -72.45 | -57.00 | -15.45 | 5.33 | -77.78 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

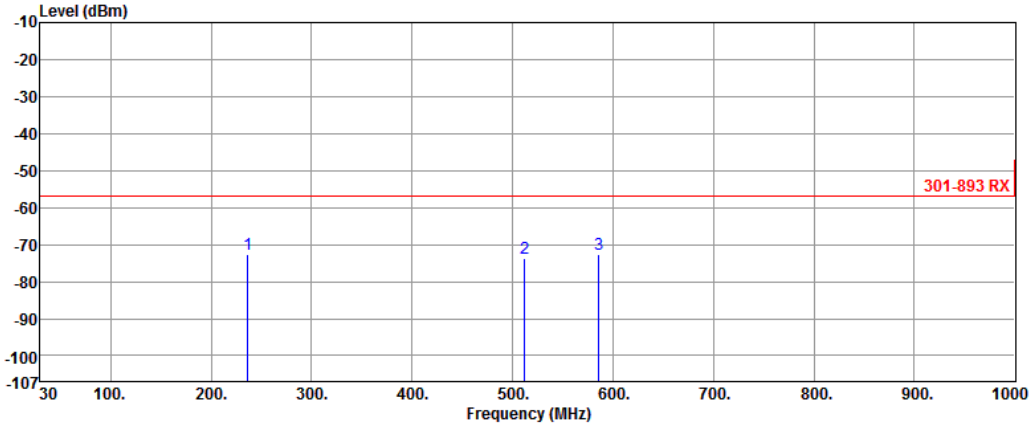
| Modulation | HT20 | Test Freq. (MHz) | 5180 |
|---|---|---|---|
| Polarization | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 236.71 | -63.58 | -57.00 | -6.58 | -1.91 | -61.67 |
| 2 | 286.76 | -66.46 | -57.00 | -9.46 | 0.38 | -66.84 |
| 3 | 461.70 | -66.45 | -57.00 | -9.45 | 2.49 | -68.94 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

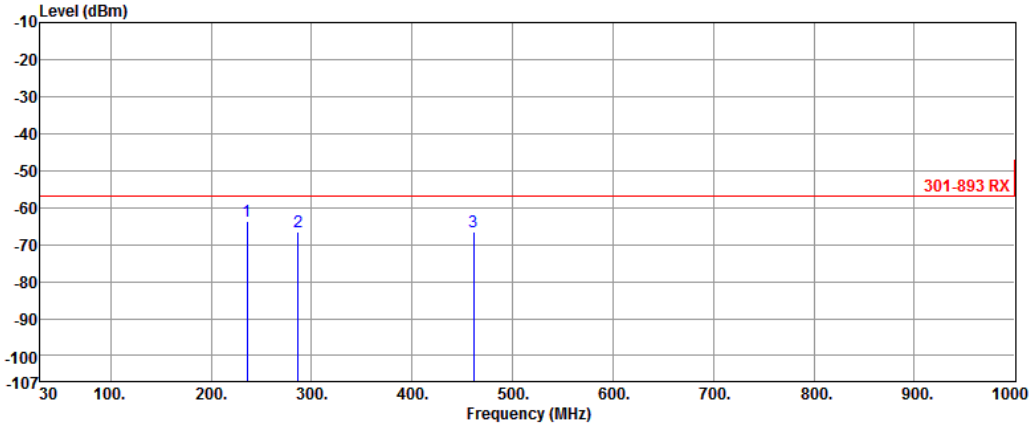
| Modulation | HT20 | Test Freq. (MHz) | 5180 |
|---|---|---|---|
| Polarization | Vertical | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 236.40 | -72.58 | -57.00 | -15.58 | -2.78 | -69.80 |
| 2 | 511.89 | -73.79 | -57.00 | -16.79 | 3.04 | -76.83 |
| 3 | 586.04 | -72.58 | -57.00 | -15.58 | 5.33 | -77.91 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

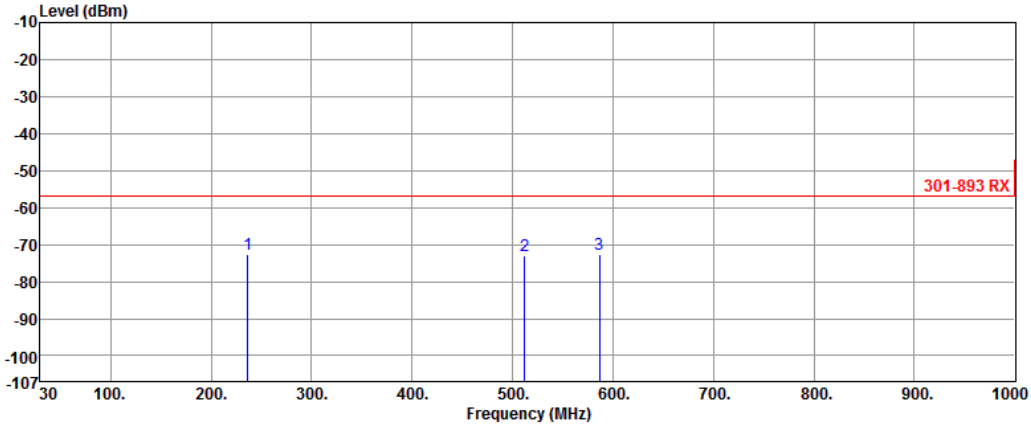
| Modulation | HT20 | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 236.05 | -63.76 | -57.00 | -6.76 | -1.95 | -61.81 |
| 2 | 286.56 | -66.54 | -57.00 | -9.54 | 0.38 | -66.92 |
| 3 | 461.57 | -66.54 | -57.00 | -9.54 | 2.49 | -69.03 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

| Modulation | HT20 | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Vertical | | |

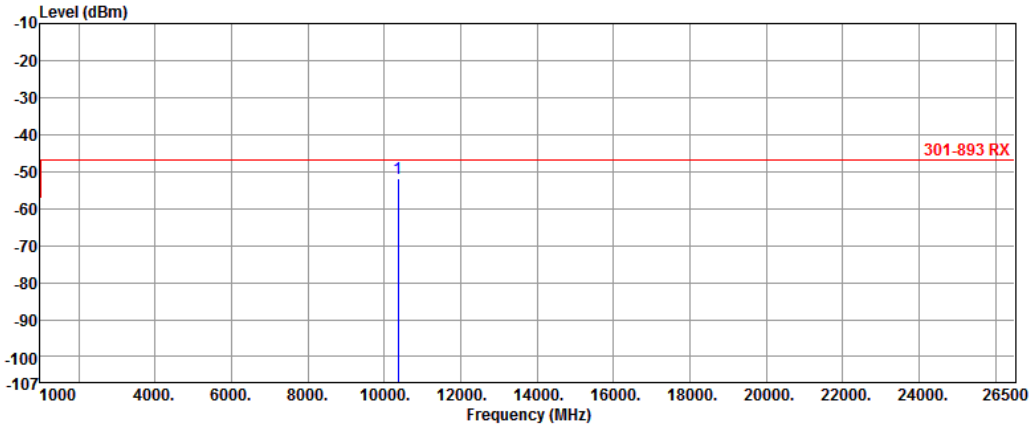



| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 236.54 | -72.52 | -57.00 | -15.52 | -2.79 | -69.73 |
| 2 | 511.75 | -73.02 | -57.00 | -16.02 | 3.05 | -76.07 |
| 3 | 586.75 | -72.75 | -57.00 | -15.75 | 5.35 | -78.10 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

