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| Test Report Serial Number: | **45461529 R2.0** |
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# EMC Test Report - New Filing

Applicant:

XETAWAVE | CUSTOM RF SOLUTIONS

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FCC ID: **PEJ-938240**

IC Registration Number: **11169A-04003**

Product Model Number / HVIN: **XETA4-TMFA**

Product Name / PMN: **XETA4-TMFA**

In Accordance With:

**FCC 47 CFR Part 90**
Private Land Mobile Radio Services

**RSS-GEN, RSS-119 Issue 12**
Land Mobile and Fixed Equipment Operating in the Frequency Range 27.41-960 MHz

Approved By:

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ilac-MRA ACCREDITED

**Test Lab Certificate: 2470.01**

Industry Canada

**IC Registration 3874A-1**

**FCC Registration: CA3874**

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## 1.0 DOCUMENT CONTROL

| Revision History | | | | | |
|---|---|---|---|---|---|
| **Samples Tested By:** | Art Voss | | **Date(s) of Evaluation:** | | 6 Aug - 15 Aug, 2019 |
| **Report Prepared By:** | Art Voss | | **Report Reviewed By:** | | Ben Hewson |
| **Report Revision** | **Description of Revision** | | **Revised Section** | **Revised By** | **Revision Date** |
| 0.1 | Draft Release | | n/a | Art Voss | 15 August 2019 |
| 0.2 | Revised Draft Release | | n/a | Art Voss | 8 October 2019 |
| 0.3 | Revised Draft Release | | n/a | Art Voss | 10 October 2019 |
| 0.4 | Revised Draft Release - Corrected Limit | | 10 | Art Voss | 21 October 2019 |
| 1.0 | Initial Release | | n/a | Art Voss | 25 October 2019 |
| 2.0 | Revised Cond. Power for 8W and 6W Operation | | 7.0 | Art Voss | 1 November 2019 |
| | Revised DUT Info to Include Antenna Gain | | 2.0 | | |

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## 2.0 CLIENT AND DUT INFORMATION

| Client Information | | |
|---|---|---|
| **Applicant Name** | **Xetawave LLC** | |
| **Applicant Address** | 258 South Taylor Ave | |
| | Louisville, Colorado, 80027 | |
| | USA | |
| **DUT Information** | | |
| **Device Identifier(s):** | **FCC ID:** | PEJ-938240 |
| | **IC:** | 11169A-04003 |
| **Device Type:** | Digital Transceiver Module | |
| **Type of Equipment/Equipment Class:** | FCC Part 90 - Licensed Non-Broadcast Station Transmitter (TNB) | |
| | RSS-119 - Land-Mobile Transmitter and Receiver (27.41–960 MHz) | |
| **Device Model(s) / HVIN:** | XETA4-TMFA | |
| **Device Marketing Name / PMN:** | XETA4-TMFA | |
| **Firmware Version ID Number / FVIN:** | n/a | |
| **Host Marketing Name / HMN:** | n/a | |
| **Test Sample Serial No.:** | T/A Sample - Identical Prototype | |
| **Transmit Frequency Range: (FCC Only)** | 450MHz - 470MHz | |
| **Transmit Frequency Range: (ISED Only)** | 406.1MHz - 430MHz, 450MHz - 470MHz | |
| **Number of Channels:** | n/a | |
| **Manuf. Max. Rated Output Power:** | 10W | |
| **Manuf. Max. Rated BW/Data Rate:** | See Section 8.0 | |
| **Antenna Make and Model:** | n/a | |
| **Antenna Type and Gain:** | 11.2dBi | |
| **Modulation:** | MSK, QPSK, 8PSK, 16QAM, 32QAM, 64QAM | |
| **Mode:** | n/a | |
| **Emission Designator:** | See Section 8.0 | |
| **DUT Power Source:** | 12 VDC External | |
| **Deviation(s) from standard/procedure:** | None | |
| **Modification of DUT:** | None | |

.

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## 3.0 SCOPE

This Certification Report was prepared on behalf of:

**XetaWave LLC**

,(the '*Applicant*"), in accordance with the applicable Federal Communications Commission (FCC) CFR 47 and Innovation, Scientific and Economic Development (ISED) Canada rules parts and regulations (the '*Rules*'). The scope of this investigation was limited to only the equipment, devices and accessories (the '*Equipment*') supplied by the *Applicant*. The tests and measurements performed on this *Equipment* were only those set forth in the applicable *Rules* and/or the Test and Measurement Standards they reference. The *Rules* applied and the Test and Measurement Standards used during this evaluation appear in the Normative References section of this report. The limits set forth in the technical requirements of the applicable *Rules* were applied to the measurement results obtained during this evaluation and ,unless otherwise noted, these limits were used as the Pass/Fail criteria. The Pass/Fail statements made in this report apply to only the tests and measurements performed on only the *Equipment* tested during this evaluation. Where applicable and permissible, information including test and measurement data and/or results from previous evaluations of same or similar equipment, devices and/or accessories may be cited in this report.

As per FCC 47 CFR Part §2.1091 and §2.1093, an RF Exposure evaluation report is required for this *Equipment* and the results of the RF Exposure evaluation appear in a separate exhibit from this report.

The Receiver of this *Equipment* is subject to Equipment Certification or Supplier's Declaration of Conformity (SDoC) in accordance with 47 CFR Part §15.101. The Receiver was evaluated in accordance with 47 CFR Part §15 Subpar B and ICES-003. A statement of the application of the SDoC procedure appears in a separate exhibit from this report.

Application: This is an application for a new FCC and ISED certification.

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## 4.0 TEST SUMMARY

| TEST SUMMARY | | | | | | |
|---|---|---|---|---|---|---|
| **Section** | **Description of Test** | **Procedure Reference** | **Applicable Rule Part(s) FCC** | **Applicable Rule Part(s) ISED** | **Test Date** | **Result** |
| **7.0** | Conducted Power (Fundamental) | ANSI C63.26 (5.2) | §2.1046<br>§90.279 | RSS-Gen (6.12)<br>RSS-119 (5.4) | 6 Aug 2019 | Complies |
| **8.0** | Occupied Bandwidth | ANSI C63.26 (5.4) | §2.1049<br>§90.210 | RSS-Gen (6.7)<br>RSS-119 (5.5) | 6 Aug 2019 | Complies |
| **9.0** | Emissions Mask and Band Edge | ANSI C63.26 (5.4) | §2.1049<br>§90.210 | RSS-Gen (6.13)<br>RSS-119 (5.8) | 8 Aug 2019 | Complies |
| **10.0** | Conducted TX Spurious Emissions | ANSI C63.26 (5.7) | §2.1051<br>§90.210 | RSS-Gen (6.13)<br>RSS-119 (5.8) | 9 Aug 2019 | Complies |
| **11.0** | Radiated TX Spurious Emissions | ANSI C63.26 (5.5) | §2.1053 | RSS-Gen (6.13) | 13 Aug 2019 | Complies |
| **12.0** | Transient Frequency Behavior | ANSI/TIA-603-E (2.2.19) | §90.214 | RSS-119 (5.9) | 9 Aug 2019 | Complies |
| **13.0** | Frequency Stability | ANSI C63.26 (5.6) | §2.1055<br>§90.213 | RSS-Gen (6.11)<br>RSS-119 (5.3) | 14 Aug 2019 | Complies |

| Test Station Day Log | | | | | |
|---|---|---|---|---|---|
| **Date** | **Ambient Temp (°C)** | **Relative Humidity (%)** | **Barometric Pressure (kPa)** | **Test Station** | **Tests Performed Section(s)** |
| 6 Aug 2019 | 27.2 | 19 | 101.5 | **EMC** | **7, 8** |
| 7 Aug 2019 | 28.3 | 16 | 101.2 | **EMC** | **9** |
| 8 Aug 2019 | 26.8 | 15 | 101.3 | **EMC** | **9** |
| 9 Aug 2019 | 28.1 | 16 | 101.0 | **EMC** | **10, 12** |
| 13 Aug 2019 | 26.5 | 21 | 102.1 | **SAC** | **11** |
| 13 Aug 2019 | 28.0 | 53 | 102.0 | **OATS** | **11** |
| 14 Aug 2019 | 26.5 | 21 | 102.0 | **TC** | **13** |

**EMC** - EMC Test Bench
**SAC** - Semi-Anechoic Chamber
**OATS** - Open Area Test Site
**TC** - Temperature Chamber
**LISN** - LISN Test Area
**ESD** - ESD Test Bench
**IMM** - Immunity Test Area
**RI** - Radiated Immunity Chamber

I attest that the data reported herein is true and accurate within the tolerance of the Measurement Instrument Uncertainty; that all tests and measurements were performed in accordance with accepted practices or procedures; and that all tests and measurements were performed by me or by trained personnel under my direct supervision. The results of this investigation are based solely on the test sample(s) provided by the client which were not adjusted, modified or altered in any manner whatsoever, except as required to carry out specific tests or measurements. This test report has been completed in accordance with ISO/IEC 17025.

Art Voss, P.Eng.
Technical Manager
Celltech Labs Inc.

6 July 2018
Date

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## 5.0 NORMATIVE REFERENCES

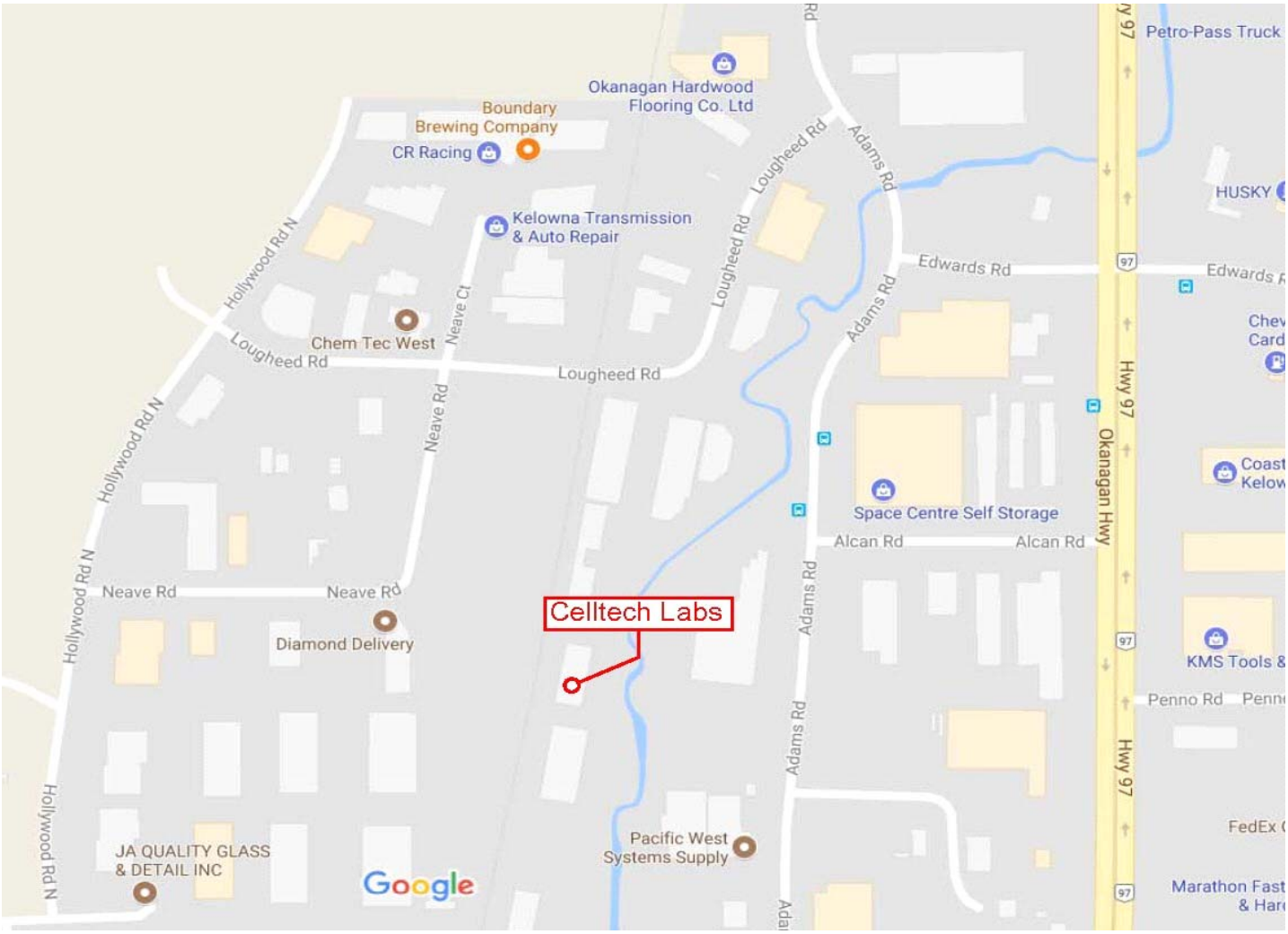
| Normative References | |
|---|---|
| ISO/IEC 17025:2017(E) | General Requirements for the Competence of Testing and Calibration Laboratories |
| ANSI C63.26-2015 | American National Standard of Procedures for Compliance Testing of Transmitters Used in Licensed Radio Services |
| ANSI/TIA-603-E-2016 | American National Standard<br>Land Mobile FM or PM Communications Equipment Measurement and Performance Standards |
| CFR<br>Title 47:<br>Part 2: | Code of Federal Regulations<br>Telecommunication<br>Frequency Allocations and Radio Treaty Matters; General Rules and Regulations |
| CFR<br>Title 47:<br>Part 90: | Code of Federal Regulations<br>Telecommunication<br>Private Land Mobile Radio Services |
| ISED<br>RSS-Gen Issue 5:<br>Amendment 1, March 2019 | Innovation, Science and Economic Development Canada<br>Spectrum Management and Telecommunications Radio Standards Specification<br>General Requirements and Information for the Certification of Radiocommunication Equipment |
| ISED<br>RSS-119 Issue 12:<br>May 2015 | Innovation, Science and Economic Development Canada<br>Spectrum Management and Telecommunications Radio Standards Specification<br>Land Mobile and Fixed Equipment Operating in the Frequency Range 27.41-960 MHz |
| ISED<br>RSP-100 Issue 12:<br>August 2019 | Innovation, Science and Economic Development Canada<br>Spectrum Management and Telecommunications Radio Standards Specification<br>Certification of Radio Apparatus and Broadcasting Equipment |
| ISED<br>SRSP-501 Issue 5:<br>Revised December 2017 | Innovation, Science and Economic Development Canada<br>Spectrum Management and Telecommunications Radio Standards Specification<br>Technical Requirements for Land Mobile and Fixed Radio Services<br>Operating in the Bands 406.1-430 MHz and 450-470 MHz |

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## 6.0 FACILITIES AND ACCREDITATIONS

### Facility and Accreditation:

The facilities used to evaluate this device outlined in this report are located at 21-364 Lougheed Road, Kelowna, British Columbia, Canada V1X 7R8. The radiated emissions site (OATS) conforms to the requirements set forth in ANSI C63.4 and is filed and listed with the FCC under Test Firm Registration Number CA3874 and Innovation, Science and Economic Development Canada under Test Site File Number ISED 3874A-1. Celltech is accredited to ISO 17025, through accrediting body A2LA and with certificate 2470.01.




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## 7.0 CONDUCTED POWER

| Test Procedure | |
|---|---|
| Normative Reference | FCC 47 CFR §2.1046, §90.279, RSS-Gen (6.12), RSS-119 (5.4)<br>ANSI C63.26 (5.2) |

| Limits | |
|---|---|
| 47 CFR §90.279 | 250W ERP at EAH: 0 - 150m |
| RSS-119 (5.4) | The output power shall be within ±1 dB of the manufacturer's rated power listed in the equipment specifications. |

| General Procedure | |
|---|---|
| ANSI C63.26 | **5.2 General**<br>Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. |

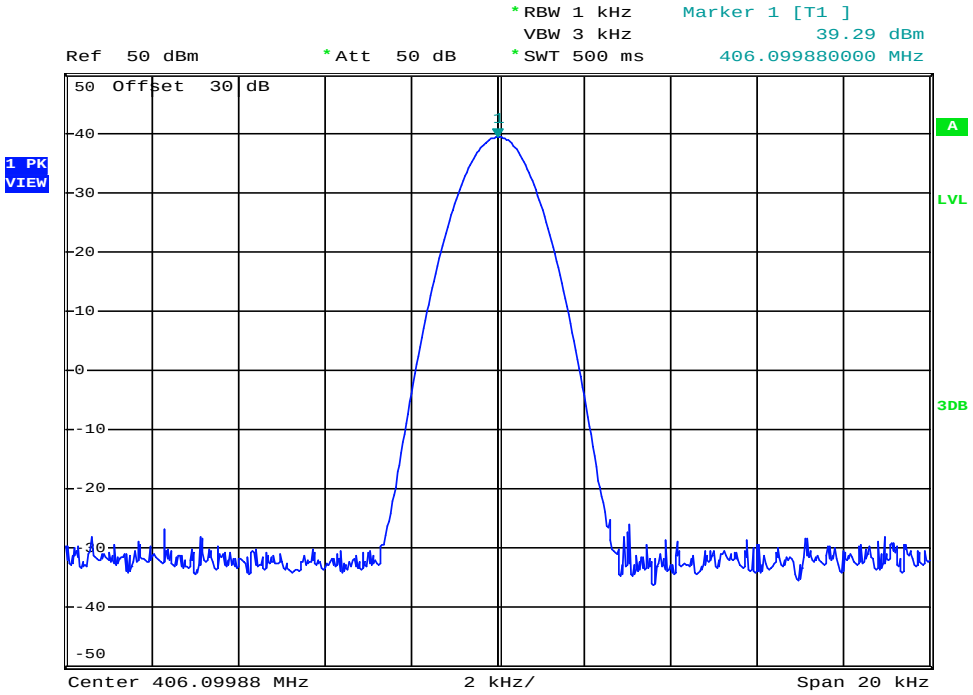
| Test Setup | Appendix A - Figure A.1 |
|---|---|

| Measurement Procedure |
|---|
| The DUT was connected to a Spectrum Analyzer (SA) via a 30dB attenuator connected to the DUT's antenna port. The SA was configured as above using the Channel Power measurement function. The output power of the DUT was set to the manufacturer's highest output power setting and set to CW mode. The DUT was set to transmit at its maximum Duty Cycle. |

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**Plot 7.1 – Conducted Power 406.1**

## Conducted Power (Peak)



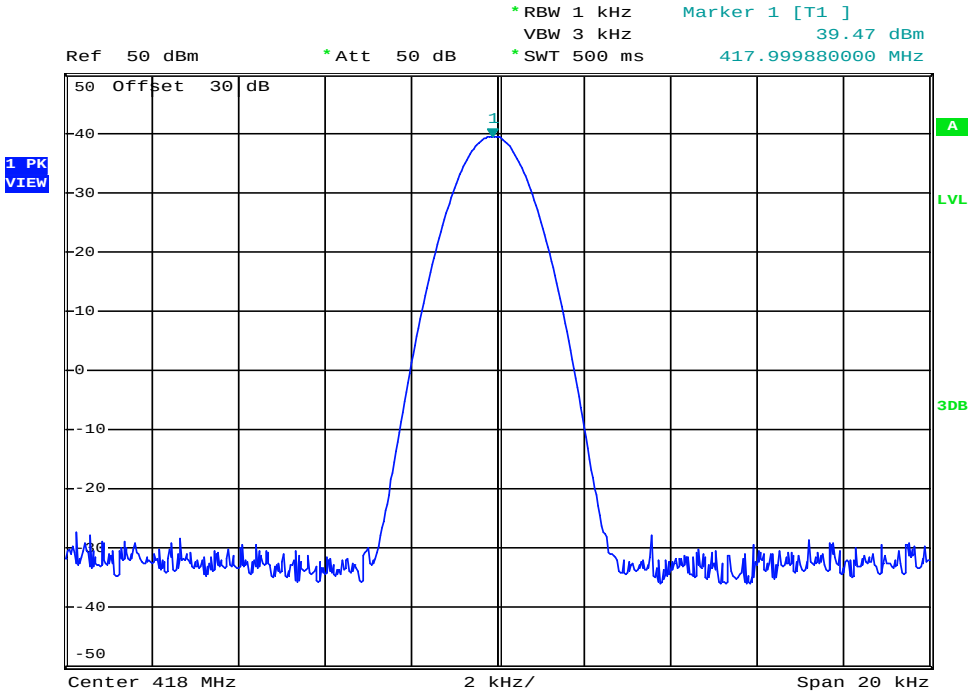

Date: 6.AUG.2019 17:22:10

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |
| | | **Measured Channel Power:** |
| | | **39.29** dBm |

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**Plot 7.2 – Conducted Power 418MHz**

## Conducted Power (Peak)



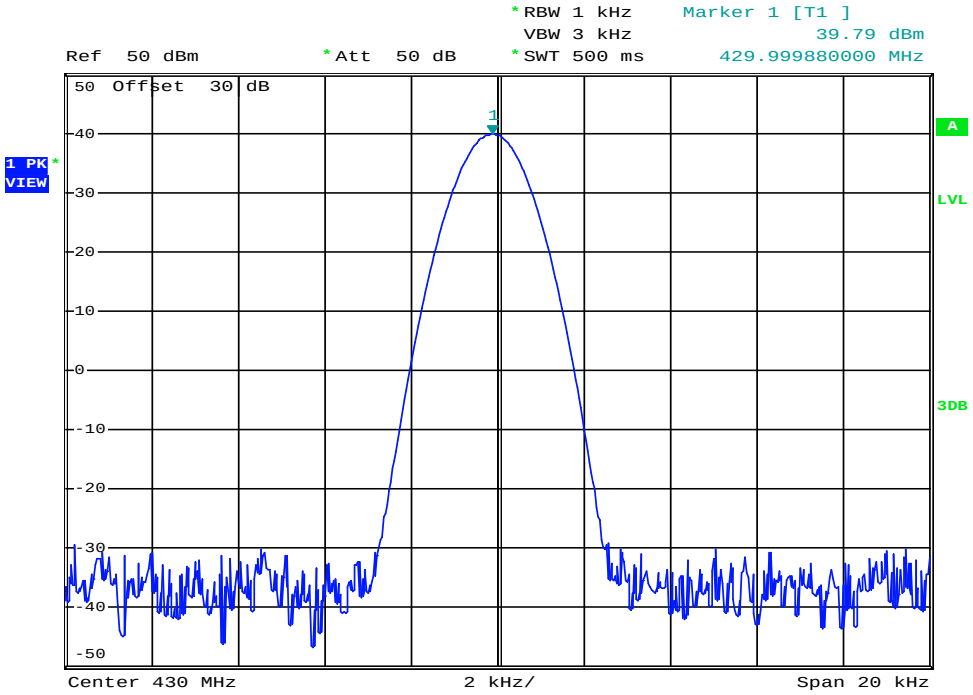

Date: 6.AUG.2019 17:24:35

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |
| | | **Measured Channel Power:** |
| | | **39.47** dBm |

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**Plot 7.3 – Conducted Power 430MHz**

## Conducted Power (Peak)



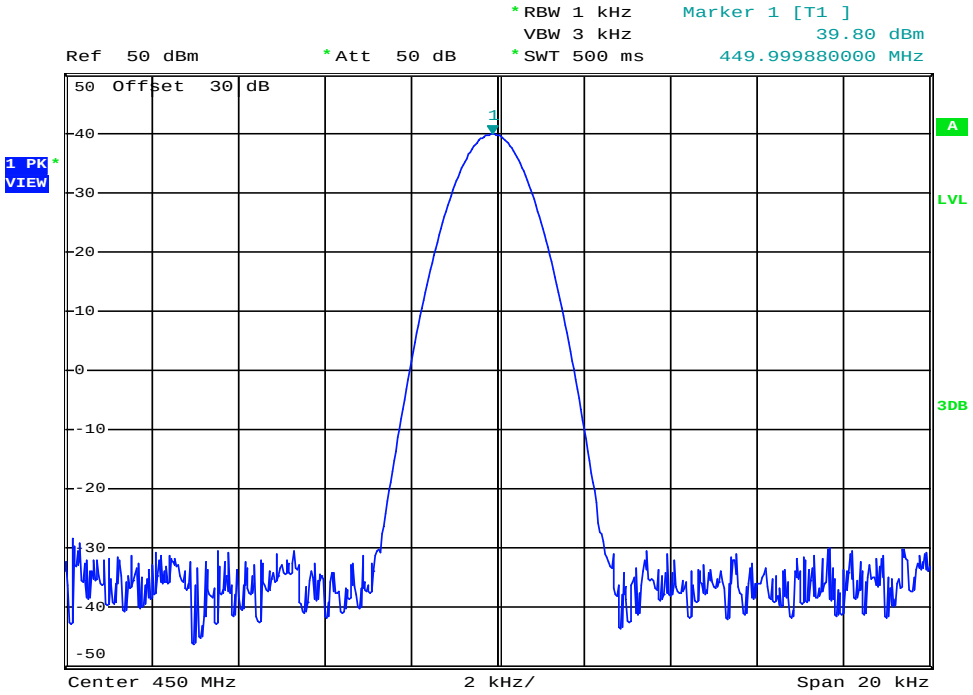

Date: 6.AUG.2019 17:26:00

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |
| | | **Measured Channel Power:** |
| | | **39.79** dBm |

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**Plot 7.4 – Conducted Power 450MHz**

## Conducted Power (Peak)



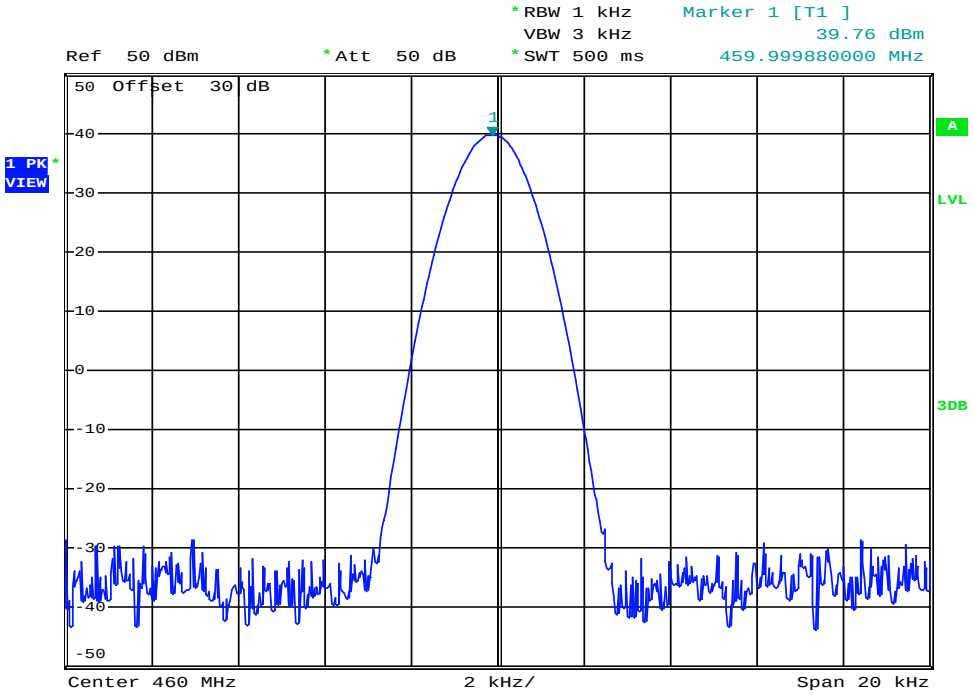

Date: 6.AUG.2019 17:26:50

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |
| | | **Measured Channel Power:** |
| | | **39.80** dBm |

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**Plot 7.5 – Conducted Power 460MHz**

## Conducted Power (Peak)



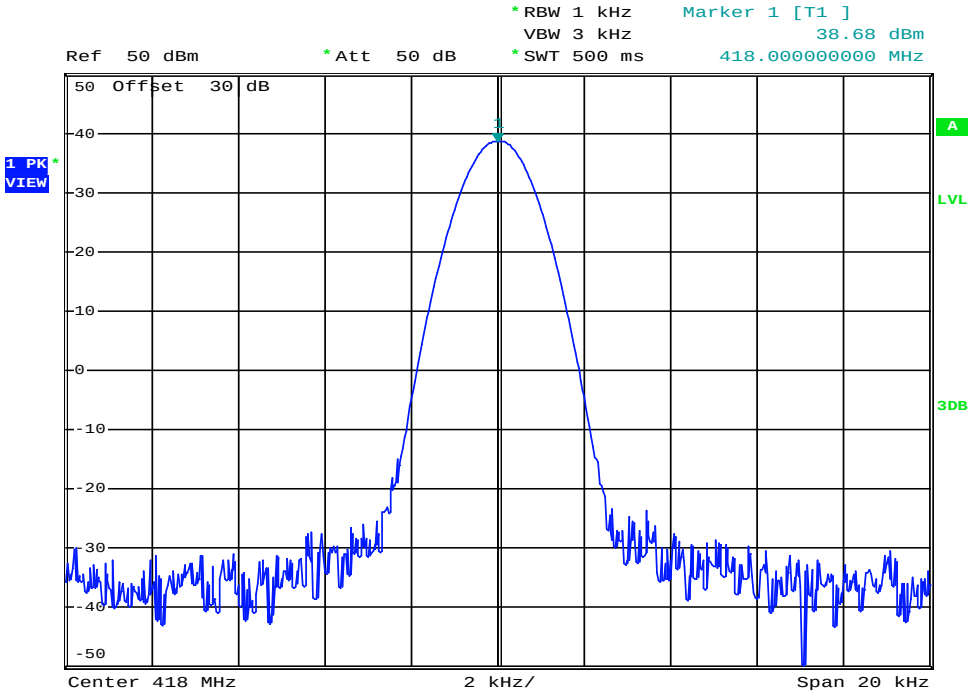

Date: 6.AUG.2019 17:27:44

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |
| | | **Measured Channel Power:** |
| | | **39.76** dBm |

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**Plot 7.6 – Conducted Power 418MHz, 39.0dBm Power Setting**

## Conducted Power (Peak)



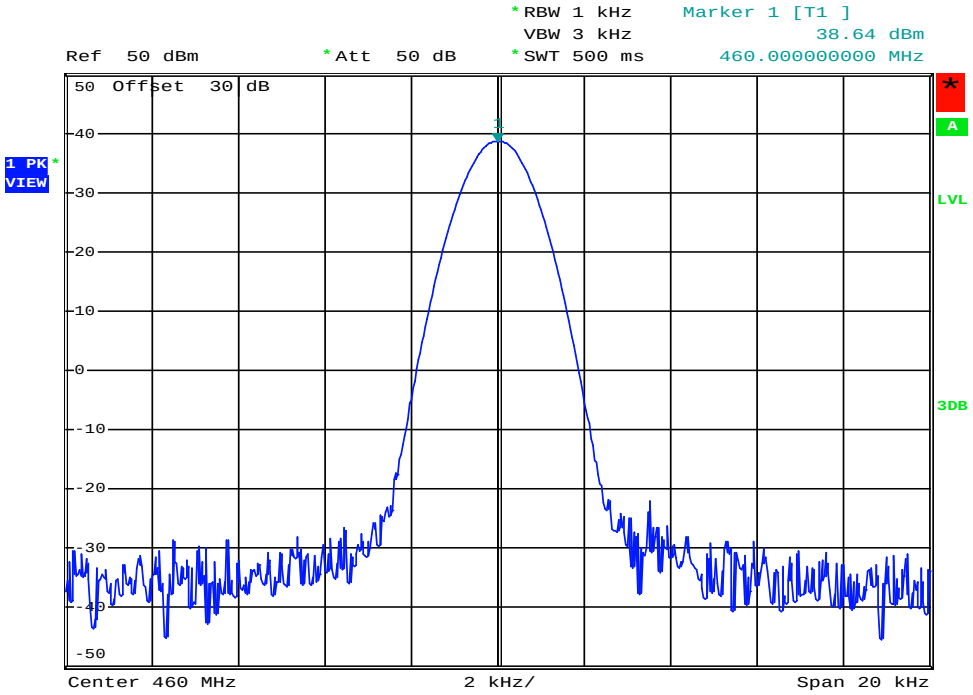

Date: 30.OCT.2019 16:48:28

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **39.00** dBm | **12.0** VDC |
| | | **Measured Channel Power:** |
| | | **38.68** dBm |

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**Plot 7.7 – Conducted Power 460MHz, 39.0dBm Power Setting**

## Conducted Power (Peak)



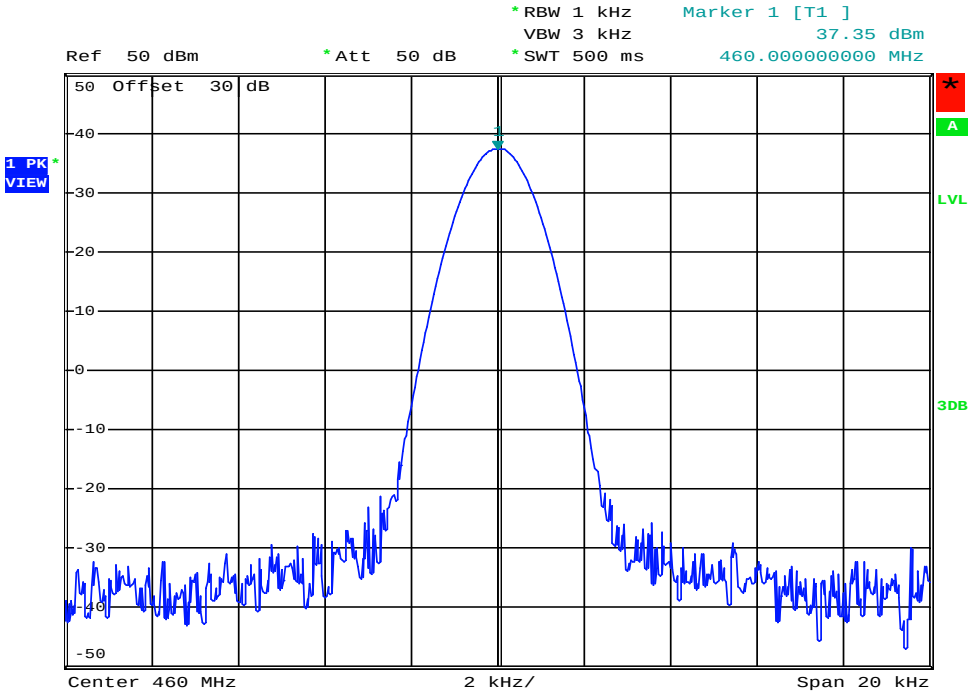

Date: 30.OCT.2019 16:50:52

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **39.00** dBm | **12.0** VDC |
| | | **Measured Channel Power:** |
| | | **38.64** dBm |

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**Plot 7.8 – Conducted Power 460MHz, 37.78dBm Power Setting**

## Conducted Power (Peak)




Date: 30.OCT.2019 16:52:10

| | | |
|---|---|---|
| Channel Frequency: **460.00** MHz | Channel Bandwidth: **n/a** kHz | Transmit Duty Cycle: **100** % |
| Modulation Setting: **CW** | Channel Power Setting: **37.78** dBm | Nominal Input Voltage: **12.0** VDC |
| | | Measured Channel Power: **37.35** dBm |

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**Table 7.1 – Summary of Conducted Power Measurements**

| §90.279, RSS-119 (5.4) Channel Output Power ERP (Peak) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | BW (kHz) | Modulation | Power Setting[(1)] (dBm) | Supply Voltage (VDC) | Measured Power [$E_{Meas}$] (dBm) | Antenna Gain [$G_T$] (dBi) | Cable Loss [$L_C$] (dB) | ERP (dBm) | ERP [ERP] (W) | Limit [Limit] (W) | Margin (dB) |
| 406.1 | n/a | CW | Max | 12.0 | 39.29 | 0 | 0.2 | 39.49 | 8.89 | 250.0 | **14.5** |
| 418.0 | | | | | 39.47 | | | 39.67 | 9.27 | | **14.3** |
| 430.0 | | | | | 39.79 | | | 39.99 | 9.98 | | **14.0** |
| 450.0 | | | | | 39.80 | | | 40.00 | 10.00 | | **14.0** |
| 460.0 | | | | | 39.76 | | | 39.96 | 9.91 | | **14.0** |
| 418.0 | | | 39.0 | | 38.68 | | | 38.88 | 7.73 | | **15.1** |
| 460.0 | | | 39.0 | | 38.64 | | | 38.84 | 7.66 | | **15.1** |
| 460.0 | | | 37.78 | | 37.35 | | | 37.55 | 5.69 | | **16.4** |
| | | | | | | | | | **Result:** | | **Complies** |

ERP (dBm) = $E_{Meas} + G_T + L_C$

Margin = 10*Log(Limit / ERP)

(1) The output power is factory set to maximum except where indicated.

39 dBm Power Setting for ISED 6.25kHz BW compliance of MSK modulation

37.8 dBm Power Setting for FCC 6.25kHz BW compliace of MSK modulation

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## 8.0 OCCUPIED BANDWIDTH

| Test Conditions | |
|---|---|
| Normative Reference | FCC 47 CFR §2.1049, §90.209, RSS-Gen (6.7), RSS-119 (5.5) |
| | ANSI C63.26 5.4.4 |

| Limits | | |
|---|---|---|
| 47 CFR §90.209(b)(5) Notes 3, 6 | 406MHz - 512MHz: Channel Spacing: **6.25kHz**<br>Note 3: Operations using equipment designed to operate with a 25 kHz channel bandwidth will be authorized a 20 kHz bandwidth.<br>Operations using equipment designed to operate with a 12.5 kHz channel bandwidth will be authorized a 11.25 kHz bandwidth.<br>Operations using equipment designed to operate with a 6.25 kHz channel bandwidth will be authorized a 6 kHz bandwidth. All stations must operate on channels with a bandwidth of 12.5 kHz or less beginning January 1, 2013, unless the operations meet the efficiency standard of §90.203(j)(3).<br>Note 6: Operations using equipment designed to operate with a 25 kilohertz channel bandwidth may be authorized up to a 20 kilohertz bandwidth unless the equipment meets the Adjacent Channel Power limits of §90.221 in which case operations may be authorized up to a 22 kilohertz bandwidth. Operations using equipment designed to operate with a 12.5 kilohertz channel bandwidth may be authorized up to an 11.25 kilohertz bandwidth. | |
| RSS-119 (5.5) | **406.1MHz - 430MHz, 450MHz - 470MHz** | |
| | **Channel Bandwidth (kHz)** | **Authorized Bandwidth (kHz)** |
| | 25 | 20 |
| | 12.5 | 11.25 |
| | 6.25 | 6 |

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| Test Conditions | |
|---|---|
| Normative Reference | FCC 47 CFR §2.1049, §90.209, RSS-Gen (6.7), RSS-119 (5.5) |
| | ANSI C63.26 5.4.4 |

**Measurement Procedure**

**ANSI C63.26 5.4.4** **Occupied bandwidth—Power bandwidth (99%) measurement procedure30**

The OBW is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.

The following procedure shall be used for measuring (99%) power bandwidth:

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (typically a span of 1.5 × OBW is sufficient).

b) The nominal IF filter 3 dB bandwidth (RBW) shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be ≥3 × RBW.

c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation.

d) Set the detection mode to peak, and the trace mode to max-hold.

| Test Setup | Appendix A | Figure A.1 |
|---|---|---|

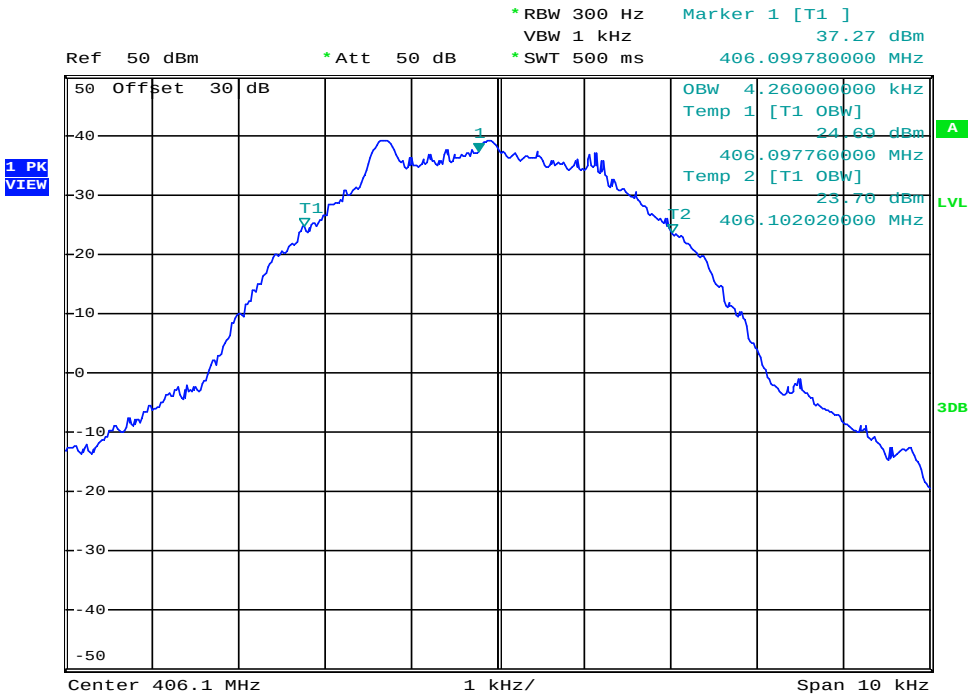
**Measurement Setup**

The DUT was connected to a Spectrum Analyzer (SA) via a 30dB attenuator connected to the DUT's antenna port. The SA was configured as above using the SA 99% Occupied Bandwidth measurement function. The output power of the DUT was set to the manufacturer's highest output power setting and set to MSK, QPSK, 8PSK, 16QAM, 32QAM and 64QAM modulation mode. The DUT was set to transmit at its maximum Duty Cycle.

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**Plot 8.1 – OBW - 6.25kHz BW – MSK - 406.1MHz, ISED**

## Occupied Bandwidth - Conducted



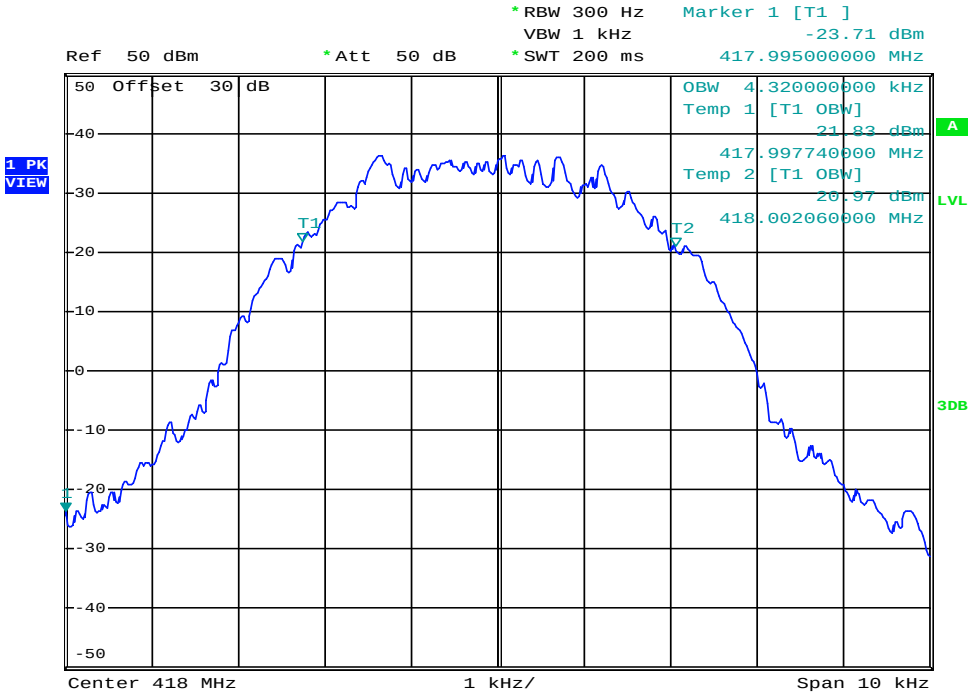

Date: 6.AUG.2019 12:26:09

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **6.25** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **4.26** kHz |

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**Plot 8.2 – OBW - 6.25kHz BW – MSK - 418MHz , ISED**

## Occupied Bandwidth - Conducted



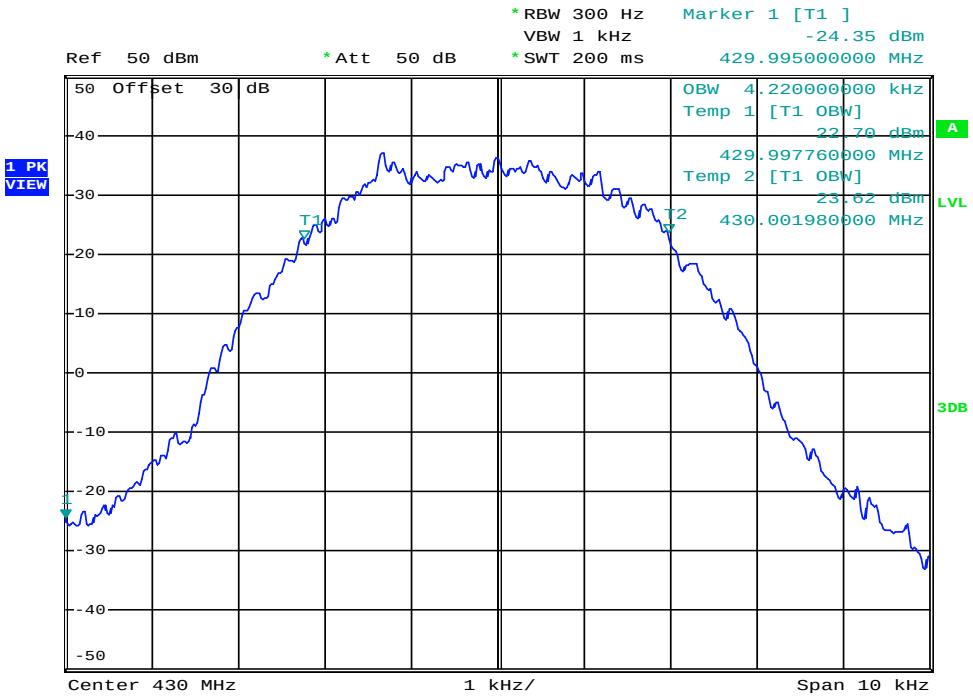

Date: 6.AUG.2019 12:27:43

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **6.25** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **4.32** kHz |

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**Plot 8.3 – OBW - 6.25kHz BW – MSK - 430MHz , ISED**

## Occupied Bandwidth - Conducted



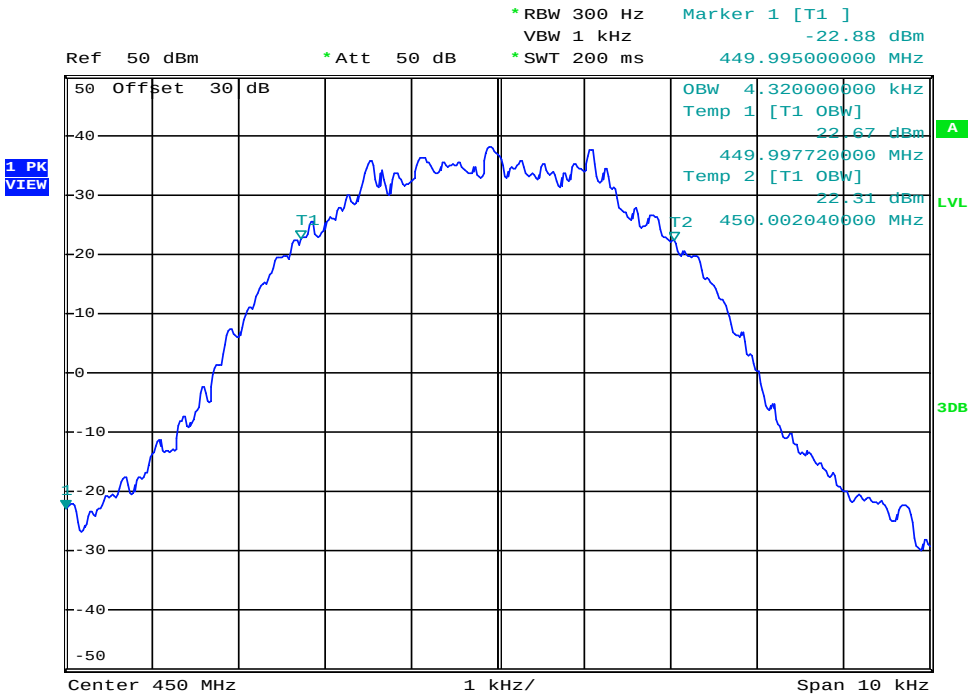

Date: 6.AUG.2019 12:29:26

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **6.25** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **4.22** kHz |

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**Plot 8.4 – OBW - 6.25kHz BW – MSK - 450MHz**

## Occupied Bandwidth - Conducted



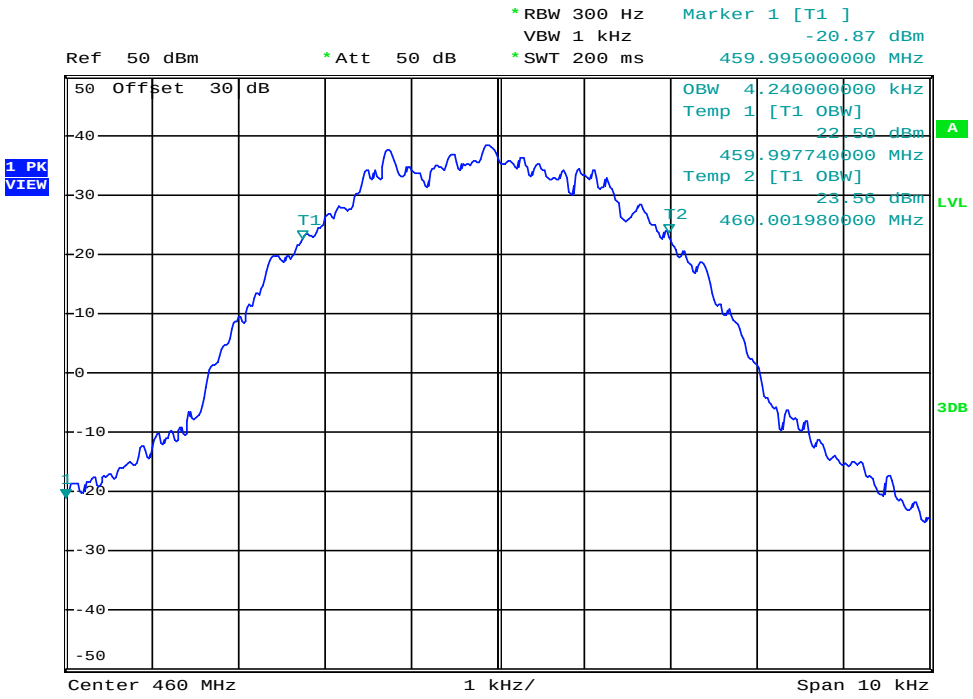

Date: 6.AUG.2019 12:31:14

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **6.25** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **4.32** kHz |

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**Plot 8.5 – OBW - 6.25kHz BW – MSK - 460MHz**

## Occupied Bandwidth - Conducted



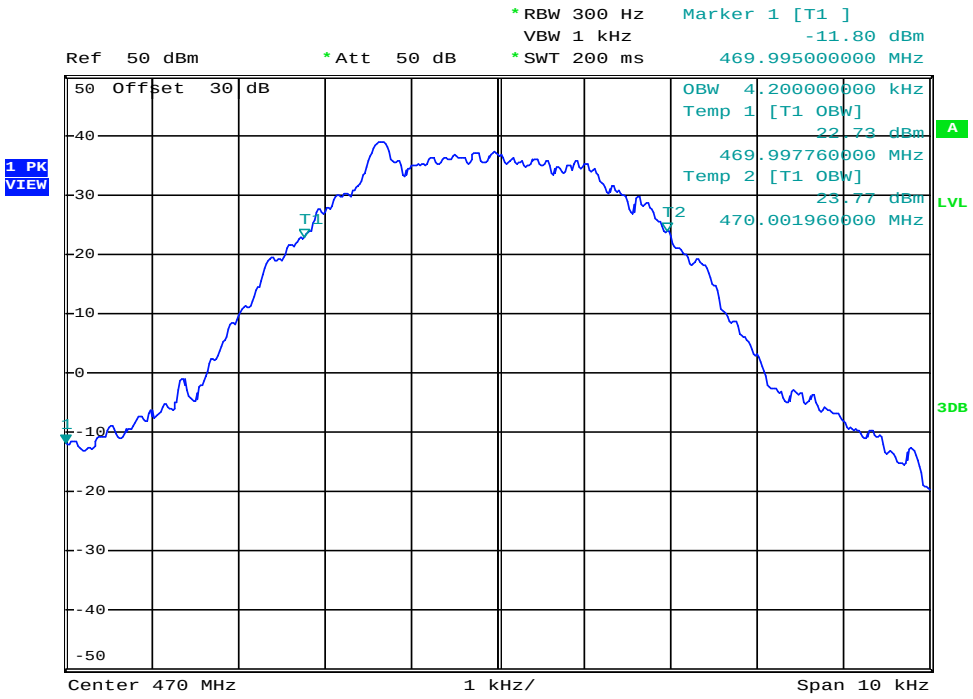

Date: 6.AUG.2019 12:33:34

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **6.25** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **4.24** kHz |

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**Plot 8.6 – OBW - 6.25kHz BW – MSK - 470MHz**

## Occupied Bandwidth - Conducted



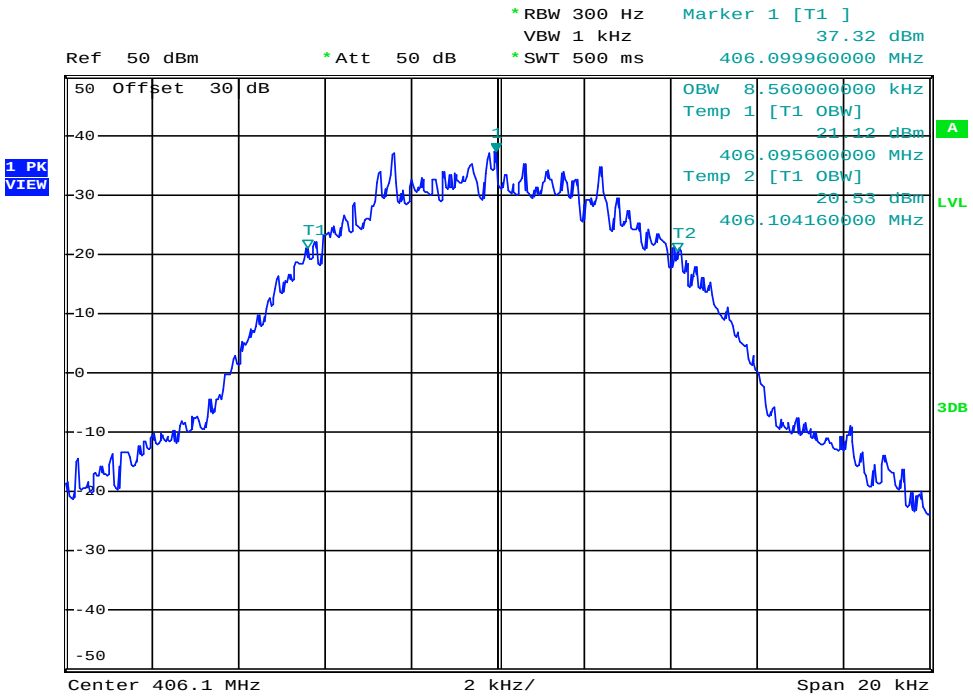

Date: 6.AUG.2019 12:35:32

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **6.25** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **4.20** kHz |

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**Plot 8.7 – OBW - 12.5kHz BW – MSK – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



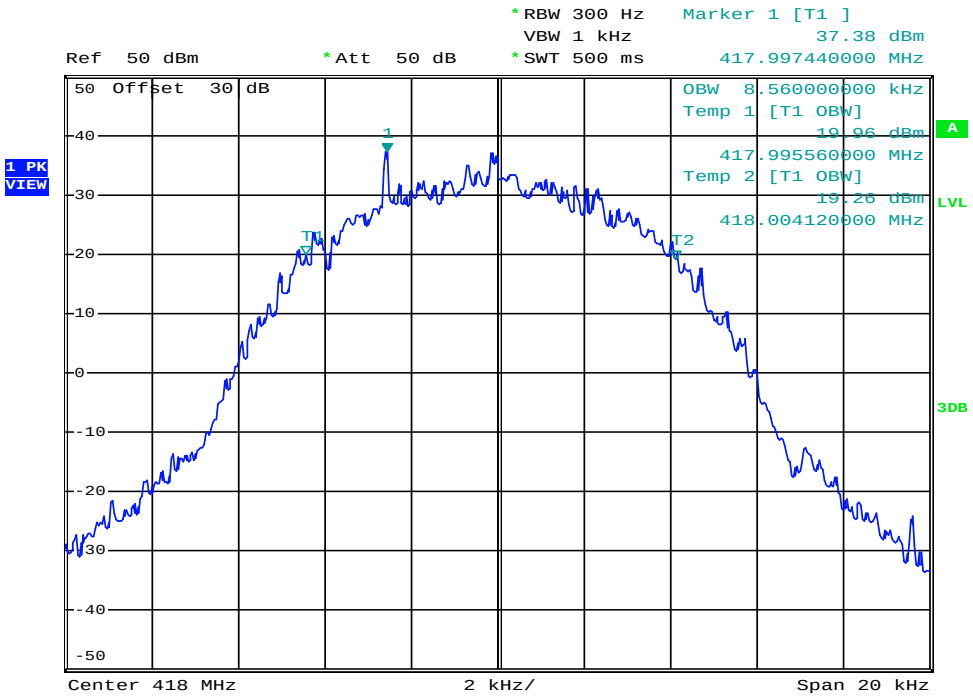

Date: 6.AUG.2019 12:44:03

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **8.56** kHz |

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**Plot 8.8 – OBW - 12.5kHz BW – MSK – 418MHz , ISED**

## Occupied Bandwidth - Conducted



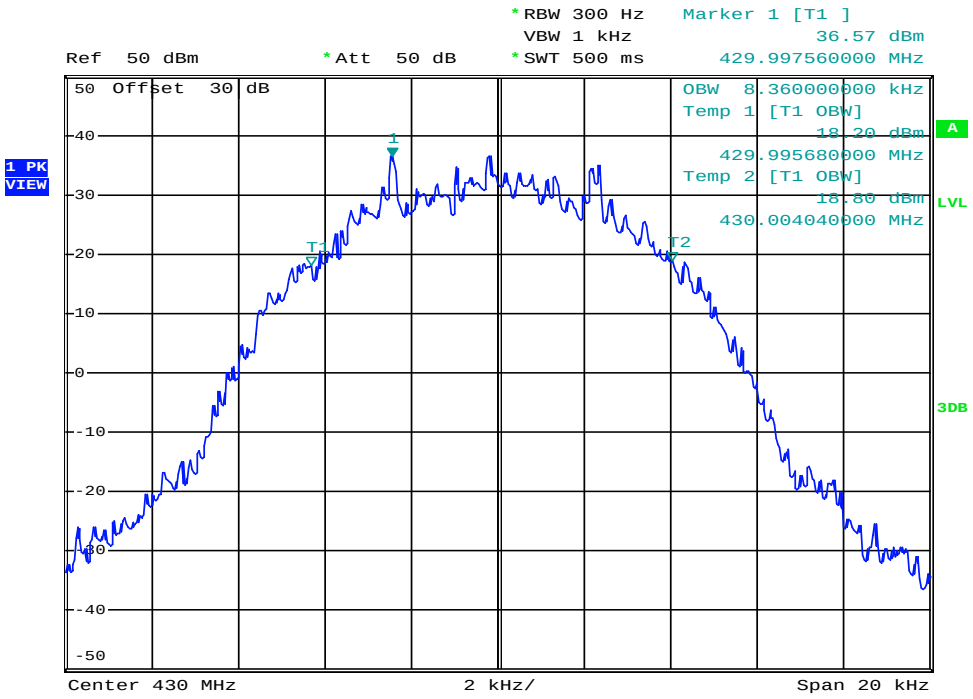

Date: 6.AUG.2019 12:45:05

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **8.56** kHz |

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**Plot 8.9 – OBW - 12.5kHz BW – MSK – 430MHz , ISED**

## Occupied Bandwidth - Conducted



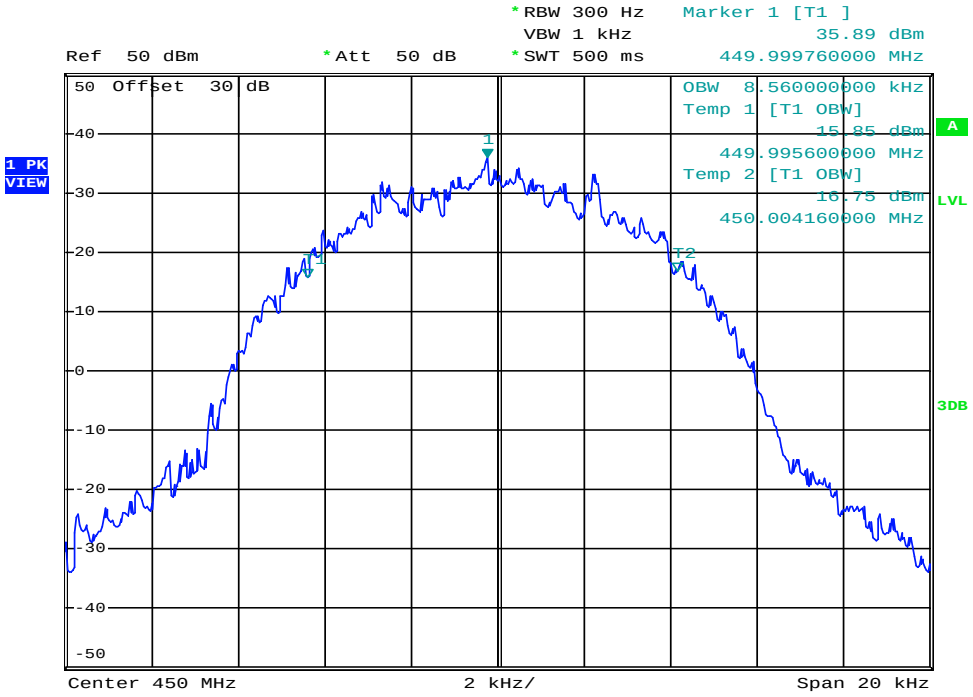

Date: 6.AUG.2019 12:46:05

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **8.36** kHz |

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**Plot 8.10 – OBW - 12.5kHz BW – MSK – 450MHz**

## Occupied Bandwidth - Conducted



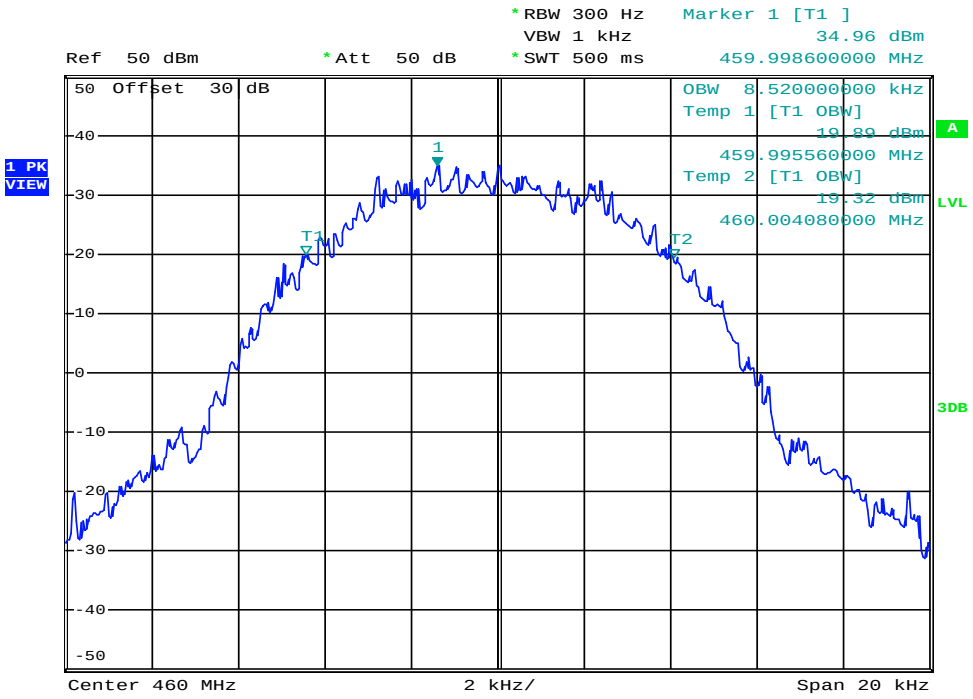

Date: 6.AUG.2019 12:47:08

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **8.56** kHz |

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**Plot 8.11 – OBW - 12.5kHz BW – MSK – 460MHz**

## Occupied Bandwidth - Conducted



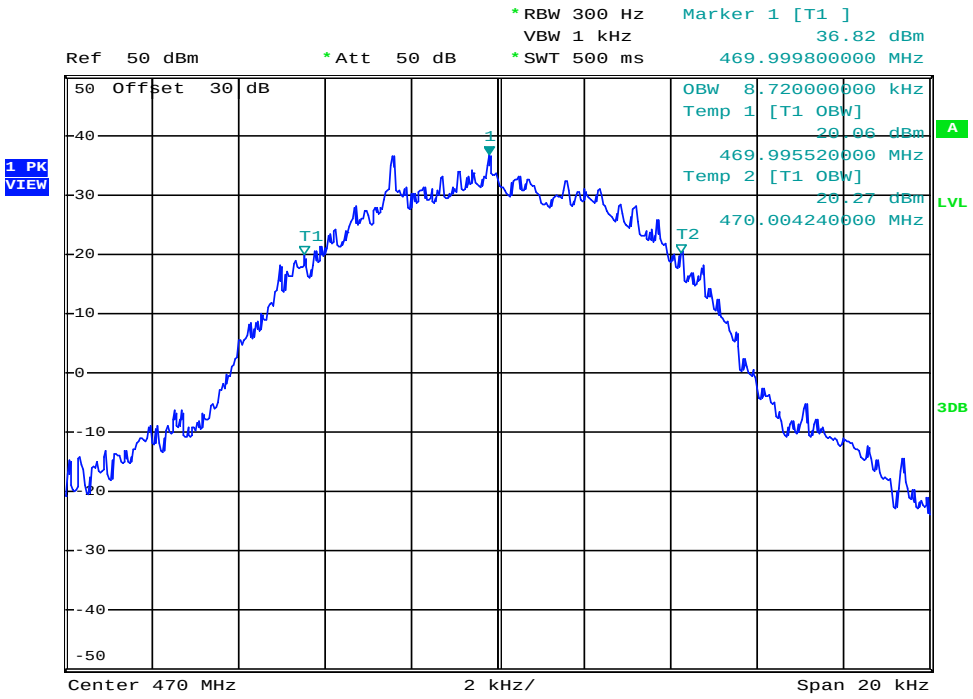

Date: 6.AUG.2019 12:48:07

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **8.52** kHz |

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**Plot 8.12 – OBW - 12.5kHz BW – MSK – 470MHz**

## Occupied Bandwidth - Conducted



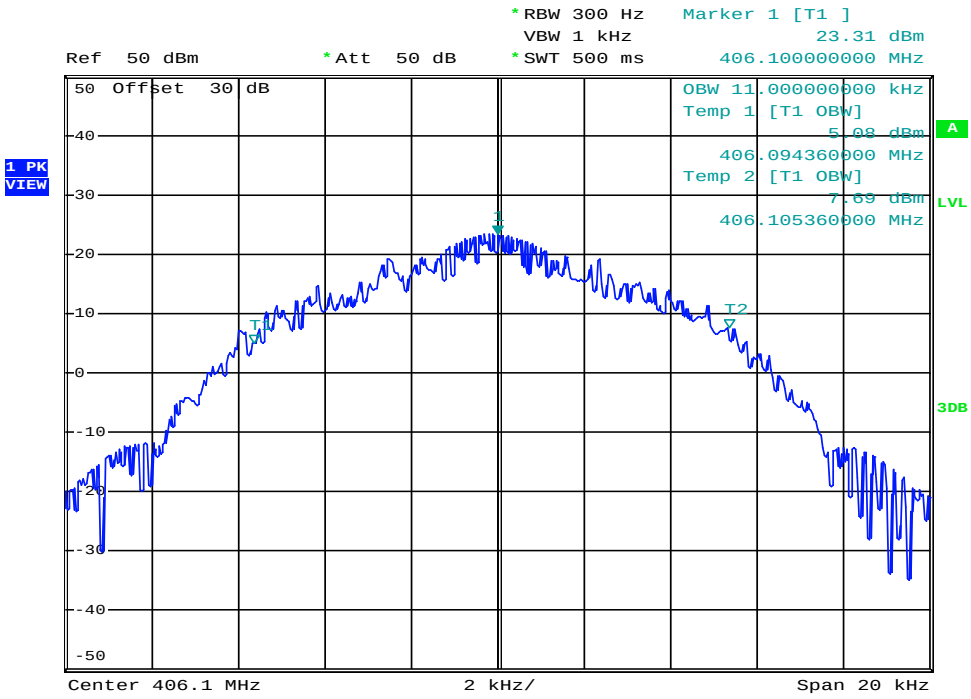

Date: 6.AUG.2019 12:49:10

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **8.72** kHz |

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**Plot 8.13 – OBW - 12.5kHz BW – 8PSK – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



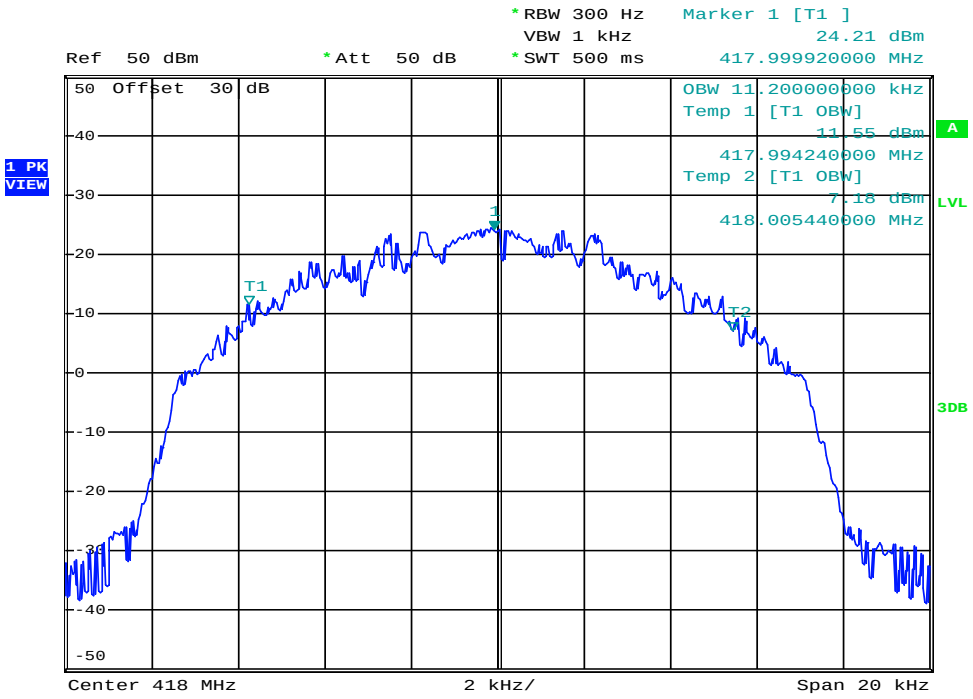

Date: 6.AUG.2019 13:19:23

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **11.00** kHz |

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**Plot 8.14 – OBW - 12.5kHz BW – 8PSK – 418MHz , ISED**

## Occupied Bandwidth - Conducted



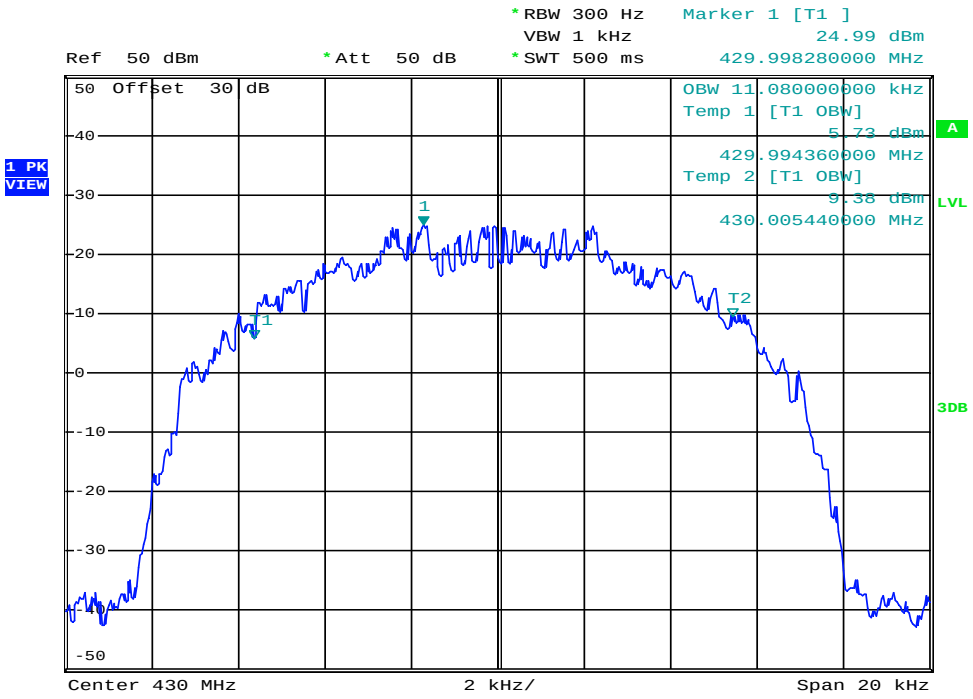

Date: 6.AUG.2019 13:22:57

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **11.20** kHz |

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**Plot 8.15 – OBW - 12.5kHz BW – 8PSK – 430MHz , ISED**

## Occupied Bandwidth - Conducted



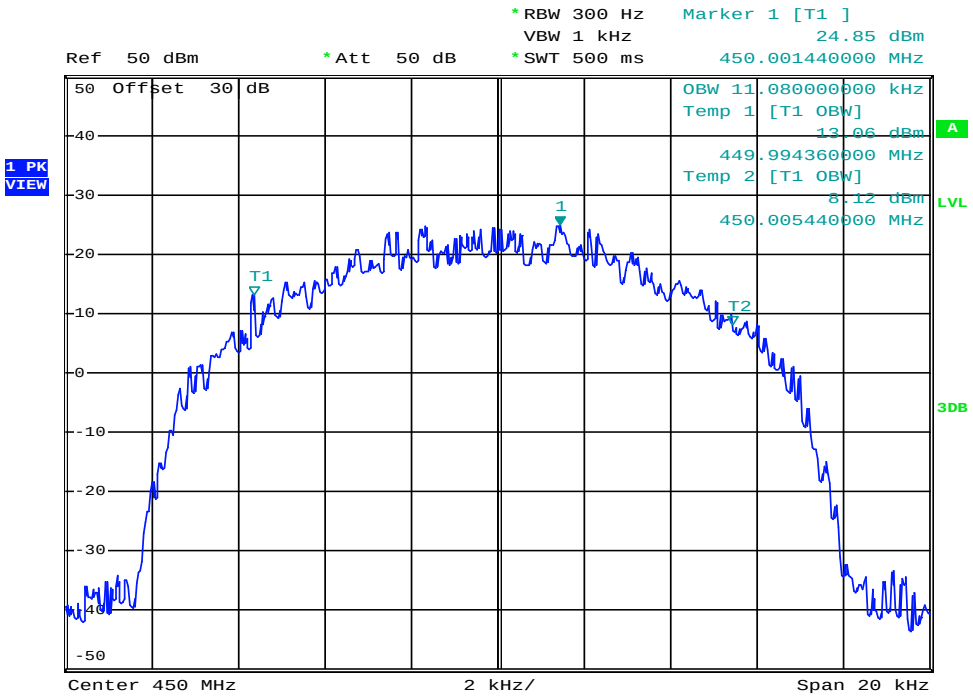

Date: 6.AUG.2019 13:26:27

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **11.08** kHz |

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**Plot 8.16 – OBW - 12.5kHz BW – 8PSK – 450MHz**

