# FCC Test Report

| | | |
|---|---|---|
| **FCC ID** | : | **QXO-AP4000U** |
| **Equipment** | : | **Access Point** |
| **Brand Name** | : | **Extreme Networks** |
| **Model Name** | : | **AP4000U** |
| **Applicant** | : | **Extreme Networks, Inc.<br>6480 Via Del Oro, San Jose, CA 95119** |
| **Manufacturer** | : | **Extreme Networks, Inc.<br>6480 Via Del Oro, San Jose, CA 95119** |
| **Standard** | : | **47 CFR FCC Part 15.517** |

**The product was received on May 20, 2021, and testing was started from Jun. 03, 2021 and completed on Aug. 25, 2021. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.**

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

Approved by: Allen Lin

***SPORTON INTERNATIONAL INC. Hsinhua Laboratory***

*No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)*

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**PHOTOGRAPHS OF EUT V01**

# History of this test report

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| FR151220-01 | 01 | Initial issue of report | Sep. 06, 2021 |
| FR151220-01 | 02 | Revised typo<br>(This report is the latest version replacing for the report issued on Sep. 06, 2021.) | Dec. 20, 2021 |
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# Summary of Test Result

| Report Clause | Ref. Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|---|---|---|---|---|
| 1.1.2 | 15.203 | Antenna Requirement | PASS | - |
| 1.1.5 | 15.517(a) | Operational Restriction | PASS | - |
| 3.1 | 15.207 | AC Power-line Conducted Emissions | PASS | - |
| 3.2 | 15.517(b) | UWB Bandwidth | PASS | - |
| 3.3 | 15.517(e) | Peak Emissions within a 50 MHz Bandwidth | PASS | - |
| 3.4 | 15.517(c) /15.517(d) | Radiated Emissions | PASS | - |

| **Declaration of Conformity:** |
|---|
| The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. |
| **Comments and explanations:** |
| After verification, the signal 1.2GHz is not generated by the UWB transmitter. |

**Reviewed by: Sam Tsai**

**Report Producer: Michelle Tsai**

# 1 General Description

## 1.1 Information

### 1.1.1 RF General Information

| RF General Information | | | | |
|---|---|---|---|---|
| Frequency Range (MHz) | Mode | Ch. Freq. (MHz) | Channel Number | Transmit Chains ($N_{TX}$) |
| 3100-10600 | UWB | 6489.6 | 5 [1] | 1 |
| | UWB | 7987.2 | 9 [1] | 1 |
| Note 1: UWB uses BPSK modulation. | | | | |

### 1.1.2 Antenna Information

| Ant. | Brand | Model Name | Antenna Type | Connector |
|---|---|---|---|---|
| 1 | WNC | N/A | PIFA | I-PEX |

| Ant. | Port | Gain (dBi) | |
|---|---|---|---|
| | | 6489.6 MHz | 7987.2 MHz |
| 1 | 1 | 4.16 | 4.17 |

**For UWB function:**

Ant. 1 (port 1) could transmit/receive.

### 1.1.3 Type of EUT

| Operational Condition | |
|---|---|
| EUT Power Type | From PoE |
| Type of EUT | |
| ☒ | Stand-alone |
| ☐ | Combined (EUT where the radio part is fully integrated within another device)<br>Combined Equipment - Brand Name / Model No.: … |
| ☐ | Plug-in radio (EUT intended for a variety of host systems)<br>Host System - Brand Name / Model No.: … |
| ☐ | Other: |

### 1.1.4 Test Signal Duty Cycle

| Mode | DC | DCF(dB) | T(s) | VBW(Hz) ≥ 1/T |
|---|---|---|---|---|
| Ultra Wide Band | 0.974 | 0.11 | 322.5u | 10k |

Note. If DC < 0.98, the DCF was added while measuring Output power and PSD.

### 1.1.5 Operational Restriction

| Operation Restriction | Informed the applicant | Not applicable | User Manual Informed | Passed |
|---|---|---|---|---|
| ☒ Indoor UWB devices & Fixed indoor infrastructure | | | | |
| Must be capable of operation only indoors. The necessity to operate with a fixed indoor infrastructure. [A transmitter that had been connected to the AC power lines and operates solely through the AC mains. Or The device under test operates solely through USB port of a PC. It is not intended to operate from any other power source and be considered sufficient to demonstrate a fixed indoor infrastructure] | ☒ | ☐ | ☐ | ☒ |
| ☒ Emissions from equipment | | | | |
| The emissions from equipment operated shall not be intentionally directed outside of the building in which the equipment is located, such as through a window or a doorway, to perform an outside function, such as the detection of persons about to enter a building. [The applicant has been informed of this requirement.] | ☒ | ☐ | ☐ | ☒ |
| ☒ Outdoor mounted antennas | | | | |
| The use of outdoor mounted antennas, e.g., antennas mounted on the outside of a building or on a telephone pole, or any other outdoors infrastructure is prohibited. [The applicant has been informed without any outdoor mounted antennas.] | ☒ | ☐ | ☐ | ☒ |
| ☒ Field disturbance sensors install | | | | |
| Field disturbance sensors installed inside of metal or underground storage tanks are considered to operate indoors provided the emissions are directed towards the ground. [Not applicable for this client.] | ☐ | ☒ | ☐ | ☒ |
| ☒ A communications system shall transmit only | | | | |
| A communications system shall transmit only when the intentional radiator is sending information to an associated receiver. [The applicant has been informed of this requirement and is clearly stated on the user manual.] | ☒ | ☐ | ☒ | ☐ |

## 1.2 Testing Applied Standards

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

- 47 CFR FCC Part 15
- ANSI C63.10-2013

The following reference test guidance is not within the scope of accreditation of TAF:

- KDB 393764 D01 v02
- KDB 412172 D01 v01r01

## 1.3 Testing Location Information

| **Test Lab.：Sporton International Inc. Hsinhua Laboratory** | | | | |
|---|---|---|---|---|
| ☒ Hsinhua | **ADD:** No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.) | | | |
| **(TAF:** 3785**)** | **TEL:** 886-3-327-3456 | | **FAX:** 886-3-327-0973 | |
| Test site Designation No. TW3785 with FCC. | | | | |
| **Test Condition** | **Test Site No.** | **Test Engineer** | **Test Environment** | **Test Date** |
| AC Conduction | CO04-HY | Billy Wang | 22.2~23.4°C / 59~60% | 23/Jun/2021 |
| RF Conducted | TH01-HY | Barry Hsiao | 25.1~25.3°C / 58~60% | 04/Jun/2021 |
| RF Conducted | TH01-HY | Barry Hsiao | 25~26.5°C / 59~62% | 23/Aug/2021 |
| Radiated | 03CH03-HY | Tony Chang | 24.1~24.5°C / 53~55% | 22/Jun/2021 |
| Radiated | 03CH03-HY | Edward Wang | 24.3~25.4°C / 58~63% | 25/Aug/2021 |
| ☒ Wen 33rd. St. | **ADD:** No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) | | | |
| **(TAF:** 3785**)** | **TEL:** 886-3-318-0787 | | **FAX:** 886-3-318-0287 | |
| Test site Designation No. TW0008 with FCC. | | | | |
| **Test Condition** | **Test Site No.** | **Test Engineer** | **Test Environment** | **Test Date** |
| Radiated | 03CH09-HY | Daniel Hsu | 25.1~25.6°C / 54~57% | 03/Jun/2021 |

## 1.4 Measurement Uncertainty

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

| **Test Items** | **Uncertainty** | **Remark** |
|---|---|---|
| Conducted Emission (150kHz ~ 30MHz) | 0.9 dB | Confidence levels of 95% |
| Radiated Emission (9kHz ~ 30MHz) | 2.4 dB | Confidence levels of 95% |
| Radiated Emission (30MHz ~ 1,000MHz) | 3.7 dB | Confidence levels of 95% |
| Radiated Emission (1GHz ~ 18GHz) | 3.6 dB | Confidence levels of 95% |
| Radiated Emission (18GHz ~ 40GHz) | 3.5 dB | Confidence levels of 95% |
| Conducted Emission | 1.0 dB | Confidence levels of 95% |
| Temperature | 0.41 °C | Confidence levels of 95% |
| Humidity | 3.4 % | Confidence levels of 95% |

# 2 Test Configuration of EUT

## 2.1 Test Condition

| RF Conducted | Abbreviation | Remark |
|---|---|---|
| TnomVnom | Tnom | 20°C |
| - | Vnom | 120V |

## 2.2 The Worst Case Configuration

| Worst Modulation Used for Conformance Testing | | |
|---|---|---|
| **Mode** | **Transmit Chains ($N_{TX}$)** | **Test Channel Frequencies (MHz)** |
| UWB | 1 | 6489.6,7987.2 |

## 2.3 The Worse Case Power Setting Parameter

| Test Software Version | Tera Term Version 4.76 |
|---|---|

| Mode | PowerSetting |
|---|---|
| Ultra Wide Band_Nss1_1TX | - |
| 6489.6MHz | 0x7f7f7f7f |
| 7987.2MHz | 0x73737373 |

## 2.4 The Worst Case Measurement Configuration

| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| **Tests Item** | AC power-line conducted emissions |
| **Condition** | AC power-line conducted measurement for line and neutral |
| **Operating Mode** | CTX |
| 1 | PoE Mode |

| The Worst Case Mode for Following Conformance Tests | |
|---|---|
| **Tests Item** | Conducted Emissions, UWB Bandwidth |
| **Test Condition** | Conducted measurement at transmit chains |

| The Worst Case Mode for Following Conformance Tests | | | |
|---|---|---|---|
| **Tests Item** | Peak Emissions within a 50 MHz Bandwidth,<br>Radiated Emissions | | |
| **Test Condition** | Radiated measurement<br>If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type. | | |
| **Operating Mode** | CTX | | |
| 1 | PoE Mode | | |
| **Operating Mode > 1GHz** | CTX | | |
| **Orthogonal Planes of EUT** | **X Plane** | **Y Plane** | **Z Plane** |
| | | | |
| **Worst Planes of EUT** | | V | |

## 2.5 Accessories

| Accessories | | | | |
|---|---|---|---|---|
| **Wall Bracket** | Brand Name | N/A | Model Name | N/A |

Reminder: Regarding to more detail and other information, please refer to user manual.

## 2.6 Support Equipment

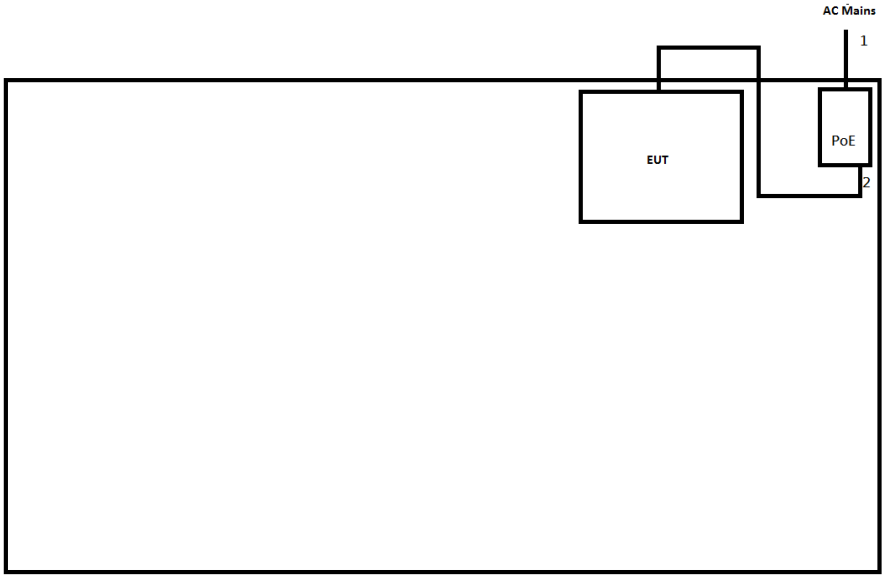
| Support Equipment – AC Conduction | | | | | |
|---|---|---|---|---|---|
| **No.** | **Equipment** | **Brand Name** | **Model Name** | **FCC ID** | **Remark** |
| 1 | RJ45 Cable | Power Sync | CAT-6E-10 | - | - |
| 2 | PoE | Microsemi | PD-9001-10GC/AC | - | - |

| Support Equipment – Conducted | | | | | |
|---|---|---|---|---|---|
| **No.** | **Equipment** | **Brand Name** | **Model Name** | **FCC ID** | **Remark** |
| 1 | Notebook | DELL | E5410 | - | - |
| 2 | Adapter for NB | DELL | HA65NM130 | - | - |

| Support Equipment – Radiated | | | | | |
|---|---|---|---|---|---|
| **No.** | **Equipment** | **Brand Name** | **Model Name** | **FCC ID** | **Remark** |
| 1 | RJ45 Cable | Power Sync | CAT-6E-10 | - | - |
| 2 | PoE | Microsemi | PD-9001-10GC/AC | - | Remote |