### 4.1.5 Radiated Results of Receiver Spurious Emissions (Above 1GHz)

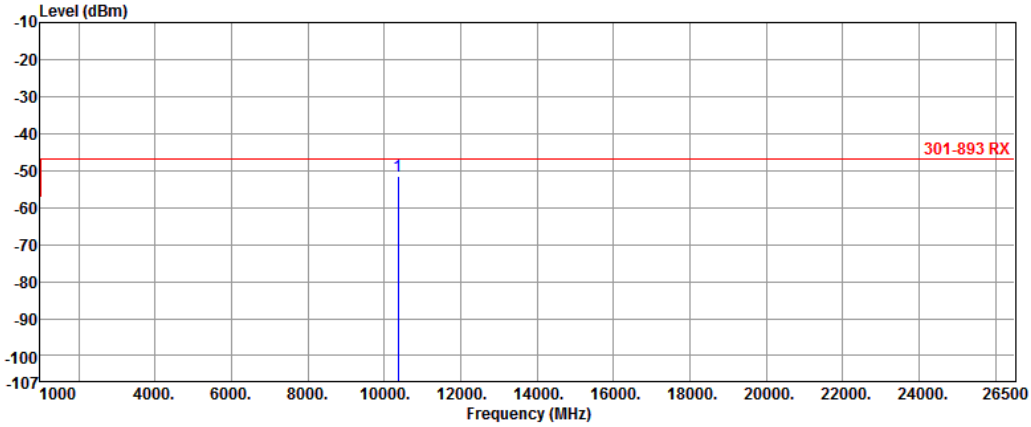
| **Modulation** | 11a | **Test Freq. (MHz)** | 5180 |
|---|---|---|---|
| **Polarization** | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 10360.07 | -51.90 | -47.00 | -4.90 | 21.81 | -73.71 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

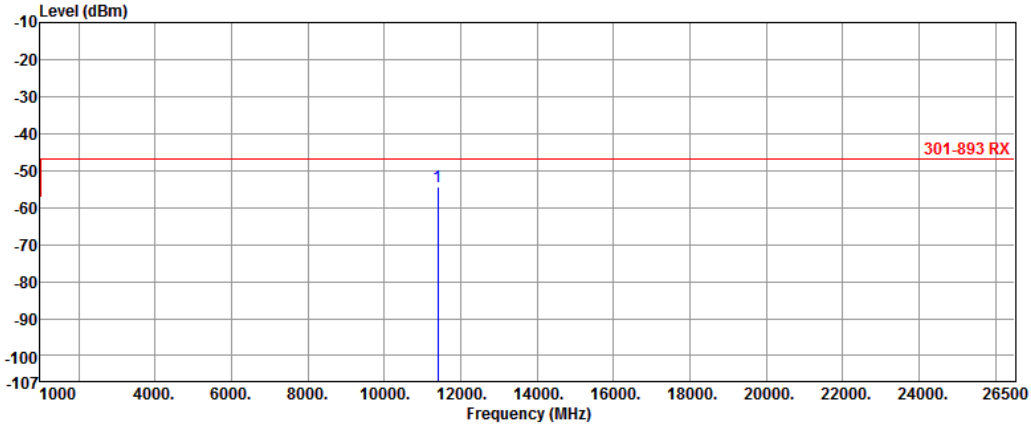
| Modulation | 11a | Test Freq. (MHz) | 5180 |
|---|---|---|---|
| Polarization | Vertical | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 10359.92 | -51.68 | -47.00 | -4.68 | 22.32 | -74.00 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

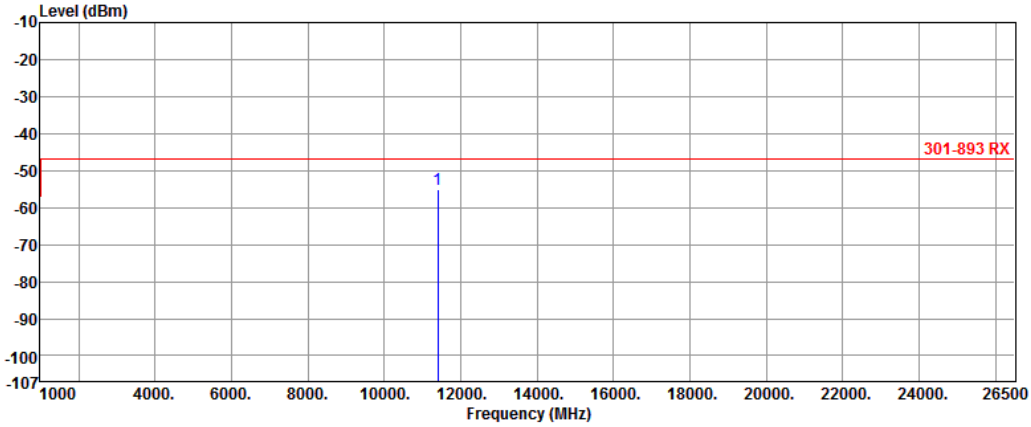
| Modulation | 11a | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 11400.06 | -54.27 | -47.00 | -7.27 | 20.98 | -75.25 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

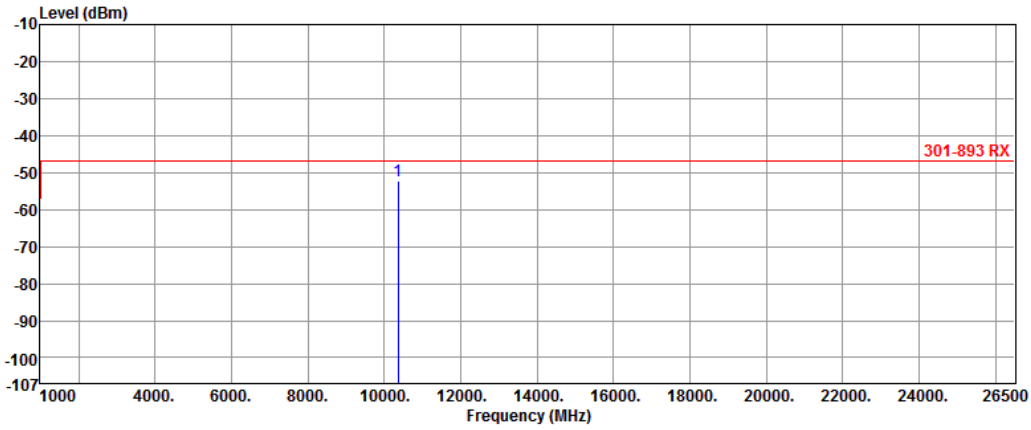
| Modulation | 11a | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Vertical | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 11400.07 | -55.06 | -47.00 | -8.06 | 21.08 | -76.14 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