## Occupied Bandwidth - Conducted



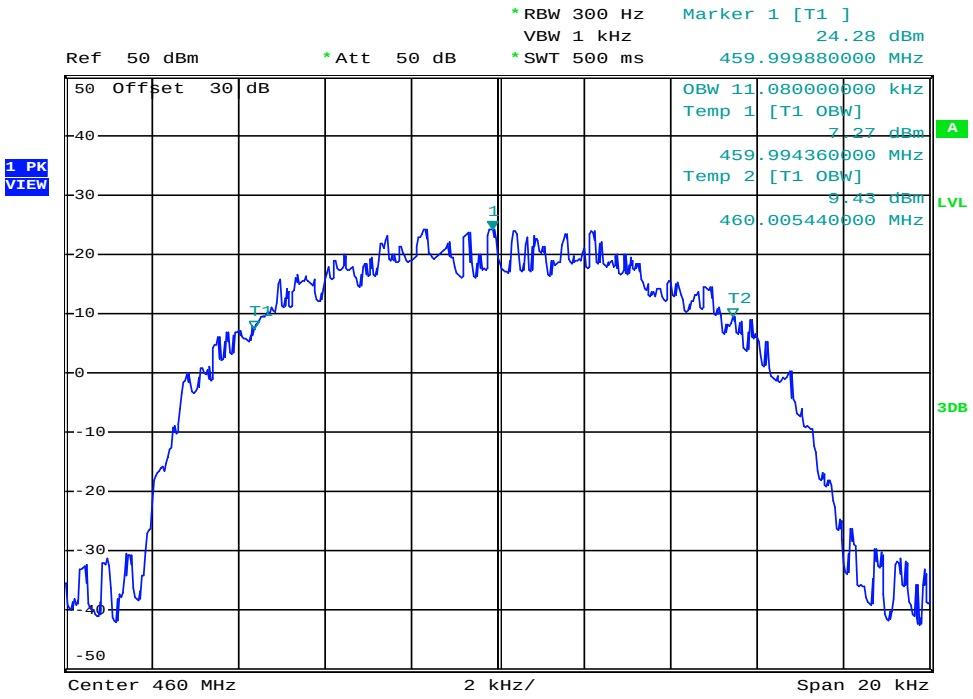

Date: 6.AUG.2019 13:27:11

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **11.08** kHz |

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**Plot 8.17 – OBW - 12.5kHz BW – 8PSK – 460MHz**

## Occupied Bandwidth - Conducted



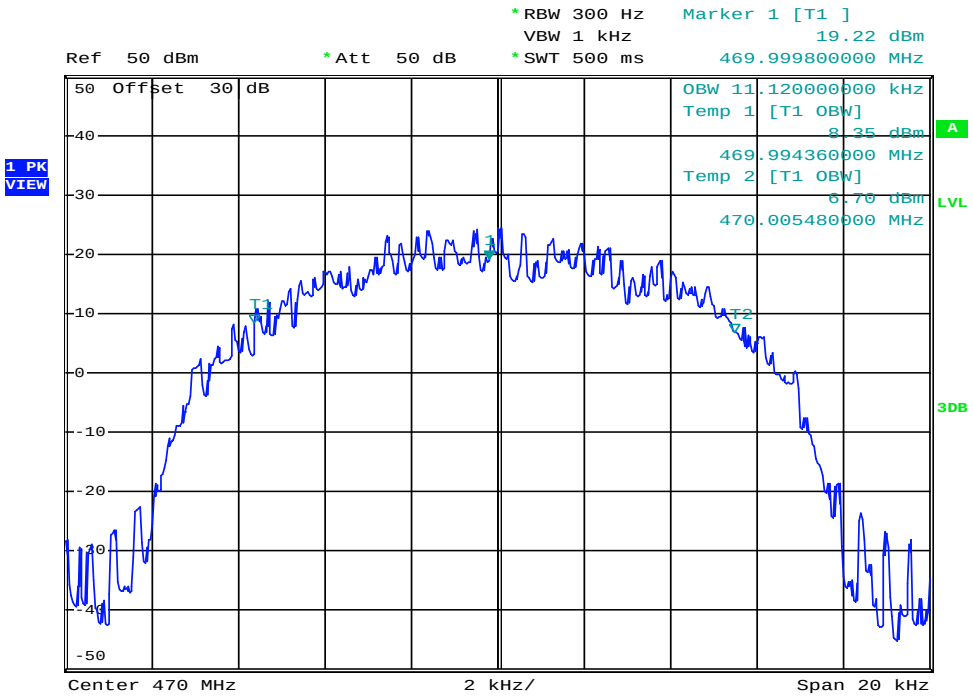

Date: 6.AUG.2019 13:28:05

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **11.08** kHz |

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**Plot 8.18 – OBW - 12.5kHz BW – 8PSK – 470MHz**

## Occupied Bandwidth - Conducted



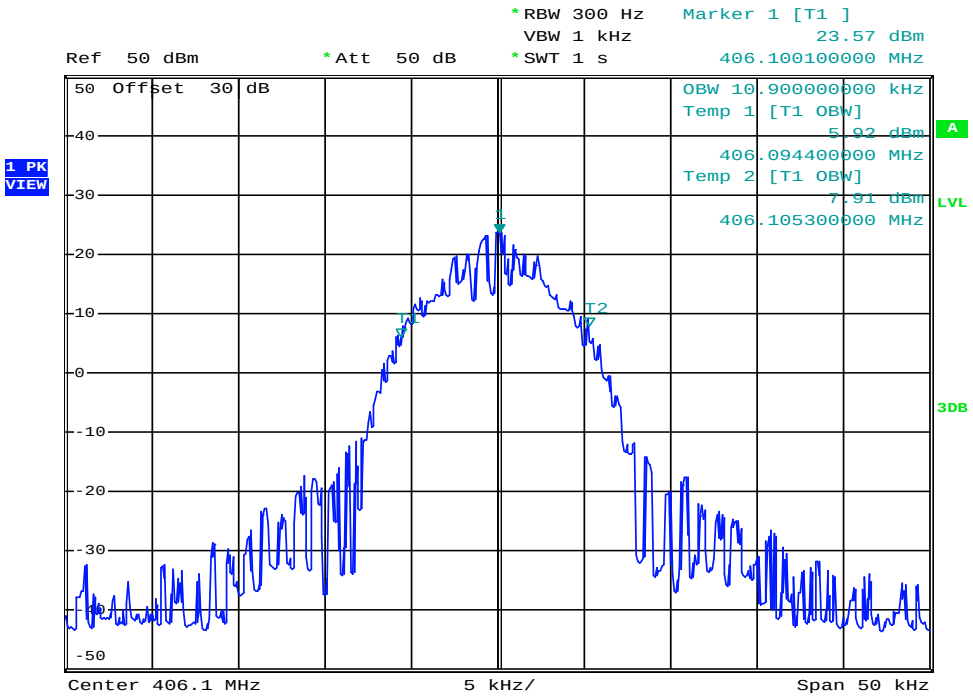

Date: 6.AUG.2019 13:29:34

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **11.12** kHz |

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**Plot 8.19 – OBW - 12.5kHz BW – QPSK – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



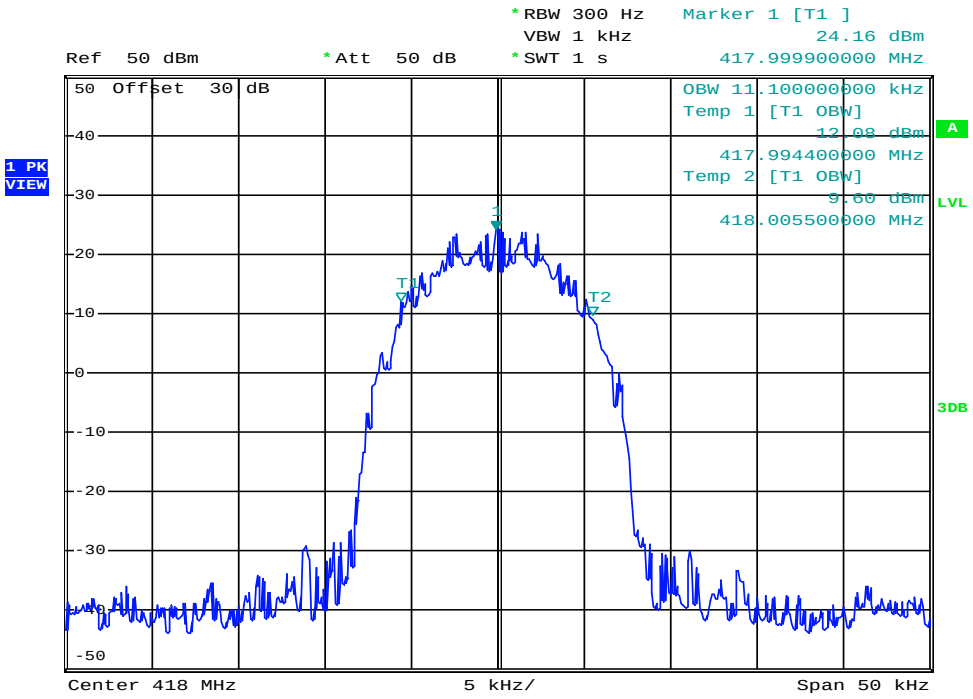

Date: 6.AUG.2019 12:58:48

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **10.90** kHz |

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**Plot 8.20 – OBW - 12.5kHz BW – QPSK – 418MHz , ISED**

## Occupied Bandwidth - Conducted



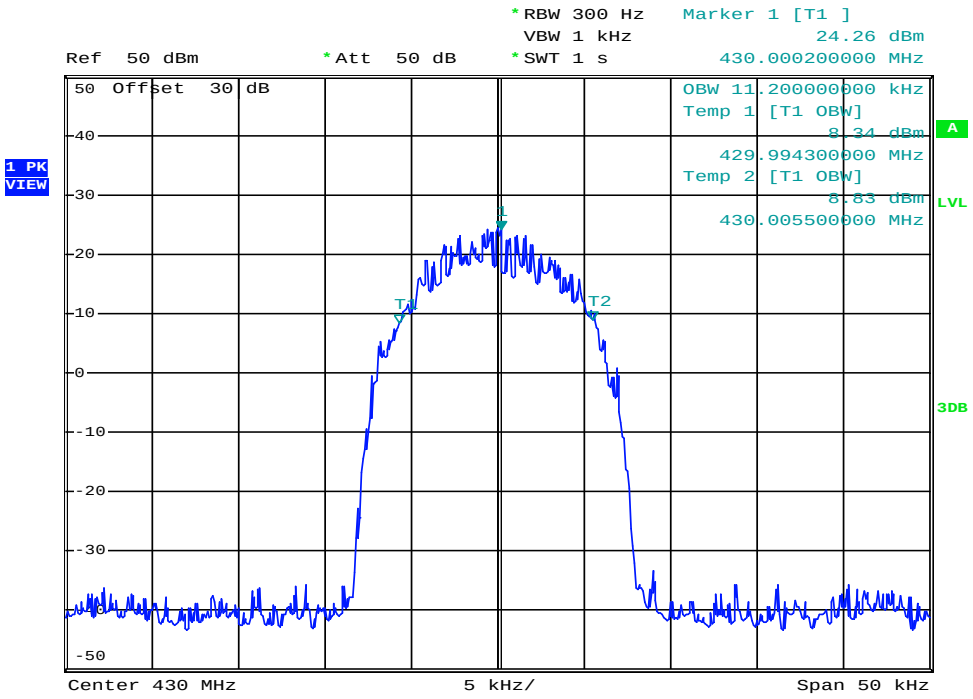

Date: 6.AUG.2019 13:00:41

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **11.10** kHz |

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**Plot 8.21 – OBW - 12.5kHz BW – QPSK – 430MHz , ISED**

## Occupied Bandwidth - Conducted



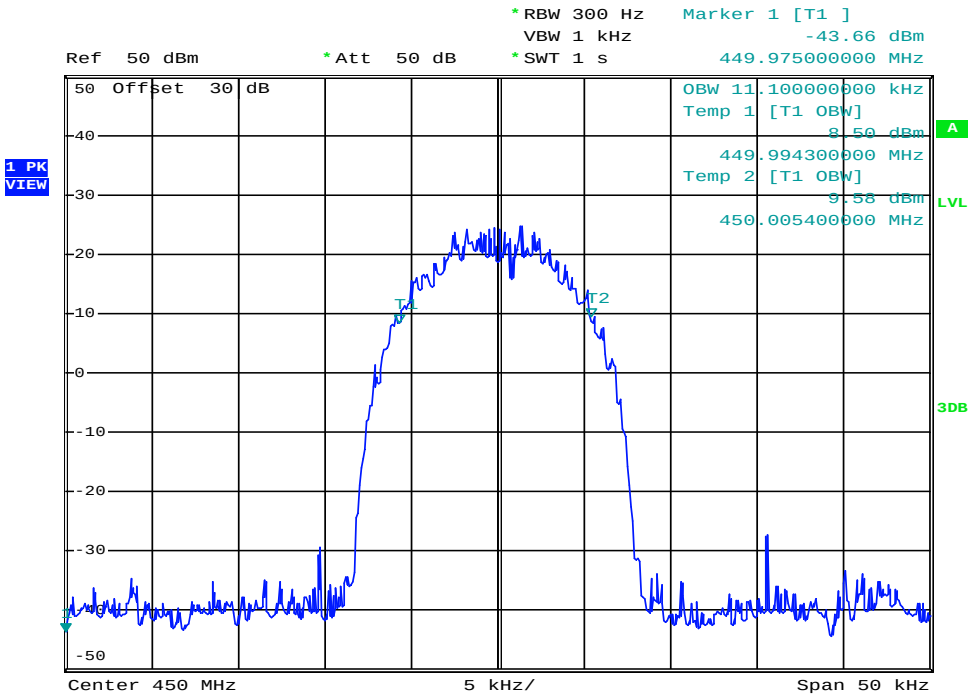

Date: 6.AUG.2019 13:04:34

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **11.20** kHz |

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**Plot 8.22 – OBW - 12.5kHz BW – QPSK – 450MHz**

## Occupied Bandwidth - Conducted



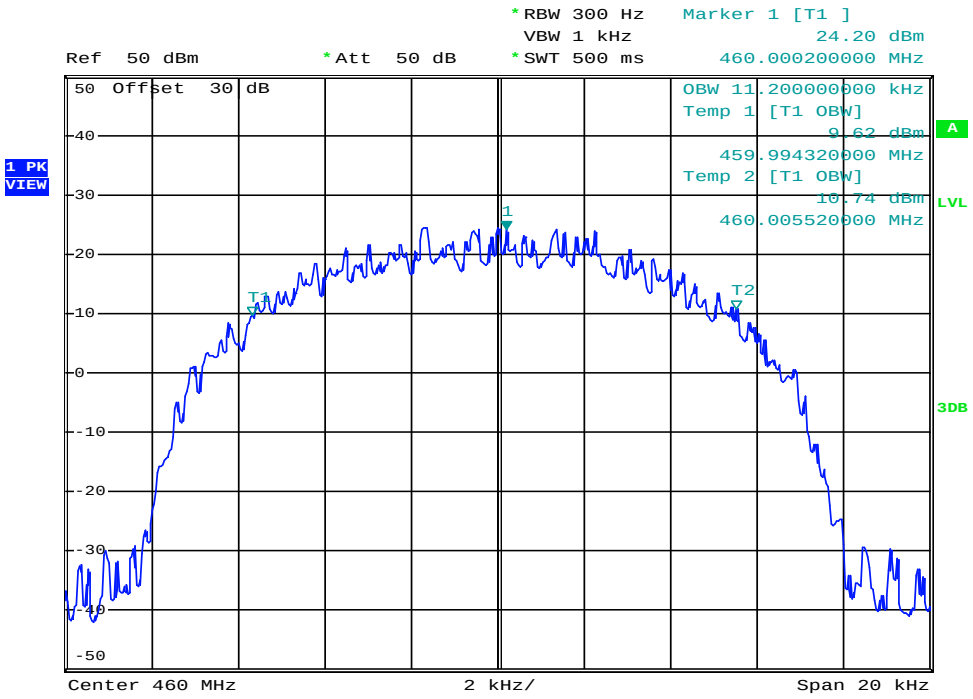

Date: 6.AUG.2019 13:06:03

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **11.10** kHz |

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**Plot 8.23 – OBW - 12.5kHz BW – QPSK – 460MHz**

## Occupied Bandwidth - Conducted



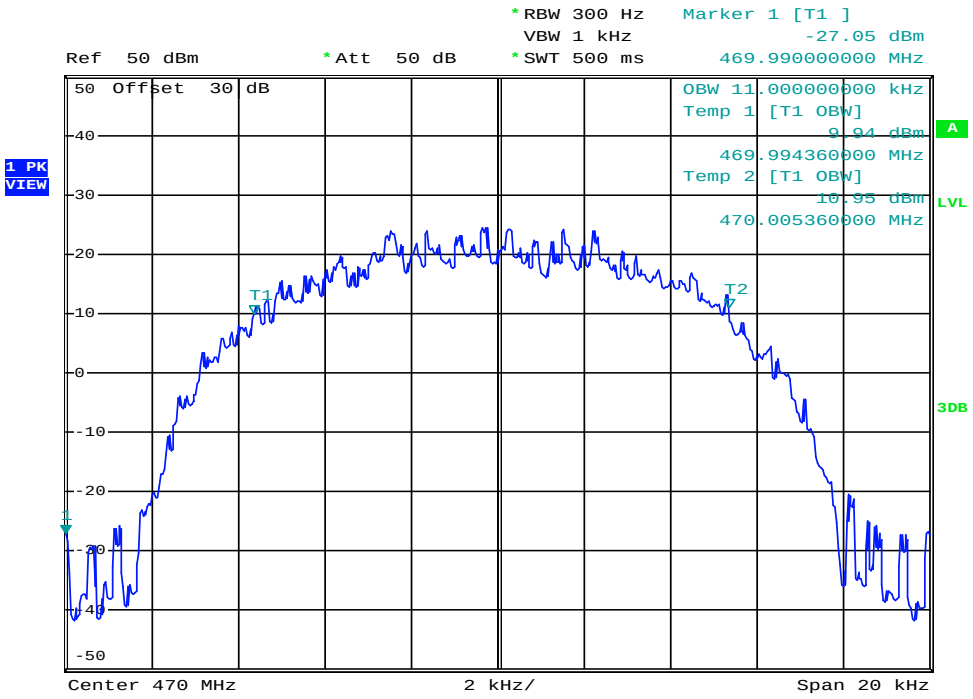

Date: 6.AUG.2019 13:07:39

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **11.20** kHz |

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**Plot 8.24 – OBW - 12.5kHz BW – QPSK – 470MHz**

## Occupied Bandwidth - Conducted



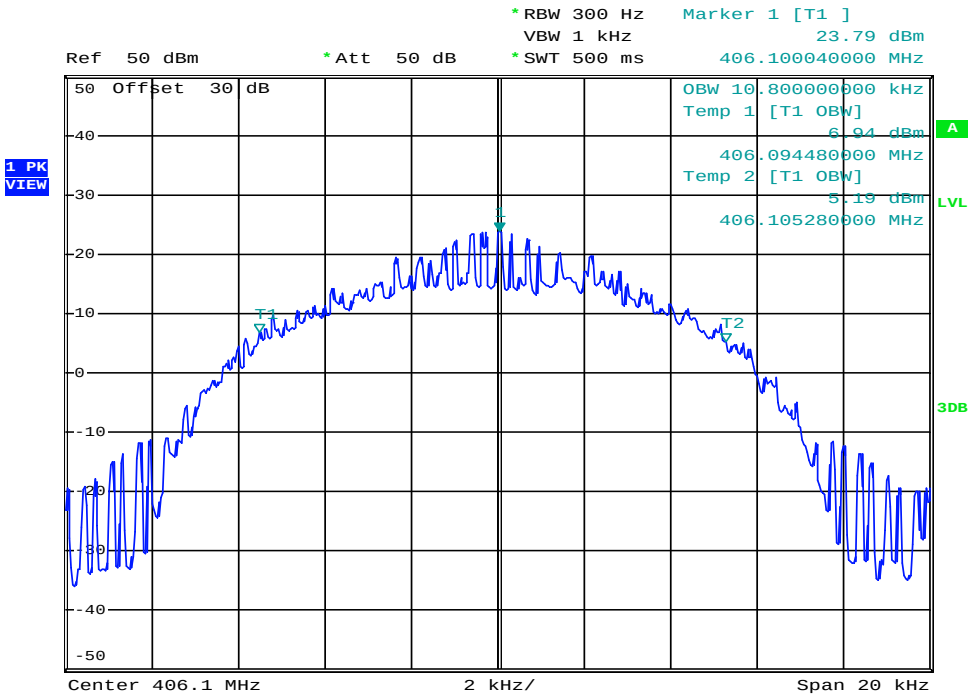

Date: 6.AUG.2019 13:08:41

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **11.00** kHz |

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**Plot 8.25 – OBW - 12.5kHz BW – 16QAM – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



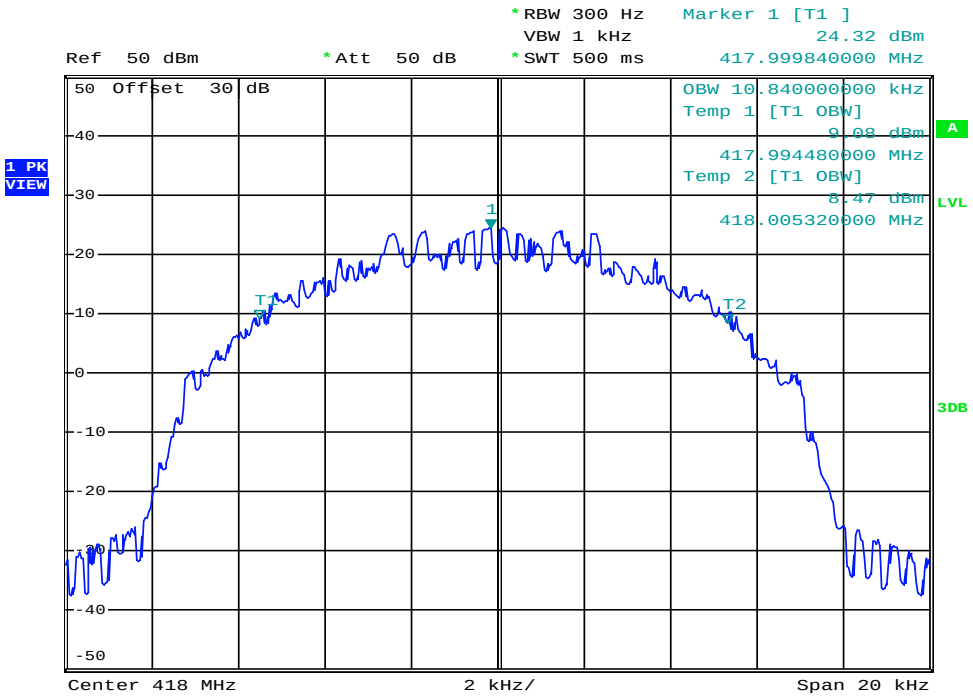

Date: 6.AUG.2019 13:33:15

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **10.80** kHz |

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**Plot 8.26 – OBW - 12.5kHz BW – 16QAM – 418MHz , ISED**

## Occupied Bandwidth - Conducted



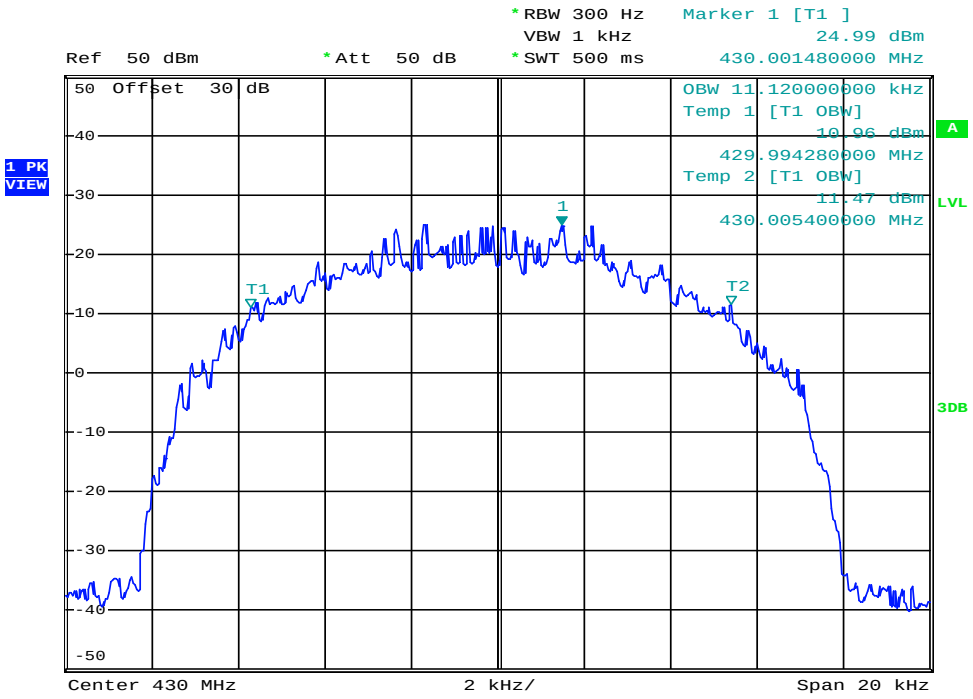

Date: 6.AUG.2019 13:34:52

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **10.84** kHz |

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**Plot 8.27 – OBW - 12.5kHz BW – 16QAM – 430MHz , ISED**

## Occupied Bandwidth - Conducted



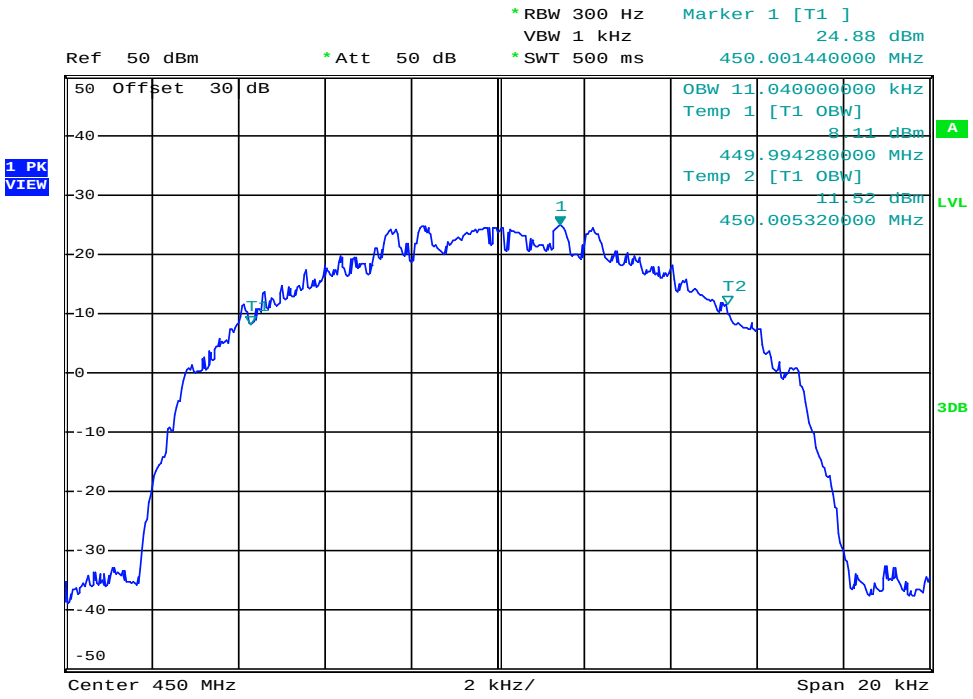

Date: 6.AUG.2019 13:35:42

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **11.12** kHz |

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**Plot 8.28 – OBW - 12.5kHz BW – 16QAM – 450MHz**

## Occupied Bandwidth - Conducted



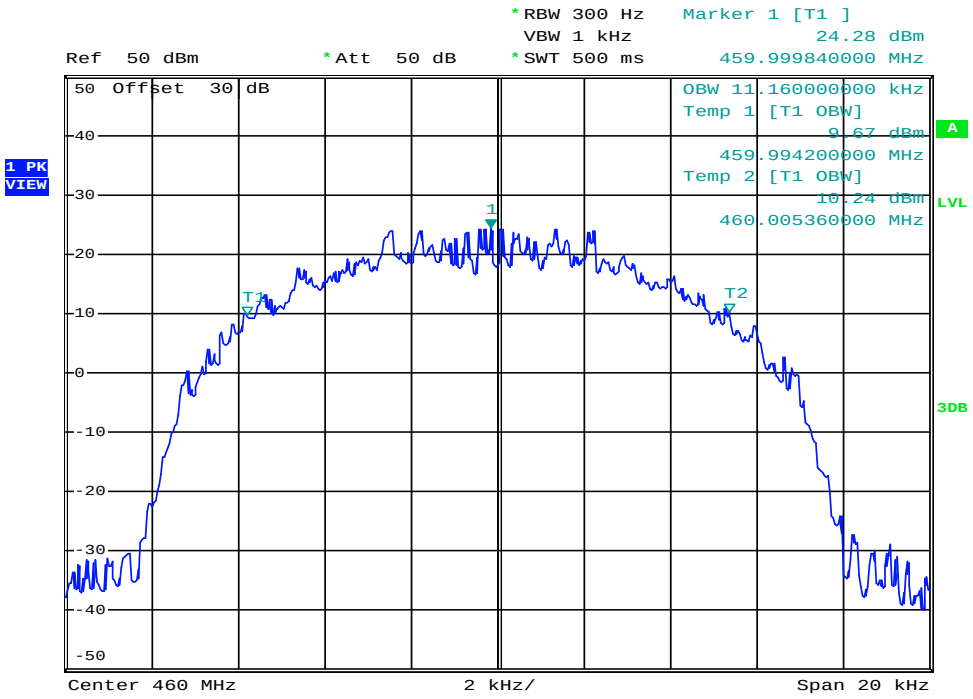

Date: 6.AUG.2019 13:37:15

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **11.04** kHz |

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**Plot 8.29 – OBW - 12.5kHz BW – 16QAM – 460MHz**

## Occupied Bandwidth - Conducted



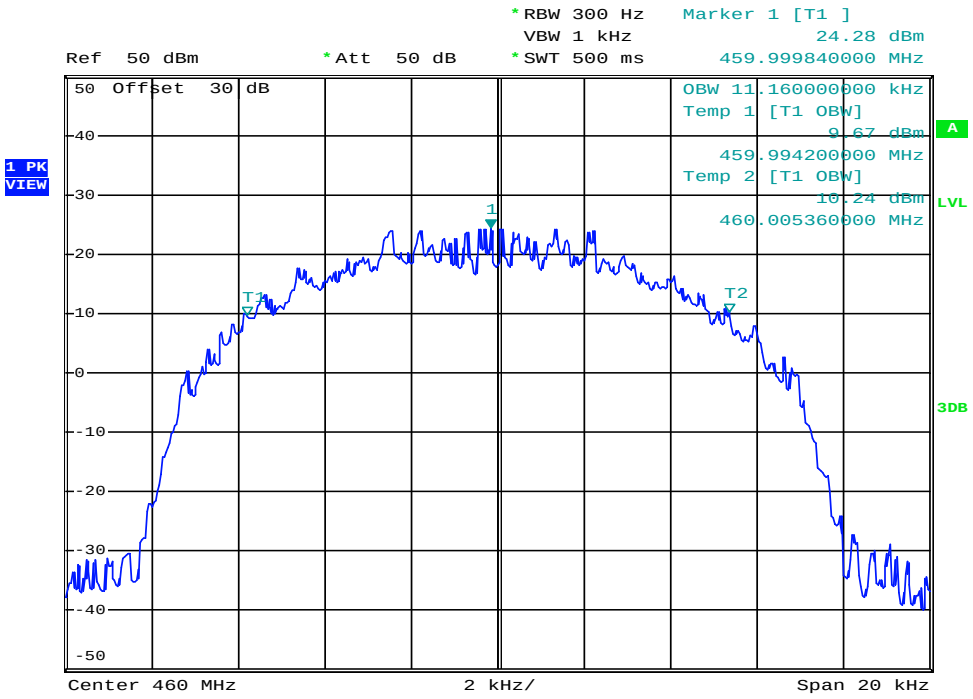

Date: 6.AUG.2019 13:38:14

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **11.16** kHz |

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**Plot 8.30 – OBW - 12.5kHz BW – 16QAM – 470MHz**

## Occupied Bandwidth - Conducted



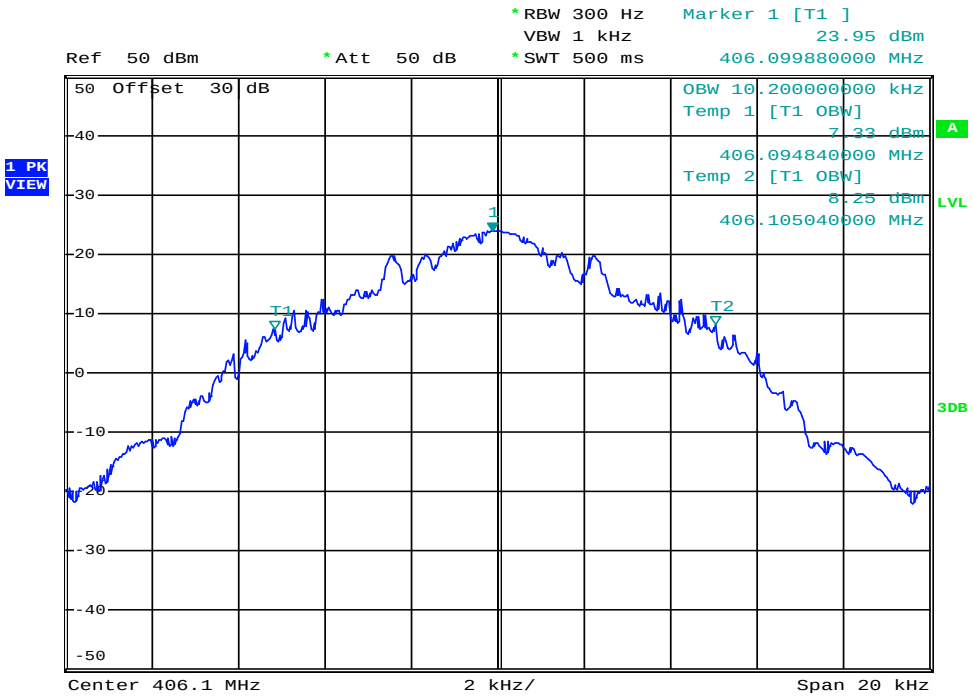

Date: 6.AUG.2019 13:38:14

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **11.16** kHz |

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**Plot 8.31 – OBW - 12.5kHz BW – 32QAM – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



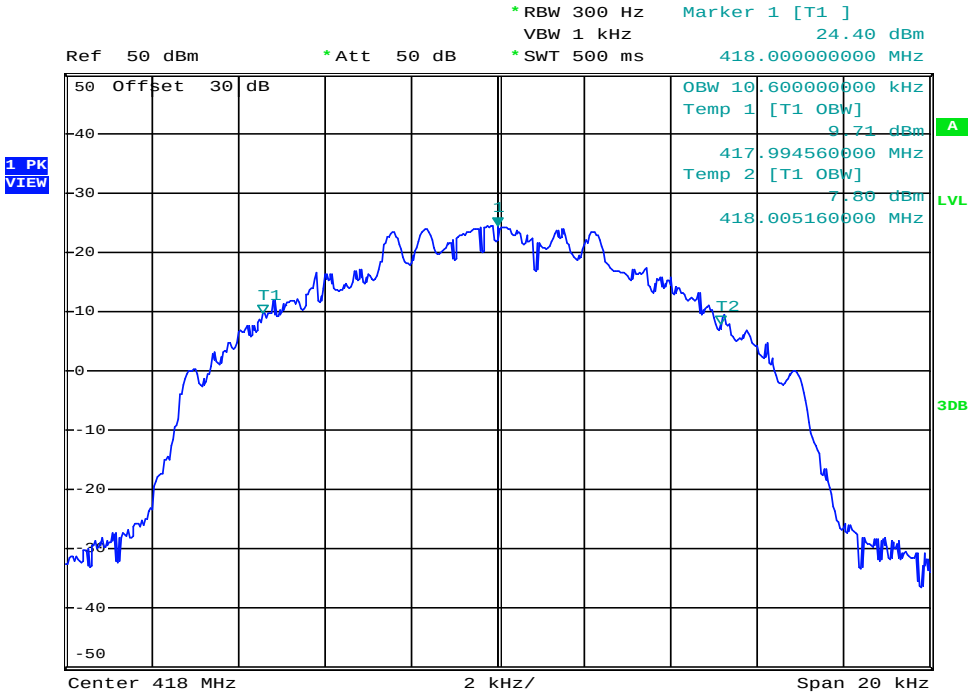

Date: 6.AUG.2019 13:42:47

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **10.20** kHz |

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**Plot 8.32 – OBW - 12.5kHz BW – 32QAM – 418MHz , ISED**

## Occupied Bandwidth - Conducted



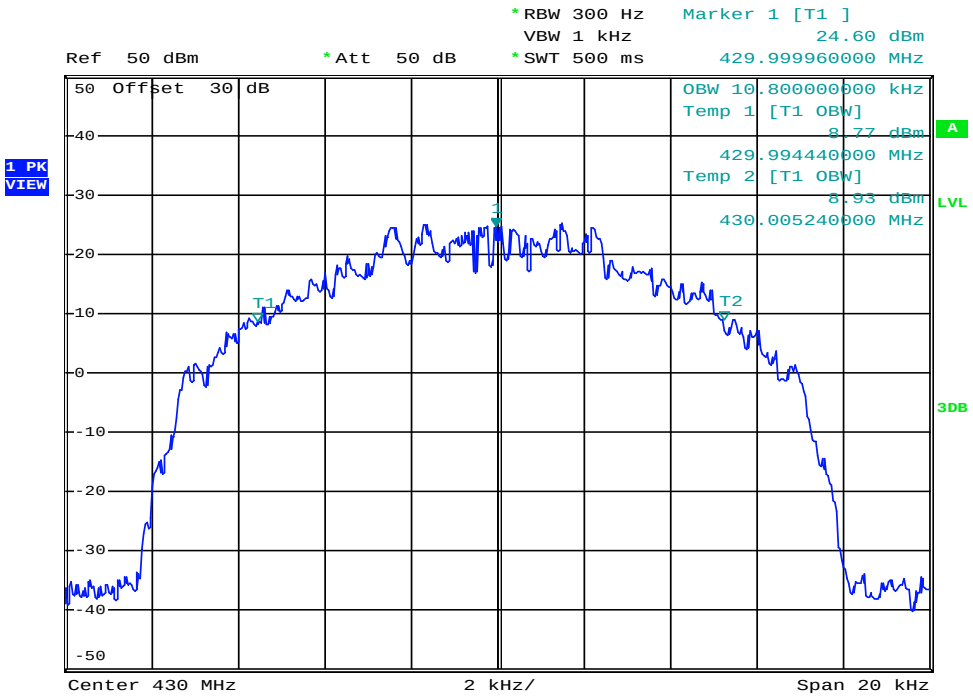

Date: 6.AUG.2019 13:43:51

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **10.60** kHz |

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**Plot 8.33 – OBW - 12.5kHz BW – 32QAM – 430MHz , ISED**

## Occupied Bandwidth - Conducted



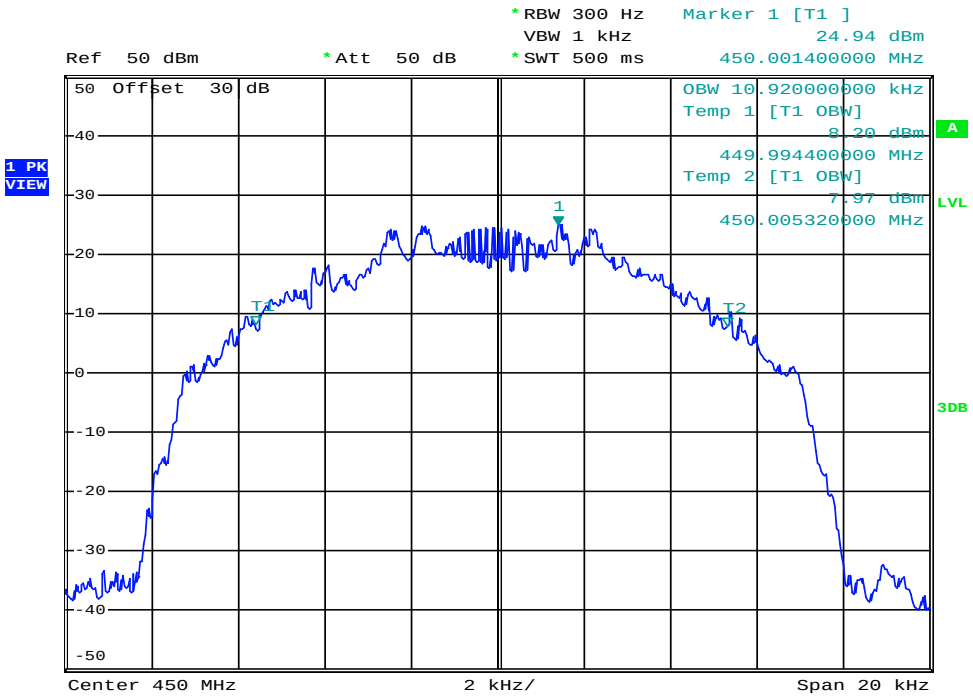

Date: 6.AUG.2019 13:44:48

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **10.80** kHz |

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**Plot 8.34 – OBW - 12.5kHz BW – 32QAM – 450MHz**

## Occupied Bandwidth - Conducted



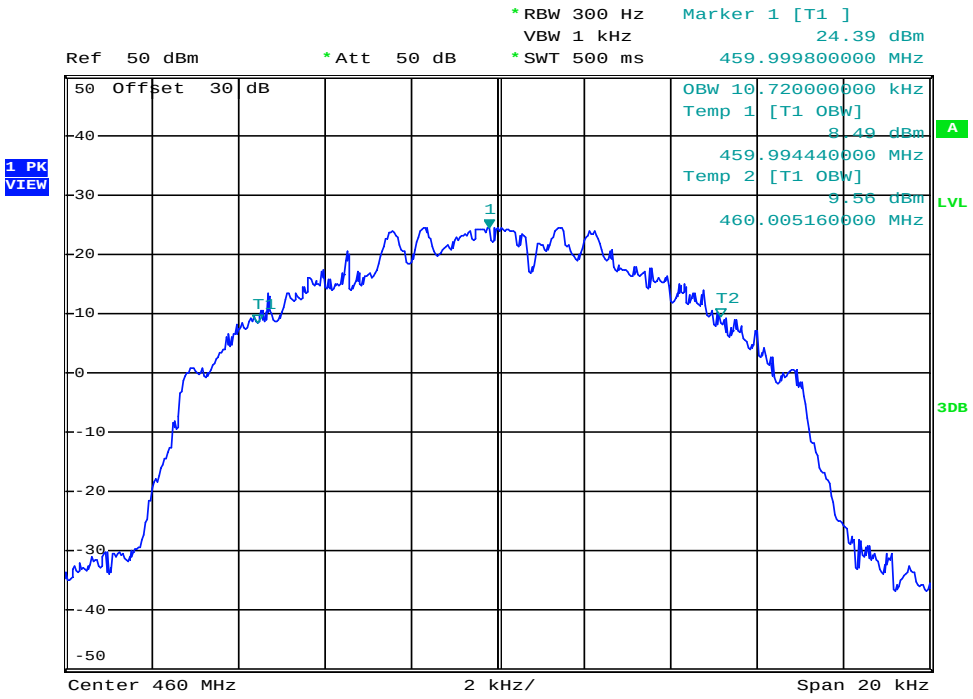

Date: 6.AUG.2019 13:45:33

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **10.92** kHz |

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**Plot 8.35 – OBW - 12.5kHz BW – 32QAM – 460MHz**

## Occupied Bandwidth - Conducted



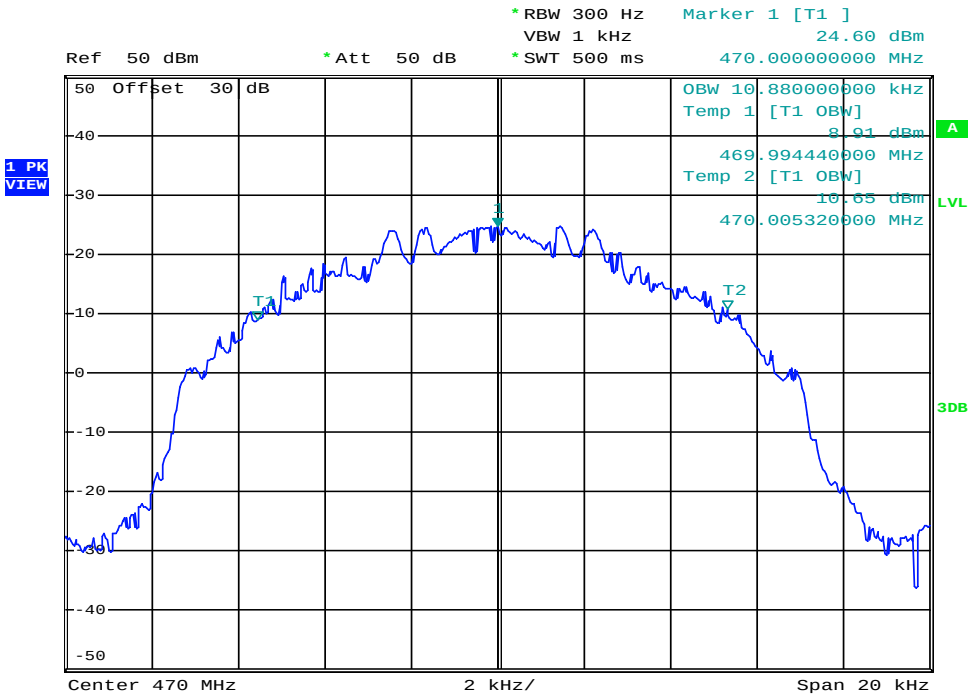

Date: 6.AUG.2019 13:46:39

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **10.72** kHz |

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**Plot 8.36 – OBW - 12.5kHz BW – 32QAM – 470MHz**

## Occupied Bandwidth - Conducted



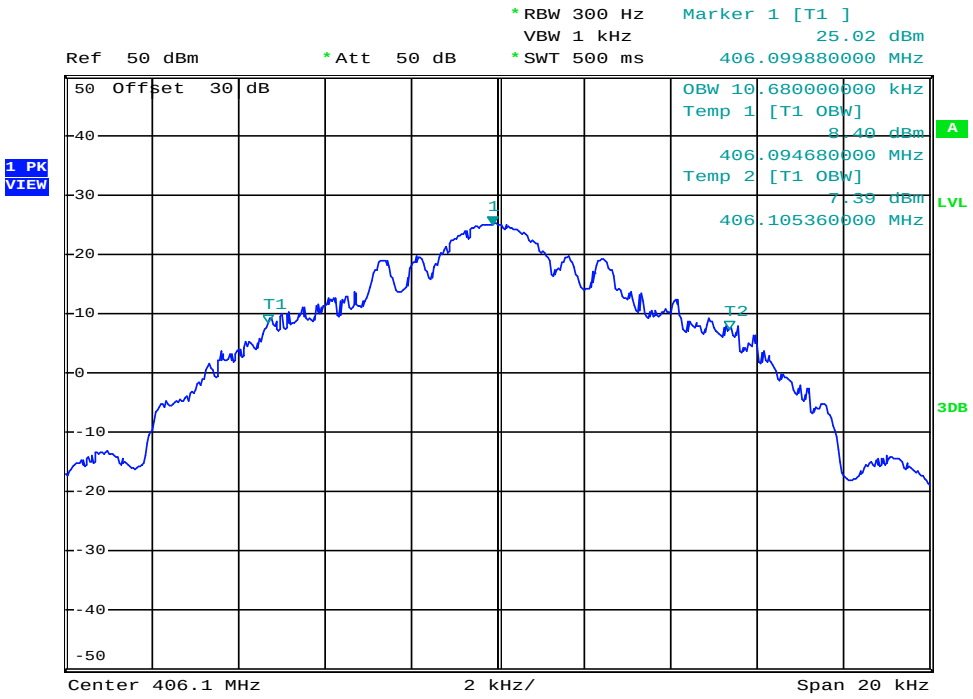

Date: 6.AUG.2019 13:47:47

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **10.88** kHz |

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**Plot 8.37 – OBW - 12.5kHz BW – 64QAM – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



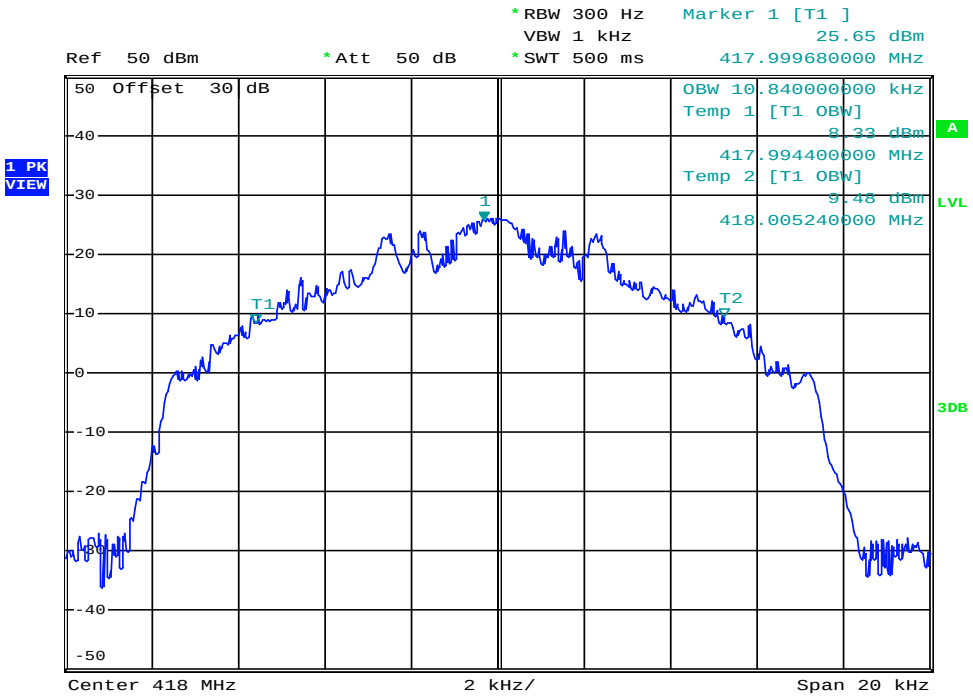

Date: 6.AUG.2019 13:51:37

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **10.68** kHz |

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**Plot 8.38 – OBW - 12.5kHz BW – 64QAM – 418MHz , ISED**

## Occupied Bandwidth - Conducted



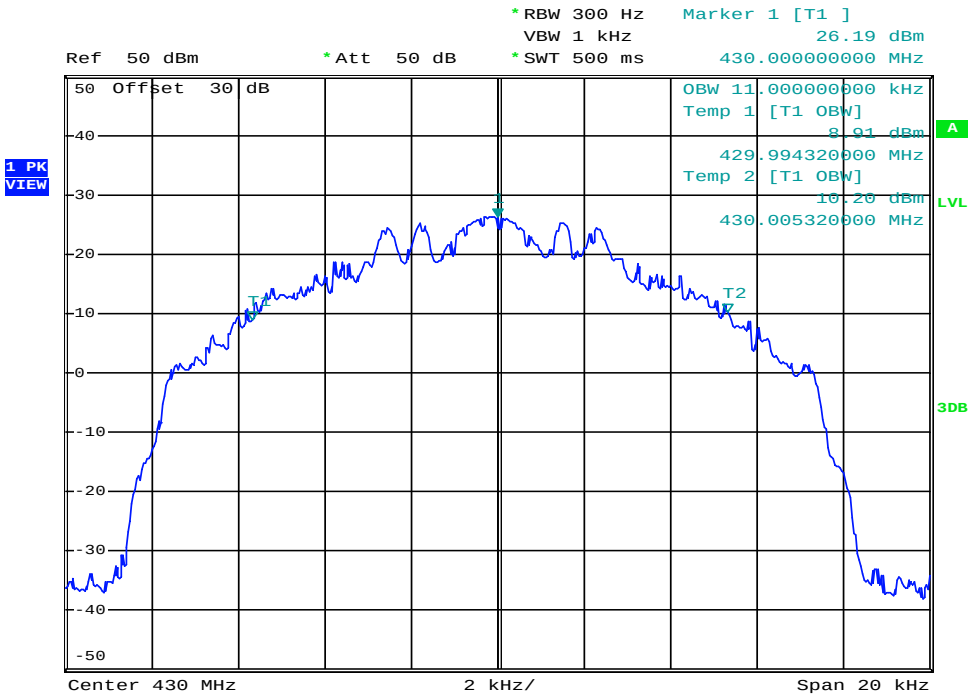

Date: 6.AUG.2019 13:54:30

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **10.84** kHz |

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**Plot 8.39 – OBW - 12.5kHz BW – 64QAM – 430MHz , ISED**

## Occupied Bandwidth - Conducted



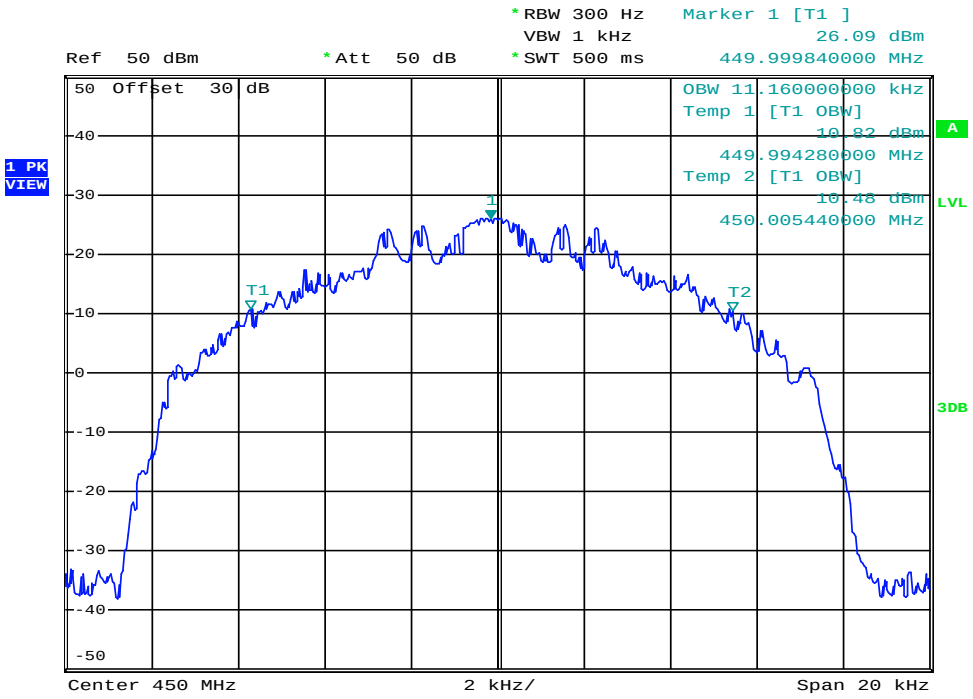

Date: 6.AUG.2019 13:55:38

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **11.00** kHz |

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**Plot 8.40 – OBW - 12.5kHz BW – 64QAM – 450MHz**

## Occupied Bandwidth - Conducted



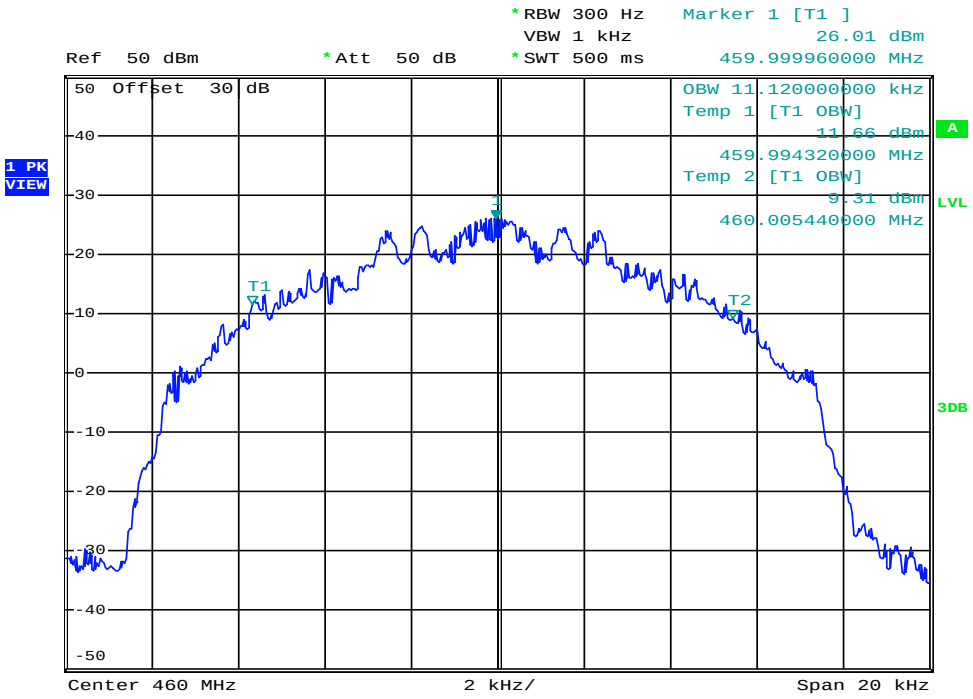

Date: 6.AUG.2019 13:56:36

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **11.16** kHz |

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**Plot 8.41 – OBW - 12.5kHz BW – 64QAM – 460MHz**

## Occupied Bandwidth - Conducted



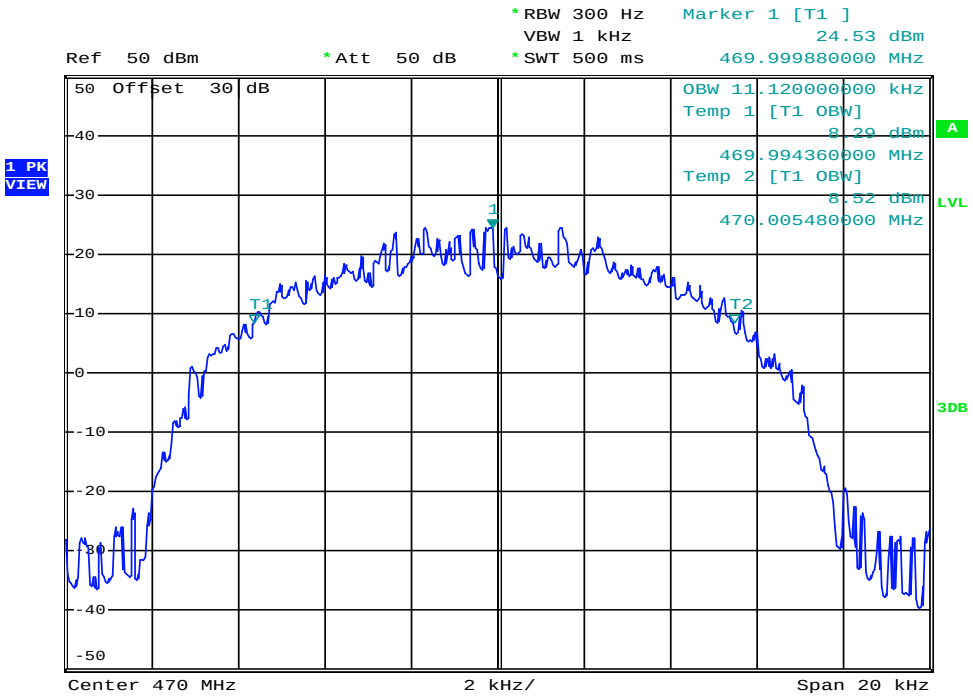

Date: 6.AUG.2019 13:57:41

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **11.12** kHz |

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**Plot 8.42 – OBW - 12.5kHz BW – 64QAM – 470MHz**

## Occupied Bandwidth - Conducted



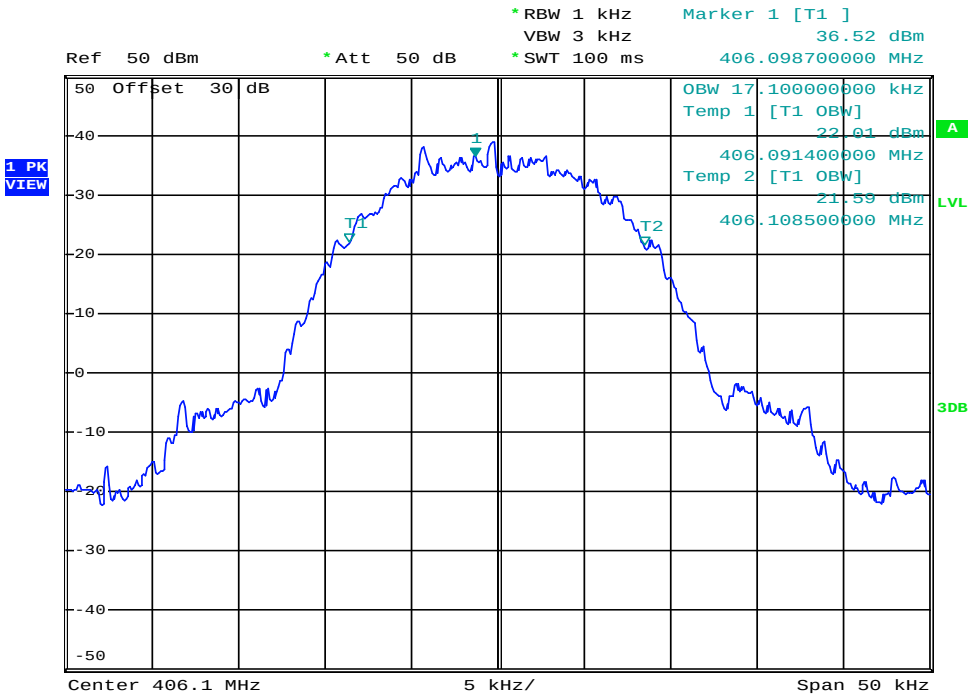

Date: 6.AUG.2019 13:39:13

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **12.50** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **11.12** kHz |

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**Plot 8.43 – OBW - 25kHz BW – MSK – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



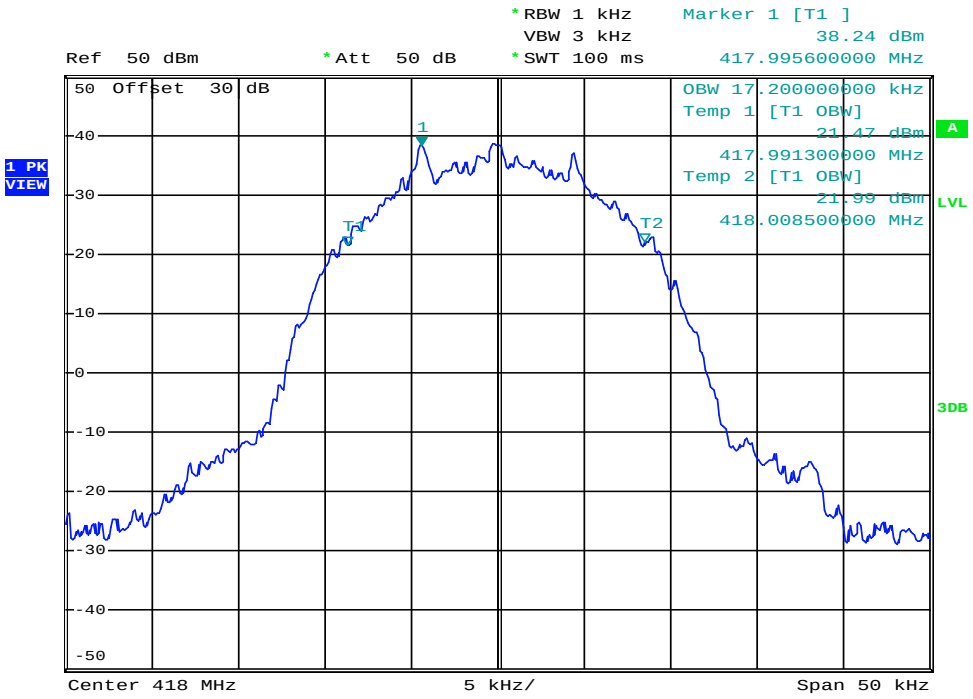

Date: 6.AUG.2019 14:30:11

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **17.10** kHz |

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**Plot 8.44 – OBW - 25kHz BW – MSK – 418MHz , ISED**

## Occupied Bandwidth - Conducted



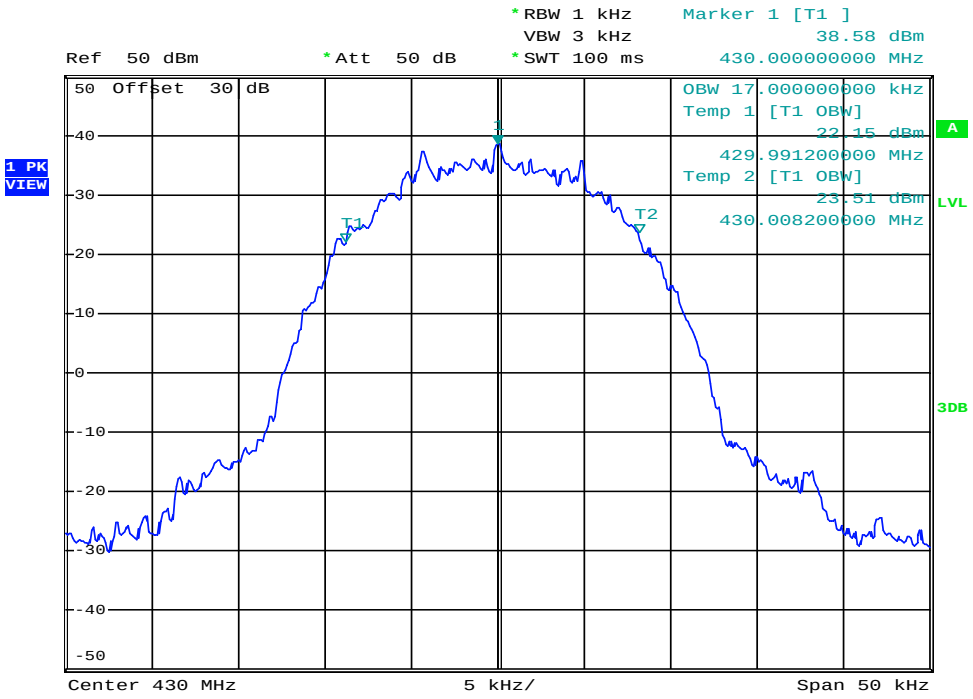

Date: 6.AUG.2019 15:16:33

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **25.00** kHz | **100** % |
| Modulation Setting: | Channel Power Setting: | Measured OBW: |
| **MSK** | **Max** dBm | **17.20** kHz |

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**Plot 8.45 – OBW - 25kHz BW – MSK – 430MHz , ISED**

## Occupied Bandwidth - Conducted



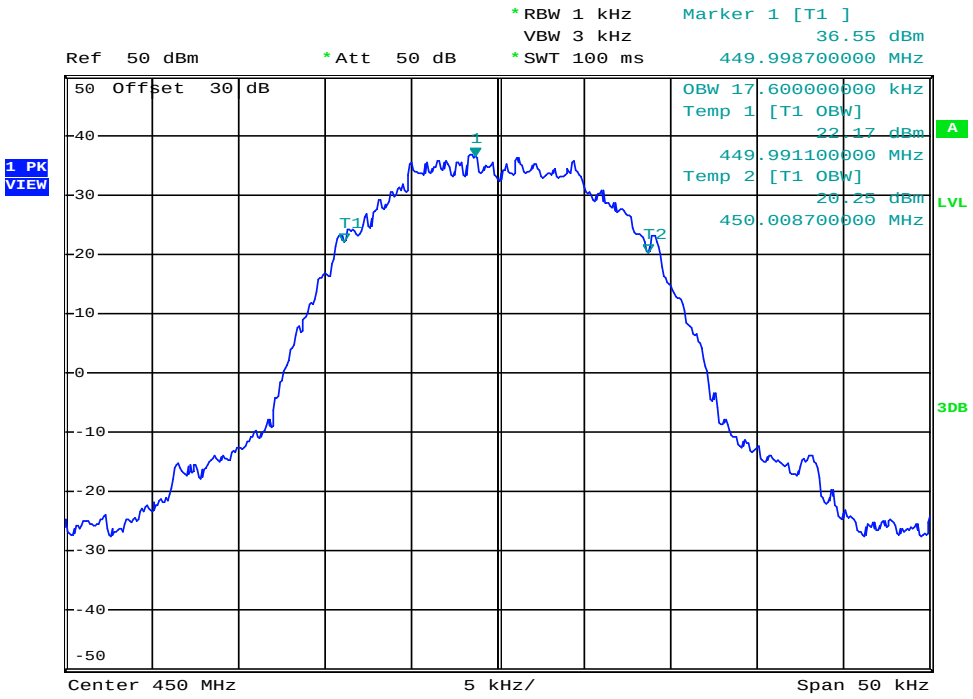

Date: 6.AUG.2019 15:17:34

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **17.00** kHz |

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**Plot 8.46 – OBW - 25kHz BW – MSK – 450MHz**

## Occupied Bandwidth - Conducted



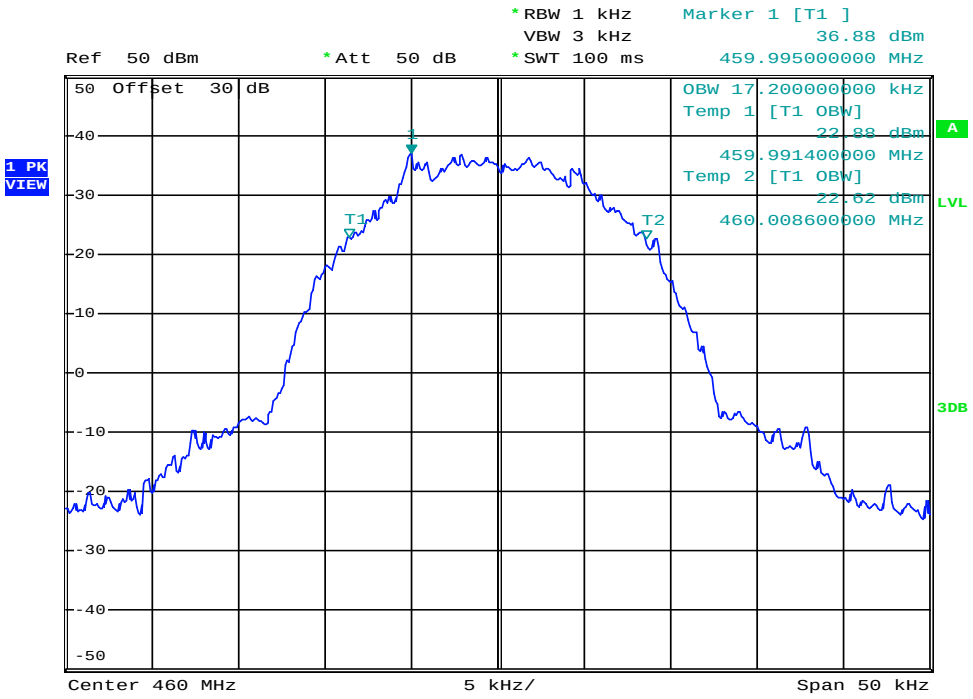

Date: 6.AUG.2019 15:18:18

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **17.60** kHz |

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**Plot 8.47 – OBW - 25kHz BW – MSK – 460MHz**

## Occupied Bandwidth - Conducted



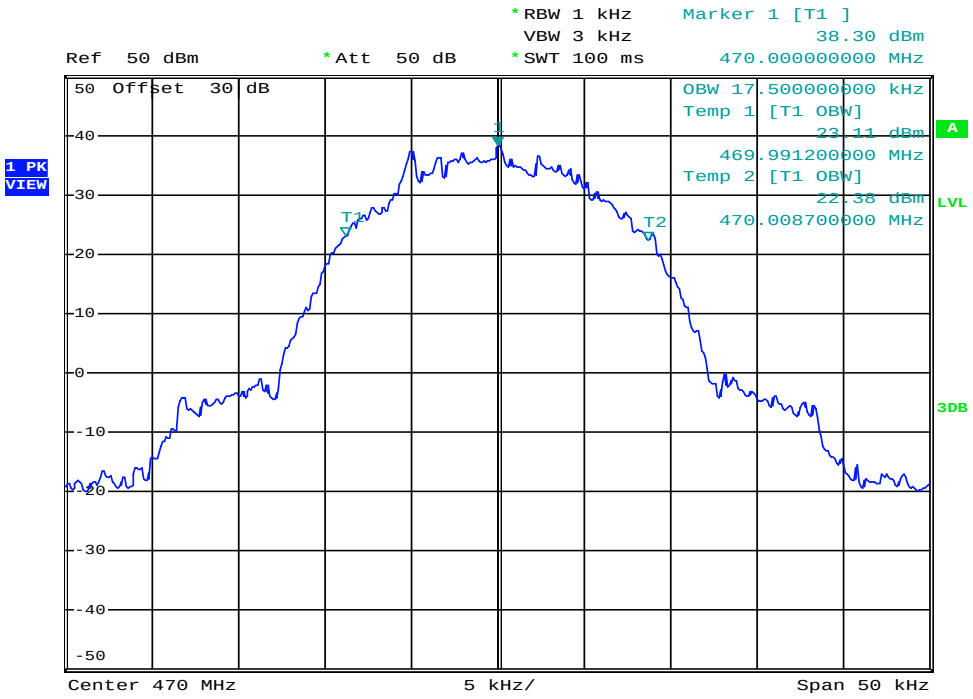

Date: 6.AUG.2019 15:19:01

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **17.20** kHz |

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**Plot 8.48 – OBW - 25kHz BW – MSK – 470MHz**

## Occupied Bandwidth - Conducted



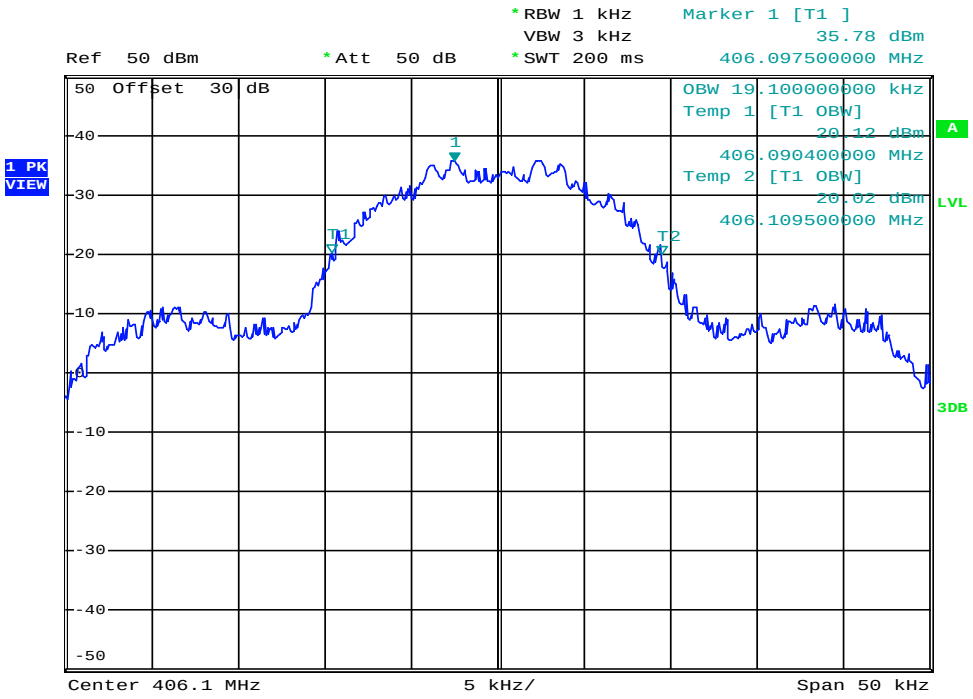

Date: 6.AUG.2019 15:19:45

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **17.00** kHz |

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**Plot 8.49 – OBW - 25kHz BW – 8PSK – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