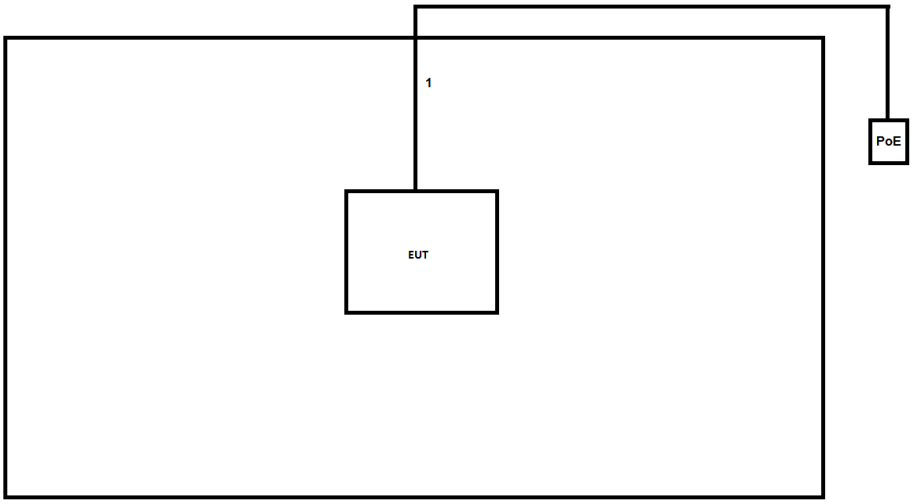
## 2.7 Test Setup Diagram

**Test Setup Diagram – AC Line Conducted Emission Test**




| Item | Connection | Shielded | Length(m) | Remark |
|---|---|---|---|---|
| 1 | AC Power cable | No | 1.8 | - |
| 2 | RJ45 cable | No | 10.0 | - |

**Test Setup Diagram - Radiated Test**




| Item | Connection | Shielded | Length(m) | Remark |
|---|---|---|---|---|
| 1 | RJ45 cable | No | 10.0 | - |

# 3 Transmitter Test Result

## 3.1 AC Power-line Conducted Emissions

### 3.1.1 AC Power-line Conducted Emissions Limit

| AC Power-line Conducted Emissions Limit | | |
|---|---|---|
| **Frequency Emission (MHz)** | **Quasi-Peak** | **Average** |
| 0.15-0.5 | 66 - 56 * | 56 - 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |
| Note 1: * Decreases with the logarithm of the frequency. | | |

### 3.1.2 Measuring Instruments

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

### 3.1.3 Test Procedures

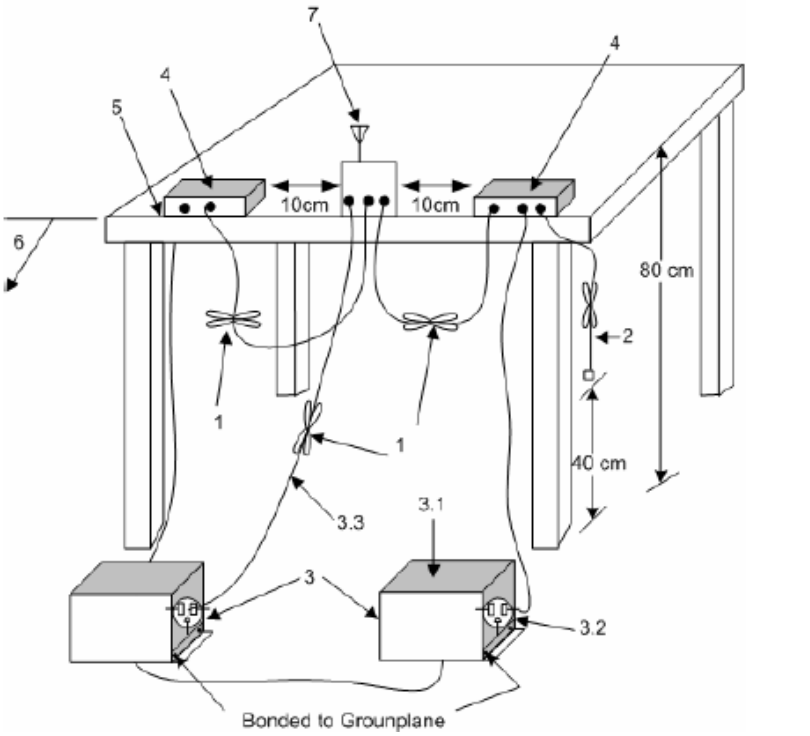
| Test Method |
|---|
| ☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions. |

### 3.1.4 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Raw(Read Level) +LISN(LISN Factor) + CL(Cable Loss) + AT(Attenuator).

### 3.1.5 Test Setup

**AC Power-line Conducted Emissions**




1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.
2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50Ωloads. LISN may be placed on top of, or immediately beneath, reference ground plane.
3.1—All other equipment powered from additional LISN(s).
3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
3.3—LISN at least 80 cm from nearest part of EUT chassis.
4—Non-EUT components of EUT system being tested.
5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

### 3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

## 3.2 UWB bandwidth

### 3.2.1 UWB bandwidth Limit

| UWB bandwidth Limit |
|---|
| ☒ UWB bandwidth ≥ 500 MHz or Fractional bandwidth ≥ 0.2; Fractional bandwidth = $2(f_H - f_L)/(f_H + f_L)$ |

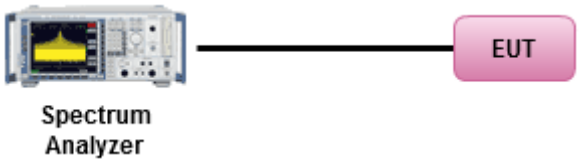
### 3.2.2 Measuring Instruments

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

### 3.2.3 Test Procedures

| Test Method | |
|---|---|
| ☒ For the UWB bandwidth shall be measured using one of the options below: | |
| | ☒ Refer as ANSI C63.10, clause 6.9.3 and clause 10.1 for UWB bandwidth testing. |

### 3.2.4 Test Setup

| UWB Bandwidth |
|---|
|   |

### 3.2.5 Test Result of UWB Bandwidth

Refer as Appendix B

# 3.3 Peak Emissions within a 50 MHz Bandwidth

## 3.3.1 Peak Emissions within a 50 MHz Bandwidth Limit

| Peak Emissions within a 50 MHz Bandwidth Limit |
|---|
| $P_{eirp}$ = 0 dBm/50MHz |

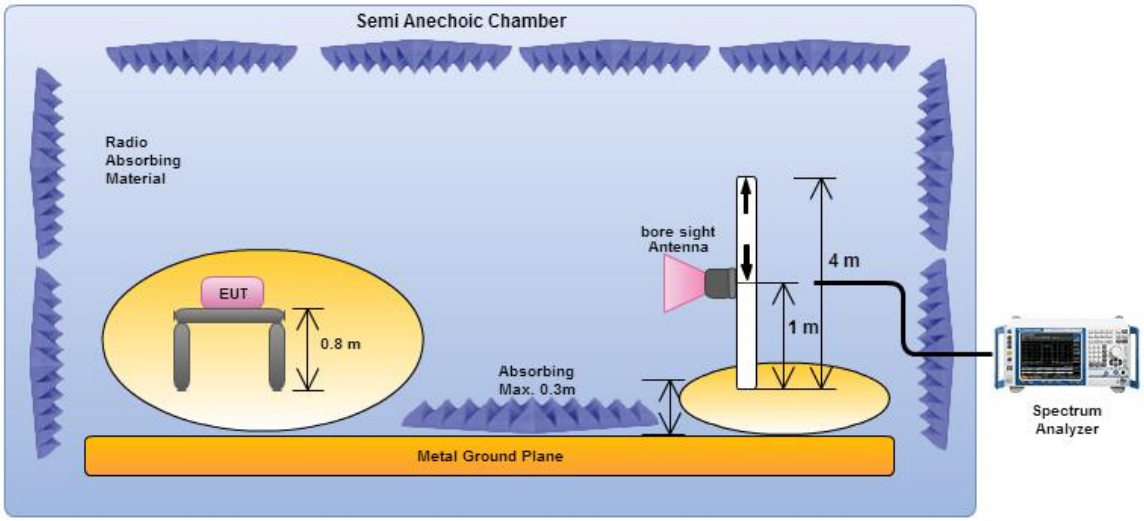
## 3.3.2 Measuring Instruments

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

## 3.3.3 Test Procedures

| Test Method | |
|---|---|
| ☒ Peak Emissions within a 50 MHz Bandwidth | |
| | ☒ Refer as ANSI C63.10, clause 10.3.1 for radiated measurement procedure testing. |
| | ☒ Refer as ANSI C63.10, clause 10.3.2 for measurement distance is 3m. |
| | ☒ Refer as ANSI C63.10, clause 10.3.4 for peak detector procedure testing. |
| | ☒ Refer as ANSI C63.10, clause 10.3.6 for bandwidth conversion of peak power.<br>$EIRP_{50MHz} = EIRP_{28MHz} – 20 \log(28MHz/50MHz)$ |

## 3.3.4 Test Setup

| Peak Emissions |
|---|
|  |



## 3.3.5 Test Result of Peak Emissions within a 50 MHz Bandwidth

Refer as Appendix C

## 3.4 Radiated Emissions

### 3.4.1 Radiated Emissions Limit

| Radiated Emissions below 960MHz and Emissions from Digital Circuitry Limit | | | |
|---|---|---|---|
| **Frequency Range (MHz)** | **Field Strength (uV/m)** | **Field Strength (dBuV/m)** | **Measure Distance (m)** |
| 0.009~0.490 | 2400/F(kHz) | 48.5 - 13.8 | 300 |
| 0.490~1.705 | 24000/F(kHz) | 33.8 - 23 | 30 |
| 1.705~30.0 | 30 | 29 | 30 |
| 30~88 | 100 | 40 | 3 |
| 88~216 | 150 | 43.5 | 3 |
| 216~960 | 200 | 46 | 3 |
| Above 960 | 500 | 54 | 3 |

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

| Radiated Emissions above 960MHz Limit | |
|---|---|
| **Frequency Range (MHz)** | **EIRP (dBm)** |
| 960-1610 | -75.3 |
| 1610-1990 | -53.3 |
| 1990-3100 | -51.3 |
| 3100-10600 | -41.3 |
| Above 10600 | -51.3 |

| Radiated Emissions in GPS Bands Limit | |
|---|---|
| **Frequency Range (MHz)** | **EIRP (dBm)** |
| 1164-1240 | -85.3 |
| 1559-1610 | -85.3 |

### 3.4.2 Measuring Instruments

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

### 3.4.3 Test Procedures

| Test Method for Radiated Emissions above 960MHz | | |
|---|---|---|
| ☒ | Radiated Emissions above 960MHz | |
| | ☒ | Refer as ANSI C63.10, clause 10.3.1 for radiated measurement procedure testing. |
| | ☒ | Refer as ANSI C63.10, clause 10.3.2 for measurement distance is 3m. In some cases, it may be necessary to measure the radiated UWB emissions at a closer distance to obtain enough signal and margin to overcome the measurement system noise floor. Distance extrapolation factor = 20 log (test distance [X m]/specific distance [3 m]) (dB) |
| | ☒ | Refer as ANSI C63.10, clause 10.3.4 for rms detector procedure testing. |
| | ☒ | Refer as ANSI C63.10, clause 10.3.7 for evaluating AVG-PSD (RBW=1MHz). |
| | ☒ | Refer as ANSI C63.10, clause 10.3.10 for evaluating AVG-PSD in GPS Band (RBW≥1kHz). |
| ☒ | For radiated measurement. | |
| | ☒ | Refer as KDB 412172, clause 2.2 following eirp can be used radiated test configuration. |
| | ☒ | Refer as KDB 412172, clause 5 following eirp can be directly determined using the field strength. |
| | ☐ | Refer as KDB 412172, clause 6 following eirp can be used signal/antenna substitution techniques. |