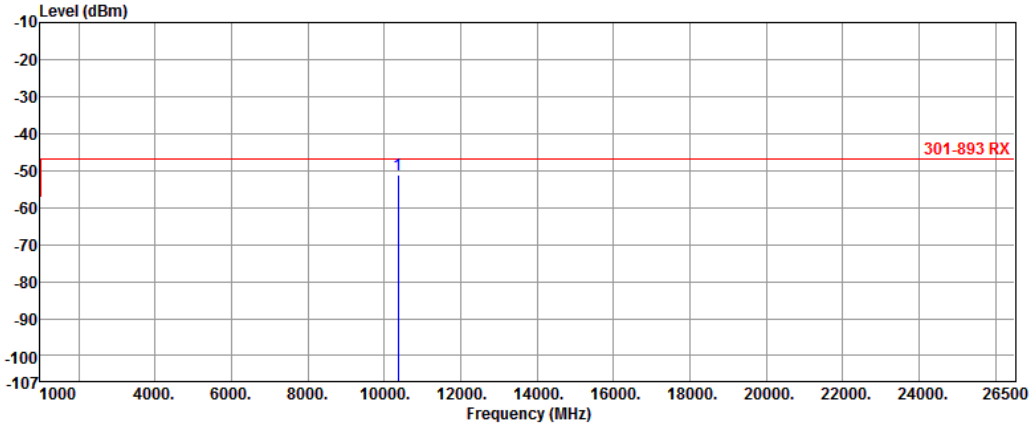
| Modulation | HT20 | Test Freq. (MHz) | 5180 |
|---|---|---|---|
| Polarization | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 10360.41 | -52.27 | -47.00 | -5.27 | 21.81 | -74.08 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

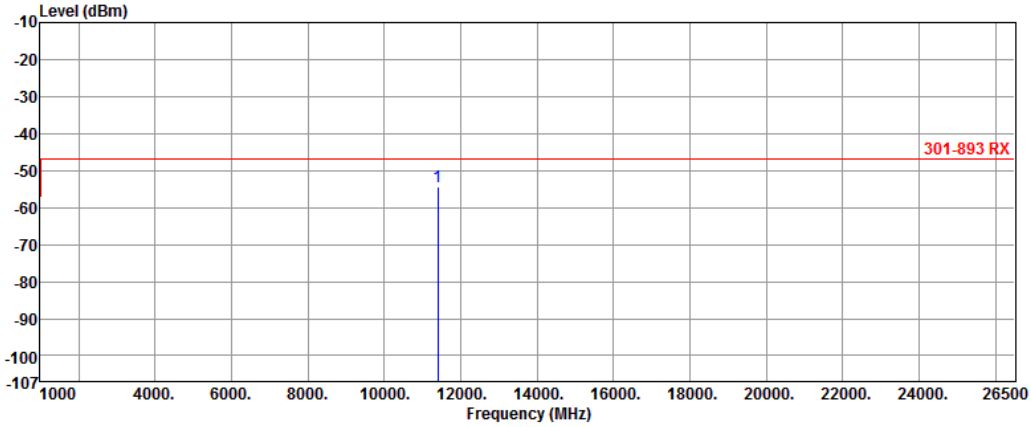
| Modulation | HT20 | Test Freq. (MHz) | 5180 |
|---|---|---|---|
| Polarization | Vertical | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 10359.40 | -51.30 | -47.00 | -4.30 | 22.32 | -73.62 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

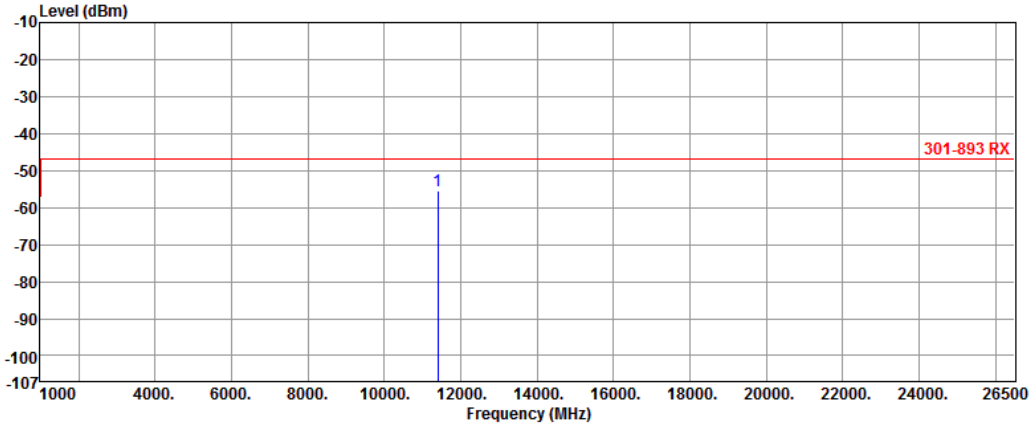
| Modulation | HT20 | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Horizontal | | |




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 11400.45 | -54.30 | -47.00 | -7.30 | 20.98 | -75.28 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

| Modulation | HT20 | Test Freq. (MHz) | 5700 |
|---|---|---|---|
| Polarization | Vertical | | |

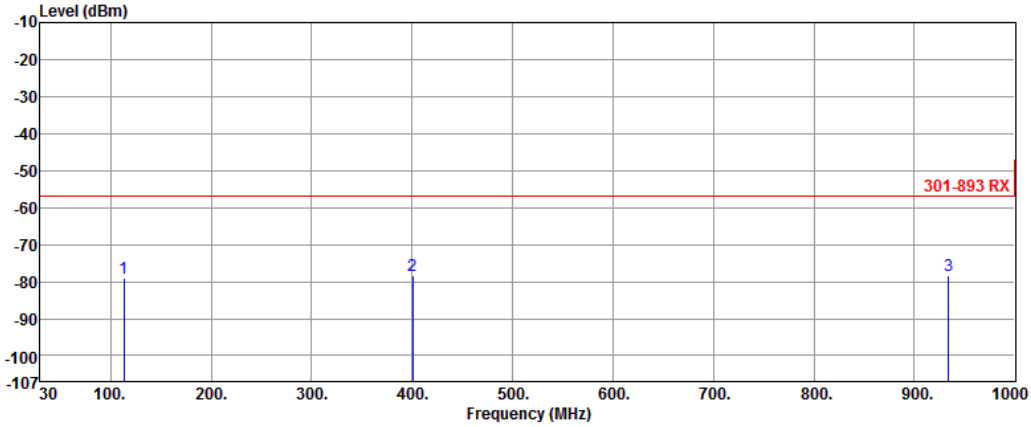



| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 11400.04 | -55.59 | -47.00 | -8.59 | 21.08 | -76.67 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