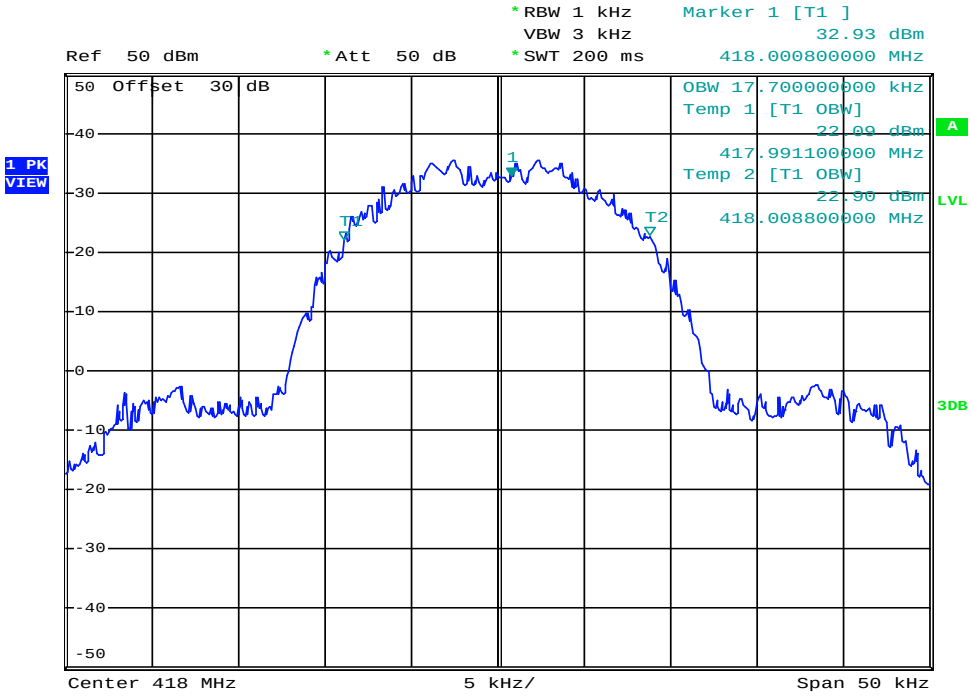

Date: 6.AUG.2019 15:30:10

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **19.10** kHz |

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**Plot 8.50 – OBW - 25kHz BW – 8PSK – 418MHz , ISED**

## Occupied Bandwidth - Conducted



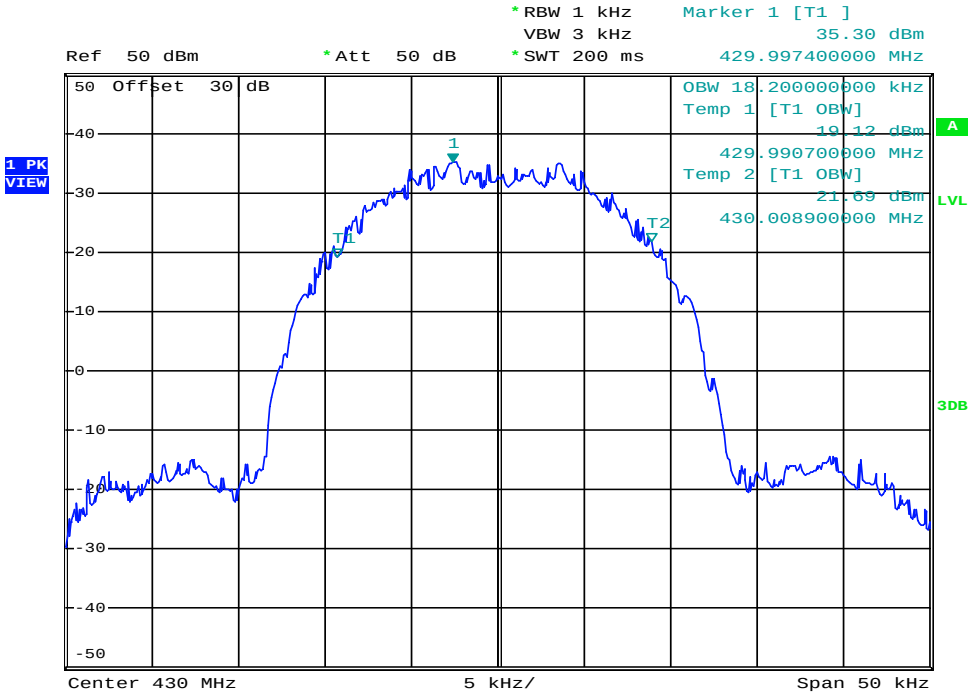

Date: 6.AUG.2019 15:29:08

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **17.70** kHz |

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**Plot 8.51 – OBW - 25kHz BW – 8PSK – 430MHz , ISED**

## Occupied Bandwidth - Conducted



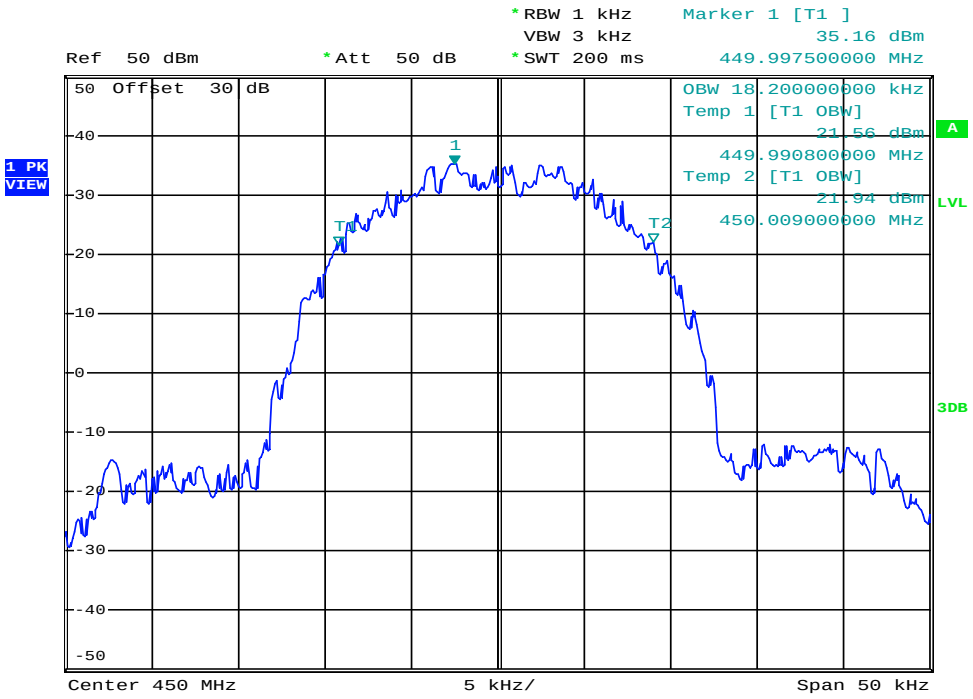

Date: 6.AUG.2019 15:31:07

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **18.20** kHz |

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**Plot 8.52 – OBW - 25kHz BW – 8PSK – 450MHz**

## Occupied Bandwidth - Conducted



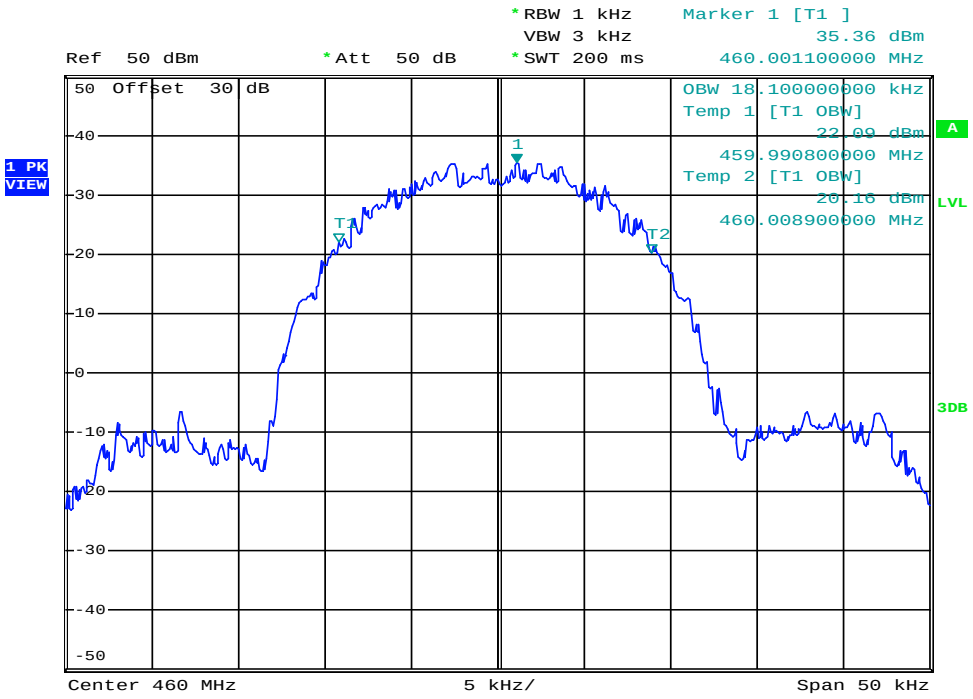

Date: 6.AUG.2019 15:31:48

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **18.20** kHz |

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**Plot 8.53 – OBW - 25kHz BW – 8PSK – 460MHz**

## Occupied Bandwidth - Conducted



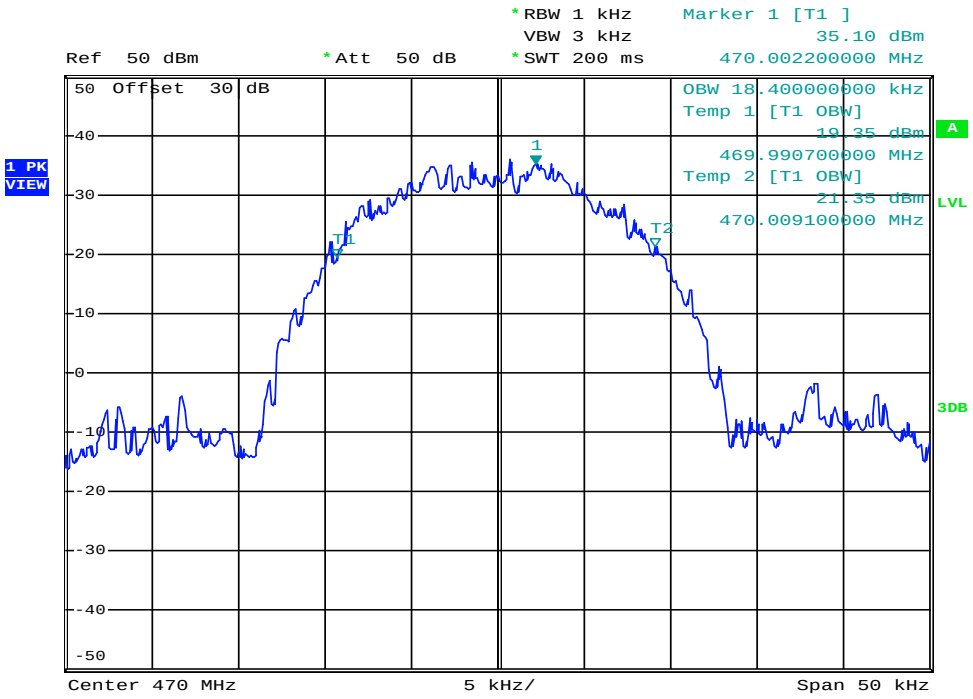

Date: 6.AUG.2019 15:32:31

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **18.10** kHz |

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**Plot 8.54 – OBW - 25kHz BW – 8PSK – 470MHz**

## Occupied Bandwidth - Conducted



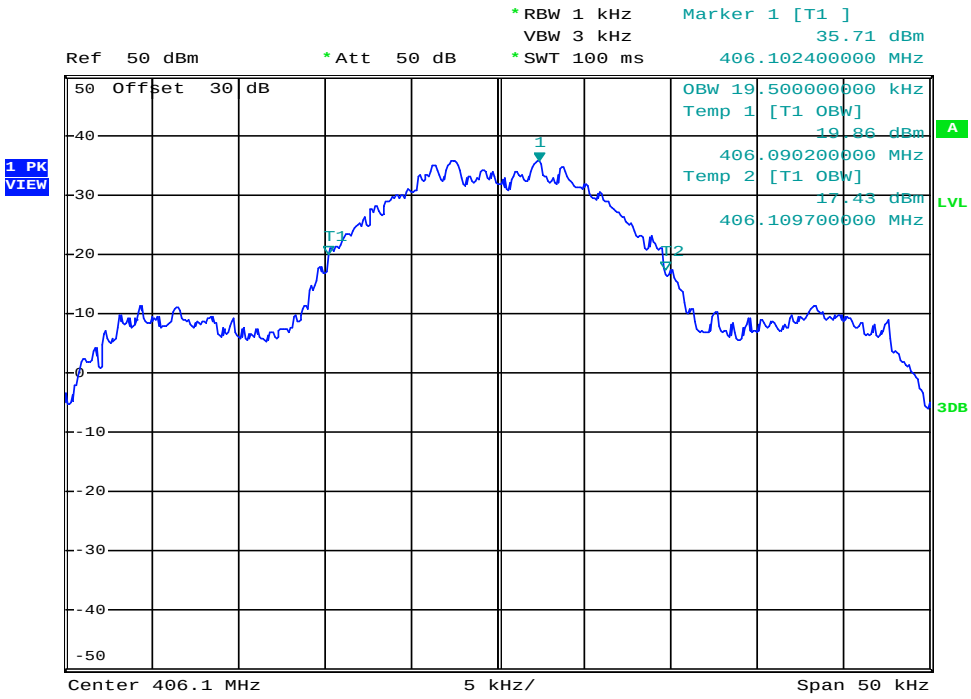

Date: 6.AUG.2019 15:33:38

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **18.40** kHz |

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**Plot 8.55 – OBW - 25kHz BW – QPSK – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



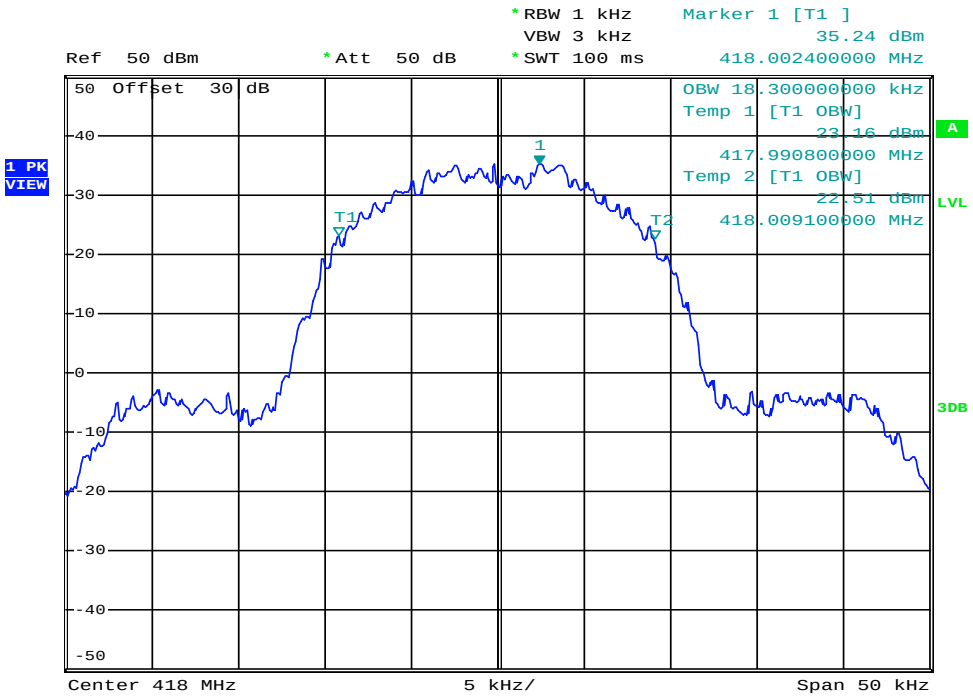

Date: 6.AUG.2019 15:21:40

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **19.50** kHz |

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**Plot 8.56 – OBW - 25kHz BW – QPSK – 418MHz , ISED**

## Occupied Bandwidth - Conducted



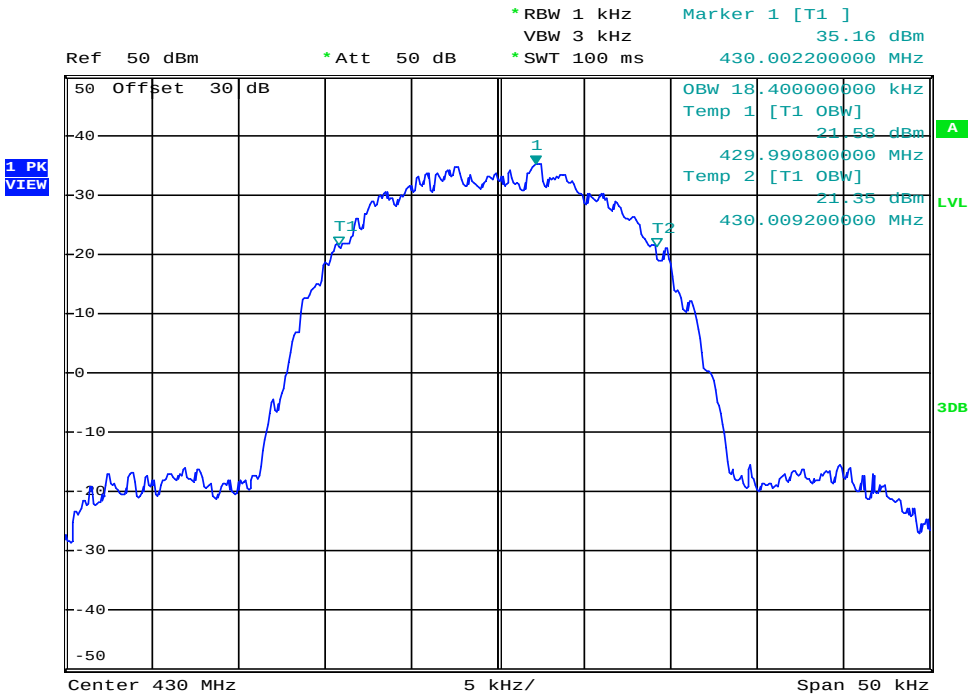

Date: 6.AUG.2019 15:22:29

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **18.30** kHz |

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**Plot 8.57 – OBW - 25kHz BW – QPSK – 430MHz , ISED**

## Occupied Bandwidth - Conducted



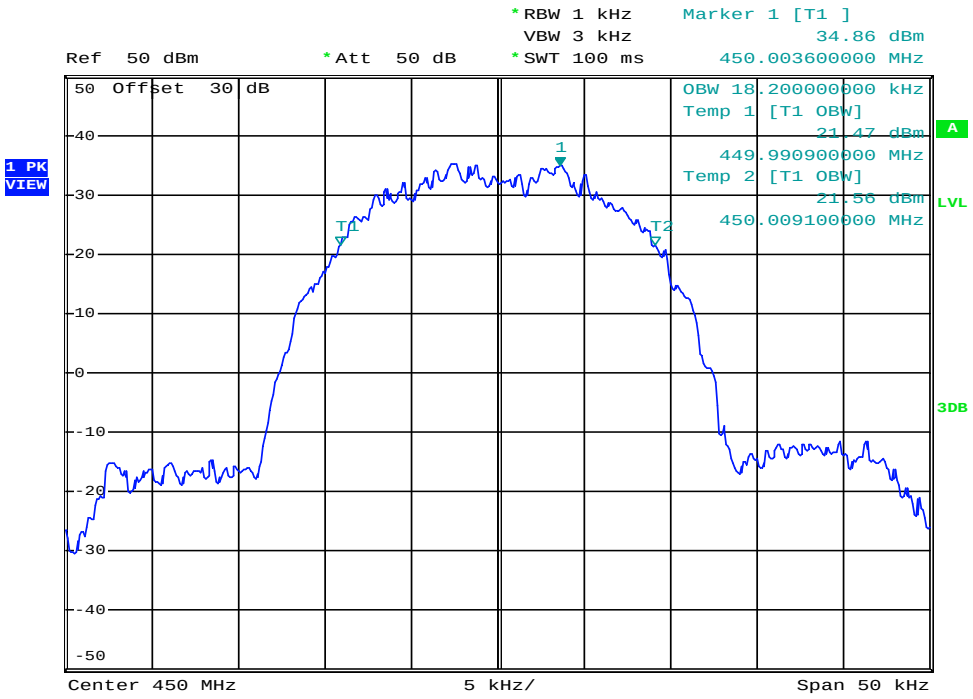

Date: 6.AUG.2019 15:23:16

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **18.40** kHz |

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**Plot 8.58 – OBW - 25kHz BW – QPSK – 450MHz**

## Occupied Bandwidth - Conducted



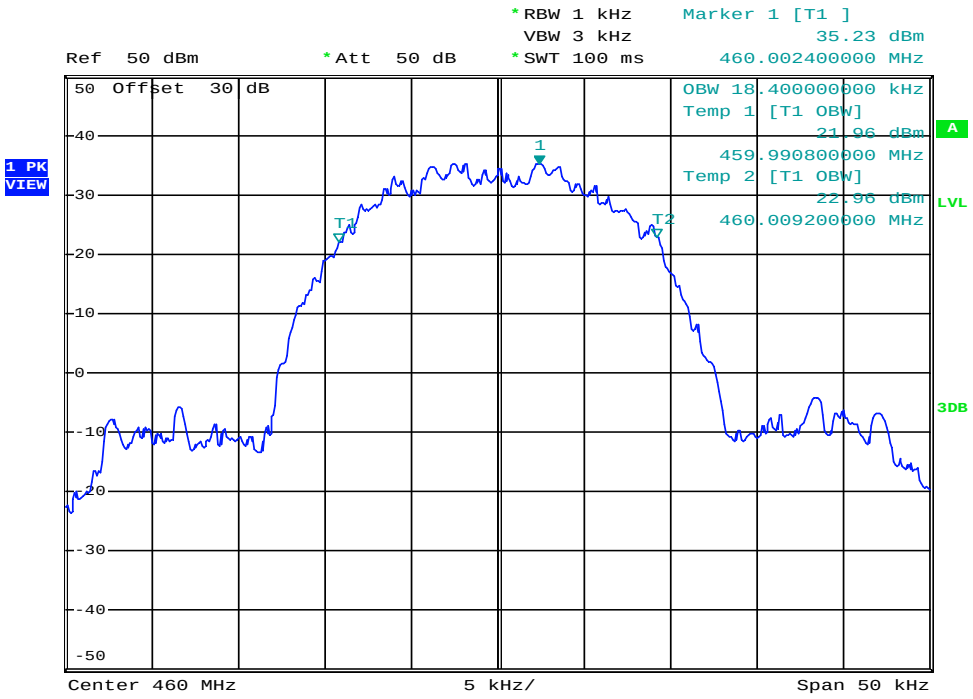

Date: 6.AUG.2019 15:24:03

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **18.20** kHz |

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**Plot 8.59 – OBW - 25kHz BW – QPSK – 460MHz**

## Occupied Bandwidth - Conducted



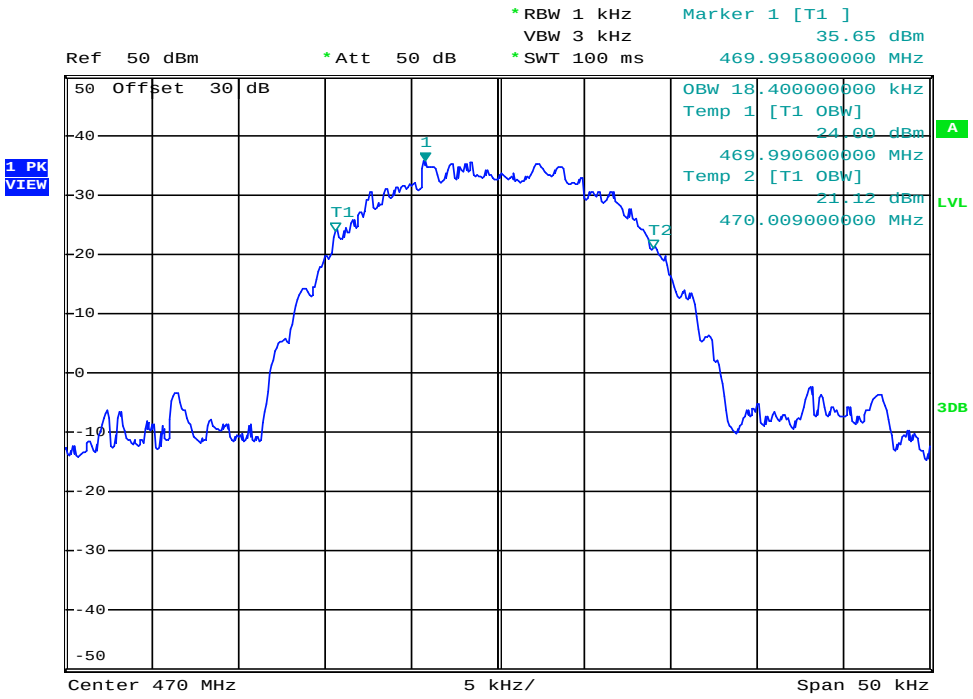

Date: 6.AUG.2019 15:24:52

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **18.40** kHz |

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**Plot 8.60 – OBW - 25kHz BW – QPSK – 470MHz**

## Occupied Bandwidth - Conducted



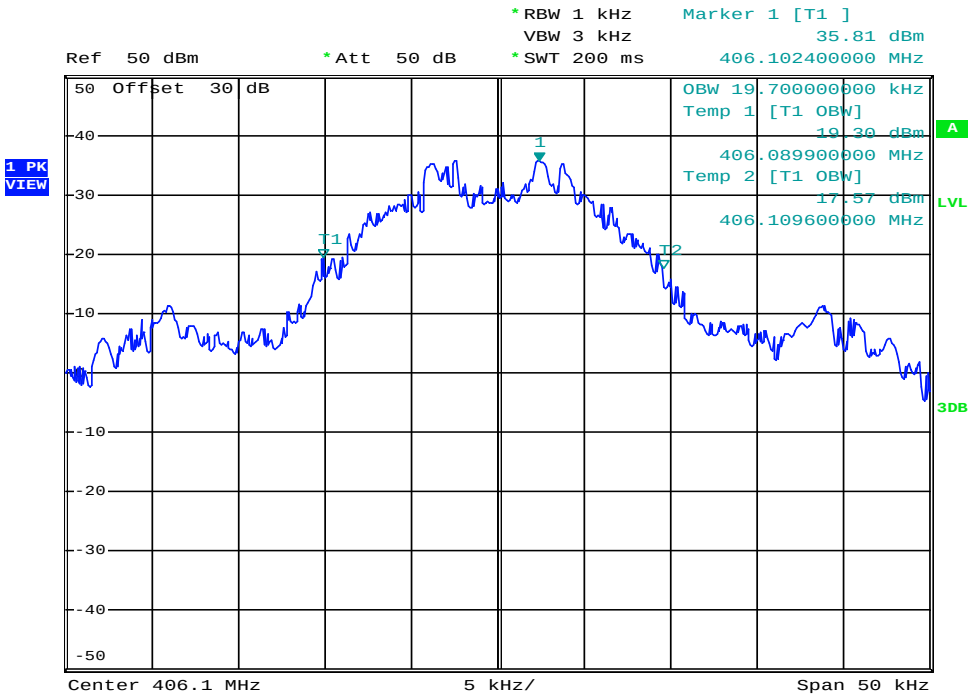

Date: 6.AUG.2019 15:25:34

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **18.40** kHz |

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**Plot 8.61 – OBW - 25kHz BW – 16QAM – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



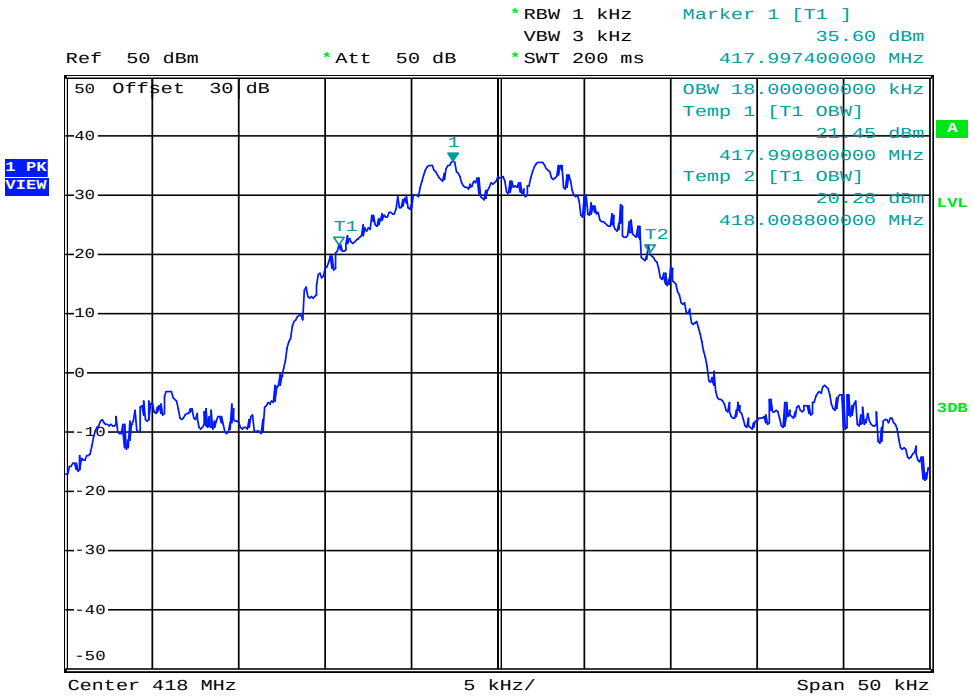

Date: 6.AUG.2019 15:35:20

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **19.70** kHz |

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**Plot 8.62 – OBW - 25kHz BW – 16QAM – 418MHz , ISED**

## Occupied Bandwidth - Conducted



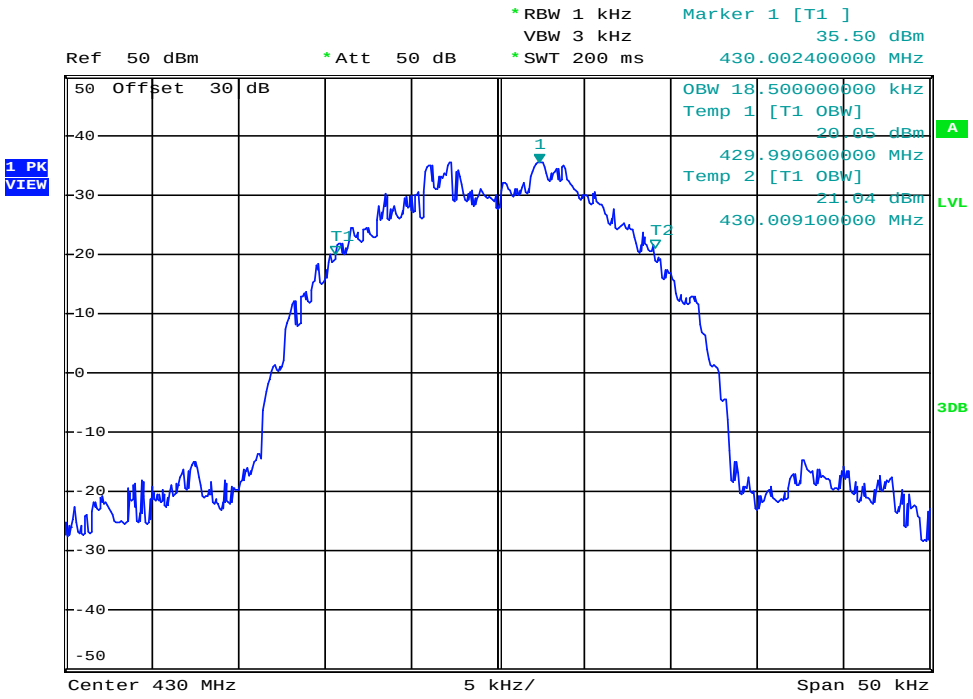

Date: 6.AUG.2019 15:36:10

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **18.00** kHz |

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**Plot 8.63 – OBW - 25kHz BW – 16QAM – 430MHz , ISED**

## Occupied Bandwidth - Conducted



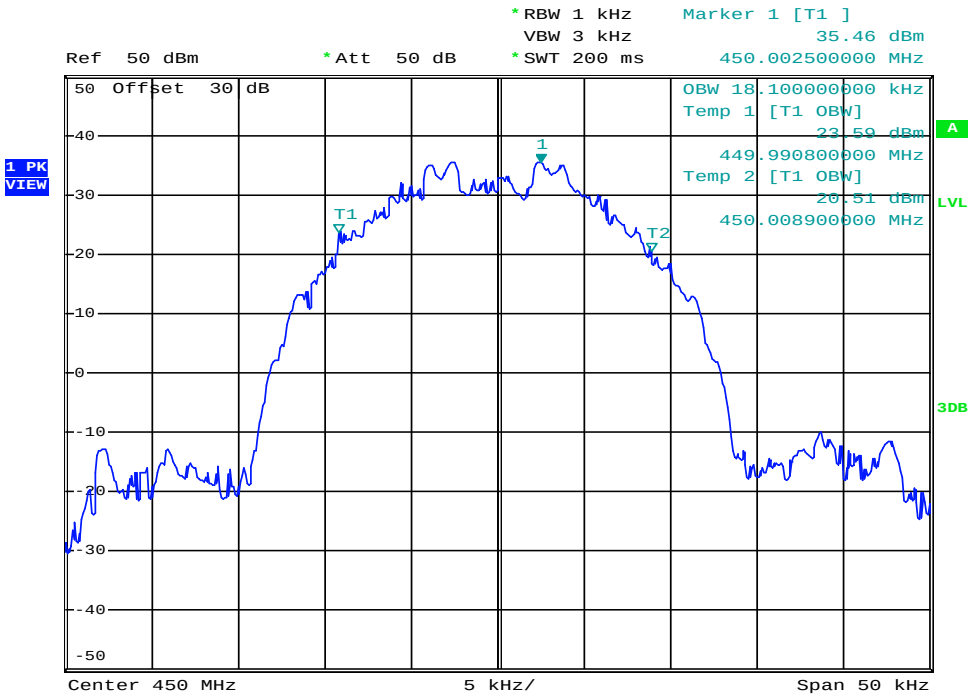

Date: 6.AUG.2019 15:36:50

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **18.50** kHz |

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**Plot 8.64 – OBW - 25kHz BW – 16QAM – 450MHz**

## Occupied Bandwidth - Conducted



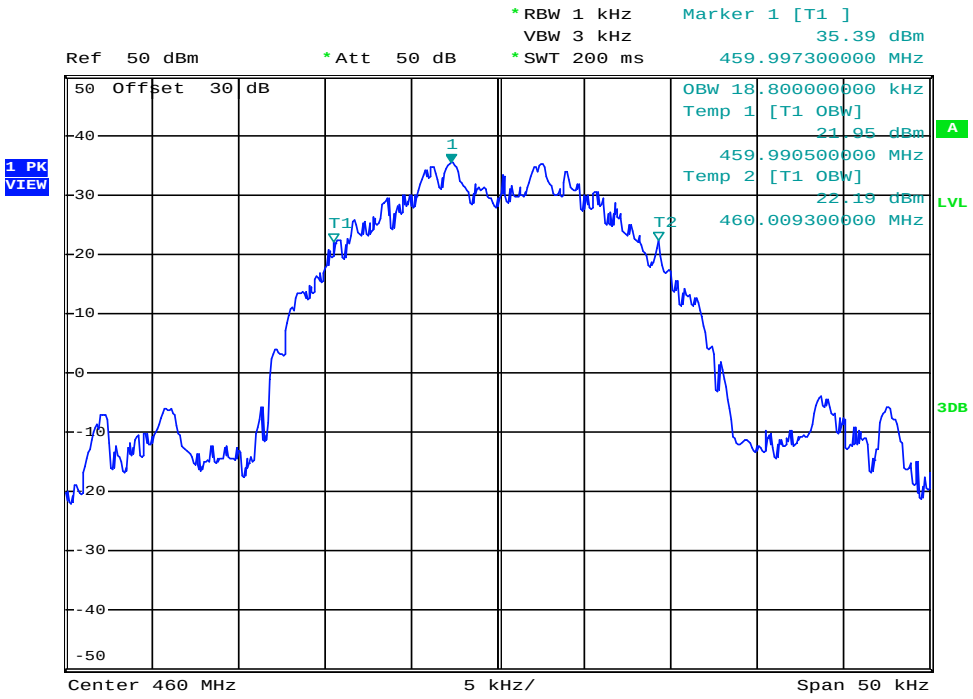

Date: 6.AUG.2019 15:37:37

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **18.10** kHz |

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**Plot 8.65 – OBW - 25kHz BW – 16QAM – 460MHz**

## Occupied Bandwidth - Conducted



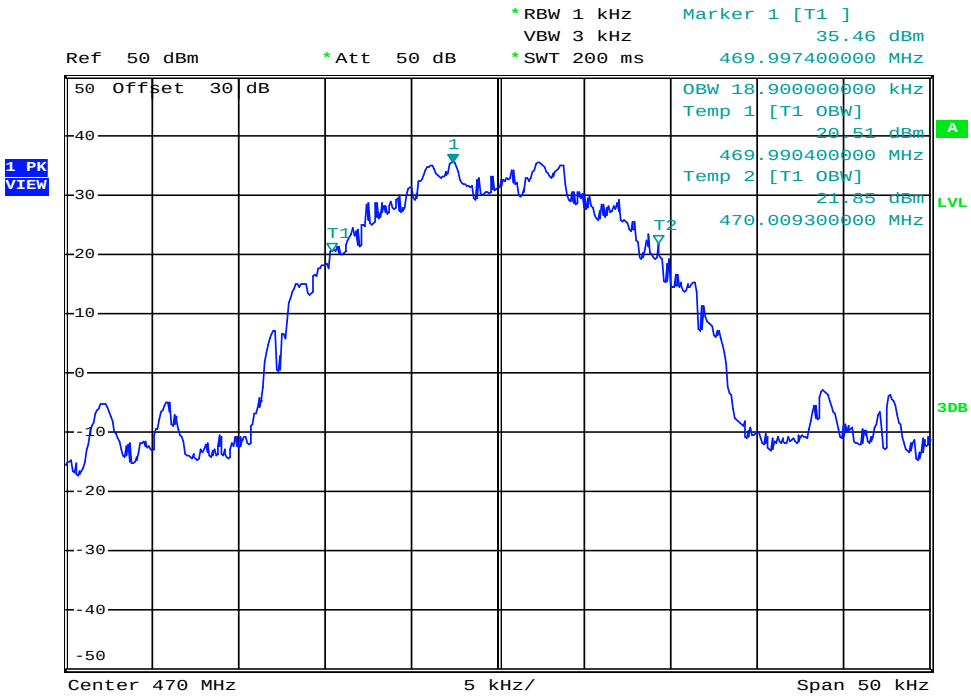

Date: 6.AUG.2019 15:38:24

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **18.80** kHz |

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**Plot 8.66 – OBW - 25kHz BW – 16QAM – 470MHz**

## Occupied Bandwidth - Conducted



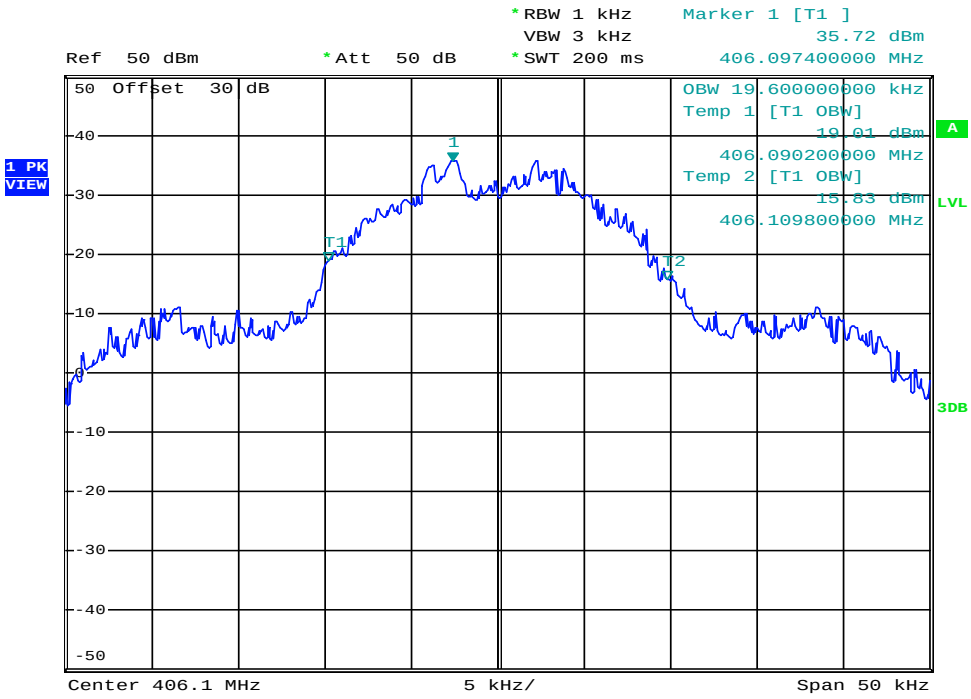

Date: 6.AUG.2019 15:40:12

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **18.90** kHz |

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**Plot 8.67 – OBW - 25kHz BW – 32QAM – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



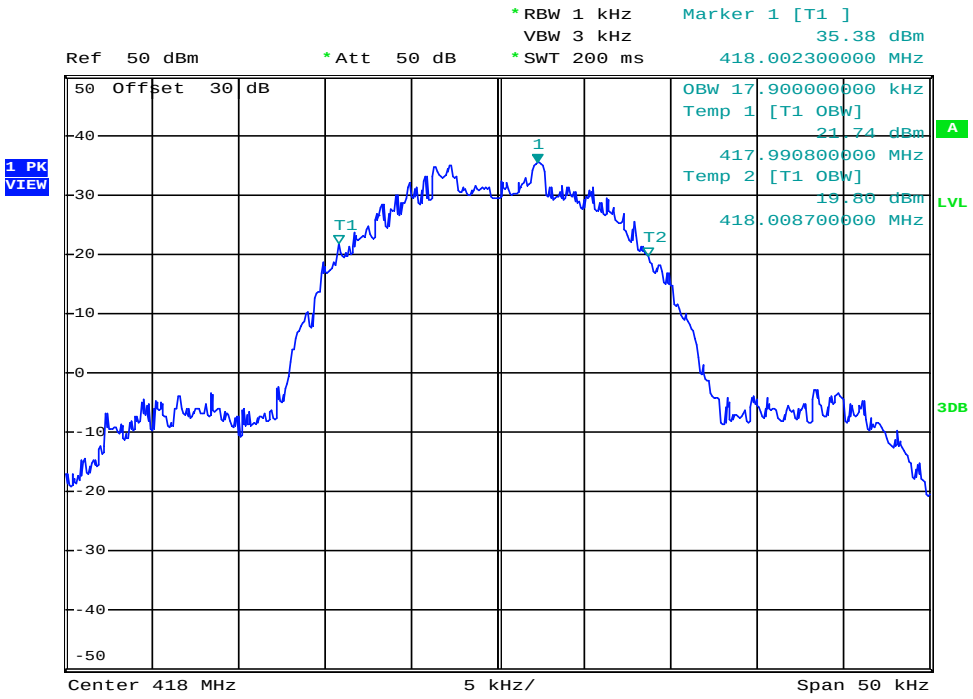

Date: 6.AUG.2019 15:41:16

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **19.60** kHz |

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**Plot 8.68 – OBW - 25kHz BW – 32QAM – 418MHz , ISED**

## Occupied Bandwidth - Conducted



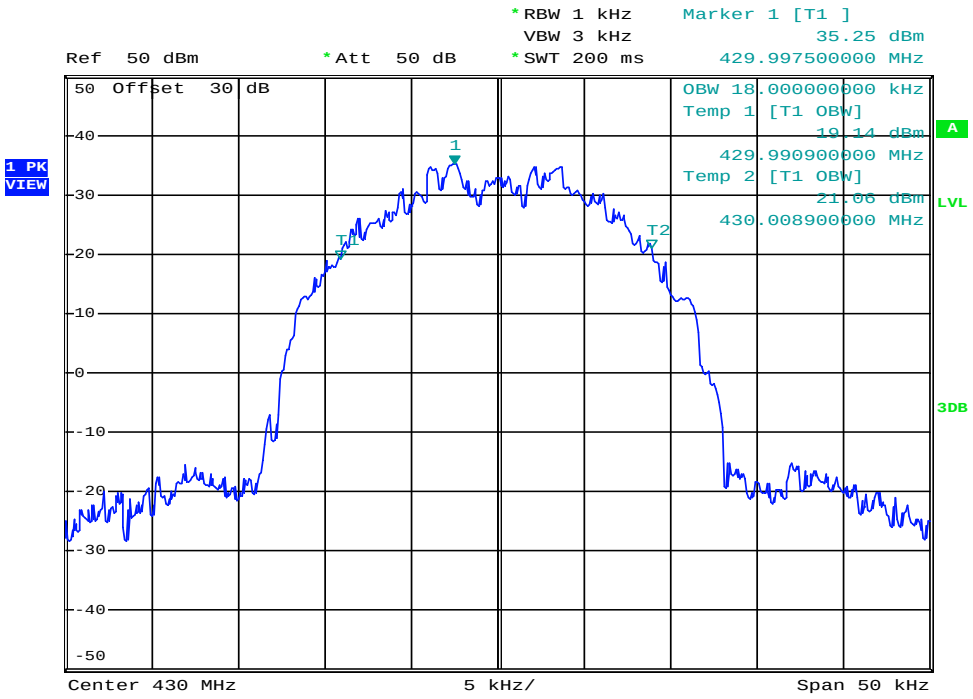

Date: 6.AUG.2019 15:41:59

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **17.90** kHz |

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**Plot 8.69 – OBW - 25kHz BW – 32QAM – 430MHz , ISED**

## Occupied Bandwidth - Conducted



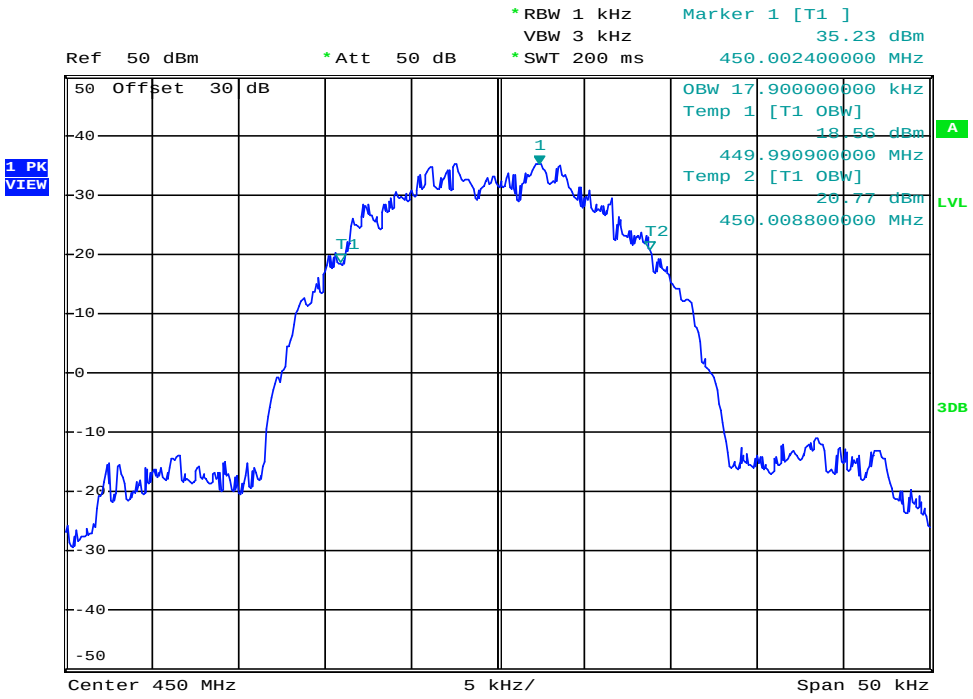

Date: 6.AUG.2019 15:42:39

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **18.00** kHz |

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**Plot 8.70 – OBW - 25kHz BW – 32QAM – 450MHz**

## Occupied Bandwidth - Conducted



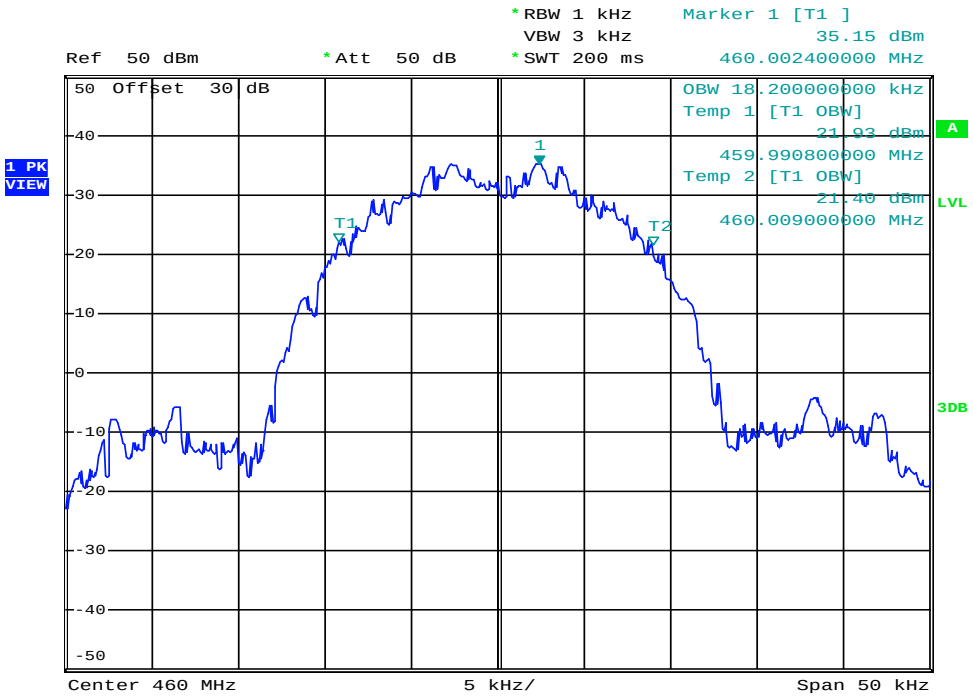

Date: 6.AUG.2019 15:43:25

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **17.90** kHz |

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**Plot 8.71 – OBW - 25kHz BW – 32QAM – 460MHz**

## Occupied Bandwidth - Conducted



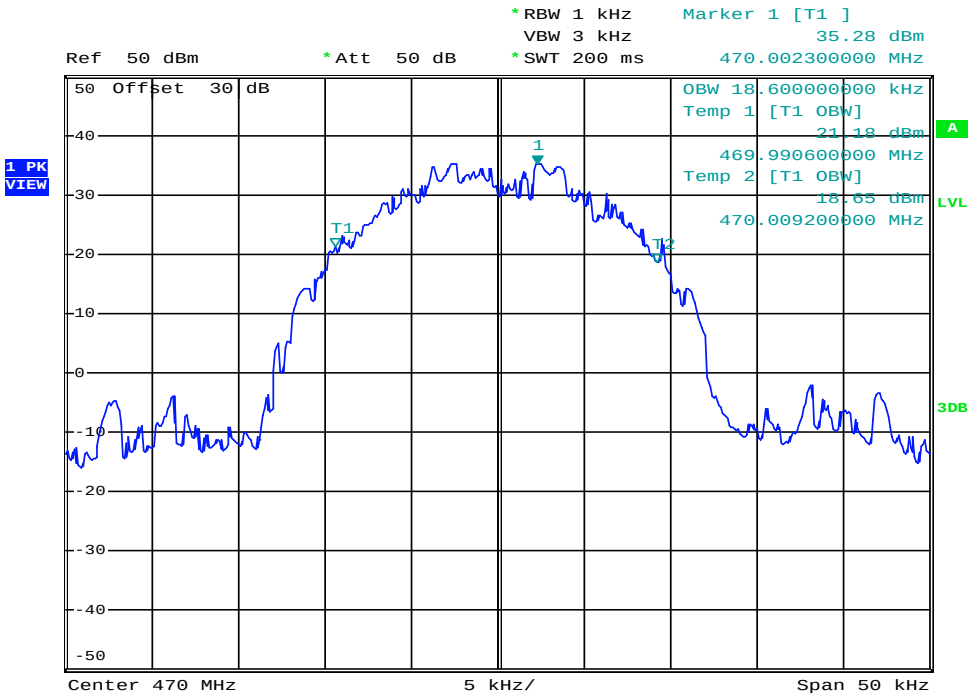

Date: 6.AUG.2019 15:44:04

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **18.20** kHz |

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**Plot 8.72 – OBW - 25kHz BW – 32QAM – 470MHz**

## Occupied Bandwidth - Conducted



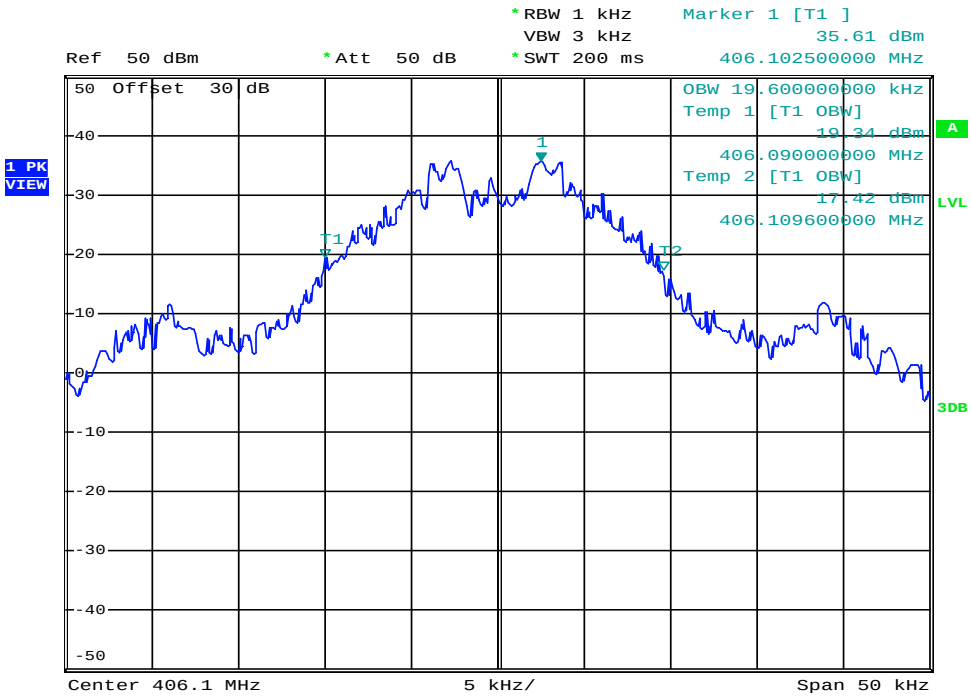

Date: 6.AUG.2019 15:45:31

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **18.60** kHz |

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**Plot 8.73 – OBW - 25kHz BW – 64QAM – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



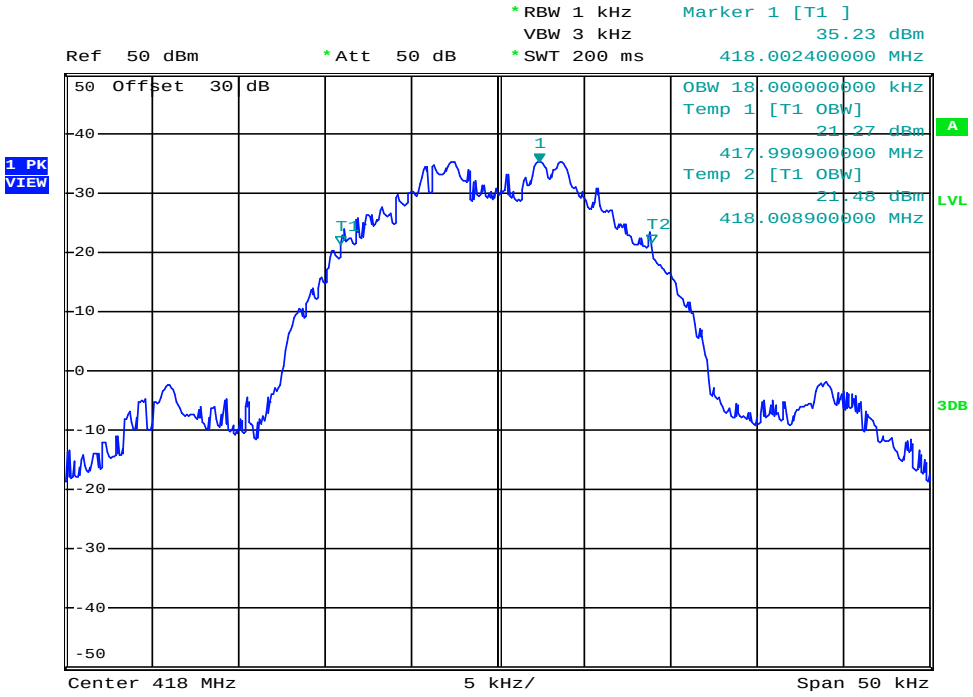

Date: 6.AUG.2019 15:46:54

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **19.60** kHz |

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**Plot 8.74 – OBW - 25kHz BW – 64QAM – 418MHz , ISED**

## Occupied Bandwidth - Conducted



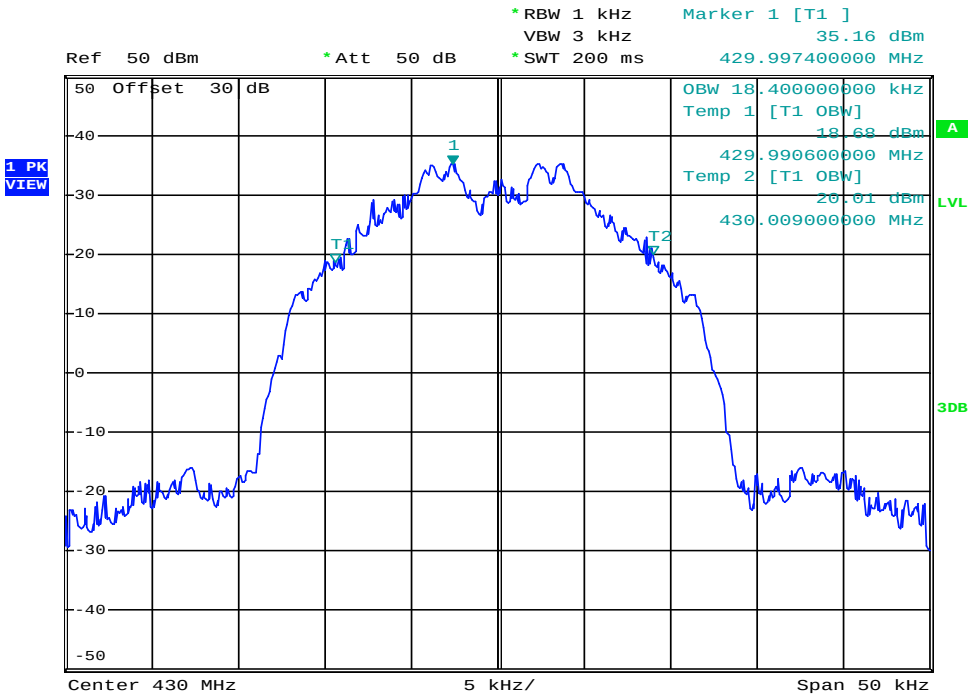

Date: 6.AUG.2019 15:47:41

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **18.00** kHz |

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**Plot 8.75 – OBW - 25kHz BW – 64QAM – 430MHz , ISED**

## Occupied Bandwidth - Conducted



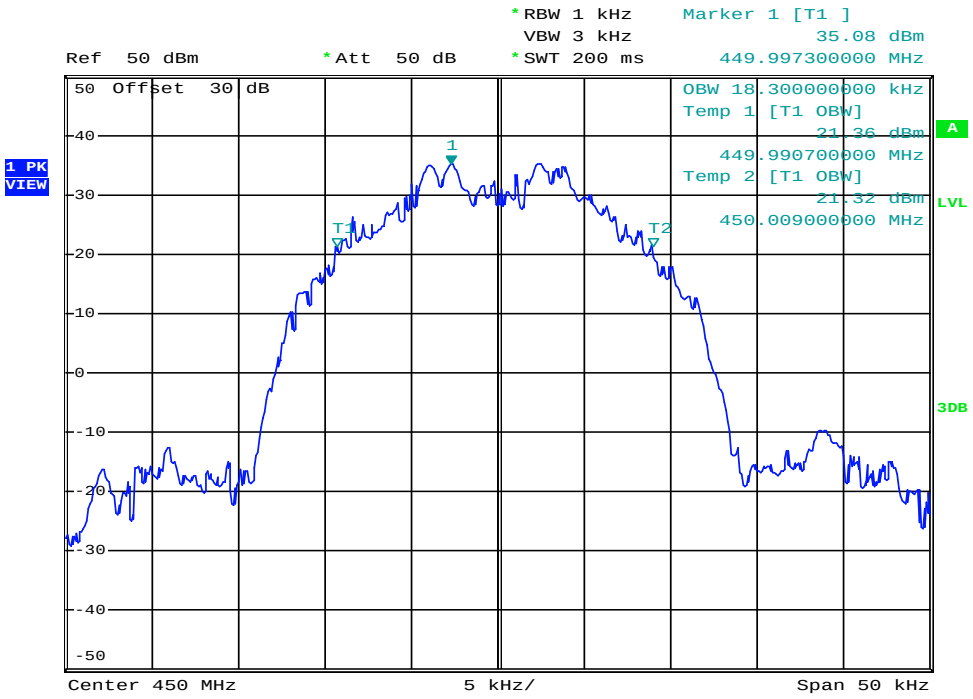

Date: 6.AUG.2019 15:48:21

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **18.40** kHz |

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**Plot 8.76 – OBW - 25kHz BW – 64QAM – 450MHz**

## Occupied Bandwidth - Conducted



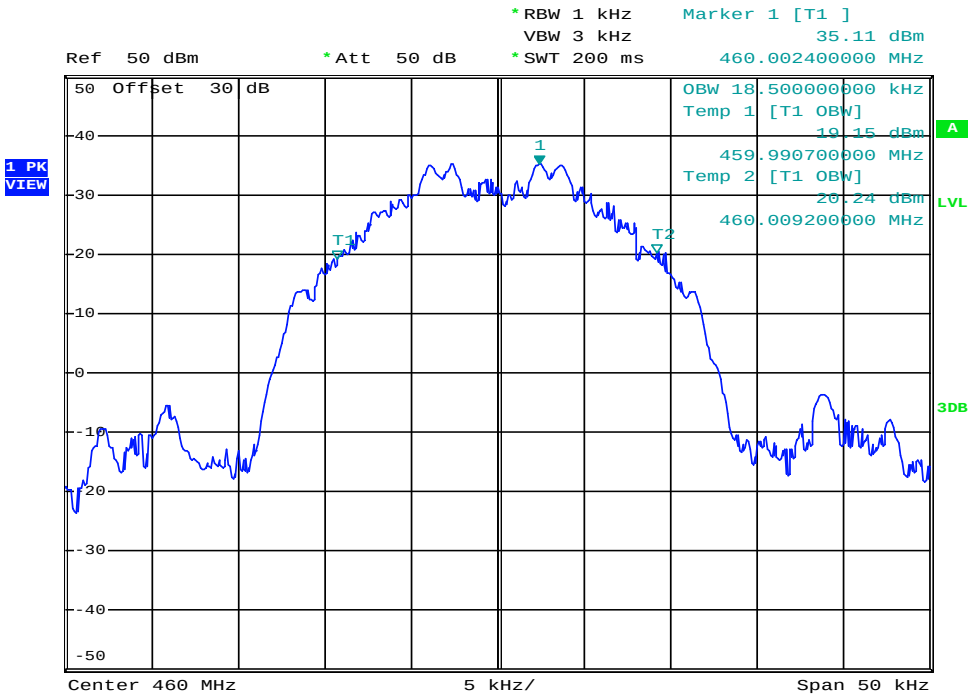

Date: 6.AUG.2019 15:49:10

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **18.30** kHz |

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**Plot 8.77 – OBW - 25kHz BW – 64QAM – 460MHz**

## Occupied Bandwidth - Conducted



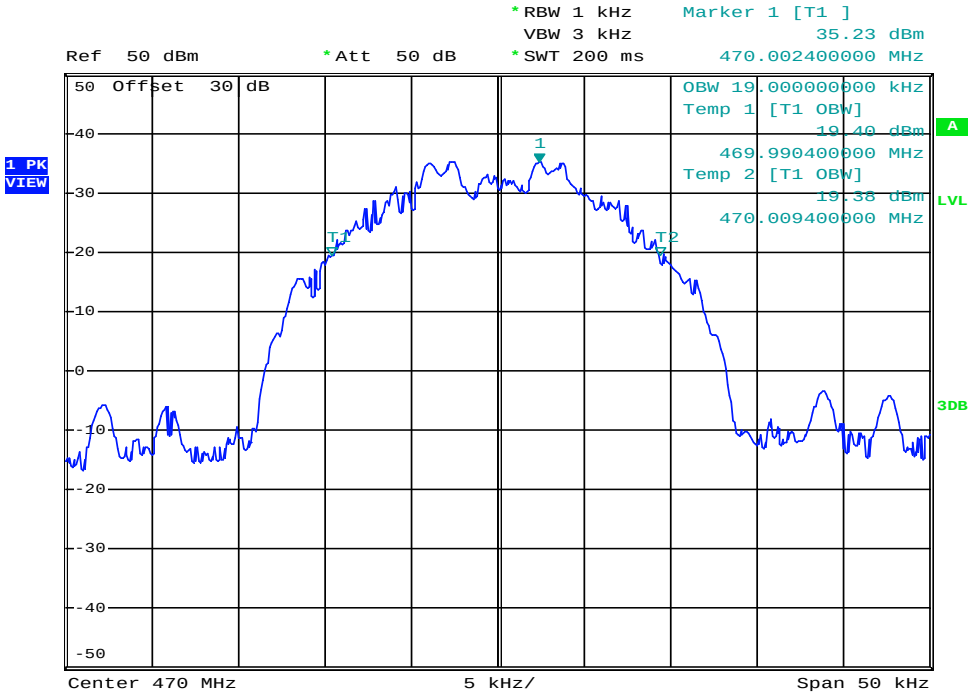

Date: 6.AUG.2019 15:49:56

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **18.50** kHz |

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**Plot 8.78 – OBW - 25kHz BW – 64QAM – 470MHz**

## Occupied Bandwidth - Conducted



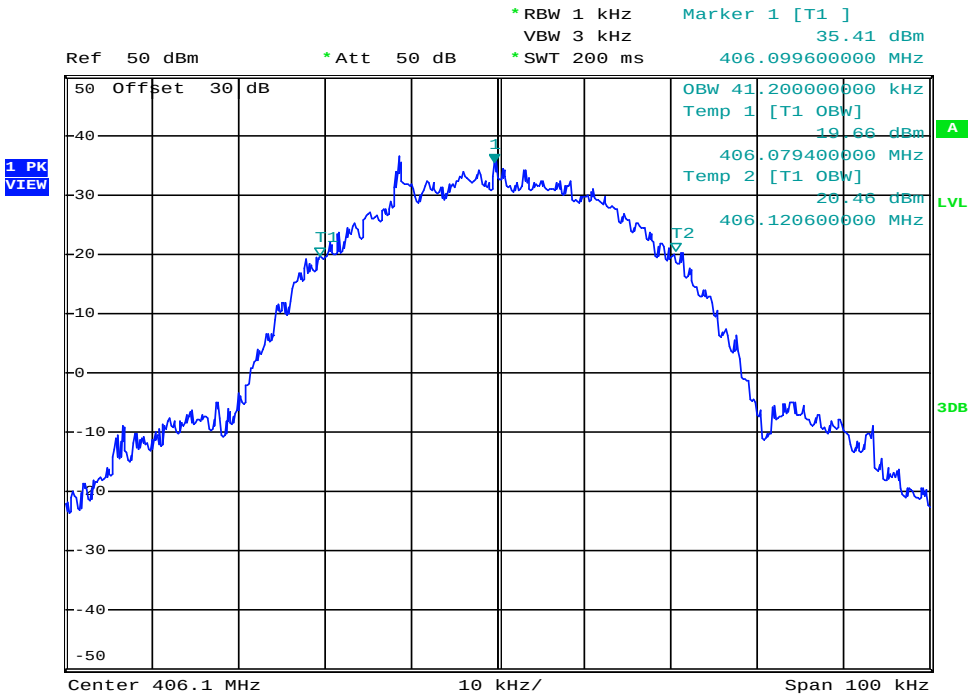

Date: 6.AUG.2019 15:50:47

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **25.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **19.00** kHz |

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**Plot 8.79 – OBW - 50kHz BW – MSK – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



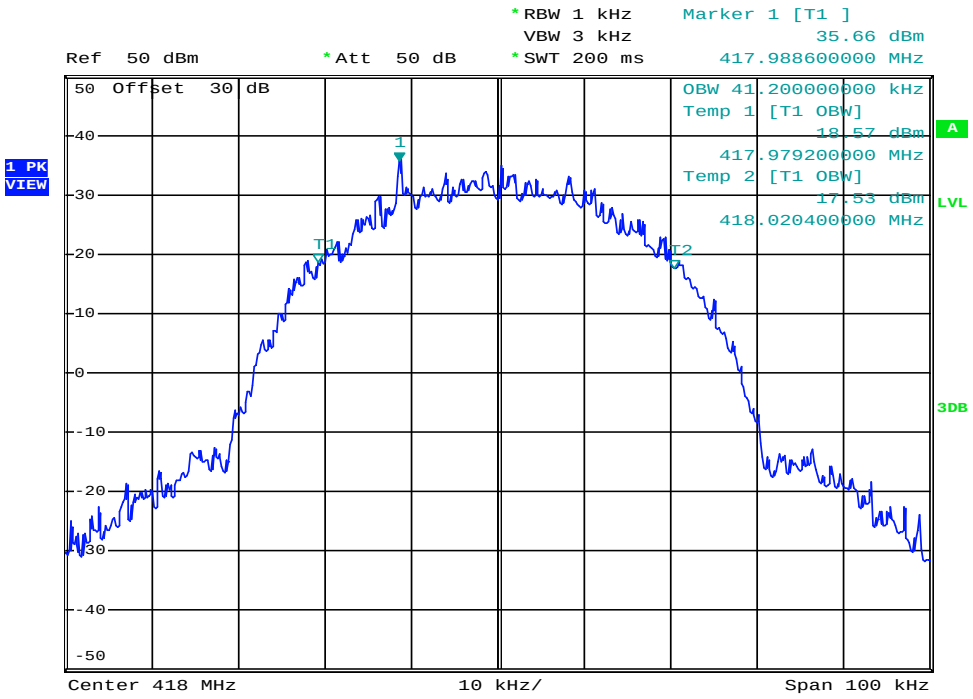

Date: 6.AUG.2019 16:08:08

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **41.20** kHz |

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**Plot 8.80 – OBW - 50kHz BW – MSK – 418MHz , ISED**

## Occupied Bandwidth - Conducted



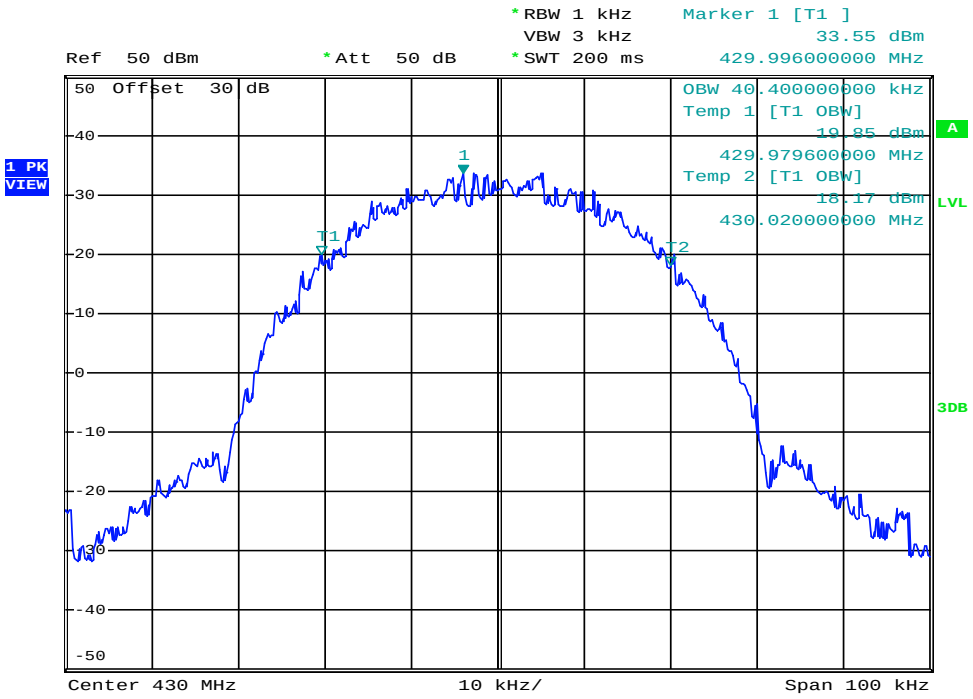

Date: 6.AUG.2019 16:09:04

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **50.00** kHz | **100** % |
| Modulation Setting: | Channel Power Setting: | Measured OBW: |
| **MSK** | **Max** dBm | **41.20** kHz |

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**Plot 8.81 – OBW - 50kHz BW – MSK – 430MHz , ISED**

## Occupied Bandwidth - Conducted



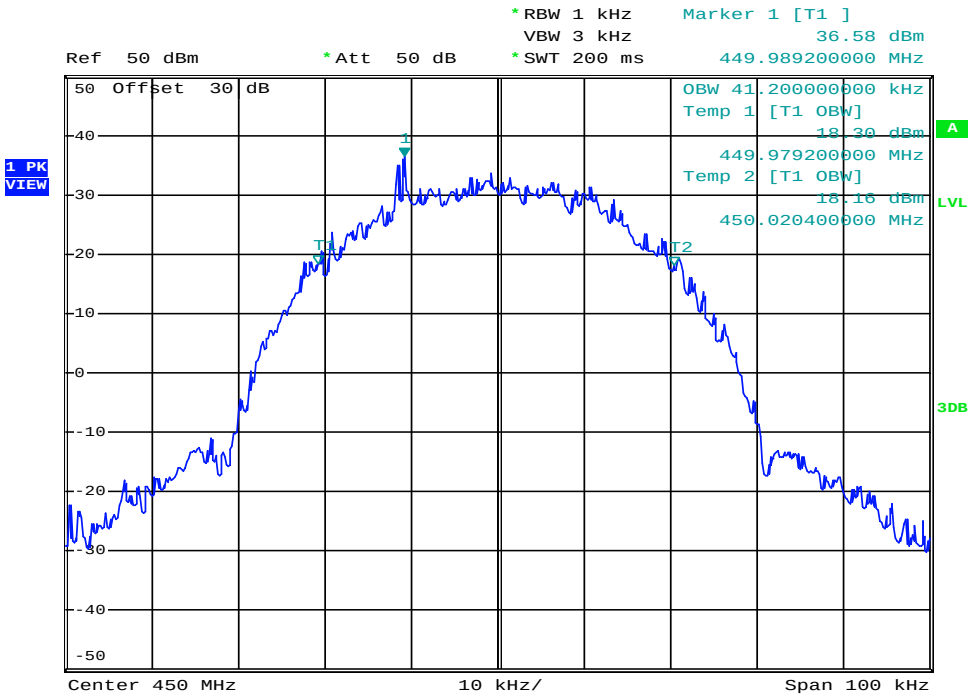

Date: 6.AUG.2019 16:09:48

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **40.40** kHz |

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**Plot 8.82 – OBW - 50kHz BW – MSK – 450MHz , ISED**