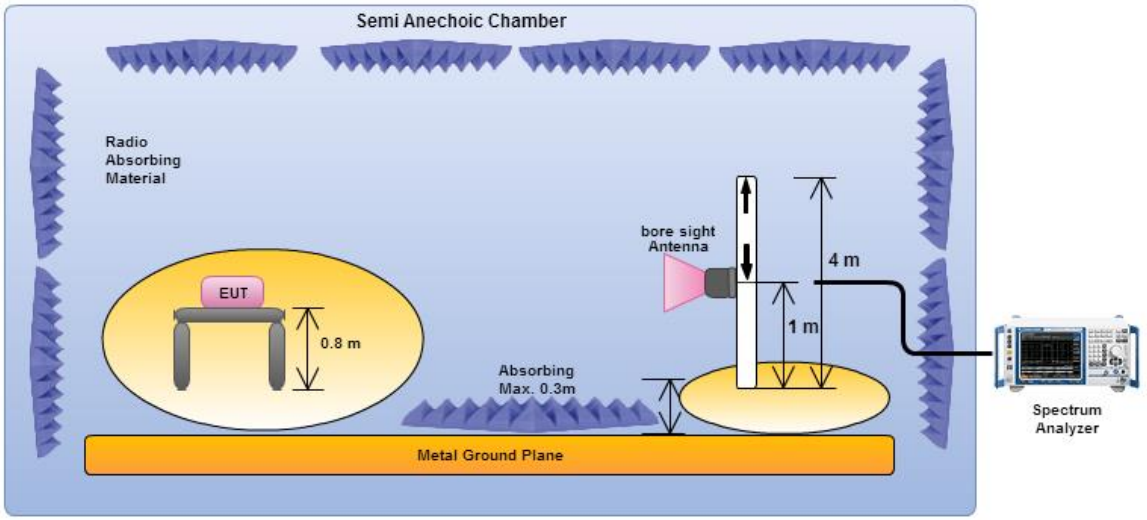
| Test Method for Radiated Emissions below 960MHz and Emissions from Digital Circuitry | | |
|---|---|---|
| ☒ | Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements). | |
| ☒ | For the transmitter unwanted emissions shall be measured using following options below: | |
| | ☒ | Refer as ANSI C63.10, clause 4.1.4.2.3 (Reduced VBW) – Duty cycle ≥ 100%. |
| | ☐ | Refer as ANSI C63.10, clause 4.1.4.2.4 average value of pulsed emissions. Adjusted by a “duty cycle correction factor”, derived from 20log (dwell time/100 ms). Average emission = peak emission + 20 log (duty cycle). |
| | ☒ | Refer as ANSI C63.10, clause 4.1.4.2.2 measurement procedure peak limit. |
| ☒ | For radiated measurement. | |
| | ☒ | Refer as ANSI C63.10, clause 6.4 for radiated emissions below 30 MHz and test distance is 3m. |
| | ☒ | Refer as ANSI C63.10, clause 6.5 for radiated emissions 30 MHz to 1 GHz and test distance is 3m. |
| | ☒ | Refer as ANSI C63.10, clause 6.6 for radiated emissions above 1 GHz and test distance is 3m. |
| ☒ | The any unwanted emissions level shall not exceed the fundamental emission level. | |

### 3.4.4 Measurement Results Calculation

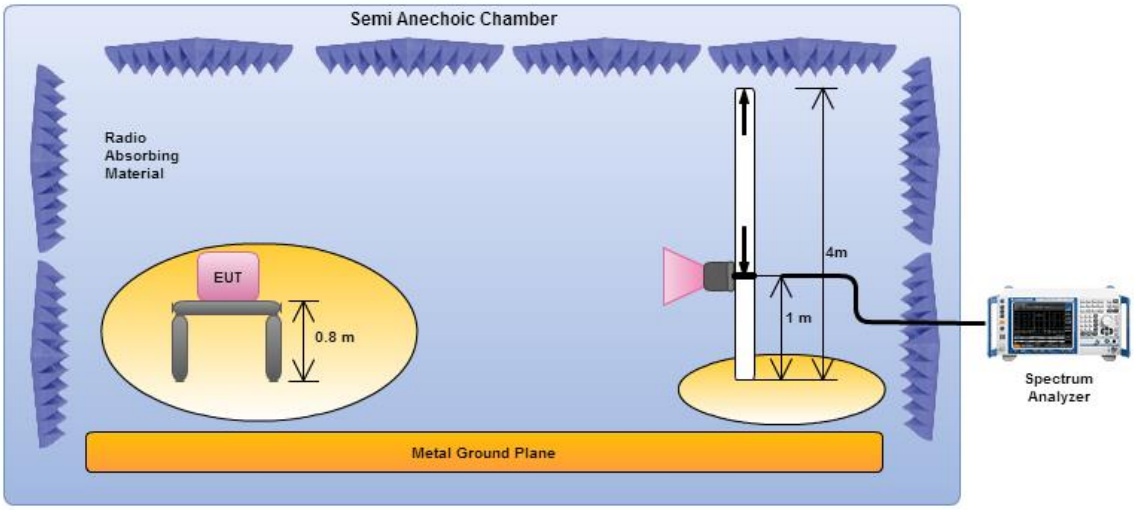
The measured Level is calculated using:
Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

### 3.4.5 Test Setup

**Radiated Emissions above 960MHz**




**Radiated Emissions below 960MHz and Emissions from Digital Circuitry**




Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna and the frequency range of 1 GHz to 40 GHz using a calibrated horn antenna.

### 3.4.6 Radiated Emissions (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

### 3.4.7 Test Result of Radiated Emissions

Refer as Appendix D

# 4 Test Equipment and Calibration Data

### Instrument for AC Conduction

| Instrument | Manufacturer /Brand | Model No. | Serial No. | Spec. | Calibration Date | Calibration Due Date |
|---|---|---|---|---|---|---|
| EMI Test Receiver | R&S | ESR | 102052 | 9kHz ~ 3.6GHz | 19/Apr/2021 | 18/Apr/2022 |
| LISN | R&S | ENV216 | 101295 | 9kHz ~ 30MHz | 11/Nov/2020 | 10/Nov/2021 |
| RF Cable 5m | TITAN | TITAN | CO04-cable-01 | 0.1MHz~200MHz | 03/Mar/2021 | 02/Mar/2022 |
| Impuls Begrenzer Pulse Limiter | SCHWARZBECK | VTSD 9561-F | 9561-F041 | 9kHz ~ 30MHz | 21/Sep/2020 | 20/Sep/2021 |

### Instrument for Conducted Test

| Instrument | Manufacturer /Brand | Model No. | Serial No. | Spec. | Calibration Date | Calibration Due Date |
|---|---|---|---|---|---|---|
| Signal Analyzer | R&S | FSV 40 | 101013 | 10Hz~40GHz | 30/Mar/2021 | 29/Mar/2022 |
| SMB100A Signal Generator | R&S | SMB100A03 | 181147 | 100kHz~40GHz | 20/Oct/2020 | 19/Oct/2021 |

## Instrument for Radiated Test (03CH03-HY)

| Instrument | Manufacturer /Brand | Model No. | Serial No. | Spec. | Calibration Date | Calibration Due Date |
|---|---|---|---|---|---|---|
| 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH03-HY | 30MHz~1GHz 3m | 03/Aug/2021 | 02/Aug/2022 |
| 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH03-HY | 1GHz~18GHz 3m | 04/Aug/2020 | 03/Aug/2021 |
| 3m Semi Anechoic Chamber | SIDT FRANKONIA | SAC-3M | 03CH03-HY | 1GHz~18GHz 3m | 03/Aug/2021 | 02/Aug/2022 |
| Signal Analyzer | R&S | FSV 40 | 101013 | 10Hz~40GHz | 30/Mar/2021 | 29/Mar/2022 |
| Amplifier | HP | 8447D | 2944A08033 | 10kHz~1.3GHz | 13/Apr/2021 | 12/Apr/2022 |
| Microwave Preamplifier | EMC INSTRUMENT | EMC051845BE | 980241 | 1GHz~18GHz | 17/May/2021 | 16/May/2022 |
| Bilog Antenna & 5dB Attenuator | SCHAFFNER / MTJ | CBL 6112B / MTJ6102-05 | 2723 / 2 | 30MHz~1GHz | 06/Sep/2020 | 05/Sep/2021 |
| Double Ridged Guide Horn Antenna | SCHWARZBECK | BBHA 9120 D | BBHA 9120 D 1531 | 1GHz~18GHz | 24/Mar/2021 | 23/Mar/2022 |
| RF Cable-R03m | Jye Bao | RG142 | CB021 | 9kHz~30MHz | 16/Jun/2021 | 15/Jun/2022 |
| RF Cable-R03m | Jye Bao | RG142 | MY37335/4+CB021-1+CB021-2 | 30MHz~1GHz | 17/Mar/2021 | 16/Mar/2022 |
| RF CABLE 5+6m | HUBER+SUHNER | SUOFLEX 104 | SN MY38596/4+SN 804300/4 | 1GHz~40GHz | 04/Aug/2020 | 03/Aug/2021 |
| RF CABLE 5+6m | HUBER+SUHNER | SUOFLEX 104 | SN MY38596/4+SN 804300/4 | 1GHz~40GHz | 28/Jul/2021 | 27/Jul/2022 |
| Broadband Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA 9170221 | 15GHz~40GHz | 11/Mar/2021 | 10/Mar/2022 |
| EMI Test Receiver | R&S | ESR3 | 102052 | 9kHz~3.6GHz | 19/Apr/2021 | 18/Apr/2022 |
| Loop Antenna | TESEQ | HLA 6120 | 31244 | 9kHz~30MHz | 16/Mar/2021 | 15/Mar/2022 |

## Instrument for Radiated Test (03CH09-HY)

| Instrument | Manufacturer /Brand | Model No. | Serial No. | Spec. | Calibration Date | Calibration Due Date |
|---|---|---|---|---|---|---|
| 3m Semi Anechoic Chamber | TDK | SAC-3M | 03CH09-HY | 30MHz~1GHz 3m | 26/Mar/2021 | 25/Mar/2022 |
| 3m Semi Anechoic Chamber | TDK | SAC-3M | 03CH09-HY | 1GHz~18GHz 3m | 18/Mar/2021 | 17/Mar/2022 |
| EXA Signal Analyzer | KEYSIGHT | N9010A | MY54200885 | 10Hz~44GHz | 11/Aug/2020 | 10/Aug/2021 |
| Amplifier | EMC | EMC9135 | 980232 | 9kHz~1GHz | 12/Apr/2021 | 11/Apr/2022 |
| Microwave Preamplifier | EMC INSTRUMENT | EMC051845BE | 980241 | 1GHz~18GHz | 17/May/2021 | 16/May/2022 |
| Bilog Antenna & 5dB Attenuator | TESEQ & MTJ | CBL6111D&MTJ6 102-05 | 35418 & 3 | 30MHz~1GHz | 06/Sep/2020 | 05/Sep/2021 |
| Double Ridged Guide Horn Antenna | SCHWARZBECK | BBHA 9120 D | BBHA9120 D 1534 | 1GHz~18GHz | 18/May/2021 | 17/May/2022 |
| RF Cable-low | Jye Bao | RG142 | CB031+324530/4 | 9kHz~30MHz | 03/Sep/2020 | 02/Sep/2021 |
| RF Cable-low | Jye Bao | RG142 | CB031+324530/4 | 30MHz~1GHz | 09/Feb/2021 | 08/Feb/2022 |
| RF CABLE 5m+3m+1m | HUBER+SUHNER | SUCOFLEX104 | SN MY25918/4+ SN MY39478/4 + SN 324530/4 | 1GHz~40GHz | 15/Aug/2020 | 14/Aug/2021 |
| Broadband Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA 9170221 | 18GHz~40GHz | 11/Mar/2021 | 10/Mar/2022 |
| Microwave Premplifier | EMC INSTRUMENTS | EM18G40G | 060604 | 18GHz ~ 40GHz | 09/Mar/2021 | 08/Mar/2022 |
| Preamplifier | MITEQ | TTA1840-35-HG | 1864481 | 18GHz~40GHz | 18/Mar/2021 | 17/Mar/2022 |
| Loop Antenna | TESEQ | HLA 6120 | 31244 | 9kHz~30MHz | 16/Mar/2021 | 15/Mar/2022 |
| EMI Test Receiver | R&S | ESR3 | 102052 | 9kHz~3.6GHz | 19/Apr/2021 | 18/Apr/2022 |

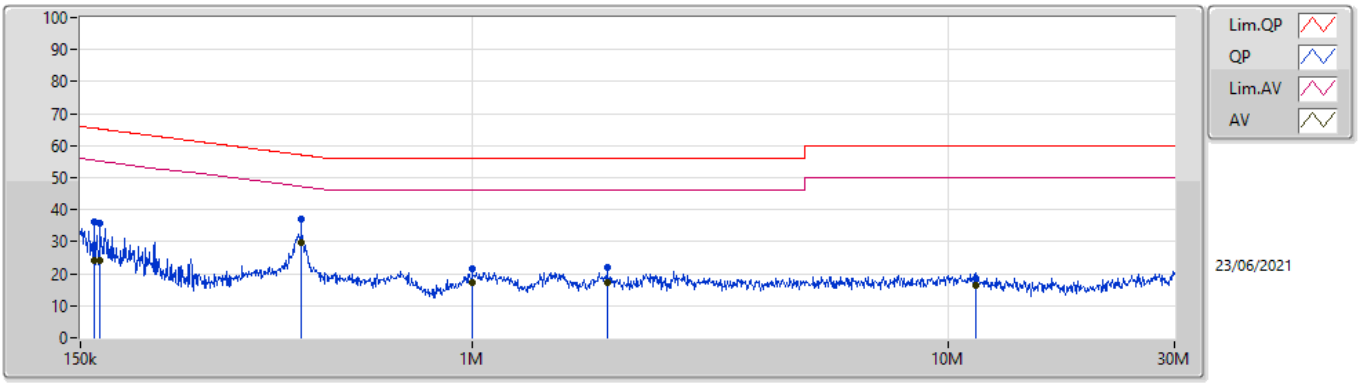
**Summary**

| Mode | Result | Type | Freq (Hz) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Condition |
|---|---|---|---|---|---|---|---|
| Mode 1 | Pass | AV | 435.504k | 29.91 | 47.15 | -17.24 | Line |