### 4.1.6 Conducted Results of Receiver Spurious Emissions (Below 1GHz)

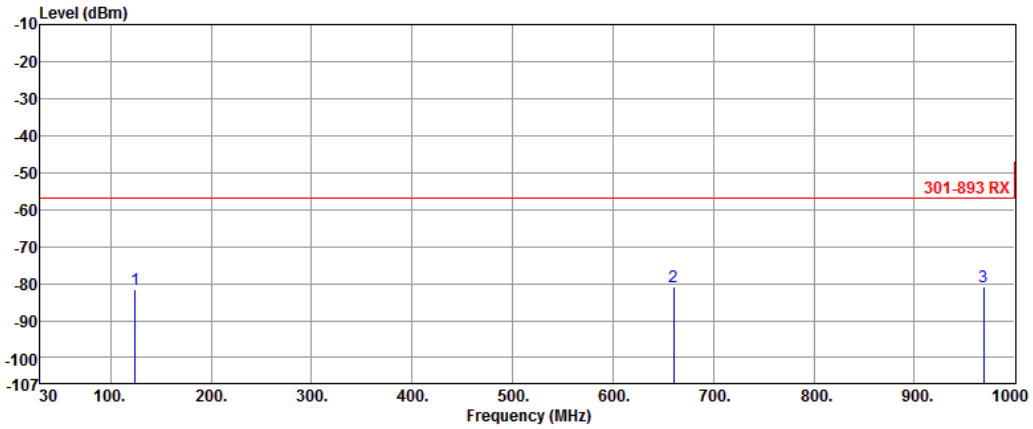
| Modulation | 11a | Test Freq. (MHz) | 5180 |
|---|---|---|---|




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 113.42 | -79.09 | -57.00 | -22.09 | 0.00 | -79.09 |
| 2 | 400.54 | -78.20 | -57.00 | -21.20 | 0.00 | -78.20 |
| 3 | 934.04 | -78.29 | -57.00 | -21.29 | 0.00 | -78.29 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

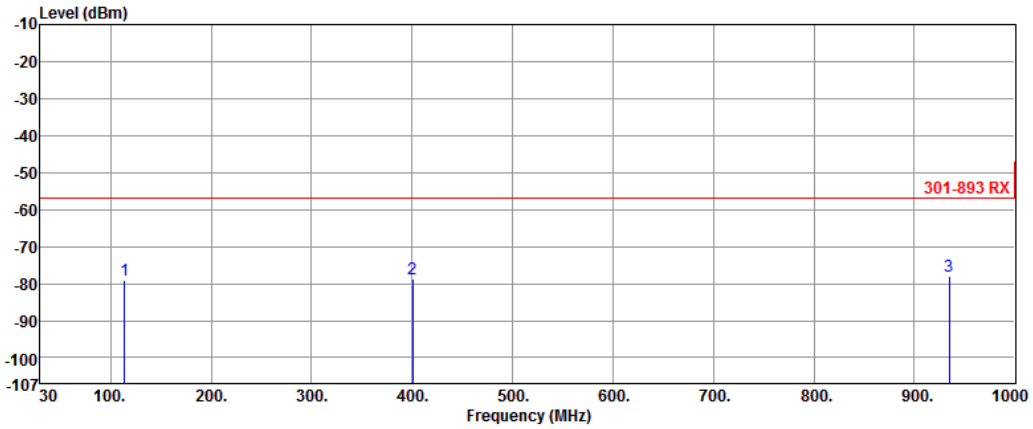
| Modulation | 11a | Test Freq. (MHz) | 5700 |
|---|---|---|---|




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 124.09 | -81.41 | -57.00 | -24.41 | 0.00 | -81.41 |
| 2 | 660.50 | -81.04 | -57.00 | -24.04 | 0.00 | -81.04 |
| 3 | 968.96 | -80.85 | -57.00 | -23.85 | 0.00 | -80.85 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

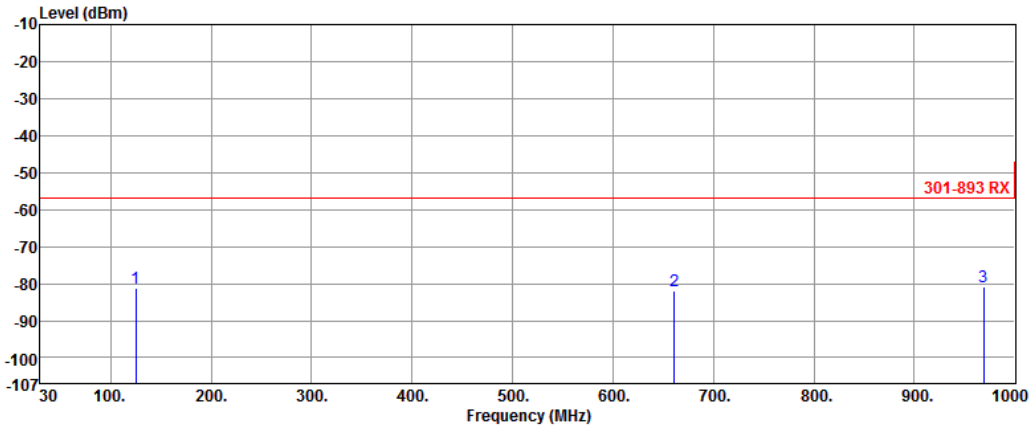
| Modulation | HT20 | Test Freq. (MHz) | 5180 |
|---|---|---|---|




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 113.54 | -79.04 | -57.00 | -22.04 | 0.00 | -79.04 |
| 2 | 400.74 | -78.60 | -57.00 | -21.60 | 0.00 | -78.60 |
| 3 | 934.75 | -78.05 | -57.00 | -21.05 | 0.00 | -78.05 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

| Modulation | HT20 | Test Freq. (MHz) | 5700 |
|---|---|---|---|

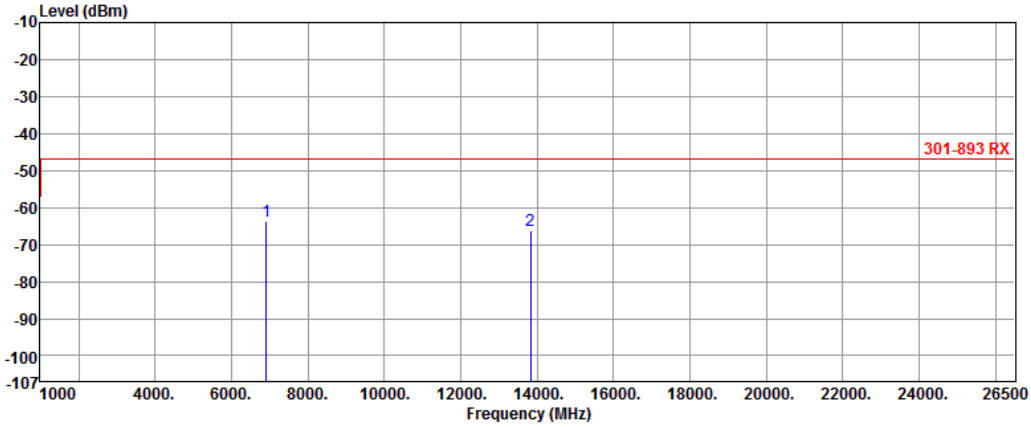



| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 124.75 | -81.32 | -57.00 | -24.32 | 0.00 | -81.32 |
| 2 | 660.75 | -81.87 | -57.00 | -24.87 | 0.00 | -81.87 |
| 3 | 968.74 | -80.75 | -57.00 | -23.75 | 0.00 | -80.75 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