## Occupied Bandwidth - Conducted



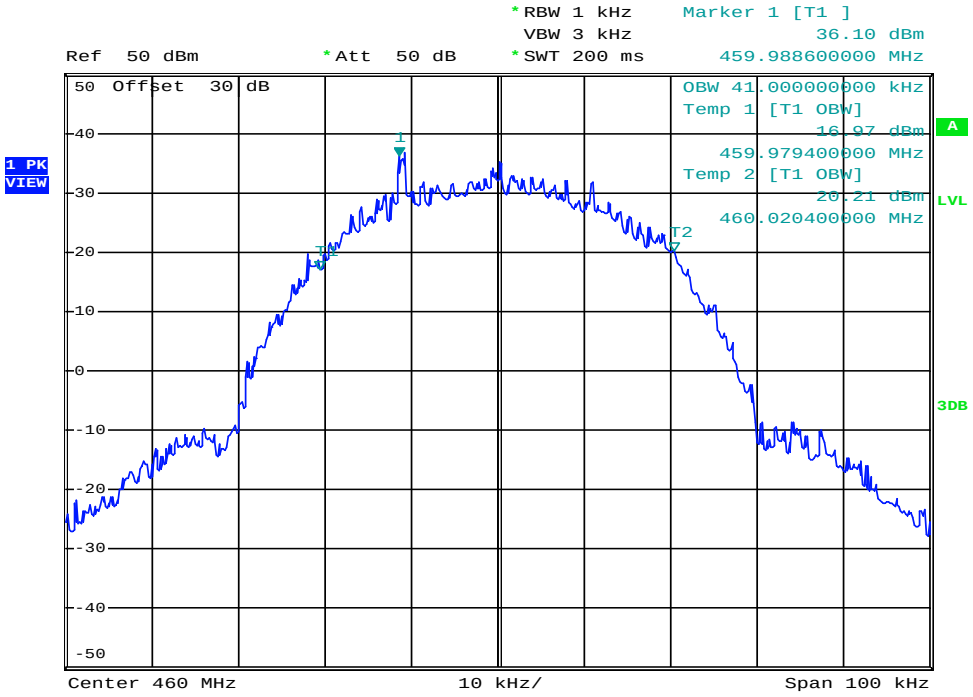

Date: 6.AUG.2019 16:10:34

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **41.20** kHz |

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**Plot 8.83 – OBW - 50kHz BW – MSK – 460MHz , ISED**

## Occupied Bandwidth - Conducted



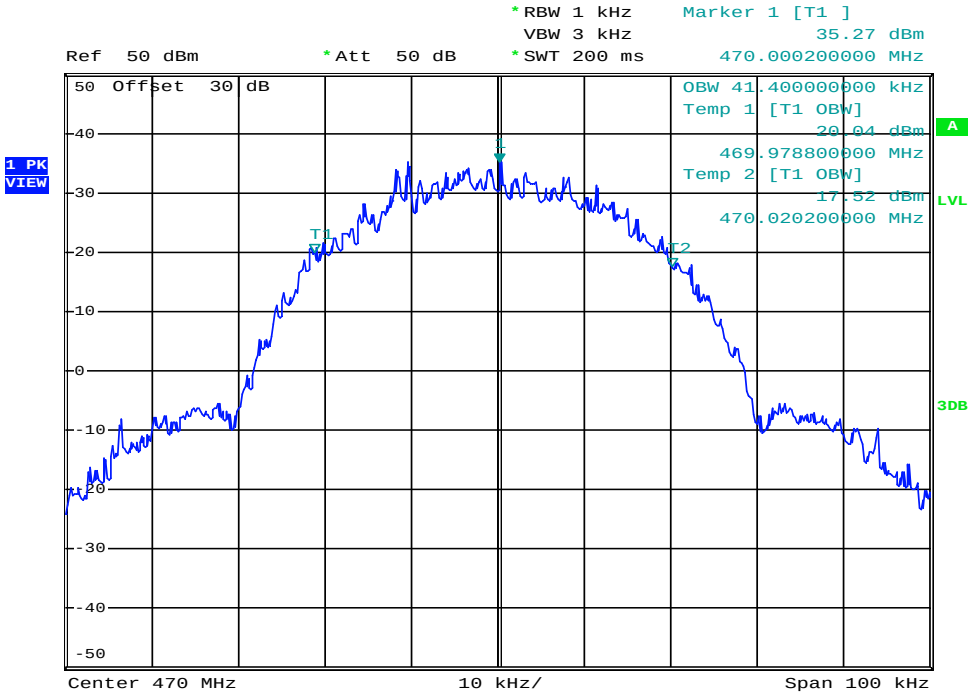

Date: 6.AUG.2019 16:11:21

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **41.00** kHz |

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**Plot 8.84 – OBW - 50kHz BW – MSK – 470MHz , ISED**

## Occupied Bandwidth - Conducted



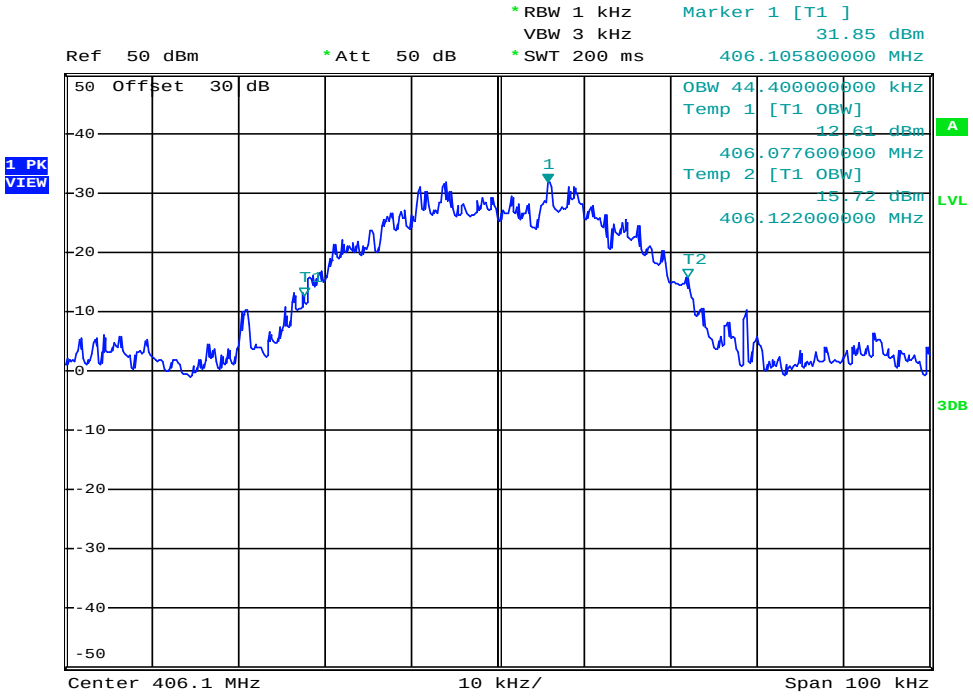

Date: 6.AUG.2019 16:12:28

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **MSK** | **Max** dBm | **41.40** kHz |

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**Plot 8.85 – OBW - 50kHz BW – 8PSK – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



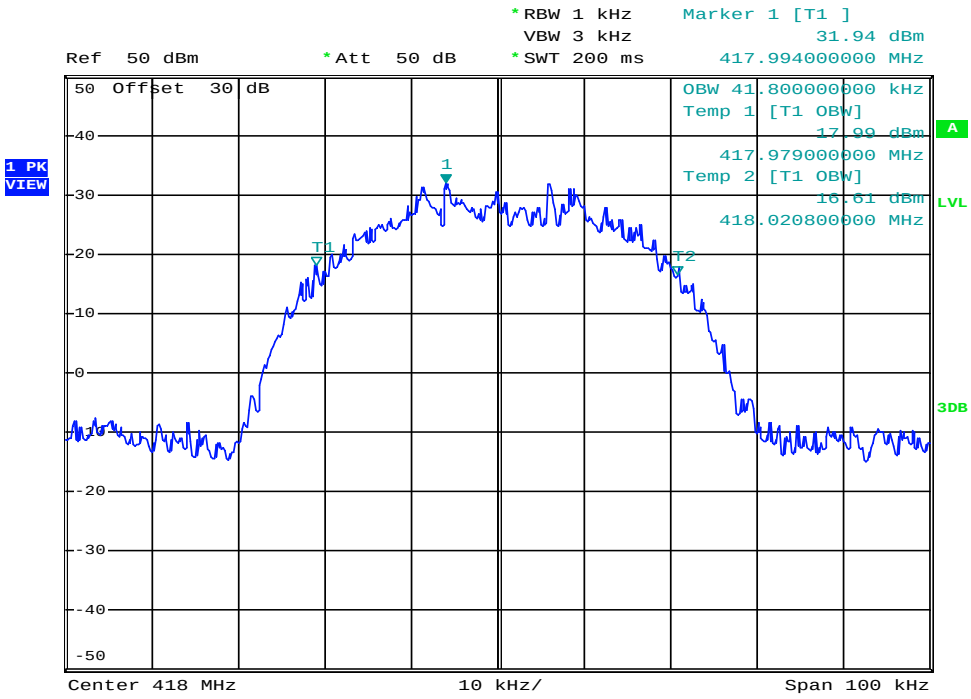

Date: 6.AUG.2019 16:23:56

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **44.40** kHz |

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**Plot 8.86 – OBW - 50kHz BW – 8PSK – 418MHz , ISED**

## Occupied Bandwidth - Conducted



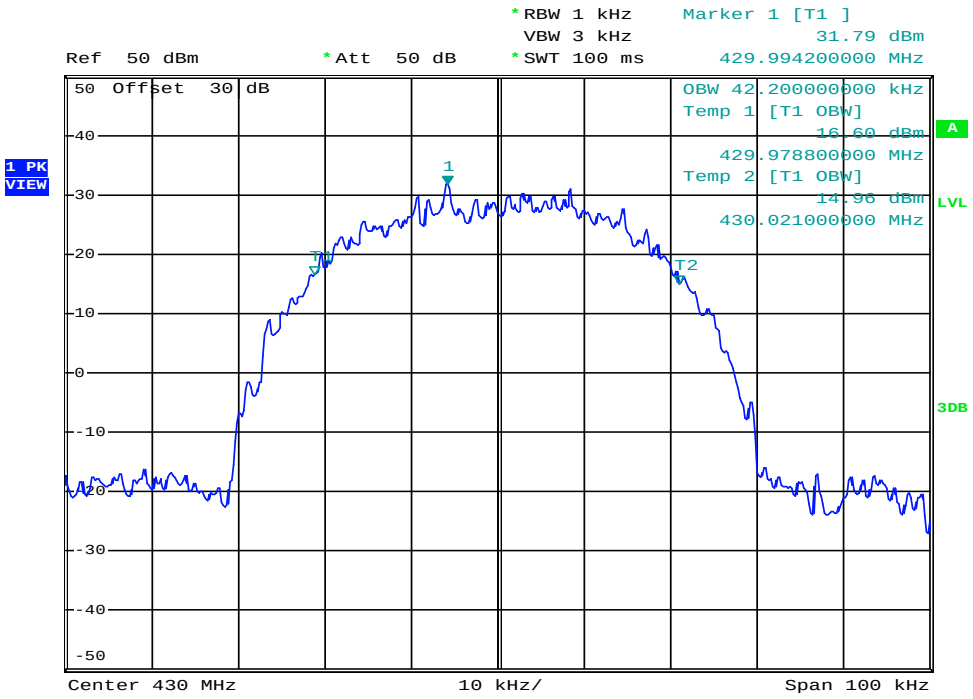

Date: 6.AUG.2019 16:24:45

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **41.80** kHz |

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**Plot 8.87 – OBW - 50kHz BW – 8PSK – 430MHz , ISED**

## Occupied Bandwidth - Conducted



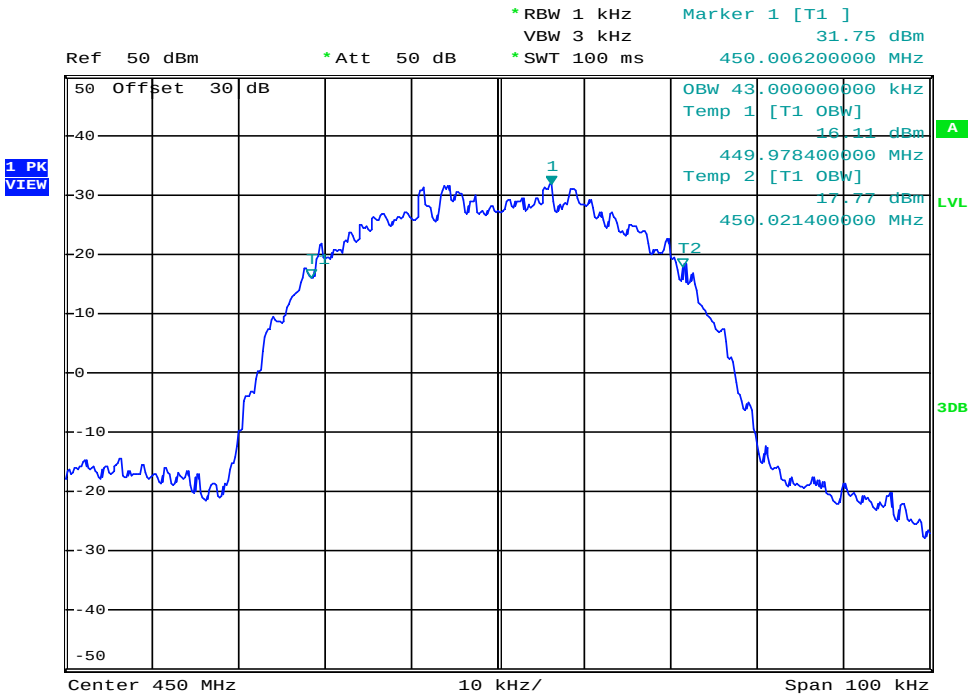

Date: 6.AUG.2019 16:26:06

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **42.20** kHz |

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**Plot 8.88 – OBW - 50kHz BW – 8PSK – 450MHz , ISED**

## Occupied Bandwidth - Conducted



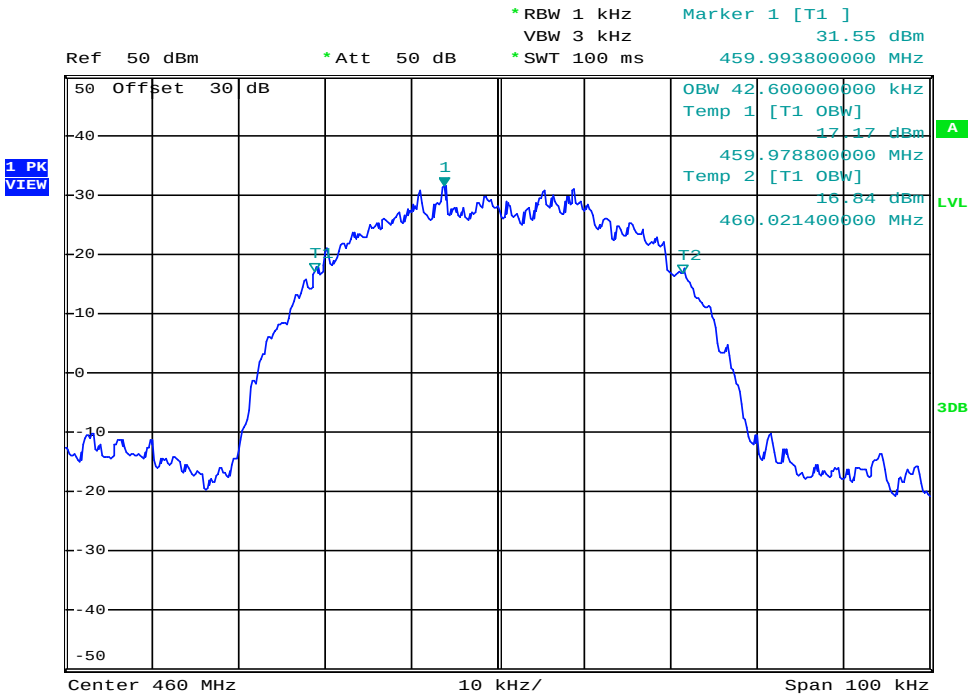

Date: 6.AUG.2019 16:26:55

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **43.00** kHz |

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**Plot 8.89 – OBW - 50kHz BW – 8PSK – 460MHz , ISED**

## Occupied Bandwidth - Conducted



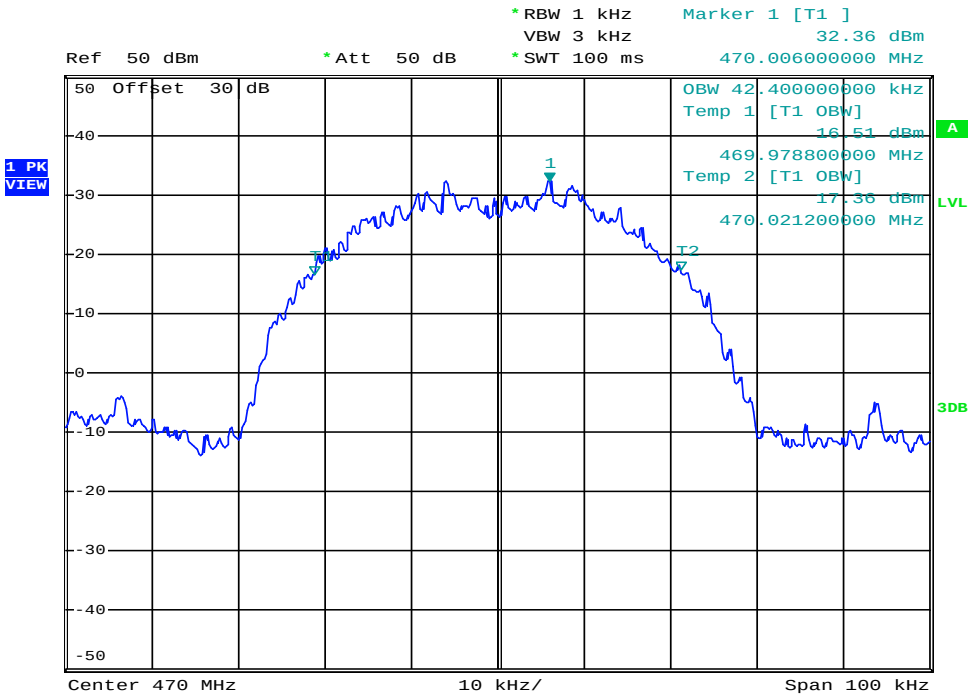

Date: 6.AUG.2019 16:27:38

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **42.60** kHz |

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**Plot 8.90 – OBW - 50kHz BW – 8PSK – 470MHz , ISED**

## Occupied Bandwidth - Conducted



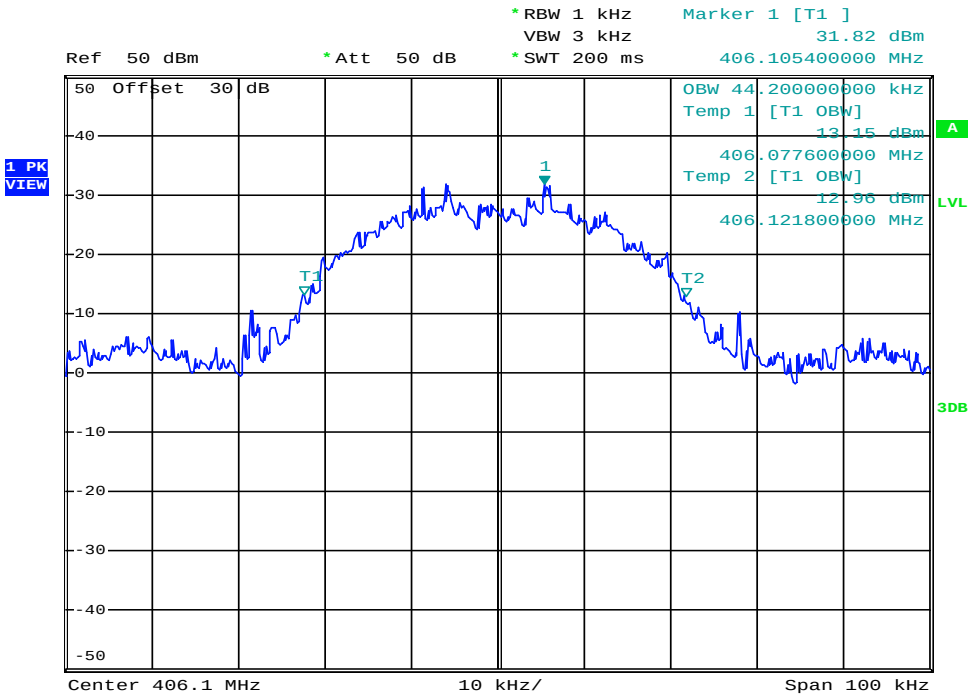

Date: 6.AUG.2019 16:28:25

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **8PSK** | **Max** dBm | **42.40** kHz |

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**Plot 8.91 – OBW - 50kHz BW – QPSK – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



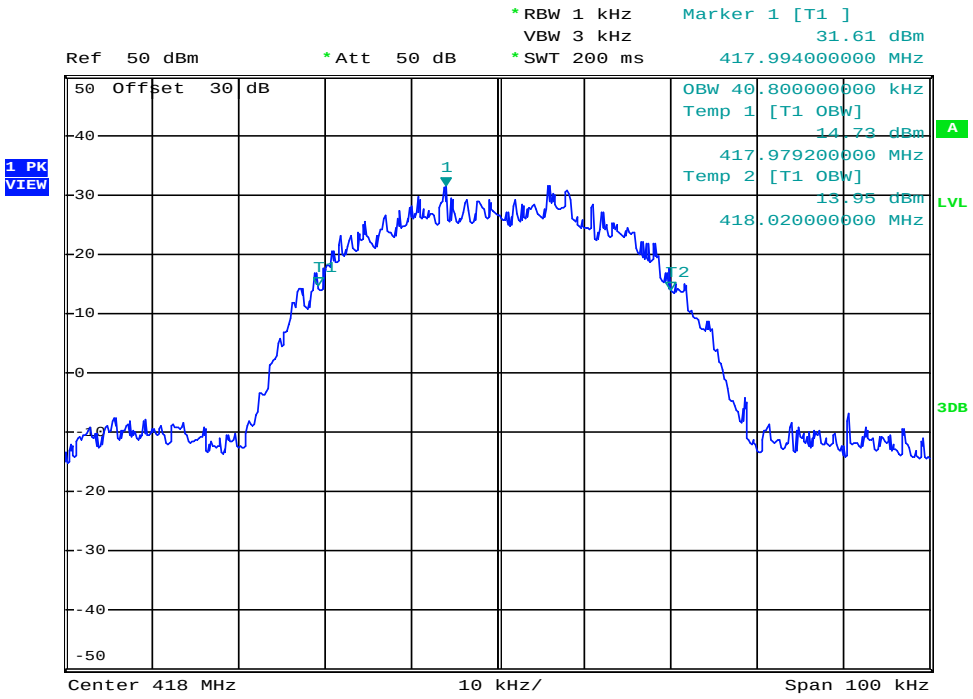

Date: 6.AUG.2019 16:17:20

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **44.20** kHz |

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**Plot 8.92 – OBW - 50kHz BW – QPSK – 418MHz , ISED**

## Occupied Bandwidth - Conducted



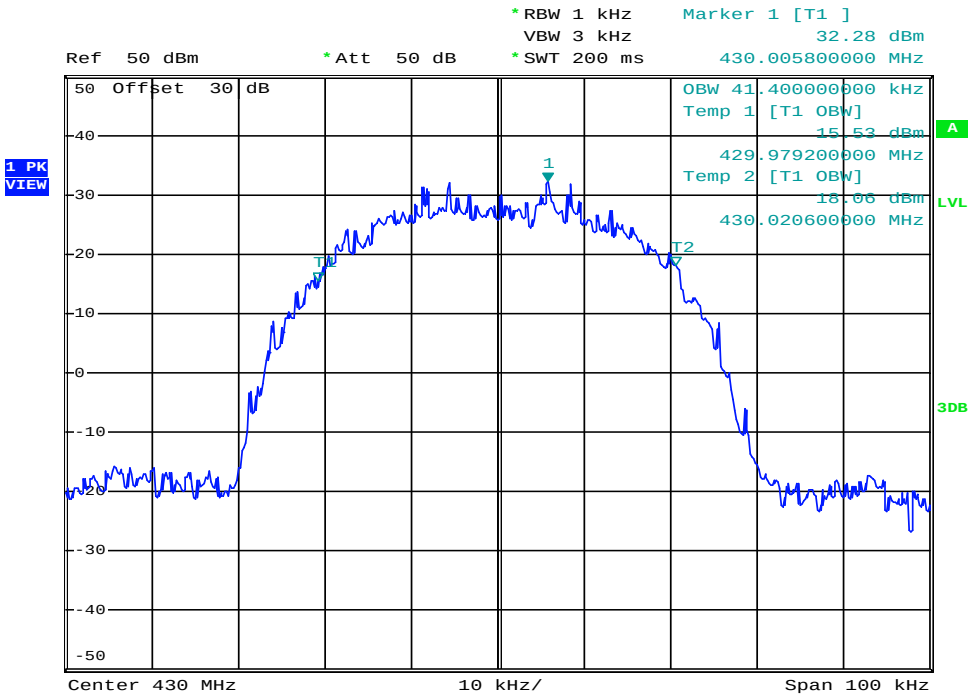

Date: 6.AUG.2019 16:18:38

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **50.00** kHz | **100** % |
| Modulation Setting: | Channel Power Setting: | Measured OBW: |
| **QPSK** | **Max** dBm | **40.80** kHz |

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**Plot 8.93 – OBW - 50kHz BW – QPSK – 430MHz , ISED**

## Occupied Bandwidth - Conducted



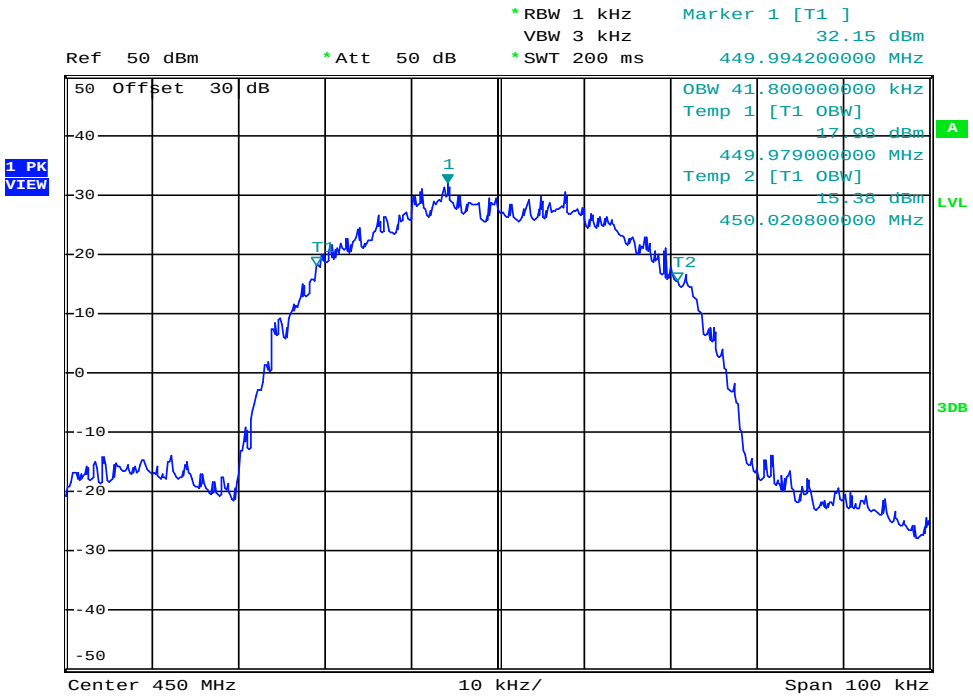

Date: 6.AUG.2019 16:19:22

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **41.40** kHz |

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**Plot 8.94 – OBW - 50kHz BW – QPSK – 450MHz , ISED**

## Occupied Bandwidth - Conducted



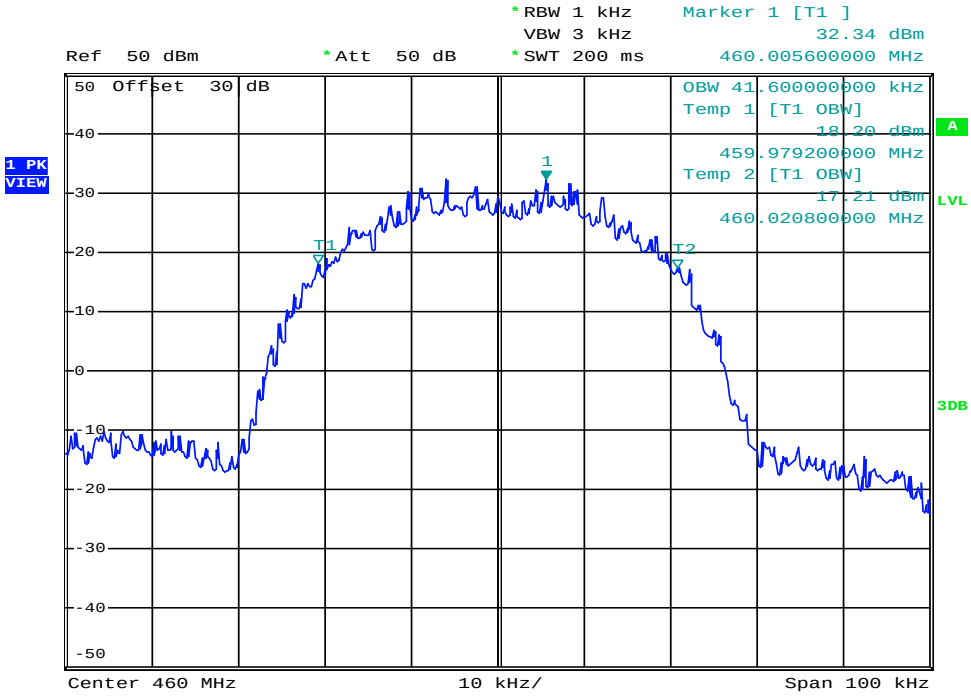

Date: 6.AUG.2019 16:20:04

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **41.80** kHz |

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**Plot 8.95 – OBW - 50kHz BW – QPSK – 460MHz , ISED**

## Occupied Bandwidth - Conducted



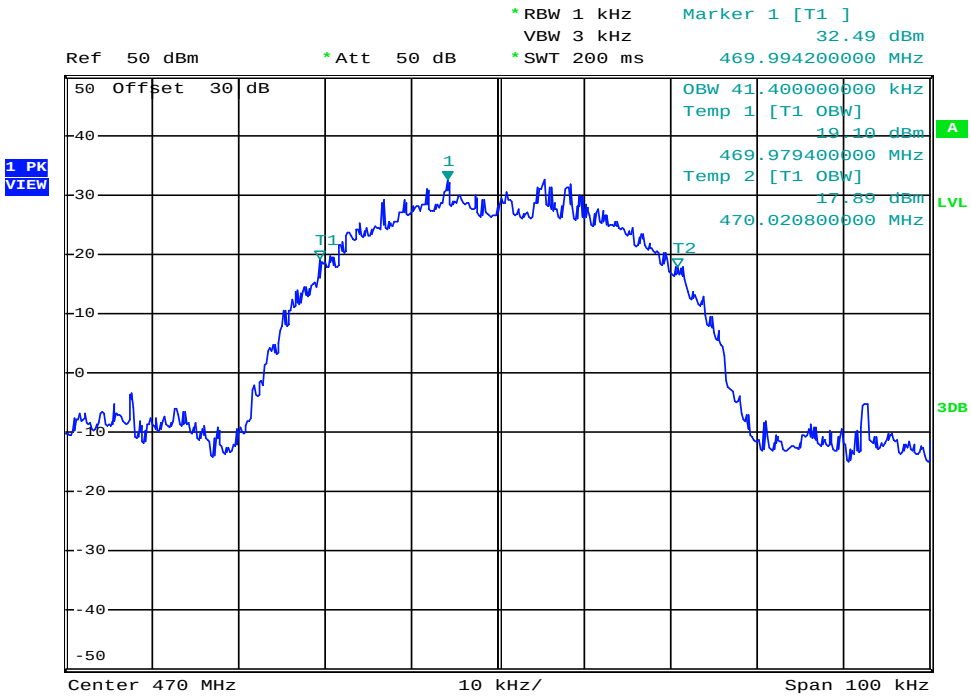

Date: 6.AUG.2019 16:20:43

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **41.60** kHz |

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**Plot 8.96 – OBW - 50kHz BW – QPSK – 470MHz , ISED**

## Occupied Bandwidth - Conducted



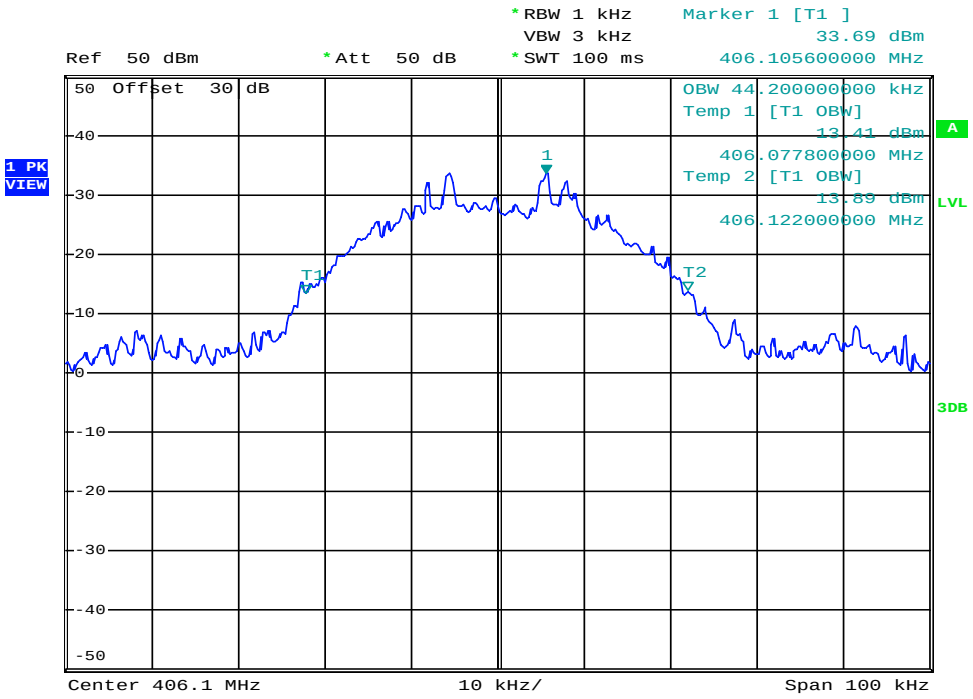

Date: 6.AUG.2019 16:21:25

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **QPSK** | **Max** dBm | **41.40** kHz |

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**Plot 8.97 – OBW - 50kHz BW – 16QAM – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



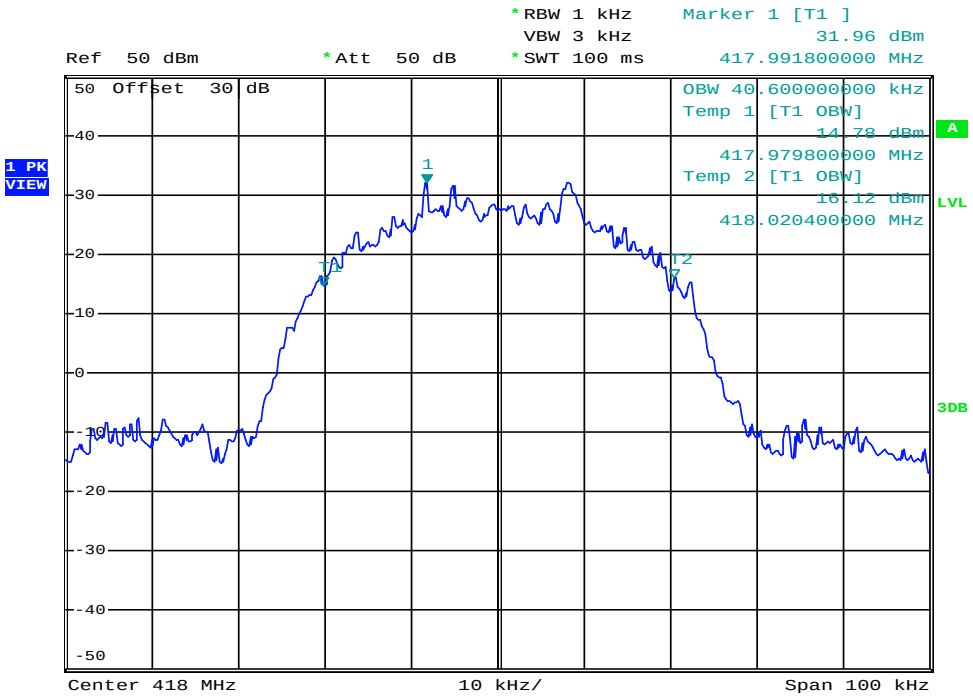

Date: 6.AUG.2019 16:34:22

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **44.20** kHz |

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**Plot 8.98 – OBW - 50kHz BW – 16QAM – 418MHz , ISED**

## Occupied Bandwidth - Conducted



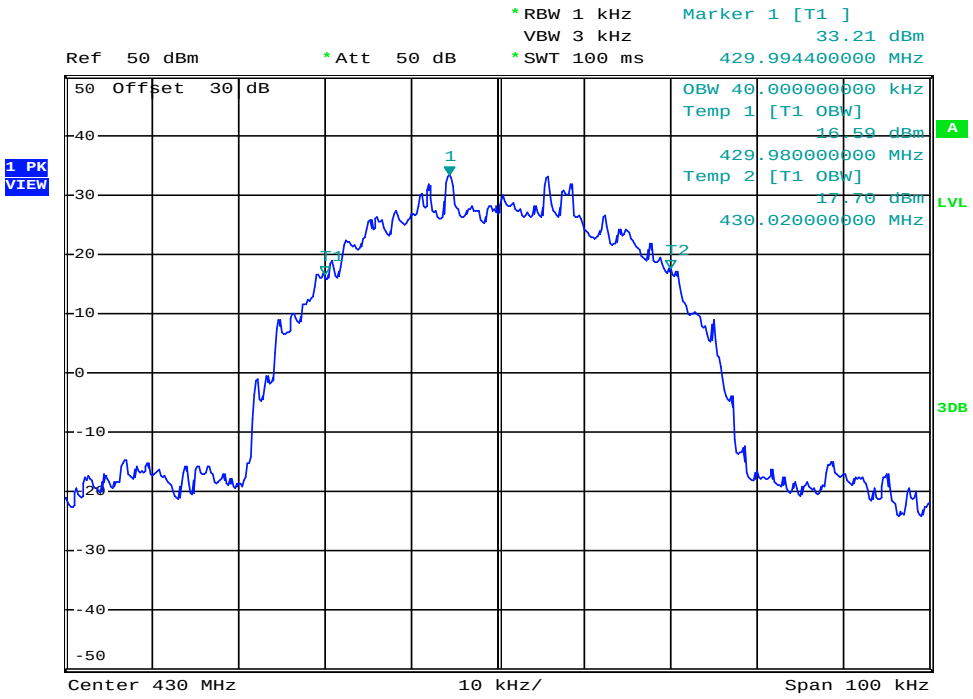

Date: 6.AUG.2019 16:35:02

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **40.60** kHz |

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**Plot 8.99 – OBW - 50kHz BW – 16QAM – 430MHz , ISED**

## Occupied Bandwidth - Conducted



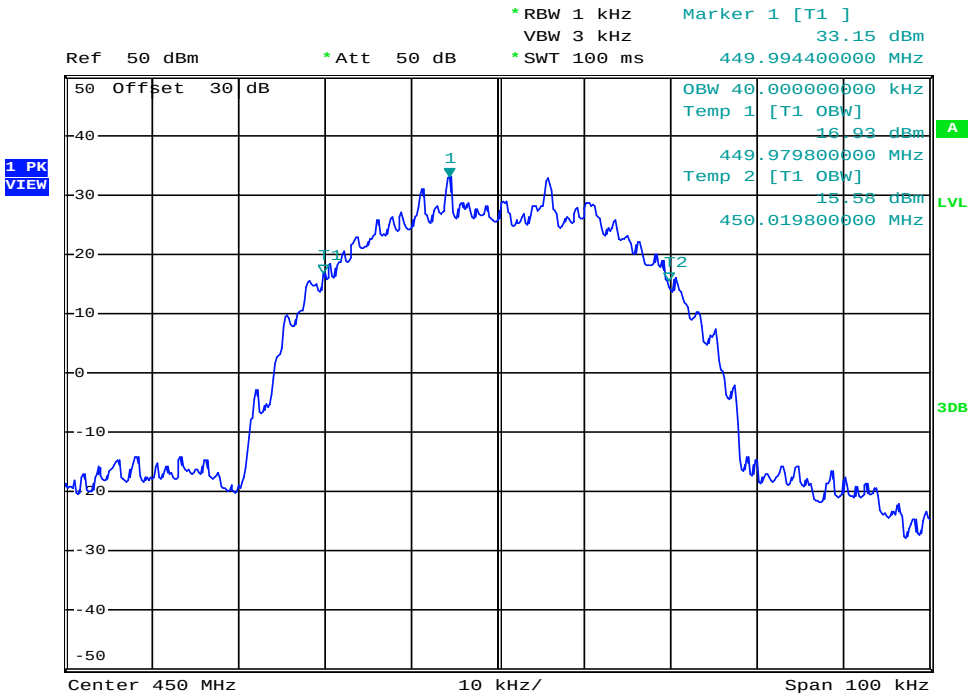

Date: 6.AUG.2019 16:35:53

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **40.00** kHz |

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**Plot 8.100 – OBW - 50kHz BW – 16QAM – 450MHz , ISED**

## Occupied Bandwidth - Conducted



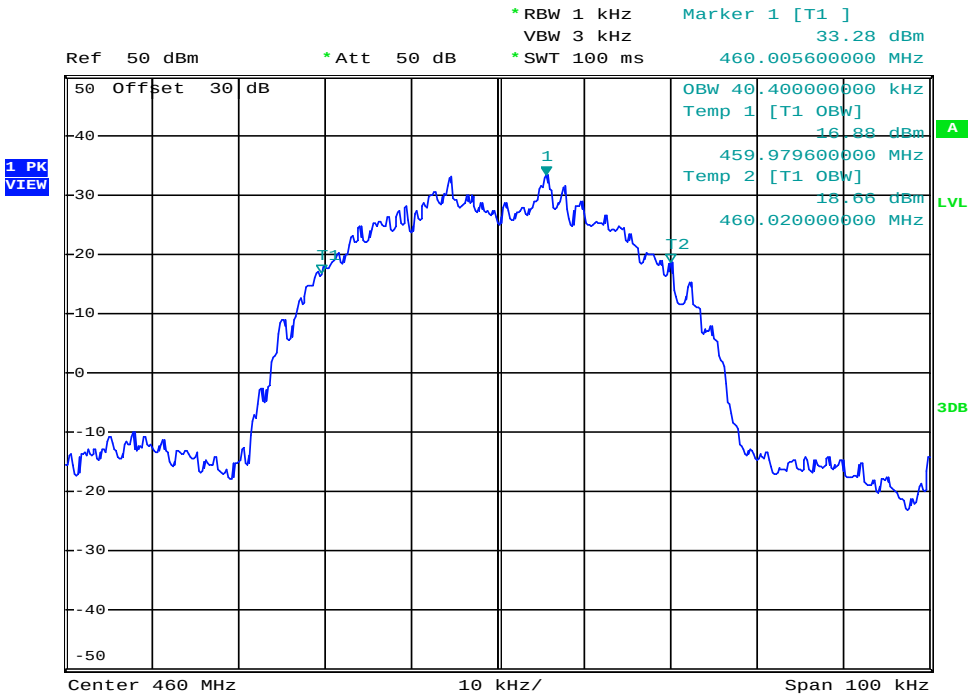

Date: 6.AUG.2019 16:36:45

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **40.00** kHz |

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**Plot 8.101 – OBW - 50kHz BW – 16QAM – 460MHz , ISED**

## Occupied Bandwidth - Conducted



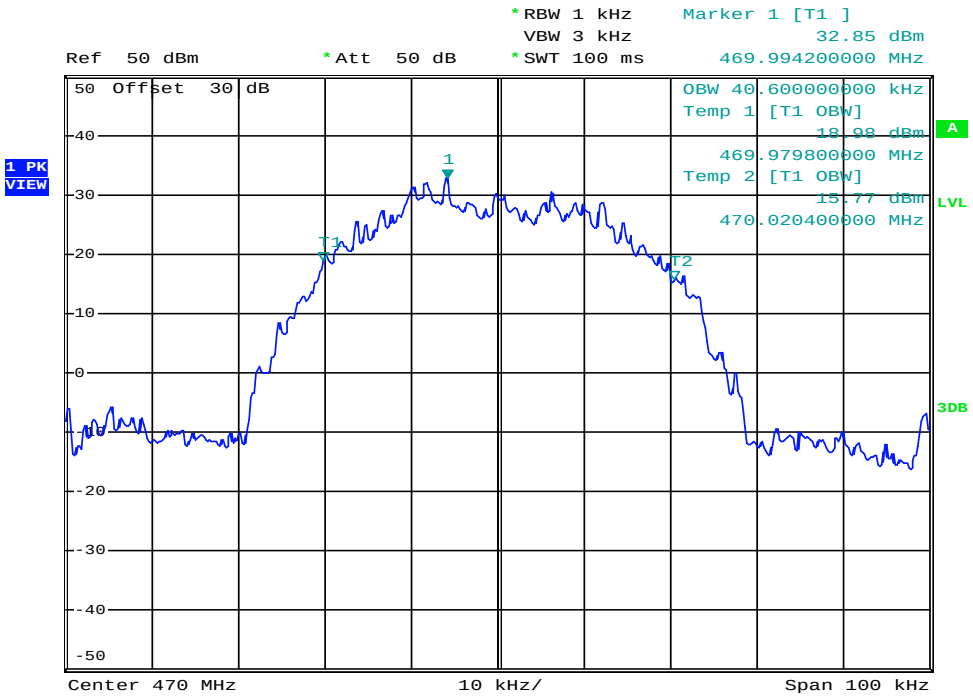

Date: 6.AUG.2019 16:37:26

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **40.40** kHz |

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**Plot 8.102 – OBW - 50kHz BW – 16QAM – 470MHz , ISED**

## Occupied Bandwidth - Conducted



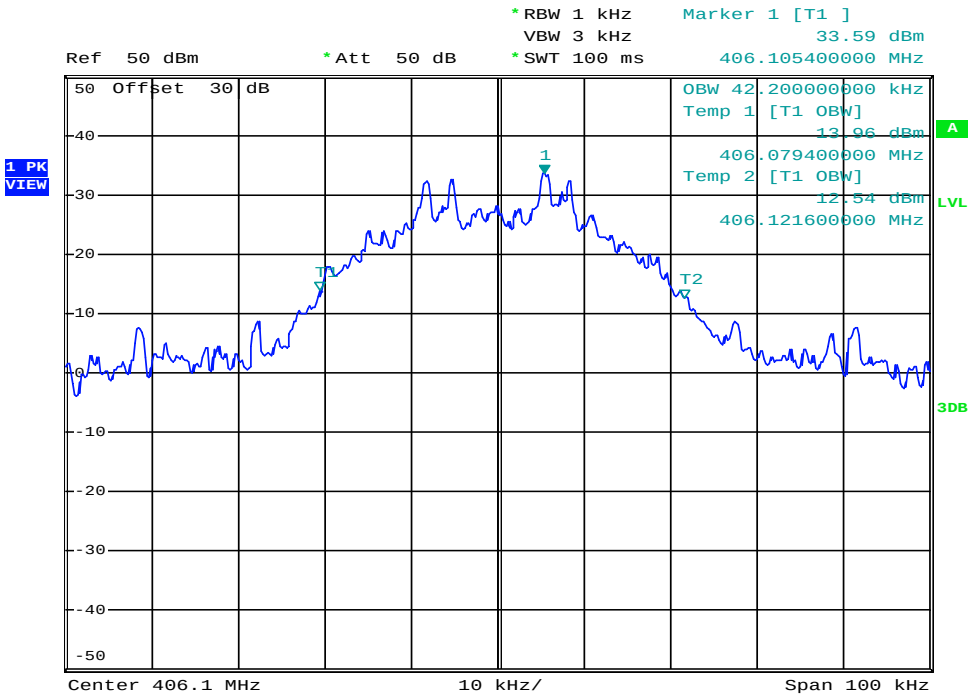

Date: 6.AUG.2019 16:38:11

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **16QAM** | **Max** dBm | **40.60** kHz |

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**Plot 8.103– OBW - 50kHz BW – 32QAM – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



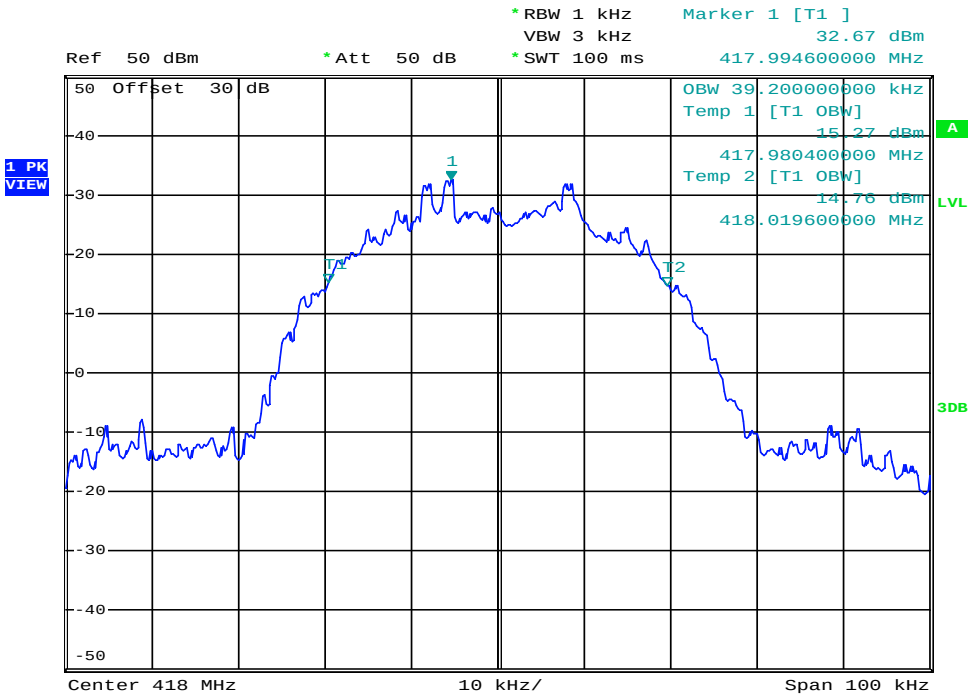

Date: 6.AUG.2019 16:40:56

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **44.20** kHz |

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**Plot 8.104– OBW - 50kHz BW – 32QAM – 418MHz , ISED**

## Occupied Bandwidth - Conducted



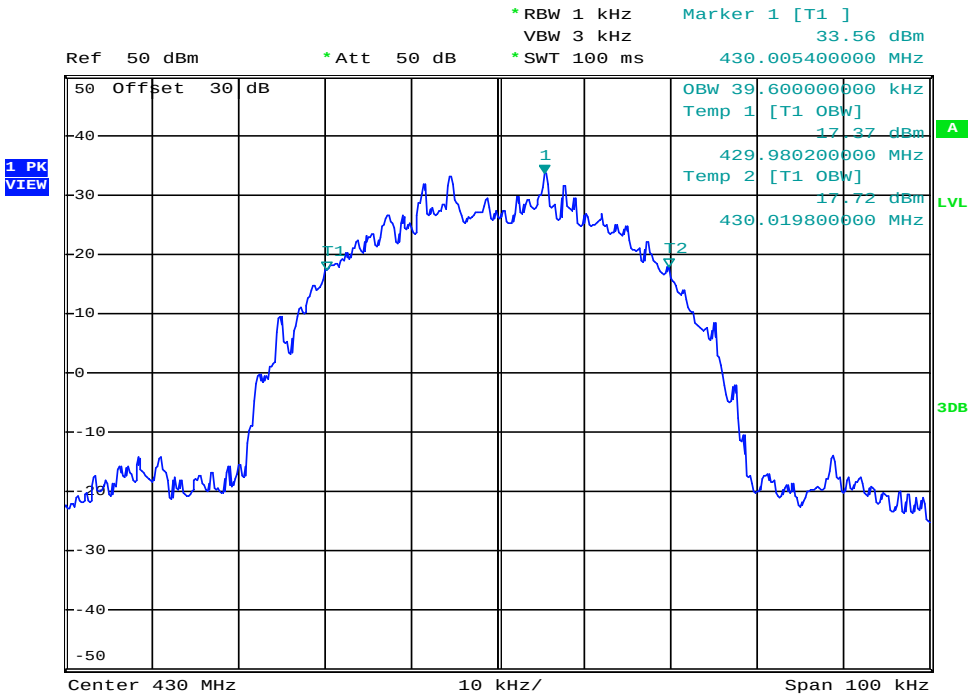

Date: 6.AUG.2019 16:41:42

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **39.20** kHz |

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**Plot 8.105– OBW - 50kHz BW – 32QAM – 430MHz , ISED**

## Occupied Bandwidth - Conducted



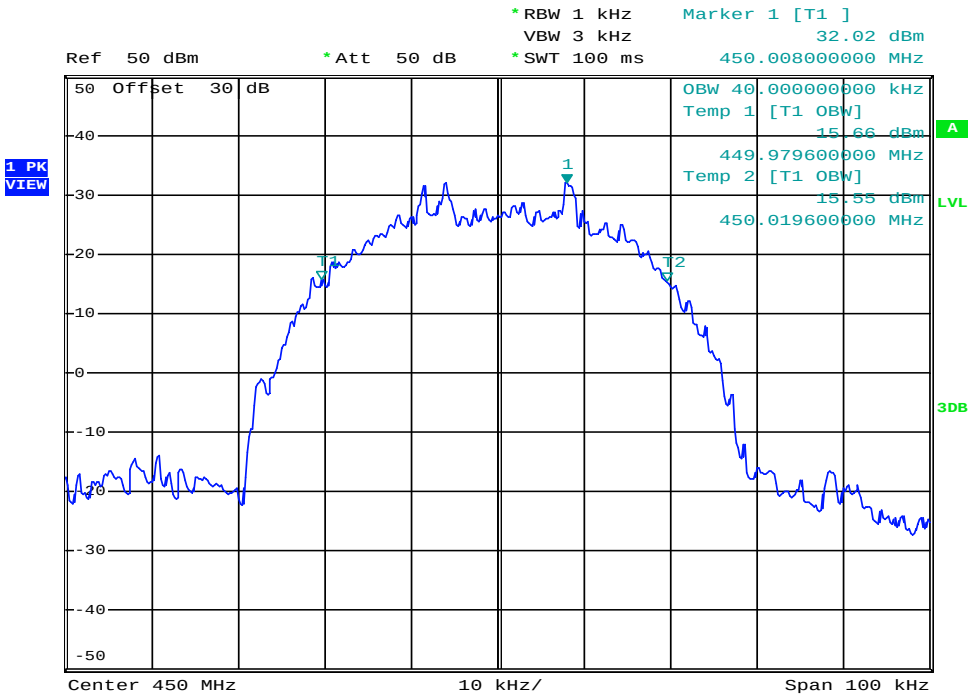

Date: 6.AUG.2019 16:42:30

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **39.60** kHz |

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**Plot 8.106– OBW - 50kHz BW – 32QAM – 450MHz , ISED**

## Occupied Bandwidth - Conducted



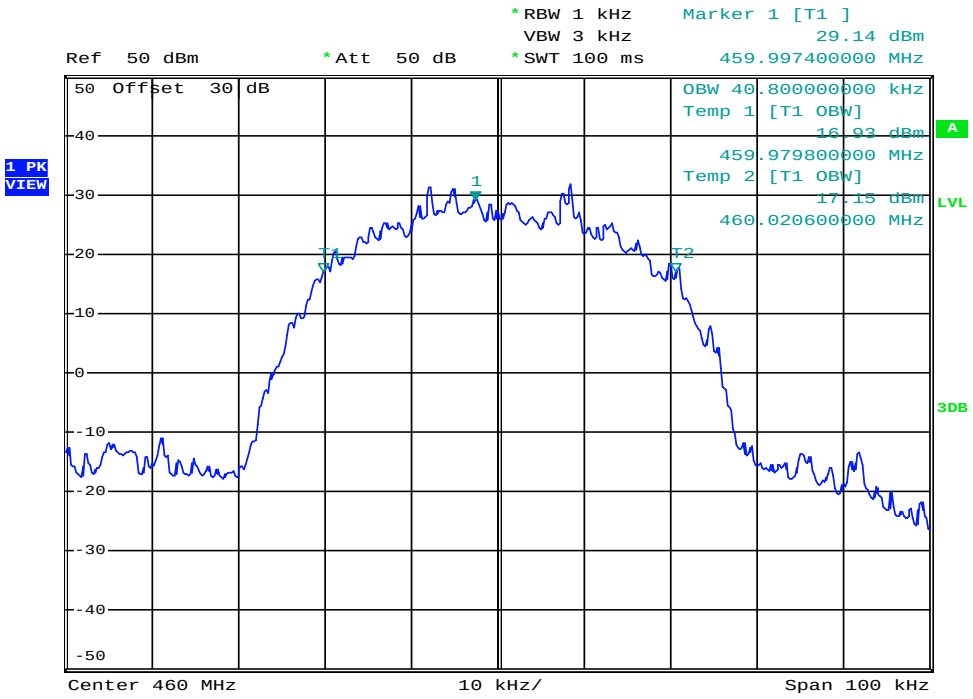

Date: 6.AUG.2019 16:43:10

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **40.00** kHz |

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**Plot 8.107– OBW - 50kHz BW – 32QAM – 460MHz , ISED**

## Occupied Bandwidth - Conducted



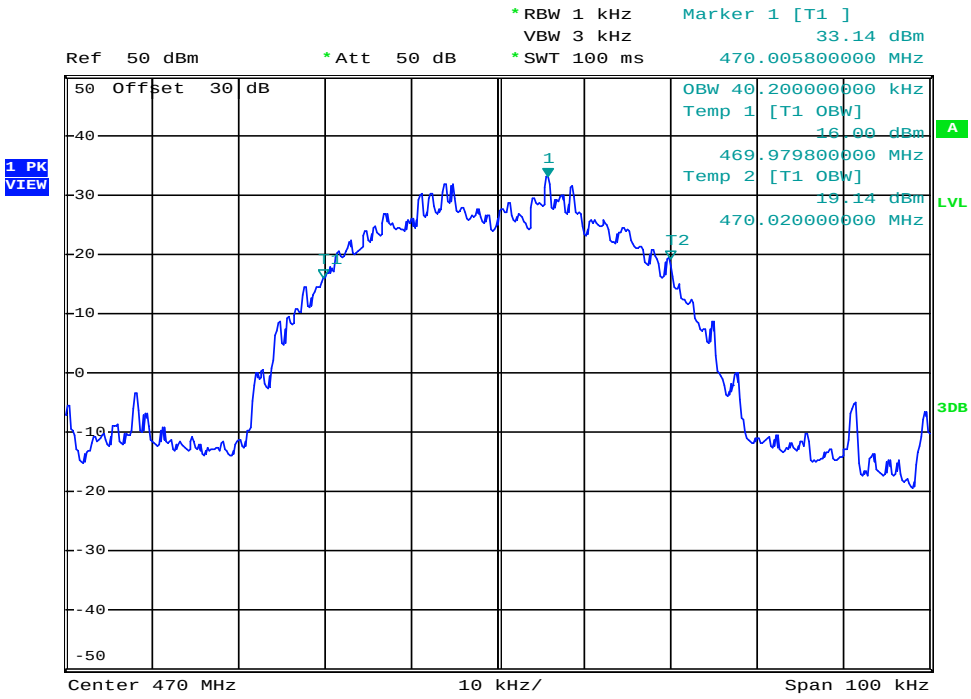

Date: 6.AUG.2019 16:44:02

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **40.80** kHz |

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**Plot 8.108– OBW - 50kHz BW – 32QAM – 470MHz , ISED**

## Occupied Bandwidth - Conducted



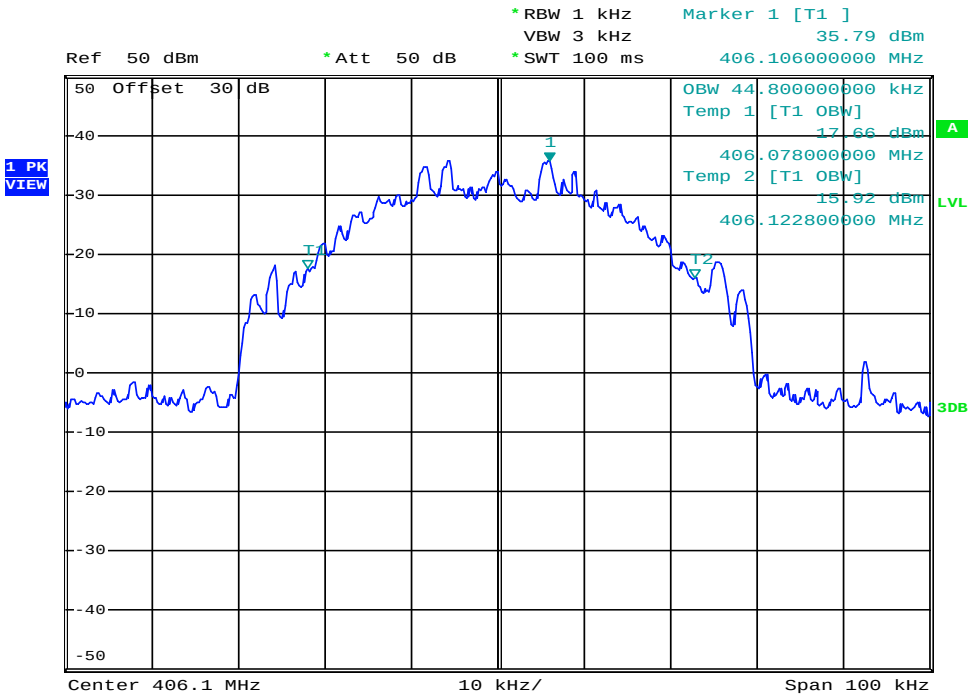

Date: 6.AUG.2019 16:44:47

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **32QAM** | **Max** dBm | **40.20** kHz |

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**Plot 8.109– OBW - 50kHz BW – 64QAM – 406.1MHz , ISED**

## Occupied Bandwidth - Conducted



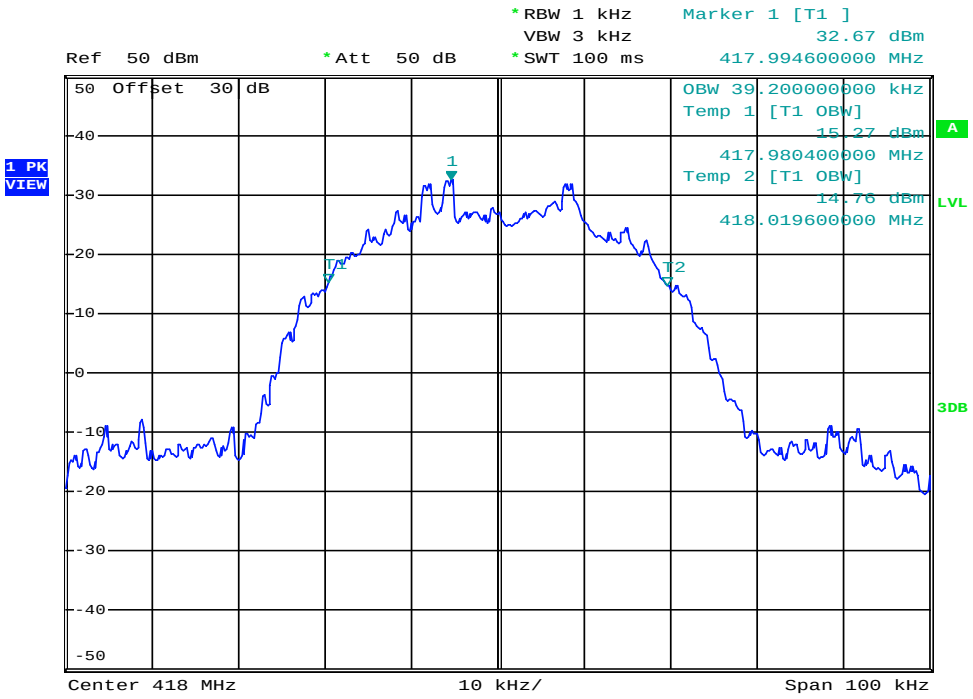

Date: 6.AUG.2019 16:46:40

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **44.80** kHz |

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**Plot 8.110– OBW - 50kHz BW – 64QAM – 418MHz , ISED**

## Occupied Bandwidth - Conducted



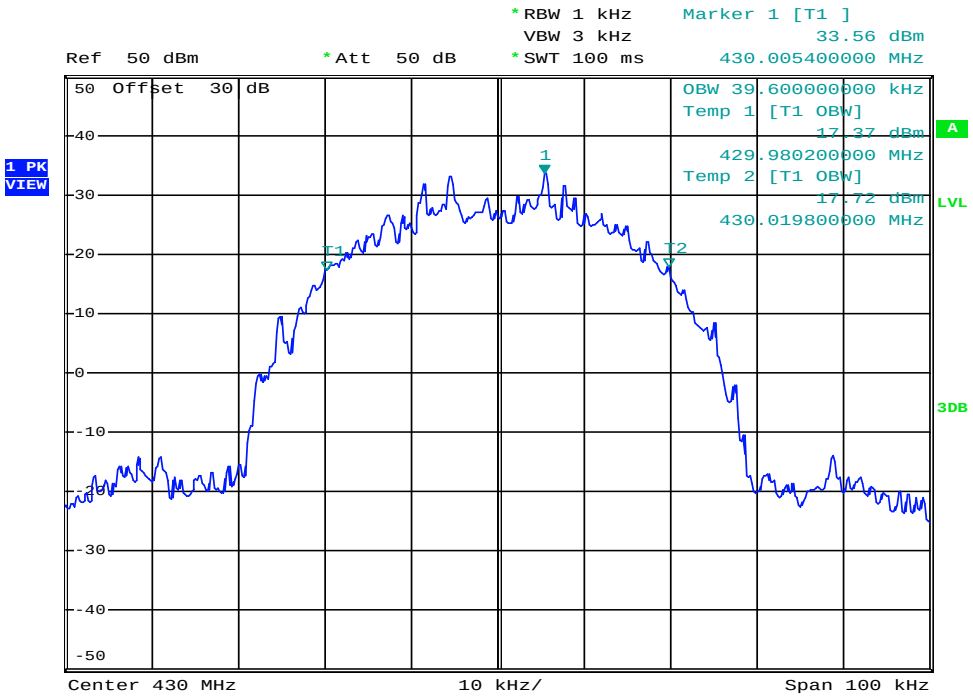

Date: 6.AUG.2019 16:41:42

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **0.00** kHz |

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**Plot 8.111– OBW - 50kHz BW – 64QAM – 430MHz , ISED**

## Occupied Bandwidth - Conducted



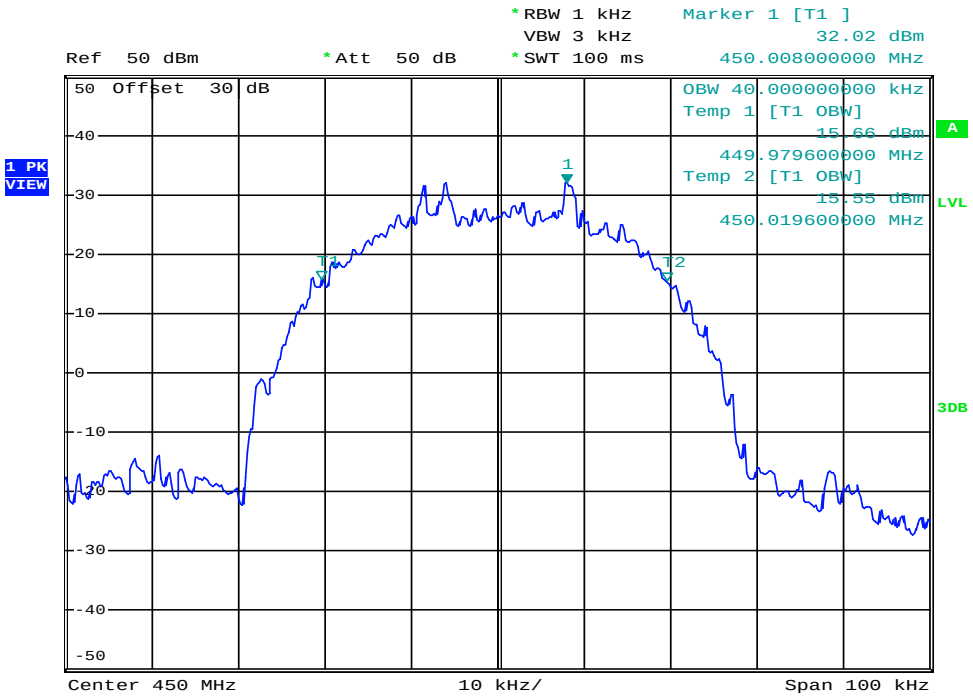

Date: 6.AUG.2019 16:42:30

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **0.00** kHz |

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**Plot 8.112– OBW - 50kHz BW – 64QAM – 450MHz , ISED**

## Occupied Bandwidth - Conducted



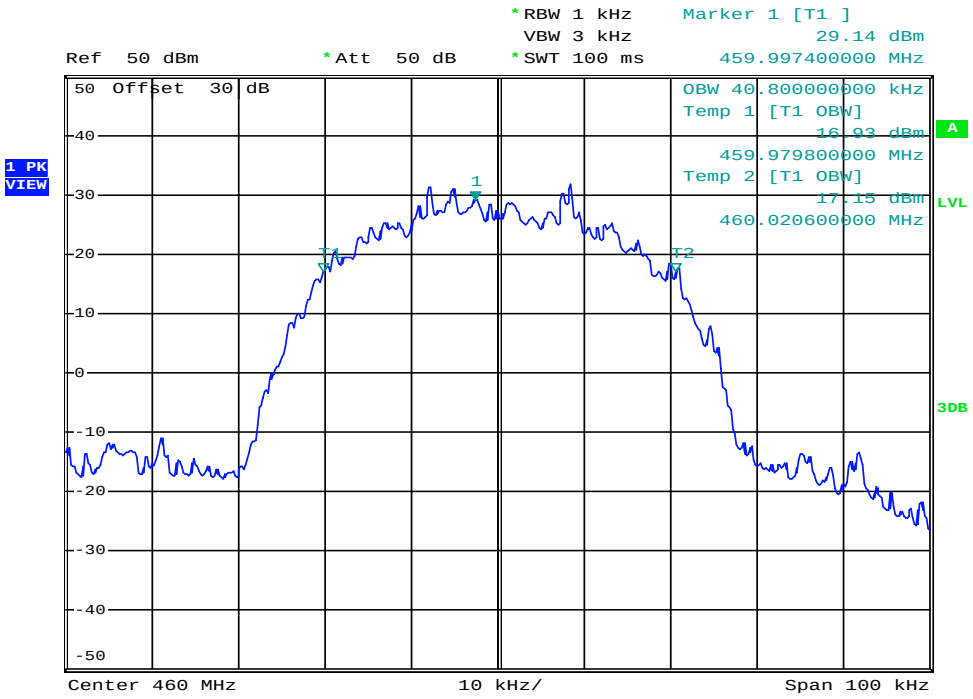

Date: 6.AUG.2019 16:43:10

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **0.00** kHz |

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**Plot 8.113– OBW - 50kHz BW – 64QAM – 460MHz , ISED**

## Occupied Bandwidth - Conducted



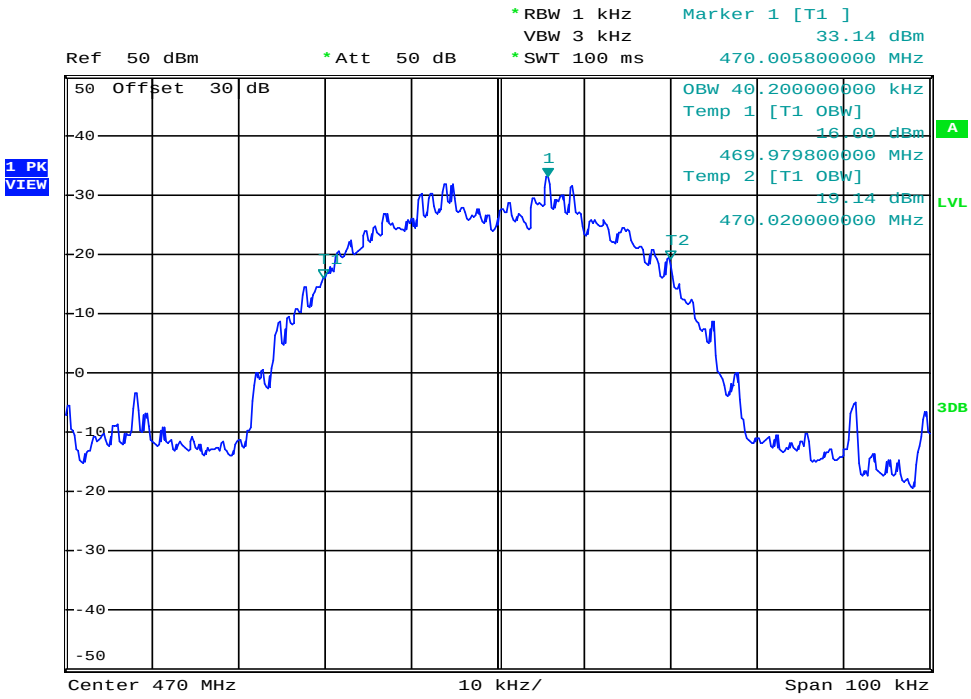

Date: 6.AUG.2019 16:44:02

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **0.00** kHz |

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**Plot 8.114– OBW - 50kHz BW – 64QAM – 470MHz , ISED**

## Occupied Bandwidth - Conducted




Date: 6.AUG.2019 16:44:47

| Channel Frequency: | Channel Bandwidth Setting: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **50.00** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Measured OBW:** |
| **64QAM** | **Max** dBm | **0.00** kHz |

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**Table 8.1 – Summary of Occupied Bandwidth Measurements, 6.25kHz and 12.5kHz**

| Occupied Bandwidth Measurements | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Modulation (see Note 2) | Data Rate (kbps) | Necessary BW (kHz) | Measured OBW (kHz) | Authorized BW kHz | Emission Designator (see Note 2) (FCC) | Emission Designator (ISED) | Result |
| **6.25kHz Bandwidth Setting** | | | | | | | | |
| 406.1 | MSK | 4.82 | 5.69 | 4.26 | 6.00 | | 4K26G1DBN | Complies |
| 418.0 | | | | 4.32 | | | 4K32G1DBN | |
| 430.0 | | | | 4.22 | | | 4K22G1DBN | |
| 450.0 | | | | 4.32 | | 4K32G1D | 4K32G1DBN | |
| 460.0 | | | | 4.24 | | 4K24G1D | 4K24G1DBN | |
| 470.0 | | | | 4.20 | | 4K20G1D | 4K20G1DBN | |
| **12.5kHz Bandwidth Setting** | | | | | | | | |
| 406.1 | MSK | 9.65 | 11.39 | 8.56 | 11.25 | | 8K56G1DBN | Complies |
| 418.0 | | | | 8.56 | | | 8K56G1DBN | |
| 430.0 | | | | 8.36 | | | 8K36G1DBN | |
| 450.0 | | | | 8.56 | | 8K56G1D | 8K56G1DBN | |
| 460.0 | | | | 8.52 | | 8K52G1D | 8K52G1DBN | |
| 470.0 | | | | 8.72 | | 8K72G1D | 8K72G1DBN | |
| 406.1 | 8PSK | 30.7 | 20.47 | 11.00 | 11.25 | | 11K0G1DEN | Complies |
| 418.0 | | | | 11.20 | | | 11K2G1DEN | |
| 430.0 | | | | 11.08 | | | 11K1G1DEN | |
| 450.0 | | | | 11.08 | | 11K1G1D | 11K1G1DEN | |
| 460.0 | | | | 11.08 | | 11K1G1D | 11K1G1DEN | |
| 470.0 | | | | 11.12 | | 11K1G1D | 11K1G1DEN | |
| 406.1 | QPSK | 20.5 | 20.5 | 10.90 | 11.25 | | 10K9G1DDN | Complies |
| 418.0 | | | | 11.10 | | | 11K1G1DDN | |
| 430.0 | | | | 11.20 | | | 11K2G1DDN | |
| 450.0 | | | | 11.10 | | 11K1G1D | 11K1G1DDN | |
| 460.0 | | | | 11.20 | | 11K2G1D | 11K2G1DDN | |
| 470.0 | | | | 11.00 | | 11K0G1D | 11K0G1DDN | |
| 406.1 | 16QAM | 41 | 20.5 | 10.80 | 11.25 | | 10K8D1DEN | Complies |
| 418.0 | | | | 10.84 | | | 10K8D1DEN | |
| 430.0 | | | | 11.12 | | | 11K1D1DEN | |
| 450.0 | | | | 11.04 | | 11K0D1D | 11K0D1DEN | |
| 460.0 | | | | 11.16 | | 11K2D1D | 11K2D1DEN | |
| 470.0 | | | | 11.12 | | 11K1D1D | 11K1D1DEN | |
| 406.1 | 32QAM | 51.2 | 20.48 | 10.20 | 11.25 | | 10K2D1DEN | Complies |
| 418.0 | | | | 10.60 | | | 10K6D1DEN | |
| 430.0 | | | | 10.80 | | | 10K8D1DEN | |
| 450.0 | | | | 10.92 | | 10K9D1D | 10K9D1DEN | |
| 460.0 | | | | 10.72 | | 10K7D1D | 10K7D1DEN | |
| 470.0 | | | | 10.88 | | 10K9D1D | 10K9D1DEN | |
| 406.1 | 64QAM | 61.4 | 20.47 | 10.68 | 11.25 | | 10K7D1DEN | Complies |
| 418.0 | | | | 10.84 | | | 10K8D1DEN | |
| 430.0 | | | | 11.00 | | | 11K0D1DEN | |
| 450.0 | | | | 11.16 | | 11K2D1D | 11K2D1DEN | |
| 460.0 | | | | 11.12 | | 11K1D1D | 11K1D1DEN | |
| 470.0 | | | | 11.12 | | 11K1D1D | 11K1D1DEN | |

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**Table 8.2 – Summary of Occupied Bandwidth Measurements, 25kHz**

| Occupied Bandwidth Measurements | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Modulation (see Note 2) | Data Rate (kbps) | Necessary BW (kHz) | Measured OBW (kHz) | Authorized BW kHz | Emission Designator (see Note 2) (FCC) | Emission Designator (ISED) | Result |
| 25kHz Bandwidth Setting | | | | | | | | |
| 406.1 | MSK | 18.1 | 21.36 | 17.10 | see Note 1 | | 17K1G1DBN | Complies |
| 418.0 | | | | 17.20 | | | 17K2G1DBN | |
| 430.0 | | | | 17.00 | | | 17K0G1DBN | |
| 450.0 | | | | 17.60 | | 17K6G1D | 17K6G1DBN | |
| 460.0 | | | | 17.20 | | 17K2G1D | 17K2G1DBN | |
| 470.0 | | | | 17.00 | | 17K0G1D | 17K0G1DBN | |
| 406.1 | 8PSK | 44.2 | 29.17 | 19.10 | see Note 1 | | 19K1G1DEN | Complies |
| 418.0 | | | | 17.70 | | | 17K7G1DEN | |
| 430.0 | | | | 18.20 | | | 18K2G1DEN | |
| 450.0 | | | | 18.20 | | 18K2G1D | 18K2G1DEN | |
| 460.0 | | | | 18.10 | | 18K1G1D | 18K1G1DEN | |
| 470.0 | | | | 18.40 | | 18K4G1D | 18K4G1DEN | |
| 406.1 | QPSK | 29.5 | 29.5 | 19.50 | see Note 1 | | 19K5G1DDN | Complies |
| 418.0 | | | | 18.30 | | | 18K3G1DDN | |
| 430.0 | | | | 18.40 | | | 18K4G1DDN | |
| 450.0 | | | | 18.20 | | 18K2G1D | 18K2G1DDN | |
| 460.0 | | | | 18.40 | | 18K4G1D | 18K4G1DDN | |
| 470.0 | | | | 18.40 | | 18K4G1D | 18K4G1DDN | |
| 406.1 | 16QAM | 58.9 | 29.45 | 19.70 | see Note 1 | | 19K7D1DEN | Complies |
| 418.0 | | | | 18.00 | | | 18K0D1DEN | |
| 430.0 | | | | 18.50 | | | 18K5D1DEN | |
| 450.0 | | | | 18.10 | | 18K1D1D | 18K1D1DEN | |
| 460.0 | | | | 18.80 | | 18K8D1D | 18K8D1DEN | |
| 470.0 | | | | 18.90 | | 18K9D1D | 18K9D1DEN | |
| 406.1 | 32QAM | 75.6 | 30.24 | 19.60 | see Note 1 | | 19K6D1DEN | Complies |
| 418.0 | | | | 17.90 | | | 17K9D1DEN | |
| 430.0 | | | | 18.00 | | | 18K0D1DEN | |
| 450.0 | | | | 17.90 | | 17K9D1D | 17K9D1DEN | |
| 460.0 | | | | 18.20 | | 18K2D1D | 18K2D1DEN | |
| 470.0 | | | | 18.60 | | 18K6D1D | 18K6D1DEN | |
| 406.1 | 64QAM | 90.8 | 30.24 | 19.60 | see Note 1 | | 19K6D1DEN | Complies |
| 418.0 | | | | 18.00 | | | 18K0D1DEN | |
| 430.0 | | | | 18.40 | | | 18K4D1DEN | |
| 450.0 | | | | 18.30 | | 18K3D1D | 18K3D1DEN | |
| 460.0 | | | | 18.50 | | 18K5D1D | 18K5D1DEN | |
| 470.0 | | | | 19.00 | | 19K0D1D | 19K0D1DEN | |

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**Table 8.3 – Summary of Occupied Bandwidth Measurements, 50kHz**

| Occupied Bandwidth Measurements | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Modulation (see Note 2) | Data Rate (kbps) | Necessary BW (kHz) | Measured OBW (kHz) | Authorized BW kHz | Emission Designator (see Note 2) (FCC) | Emission Designator (ISED) | Result |
| 25kHz Bandwidth Setting | | | | | | | | |
| 406.1 | MSK | 18.1 | 21.36 | 17.10 | see Note 1 | | 17K1G1DBN | Complies |
| 418.0 | | | | 17.20 | | | 17K2G1DBN | |
| 430.0 | | | | 17.00 | | | 17K0G1DBN | |
| 450.0 | | | | 17.60 | | 17K6G1D | 17K6G1DBN | |
| 460.0 | | | | 17.20 | | 17K2G1D | 17K2G1DBN | |
| 470.0 | | | | 17.00 | | 17K0G1D | 17K0G1DBN | |
| 406.1 | 8PSK | 44.2 | 29.17 | 19.10 | see Note 1 | | 19K1G1DEN | Complies |
| 418.0 | | | | 17.70 | | | 17K7G1DEN | |
| 430.0 | | | | 18.20 | | | 18K2G1DEN | |
| 450.0 | | | | 18.20 | | 18K2G1D | 18K2G1DEN | |
| 460.0 | | | | 18.10 | | 18K1G1D | 18K1G1DEN | |
| 470.0 | | | | 18.40 | | 18K4G1D | 18K4G1DEN | |
| 406.1 | QPSK | 29.5 | 29.5 | 19.50 | see Note 1 | | 19K5G1DDN | Complies |
| 418.0 | | | | 18.30 | | | 18K3G1DDN | |
| 430.0 | | | | 18.40 | | | 18K4G1DDN | |
| 450.0 | | | | 18.20 | | 18K2G1D | 18K2G1DDN | |
| 460.0 | | | | 18.40 | | 18K4G1D | 18K4G1DDN | |
| 470.0 | | | | 18.40 | | 18K4G1D | 18K4G1DDN | |
| 406.1 | 16QAM | 58.9 | 29.45 | 19.70 | see Note 1 | | 19K7D1DEN | Complies |
| 418.0 | | | | 18.00 | | | 18K0D1DEN | |
| 430.0 | | | | 18.50 | | | 18K5D1DEN | |
| 450.0 | | | | 18.10 | | 18K1D1D | 18K1D1DEN | |
| 460.0 | | | | 18.80 | | 18K8D1D | 18K8D1DEN | |
| 470.0 | | | | 18.90 | | 18K9D1D | 18K9D1DEN | |
| 406.1 | 32QAM | 75.6 | 30.24 | 19.60 | see Note 1 | | 19K6D1DEN | Complies |
| 418.0 | | | | 17.90 | | | 17K9D1DEN | |
| 430.0 | | | | 18.00 | | | 18K0D1DEN | |
| 450.0 | | | | 17.90 | | 17K9D1D | 17K9D1DEN | |
| 460.0 | | | | 18.20 | | 18K2D1D | 18K2D1DEN | |
| 470.0 | | | | 18.60 | | 18K6D1D | 18K6D1DEN | |
| 406.1 | 64QAM | 90.8 | 30.24 | 19.60 | see Note 1 | | 19K6D1DEN | Complies |
| 418.0 | | | | 18.00 | | | 18K0D1DEN | |
| 430.0 | | | | 18.40 | | | 18K4D1DEN | |
| 450.0 | | | | 18.30 | | 18K3D1D | 18K3D1DEN | |
| 460.0 | | | | 18.50 | | 18K5D1D | 18K5D1DEN | |
| 470.0 | | | | 19.00 | | 19K0D1D | 19K0D1DEN | |

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**Notes to Tables 8.1, 8.2 and 8.3**

**Note 1.**

This device meets the spectrum efficiency requirements of §90.203(j)(3). In accordance with §90.209(b)(5) Note 3:

[3]Operations using equipment designed to operate with a 25 kHz channel bandwidth will be authorized a 20 kHz bandwidth. Operations using equipment designed to operate with a 12.5 kHz channel bandwidth will be authorized a 11.25 kHz bandwidth. Operations using equipment designed to operate with a 6.25 kHz channel bandwidth will be authorized a 6 kHz bandwidth. All stations must operate on channels with a bandwidth of 12.5 kHz or less beginning January 1, 2013, unless the operations meet the efficiency standard of §90.203(j)(3).