**Mode config**

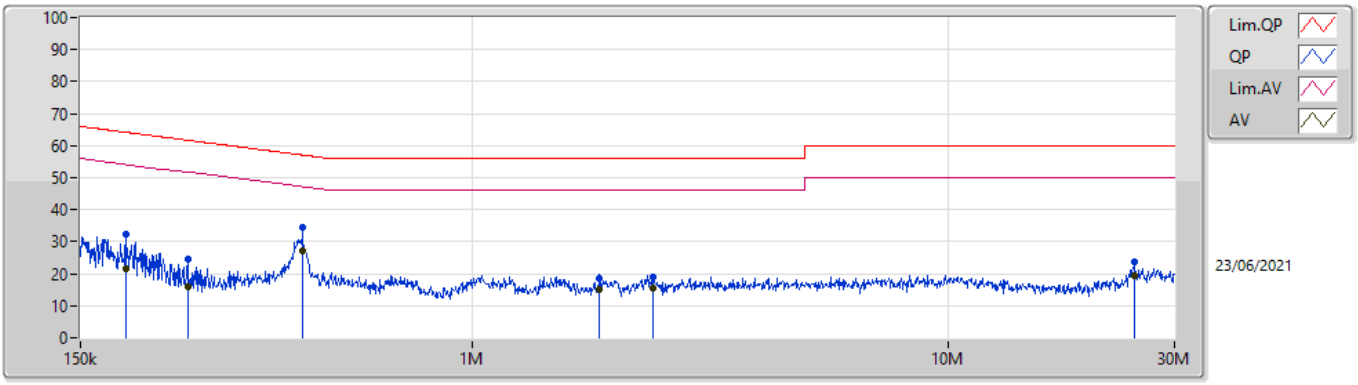
| Mode | Result | Type | Freq (Hz) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Condition | Comments |
|---|---|---|---|---|---|---|---|---|
| Mode 1 | Pass | QP | 159.893k | 36.24 | 65.46 | -29.22 | Line | - |
| Mode 1 | Pass | AV | 159.893k | 24.32 | 55.46 | -31.14 | Line | - |
| Mode 1 | Pass | QP | 165.082k | 35.80 | 65.20 | -29.40 | Line | - |
| Mode 1 | Pass | AV | 165.082k | 24.25 | 55.20 | -30.95 | Line | - |
| Mode 1 | Pass | QP | 435.504k | 36.97 | 57.15 | -20.18 | Line | - |
| Mode 1 | Pass | AV | 435.504k | 29.91 | 47.15 | -17.24 | Line | - |
| Mode 1 | Pass | QP | 1.003M | 21.58 | 56.00 | -34.42 | Line | - |
| Mode 1 | Pass | AV | 1.003M | 17.39 | 46.00 | -28.61 | Line | - |
| Mode 1 | Pass | QP | 1.923M | 22.02 | 56.00 | -33.98 | Line | - |
| Mode 1 | Pass | AV | 1.923M | 17.35 | 46.00 | -28.65 | Line | - |
| Mode 1 | Pass | QP | 11.453M | 18.45 | 60.00 | -41.55 | Line | - |
| Mode 1 | Pass | AV | 11.453M | 16.30 | 50.00 | -33.70 | Line | - |
| Mode 1 | Pass | QP | 186.83k | 32.25 | 64.18 | -31.93 | Neutral | - |
| Mode 1 | Pass | AV | 186.83k | 21.60 | 54.18 | -32.58 | Neutral | - |
| Mode 1 | Pass | QP | 252.043k | 24.40 | 61.70 | -37.30 | Neutral | - |
| Mode 1 | Pass | AV | 252.043k | 16.07 | 51.70 | -35.63 | Neutral | - |
| Mode 1 | Pass | QP | 440.751k | 34.50 | 57.05 | -22.55 | Neutral | - |
| Mode 1 | Pass | AV | 440.751k | 27.31 | 47.05 | -19.74 | Neutral | - |
| Mode 1 | Pass | QP | 1.855M | 18.56 | 56.00 | -37.44 | Neutral | - |
| Mode 1 | Pass | AV | 1.855M | 15.13 | 46.00 | -30.87 | Neutral | - |
| Mode 1 | Pass | QP | 2.395M | 19.11 | 56.00 | -36.89 | Neutral | - |
| Mode 1 | Pass | AV | 2.395M | 15.33 | 46.00 | -30.67 | Neutral | - |
| Mode 1 | Pass | QP | 24.746M | 23.53 | 60.00 | -36.47 | Neutral | - |
| Mode 1 | Pass | AV | 24.746M | 19.22 | 50.00 | -30.78 | Neutral | - |

## Conducted Emissions at Powerline_Mode 1




| Type | Freq | Level | Limit | Margin | Factor | Condition | Comment | Raw | LISN | CL | AT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV) | (dBuV) | (dB) | (dB) | | | (dBuV) | (dB) | (dB) | (dB) |
| QP | 159.893k | 36.24 | 65.46 | -29.22 | 19.63 | Line | - | 16.61 | 9.69 | 0.04 | 9.90 |
| AV | 159.893k | 24.32 | 55.46 | -31.14 | 19.63 | Line | - | 4.69 | 9.69 | 0.04 | 9.90 |
| QP | 165.082k | 35.80 | 65.20 | -29.40 | 19.63 | Line | - | 16.17 | 9.69 | 0.04 | 9.90 |
| AV | 165.082k | 24.25 | 55.20 | -30.95 | 19.63 | Line | - | 4.62 | 9.69 | 0.04 | 9.90 |
| QP | 435.504k | 36.97 | 57.15 | -20.18 | 19.62 | Line | - | 17.35 | 9.67 | 0.06 | 9.89 |
| AV | 435.504k | 29.91 | 47.15 | -17.24 | 19.62 | Line | - | 10.29 | 9.67 | 0.06 | 9.89 |
| QP | 1.003M | 21.58 | 56.00 | -34.42 | 19.55 | Line | - | 2.03 | 9.67 | 0.08 | 9.80 |
| AV | 1.003M | 17.39 | 46.00 | -28.61 | 19.55 | Line | - | -2.16 | 9.67 | 0.08 | 9.80 |
| QP | 1.923M | 22.02 | 56.00 | -33.98 | 19.58 | Line | - | 2.44 | 9.68 | 0.10 | 9.80 |
| AV | 1.923M | 17.35 | 46.00 | -28.65 | 19.58 | Line | - | -2.23 | 9.68 | 0.10 | 9.80 |
| QP | 11.453M | 18.45 | 60.00 | -41.55 | 19.83 | Line | - | -1.38 | 9.71 | 0.22 | 9.90 |
| AV | 11.453M | 16.30 | 50.00 | -33.70 | 19.83 | Line | - | -3.53 | 9.71 | 0.22 | 9.90 |

## Conducted Emissions at Powerline_Mode 1




| Type | Freq | Level | Limit | Margin | Factor | Condition | Comment | Raw | LISN | CL | AT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV) | (dBuV) | (dB) | (dB) | | | (dBuV) | (dB) | (dB) | (dB) |
| QP | 186.83k | 32.25 | 64.18 | -31.93 | 19.62 | Neutral | - | 12.63 | 9.68 | 0.04 | 9.90 |
| AV | 186.83k | 21.60 | 54.18 | -32.58 | 19.62 | Neutral | - | 1.98 | 9.68 | 0.04 | 9.90 |
| QP | 252.043k | 24.40 | 61.70 | -37.30 | 19.63 | Neutral | - | 4.77 | 9.68 | 0.05 | 9.90 |
| AV | 252.043k | 16.07 | 51.70 | -35.63 | 19.63 | Neutral | - | -3.56 | 9.68 | 0.05 | 9.90 |
| QP | 440.751k | 34.50 | 57.05 | -22.55 | 19.62 | Neutral | - | 14.88 | 9.67 | 0.06 | 9.89 |
| AV | 440.751k | 27.31 | 47.05 | -19.74 | 19.62 | Neutral | - | 7.69 | 9.67 | 0.06 | 9.89 |
| QP | 1.855M | 18.56 | 56.00 | -37.44 | 19.58 | Neutral | - | -1.02 | 9.68 | 0.10 | 9.80 |
| AV | 1.855M | 15.13 | 46.00 | -30.87 | 19.58 | Neutral | - | -4.45 | 9.68 | 0.10 | 9.80 |
| QP | 2.395M | 19.11 | 56.00 | -36.89 | 19.62 | Neutral | - | -0.51 | 9.68 | 0.11 | 9.83 |
| AV | 2.395M | 15.33 | 46.00 | -30.67 | 19.62 | Neutral | - | -4.29 | 9.68 | 0.11 | 9.83 |
| QP | 24.746M | 23.53 | 60.00 | -36.47 | 19.94 | Neutral | - | 3.59 | 9.72 | 0.32 | 9.90 |
| AV | 24.746M | 19.22 | 50.00 | -30.78 | 19.94 | Neutral | - | -0.72 | 9.72 | 0.32 | 9.90 |

## Summary

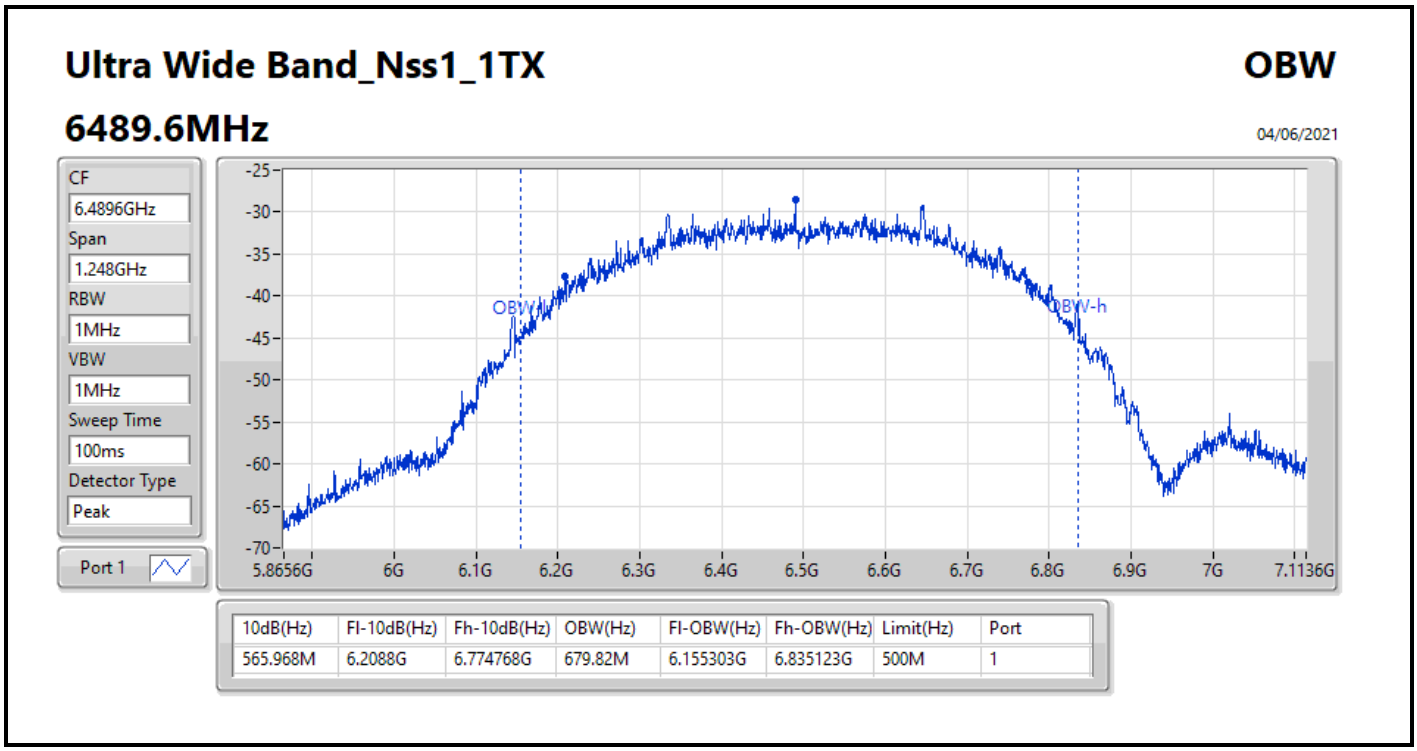
| Mode | Max-N dB (Hz) | Max-OBW (Hz) | ITU-Code | Min-N dB (Hz) | Min-OBW (Hz) |
|---|---|---|---|---|---|
| 3.1-10.6GHz | - | - | - | - | - |
| Ultra Wide Band_Nss1_1TX | 565.968M | 684.81M | 685MD1D | 565.968M | 679.82M |

**Max-N dB** = Maximum 10dB down bandwidth
**Max-OBW** = Maximum99% occupied bandwidth;
**Min-N dB** = Minimum 10dB down bandwidth
**Min-OBW** = Minimum 99% occupied bandwidth;