### 4.1.7 Conducted Results of Receiver Spurious Emissions (Above 1GHz)

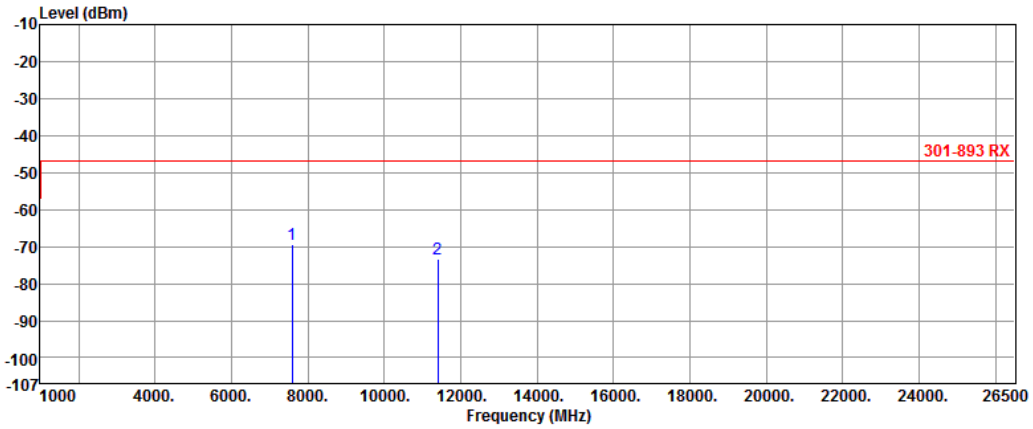
| Modulation | 11a | Test Freq. (MHz) | 5180 |
|---|---|---|---|




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 6916.00 | -63.59 | -47.00 | -16.59 | 0.00 | -63.59 |
| 2 | 13826.50 | -66.09 | -47.00 | -19.09 | 0.00 | -66.09 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

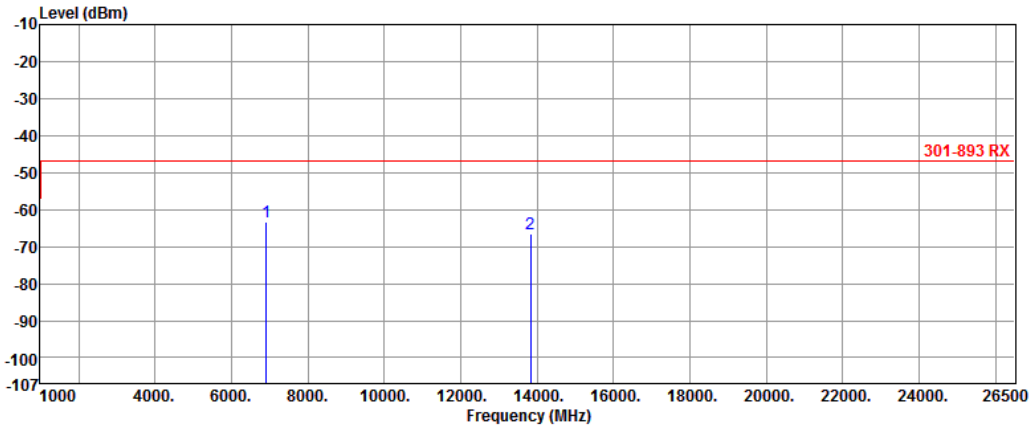
| Modulation | 11a | Test Freq. (MHz) | 5700 |
|---|---|---|---|




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 7579.00 | -69.58 | -47.00 | -22.58 | 0.00 | -69.58 |
| 2 | 11400.00 | -73.47 | -47.00 | -26.47 | 0.00 | -73.47 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

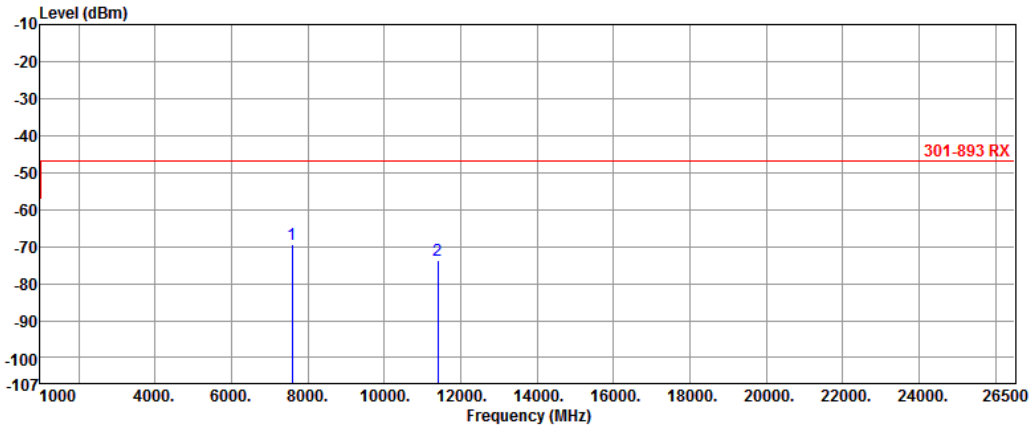
| Modulation | HT20 | Test Freq. (MHz) | 5180 |
|---|---|---|---|




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 6916.00 | -63.45 | -47.00 | -16.45 | 0.00 | -63.45 |
| 2 | 13826.50 | -66.65 | -47.00 | -19.65 | 0.00 | -66.65 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

| Modulation | HT20 | Test Freq. (MHz) | 5700 |
|---|---|---|---|




| | Freq. | Measured value | Limit | Margin | Factor | Reading |
|---|---|---|---|---|---|---|
| | MHz | dBm | dBm | dB | dB | dBm |
| 1 | 7579.00 | -69.54 | -47.00 | -22.54 | 0.00 | -69.54 |
| 2 | 11400.00 | -73.75 | -47.00 | -26.75 | 0.00 | -73.75 |

Note 1: Measured Value (dBm) = Reading (dBm) + Factor (dB)
Note 2: Margin (dB) = Measured Value (dBm) – Limit (dBm)