This device is permitted to operate with a 25kHz channel bandwidth.

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**Note 2:**

This device is identical to FCC ID: PEJ-9384-XETA4HP. In April 2017 the FCC waived the emission designator limitations of §90.207(i) to permit the use of D1D and G1D emission designators. The D1D and G1D emission designators are permitted for use by this device.

---

**Note 3:**

Per ISED RSS-119 (5.6):

**5.6 Fixed Equipment With an Occupied Bandwidth Larger Than the Authorized Bandwidth Permitted in This Standard**

Fixed equipment requiring an occupied bandwidth larger than the authorized bandwidth shown in Table 3 may be permitted if that the equipment complies with the three following conditions:

(1) The equipment is allowed to have aggregate channels as per the SRSP for its operating frequency bands.
(2) The ERP shall not be increased with increased occupied bandwidth.
(3) The equipment shall employ an emission mask that does not result in more adjacent channel interference than the standard narrowband channel equipment emission mask specified in Table 3.

This device complies with (1) as it aggregates adjacent channels and (2) as the ERP does not increase with increased bandwidth. Emission Mask C was modified by increasing the upper and lower skirts by 25kHz (+/- 12.5kHz). The following emissions mask was used for compliance with (3):

| Displacement Frequency $f_d$ (kHz) | Minimum Attenuation (dB) |
|---|---|
| 25kHz Channel Bandwidth | |
| $5 < f_d \leq 10$ | $83\text{Log}_{10}(f_d/5)$ |
| $10 < f_d \leq 50$ | Lesser of: 50 or $29\text{Log}_{10}(f_d^2/11)$ |
| $f_d > 50$ | $43 + 10\text{Log}_{10}(P)$ |
| 50kHz Channel Bandwidth | |
| $17.5 < f_d \leq 22.5$ | $83\text{Log}_{10}(f_d/5)$ |
| $22.5 < f_d \leq 62.5$ | Lesser of: 50 or $29\text{Log}_{10}(f_d^2/11)$ |
| $f_d > 62.5$ | $43 + 10\text{Log}_{10}(P)$ |

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## 9.0 EMISSION MASK AND BAND EDGE

| Test Conditions | |
|---|---|
| Normative Reference | FCC 47 CFR §2.1049, §90.210, RSS-Gen (6.7), RSS-119 (5.5) |
| | ANSI C63.26 7.2.3 |

| Limits | |
|---|---|
| 47 CFR §90.210 Notes 2, 5 | 421MHz - 512MHz:<br>Note 2: Equipment designed to operate with a 25 kHz channel bandwidth must meet the requirements of Emission Mask B or C, as applicable. Equipment designed to operate with a 12.5 kHz channel bandwidth must meet the requirements of Emission Mask D, and equipment designed to operate with a 6.25 kHz channel bandwidth must meet the requirements of Emission Mask E.<br>Note 5: Equipment designed to operate on 25 kilohertz bandwidth channels must meet the requirements of either Emission Mask B or G, whichever is applicable, while equipment designed to operate on 12.5 kilohertz bandwidth channels must meet the requirements of Emission Mask D. Equipment designed to operate on 25 kilohertz bandwidth channels may alternatively meet the Adjacent Channel Power limits of §90.221. |
| 47 CFR §90.210( c) | (c) Emission Mask C. For transmitters that are not equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier output power (P) as follows:<br>(1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency ($f_d$ in kHz) of more than 5 kHz, but not more than 10 kHz: At least $83\text{Log}_{10}$ ($f_d$/5) dB;<br>(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency ($f_d$ in kHz) of more than 10 kHz, but not more than 250 percent of the authorized bandwidth: At least $29\text{Log}_{10}$ ($f_d$ 2/11) dB or 50 dB, whichever is the lesser attenuation;<br>(3) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least 43 + $10\text{Log}_{10}$ (P) dB. |
| 47 CFR §90.210(d) | (d) Emission Mask D—12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:<br>(1) On any frequency from the center of the authorized bandwidth f0 to 5.625 kHz removed from f0: Zero dB.<br>(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least 7.27(fd−2.88 kHz) dB.<br>(3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 12.5 kHz: At least 50 + $10\text{Log}_{10}$(P) dB or 70 dB, whichever is the lesser attenuation. |
| 47 CFR §90.210(e) | (e) Emission Mask E—6.25 kHz or less channel bandwidth equipment. For transmitters designed to operate with a 6.25 kHz or less bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:<br>(1) On any frequency from the center of the authorized bandwidth $f_0$ to 3.0 kHz removed from $f_0$: Zero dB.<br>(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 3.0 kHz but no more than 4.6 kHz: At least 30 + 16.67(fd−3 kHz) or 55 + $10\text{Log}_{10}$(P) or 65 dB, whichever is the lesser attenuation.<br>(3) On any frequency removed from the center of the authorized bandwidth by more than 4.6 kHz: At least 55 + $10\text{Log}_{10}$ (P) or 65 dB, whichever is the lesser attenuation. |

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| Test Conditions | |
|---|---|
| Normative Reference | FCC 47 CFR §2.1049, §90.210, RSS-Gen (6.7), RSS-119 (5.5) |
| | ANSI C63.26 7.2.3 |

**Limits**

**RSS-119 (5.5)**

**406.1MHz - 430MHz, 450MHz - 470MHz**

| Channel Bandwidth (kHz) | Mask w/o Audio Low Pass Filter |
|---|---|
| 25 | C |
| 12.5 | D |
| 6.25 | E |

**RSS-119 (5.8.2)**

**Emission Mask C for Transmitters not Equipped With an Audio Low-Pass Filter**

The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 6.

**Table 6 - Emission Mask C**

| Displacement Frequency, $f_d$(kHz) | Minimum Attenuation (dB) |
|---|---|
| $5 < f_d \leq 10$ (see Note 1) | $83\text{Log}_{10}(f_d/5)$ |
| $10 < f_d \leq 50$ (see Note 1) | Whichever is the lesser:<br>50 or<br>$29\text{Log}_{10}(f_d^2/11)$ |
| $f_d > 50$ (see Note 2) | $43\text{Log}_{10}(P)$ |

**RSS-119 (5.8.3)**

**Emission Mask D for Transmitters Equipped With or Without an Audio Low-Pass Filter**

The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 7.

**Table 7 - Emission Mask D**

| Displacement Frequency, $f_d$(kHz) | Minimum Attenuation (dB) |
|---|---|
| $5.625 < f_d \leq 12.5$ (see Note 3) | $7.27(f_d - 2.88)$ |
| $f_d > 12.5$ (see Note 3) | Whichever is the lesser:<br>70 or<br>$50 + \text{Log}_{10}(P)$ |

**RSS-119 (5.8.4)**

**Emission Mask E for Transmitters Equipped With or Without an Audio Low-Pass Filter**

The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 8.

**Table 8 - Emission Mask E**

| Displacement Frequency, $f_d$(kHz) | Minimum Attenuation (dB) |
|---|---|
| $3 < f_d \leq 4.6$ (see Note 3) | Whichever is the lesser:<br>$30 + 16.67(f_d - 3)$ or<br>$55 + \text{Log}_{10}(P)$ |
| $f_d > 4.6$ (see Note 3) | Whichever is the lesser:<br>57 or<br>$55 + \text{Log}_{10}(P)$ |

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| Test Conditions | |
|---|---|
| Normative Reference | FCC 47 CFR §2.1049, §90.210, RSS-Gen (6.7), RSS-119 (5.5) |
| | ANSI C63.26 7.2.3 |

| Measurement Procedure | |
|---|---|
| 47 CFR §90.210(d)(4)<br>47 CFR §90.210(e)(4) | (4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings do not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior commission approval is obtained. |
| RSS-119 (4.2.1) | **4.2.1 Emission Masks B, C, G, I and J**<br>Unwanted emission measurements can be in peak or averaging mode, provided that the same parameter, peak power or average power, used for the transmitter's output power measurement is also used for the unwanted emission measurements.<br>Except where otherwise stated, on any frequency removed from the carrier frequency by more than 250% of the authorized bandwidth, a resolution bandwidth of at least 100 kHz must be used for frequencies to be measured at or below 1 GHz, and a resolution bandwidth of at least 1 MHz must be used for frequencies to be measured above 1 GHz. If a narrower resolution bandwidth is used, power integration shall be applied. |
| RSS-119 (4.2.2) | **4.2.2 Emission Masks D, E, F and Y**<br>In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak mode. For emissions beyond 50 kHz from the edge of the authorized bandwidth, the resolution bandwidth shall be 100 kHz for frequencies at or below 1 GHz, and 1 MHz for frequencies above 1 GHz. However, for emission mask F, at a displacement frequency of less than 3.75 kHz, the resolution bandwidth shall be 30 Hz. |
| Note 1: RBW = 300Hz<br>Note 2: RBW = Specified in Section 4.2.1<br>Note 3: RBW = Specified in Section 4.2.2 | |

| Test Setup | Appendix A | Figure A.1 |
|---|---|---|

| Measurement Setup |
|---|
| The DUT was connected to a Spectrum Analyzer (SA) via a 30dB attenuator connected to the DUT's antenna port. The SA was configured as above using the appropriate mask and the SA Limit Check function. The output power of the DUT was set to the manufacturer's highest output power setting (except as noted) and set to MSK, QPSK, 8PSK, 16QAM, 32QAM and 64QAM modulation mode. The DUT was set to transmit at its maximum Duty Cycle. |

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**Notes to Emissions Mask**

**Note 1.**

This device meets the spectrum efficiency requirements of §90.203(j)(3). In accordance with §90.209(b)(5) Note 3:

[3]Operations using equipment designed to operate with a 25 kHz channel bandwidth will be authorized a 20 kHz bandwidth. Operations using equipment designed to operate with a 12.5 kHz channel bandwidth will be authorized a 11.25 kHz bandwidth. Operations using equipment designed to operate with a 6.25 kHz channel bandwidth will be authorized a 6 kHz bandwidth. All stations must operate on channels with a bandwidth of 12.5 kHz or less beginning January 1, 2013, unless the operations meet the efficiency standard of §90.203(j)(3).

This device is permitted to operate with a 25kHz channel bandwidth.

---

**Note 2:**

This device is identical to FCC ID: PEJ-9384-XETA4HP. In April 2017 the FCC waived the emission designator limitations of §90.207(i) to permit the use of D1D and G1D emission designators. The D1D and G1D emission designators are permitted for use by this device.

---

**Note 3:**

Per ISED RSS-119 (5.6):

**5.6 Fixed Equipment With an Occupied Bandwidth Larger Than the Authorized Bandwidth Permitted in This Standard**

Fixed equipment requiring an occupied bandwidth larger than the authorized bandwidth shown in Table 3 may be permitted if that the equipment complies with the three following conditions:

(1) The equipment is allowed to have aggregate channels as per the SRSP for its operating frequency bands.
(2) The ERP shall not be increased with increased occupied bandwidth.
(3) The equipment shall employ an emission mask that does not result in more adjacent channel interference than the standard narrowband channel equipment emission mask specified in Table 3.

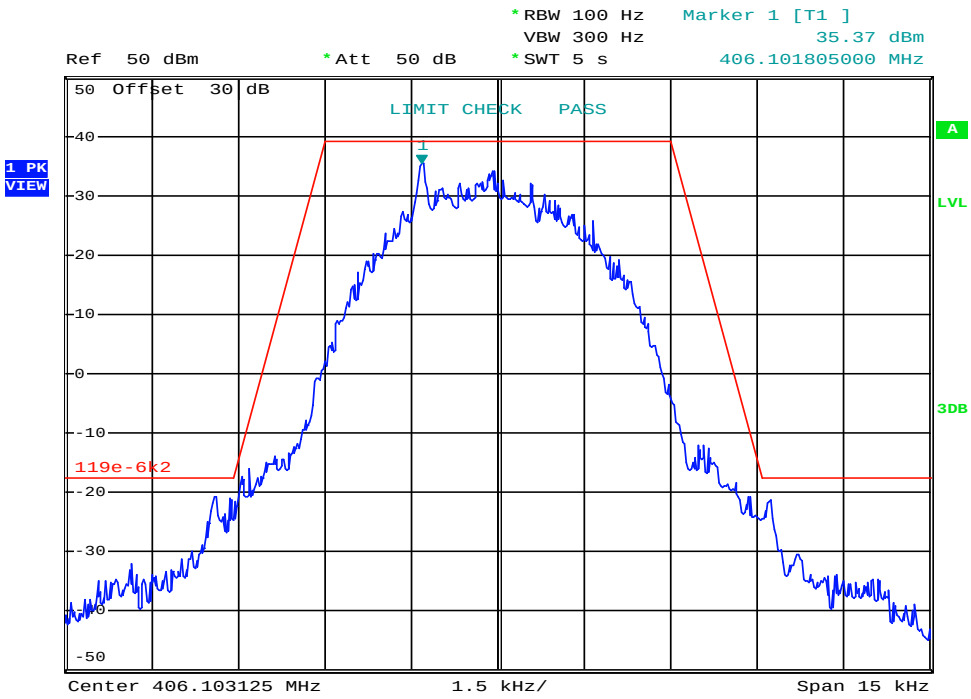
This device complies with (1) as it aggregates adjacent channels and (2) as the ERP does not increase with increased bandwidth. Emission Mask C was modified by increasing the upper and lower skirts by 25kHz (+/- 12.5kHz). The following emissions mask was used for compliance with (3):

| Displacement Frequency $f_d$ (kHz) | Minimum Attenuation (dB) |
|---|---|
| 25kHz Channel Bandwidth | |
| $5 < f_d \leq 10$ | $83\text{Log}_{10}(f_d/5)$ |
| $10 < f_d \leq 50$ | Lesser of: 50 or $29\text{Log}_{10}(f_d^2/11)$ |
| $f_d > 50$ | $43 + 10\text{Log}_{10}(P)$ |
| 50kHz Channel Bandwidth | |
| $17.5 < f_d \leq 22.5$ | $83\text{Log}_{10}(f_d/5)$ |
| $22.5 < f_d \leq 62.5$ | Lesser of: 50 or $29\text{Log}_{10}(f_d^2/11)$ |
| $f_d > 62.5$ | $43 + 10\text{Log}_{10}(P)$ |

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**Plot 9.1 – Band Edge and Emissions Mask – 6.25kHz BW – MSK – 406.103125MHz, ISED**

## RSS-119 (5.8.4) Mask E



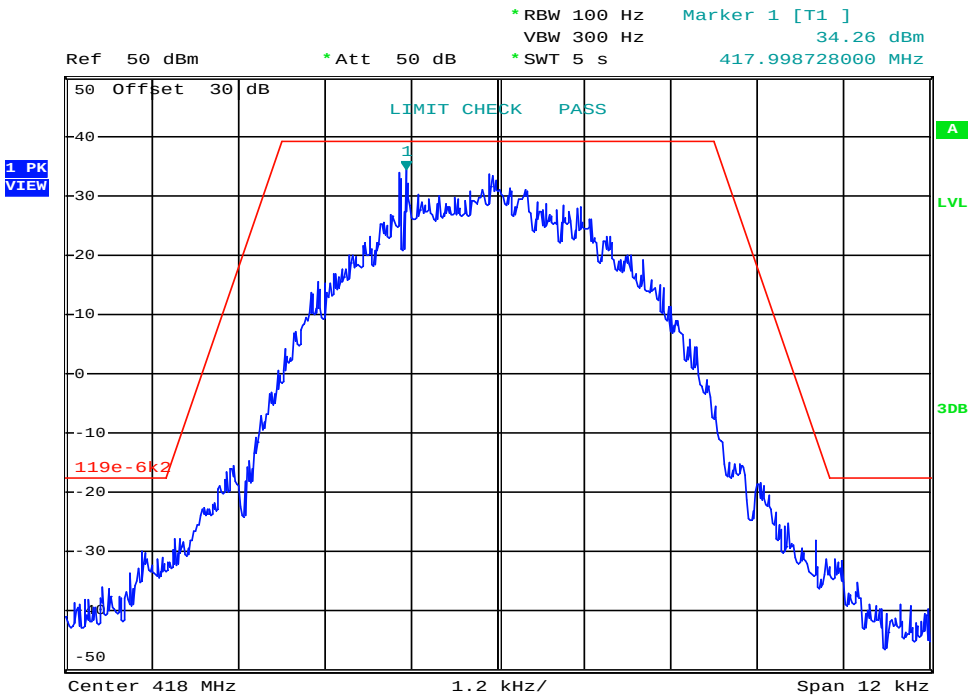

Date: 7.AUG.2019 14:15:01

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.103125** MHz | **Lower Band Edge** | **6.25** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **MSK** | **39.00** dBm | **PASS** |

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**Plot 9.2 – Band Edge and Emissions Mask – 6.25kHz BW – MSK – 418MHz, ISED**

## RSS-119 (5.8.4) Mask E



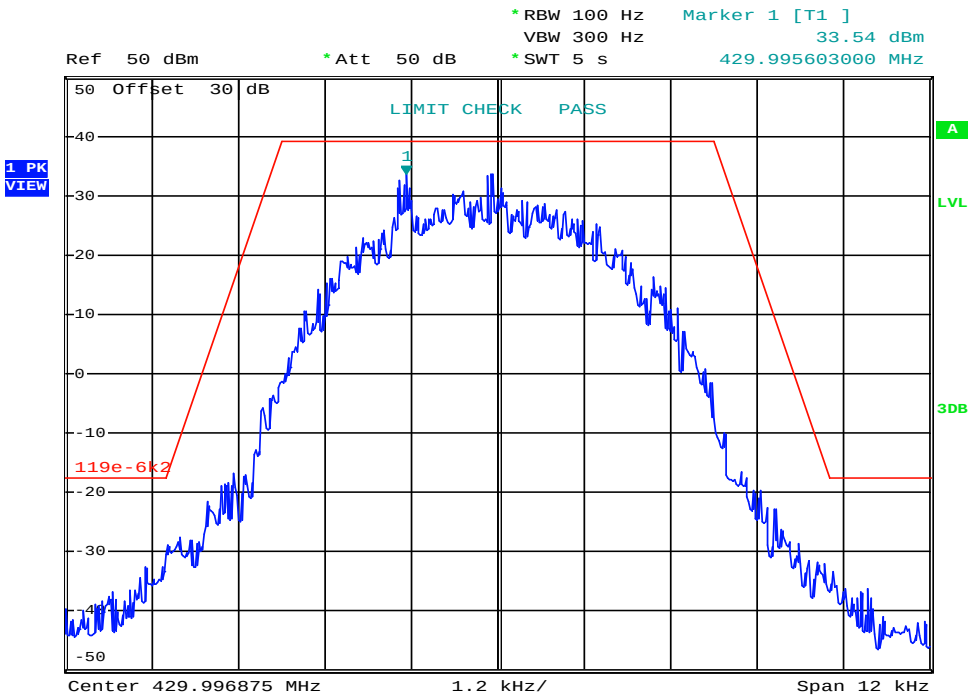

Date: 7.AUG.2019 15:42:08

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **6.25** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **MSK** | **39.00** dBm | **PASS** |

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**Plot 9.3 – Band Edge and Emissions Mask – 6.25kHz BW – MSK – 429.996875MHz, ISED**

## RSS-119 (5.8.4) Mask E



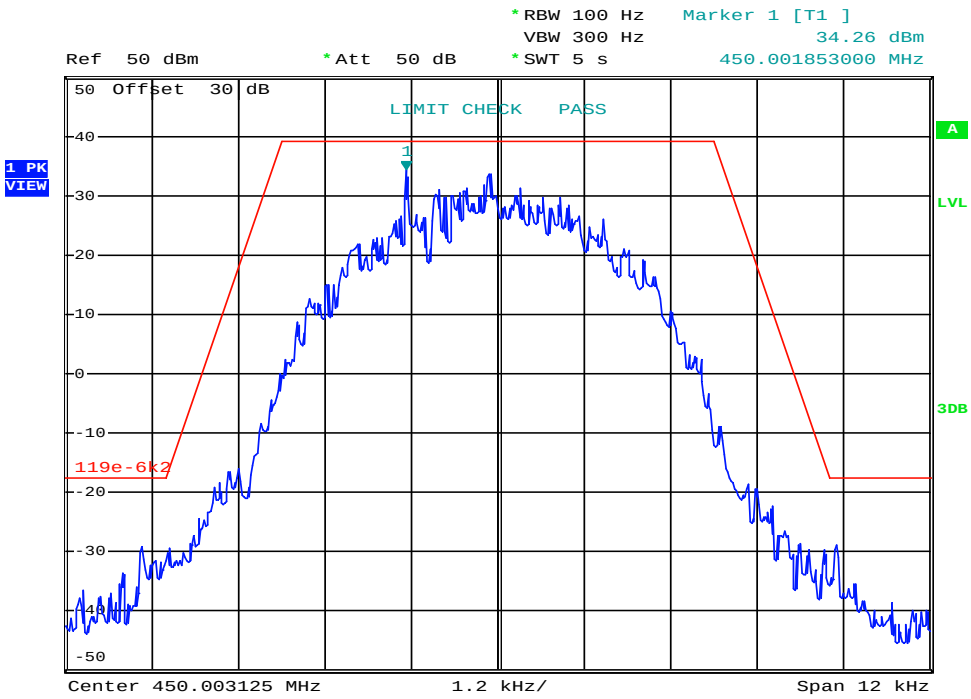

Date: 7.AUG.2019 15:37:37

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.996875** MHz | **Upper Band Edge** | **6.25** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **MSK** | **39.00** dBm | **PASS** |

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**Plot 9.4 – Band Edge and Emissions Mask – 6.25kHz BW – MSK – 450.003125MHz, ISED**

## RSS-119 (5.8.4) Mask E



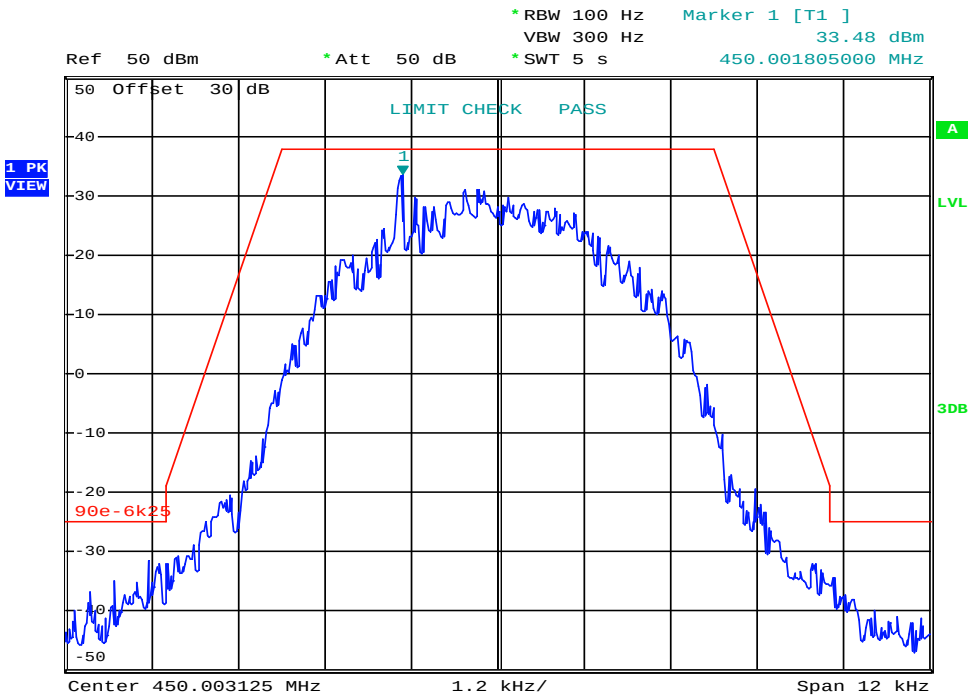

Date: 7.AUG.2019 15:35:46

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.003125** MHz | **Lower Band Edge** | **6.25** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **MSK** | **39.00** dBm | **PASS** |

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**Plot 9.5 – Band Edge and Emissions Mask – 6.25kHz BW – MSK – 450.003125MHz, FCC**

## FCC §90.210(e) Mask E



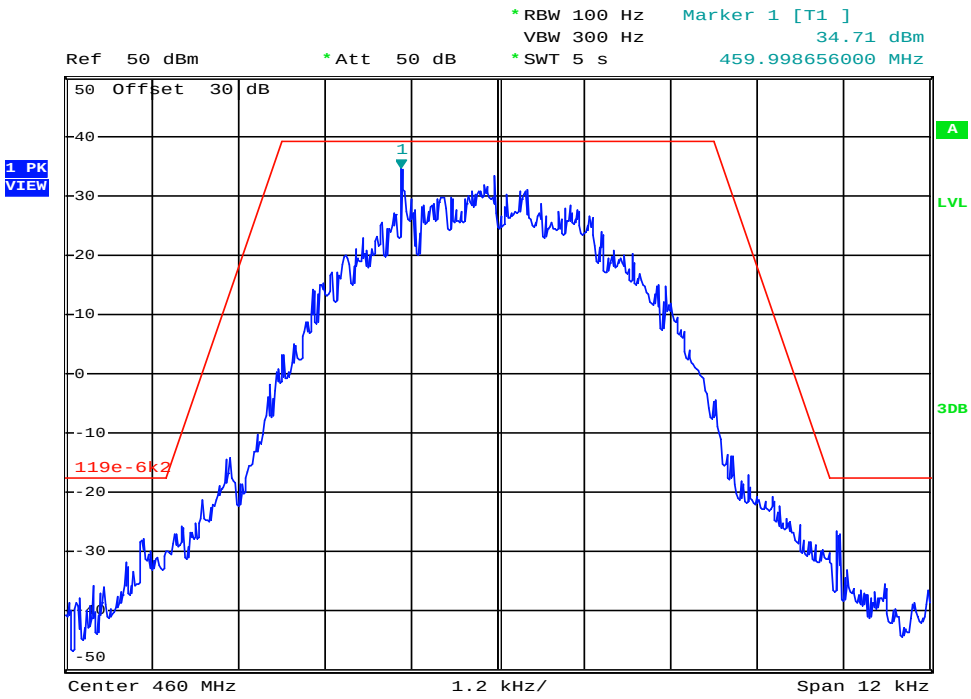

Date: 7.AUG.2019 15:34:15

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.003125** MHz | **Lower Band Edge** | **6.25** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **MSK** | **37.78** dBm | **PASS** |

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**Plot 9.6 – Band Edge and Emissions Mask – 6.25kHz BW – MSK – 460MHz, ISED**

## RSS-119 (5.8.4) Mask E



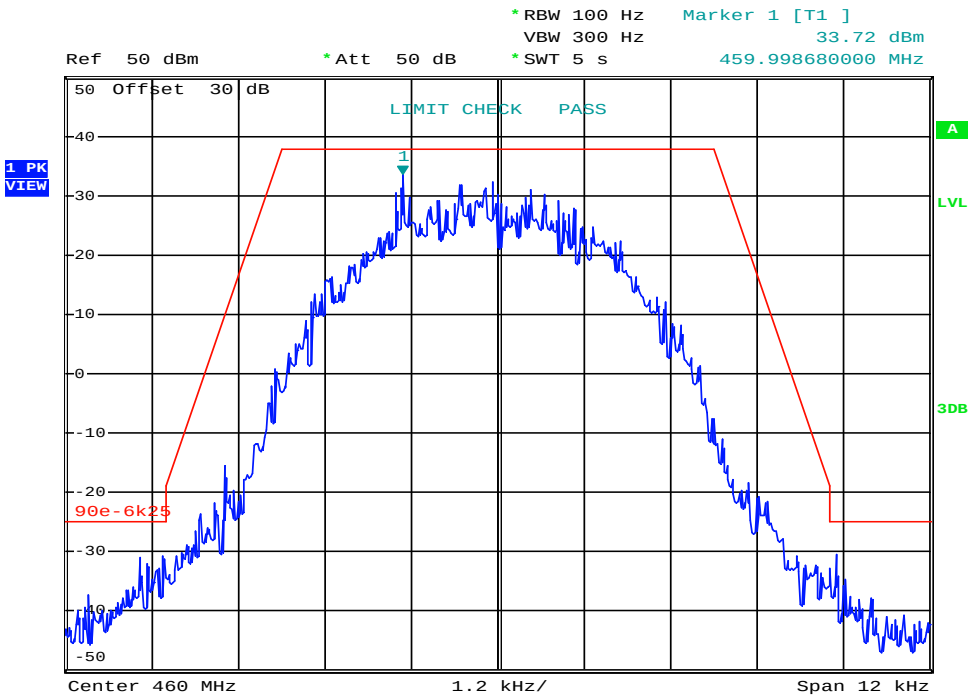

Date: 7.AUG.2019 15:30:57

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **6.25** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **MSK** | **39.00** dBm | **PASS** |

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**Plot 9.7 – Band Edge and Emissions Mask – 6.25kHz BW – MSK – 460MHz, FCC**

## FCC §90.210(e) Mask E



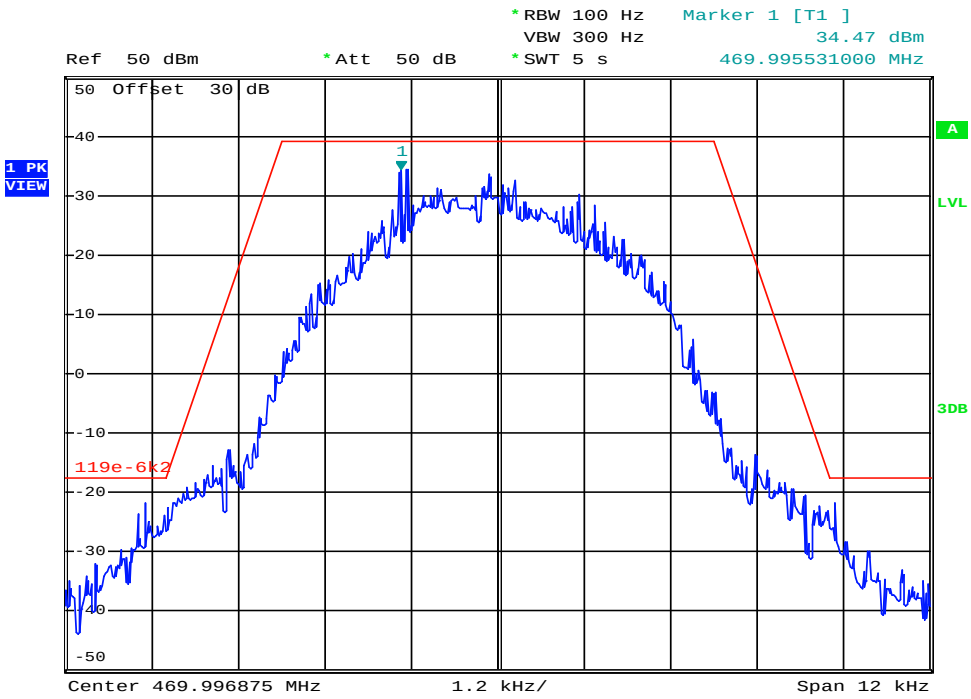

Date: 7.AUG.2019 15:32:21

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **6.25** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **MSK** | **37.78** dBm | **PASS** |

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**Plot 9.8 – Band Edge and Emissions Mask – 6.25kHz BW – MSK – 469.996875MHz, ISED**

## RSS-119 (5.8.4) Mask E



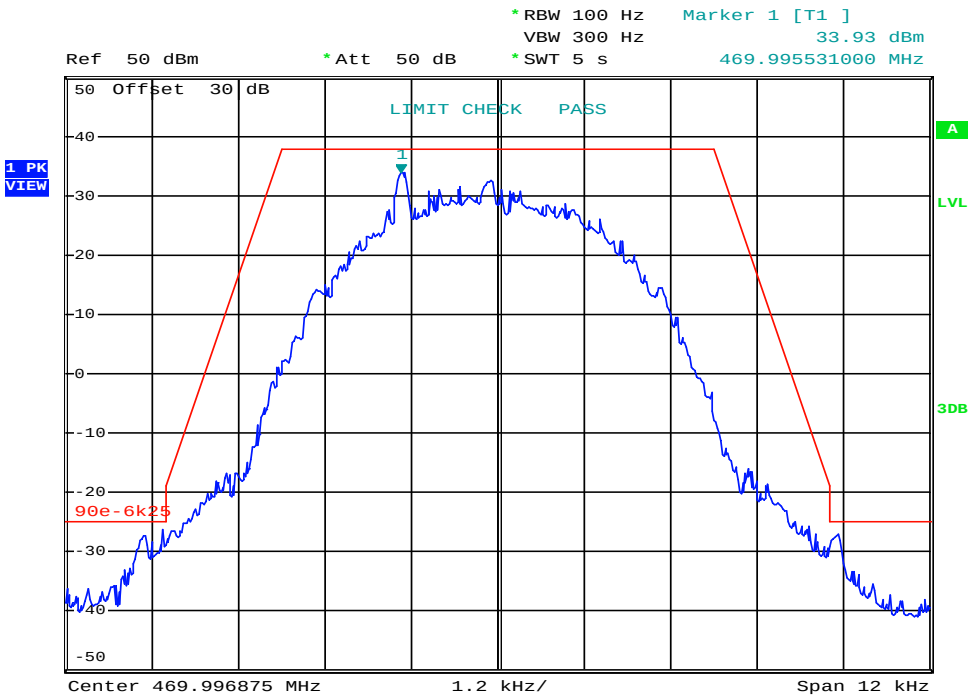

Date: 7.AUG.2019 15:25:04

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.996875** MHz | **Upper Band Edge** | **6.25** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **MSK** | **39.00** dBm | **PASS** |

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**Plot 9.9 – Band Edge and Emissions Mask – 6.25kHz BW – MSK – 469.996875MHz, FCC**

## FCC §90.210(e) Mask E



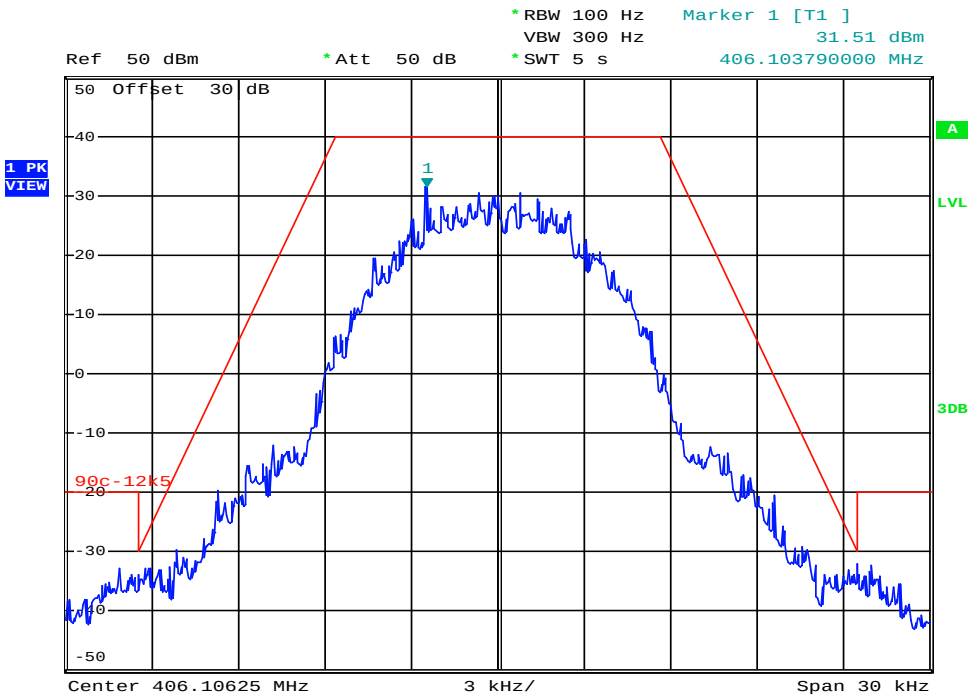

Date: 7.AUG.2019 15:23:33

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.996875** MHz | **Upper Band Edge** | **6.25** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **MSK** | **37.78** dBm | **PASS** |

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**Plot 9.10 – Band Edge and Emissions Mask – 12.5kHz BW – MSK – 406.10625MHz, ISED**

## RSS-119 (5.8.3) Mask D



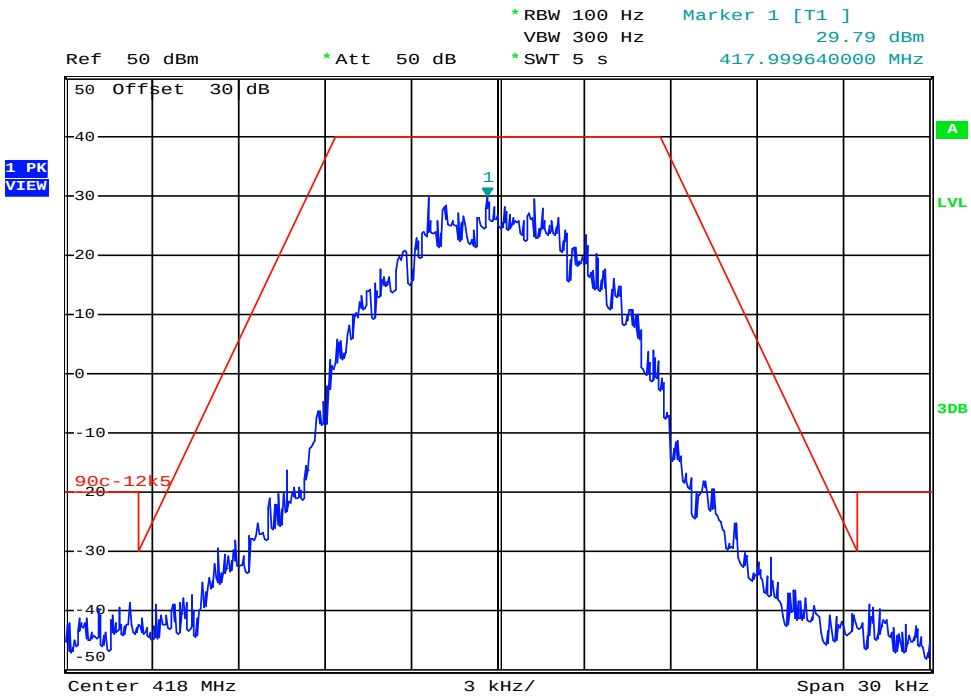

Date: 7.AUG.2019 16:07:32

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.106250** MHz | **Lower Band Edge** | **12.50** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.11 – Band Edge and Emissions Mask – 12.5kHz BW – MSK – 418MHz, ISED**

## RSS-119 (5.8.3) Mask D



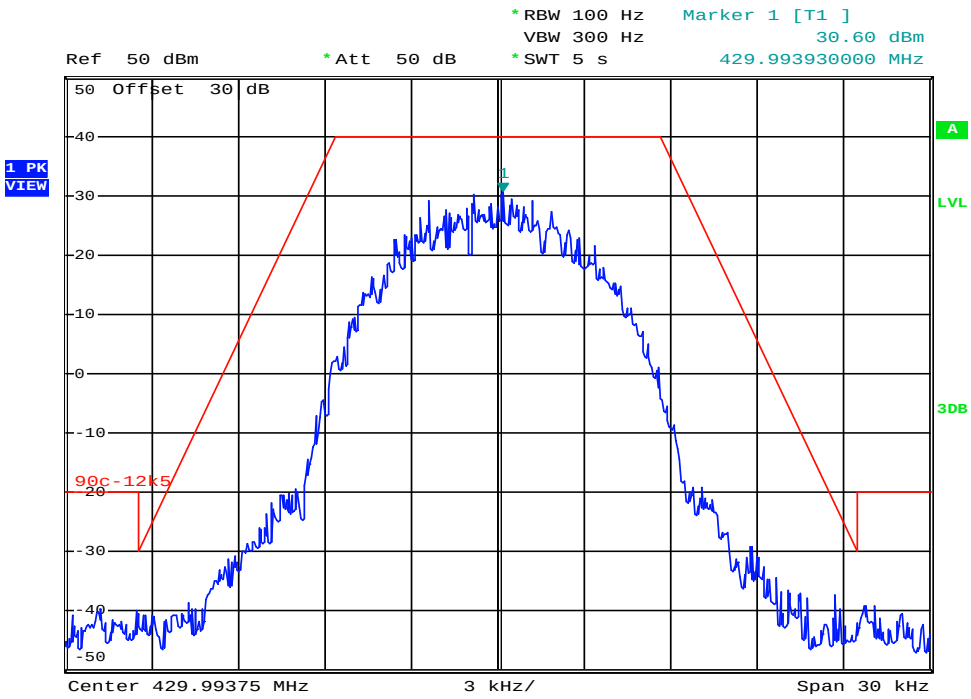

Date: 7.AUG.2019 16:09:33

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **12.50** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.12 – Band Edge and Emissions Mask – 12.5kHz BW – MSK – 429.99375MHz, ISED**

## RSS-119 (5.8.3) Mask D



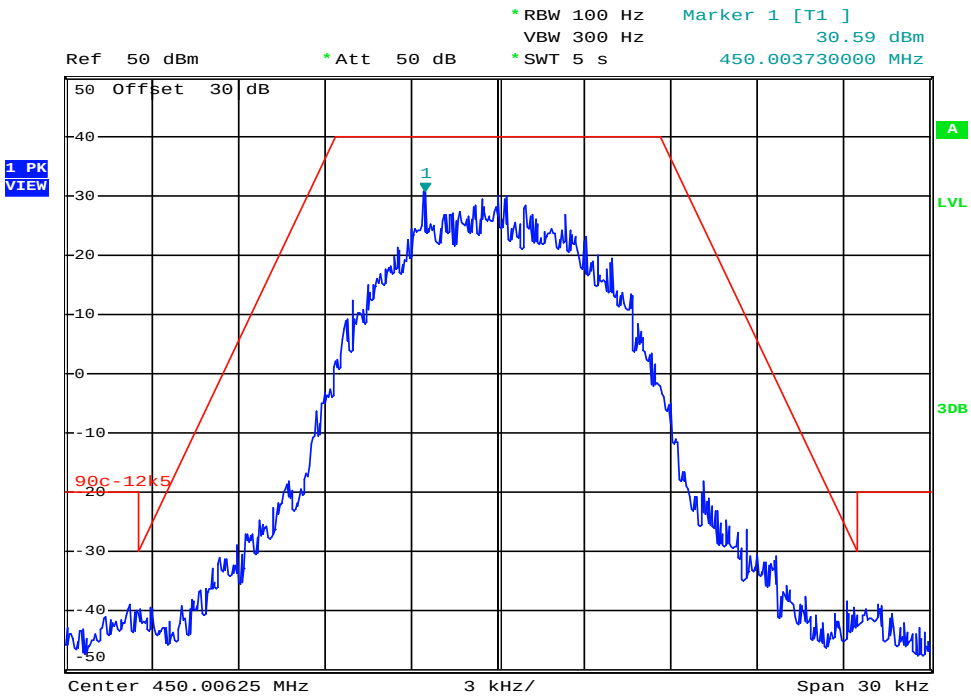

Date: 7.AUG.2019 16:15:57

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.993750** MHz | **Upper Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.13 – Band Edge and Emissions Mask – 12.5kHz BW – MSK – 450.00625MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



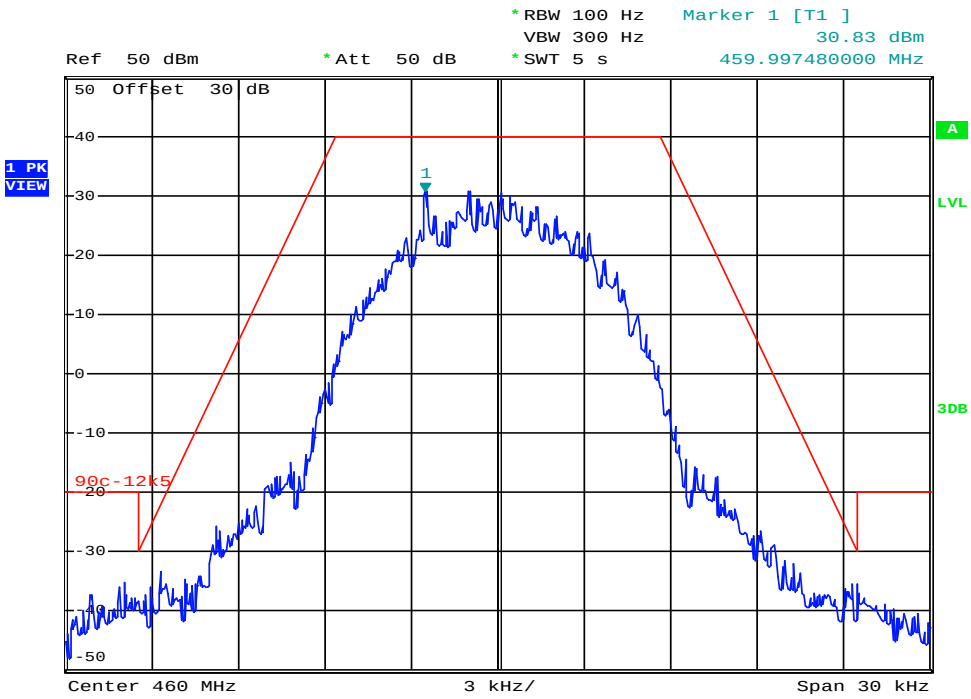

Date: 7.AUG.2019 16:17:28

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.006250** MHz | **Lower Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.14 – Band Edge and Emissions Mask – 12.5kHz BW – MSK – 460MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



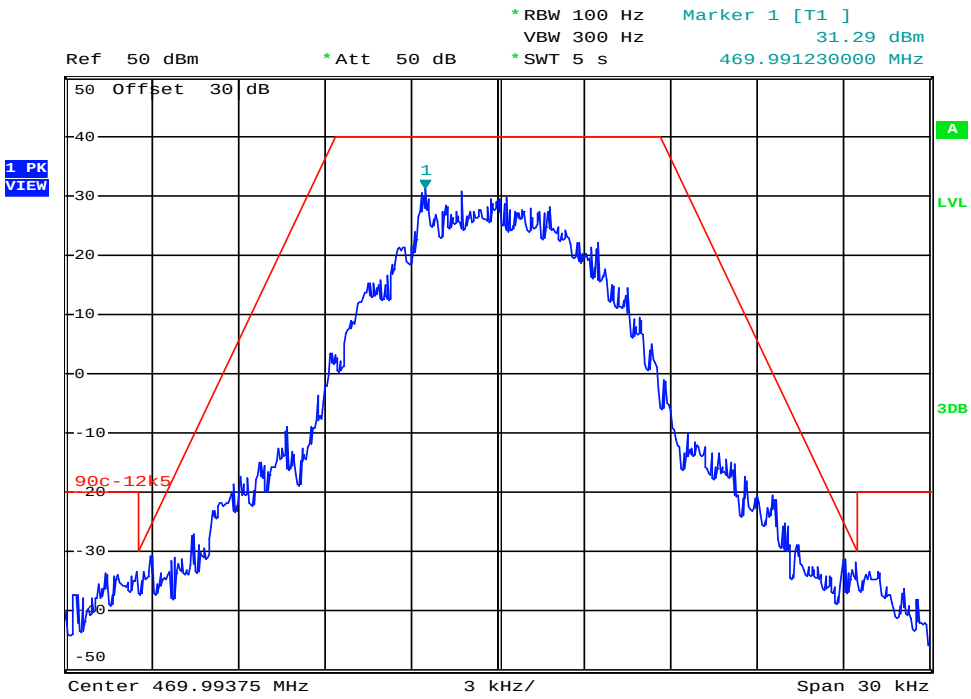

Date: 7.AUG.2019 16:18:45

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.15 – Band Edge and Emissions Mask – 12.5kHz BW – MSK – 469.99375MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



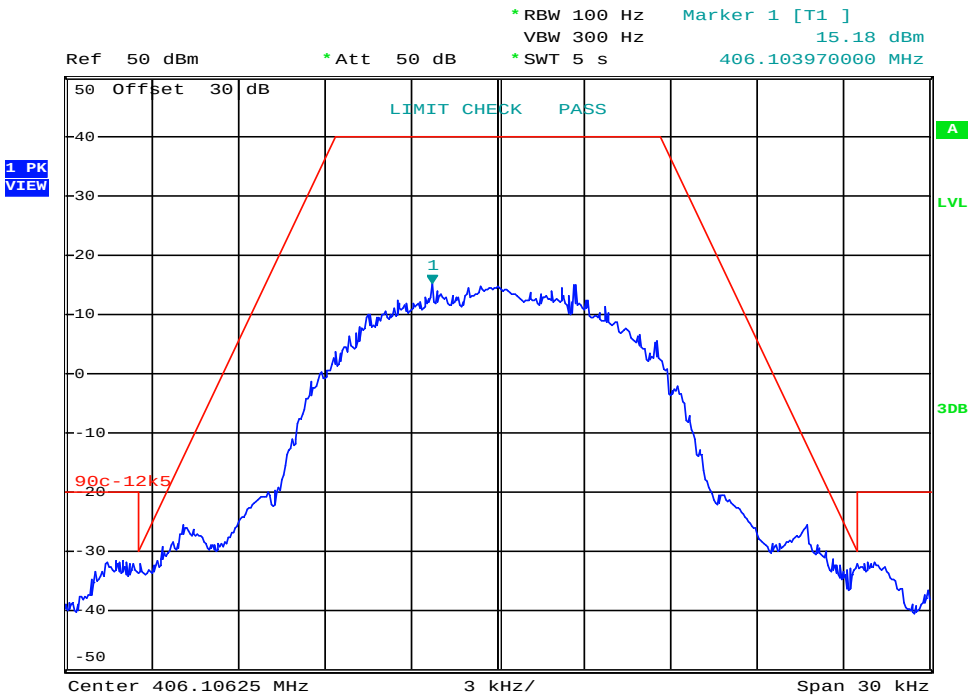

Date: 7.AUG.2019 16:20:25

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.993750** MHz | **Upper Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.16 – Band Edge and Emissions Mask – 12.5kHz BW – 8PSK – 406.10625MHz, ISED**

## RSS-119 (5.8.3) Mask D



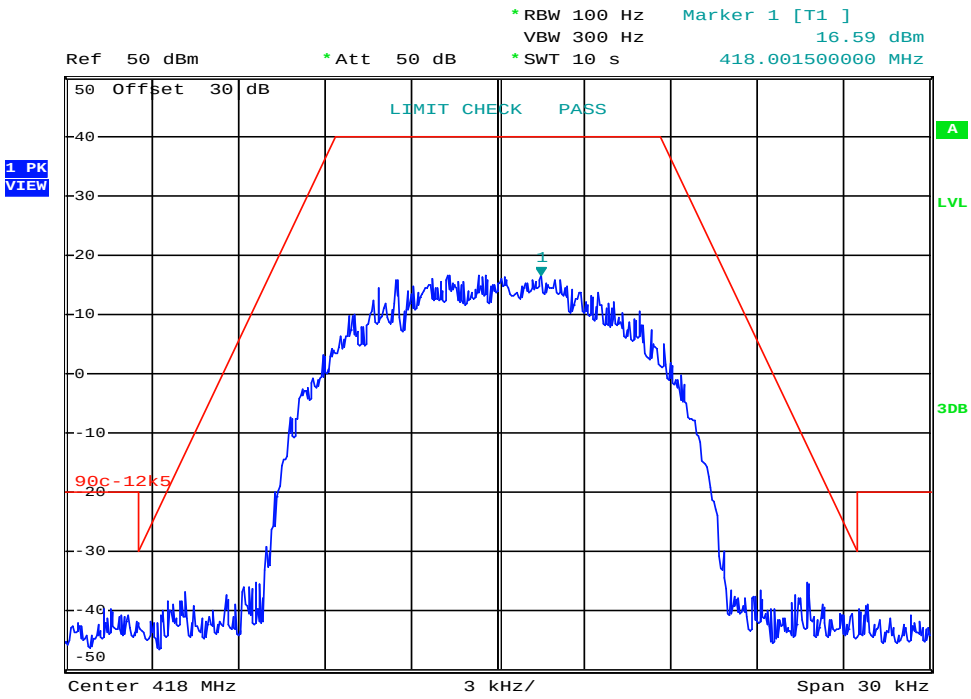

Date: 7.AUG.2019 16:54:03

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.106250** MHz | **Lower Band Edge** | **12.50** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.17 – Band Edge and Emissions Mask – 12.5kHz BW – 8PSK – 418MHz, ISED**

## RSS-119 (5.8.3) Mask D



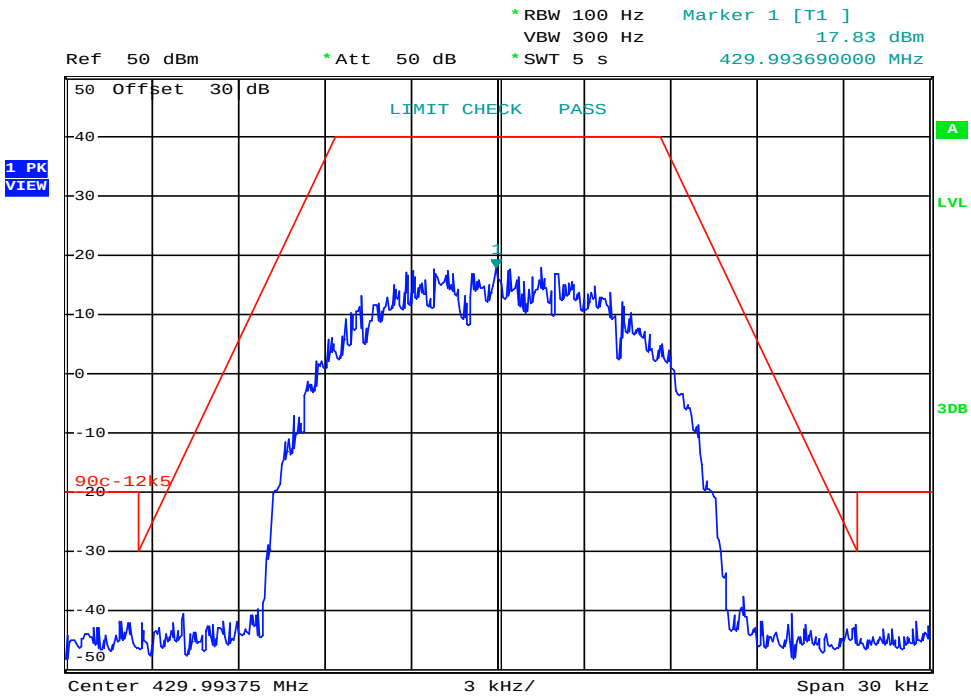

Date: 7.AUG.2019 16:56:54

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **12.50** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.18 – Band Edge and Emissions Mask – 12.5kHz BW – 8PSK – 429.99375MHz, ISED**

## RSS-119 (5.8.3) Mask D



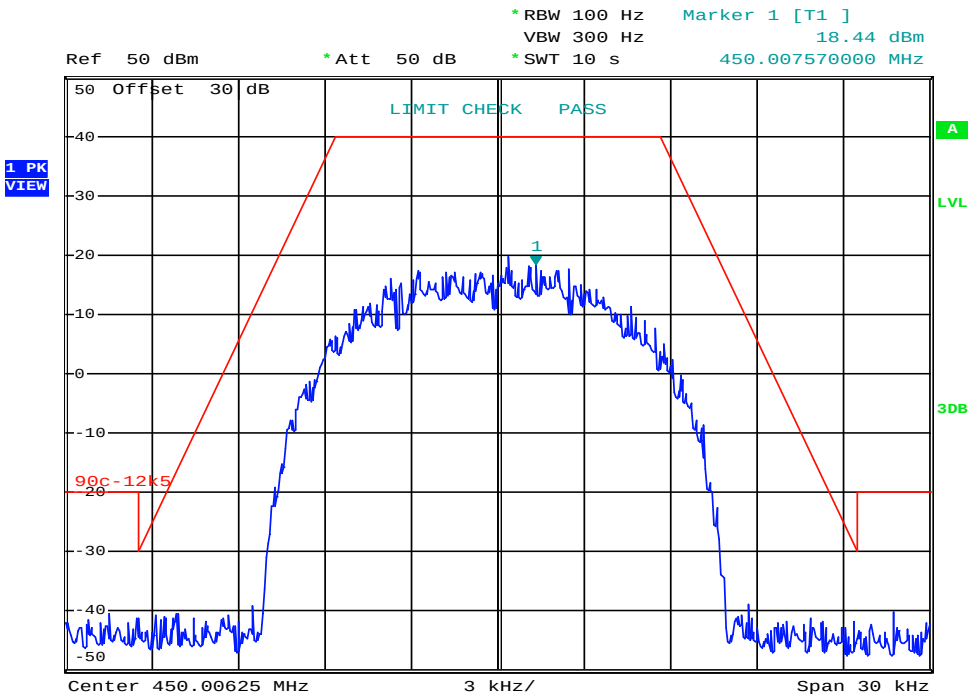

Date: 7.AUG.2019 17:04:06

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.993750** MHz | **Upper Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.19 – Band Edge and Emissions Mask – 12.5kHz BW – 8PSK – 450.00625MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



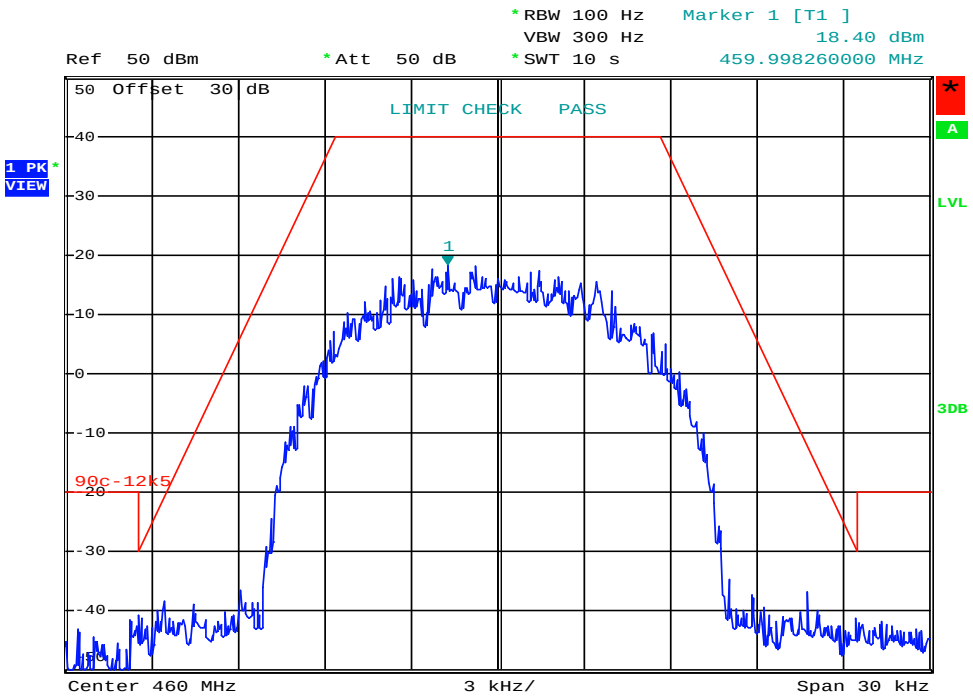

Date: 7.AUG.2019 17:06:30

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.006250** MHz | **Lower Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.20 – Band Edge and Emissions Mask – 12.5kHz BW – 8PSK – 460MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



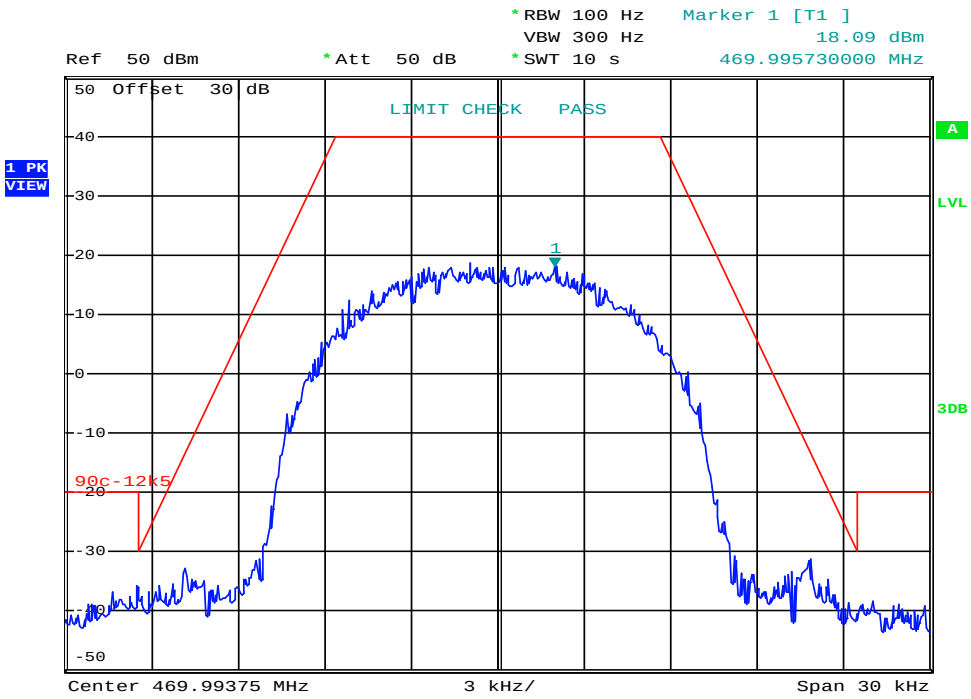

Date: 7.AUG.2019 17:08:32

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.21 – Band Edge and Emissions Mask – 12.5kHz BW – 8PSK – 469.99375MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



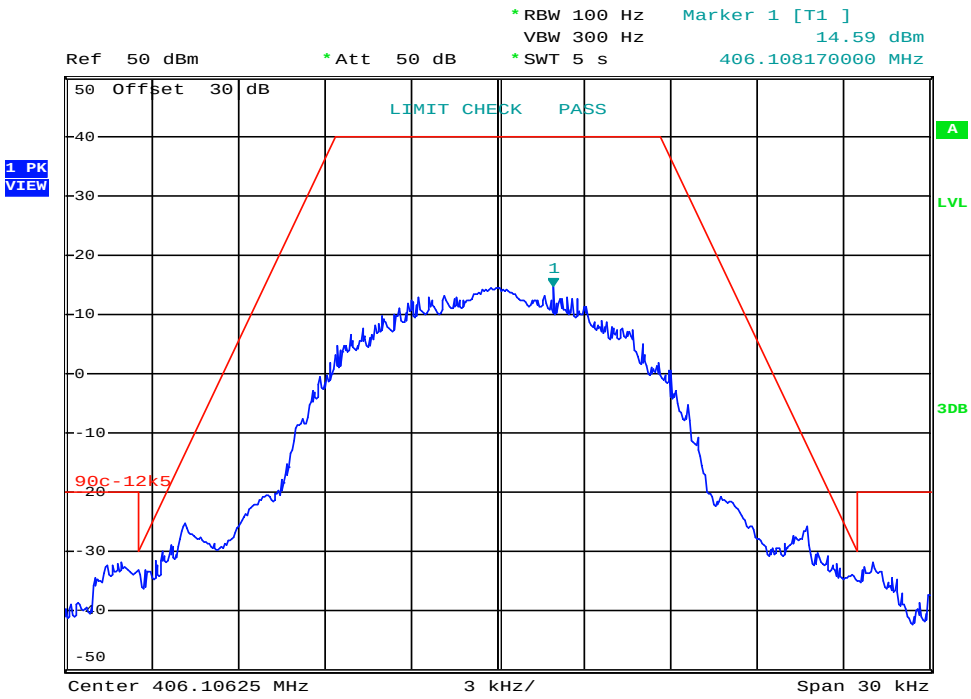

Date: 7.AUG.2019 17:15:37

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.993750** MHz | **Upper Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.22 – Band Edge and Emissions Mask – 12.5kHz BW – QPSK – 406.10625MHz, ISED**

## RSS-119 (5.8.3) Mask D



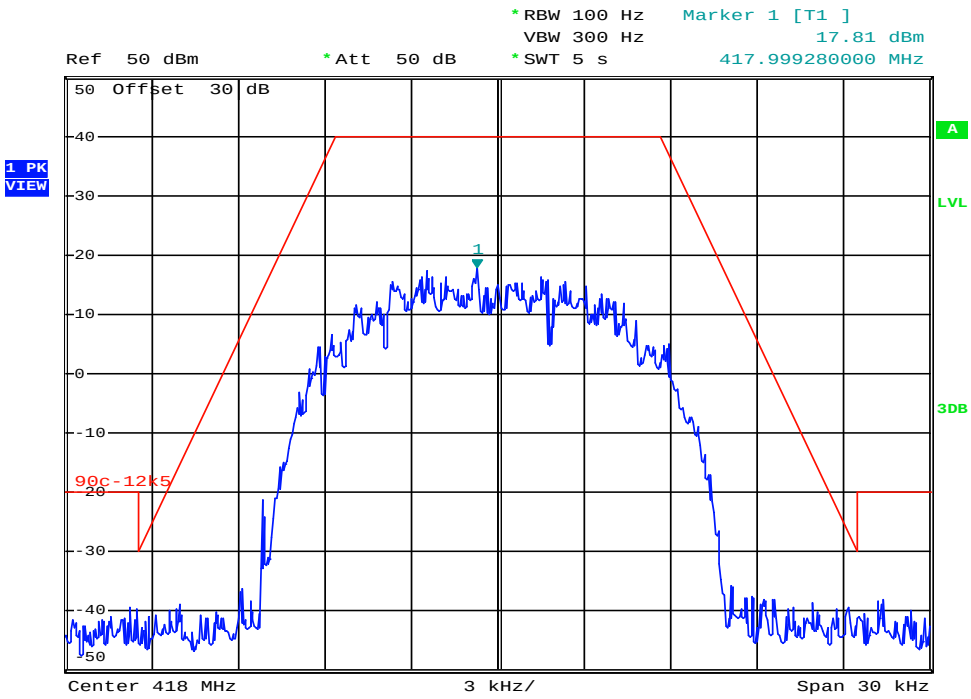

Date: 7.AUG.2019 16:35:43

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.106250** MHz | **Lower Band Edge** | **12.50** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.23 – Band Edge and Emissions Mask – 12.5kHz BW – QPSK – 418MHz, ISED**

## RSS-119 (5.8.3) Mask D



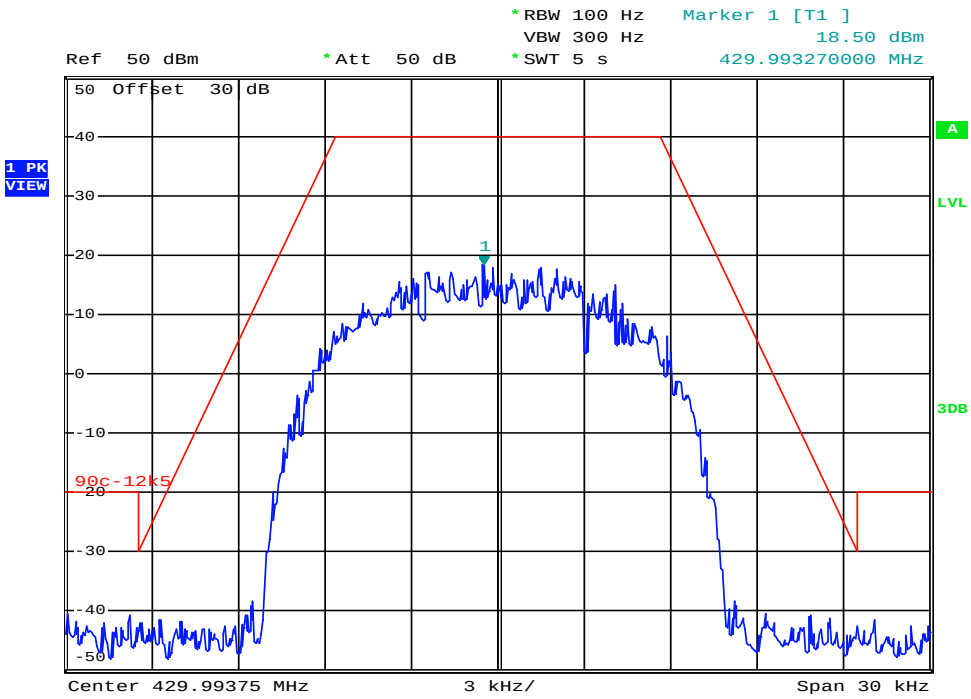

Date: 7.AUG.2019 16:32:11

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.24 – Band Edge and Emissions Mask – 12.5kHz BW – QPSK – 429.99375MHz, ISED**