## Result

| Mode | Result | Limit (Hz) | Port 1-N dB (Hz) | Port 1-OBW (Hz) |
|---|---|---|---|---|
| Ultra Wide Band_Nss1_1TX | - | - | - | - |
| 6489.6MHz | Pass | 500M | 565.968M | 679.82M |
| 7987.2MHz | Pass | 500M | 565.968M | 684.81M |

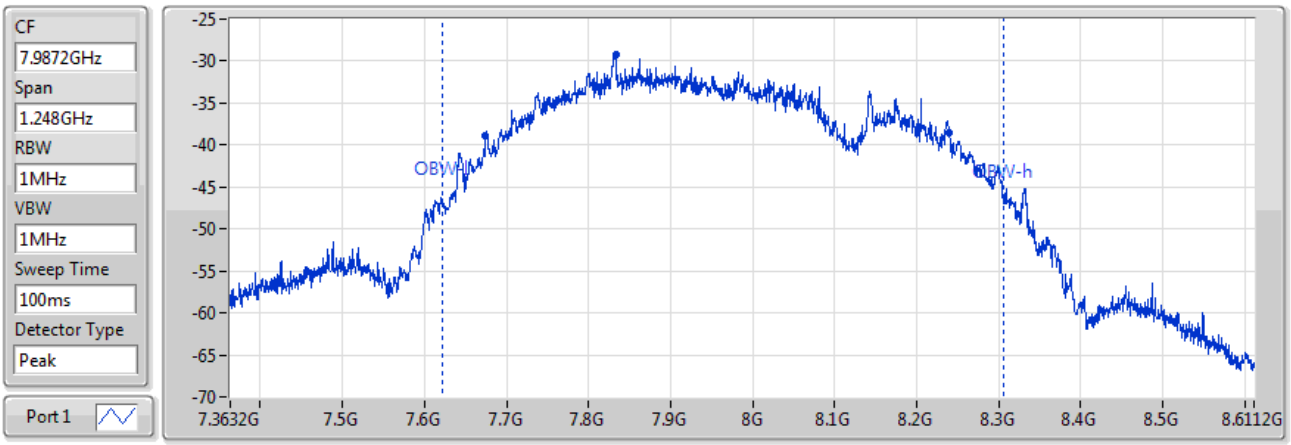
**Port X-N dB** = Port **X** 10dB down bandwidth
**Port X-OBW** = Port **X** 99% occupied bandwidth



## Ultra Wide Band_Nss1_1TX OBW

## 7987.2MHz

23/08/2021




| 10dB(Hz) | Fl-10dB(Hz) | Fh-10dB(Hz) | OBW(Hz) | Fl-OBW(Hz) | Fh-OBW(Hz) | Limit(Hz) | Port |
|---|---|---|---|---|---|---|---|
| 565.968M | 7.673952G | 8.23992G | 684.81M | 7.621719G | 8.306528G | 3G | 1 |

## Summary

| Mode | EIRP PD (dBm/50MHz) |
|---|---|
| 3.1-10.6GHz | - |
| Ultra Wide Band_Nss1_1TX | -0.29 |

## Result

| Mode | Result | Raw (dBuV/m) | Factor (dB) | EIRP PD (dBm/50MHz) | EIRP PD Limit (dBm/50MHz) |
|---|---|---|---|---|---|
| Ultra Wide Band_Nss1_1TX | - | - | - | - | - |
| 6489.6MHz | Pass | 102.14 | -102.43 | -0.29 | 0 |
| 7987.2MHz | Pass | 101.58 | -102.43 | -0.85 | 0 |

**EIRP PD**= Raw + Factor

## Summary

| Mode | Result | Type | Freq (Hz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Dist (m) | Condition | Azimuth (°) | Height (m) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.1-10.6GHz | - | - | - | - | - | - | - | - | - | - | - |
| Ultra Wide Band_Nss1_1TX | Pass | QP | 43.58M | 38.94 | 40.00 | -1.06 | 3 | Vertical | 12 | 1.00 | - |

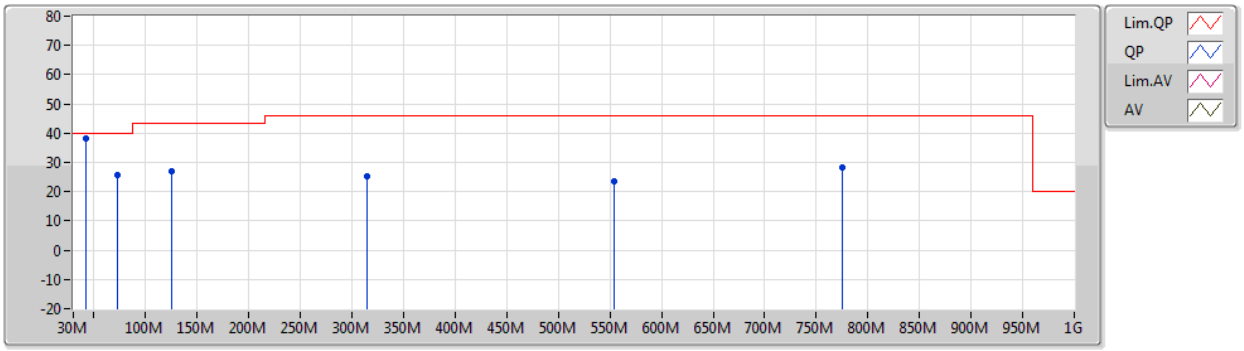
## Result

| Mode | Result | Type | Freq (Hz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Dist (m) | Condition | Azimuth (°) | Height (m) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ultra Wide Band_Nss1_1TX | - | - | - | - | - | - | - | - | - | - | - |
| 6489.6MHz_PoE | Pass | PK | 72.68M | 25.58 | 40.00 | -14.42 | 3 | Vertical | 360 | 1.00 | - |
| 6489.6MHz_PoE | Pass | PK | 125.06M | 27.10 | 43.50 | -16.40 | 3 | Vertical | 360 | 1.00 | - |
| 6489.6MHz_PoE | Pass | PK | 315.18M | 25.14 | 46.00 | -20.86 | 3 | Vertical | 360 | 1.00 | - |
| 6489.6MHz_PoE | Pass | PK | 553.8M | 23.67 | 46.00 | -22.33 | 3 | Vertical | 360 | 1.00 | - |
| 6489.6MHz_PoE | Pass | PK | 774.96M | 28.20 | 46.00 | -17.80 | 3 | Vertical | 360 | 1.00 | - |
| 6489.6MHz_PoE | Pass | QP | 41.64M | 38.31 | 40.00 | -1.69 | 3 | Vertical | 355 | 1.00 | - |
| 6489.6MHz_PoE | Pass | PK | 47.46M | 23.37 | 40.00 | -16.63 | 3 | Horizontal | 0 | 1.00 | - |
| 6489.6MHz_PoE | Pass | PK | 125.06M | 27.57 | 43.50 | -15.93 | 3 | Horizontal | 0 | 1.00 | - |
| 6489.6MHz_PoE | Pass | PK | 315.18M | 26.89 | 46.00 | -19.11 | 3 | Horizontal | 0 | 1.00 | - |
| 6489.6MHz_PoE | Pass | PK | 445.16M | 21.25 | 46.00 | -24.75 | 3 | Horizontal | 0 | 1.00 | - |
| 6489.6MHz_PoE | Pass | PK | 571.26M | 23.60 | 46.00 | -22.40 | 3 | Horizontal | 0 | 1.00 | - |
| 6489.6MHz_PoE | Pass | PK | 776.9M | 27.61 | 46.00 | -18.39 | 3 | Horizontal | 0 | 1.00 | - |
| 7987.2MHz_PoE | Pass | PK | 99.84M | 30.90 | 43.50 | -12.60 | 3 | Vertical | 360 | 1.00 | - |
| 7987.2MHz_PoE | Pass | PK | 165.8M | 30.03 | 43.50 | -13.47 | 3 | Vertical | 360 | 1.00 | - |
| 7987.2MHz_PoE | Pass | PK | 239.52M | 26.31 | 46.00 | -19.69 | 3 | Vertical | 360 | 1.00 | - |
| 7987.2MHz_PoE | Pass | PK | 398.6M | 28.15 | 46.00 | -17.85 | 3 | Vertical | 360 | 1.00 | - |
| 7987.2MHz_PoE | Pass | PK | 489.78M | 28.44 | 46.00 | -17.56 | 3 | Vertical | 360 | 1.00 | - |
| 7987.2MHz_PoE | Pass | QP | 43.58M | 38.94 | 40.00 | -1.06 | 3 | Vertical | 12 | 1.00 | - |
| 7987.2MHz_PoE | Pass | PK | 97.9M | 25.47 | 43.50 | -18.03 | 3 | Horizontal | 0 | 1.00 | - |
| 7987.2MHz_PoE | Pass | PK | 239.52M | 33.42 | 46.00 | -12.58 | 3 | Horizontal | 0 | 1.00 | - |
| 7987.2MHz_PoE | Pass | PK | 398.6M | 28.12 | 46.00 | -17.88 | 3 | Horizontal | 0 | 1.00 | - |
| 7987.2MHz_PoE | Pass | PK | 464.56M | 27.46 | 46.00 | -18.54 | 3 | Horizontal | 0 | 1.00 | - |
| 7987.2MHz_PoE | Pass | PK | 557.68M | 28.15 | 46.00 | -17.85 | 3 | Horizontal | 0 | 1.00 | - |
| 7987.2MHz_PoE | Pass | QP | 45.52M | 38.66 | 40.00 | -1.34 | 3 | Horizontal | 0 | 1.46 | - |

## Ultra Wide Band_Nss1_1TX

## 6489.6MHz_PoE

03/06/2021

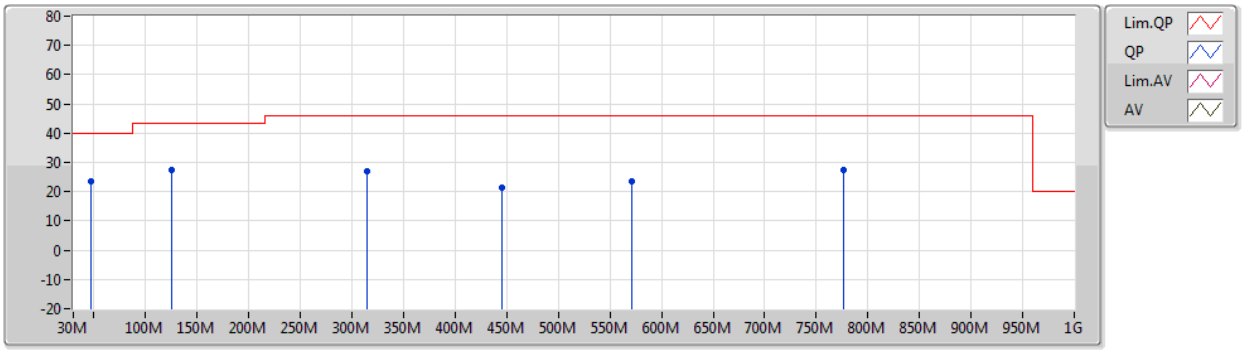



| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| PK | 72.68M | 25.58 | 40.00 | -14.42 | -24.58 | 3 | Vertical | 360 | 1.00 | - | 50.16 | 11.52 | 0.85 | 36.95 |
| PK | 125.06M | 27.10 | 43.50 | -16.40 | -18.63 | 3 | Vertical | 360 | 1.00 | - | 45.73 | 16.88 | 1.10 | 36.61 |
| PK | 315.18M | 25.14 | 46.00 | -20.86 | -16.22 | 3 | Vertical | 360 | 1.00 | - | 41.36 | 18.55 | 1.70 | 36.47 |
| PK | 553.8M | 23.67 | 46.00 | -22.33 | -9.77 | 3 | Vertical | 360 | 1.00 | - | 33.44 | 24.92 | 2.39 | 37.08 |
| PK | 774.96M | 28.20 | 46.00 | -17.80 | -7.42 | 3 | Vertical | 360 | 1.00 | - | 35.62 | 27.36 | 2.77 | 37.55 |
| QP | 41.64M | 38.31 | 40.00 | -1.69 | -18.63 | 3 | Vertical | 355 | 1.00 | - | 56.94 | 17.69 | 0.75 | 37.07 |