# 5 Adaptivity Test Results

## 5.1 Adaptivity

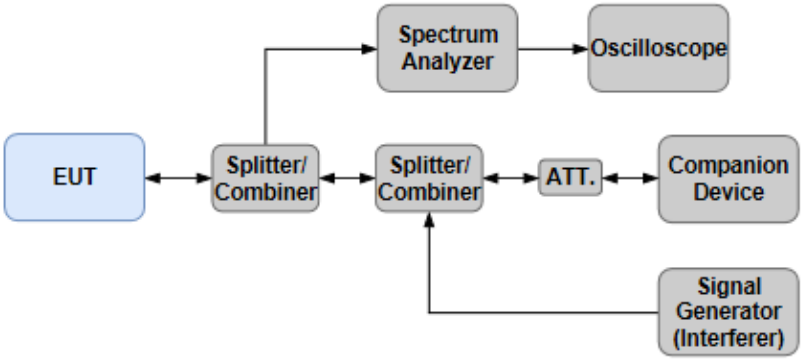
### 5.1.1 Adaptivity Limit

| Adaptivity Limit | |
|---|---|
| ☐ | Frame Based Equipment<br>The ED Threshold Level (TL), at the input of the receiver, shall be proportional to the maximum transmit power (PH) according to the formula which assumes a 0 dBi receive antenna and PH to be specified in dBm e.i.r.p.<br>For $P_H$ ≤ 13 dBm: TL = -75 dBm/MHz<br>For 13 dBm < $P_H$ < 23 dBm: TL = -85 dBm/MHz + (23 dBm - $P_H$)<br>For $P_H$ ≥ 23 dBm: TL = -85 dBm/MHz |
| ☒ | Load Based Equipment<br>☒ **Option 1:**<br>For equipment that for its operation in the 5 GHz bands is conforming to IEEE 802.11™-2016 [9], clause 17, clause 19 or clause 21, or any combination of these clauses, the *ED Threshold Level (TL)* is independent of the equipment's maximum transmit power ($P_H$). Assuming a 0 dBi receive antenna the *ED Threshold Level (TL)* shall be:<br>TL = -75 dBm/MHz |
| | ☐ **Option 2:**<br>For equipment conforming to one or more of the clauses listed in Option 1, and to at least one other operating mode, and for equipment conforming to none of the clauses listed in Option 1, the *ED Threshold Level (TL)* shall be proportional to the equipment's maximum transmit power ($P_H$). Assuming a 0 dBi receive antenna the *ED Threshold Level (TL)* shall be:<br>For $P_H$ ≤ 13 dBm: TL = -75 dBm/MHz<br>For 13 dBm < $P_H$ < 23 dBm: TL = -85 dBm/MHz + (23 dBm - $P_H$)<br>For $P_H$ ≥ 23 dBm: TL = -85 dBm/MHz |
| ☒ | Short Control Signalling Transmissions:<br>● within an observation period of 50 ms, the number of *Short Control Signalling Transmissions* by the equipment shall be equal to or less than 50; and<br>● the total duration of the equipment's *Short Control Signalling Transmissions* shall be less than 2 500 µs within said observation period. |
| ☒ | Channel Access Mechanism / Maximum Channel Occupancy Time(s) :<br>For Supervising Devices refer to clause 4.2.7.3.2.4 Table 7.<br>For Supervised Devices refer to clause 4.2.7.3.2.4 Table 8.<br>☐Option A: Measurement for Channel Access Mechanism and Maximum Channel Occupancy Time(s)<br>☒Option B: Compliance by declaration for the Channel Access Mechanism and Maximum Channel Occupancy Time(s) |

### 5.1.2 Test Procedures

Reference to clause 5.4.9.3 of ETSI EN 301 893 V2.1.1 (2017-05).

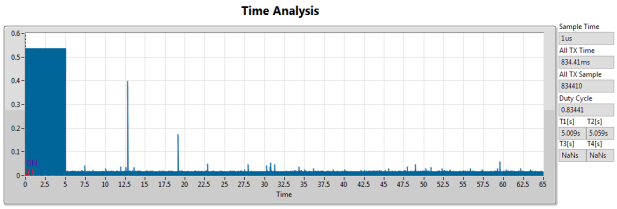
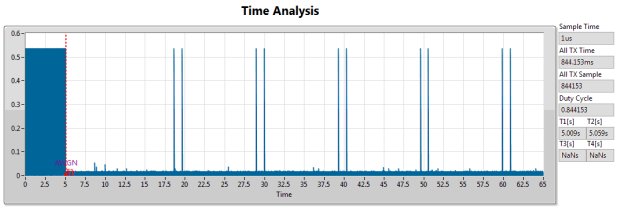
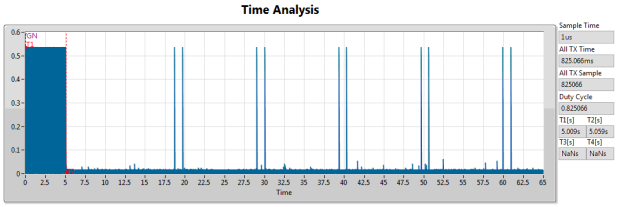
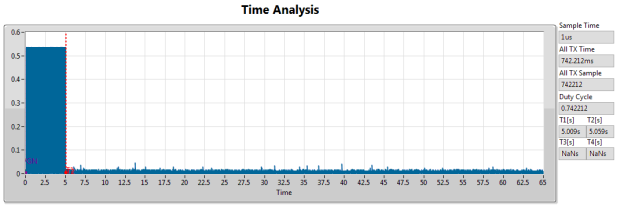
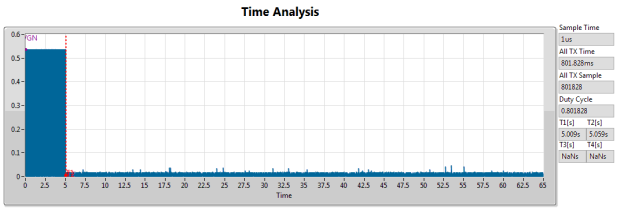
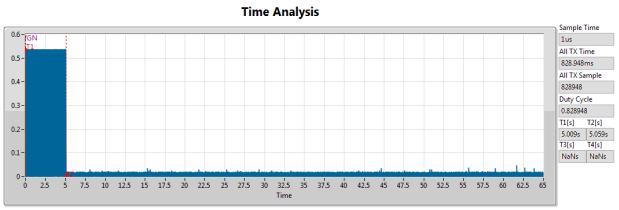
### 5.1.3 Test Setup




### 5.1.4 Test Result of Adaptivity and Short Control Signalling Transmissions

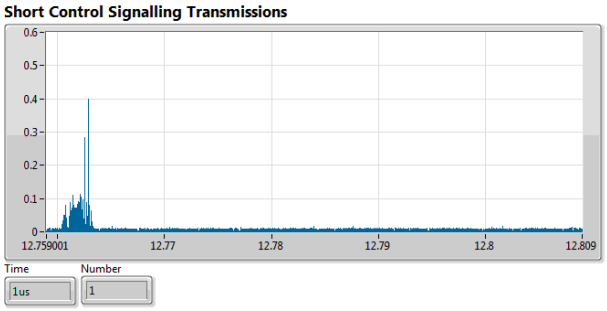
| Adaptivity Result | | | | | |
|---|---|---|---|---|---|
| **Equipment / Device type** | Load Based Equipment / Supervised Device | | | | |
| **EUT firmware / software version** | 23.3.3.5 | | | | |
| **Energy Detect Threshold Level (dBm)** | -75 | | | | |
| **Modulation Mode** | **Freq. (MHz)** | **Interference Signal Frequency (MHz)** | **Interference Signal Type** | **Short Control Signalling Transmissions (ms)/period Numbers** | **Adaptivity** |
| 802.11an (HT20) | 5180 | 5180 | AWGN | 0.001/1 | PASS |
| 802.11an (HT20) | 5180 | 5180 | OFDM | 0.245/2 | |
| 802.11an (HT20) | 5180 | 5180 | LTE | 0.245/2 | |
| 802.11an (HT20) | 5500 | 5500 | AWGN | 0/0 | PASS |
| 802.11an (HT20) | 5500 | 5500 | OFDM | 0/0 | |
| 802.11an (HT20) | 5500 | 5500 | LTE | 0/0 | |
| **Limit** | | | | < 2.5 ms / 50 | N/A |