## RSS-119 (5.8.3) Mask D



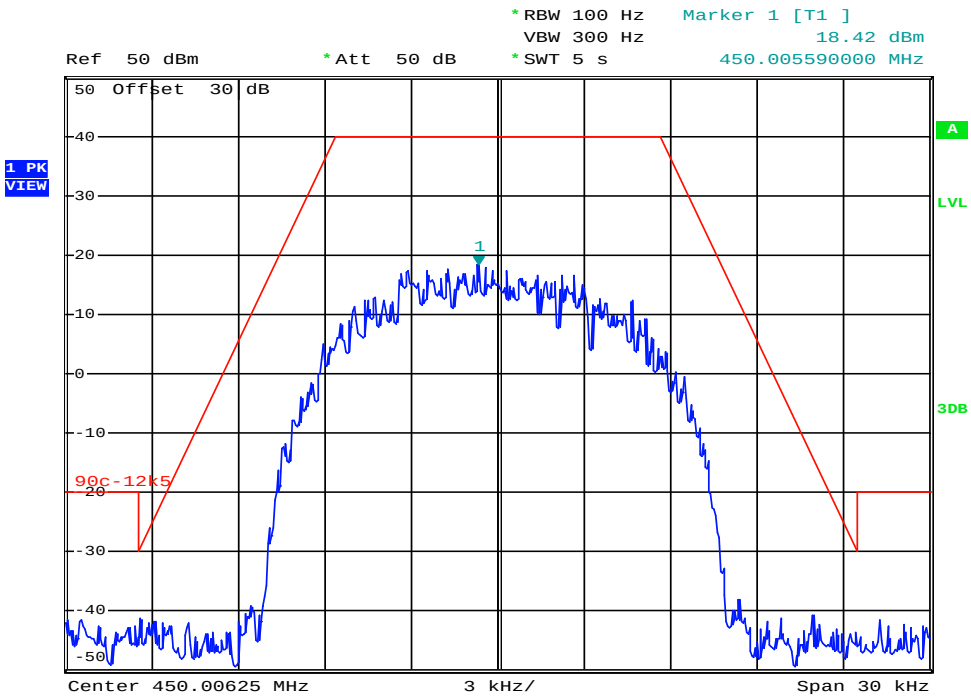

Date: 7.AUG.2019 16:27:37

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.993750** MHz | **Upper Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.25 – Band Edge and Emissions Mask – 12.5kHz BW – QPSK – 450.00625MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



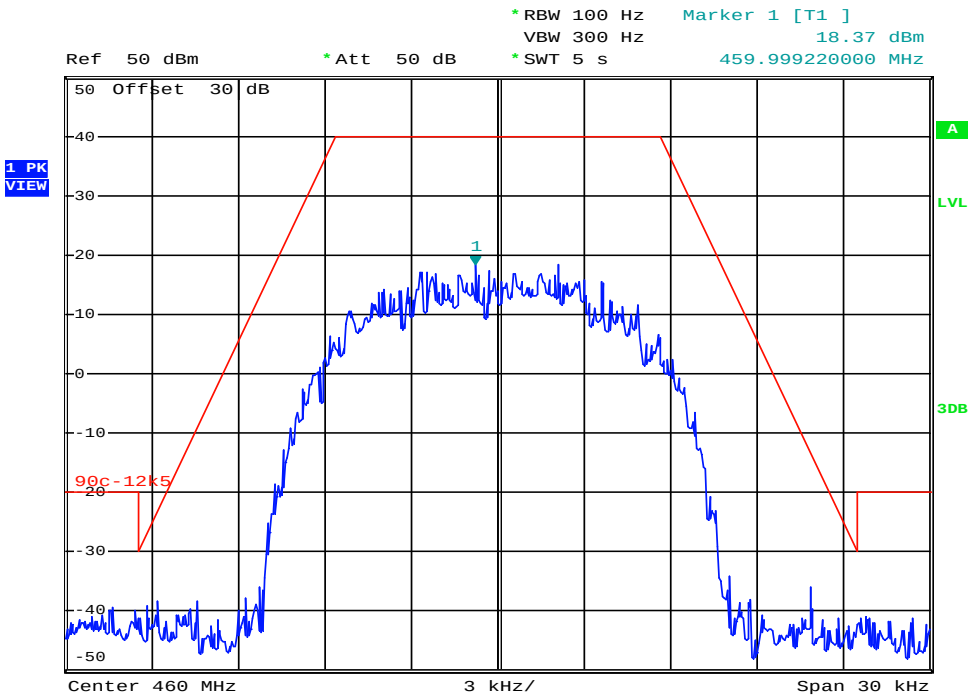

Date: 7.AUG.2019 16:26:06

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.006250** MHz | **Lower Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.26 – Band Edge and Emissions Mask – 12.5kHz BW – QPSK – 460MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



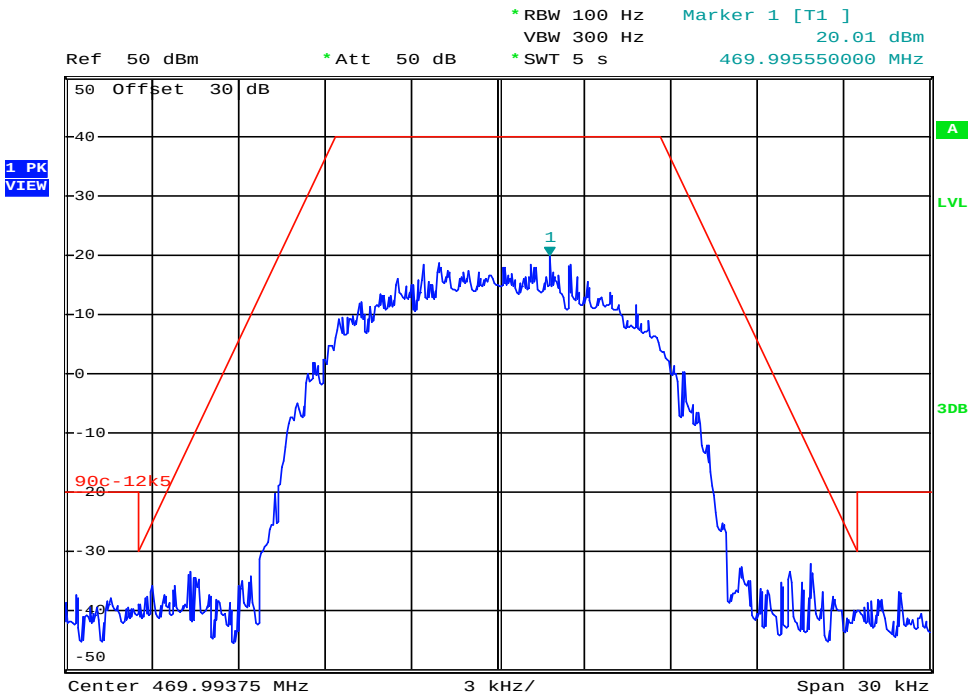

Date: 7.AUG.2019 16:24:42

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.27 – Band Edge and Emissions Mask – 12.5kHz BW – QPSK – 469.99375MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



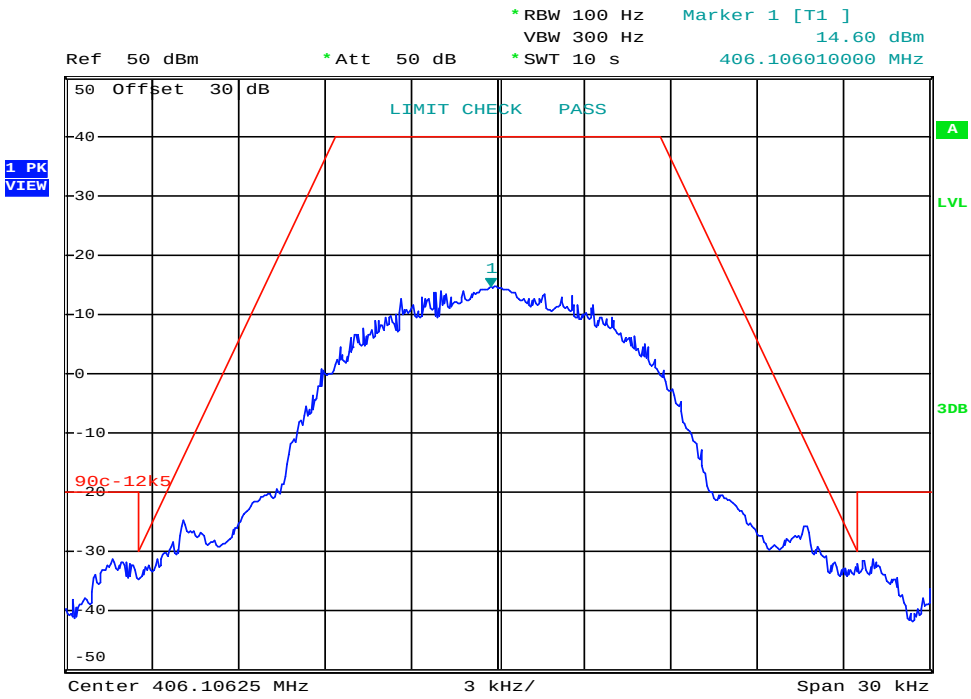

Date: 7.AUG.2019 16:23:20

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.993750** MHz | **Upper Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.28 – Band Edge and Emissions Mask – 12.5kHz BW – 16QAM – 406.10625MHz, ISED**

## RSS-119 (5.8.3) Mask D



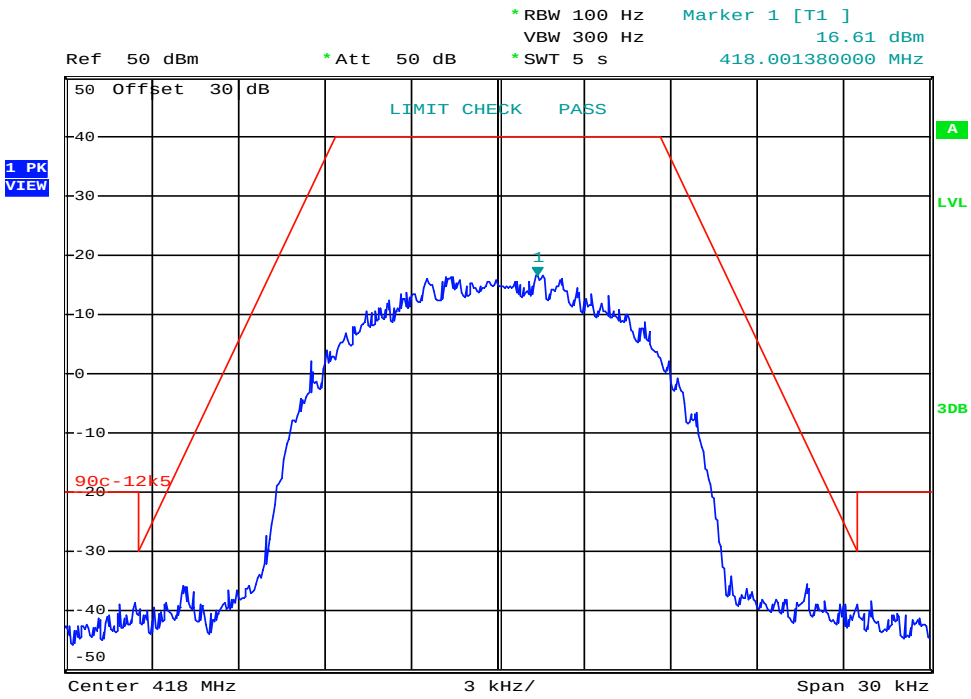

Date: 7.AUG.2019 17:48:11

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.106250** MHz | **Lower Band Edge** | **12.50** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.29 – Band Edge and Emissions Mask – 12.5kHz BW – 16QAM – 418MHz, ISED**

## RSS-119 (5.8.3) Mask D



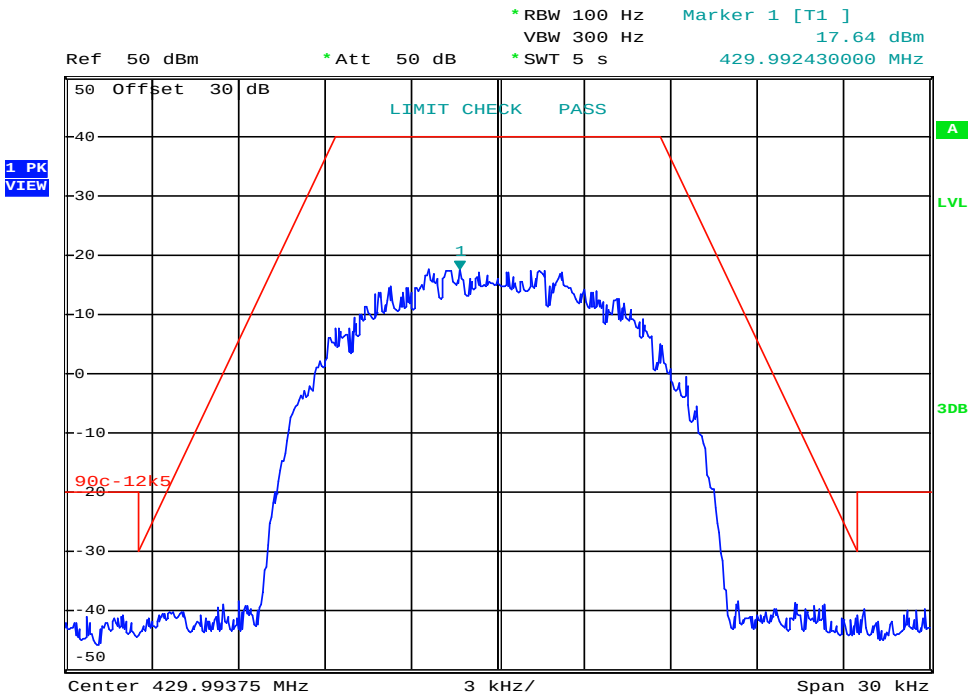

Date: 7.AUG.2019 17:36:41

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.30 – Band Edge and Emissions Mask – 12.5kHz BW – 16QAM – 429.99375MHz, ISED**

## RSS-119 (5.8.3) Mask D



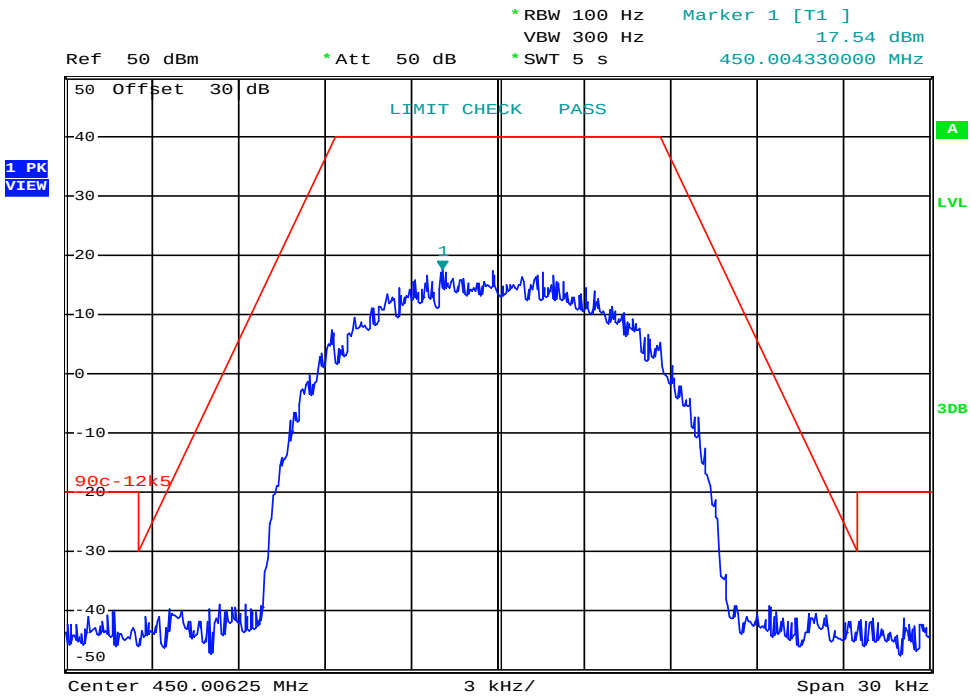

Date: 7.AUG.2019 17:27:51

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.993750** MHz | **Upper Band Edge** | **12.50** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.31 – Band Edge and Emissions Mask – 12.5kHz BW – 16QAM – 450.00625MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



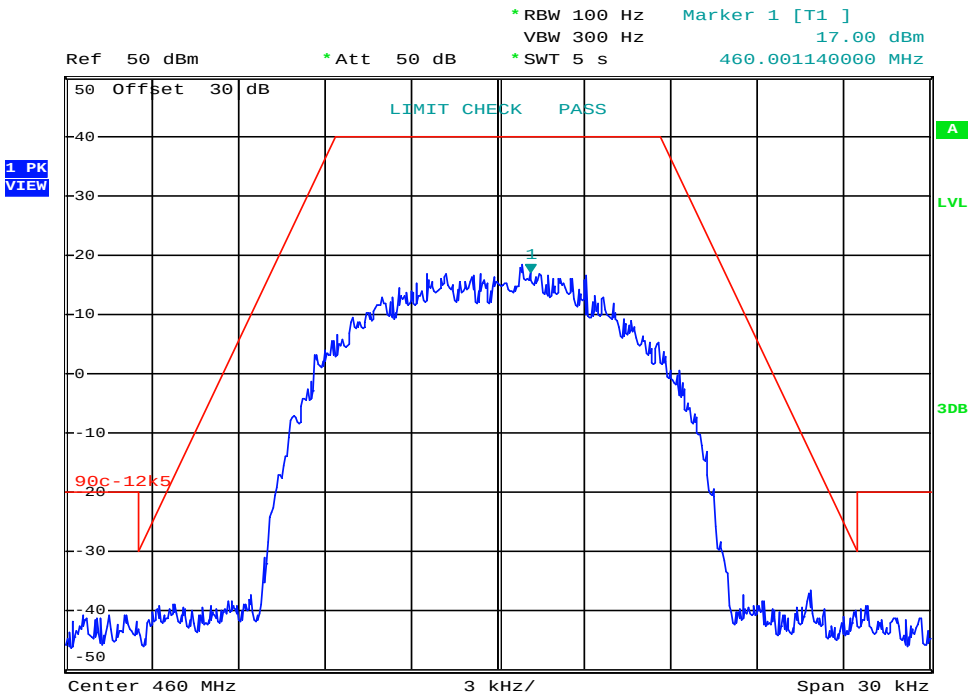

Date: 7.AUG.2019 17:23:42

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.006250** MHz | **Lower Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.32 – Band Edge and Emissions Mask – 12.5kHz BW – 16QAM – 460MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



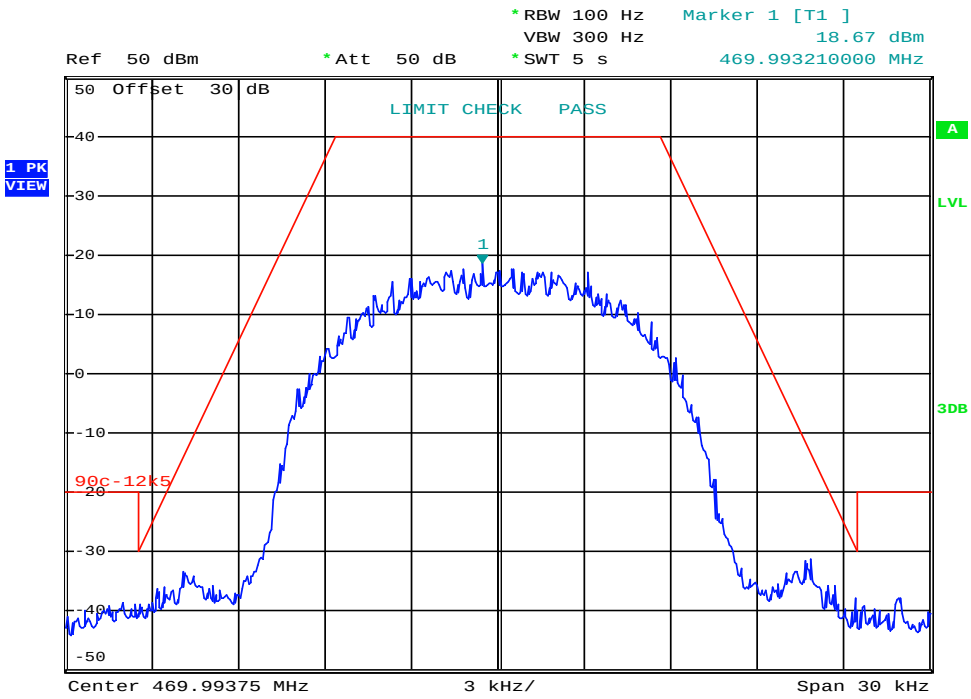

Date: 7.AUG.2019 17:21:42

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.33 – Band Edge and Emissions Mask – 12.5kHz BW – 16QAM – 469.99375MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



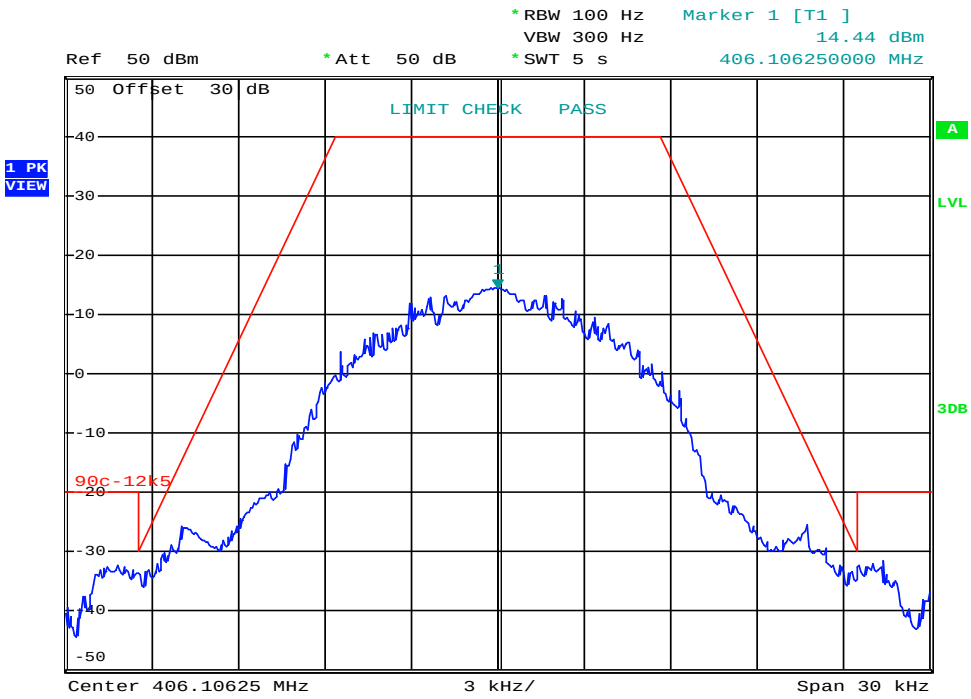

Date: 7.AUG.2019 17:19:24

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.993750** MHz | **Upper Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.34 – Band Edge and Emissions Mask – 12.5kHz BW – 32QAM – 406.10625MHz, ISED**

## RSS-119 (5.8.3) Mask D



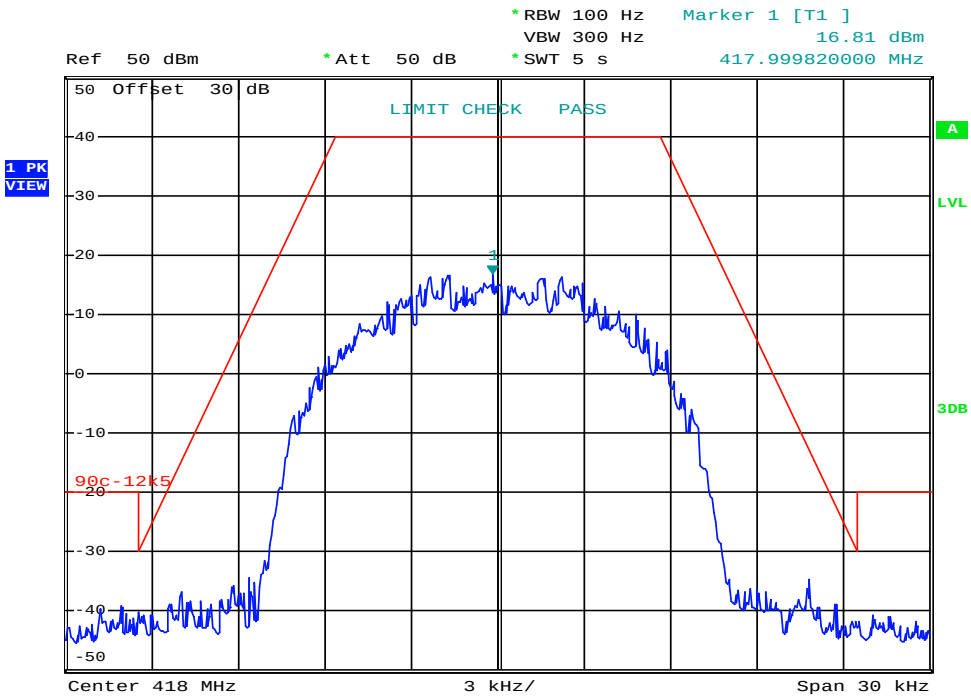

Date: 7.AUG.2019 17:52:38

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.106250** MHz | **Lower Band Edge** | **12.50** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.35 – Band Edge and Emissions Mask – 12.5kHz BW – 32QAM – 418MHz, ISED**

## RSS-119 (5.8.3) Mask D



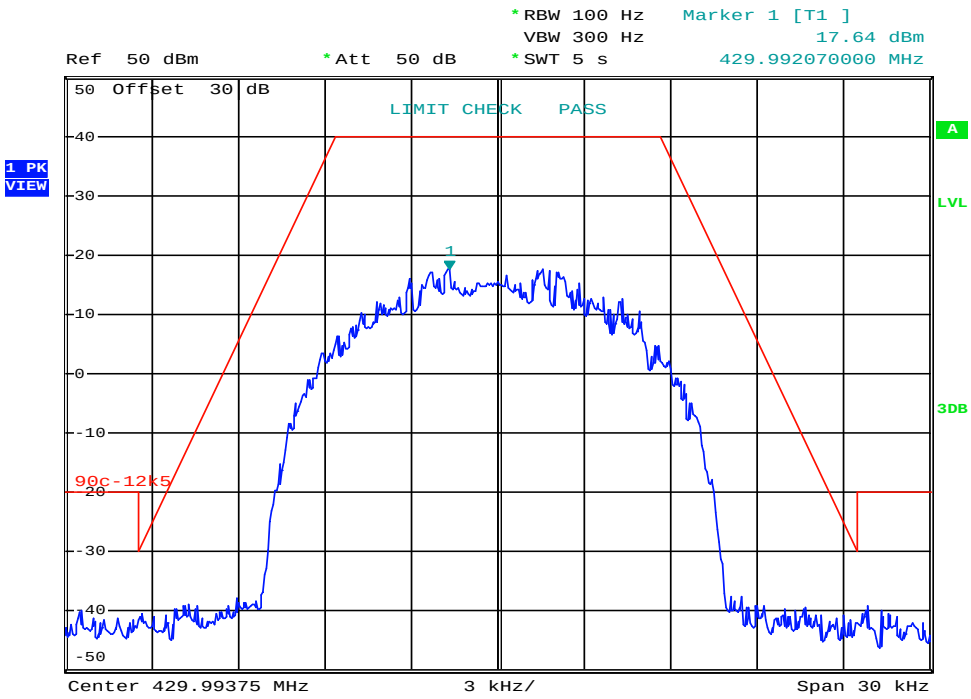

Date: 7.AUG.2019 17:55:07

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.36 – Band Edge and Emissions Mask – 12.5kHz BW – 32QAM – 429.99375MHz, ISED**

## RSS-119 (5.8.3) Mask D



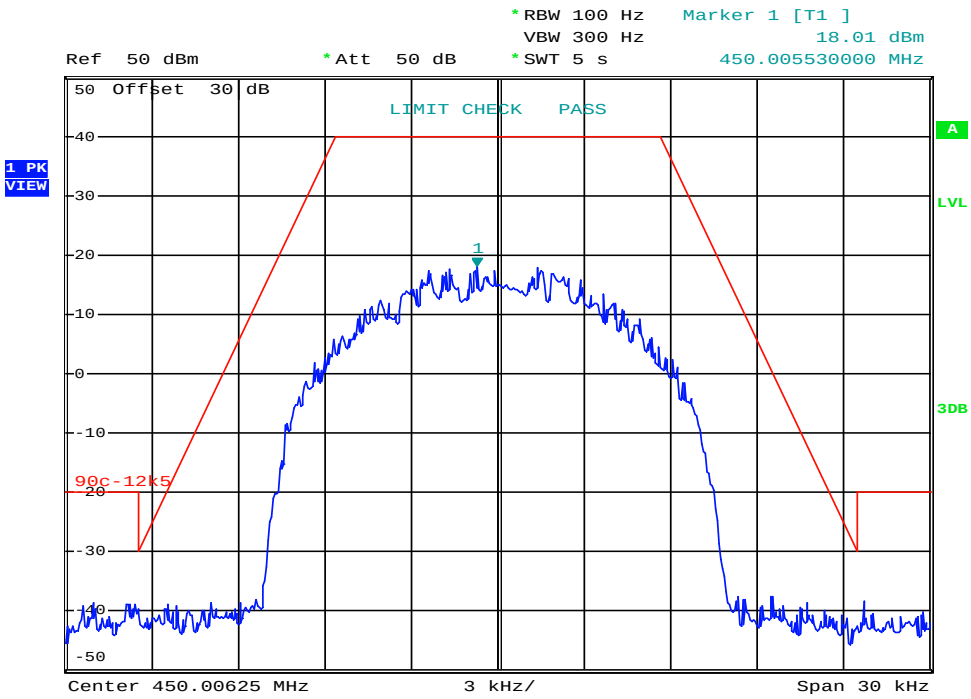

Date: 7.AUG.2019 18:02:03

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.993750** MHz | **Upper Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.37 – Band Edge and Emissions Mask – 12.5kHz BW – 32QAM – 450.00625MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



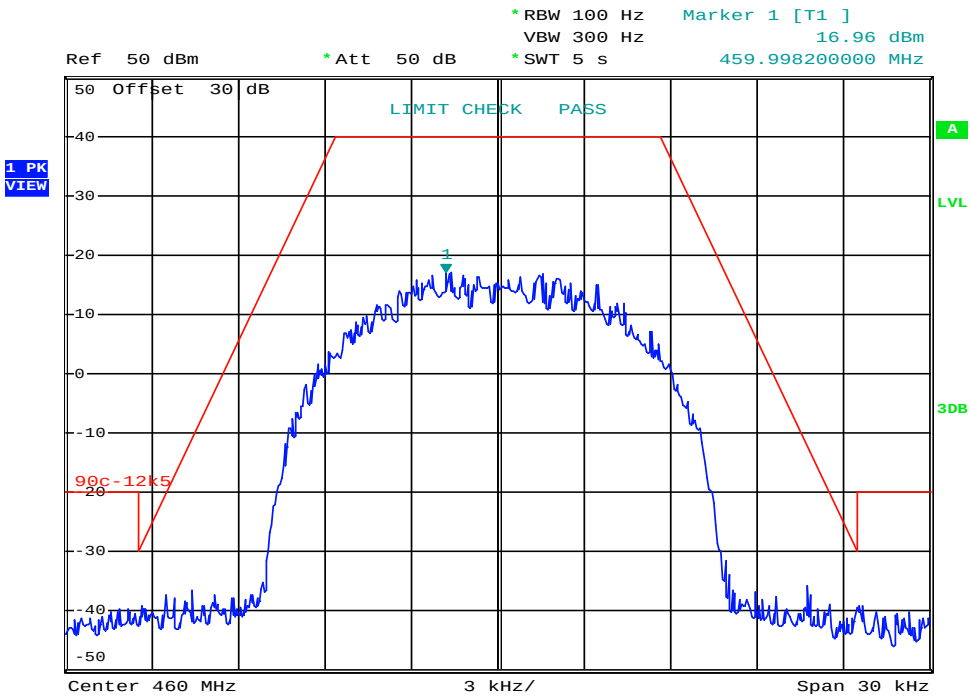

Date: 7.AUG.2019 18:04:52

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.006250** MHz | **Lower Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.38 – Band Edge and Emissions Mask – 12.5kHz BW – 32QAM – 460MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



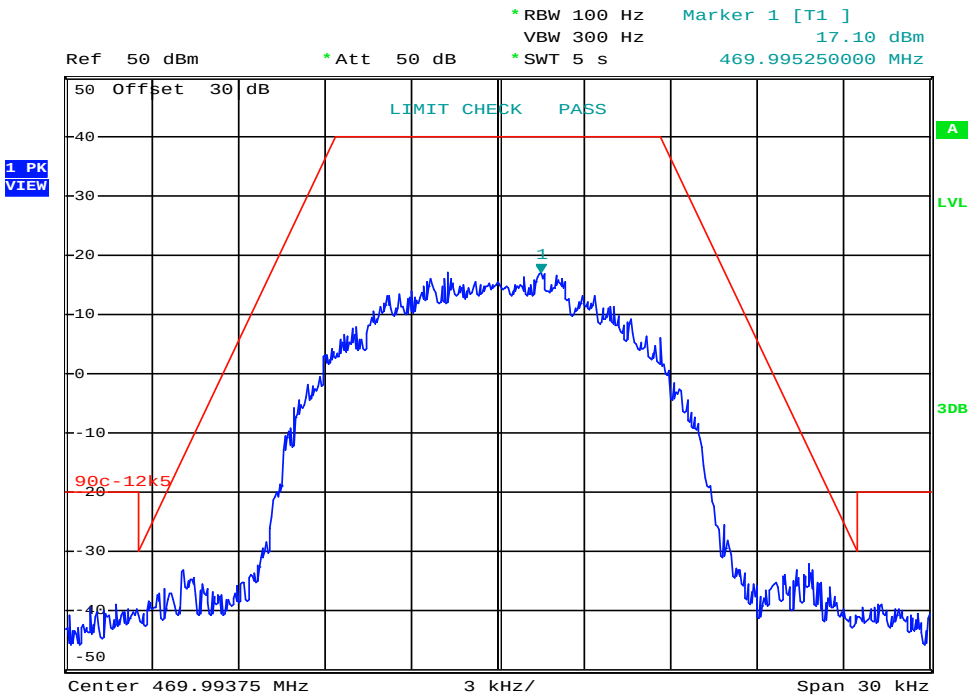

Date: 7.AUG.2019 18:07:13

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.39 – Band Edge and Emissions Mask – 12.5kHz BW – 32QAM – 469.99375MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



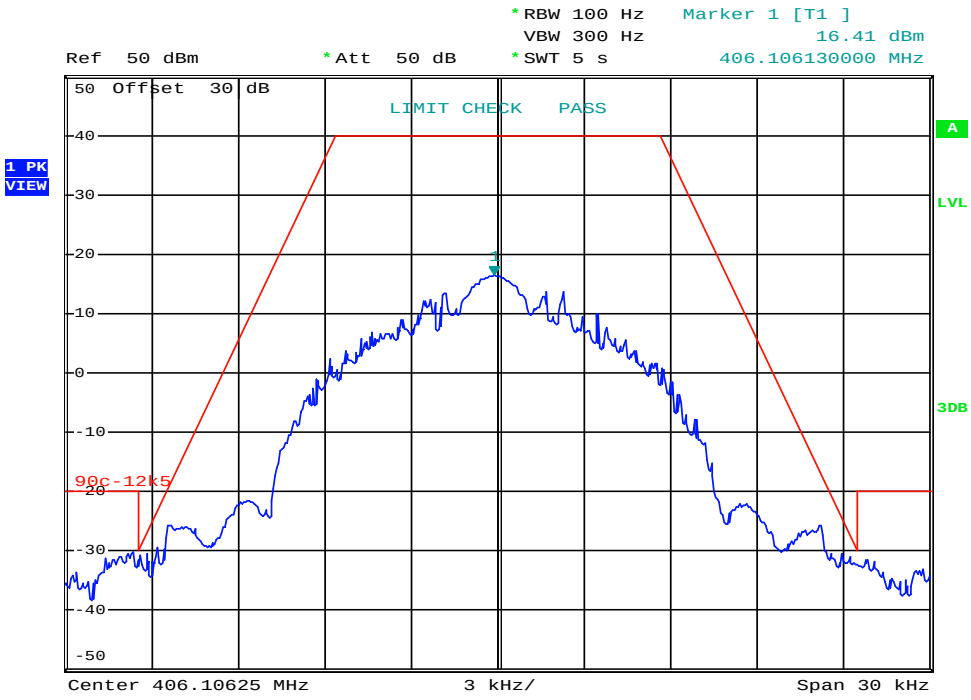

Date: 7.AUG.2019 18:09:13

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.993750** MHz | **Upper Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.40 – Band Edge and Emissions Mask – 12.5kHz BW – 64QAM – 406.10625MHz, ISED**

## RSS-119 (5.8.3) Mask D



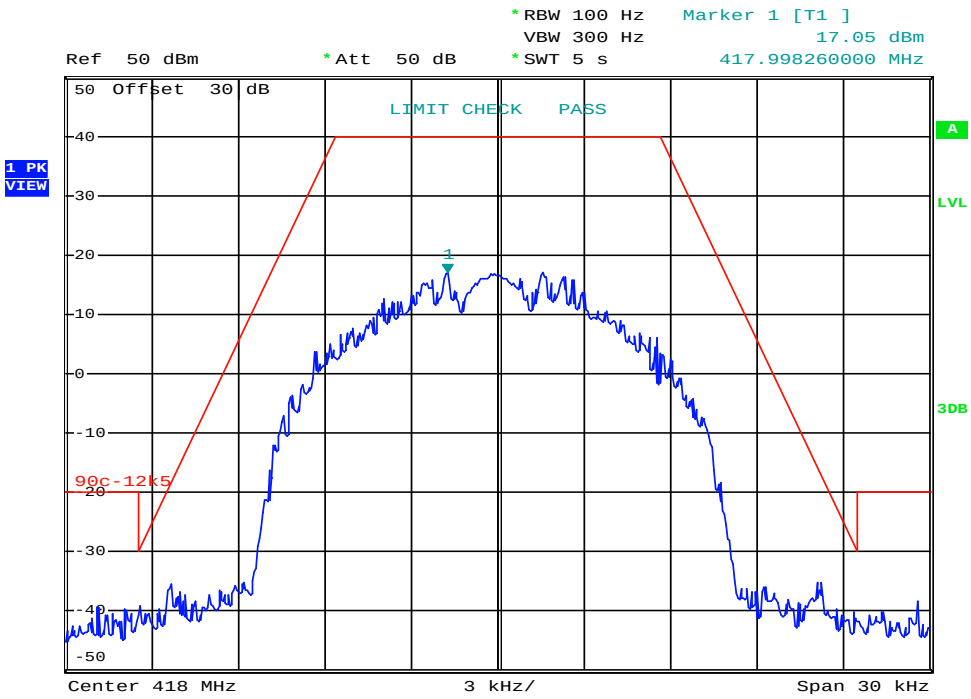

Date: 7.AUG.2019 18:28:20

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.106250** MHz | **Lower Band Edge** | **12.50** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.41 – Band Edge and Emissions Mask – 12.5kHz BW – 64QAM – 418MHz, ISED**

## RSS-119 (5.8.3) Mask D



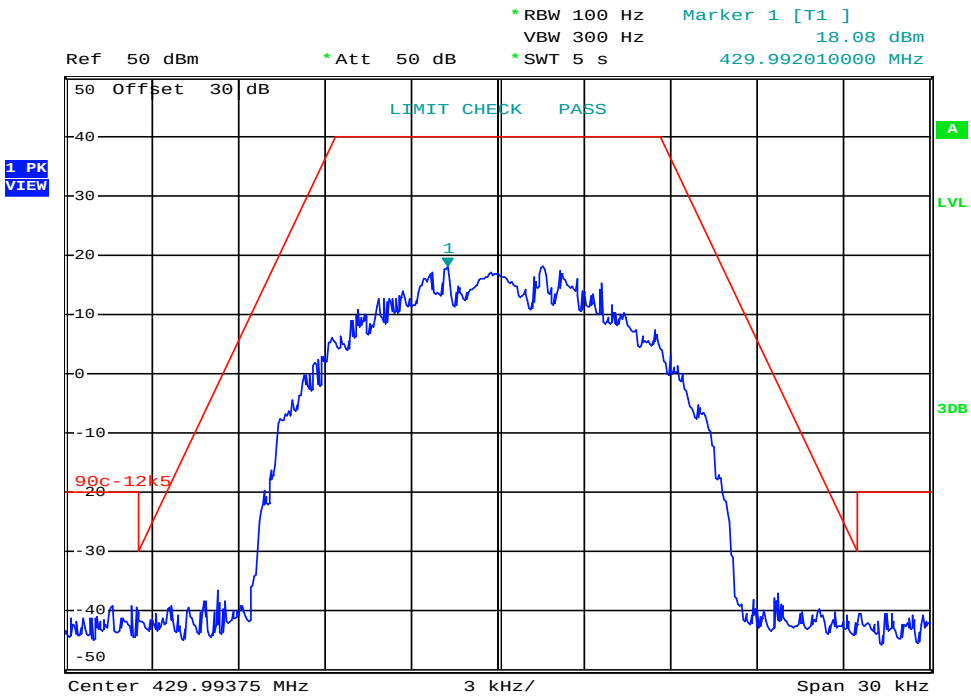

Date: 7.AUG.2019 18:25:31

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.42 – Band Edge and Emissions Mask – 12.5kHz BW – 64QAM – 429.99375MHz, ISED**

## RSS-119 (5.8.3) Mask D



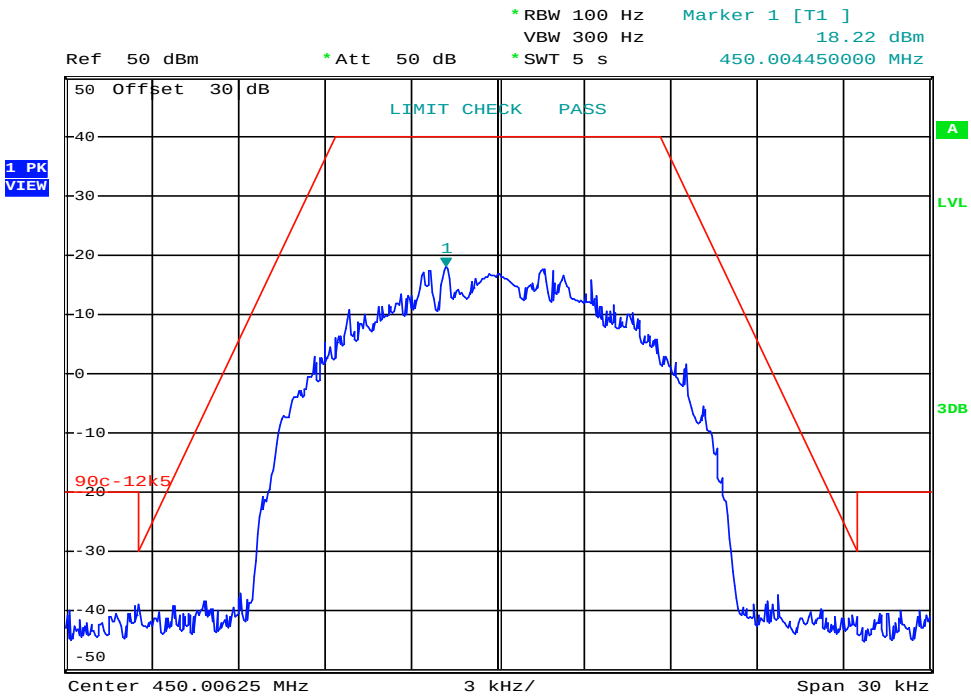

Date: 7.AUG.2019 18:19:17

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.993750** MHz | **Upper Band Edge** | **12.50** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.43 – Band Edge and Emissions Mask – 12.5kHz BW – 64QAM – 450.00625MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



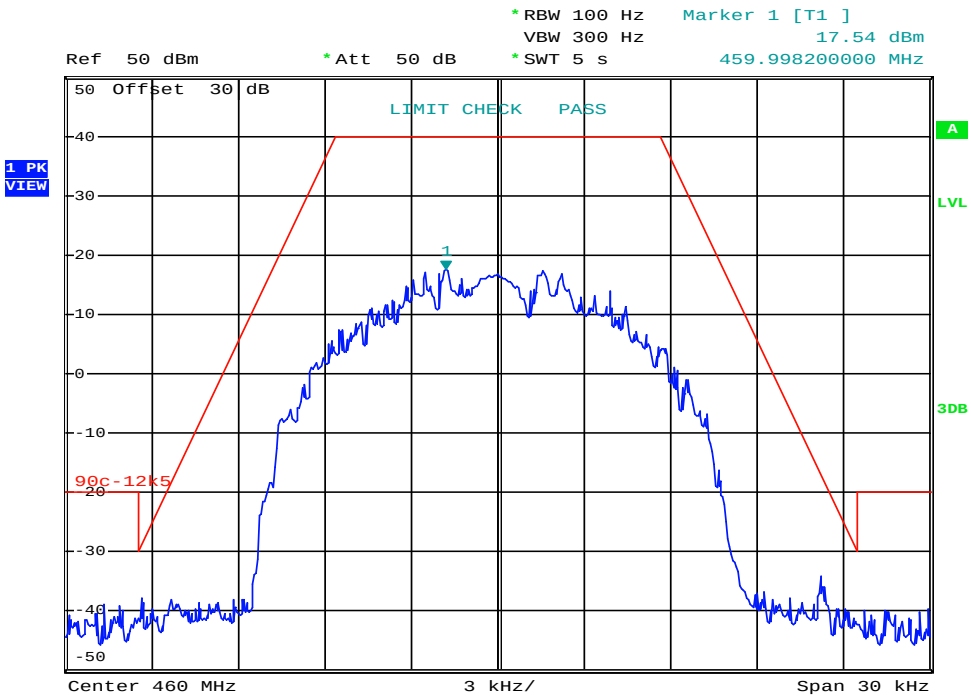

Date: 7.AUG.2019 18:16:43

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.006250** MHz | **Lower Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.44 – Band Edge and Emissions Mask – 12.5kHz BW – 64QAM – 460MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



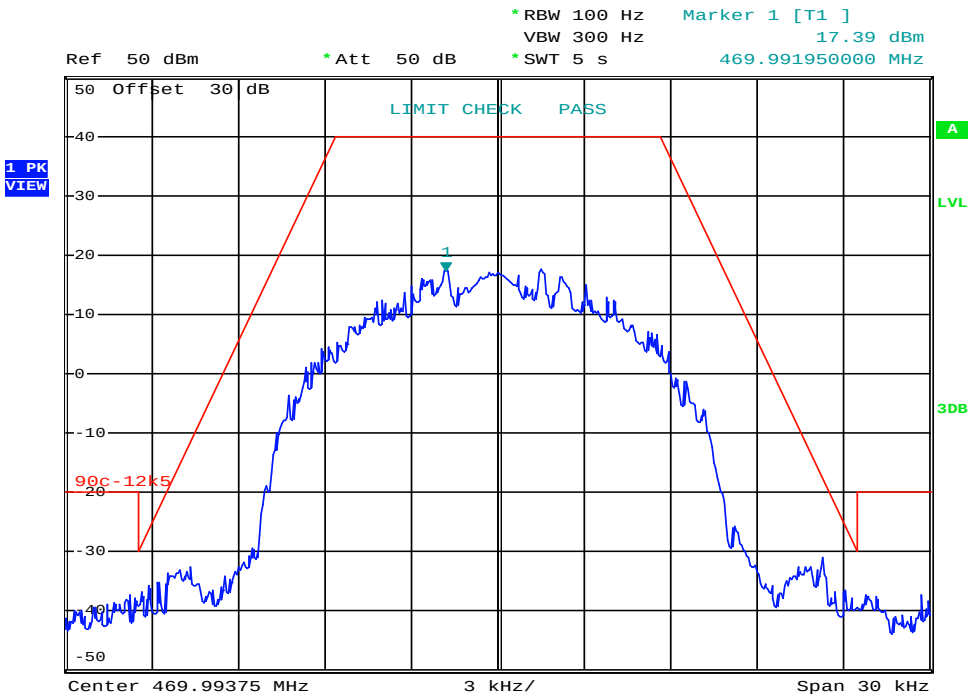

Date: 7.AUG.2019 18:13:53

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.45 – Band Edge and Emissions Mask – 12.5kHz BW – 64QAM – 469.99375MHz**

## FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



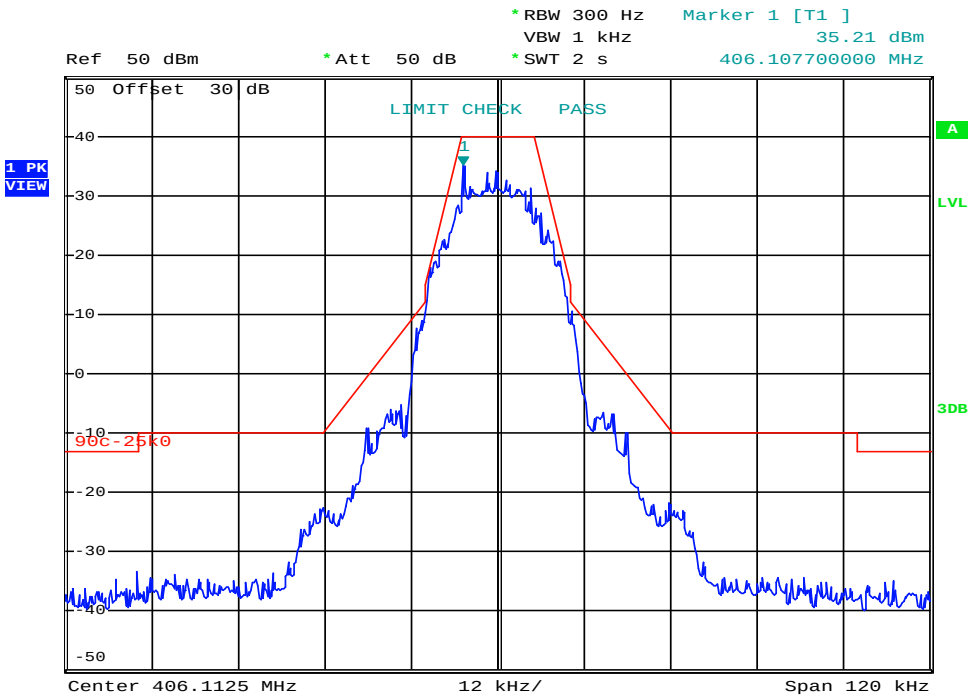

Date: 7.AUG.2019 18:11:55

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.993750** MHz | **Upper Band Edge** | **12.50** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.46 – Band Edge and Emissions Mask – 25kHz BW – MSK – 406.1125MHz, ISED**

## RSS-119 (5.8.2) Mask C



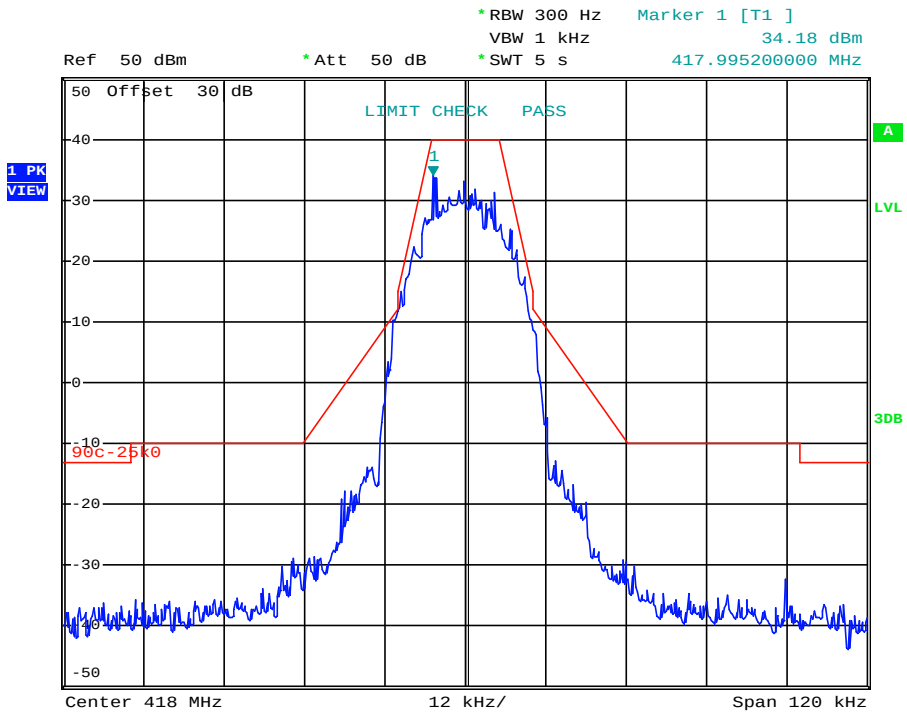

Date: 8.AUG.2019 11:40:09

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.112500** MHz | **Lower Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.47 – Band Edge and Emissions Mask – 25kHz BW – MSK – 418MHz, ISED**

## RSS-119 (5.8.2) Mask C



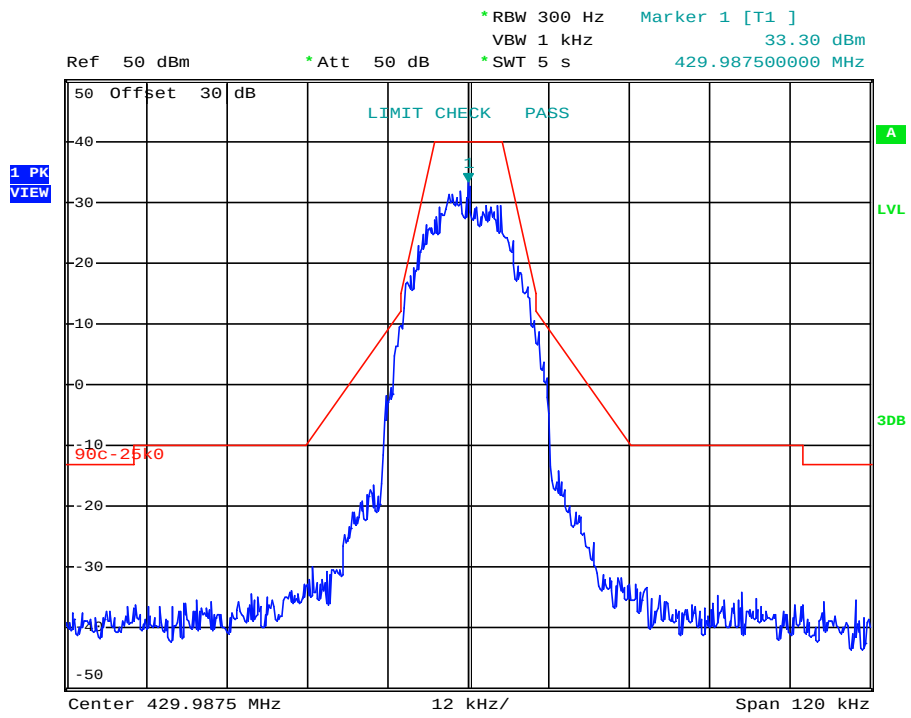

Date: 8.AUG.2019 11:41:38

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **25.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.48 – Band Edge and Emissions Mask – 25kHz BW – MSK – 429.9875MHz, ISED**

**RSS-119 (5.8.2) Mask C**



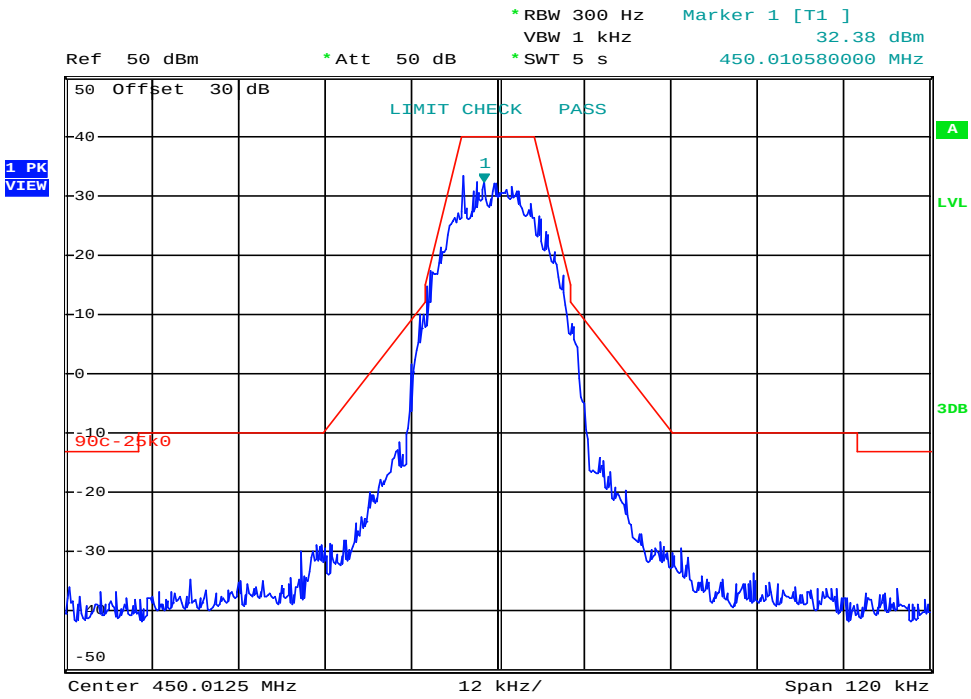

Date: 8.AUG.2019 11:46:28

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.987500** MHz | **Upper Band Edge** | **25.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.49 – Band Edge and Emissions Mask – 25kHz BW – MSK – 450.0125MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



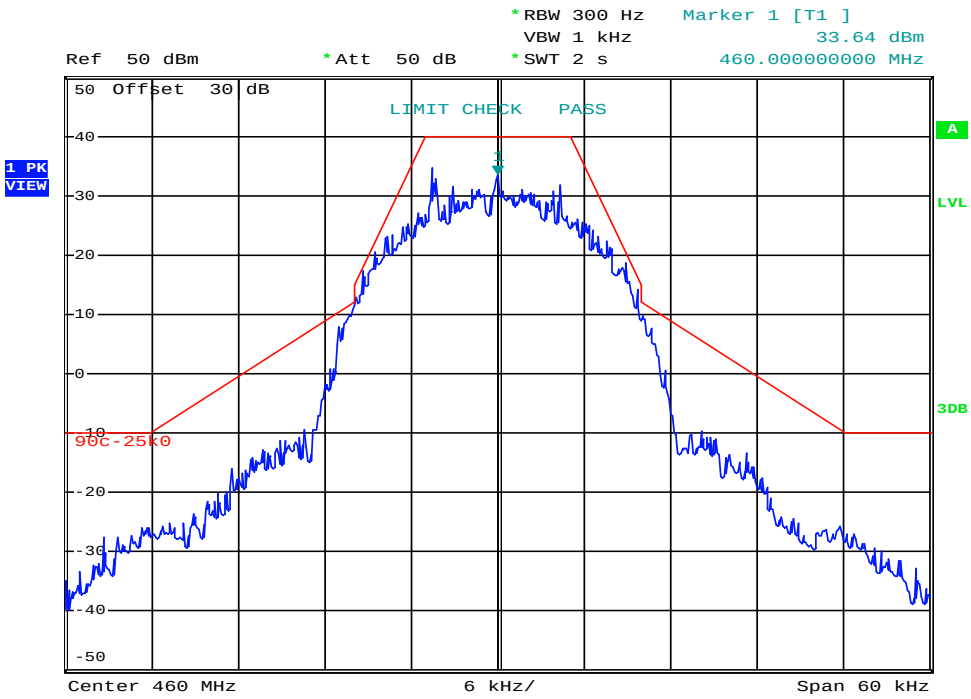

Date: 8.AUG.2019 11:47:48

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.012500** MHz | **Lower Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.50 – Band Edge and Emissions Mask – 25kHz BW – MSK – 460MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



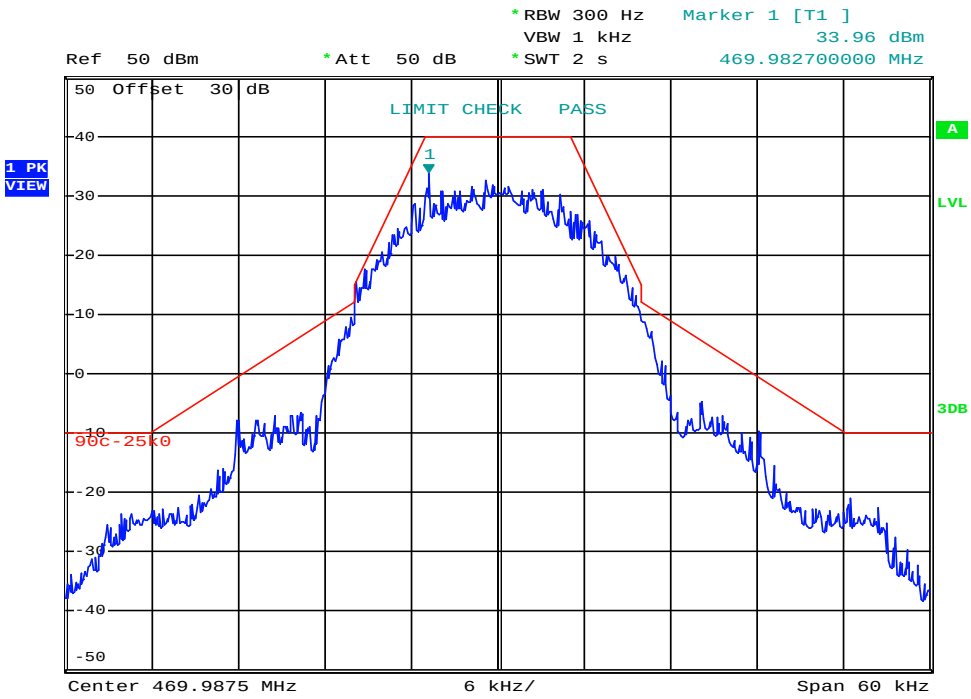

Date: 8.AUG.2019 11:51:28

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.51 – Band Edge and Emissions Mask – 25kHz BW – MSK – 469.9875MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



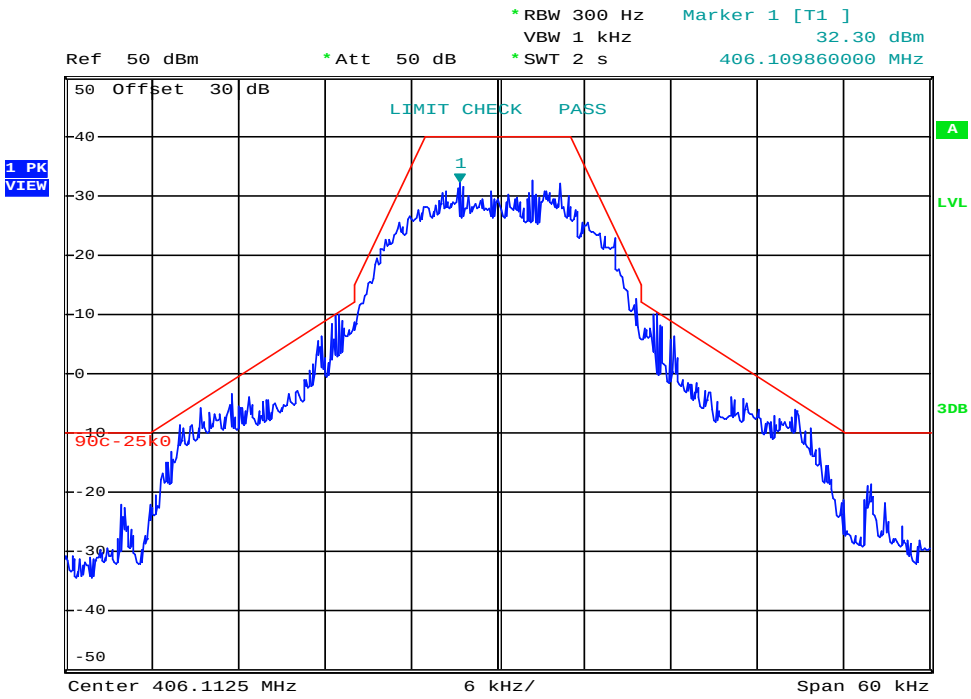

Date: 8.AUG.2019 11:54:59

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.987500** MHz | **Upper Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.52 – Band Edge and Emissions Mask – 25kHz BW – 8PSK – 406.1125MHz, ISED**

## RSS-119 (5.8.2) Mask C



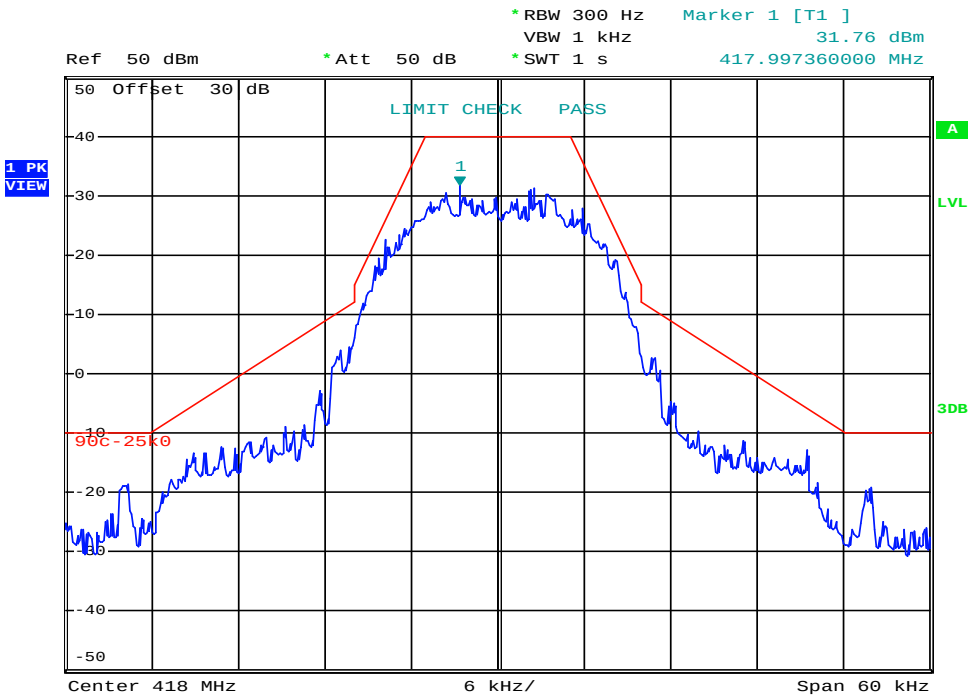

Date: 8.AUG.2019 12:55:33

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.112500** MHz | **Lower Band Edge** | **25.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.53 – Band Edge and Emissions Mask – 25kHz BW – 8PSK – 418MHz, ISED**

## RSS-119 (5.8.2) Mask C



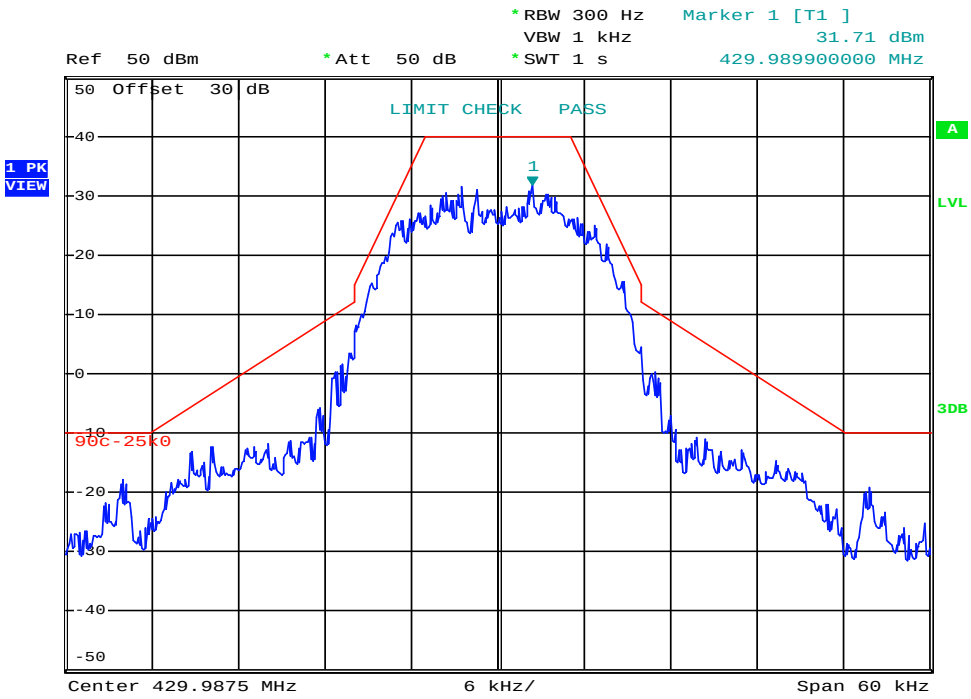

Date: 8.AUG.2019 12:58:52

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.54 – Band Edge and Emissions Mask – 25kHz BW – 8PSK – 429.9875MHz, ISED**

## RSS-119 (5.8.2) Mask C



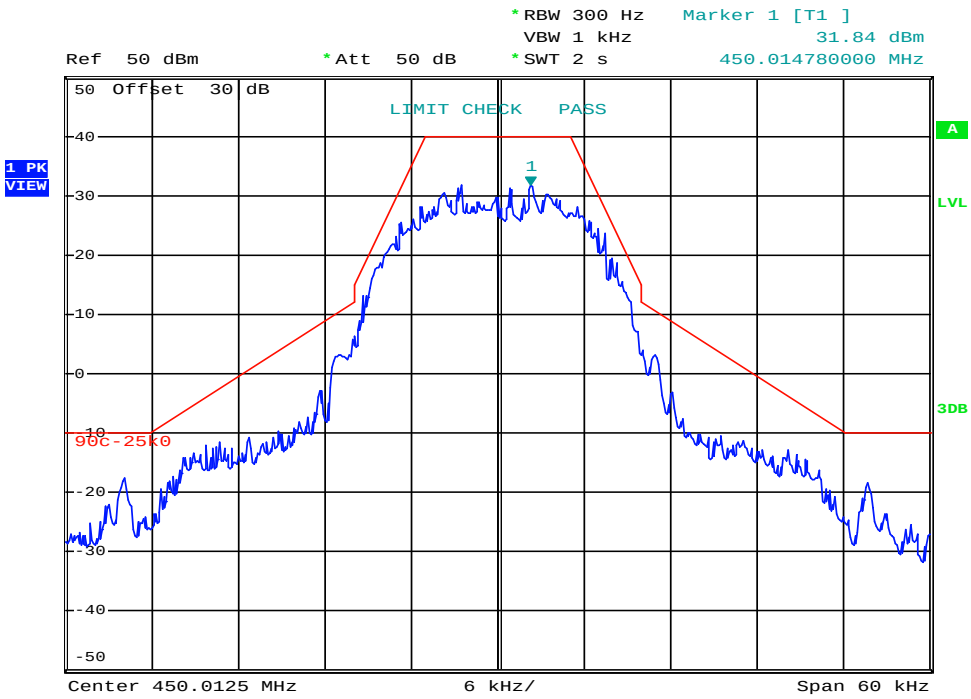

Date: 8.AUG.2019 13:03:18

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.987500** MHz | **Upper Band Edge** | **25.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.55 – Band Edge and Emissions Mask – 25kHz BW – 8PSK – 450.0125MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



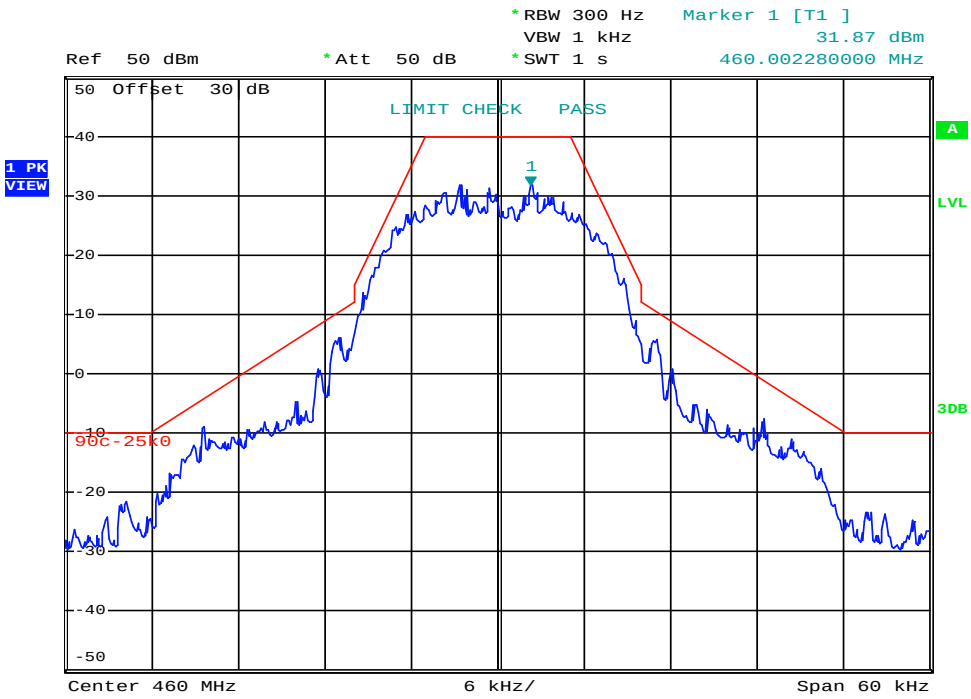

Date: 8.AUG.2019 13:05:28

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.012500** MHz | **Lower Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.56 – Band Edge and Emissions Mask – 25kHz BW – 8PSK – 460MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



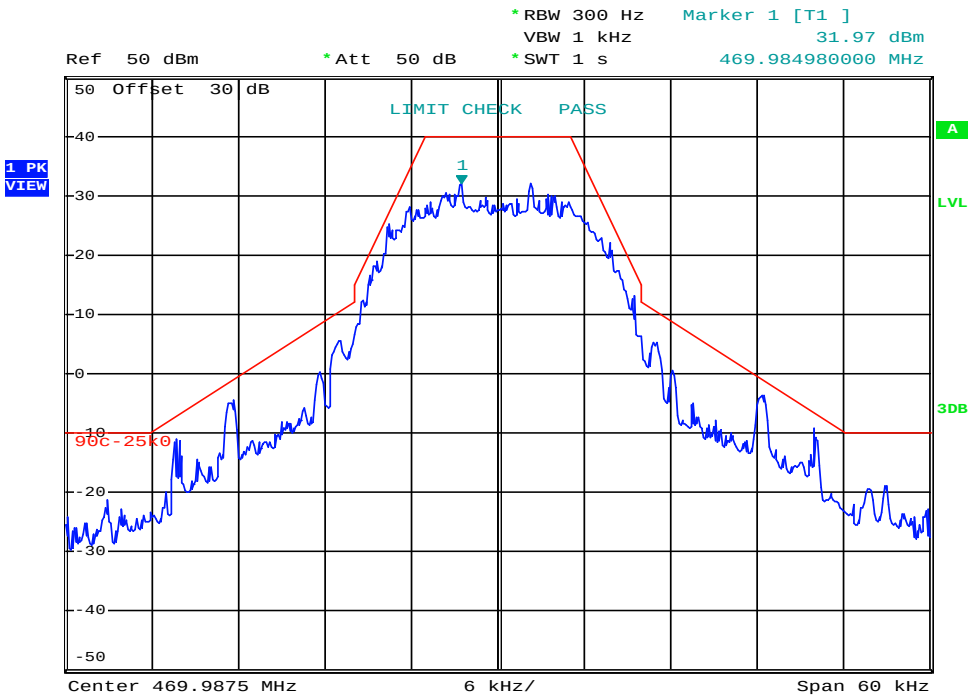

Date: 8.AUG.2019 13:07:00

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.57 – Band Edge and Emissions Mask – 25kHz BW – 8PSK – 469.9875MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