## Ultra Wide Band_Nss1_1TX

## 6489.6MHz_PoE

03/06/2021

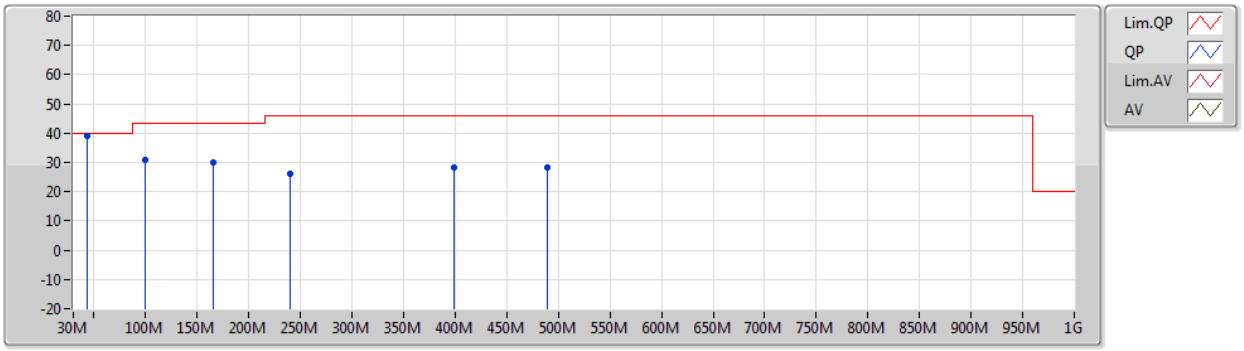



| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| PK | 47.46M | 23.37 | 40.00 | -16.63 | -21.91 | 3 | Horizontal | 0 | 1.00 | - | 45.28 | 14.37 | 0.80 | 37.08 |
| PK | 125.06M | 27.57 | 43.50 | -15.93 | -18.63 | 3 | Horizontal | 0 | 1.00 | - | 46.20 | 16.88 | 1.10 | 36.61 |
| PK | 315.18M | 26.89 | 46.00 | -19.11 | -16.22 | 3 | Horizontal | 0 | 1.00 | - | 43.11 | 18.55 | 1.70 | 36.47 |
| PK | 445.16M | 21.25 | 46.00 | -24.75 | -12.20 | 3 | Horizontal | 0 | 1.00 | - | 33.45 | 22.34 | 2.08 | 36.62 |
| PK | 571.26M | 23.60 | 46.00 | -22.40 | -9.52 | 3 | Horizontal | 0 | 1.00 | - | 33.12 | 25.16 | 2.42 | 37.10 |
| PK | 776.9M | 27.61 | 46.00 | -18.39 | -7.41 | 3 | Horizontal | 0 | 1.00 | - | 35.02 | 27.36 | 2.77 | 37.54 |

## Ultra Wide Band_Nss1_1TX

## 7987.2MHz_PoE

25/08/2021

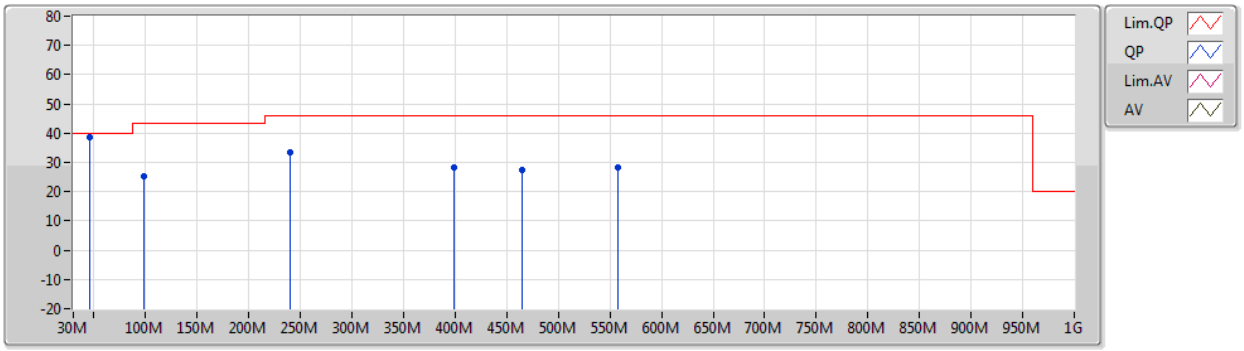



| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| PK | 99.84M | 30.90 | 43.50 | -12.60 | -9.60 | 3 | Vertical | 360 | 1.00 | - | 40.50 | 16.09 | 1.70 | 27.39 |
| PK | 165.8M | 30.03 | 43.50 | -13.47 | -10.10 | 3 | Vertical | 360 | 1.00 | - | 40.13 | 14.92 | 2.16 | 27.18 |
| PK | 239.52M | 26.31 | 46.00 | -19.69 | -7.76 | 3 | Vertical | 360 | 1.00 | - | 34.07 | 16.42 | 2.61 | 26.79 |
| PK | 398.6M | 28.15 | 46.00 | -17.85 | -2.83 | 3 | Vertical | 360 | 1.00 | - | 30.98 | 20.98 | 3.44 | 27.25 |
| PK | 489.78M | 28.44 | 46.00 | -17.56 | -1.09 | 3 | Vertical | 360 | 1.00 | - | 29.53 | 22.77 | 3.83 | 27.69 |
| QP | 43.58M | 38.94 | 40.00 | -1.06 | -10.74 | 3 | Vertical | 12 | 1.00 | - | 49.68 | 15.79 | 1.07 | 27.60 |

## Ultra Wide Band_Nss1_1TX

## 7987.2MHz_PoE

25/08/2021




| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| PK | 97.9M | 25.47 | 43.50 | -18.03 | -10.04 | 3 | Horizontal | 0 | 1.00 | - | 35.51 | 15.70 | 1.68 | 27.42 |
| PK | 239.52M | 33.42 | 46.00 | -12.58 | -7.76 | 3 | Horizontal | 0 | 1.00 | - | 41.18 | 16.42 | 2.61 | 26.79 |
| PK | 398.6M | 28.12 | 46.00 | -17.88 | -2.83 | 3 | Horizontal | 0 | 1.00 | - | 30.95 | 20.98 | 3.44 | 27.25 |
| PK | 464.56M | 27.46 | 46.00 | -18.54 | -1.51 | 3 | Horizontal | 0 | 1.00 | - | 28.97 | 22.47 | 3.74 | 27.72 |
| PK | 557.68M | 28.15 | 46.00 | -17.85 | 0.17 | 3 | Horizontal | 0 | 1.00 | - | 27.98 | 24.16 | 4.13 | 28.12 |
| QP | 45.52M | 38.66 | 40.00 | -1.34 | -11.52 | 3 | Horizontal | 0 | 1.46 | - | 50.18 | 14.98 | 1.09 | 27.59 |

## Summary

| Mode | Result | Type | Freq (Hz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Dist (m) | Condition | Azimuth (°) | Height (m) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 3.1-10.6GHz | - | - | - | - | - | - | - | - | - | - | - |
| Ultra Wide Band_Nss1_1TX | Pass | AV | 1.2G | 13.28 | - | - | 3 | Vertical | 344 | 2.54 | - |

## Result

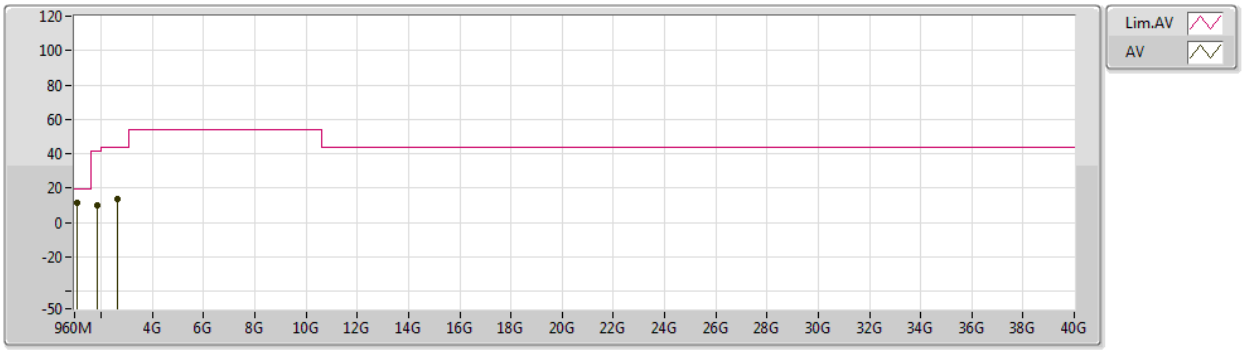
| Mode | Result | Type | Freq (Hz) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Dist (m) | Condition | Azimuth (°) | Height (m) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ultra Wide Band_Nss1_1TX | - | - | - | - | - | - | - | - | - | - | - |
| 6489.6MHz_TX | Pass | AV | 1.03568G | 11.63 | 19.90 | -8.27 | 3 | Vertical | 360 | 1.50 | - |
| 6489.6MHz_TX | Pass | AV | 1.86128G | 10.32 | 41.90 | -31.58 | 3 | Vertical | 360 | 1.50 | - |
| 6489.6MHz_TX | Pass | AV | 2.63872G | 14.09 | 43.90 | -29.81 | 3 | Vertical | 360 | 1.50 | - |
| 6489.6MHz_TX | Pass | AV | 1.04944G | 11.35 | 19.90 | -8.55 | 3 | Horizontal | 0 | 1.50 | - |
| 6489.6MHz_TX | Pass | AV | 1.97136G | 11.28 | 41.90 | -30.62 | 3 | Horizontal | 0 | 1.50 | - |
| 6489.6MHz_TX | Pass | AV | 2.99648G | 15.32 | 43.90 | -28.58 | 3 | Horizontal | 0 | 1.50 | - |
| 6489.6MHz_TX | Pass | AV | 1.17479G | -7.47 | 9.90 | -17.37 | 3 | Vertical | 143 | 1.40 | - |
| 6489.6MHz_TX* | Pass | AV | 1.2G | 13.28 | NaN | NaN | 3 | Vertical | 344 | 2.54 | - |
| 6489.6MHz_TX | Pass | AV | 1.22784G | -5.32 | 9.90 | -15.22 | 3 | Vertical | 262 | 2.27 | - |
| 6489.6MHz_TX | Pass | AV | 1.18832G | -8.32 | 9.90 | -18.22 | 3 | Horizontal | 171 | 2.16 | - |
| 6489.6MHz_TX* | Pass | AV | 1.2G | 15.93 | NaN | NaN | 3 | Horizontal | 153 | 1.68 | - |
| 6489.6MHz_TX | Pass | AV | 1.23498G | -8.10 | 9.90 | -18.00 | 3 | Horizontal | 135 | 2.17 | - |
| 6489.6MHz_TX | Pass | AV | 1.56859G | -6.65 | 9.90 | -16.55 | 3 | Vertical | 190 | 1.10 | - |
| 6489.6MHz_TX | Pass | AV | 1.58736G | -8.13 | 9.90 | -18.03 | 3 | Vertical | 62 | 2.13 | - |
| 6489.6MHz_TX | Pass | AV | 1.6G | 6.19 | 9.90 | -3.71 | 3 | Vertical | 21 | 1.77 | - |
| 6489.6MHz_TX | Pass | AV | 1.56859G | -7.99 | 9.90 | -17.89 | 3 | Horizontal | 54 | 1.98 | - |
| 6489.6MHz_TX | Pass | AV | 1.58736G | -8.71 | 9.90 | -18.61 | 3 | Horizontal | 221 | 1.37 | - |
| 6489.6MHz_TX | Pass | AV | 1.6G | 7.55 | 9.90 | -2.35 | 3 | Horizontal | 196 | 1.64 | - |
| 7987.2MHz_TX | Pass | AV | 1.153G | 13.69 | 19.90 | -6.21 | 3 | Vertical | 325 | 1.54 | - |
| 7987.2MHz_TX | Pass | AV | 2.251G | 16.24 | 43.90 | -27.66 | 3 | Vertical | 125 | 1.45 | - |
| 7987.2MHz_TX | Pass | AV | 2.998G | 21.00 | 43.90 | -22.90 | 3 | Vertical | 142 | 1.33 | - |
| 7987.2MHz_TX | Pass | AV | 1.153G | 12.99 | 19.90 | -6.91 | 3 | Horizontal | 241 | 1.24 | - |
| 7987.2MHz_TX | Pass | AV | 2.233G | 16.24 | 43.90 | -27.66 | 3 | Horizontal | 222 | 1.33 | - |
| 7987.2MHz_TX | Pass | AV | 2.998G | 19.04 | 43.90 | -24.86 | 3 | Horizontal | 120 | 1.45 | - |
| 7987.2MHz_TX | Pass | AV | 1.1725G | -8.59 | 9.90 | -18.49 | 3 | Vertical | 228 | 1.49 | - |
| 7987.2MHz_TX | Pass | AV | 1.19649G | -10.70 | 9.90 | -20.60 | 3 | Vertical | 333 | 1.48 | - |
| 7987.2MHz_TX* | Pass | AV | 1.2G | 13.32 | NaN | NaN | 3 | Vertical | 12 | 1.58 | - |
| 7987.2MHz_TX | Pass | AV | 1.23367G | -11.59 | 9.90 | -21.49 | 3 | Vertical | 319 | 1.49 | - |
| 7987.2MHz_TX | Pass | AV | 1.17929G | -10.51 | 9.90 | -20.41 | 3 | Horizontal | 197 | 1.49 | - |
| 7987.2MHz_TX | Pass | AV | 1.19108G | -11.02 | 9.90 | -20.92 | 3 | Horizontal | 151 | 1.49 | - |
| 7987.2MHz_TX* | Pass | AV | 1.2G | 17.24 | NaN | NaN | 3 | Horizontal | 152 | 1.48 | - |
| 7987.2MHz_TX | Pass | AV | 1.20678G | -11.29 | 9.90 | -21.19 | 3 | Horizontal | 141 | 1.48 | - |
| 7987.2MHz_TX | Pass | AV | 1.57021G | -9.22 | 9.90 | -19.12 | 3 | Vertical | 51 | 1.49 | - |
| 7987.2MHz_TX | Pass | AV | 1.5775G | -9.02 | 9.90 | -18.92 | 3 | Vertical | 163 | 1.11 | - |
| 7987.2MHz_TX | Pass | AV | 1.6G | 8.40 | 9.90 | -1.50 | 3 | Vertical | 28 | 2.04 | - |
| 7987.2MHz_TX | Pass | AV | 1.56071G | -13.41 | 9.90 | -23.31 | 3 | Horizontal | 205 | 1.48 | - |
| 7987.2MHz_TX | Pass | AV | 1.5744G | -13.51 | 9.90 | -23.41 | 3 | Horizontal | 205 | 1.49 | - |
| 7987.2MHz_TX | Pass | AV | 1.6G | 8.30 | 9.90 | -1.60 | 3 | Horizontal | 209 | 1.49 | - |

*The frequencies mentioned in Comments and Explanations are not limited to this Limit.