## Adaptivity Result Plots

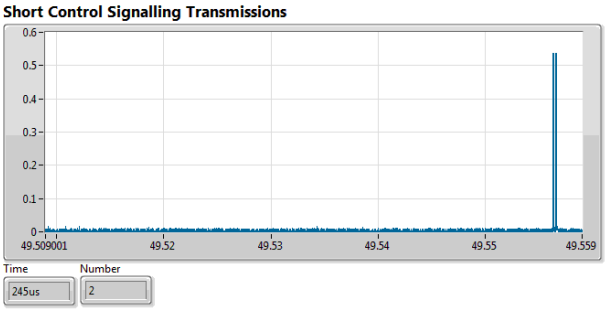
| 802.11an (HT20) - 5180MHz (AWGN) | 802.11an (HT20) - 5180MHz (OFDM) |
|---|---|
|   |   |
| **802.11an (HT20) - 5180MHz (LTE)** | **802.11an (HT20) - 5500MHz (AWGN)** |
|   |   |
| **802.11an (HT20) - 5500MHz (OFDM)** | **802.11an (HT20) - 5500MHz (LTE)** |
|   |   |

## Short Control Signalling Transmissions Plots

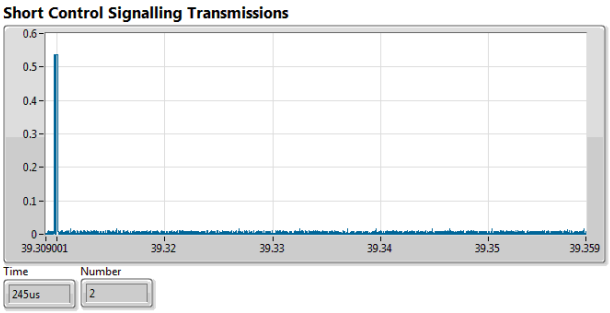
### 802.11an (HT20) - 5180MHz (AWGN)



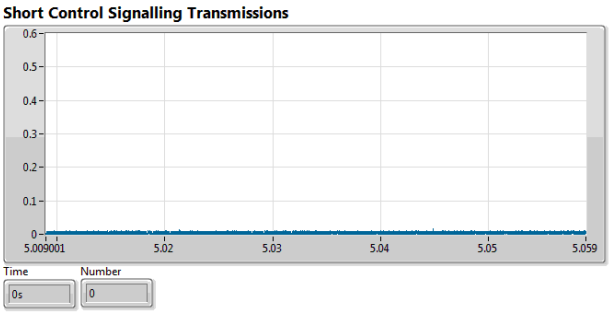

### 802.11an (HT20) - 5180MHz (OFDM)



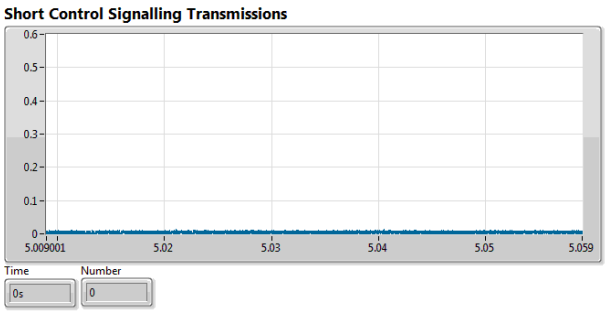

### 802.11an (HT20) - 5180MHz (LTE)



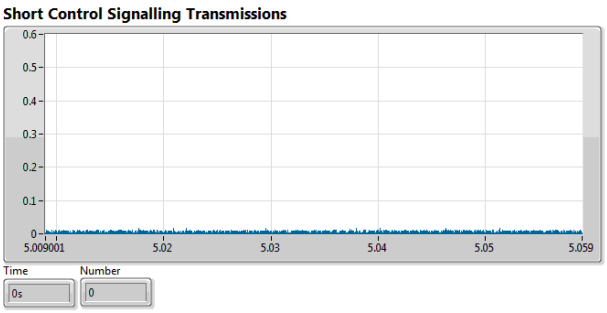

### 802.11an (HT20) - 5500MHz (AWGN)




### 802.11an (HT20) - 5500MHz (OFDM)




### 802.11an (HT20) - 5500MHz (LTE)



# 6 Receiver Blocking Test Results

## 6.1 Receiver Blocking

### 6.1.1 Limit of Receiver Blocking

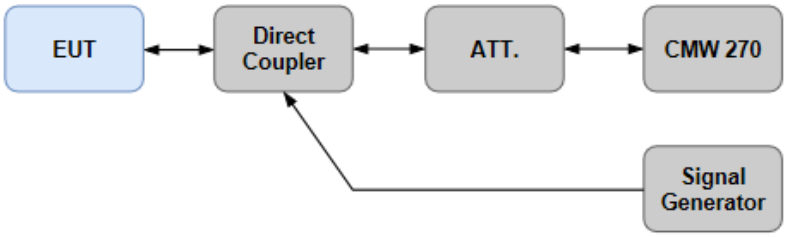
| Receiver Blocking Parameters | | | | |
|---|---|---|---|---|
| Wanted Signal Mean Power from Companion Device (dBm) | Blocking Signal Frequency (MHz) | Blocking Signal Power (dBm) (see note 2) | | Type of Blocking Signal |
| | | Master or Slave with radar detection | Slave without radar detection | |
| $P_{min}$ + 6 dB | 5 100 | -53 | -59 | Continuous Wave |
| $P_{min}$ + 6 dB | 4 900<br>5 000<br>5 975 | -47 | -53 | Continuous Wave |

Note 1: $P_{min}$ is the minimum level of the wanted signal (in dBm) required to meet the minimum performance criteria (The minimum performance criterion shall be a PER of less than or equal to 10 %) in the absence of any blocking signal.
Note 2: The levels specified are levels in front of the UUT antenna. In case of conducted measurements, the same levels should be used at the antenna connector irrespective of antenna gain.

### 6.1.2 Test Procedures

Reference to clause 5.4.10.2 of ETSI EN 301 893 V2.1.1 (2017-05).