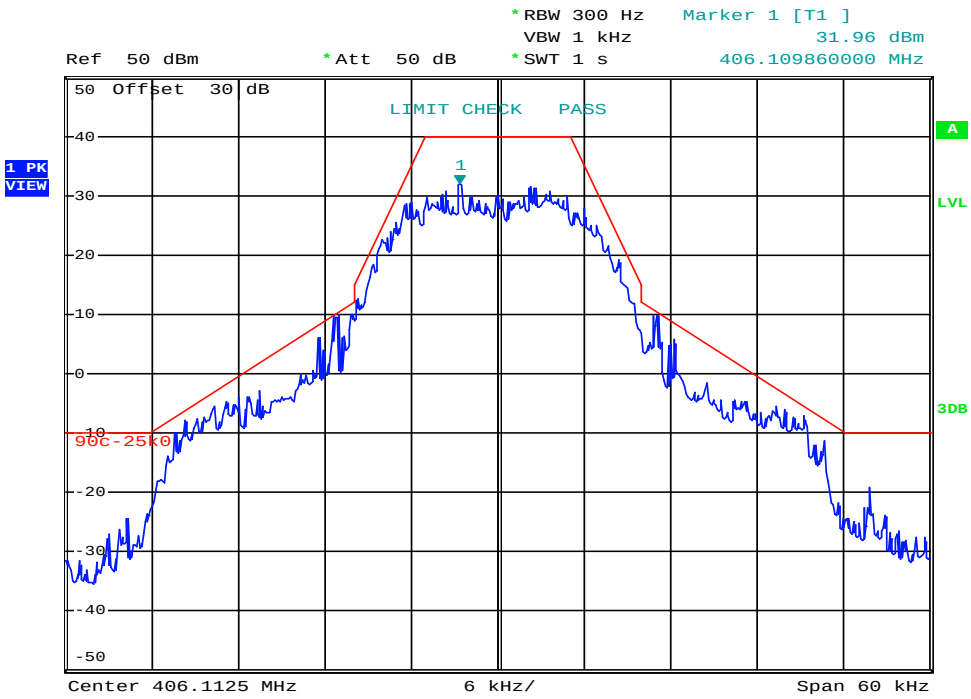

Date: 8.AUG.2019 13:15:23

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.987500** MHz | **Upper Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.58 – Band Edge and Emissions Mask – 25kHz BW – QPSK – 406.1125MHz, ISED**

## RSS-119 (5.8.2) Mask C



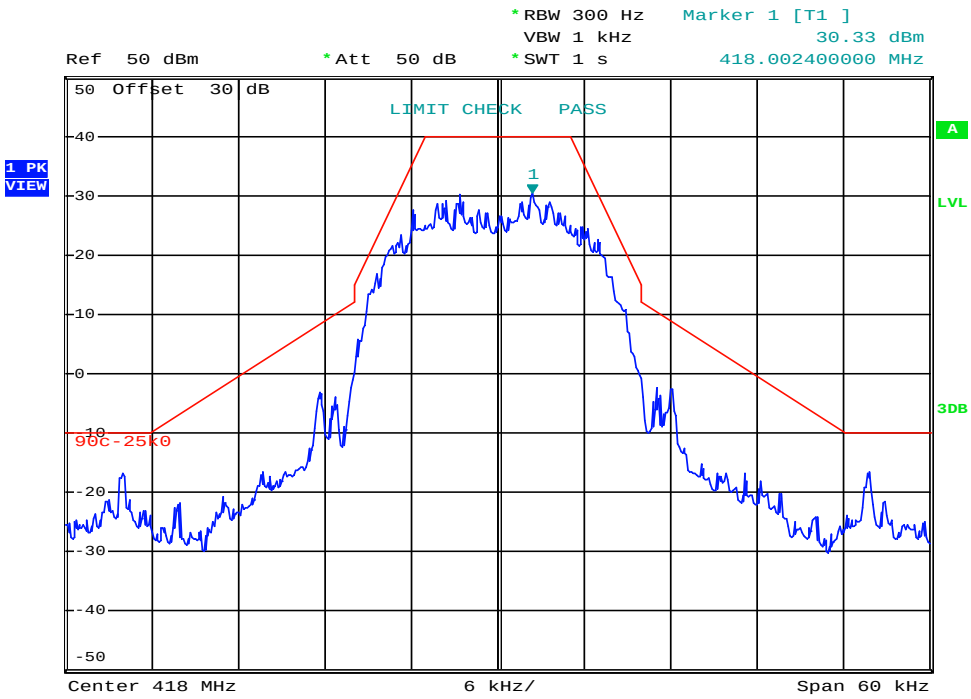

Date: 8.AUG.2019 12:53:11

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.112500** MHz | **Lower Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.59 – Band Edge and Emissions Mask – 25kHz BW – QPSK – 418MHz, ISED**

## RSS-119 (5.8.2) Mask C



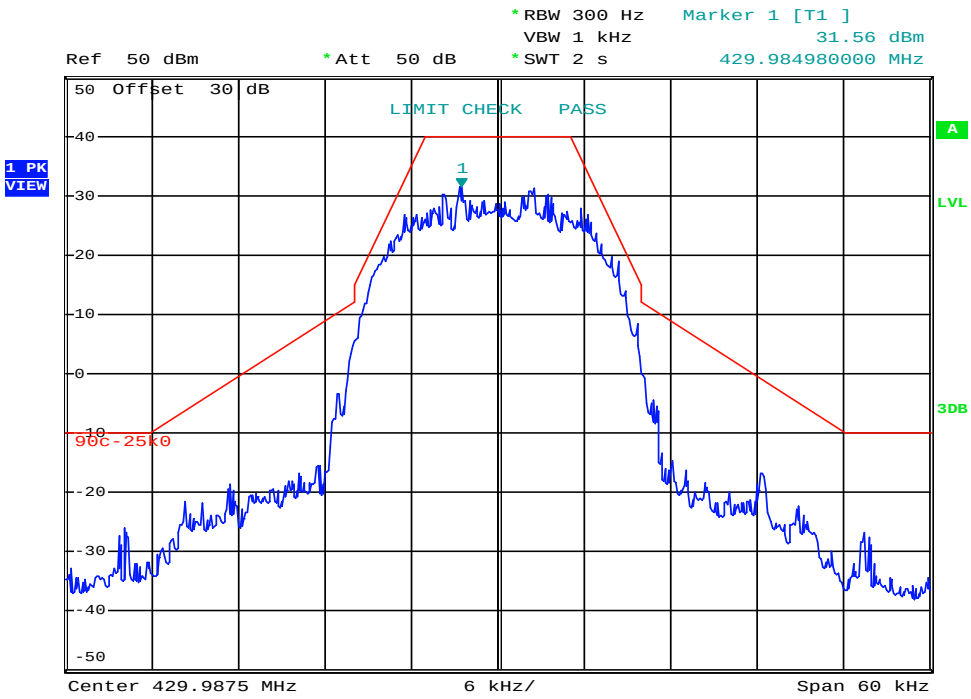

Date: 8.AUG.2019 12:32:17

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **25.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.60 – Band Edge and Emissions Mask – 25kHz BW – QPSK – 429.9875MHz, ISED**

## RSS-119 (5.8.2) Mask C



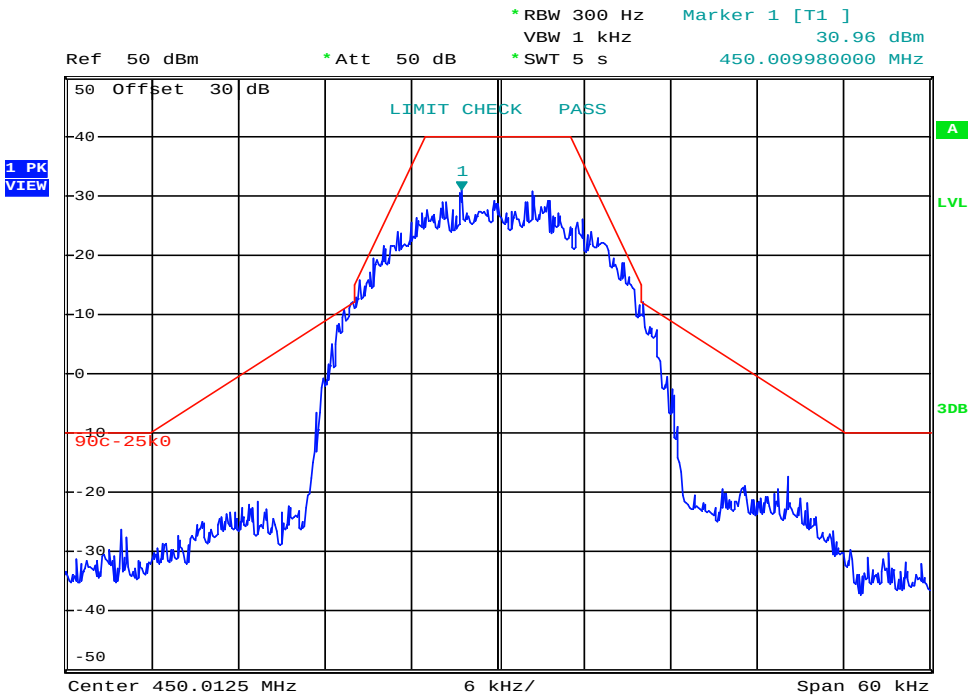

Date: 8.AUG.2019 12:27:11

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.987500** MHz | **Upper Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.61 – Band Edge and Emissions Mask – 25kHz BW – QPSK – 450.0125MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



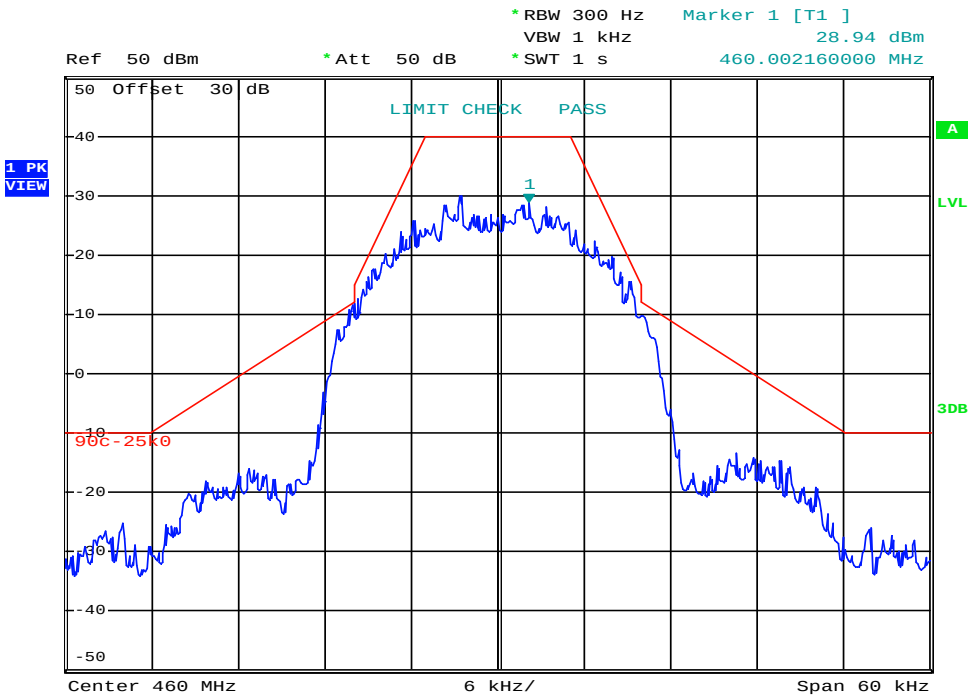

Date: 8.AUG.2019 12:18:48

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.012500** MHz | **Lower Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.62 – Band Edge and Emissions Mask – 25kHz BW – QPSK – 460MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



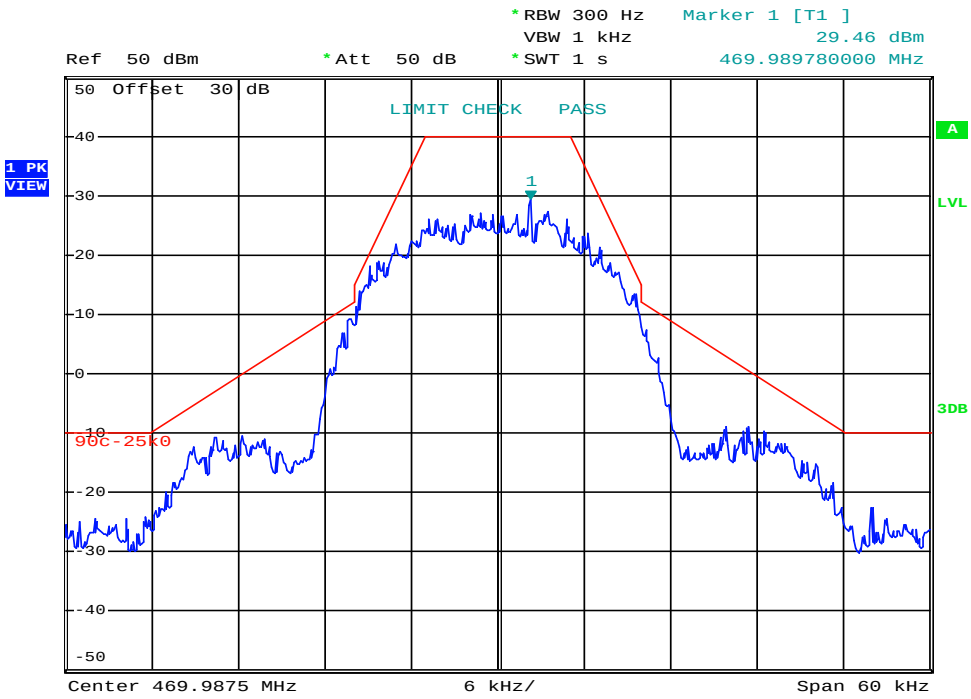

Date: 8.AUG.2019 12:16:33

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.63 – Band Edge and Emissions Mask – 25kHz BW – QPSK – 469.9875MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



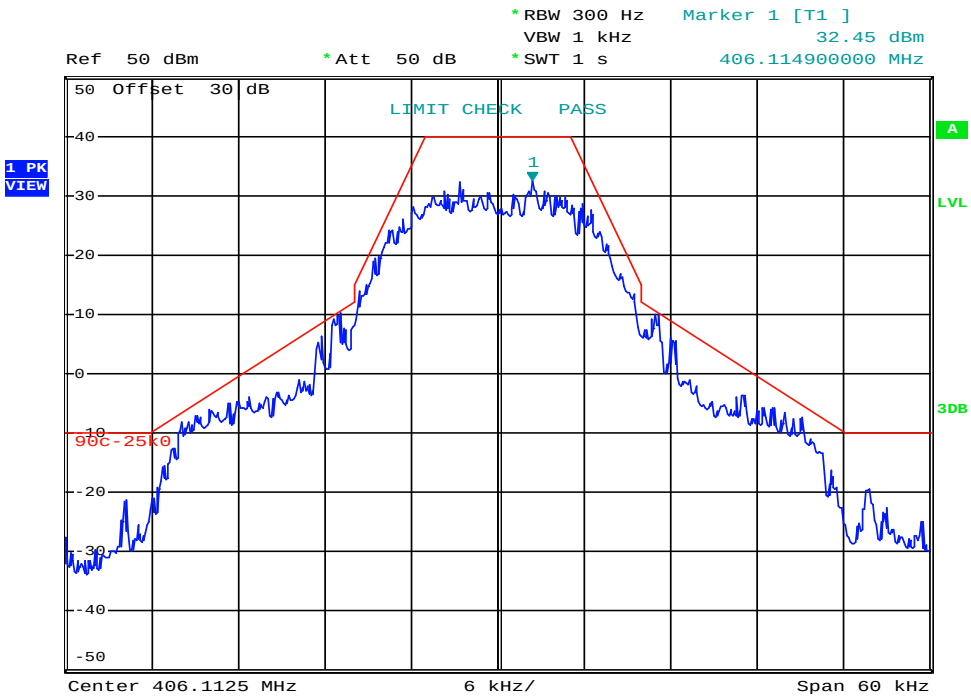

Date: 8.AUG.2019 12:15:08

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.987500** MHz | **Upper Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.64 – Band Edge and Emissions Mask – 25kHz BW – 16QAM – 406.1125MHz, ISED**

## RSS-119 (5.8.2) Mask C



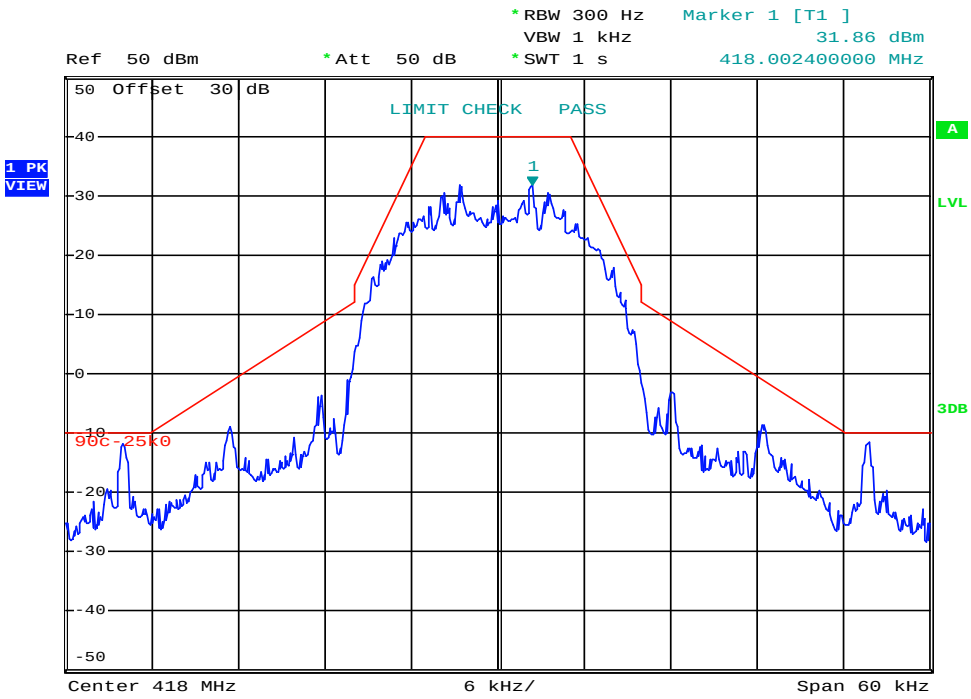

Date: 8.AUG.2019 13:36:19

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.112500** MHz | **Lower Band Edge** | **25.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.65 – Band Edge and Emissions Mask – 25kHz BW – 16QAM – 418MHz, ISED**

## RSS-119 (5.8.2) Mask C



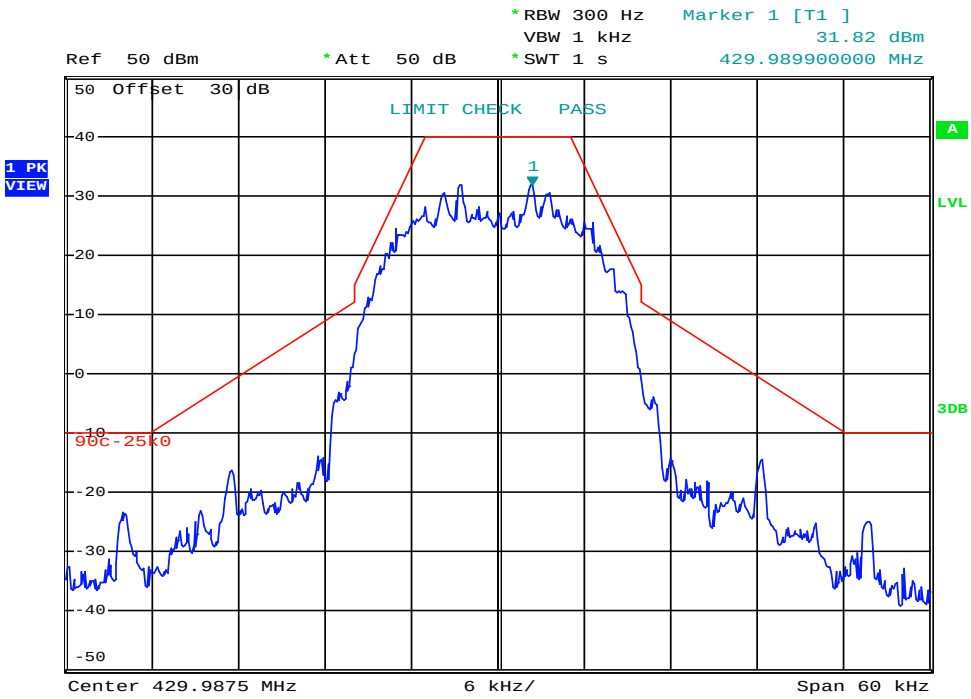

Date: 8.AUG.2019 13:30:15

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.66 – Band Edge and Emissions Mask – 25kHz BW – 16QAM – 429.9875MHz, ISED**

## RSS-119 (5.8.2) Mask C



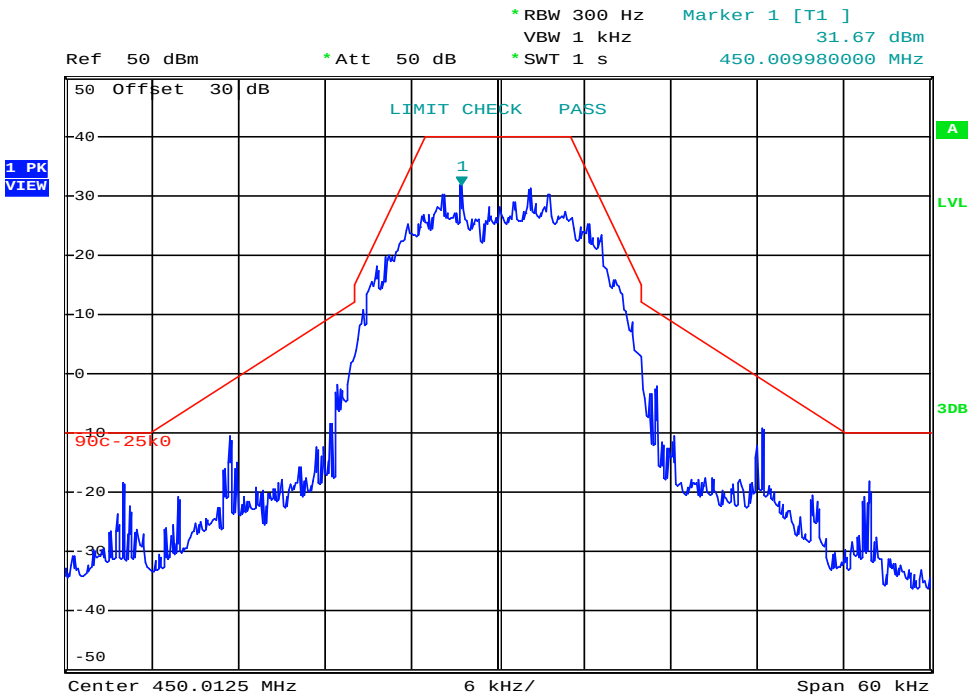

Date: 8.AUG.2019 13:25:24

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.987500** MHz | **Upper Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.67 – Band Edge and Emissions Mask – 25kHz BW – 16QAM – 450.0125MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



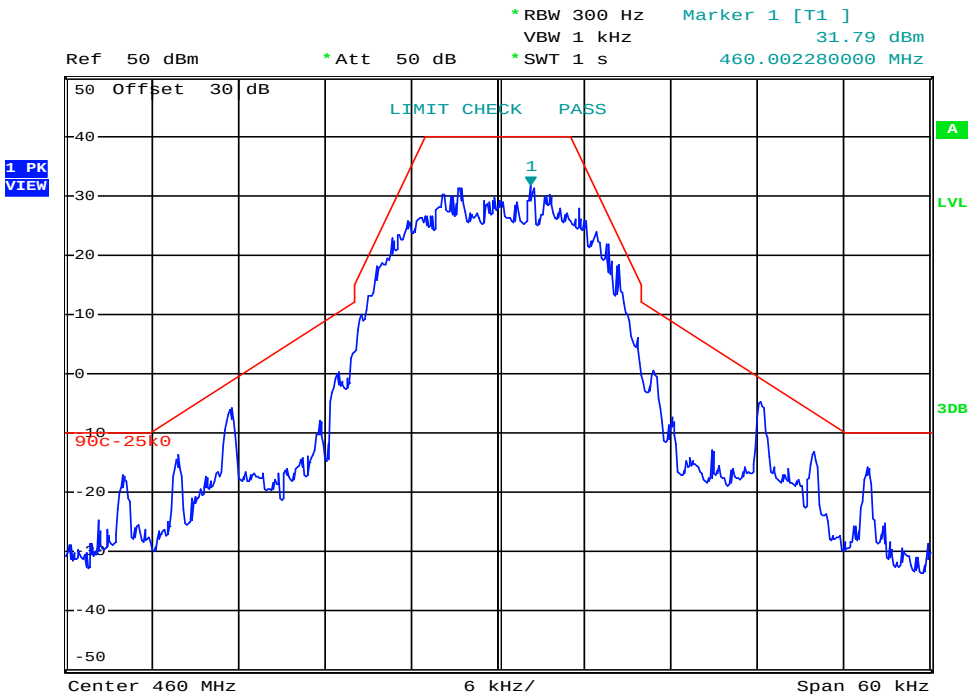

Date: 8.AUG.2019 13:23:41

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.012500** MHz | **Lower Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.68 – Band Edge and Emissions Mask – 25kHz BW – 16QAM – 460MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



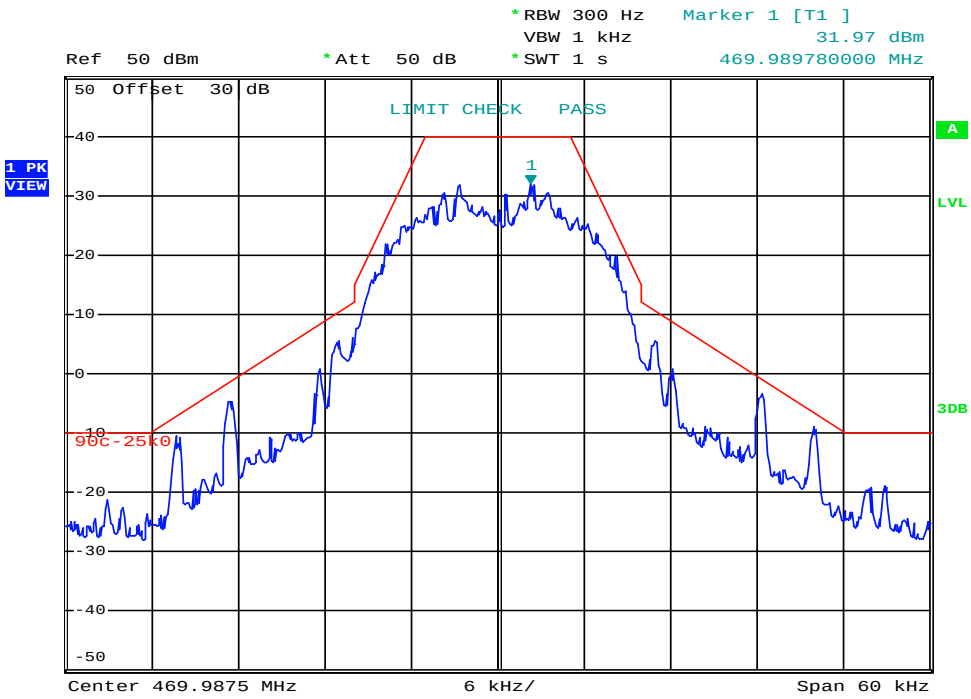

Date: 8.AUG.2019 13:20:28

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.69 – Band Edge and Emissions Mask – 25kHz BW – 16QAM – 469.9875MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



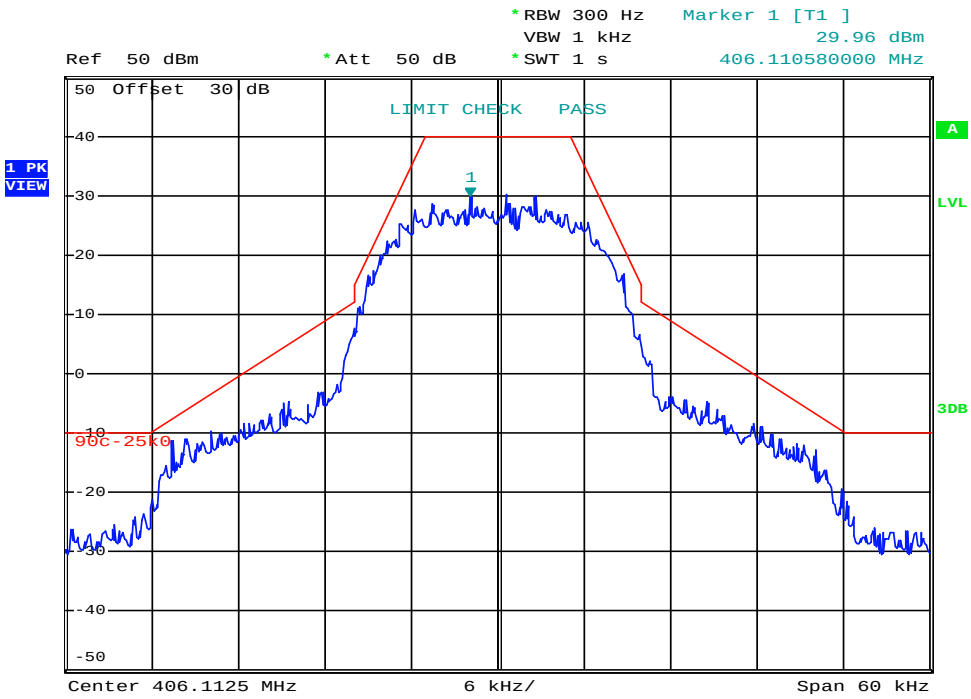

Date: 8.AUG.2019 13:22:11

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.987500** MHz | **Upper Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.70 – Band Edge and Emissions Mask – 25kHz BW – 32QAM – 406.1125MHz, ISED**

## RSS-119 (5.8.2) Mask C



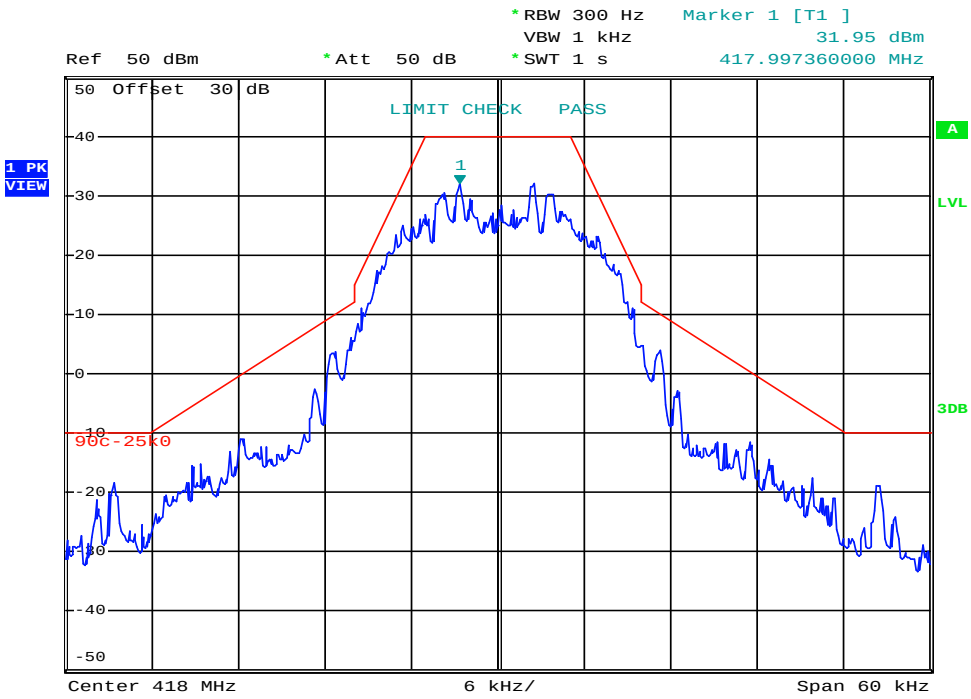

Date: 8.AUG.2019 13:46:55

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.112500** MHz | **Lower Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.71 – Band Edge and Emissions Mask – 25kHz BW – 32QAM – 418MHz, ISED**

## RSS-119 (5.8.2) Mask C



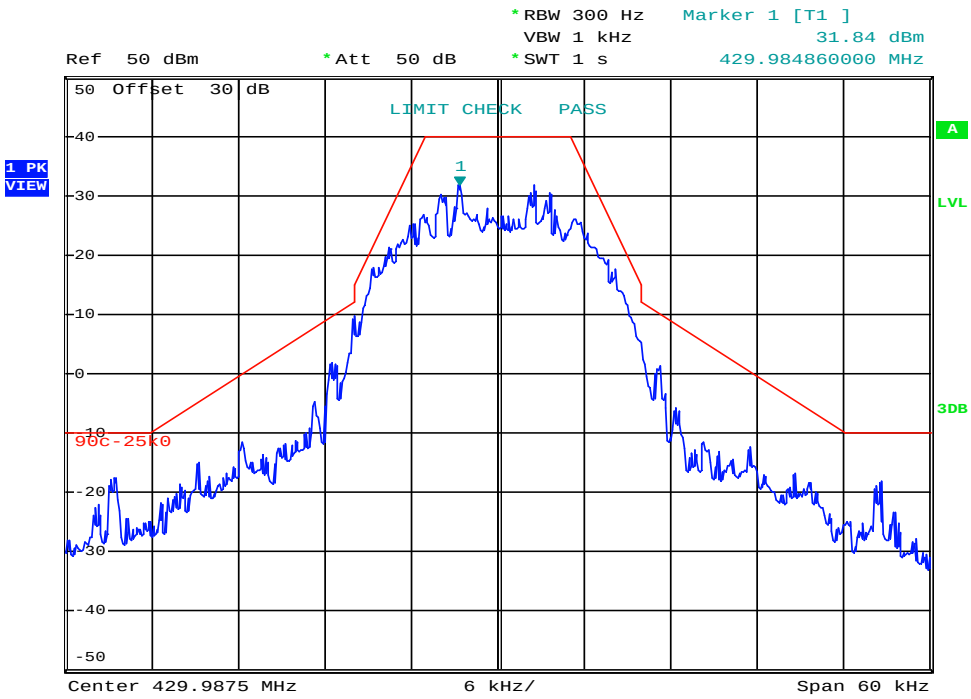

Date: 8.AUG.2019 13:49:28

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **25.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.72 – Band Edge and Emissions Mask – 25kHz BW – 32QAM – 429.9875MHz, ISED**

## RSS-119 (5.8.2) Mask C



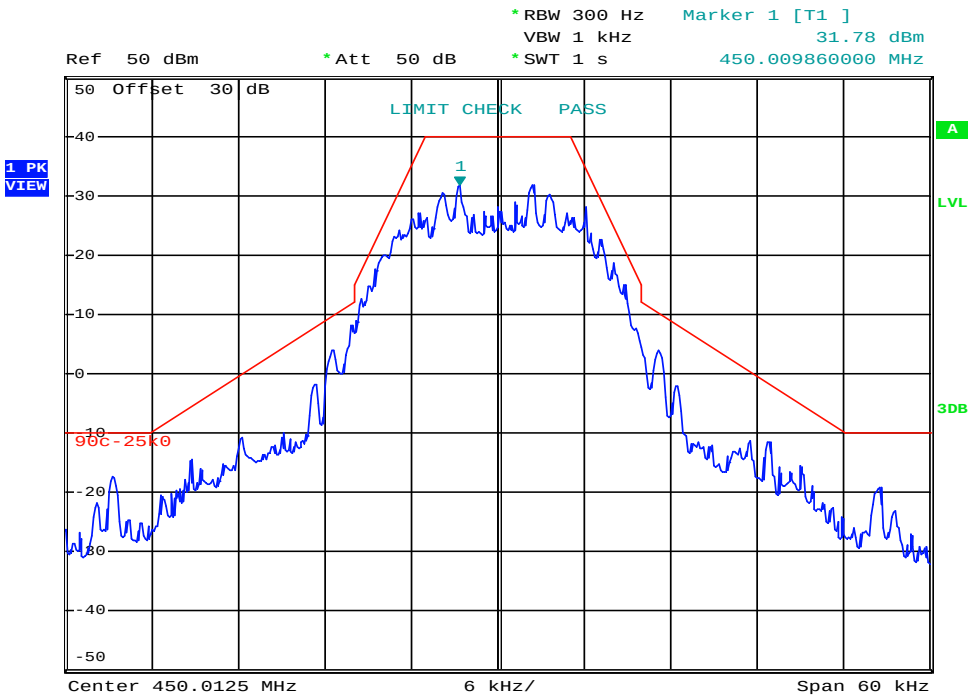

Date: 8.AUG.2019 13:53:53

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.987500** MHz | **Upper Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.73 – Band Edge and Emissions Mask – 25kHz BW – 32QAM – 450.0125MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



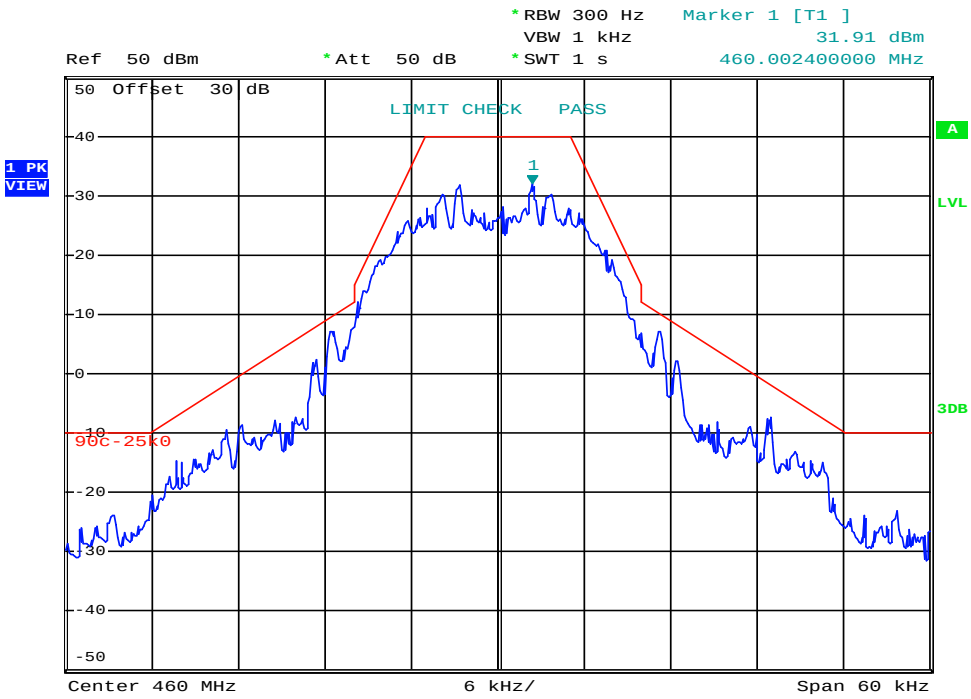

Date: 8.AUG.2019 13:55:21

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.012500** MHz | **Lower Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.74 – Band Edge and Emissions Mask – 25kHz BW – 32QAM – 460MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



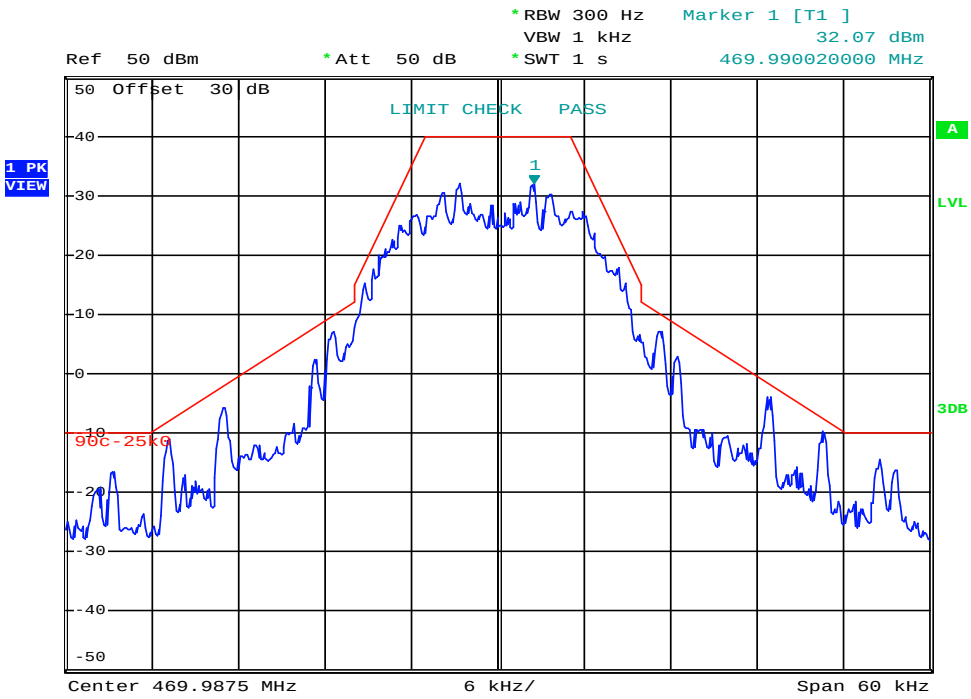

Date: 8.AUG.2019 13:56:49

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.75 – Band Edge and Emissions Mask – 25kHz BW – 32QAM – 469.9875MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



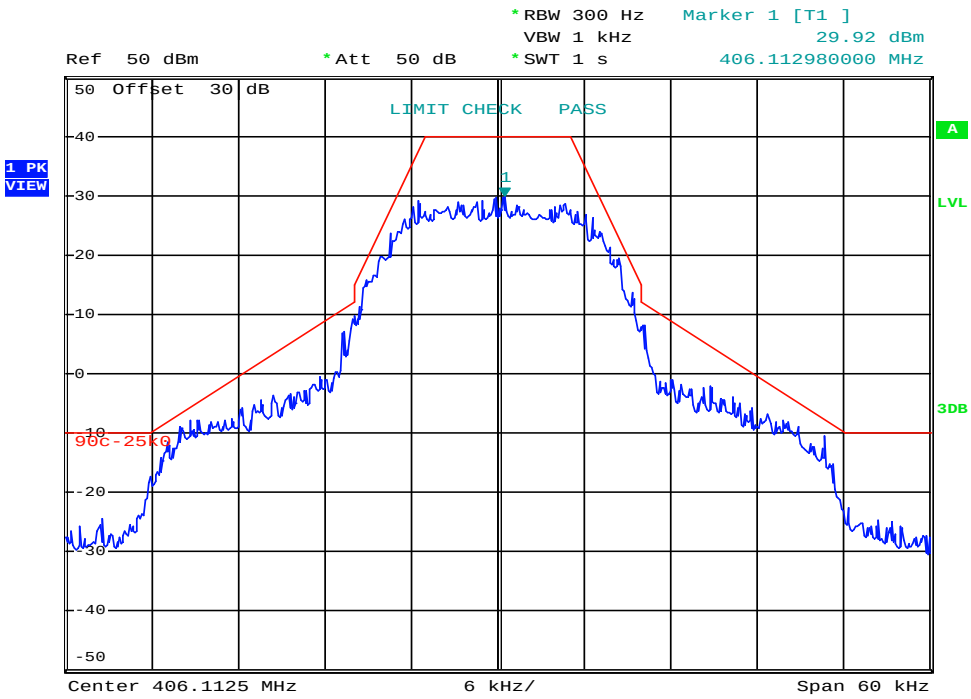

Date: 8.AUG.2019 13:59:43

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.987500** MHz | **Upper Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.76 – Band Edge and Emissions Mask – 25kHz BW – 64QAM – 406.1125MHz, ISED**

## RSS-119 (5.8.2) Mask C



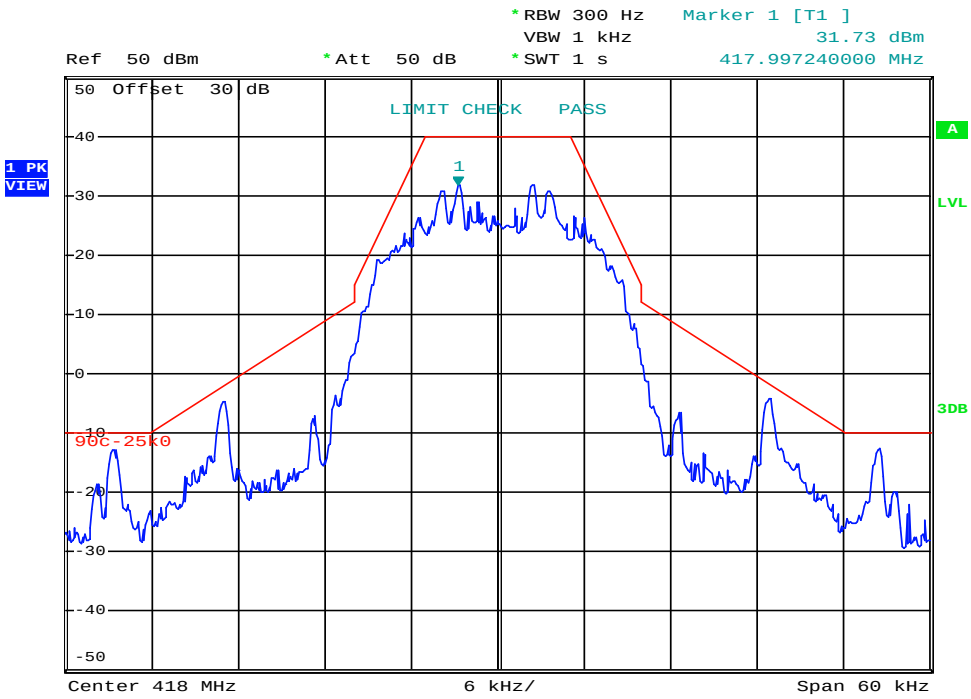

Date: 8.AUG.2019 15:28:25

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.112500** MHz | **Lower Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.77 – Band Edge and Emissions Mask – 25kHz BW – 64QAM – 418MHz, ISED**

## RSS-119 (5.8.2) Mask C



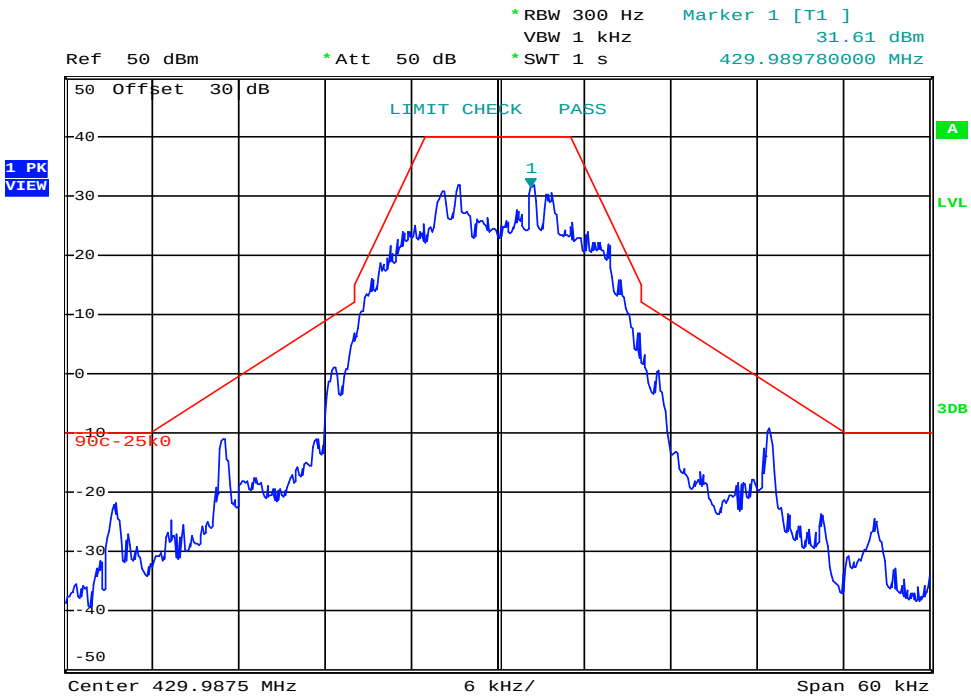

Date: 8.AUG.2019 15:22:20

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **25.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.78 – Band Edge and Emissions Mask – 25kHz BW – 64QAM – 429.9875MHz, ISED**

## RSS-119 (5.8.2) Mask C



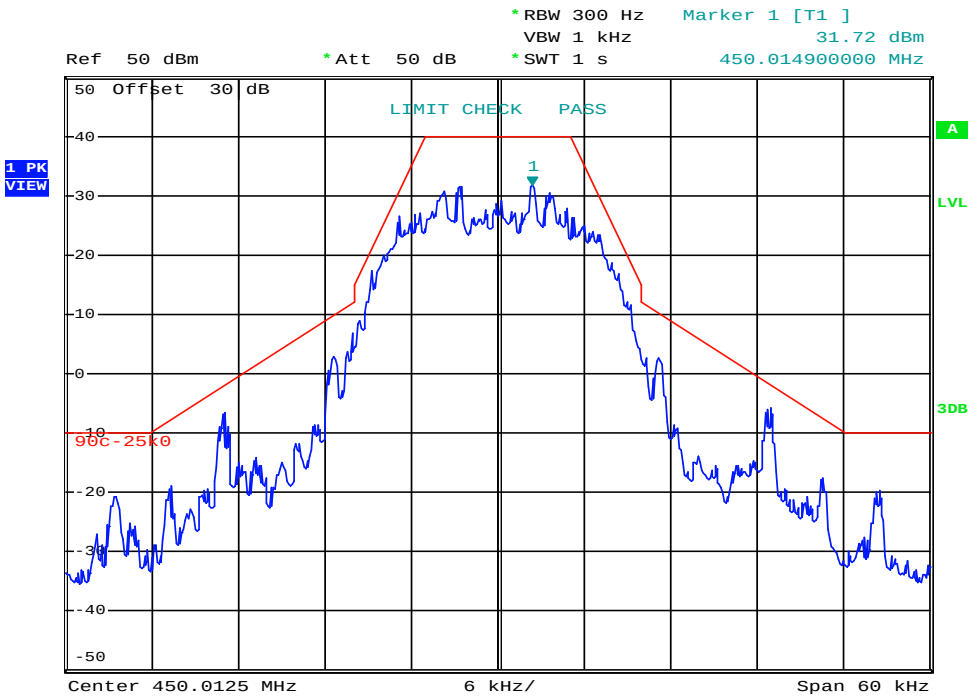

Date: 8.AUG.2019 15:16:52

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.987500** MHz | **Upper Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.79 – Band Edge and Emissions Mask – 25kHz BW – 64QAM – 450.0125MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



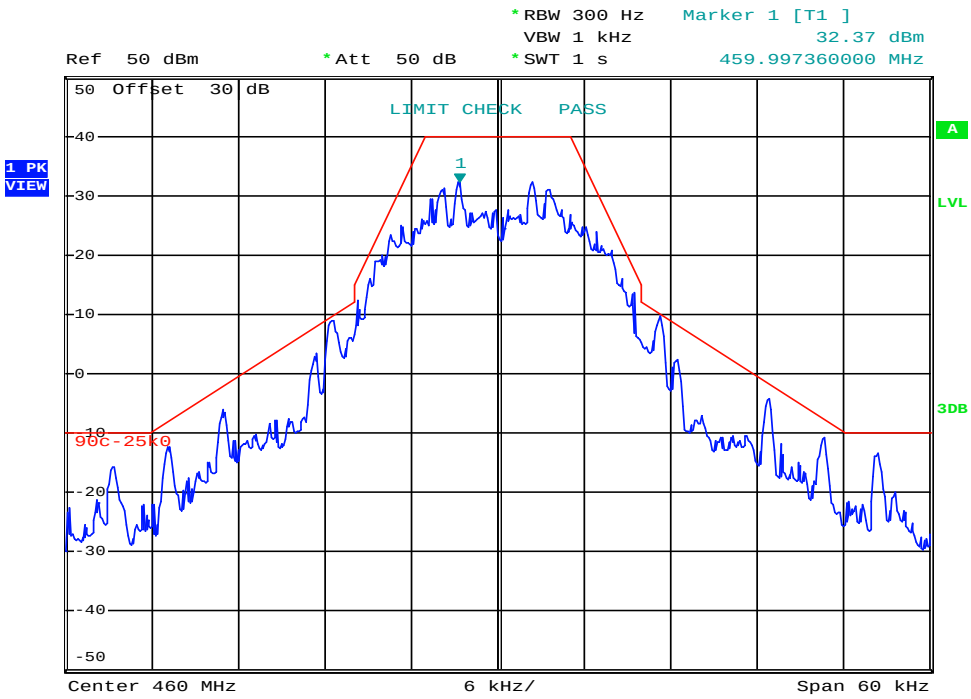

Date: 8.AUG.2019 15:15:40

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.012500** MHz | **Lower Band Edge** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.80 – Band Edge and Emissions Mask – 25kHz BW – 64QAM – 460MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



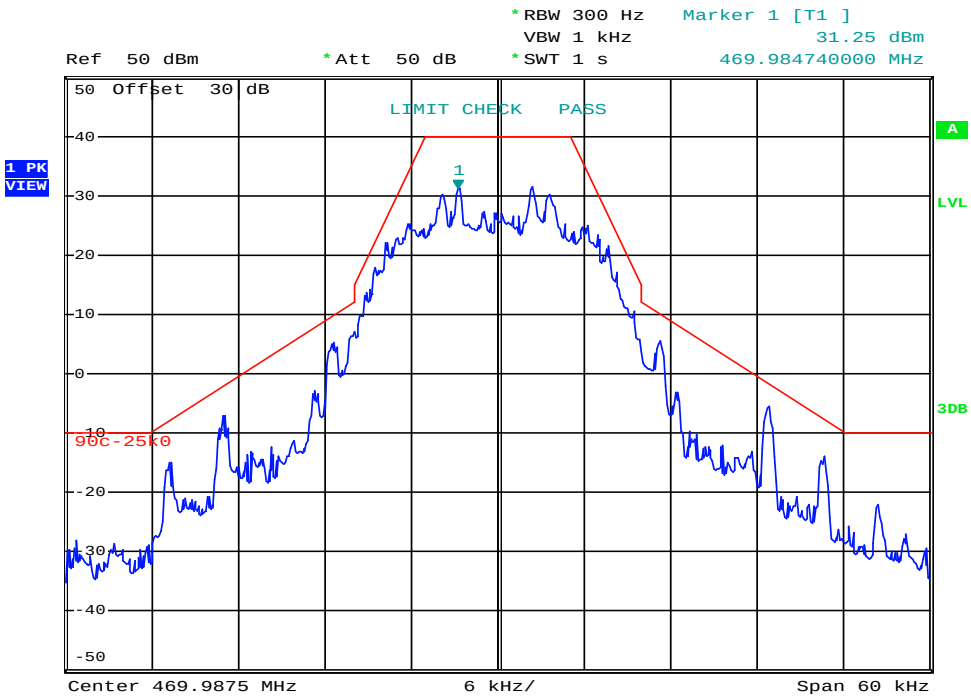

Date: 8.AUG.2019 15:09:47

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **25.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.81 – Band Edge and Emissions Mask – 25kHz BW – 64QAM – 469.9875MHz**

## FCC §90.210( c) Mask C, RSS-119 (5.8.2) Mask C



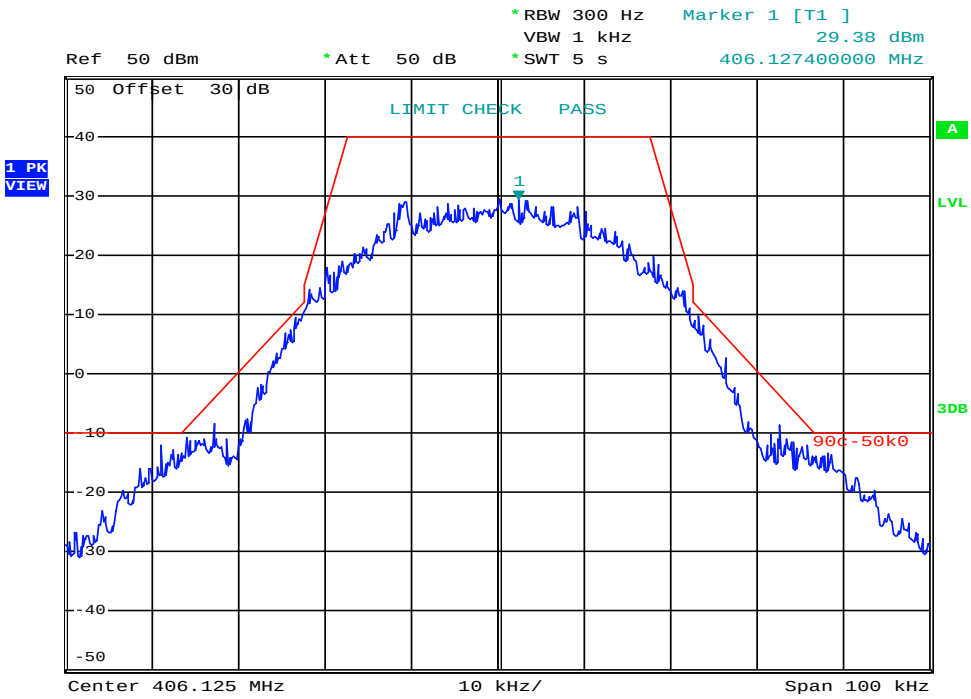

Date: 8.AUG.2019 15:08:28

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.987500** MHz | **Upper Band Edge** | **25.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.82 – Band Edge and Emissions Mask – 50kHz BW – MSK – 406.125MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



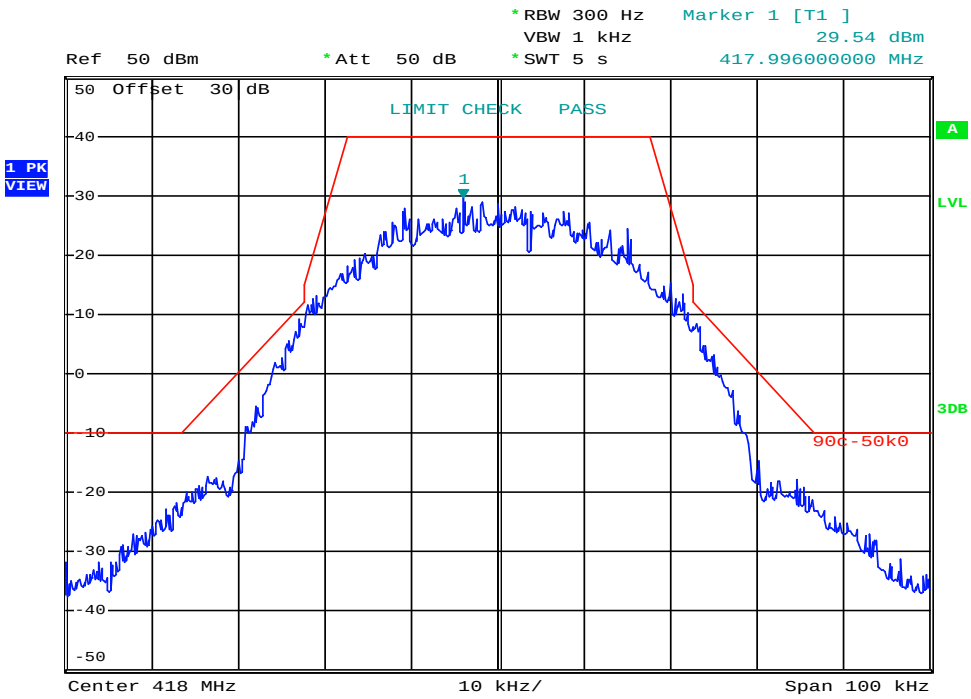

Date: 8.AUG.2019 16:10:40

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.125000** MHz | **Lower Band Edge** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.83 – Band Edge and Emissions Mask – 50kHz BW – MSK – 418MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



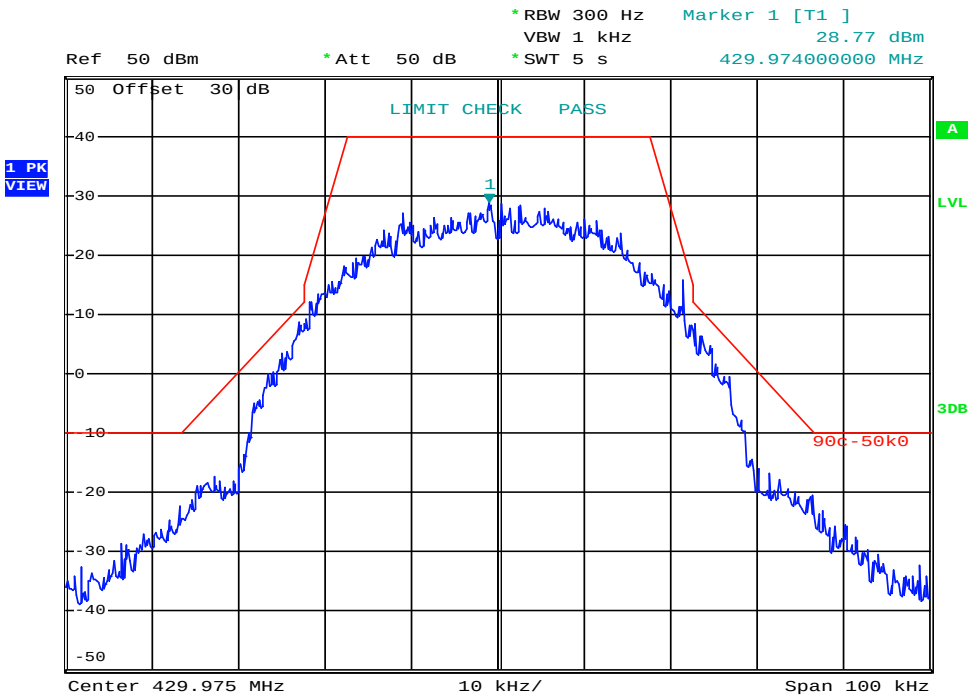

Date: 8.AUG.2019 16:15:53

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.84 – Band Edge and Emissions Mask – 50kHz BW – MSK – 429.975MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



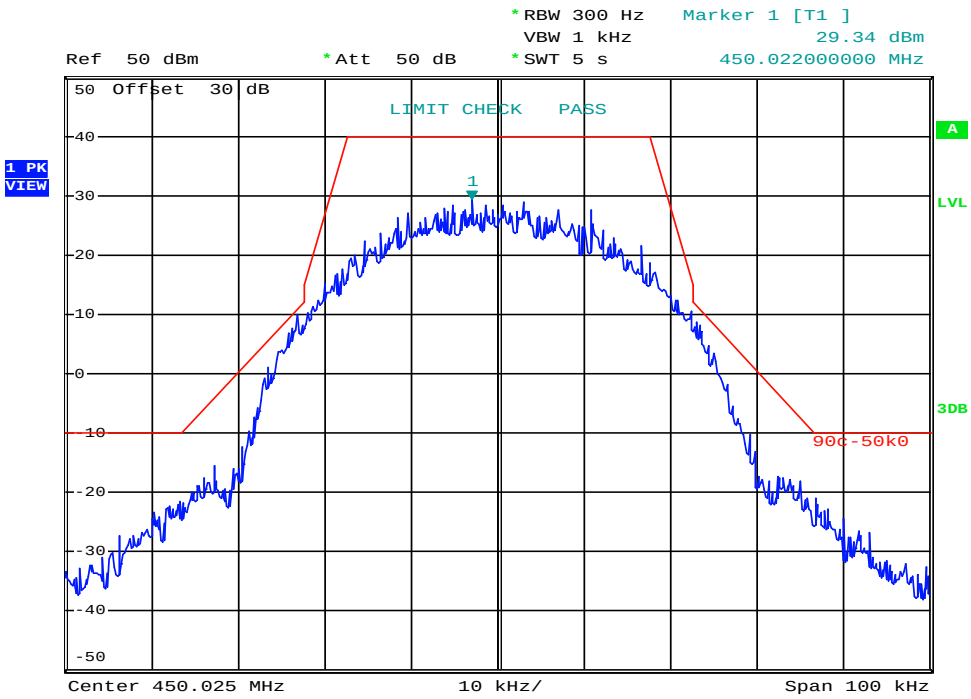

Date: 8.AUG.2019 16:17:14

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.975000** MHz | **Upper Band Edge** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.85 – Band Edge and Emissions Mask – 50kHz BW – MSK – 450.025MHz**

## RSS-119 (5.8.2) Mask C (Modified)



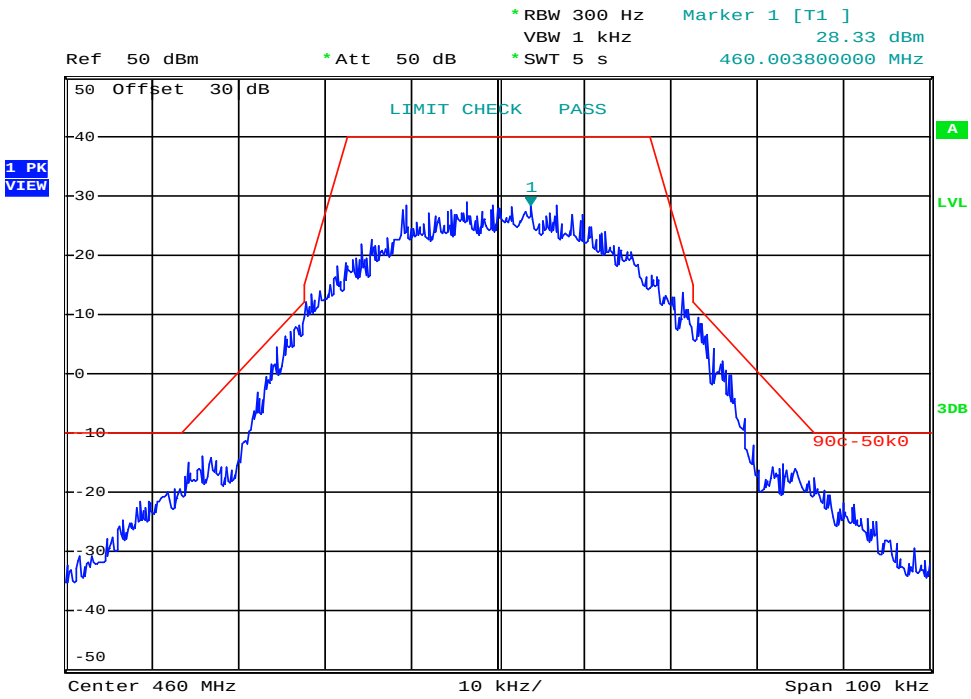

Date: 8.AUG.2019 16:18:27

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.025000** MHz | **Lower Band Edge** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.86 – Band Edge and Emissions Mask – 50kHz BW – MSK – 460MHz**

## RSS-119 (5.8.2) Mask C (Modified)



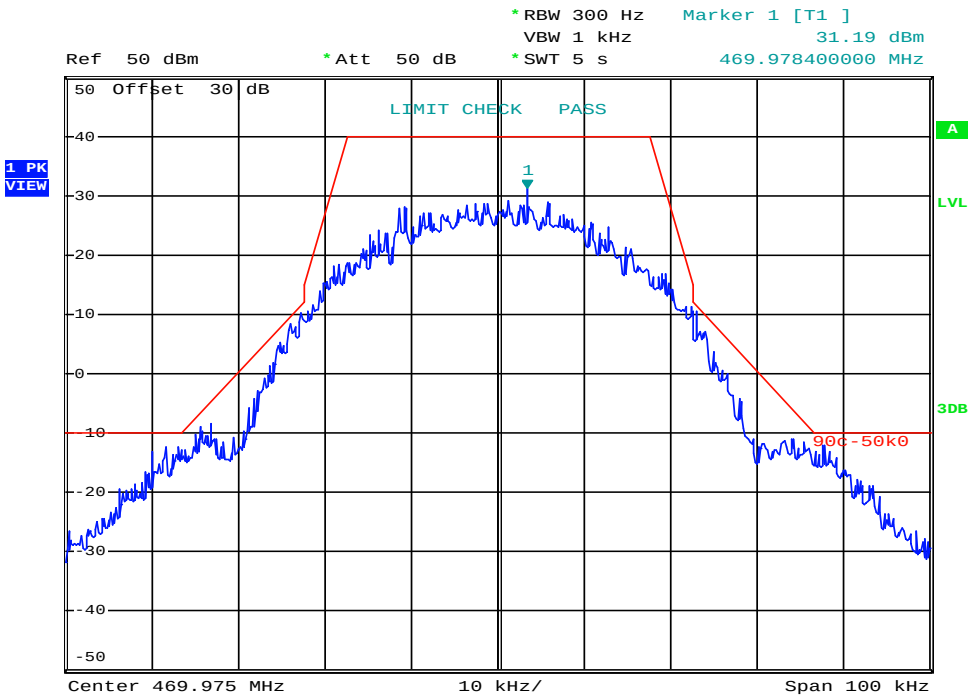

Date: 8.AUG.2019 16:19:38

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.86 – Band Edge and Emissions Mask – 50kHz BW – MSK – 469.975MHz**

## RSS-119 (5.8.2) Mask C (Modified)



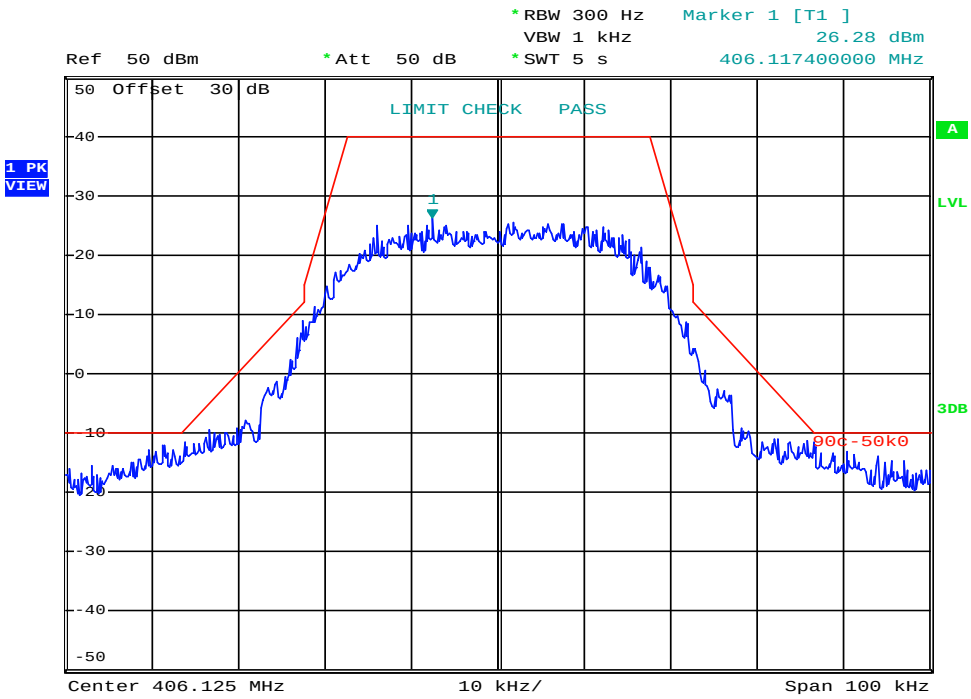

Date: 8.AUG.2019 16:20:45

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.975000** MHz | **Upper Band Edge** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **MSK** | **40.00** dBm | **PASS** |

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**Plot 9.87 – Band Edge and Emissions Mask – 50kHz BW – 8PSK – 406.125MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



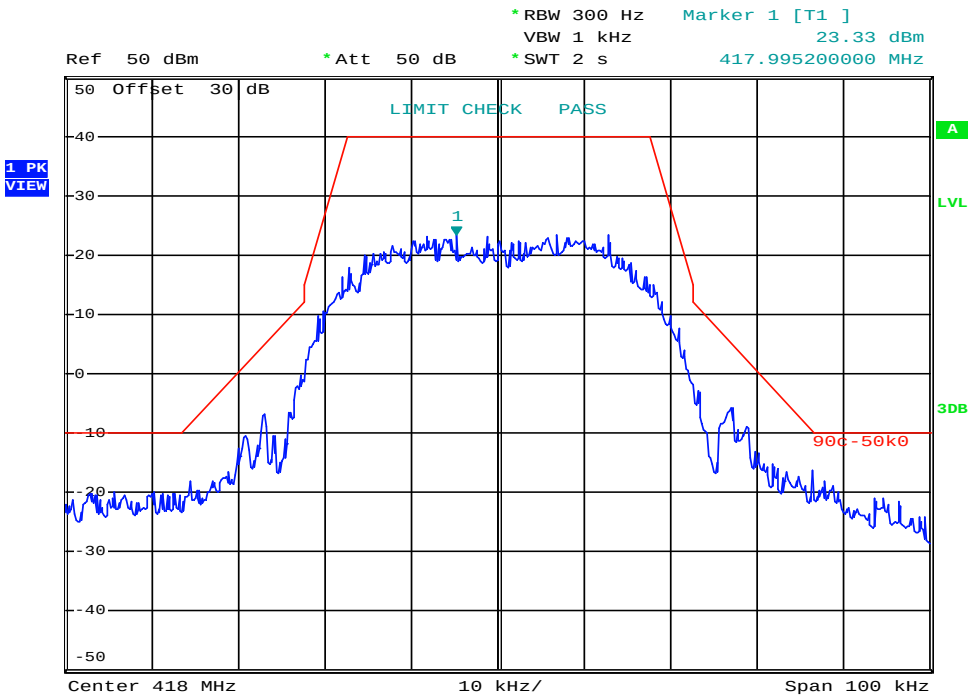

Date: 8.AUG.2019 16:40:24

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.125000** MHz | **Lower Band Edge** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.88 – Band Edge and Emissions Mask – 50kHz BW – 8PSK – 418MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



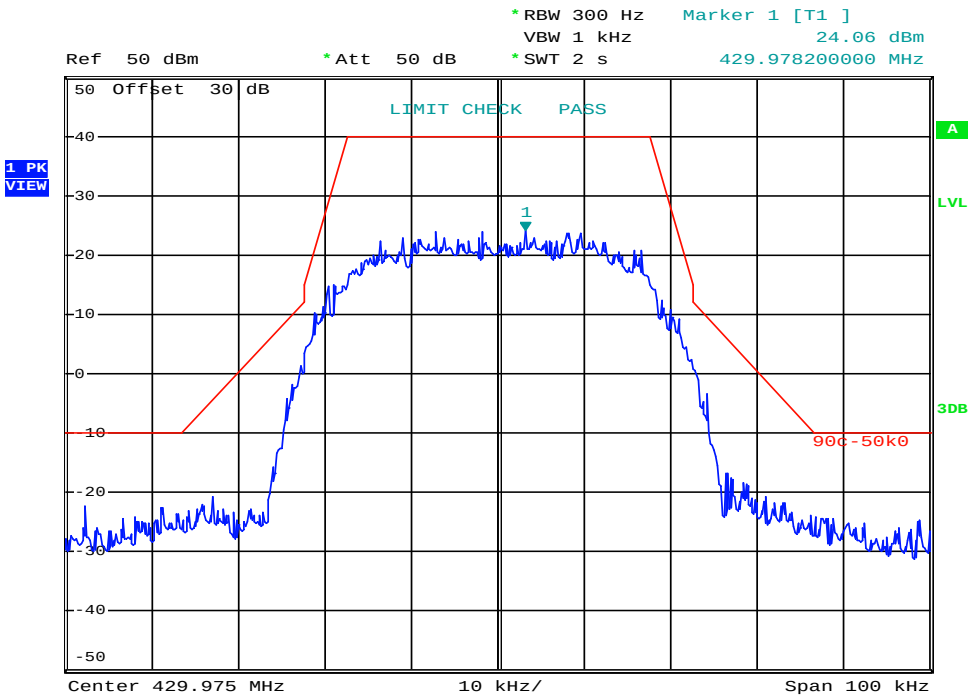

Date: 8.AUG.2019 16:42:57

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.89 – Band Edge and Emissions Mask – 50kHz BW – 8PSK – 429.975MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