## Ultra Wide Band_Nss1_1TX

## 6489.6MHz_TX

03/06/2021

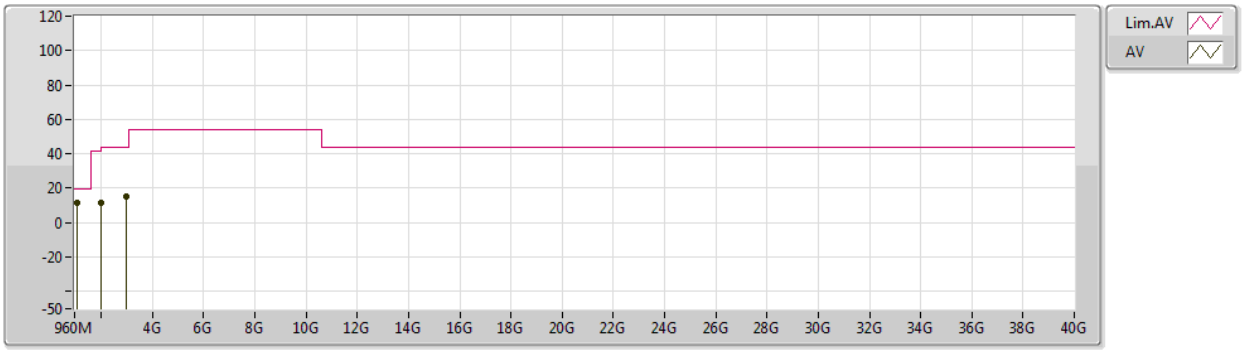



| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| AV | 1.03568G | 11.63 | 19.90 | -8.27 | -34.45 | 3 | Vertical | 360 | 1.50 | - | 46.08 | 24.47 | 2.44 | 51.82 |
| AV | 1.86128G | 10.32 | 41.90 | -31.58 | -32.86 | 3 | Vertical | 360 | 1.50 | - | 43.18 | 25.45 | 3.26 | 52.03 |
| AV | 2.63872G | 14.09 | 43.90 | -29.81 | -29.32 | 3 | Vertical | 360 | 1.50 | - | 43.41 | 27.73 | 4.26 | 51.77 |

## Ultra Wide Band_Nss1_1TX

## 6489.6MHz_TX

03/06/2021

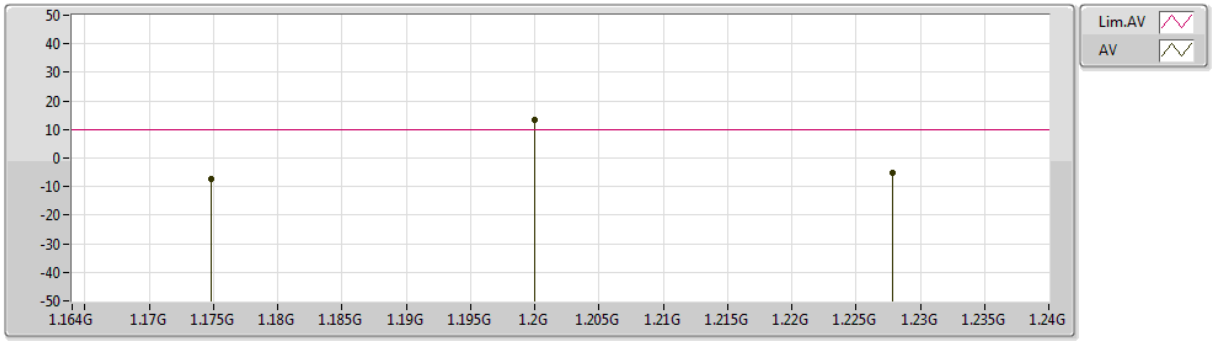



| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| AV | 1.04944G | 11.35 | 19.90 | -8.55 | -34.41 | 3 | Horizontal | 0 | 1.50 | - | 45.76 | 24.50 | 2.45 | 51.82 |
| AV | 1.97136G | 11.28 | 41.90 | -30.62 | -32.35 | 3 | Horizontal | 0 | 1.50 | - | 43.63 | 25.89 | 3.37 | 52.07 |
| AV | 2.99648G | 15.32 | 43.90 | -28.58 | -28.21 | 3 | Horizontal | 0 | 1.50 | - | 43.53 | 28.30 | 4.70 | 51.67 |

## Ultra Wide Band_Nss1_1TX

## 6489.6MHz_TX

03/06/2021



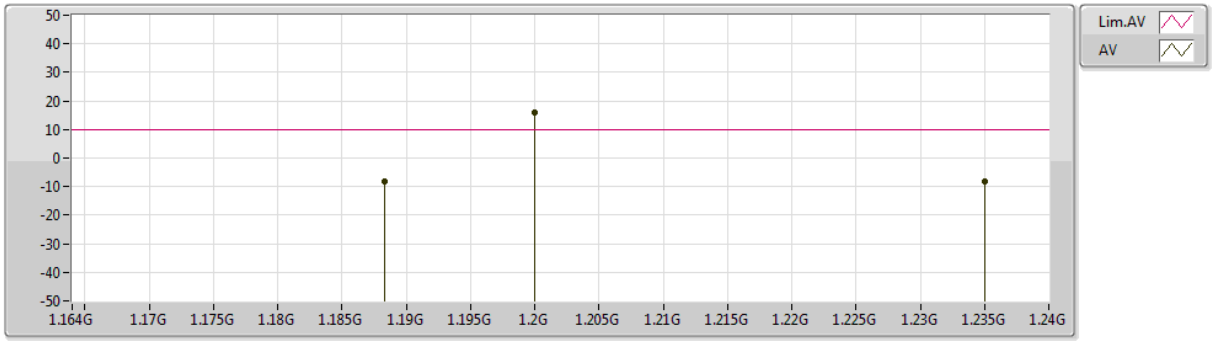

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| AV | 1.17479G | -7.47 | 9.90 | -17.37 | -33.31 | 3 | Vertical | 143 | 1.40 | - | 25.84 | 25.50 | 2.57 | 51.84 |
| AV | 1.2G | 13.28 | - | - | -33.29 | 3 | Vertical | 344 | 2.54 | - | 46.57 | 25.50 | 2.60 | 51.85 |
| AV | 1.22784G | -5.32 | 9.90 | -15.22 | -33.21 | 3 | Vertical | 262 | 2.27 | - | 27.89 | 25.56 | 2.63 | 51.86 |

Note: The frequencies mentioned in Comments and Explanations are not limited to this Limit.

## Ultra Wide Band_Nss1_1TX

## 6489.6MHz_TX

03/06/2021



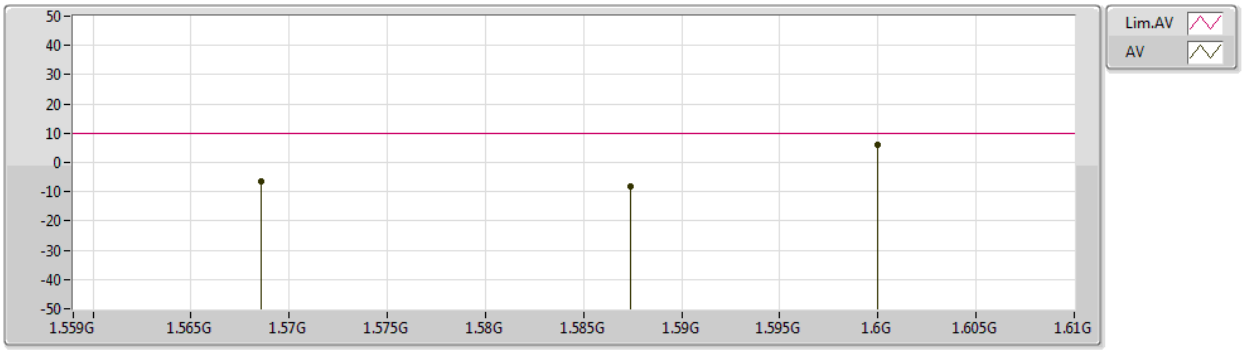

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| AV | 1.18832G | -8.32 | 9.90 | -18.22 | -33.30 | 3 | Horizontal | 171 | 2.16 | - | 24.98 | 25.50 | 2.59 | 51.85 |
| AV | 1.2G | 15.93 | - | - | -33.29 | 3 | Horizontal | 153 | 1.68 | - | 49.22 | 25.50 | 2.60 | 51.85 |
| AV | 1.23498G | -8.10 | 9.90 | -18.00 | -33.20 | 3 | Horizontal | 135 | 2.17 | - | 25.10 | 25.57 | 2.63 | 51.86 |

Note: The frequencies mentioned in Comments and Explanations are not limited to this Limit.

## Ultra Wide Band_Nss1_1TX

## 6489.6MHz_TX

03/06/2021

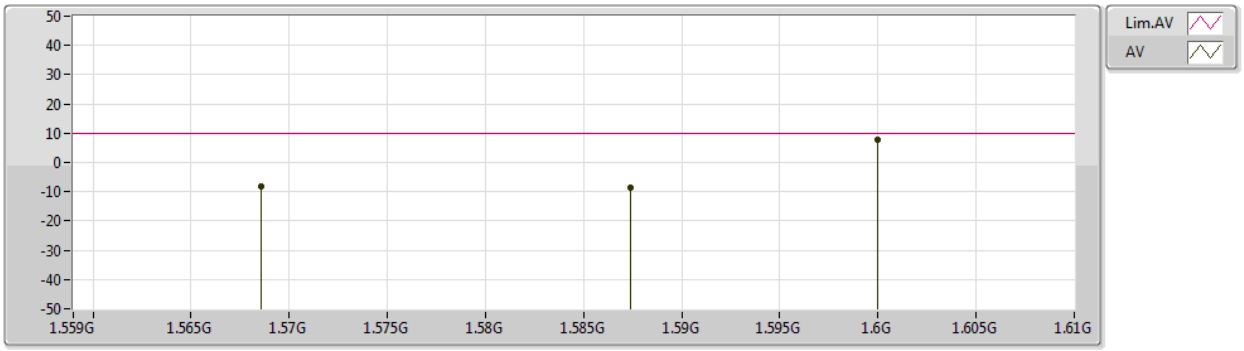



| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| AV | 1.56859G | -6.65 | 9.90 | -16.55 | -33.37 | 3 | Vertical | 190 | 1.10 | - | 26.72 | 25.13 | 2.97 | 51.93 |
| AV | 1.58736G | -8.13 | 9.90 | -18.03 | -33.44 | 3 | Vertical | 62 | 2.13 | - | 25.31 | 25.05 | 2.99 | 51.94 |
| AV | 1.6G | 6.19 | 9.90 | -3.71 | -33.48 | 3 | Vertical | 21 | 1.77 | - | 39.67 | 25.00 | 3.00 | 51.94 |

## Ultra Wide Band_Nss1_1TX

## 6489.6MHz_TX

03/06/2021

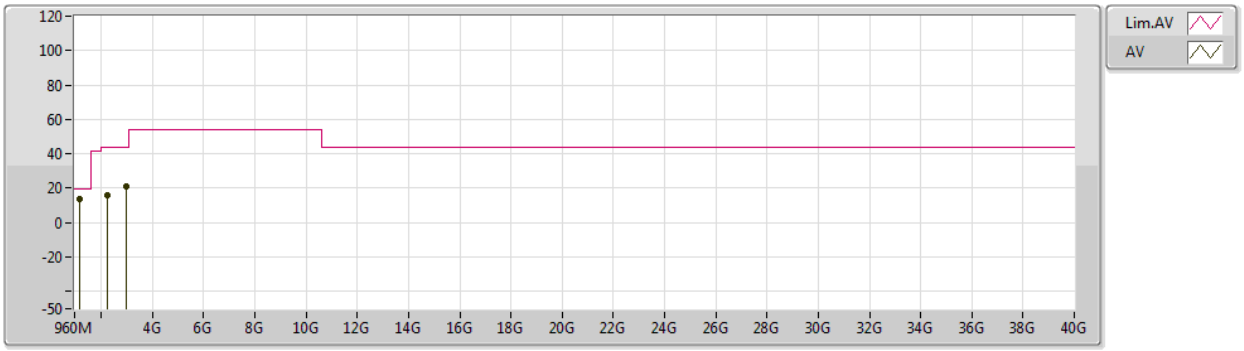



| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| AV | 1.56859G | -7.99 | 9.90 | -17.89 | -33.37 | 3 | Horizontal | 54 | 1.98 | - | 25.38 | 25.13 | 2.97 | 51.93 |
| AV | 1.58736G | -8.71 | 9.90 | -18.61 | -33.44 | 3 | Horizontal | 221 | 1.37 | - | 24.73 | 25.05 | 2.99 | 51.94 |
| AV | 1.6G | 7.55 | 9.90 | -2.35 | -33.48 | 3 | Horizontal | 196 | 1.64 | - | 41.03 | 25.00 | 3.00 | 51.94 |