### 6.1.3 Test Setup



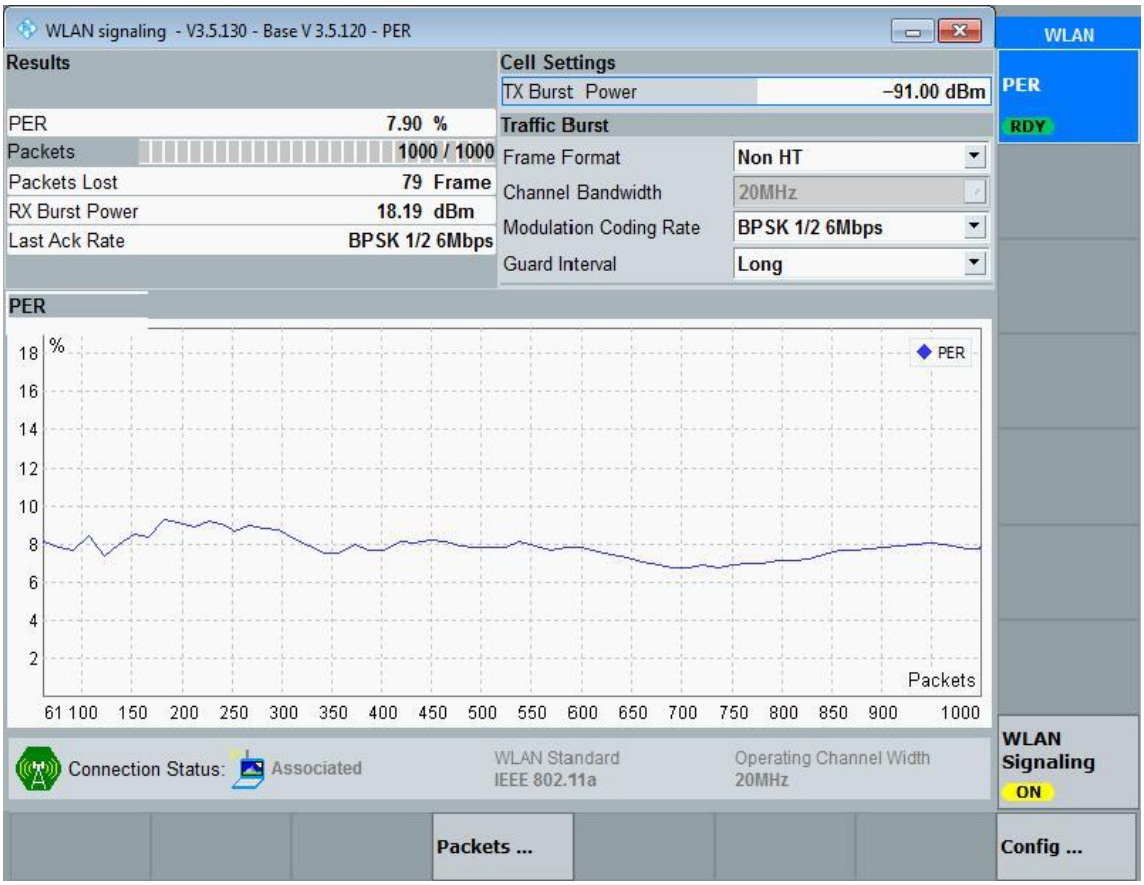
### 6.1.4 Test Result of Receiver Blocking

| 11a / 5180 MHz |
|---|
| Without Interference Signal Sensitivity Level |

| PER Minimum Performance Criteria | 10 % | | |
|---|---|---|---|
| **Sensitivity Level** | -91 | | **dBm** |
| **Want Signal Mean Power form Companion Device (dBm)** | **Blocking Signal Frequency (MHz)** | **Blocking Signal Power (dBm)** | **Test Result** |
| -85 | 5100 | -55.1 | Pass |
| -85 | 4900 | -49.1 | Pass |
| -85 | 5000 | | Pass |
| -85 | 5975 | | Pass |

**11a / 5700 MHz**

**Without Interference Signal Sensitivity Level**




| | | | |
|---|---|---|---|
| **PER Minimum Performance Criteria** | 10 % | | |
| **Sensitivity Level** | -91 | | **dBm** |
| **Want Signal Mean Power form Companion Device (dBm)** | **Blocking Signal Frequency (MHz)** | **Blocking Signal Power (dBm)** | **Test Result** |
| -85 | 5100 | -55 | Pass |
| -85 | 4900 | -49 | Pass |
| -85 | 5000 | | Pass |
| -85 | 5975 | | Pass |

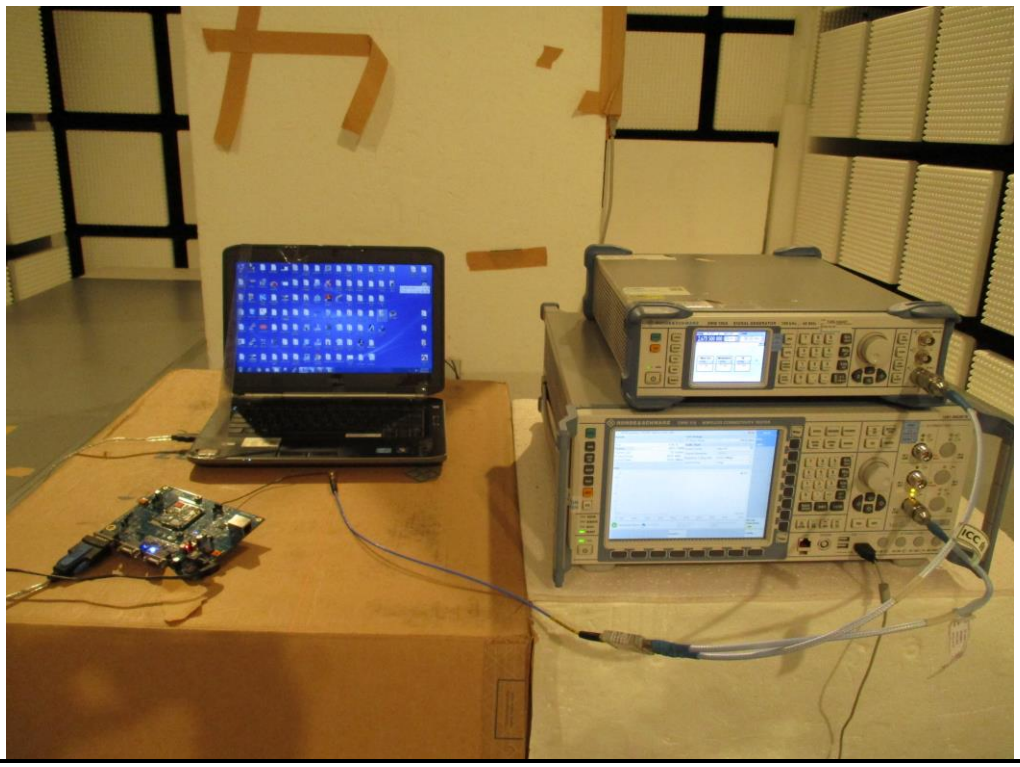
# 7 Photographs of the Test Configuration

**Spurious Emission Test**

**Spurious Emission Conducted Test**

**Adaptivity Test**

**Receiver Blocking Test**



# 8 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website http://www.icertifi.com.tw.

| **Linkou** | **Kwei Shan** | **Kwei Shan Site II** |
|---|---|---|
| Tel: 886-2-2601-1640 | Tel: 886-3-271-8666 | Tel: 886-3-271-8640 |
| No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C. | No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C. | No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.. |

If you have any suggestion, please feel free to contact us as below information

Tel: 886-3-271-8666
Fax: 886-3-318-0155
Email: ICC_Service@icertifi.com.tw

**═END═**