## Ultra Wide Band_Nss1_1TX

## 7987.2MHz_TX

25/08/2021

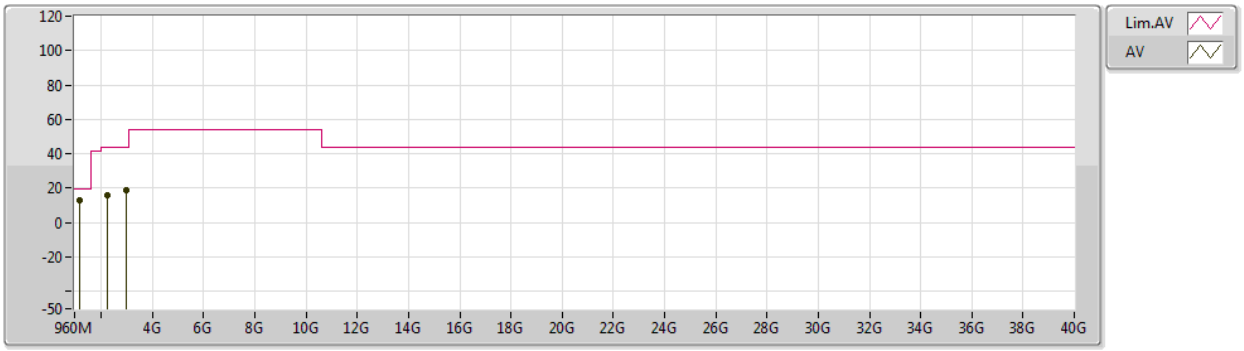



| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| AV | 1.153G | 13.69 | 19.90 | -6.21 | -32.88 | 3 | Vertical | 325 | 1.54 | - | 46.57 | 25.51 | 2.99 | 51.84 |
| AV | 2.251G | 16.24 | 43.90 | -27.66 | -29.07 | 3 | Vertical | 125 | 1.45 | - | 45.31 | 28.19 | 4.22 | 51.94 |
| AV | 2.998G | 21.00 | 43.90 | -22.90 | -27.76 | 3 | Vertical | 142 | 1.33 | - | 48.76 | 28.50 | 4.95 | 51.67 |

## Ultra Wide Band_Nss1_1TX

## 7987.2MHz_TX

25/08/2021

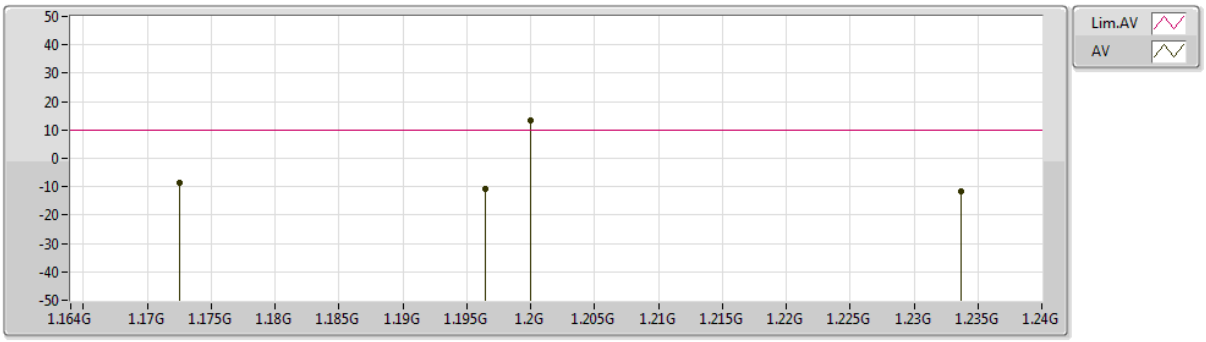



| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| AV | 1.153G | 12.99 | 19.90 | -6.91 | -32.88 | 3 | Horizontal | 241 | 1.24 | - | 45.87 | 25.51 | 2.99 | 51.84 |
| AV | 2.233G | 16.24 | 43.90 | -27.66 | -29.12 | 3 | Horizontal | 222 | 1.33 | - | 45.36 | 28.17 | 4.20 | 51.95 |
| AV | 2.998G | 19.04 | 43.90 | -24.86 | -27.76 | 3 | Horizontal | 120 | 1.45 | - | 46.80 | 28.50 | 4.95 | 51.67 |

## Ultra Wide Band_Nss1_1TX

## 7987.2MHz_TX

25/08/2021



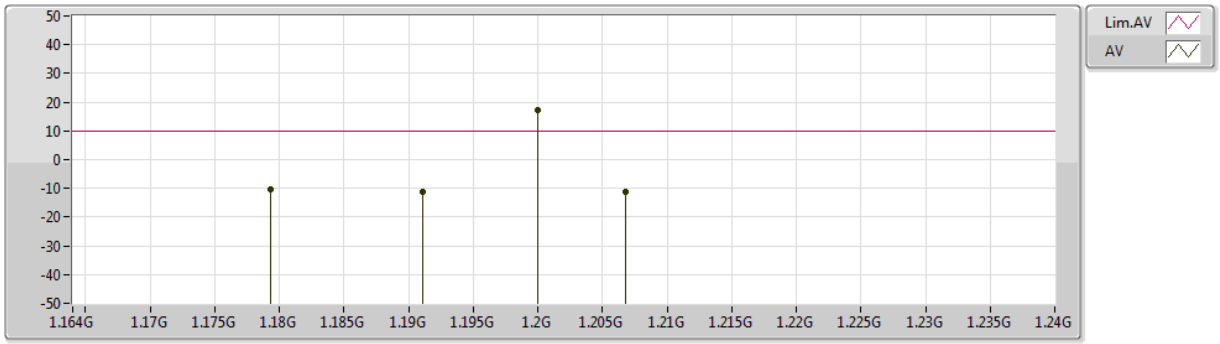

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| AV | 1.1725G | -8.59 | 9.90 | -18.49 | -32.78 | 3 | Vertical | 228 | 1.49 | - | 24.19 | 25.59 | 3.01 | 51.84 |
| AV | 1.19649G | -10.70 | 9.90 | -20.60 | -32.65 | 3 | Vertical | 333 | 1.48 | - | 21.95 | 25.69 | 3.05 | 51.85 |
| AV | 1.2G | 13.32 | - | - | -32.64 | 3 | Vertical | 12 | 1.58 | - | 45.96 | 25.70 | 3.05 | 51.85 |
| AV | 1.23367G | -11.59 | 9.90 | -21.49 | -32.60 | 3 | Vertical | 319 | 1.49 | - | 21.01 | 25.70 | 3.10 | 51.86 |

Note: The frequencies mentioned in Comments and Explanations are not limited to this Limit.

## Ultra Wide Band_Nss1_1TX

## 7987.2MHz_TX

25/08/2021



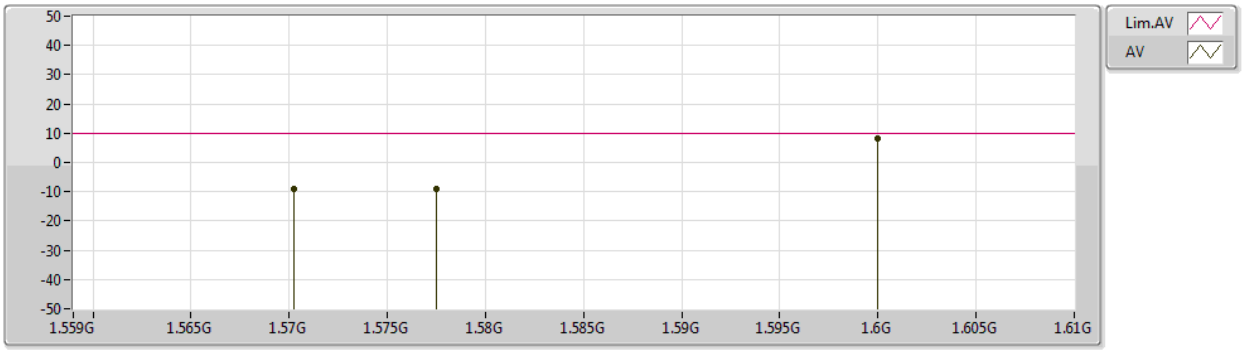

| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| AV | 1.17929G | -10.51 | 9.90 | -20.41 | -32.75 | 3 | Horizontal | 197 | 1.49 | - | 22.24 | 25.62 | 3.02 | 51.85 |
| AV | 1.19108G | -11.02 | 9.90 | -20.92 | -32.69 | 3 | Horizontal | 151 | 1.49 | - | 21.67 | 25.66 | 3.04 | 51.85 |
| AV | 1.2G | 17.24 | - | - | -32.64 | 3 | Horizontal | 152 | 1.48 | - | 49.88 | 25.70 | 3.05 | 51.85 |
| AV | 1.20678G | -11.29 | 9.90 | -21.19 | -32.63 | 3 | Horizontal | 141 | 1.48 | - | 21.34 | 25.70 | 3.06 | 51.85 |

Note: The frequencies mentioned in Comments and Explanations are not limited to this Limit.

## Ultra Wide Band_Nss1_1TX

## 7987.2MHz_TX

25/08/2021

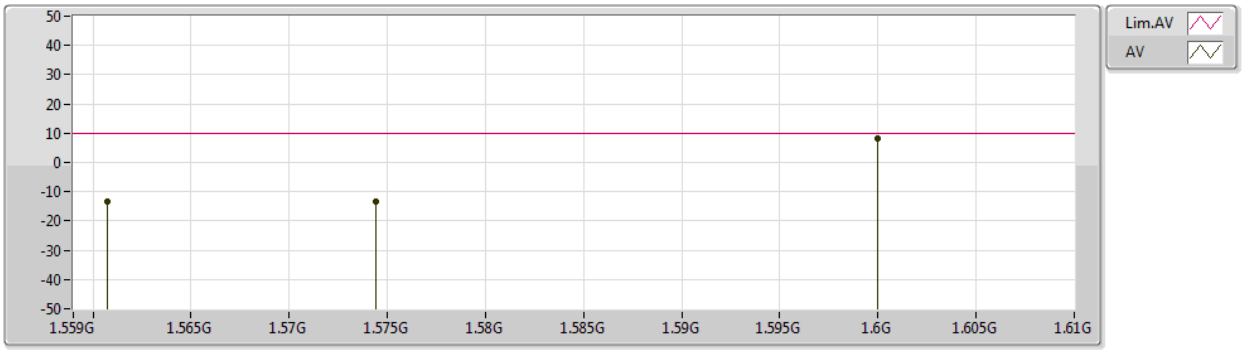



| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| AV | 1.57021G | -9.22 | 9.90 | -19.12 | -32.80 | 3 | Vertical | 51 | 1.49 | - | 23.58 | 25.18 | 3.49 | 51.93 |
| AV | 1.5775G | -9.02 | 9.90 | -18.92 | -32.85 | 3 | Vertical | 163 | 1.11 | - | 23.83 | 25.13 | 3.50 | 51.94 |
| AV | 1.6G | 8.40 | 9.90 | -1.50 | -32.96 | 3 | Vertical | 28 | 2.04 | - | 41.36 | 25.00 | 3.52 | 51.94 |

## Ultra Wide Band_Nss1_1TX

## 7987.2MHz_TX

25/08/2021




| Type | Freq | Level | Limit | Margin | Factor | Dist | Condition | Azimuth | Height | Comment | Raw | AF | CL | PA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (Hz) | (dBuV/m) | (dBuV/m) | (dB) | (dB) | (m) | | (°) | (m) | | (dBuV) | (dB) | (dB) | (dB) |
| AV | 1.56071G | -13.41 | 9.90 | -23.31 | -32.75 | 3 | Horizontal | 205 | 1.48 | - | 19.34 | 25.24 | 3.48 | 51.93 |
| AV | 1.5744G | -13.51 | 9.90 | -23.41 | -32.83 | 3 | Horizontal | 205 | 1.49 | - | 19.32 | 25.15 | 3.50 | 51.94 |
| AV | 1.6G | 8.30 | 9.90 | -1.60 | -32.96 | 3 | Horizontal | 209 | 1.49 | - | 41.26 | 25.00 | 3.52 | 51.94 |