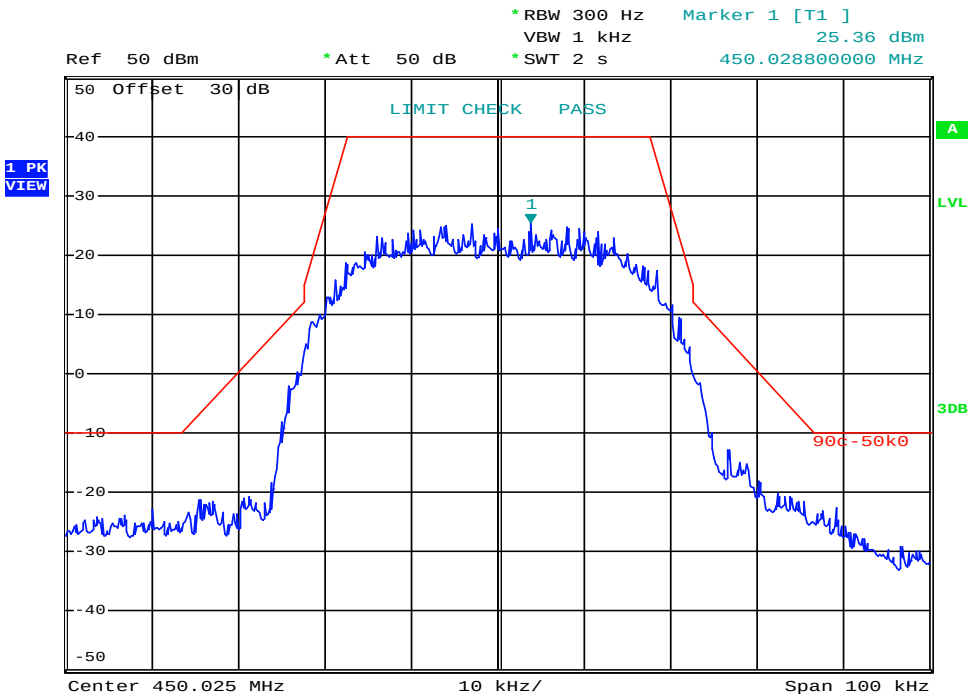

Date: 8.AUG.2019 16:44:12

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.975000** MHz | **Upper Band Edge** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.90 – Band Edge and Emissions Mask – 50kHz BW – 8PSK – 450.025MHz**

## RSS-119 (5.8.2) Mask C (Modified)



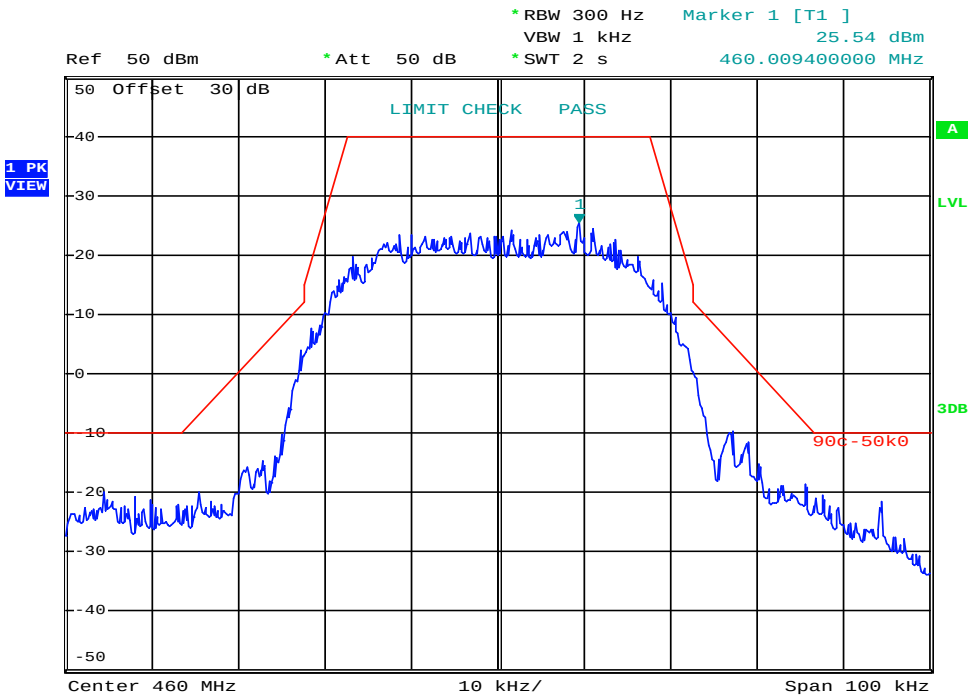

Date: 8.AUG.2019 16:45:56

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.025000** MHz | **Lower Band Edge** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.91 – Band Edge and Emissions Mask – 50kHz BW – 8PSK – 460MHz**

## RSS-119 (5.8.2) Mask C (Modified)



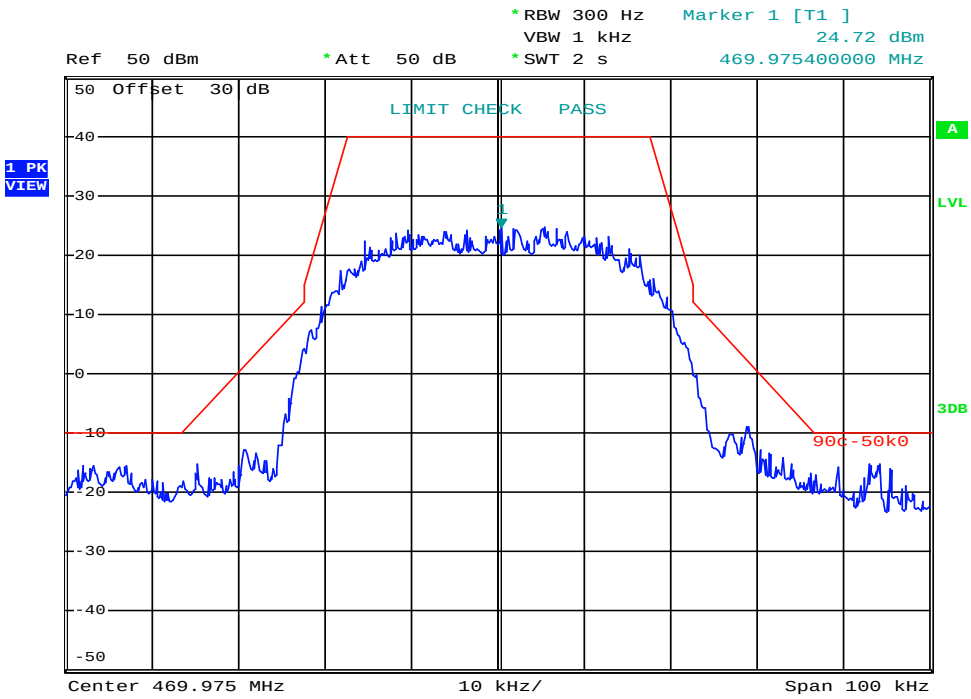

Date: 8.AUG.2019 16:47:19

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.92 – Band Edge and Emissions Mask – 50kHz BW – 8PSK – 469.975MHz**

## RSS-119 (5.8.2) Mask C (Modified)



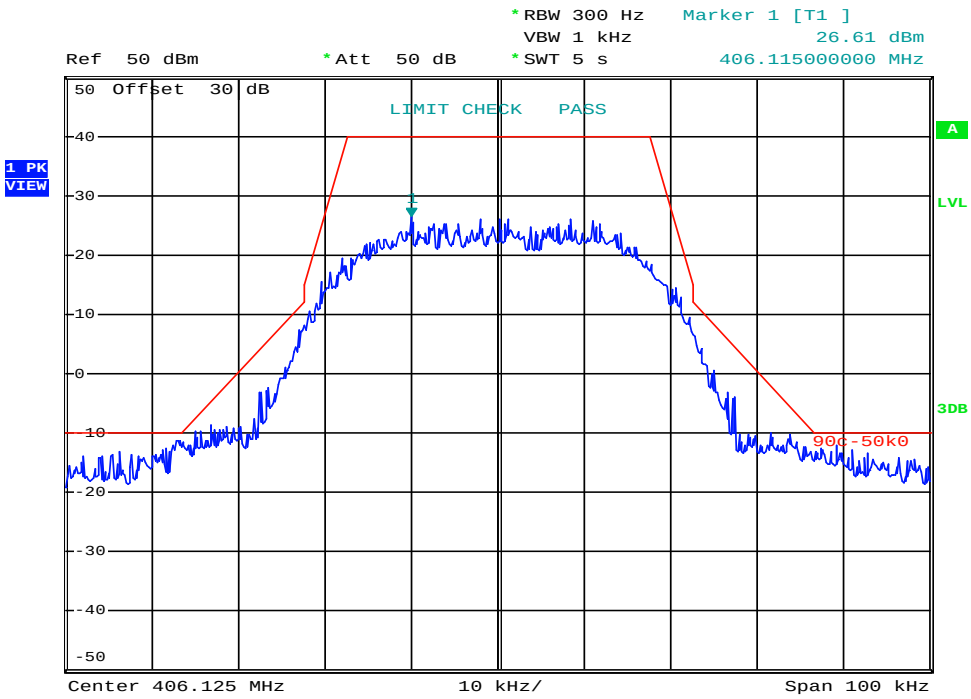

Date: 8.AUG.2019 16:48:54

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.975000** MHz | **Upper Band Edge** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **8PSK** | **40.00** dBm | **PASS** |

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**Plot 9.93 – Band Edge and Emissions Mask – 50kHz BW – QPSK – 406.125MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



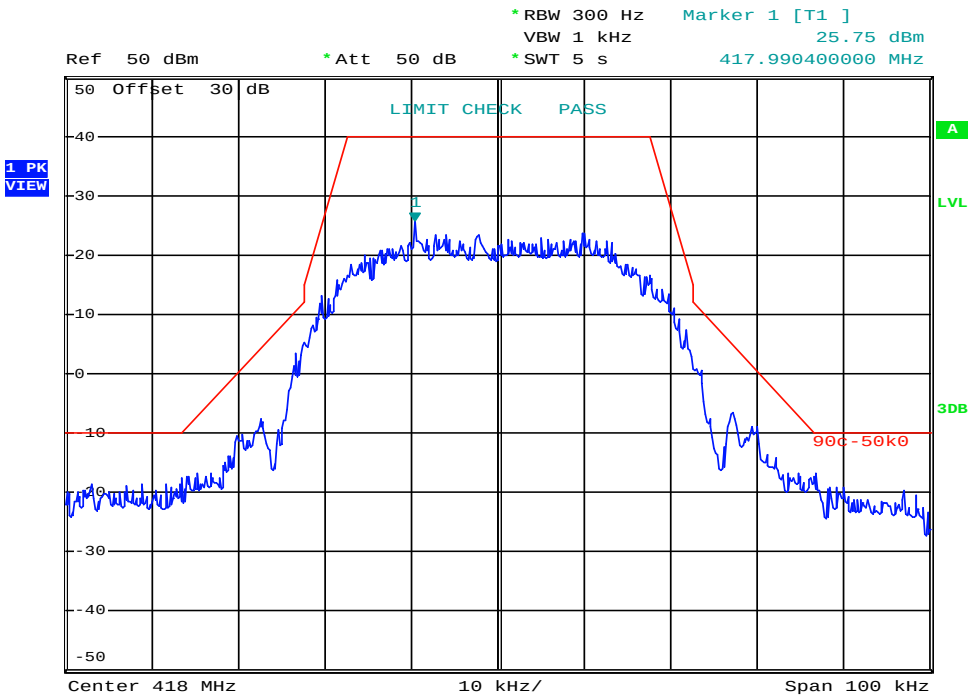

Date: 8.AUG.2019 16:37:58

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.125000** MHz | **Lower Band Edge** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.94 – Band Edge and Emissions Mask – 50kHz BW – QPSK – 418MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



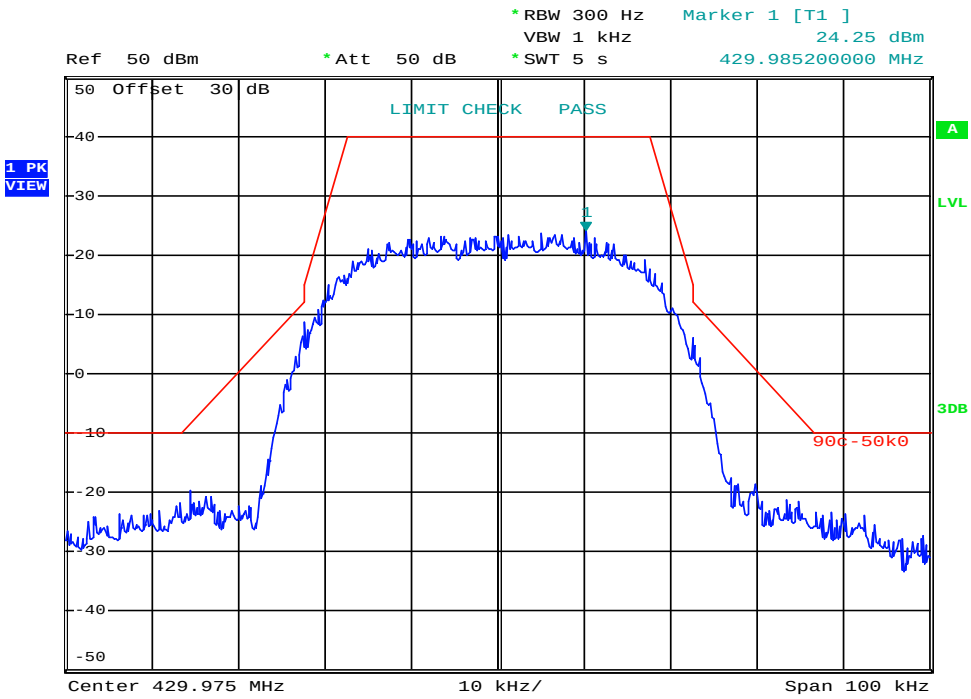

Date: 8.AUG.2019 16:34:44

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.95 – Band Edge and Emissions Mask – 50kHz BW – QPSK – 429.975MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



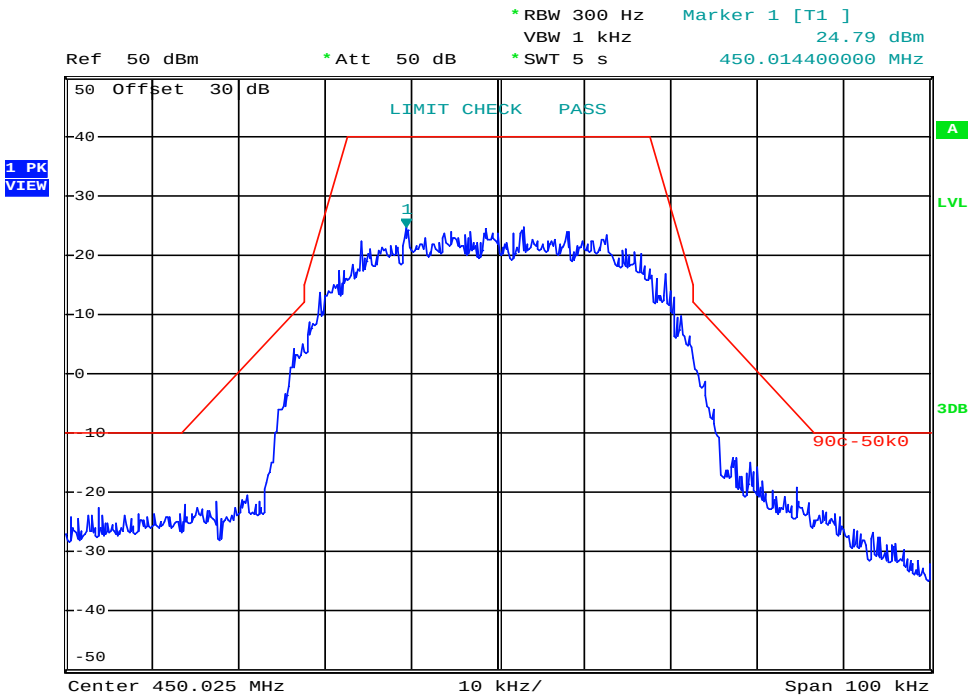

Date: 8.AUG.2019 16:33:01

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.975000** MHz | **Upper Band Edge** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.96 – Band Edge and Emissions Mask – 50kHz BW – QPSK – 450.025MHz**

## RSS-119 (5.8.2) Mask C (Modified)



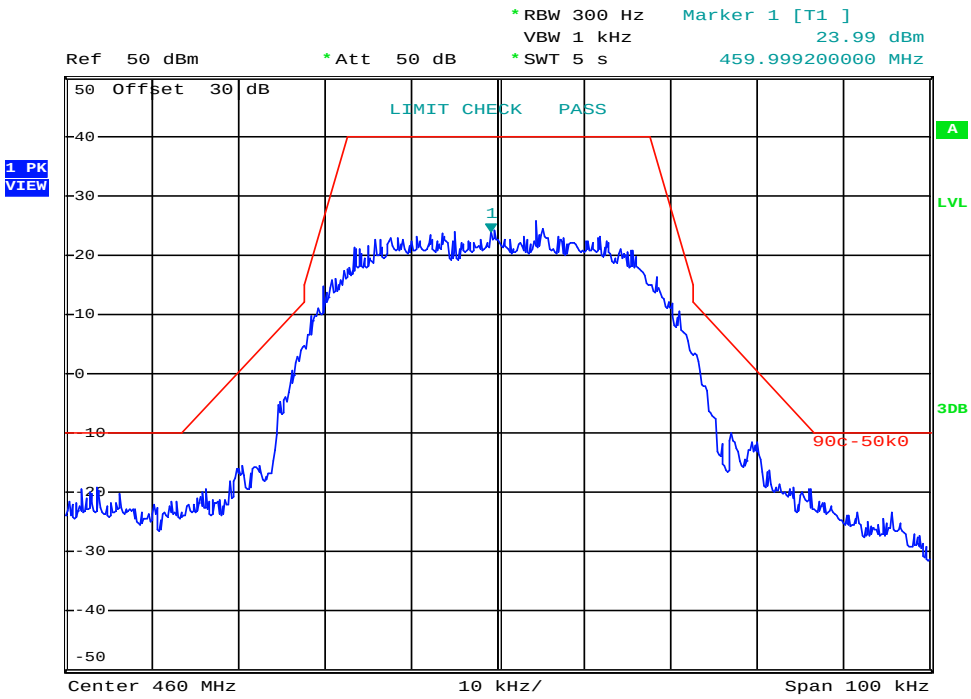

Date: 8.AUG.2019 16:31:27

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.025000** MHz | **Lower Band Edge** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.97 – Band Edge and Emissions Mask – 50kHz BW – QPSK – 460MHz**

## RSS-119 (5.8.2) Mask C (Modified)



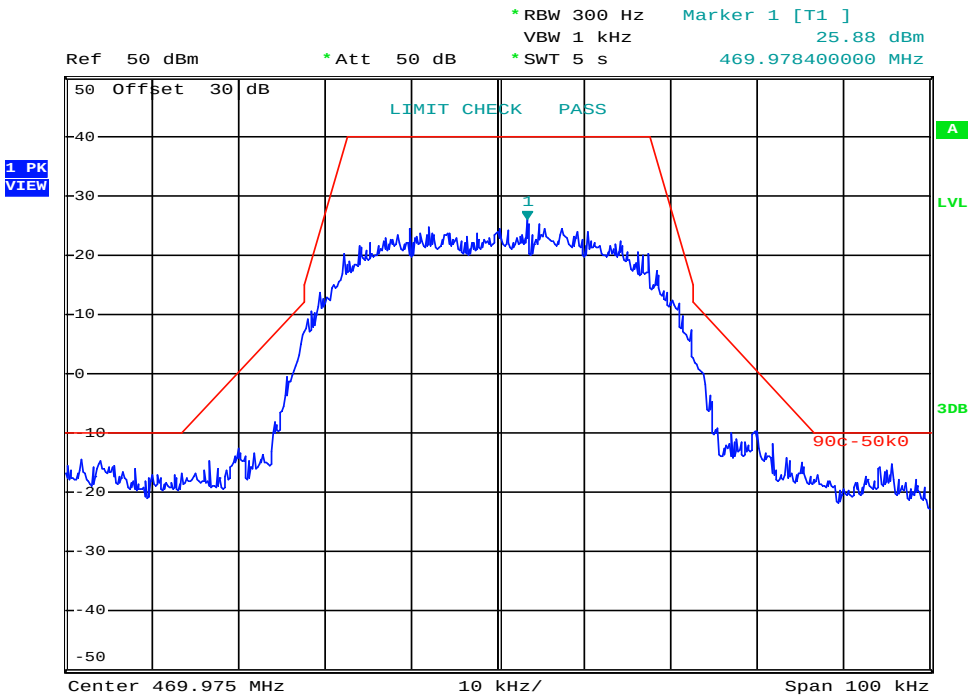

Date: 8.AUG.2019 16:29:42

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.98 – Band Edge and Emissions Mask – 50kHz BW – QPSK – 469.975MHz**

## RSS-119 (5.8.2) Mask C (Modified)



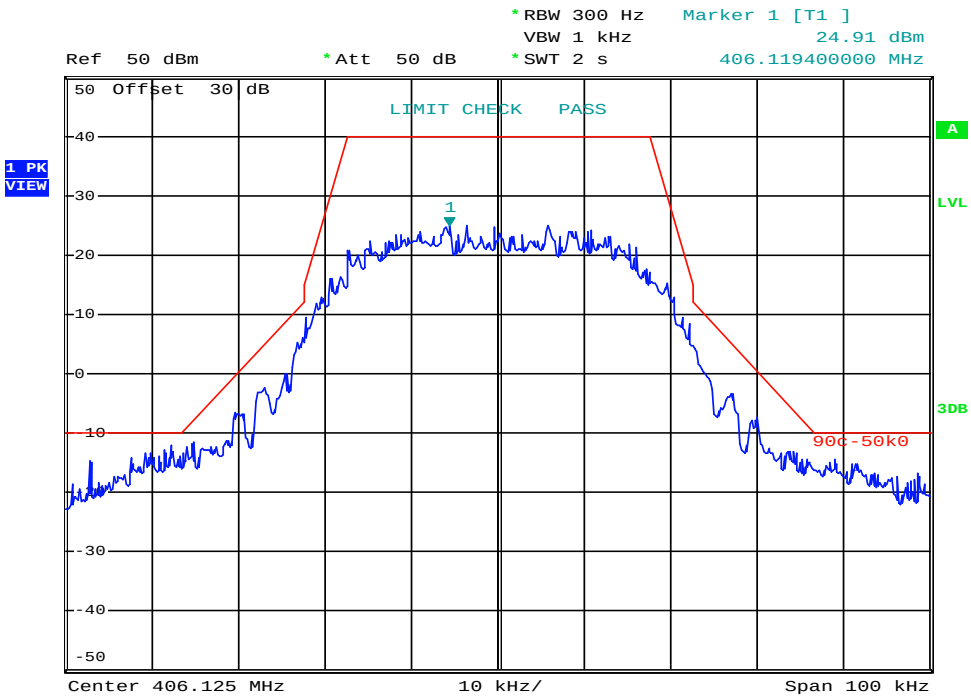

Date: 8.AUG.2019 16:27:52

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.975000** MHz | **Upper Band Edge** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **QPSK** | **40.00** dBm | **PASS** |

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**Plot 9.99 – Band Edge and Emissions Mask – 50kHz BW – 16QAM – 406.125MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



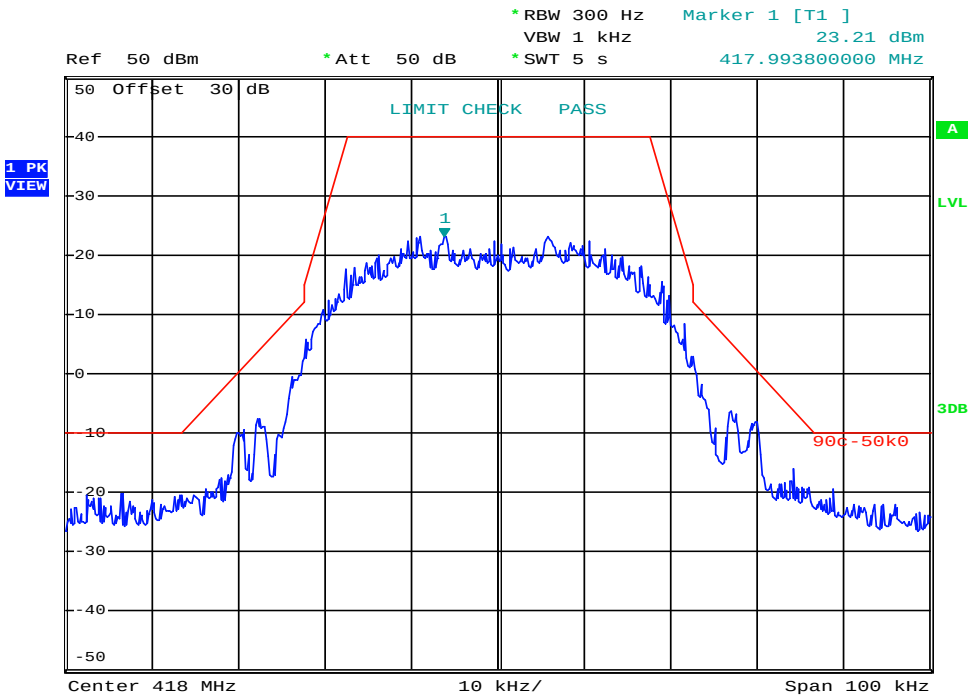

Date: 8.AUG.2019 17:02:31

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.125000** MHz | **Lower Band Edge** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.100 – Band Edge and Emissions Mask – 50kHz BW – 16QAM – 418MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



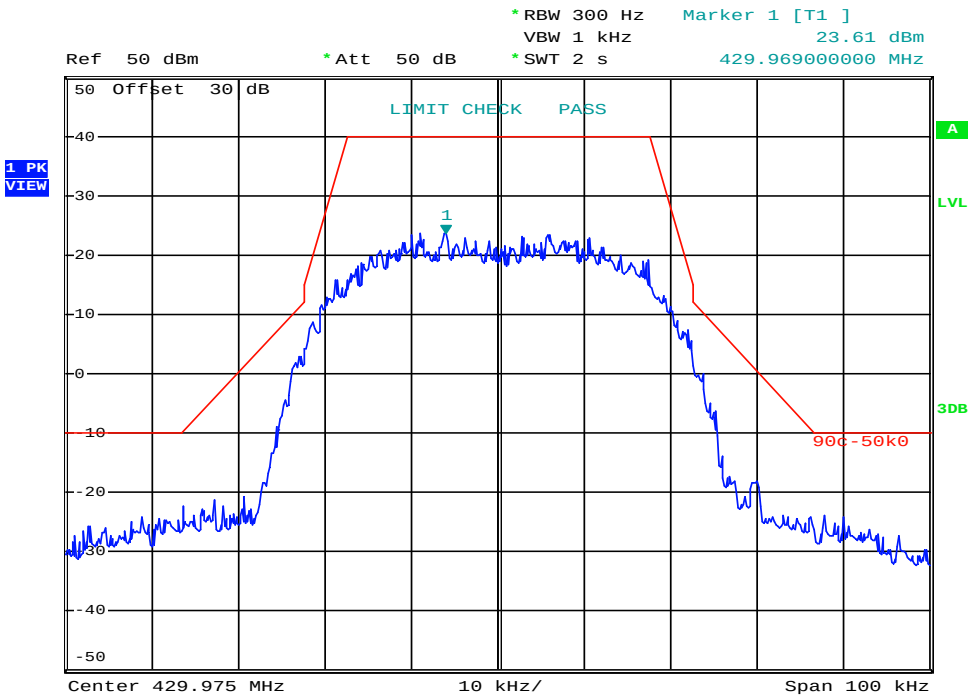

Date: 8.AUG.2019 17:00:15

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.101 – Band Edge and Emissions Mask – 50kHz BW – 16QAM – 429.975MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



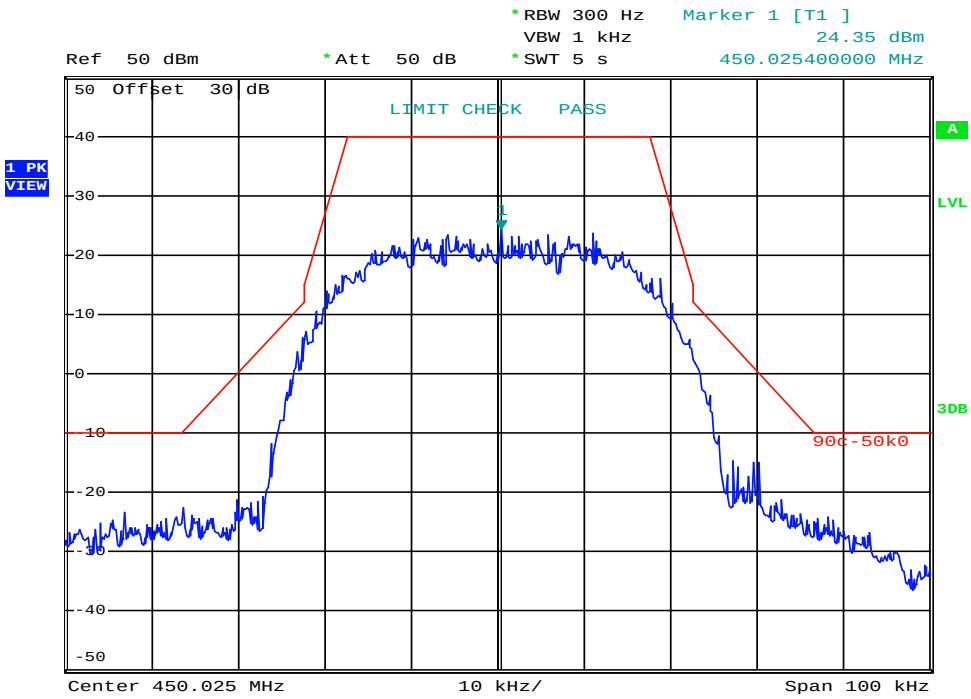

Date: 8.AUG.2019 16:57:11

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.975000** MHz | **Upper Band Edge** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.102 – Band Edge and Emissions Mask – 50kHz BW – 16QAM – 450.025MHz**

## RSS-119 (5.8.2) Mask C (Modified)



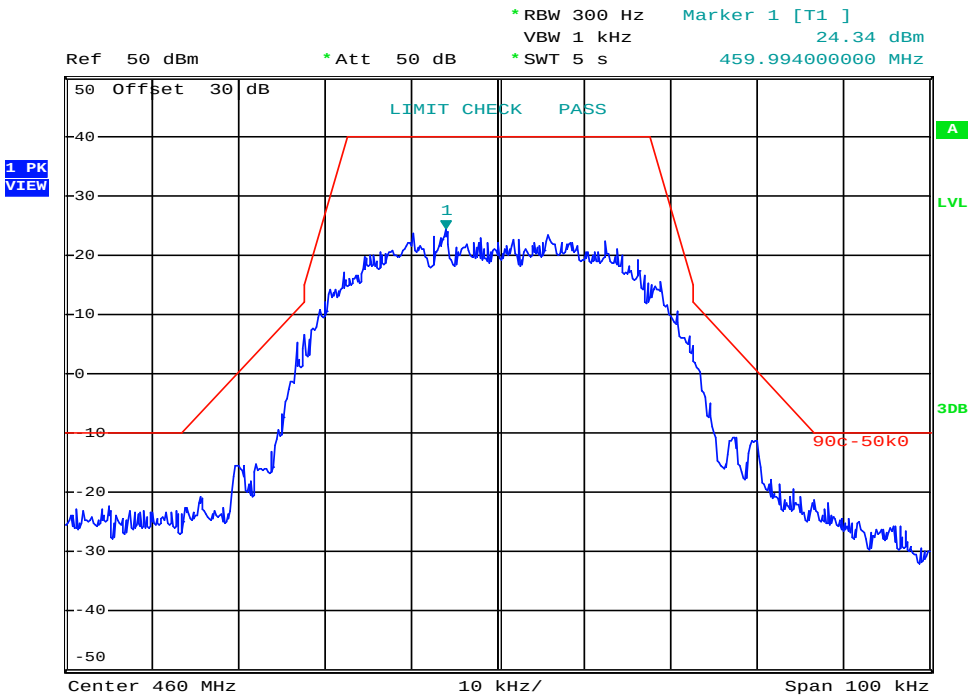

Date: 8.AUG.2019 16:55:10

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.025000** MHz | **Lower Band Edge** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.103 – Band Edge and Emissions Mask – 50kHz BW – 16QAM – 460MHz**

## RSS-119 (5.8.2) Mask C (Modified)



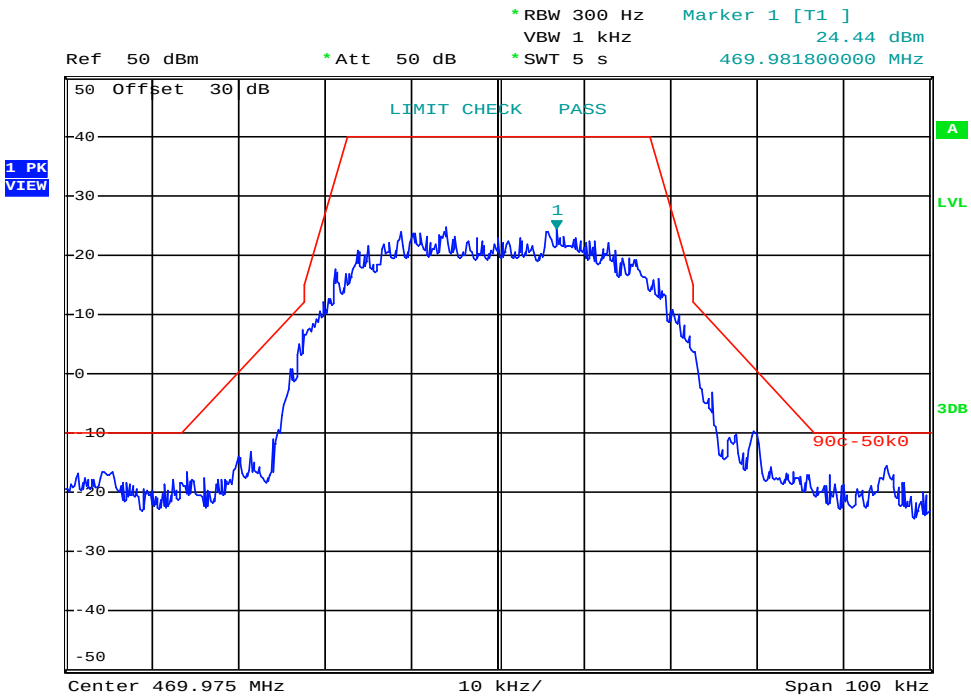

Date: 8.AUG.2019 16:53:17

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.104 – Band Edge and Emissions Mask – 50kHz BW – 16QAM – 469.975MHz**

## RSS-119 (5.8.2) Mask C (Modified)



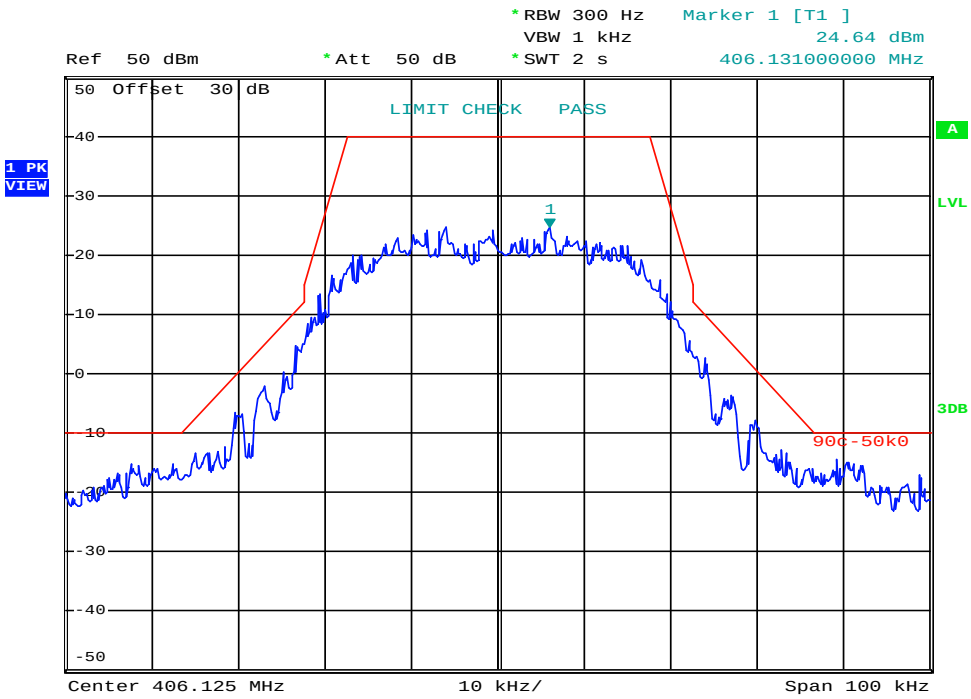

Date: 8.AUG.2019 16:51:36

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.975000** MHz | **Upper Band Edge** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **16QAM** | **40.00** dBm | **PASS** |

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**Plot 9.105 – Band Edge and Emissions Mask – 50kHz BW – 32QAM – 406.125MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



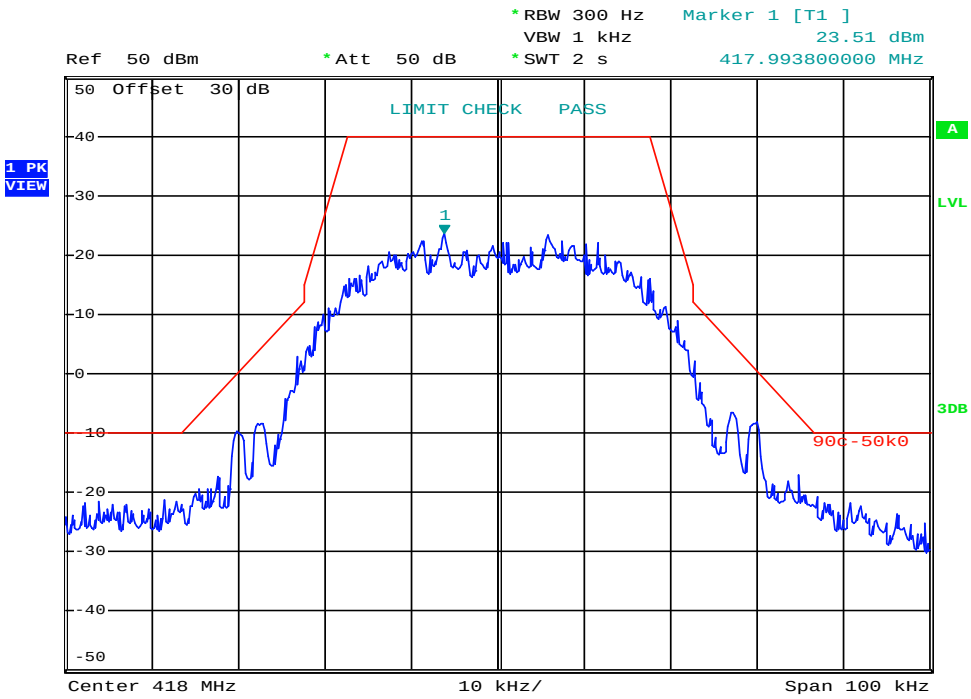

Date: 8.AUG.2019 17:04:13

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.125000** MHz | **Lower Band Edge** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.106 – Band Edge and Emissions Mask – 50kHz BW – 32QAM – 418MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



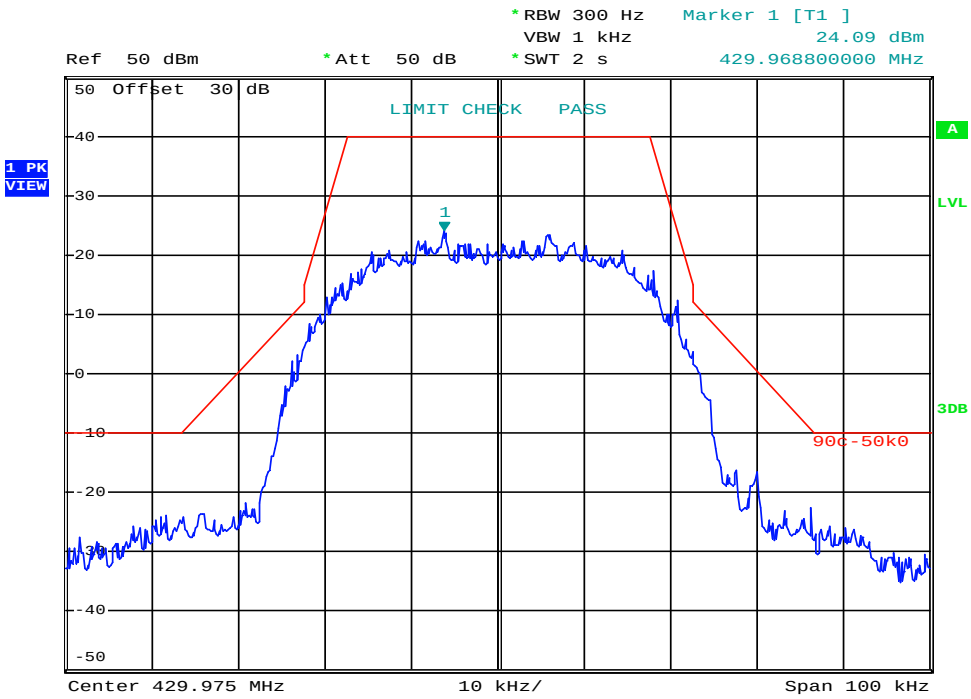

Date: 8.AUG.2019 17:06:03

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.107 – Band Edge and Emissions Mask – 50kHz BW – 32QAM – 429.975MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



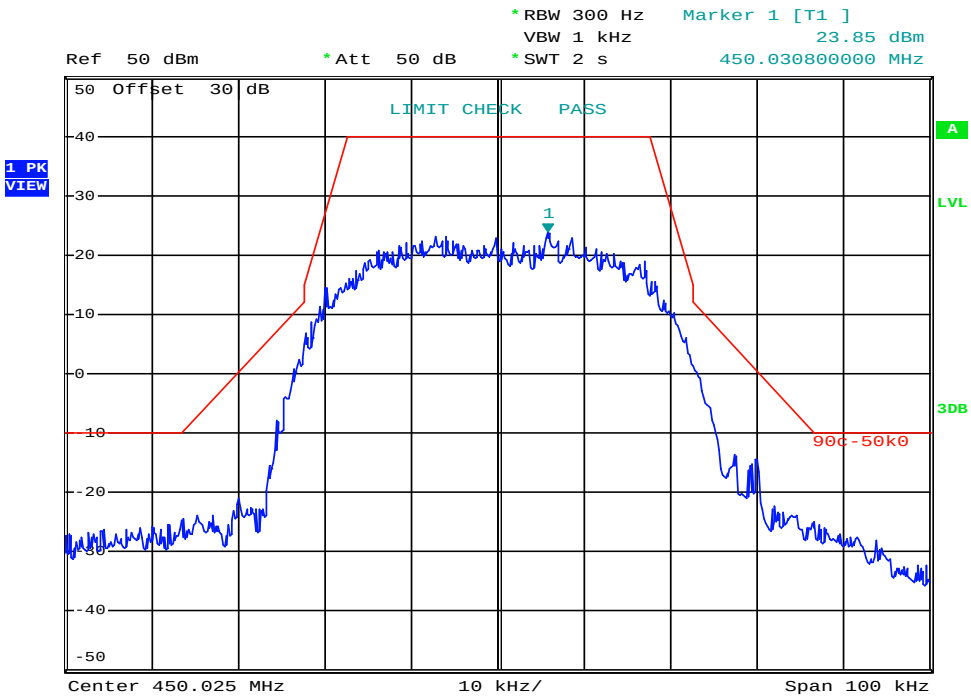

Date: 8.AUG.2019 17:08:11

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.975000** MHz | **Upper Band Edge** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.108 – Band Edge and Emissions Mask – 50kHz BW – 32QAM – 450.025MHz**

## RSS-119 (5.8.2) Mask C (Modified)



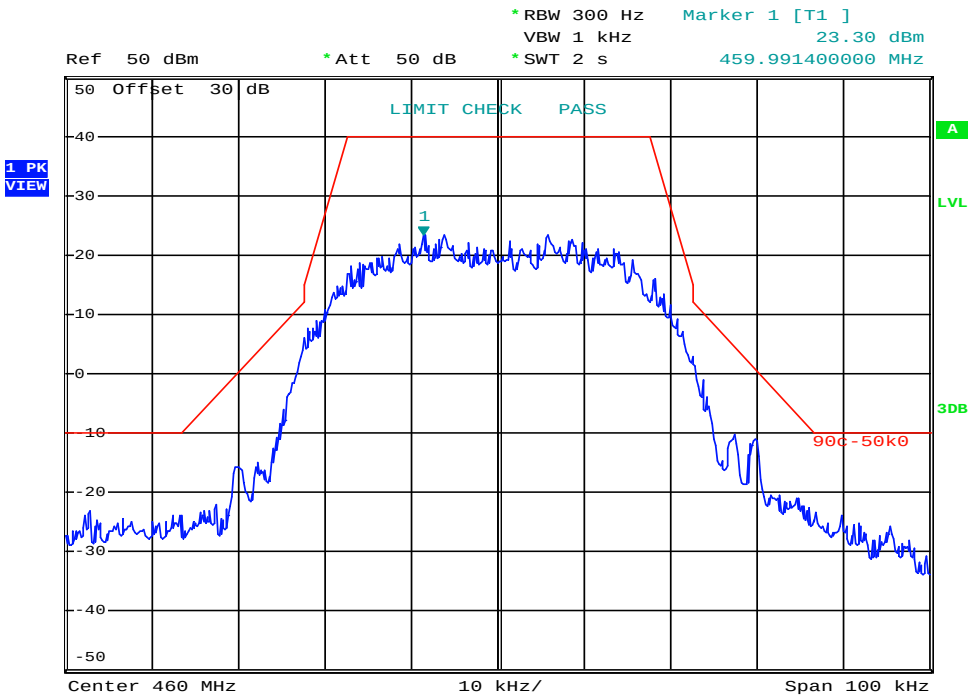

Date: 8.AUG.2019 17:10:24

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.025000** MHz | **Lower Band Edge** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.109 – Band Edge and Emissions Mask – 50kHz BW – 32QAM – 460MHz**

## RSS-119 (5.8.2) Mask C (Modified)



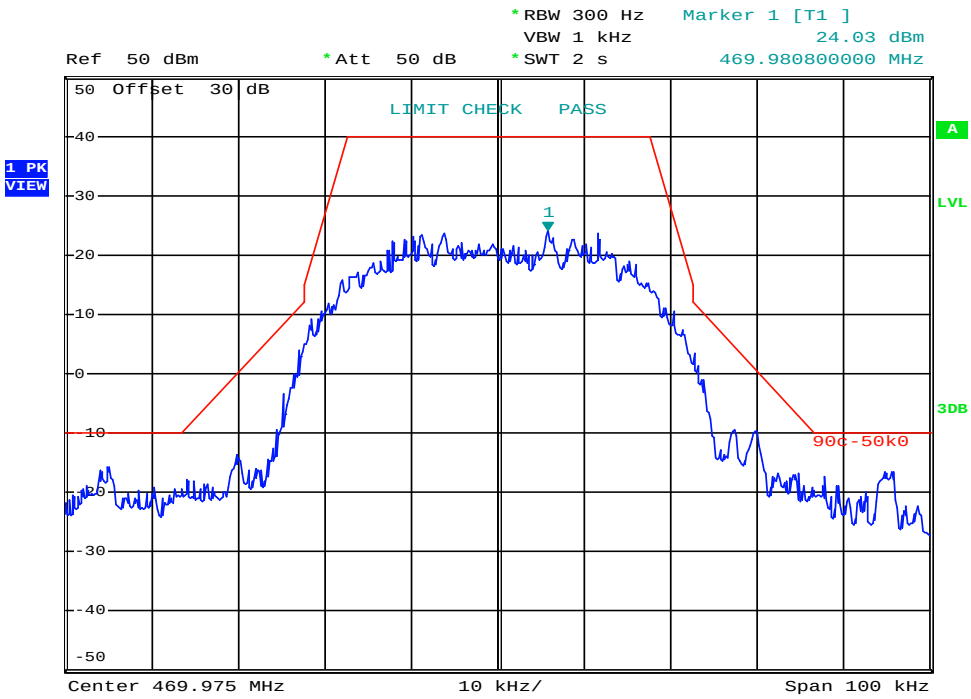

Date: 8.AUG.2019 17:12:07

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.110 – Band Edge and Emissions Mask – 50kHz BW – 32QAM – 469.975MHz**

## RSS-119 (5.8.2) Mask C (Modified)



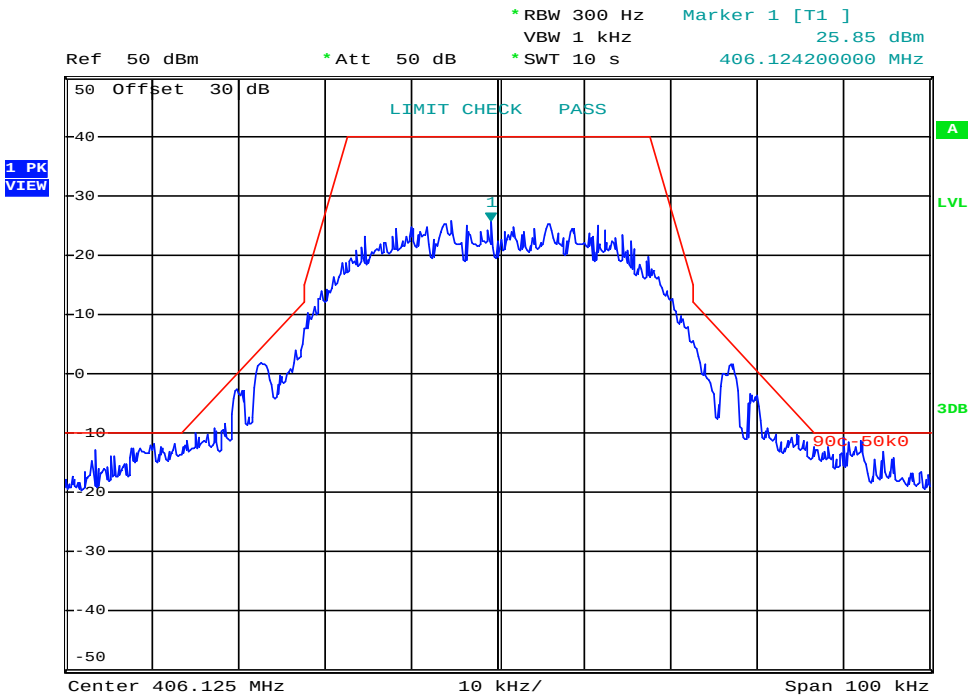

Date: 8.AUG.2019 17:13:43

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.975000** MHz | **Upper Band Edge** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **32QAM** | **40.00** dBm | **PASS** |

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**Plot 9.111 – Band Edge and Emissions Mask – 50kHz BW – 64QAM – 406.125MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



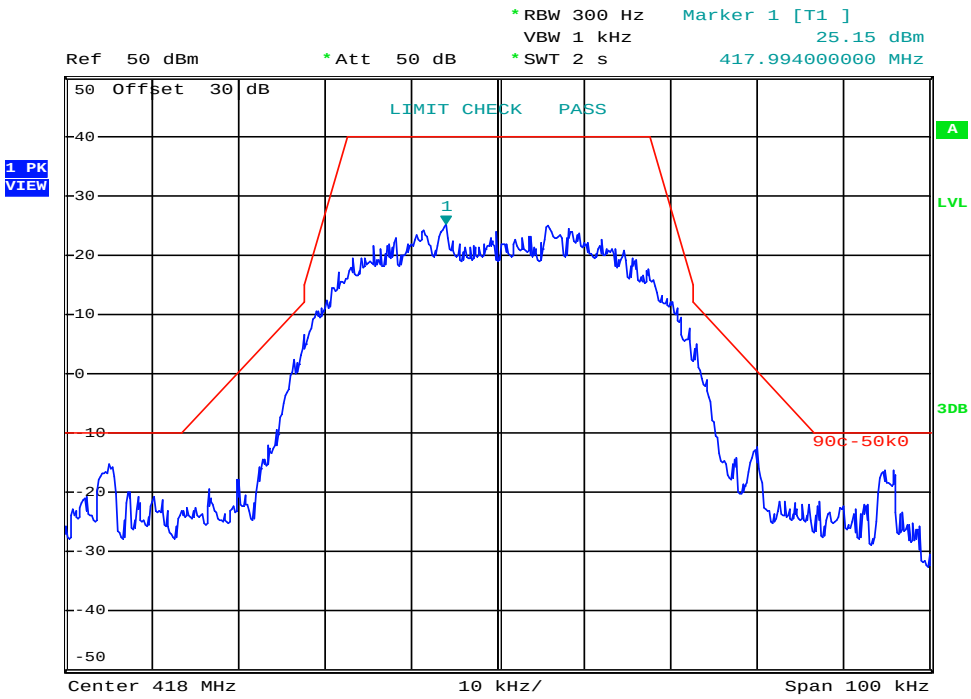

Date: 8.AUG.2019 17:48:13

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **406.125000** MHz | **Lower Band Edge** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.112 – Band Edge and Emissions Mask – 50kHz BW – 64QAM – 418MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



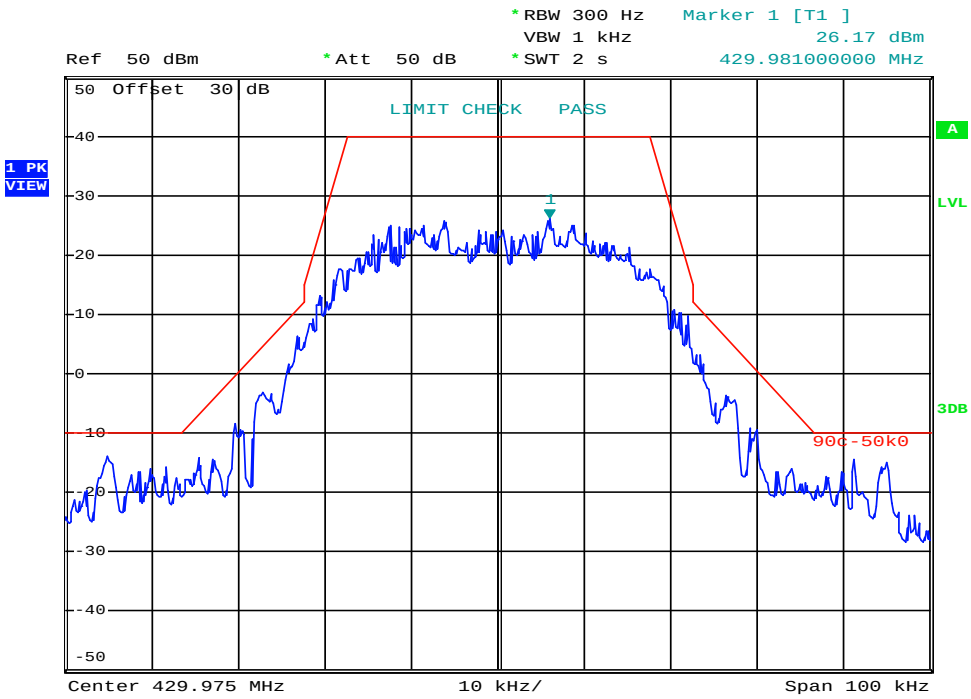

Date: 8.AUG.2019 17:44:10

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **418.000000** MHz | **Mid Band** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.113 – Band Edge and Emissions Mask – 50kHz BW – 64QAM – 429.975MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



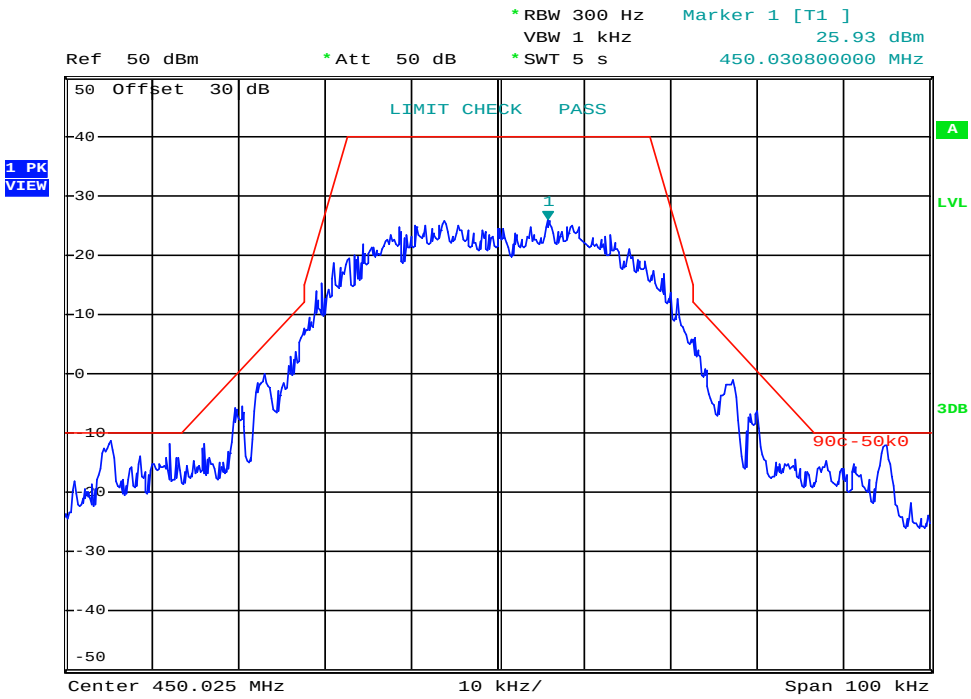

Date: 8.AUG.2019 17:42:35

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **429.975000** MHz | **Upper Band Edge** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.114 – Band Edge and Emissions Mask – 50kHz BW – 64QAM – 450.025MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



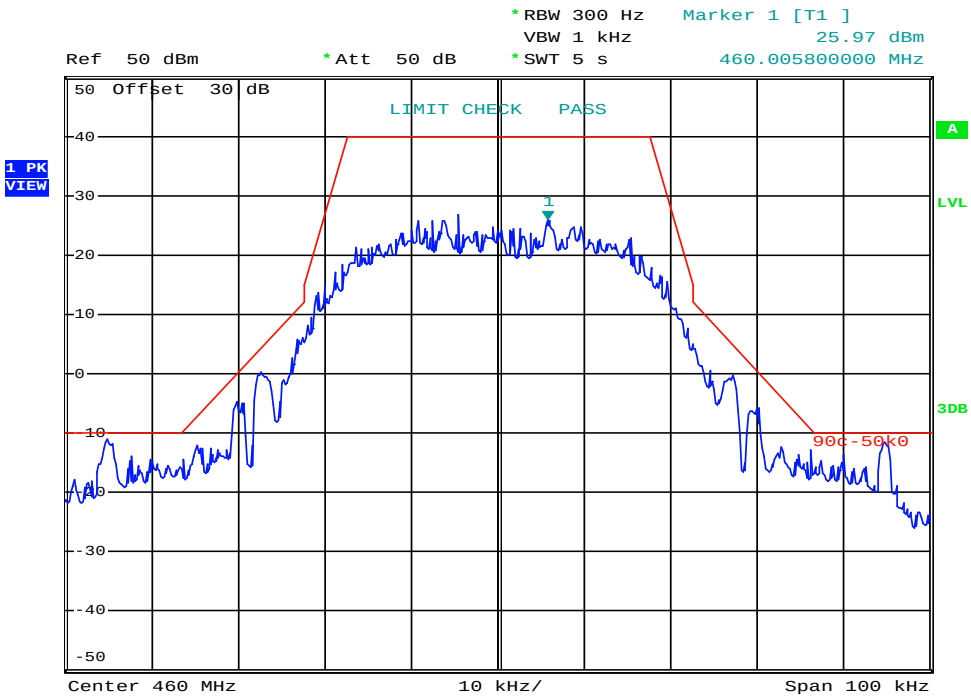

Date: 8.AUG.2019 17:40:59

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **450.025000** MHz | **Lower Band Edge** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.115 – Band Edge and Emissions Mask – 50kHz BW – 64QAM – 460MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)



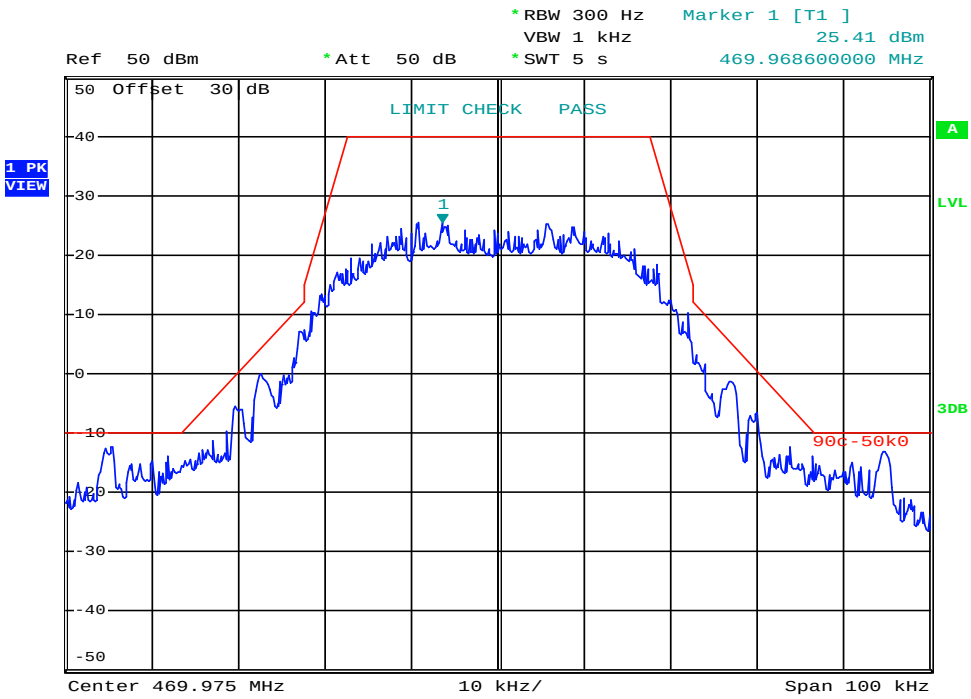

Date: 8.AUG.2019 17:29:17

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **460.000000** MHz | **Mid Band** | **50.00** kHz |
| Modulation Setting: | Channel Power Setting: | Mask Limit Check: |
| **64QAM** | **40.00** dBm | **PASS** |

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**Plot 9.116 – Band Edge and Emissions Mask – 50kHz BW – 64QAM – 469.975MHz, ISED**

## RSS-119 (5.8.2) Mask C (Modified)




Date: 8.AUG.2019 17:26:47

| Channel Frequency: | Band Edge: | Channel Bandwidth Setting: |
|---|---|---|
| **469.975000** MHz | **Upper Band Edge** | **50.00** kHz |
| **Modulation Setting:** | **Channel Power Setting:** | **Mask Limit Check:** |
| **64QAM** | **40.00** dBm | **PASS** |

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**Table 9.1 – Summary of Band Edge and Emissions Mask Measurements, 6.25kHz and 12.5kHz**

| Band Edge and Emissions Mask Measurements | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Modulation | BW Setting (kHz) | Power Setting (dBm) | Power Setting (W) | Emission Mask (FCC) | Emission Mask (ISED) | Band Edge Result | Mask Limit Check | Result |
| 406.103125<br>418.000000<br>429.996875<br>450.003125<br>460.000000<br>469.996875 | MSK | 6.25 | 39.00* | 8.0* | | RSS-119<br>5.8.4<br>Mask E | PASS | PASS | Complies |
| 450.003125<br>460.000000<br>469.996875 | | | 37.78** | 6.0** | §90.210(e)<br>Mask E | | PASS | PASS | Complies |
| 406.106250<br>418.000000<br>429.993750<br>450.006250<br>460.000000<br>469.993750 | MSK | 12.5 | 40 | 10 | §90.210(d)<br>Mask D | RSS-119<br>5.8.3<br>Mask D | PASS | PASS | Complies |
| 406.106250<br>418.000000<br>429.993750<br>450.006250<br>460.000000<br>469.993750 | 8PSK | 12.5 | 40 | 10 | §90.210(d)<br>Mask D | RSS-119<br>5.8.3<br>Mask D | PASS | PASS | Complies |
| 406.106250<br>418.000000<br>429.993750<br>450.006250<br>460.000000<br>469.993750 | QPSK | 12.5 | 40 | 10 | §90.210(d)<br>Mask D | RSS-119<br>5.8.3<br>Mask D | PASS | PASS | Complies |
| 406.106250<br>418.000000<br>429.993750<br>450.006250<br>460.000000<br>469.993750 | 16QAM | 12.5 | 40 | 10 | §90.210(d)<br>Mask D | RSS-119<br>5.8.3<br>Mask D | PASS | PASS | Complies |
| 406.106250<br>418.000000<br>429.993750<br>450.006250<br>460.000000<br>469.993750 | 32QAM | 12.5 | 40 | 10 | §90.210(d)<br>Mask D | RSS-119<br>5.8.3<br>Mask D | PASS | PASS | Complies |
| 406.106250<br>418.000000<br>429.993750<br>450.006250<br>460.000000<br>469.993750 | 64QAM | 12.5 | 40 | 10 | §90.210(d)<br>Mask D | RSS-119<br>5.8.3<br>Mask D | PASS | PASS | Complies |

* To meet compliance with RSS-199 (5.8.4) Mask E, the output power must be reduced to 39.00dBm (8W).
** To meet compliance with FCC §90.210(e) Mask E, the output power must be reduced to 37.8dBm (6W)

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**Table 9.2 – Summary of Band Edge and Emissions Mask Measurements, 25kHz**

| Band Edge and Emissions Mask Measurements | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Modulation | BW Setting (kHz) | Power Setting (dBm) | Power Setting (W) | Emission Mask (FCC) | Emission Mask (ISED) | Band Edge Result | Mask Limit Check | Result |
| 406.112500<br>418.000000<br>429.987500<br>450.012500<br>460.000000<br>469.987500 | MSK | 25 | 40 | 10 | §90.210( c)<br>Mask C | RSS-119 5.8.2 Mask C | PASS | PASS | Complies |
| 406.112500<br>418.000000<br>429.987500<br>450.012500<br>460.000000<br>469.987500 | 8PSK | 25 | 40 | 10 | §90.210( c)<br>Mask C | RSS-119 5.8.2 Mask C | PASS | PASS | Complies |
| 406.112500<br>418.000000<br>429.987500<br>450.012500<br>460.000000<br>469.987500 | QPSK | 25 | 40 | 10 | §90.210( c)<br>Mask C | RSS-119 5.8.2 Mask C | PASS | PASS | Complies |
| 406.112500<br>418.000000<br>429.987500<br>450.012500<br>460.000000<br>469.987500 | 16QAM | 25 | 40 | 10 | §90.210( c)<br>Mask C | RSS-119 5.8.2 Mask C | PASS | PASS | Complies |
| 406.112500<br>418.000000<br>429.987500<br>450.012500<br>460.000000<br>469.987500 | 32QAM | 25 | 40 | 10 | §90.210( c)<br>Mask C | RSS-119 5.8.2 Mask C | PASS | PASS | Complies |
| 406.112500<br>418.000000<br>429.987500<br>450.012500<br>460.000000<br>469.987500 | 64QAM | 25 | 40 | 10 | §90.210( c)<br>Mask C | RSS-119 5.8.2 Mask C | PASS | PASS | Complies |

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**Table 9.3 – Summary of Band Edge and Emissions Mask Measurements, 50kHz**

| Band Edge and Emissions Mask Measurements | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Modulation | BW Setting (kHz) | Power Setting (dBm) | Power Setting (W) | Emission Mask (FCC) | Emission Mask (ISED) | Band Edge Result | Mask Limit Check | Result |
| 406.125000<br>418.000000<br>429.975000<br>450.025000<br>460.000000<br>469.975000 | MSK | 50 | 40 | 10 | | RSS-119 5.8.2 Mask C* | PASS | PASS | Complies |
| 406.125000<br>418.000000<br>429.975000<br>450.025000<br>460.000000<br>469.975000 | 8PSK | 50 | 40 | 10 | | RSS-119 5.8.2 Mask C* | PASS | PASS | Complies |
| 406.125000<br>418.000000<br>429.975000<br>450.025000<br>460.000000<br>469.975000 | QPSK | 50 | 40 | 10 | | RSS-119 5.8.2 Mask C* | PASS | PASS | Complies |
| 406.125000<br>418.000000<br>429.975000<br>450.025000<br>460.000000<br>469.975000 | 16QAM | 50 | 40 | 10 | | RSS-119 5.8.2 Mask C* | PASS | PASS | Complies |
| 406.125000<br>418.000000<br>429.975000<br>450.025000<br>460.000000<br>469.975000 | 32QAM | 50 | 40 | 10 | | RSS-119 5.8.2 Mask C* | PASS | PASS | Complies |
| 406.125000<br>418.000000<br>429.975000<br>450.025000<br>460.000000<br>469.975000 | 64QAM | 50 | 40 | 10 | | RSS-119 5.8.2 Mask C* | PASS | PASS | Complies |

* See Notes at beginning of Section 9.0

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## 10.0 CONDUCTED SPURIOUS EMISSIONS

| Test Conditions | |
|---|---|
| Normative Reference | FCC 47 CFR §2.1049, §90.210, RSS-Gen (6.7), RSS-119 (5.5) |
| | ANSI C63.26 7.2.3 |
| **Limits** | |
| 47 CFR §90.210 Notes 2, 5 | 421MHz - 512MHz:<br>Note 2: Equipment designed to operate with a 25 kHz channel bandwidth must meet the requirements of Emission Mask B or C, as applicable. Equipment designed to operate with a 12.5 kHz channel bandwidth must meet the requirements of Emission Mask D, and equipment designed to operate with a 6.25 kHz channel bandwidth must meet the requirements of Emission Mask E.<br>Note 5: Equipment designed to operate on 25 kilohertz bandwidth channels must meet the requirements of either Emission Mask B or G, whichever is applicable, while equipment designed to operate on 12.5 kilohertz bandwidth channels must meet the requirements of Emission Mask D. Equipment designed to operate on 25 kilohertz bandwidth channels may alternatively meet the Adjacent Channel Power limits of §90.221. |
| 47 CFR §90.210( c) | (c) Emission Mask C. For transmitters that are not equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier output power (P) as follows:<br>(1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency ($f_d$ in kHz) of more than 5 kHz, but not more than 10 kHz: At least $83\text{Log}_{10}$ ($f_d$/5) dB;<br>(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency ($f_d$ in kHz) of more than 10 kHz, but not more than 250 percent of the authorized bandwidth: At least $29\text{Log}_{10}$ ($f_d$ 2/11) dB or 50 dB, whichever is the lesser attenuation;<br>(3) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least 43 + $10\text{Log}_{10}$ (P) dB. |
| 47 CFR §90.210(d) | (d) Emission Mask D—12.5 kHz channel bandwidth equipment. For transmitters designed to operate with a 12.5 kHz channel bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:<br>(1) On any frequency from the center of the authorized bandwidth f0 to 5.625 kHz removed from f0: Zero dB.<br>(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5.625 kHz but no more than 12.5 kHz: At least 7.27(fd−2.88 kHz) dB.<br>(3) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 12.5 kHz: At least 50 + $10\text{Log}_{10}$(P) dB or 70 dB, whichever is the lesser attenuation. |
| 47 CFR §90.210(e) | (e) Emission Mask E—6.25 kHz or less channel bandwidth equipment. For transmitters designed to operate with a 6.25 kHz or less bandwidth, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:<br>(1) On any frequency from the center of the authorized bandwidth $f_0$ to 3.0 kHz removed from $f_0$: Zero dB.<br>(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 3.0 kHz but no more than 4.6 kHz: At least 30 + 16.67(fd−3 kHz) or 55 + $10\text{Log}_{10}$(P) or 65 dB, whichever is the lesser attenuation.<br>(3) On any frequency removed from the center of the authorized bandwidth by more than 4.6 kHz: At least 55 + $10\text{Log}_{10}$ (P) or 65 dB, whichever is the lesser attenuation. |

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| Test Conditions | | |
|---|---|---|
| Normative Reference | FCC 47 CFR §2.1049, §90.210, RSS-Gen (6.7), RSS-119 (5.5) | |
| | ANSI C63.26 7.2.3 | |
| **Limits** | | |
| RSS-119 (5.5) | 406.1MHz - 430MHz, 450MHz - 470MHz | |
| | Channel Bandwidth (kHz) | Mask w/o Audio Low Pass Filter |
| | 25 | C |
| | 12.5 | D |
| | 6.25 | E |
| RSS-119 (5.8.2) | **Emission Mask C for Transmitters not Equipped With an Audio Low-Pass Filter**<br>The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 6.<br>**Table 6 - Emission Mask C** | |
| | Displacement Frequency, $f_d$(kHz) | Minimum Attenuation (dB) |
| | $5 < f_d \leq 10$ (see Note 1) | $83\text{Log}_{10}(f_d/5)$ |
| | $10 < f_d \leq 50$ (see Note 1) | Whichever is the lesser:<br>50 or<br>$29\text{Log}_{10}(f_d^2/11)$ |
| | $f_d > 50$ (see Note 2) | $43\text{Log}_{10}(P)$ |
| RSS-119 (5.8.3) | **Emission Mask D for Transmitters Equipped With or Without an Audio Low-Pass Filter**<br>The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 7.<br>**Table 7 - Emission Mask D** | |
| | Displacement Frequency, $f_d$(kHz) | Minimum Attenuation (dB) |
| | $5.625 < f_d \leq 12.5$ (see Note 3) | $7.27(f_d - 2.88)$ |
| | $f_d > 12.5$ (see Note 3) | Whichever is the lesser:<br>70 or<br>$50 + \text{Log}_{10}(P)$ |
| RSS-119 (5.8.4) | **Emission Mask E for Transmitters Equipped With or Without an Audio Low-Pass Filter**<br>The power of any emission shall be attenuated below the transmitter output power P (dBW) as specified in Table 8.<br>**Table 8 - Emission Mask E** | |
| | Displacement Frequency, $f_d$(kHz) | Minimum Attenuation (dB) |
| | $3 < f_d \leq 4.6$ (see Note 3) | Whichever is the lesser:<br>$30 + 16.67(f_d - 3)$ or<br>$55 + \text{Log}_{10}(P)$ |
| | $f_d > 4.6$ (see Note 3) | Whichever is the lesser:<br>57 or<br>$55 + \text{Log}_{10}(P)$ |

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| Test Conditions | |
|---|---|
| Normative Reference | FCC 47 CFR §2.1049, §90.210, RSS-Gen (6.7), RSS-119 (5.5) |
| | ANSI C63.26 7.2.3 |

| Measurement Procedure | |
|---|---|
| 47 CFR §90.210(d)(4)<br>47 CFR §90.210(e)(4) | (4) The reference level for showing compliance with the emission mask shall be established using a resolution bandwidth sufficiently wide (usually two or three times the channel bandwidth) to capture the true peak emission of the equipment under test. In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak hold mode. A sufficient number of sweeps must be measured to insure that the emission profile is developed. If video filtering is used, its bandwidth must not be less than the instrument resolution bandwidth. For emissions beyond 50 kHz from the edge of the authorized bandwidth, see paragraph (o) of this section. If it can be shown that use of the above instrumentation settings do not accurately represent the true interference potential of the equipment under test, an alternate procedure may be used provided prior commission approval is obtained. |
| RSS-119 (4.2.1) | **4.2.1 Emission Masks B, C, G, I and J**<br>Unwanted emission measurements can be in peak or averaging mode, provided that the same parameter, peak power or average power, used for the transmitter's output power measurement is also used for the unwanted emission measurements.<br>Except where otherwise stated, on any frequency removed from the carrier frequency by more than 250% of the authorized bandwidth, a resolution bandwidth of at least 100 kHz must be used for frequencies to be measured at or below 1 GHz, and a resolution bandwidth of at least 1 MHz must be used for frequencies to be measured above 1 GHz. If a narrower resolution bandwidth is used, power integration shall be applied. |
| RSS-119 (4.2.2) | **4.2.2 Emission Masks D, E, F and Y**<br>In order to show compliance with the emission mask up to and including 50 kHz removed from the edge of the authorized bandwidth, adjust the resolution bandwidth to 100 Hz with the measuring instrument in a peak mode. For emissions beyond 50 kHz from the edge of the authorized bandwidth, the resolution bandwidth shall be 100 kHz for frequencies at or below 1 GHz, and 1 MHz for frequencies above 1 GHz. However, for emission mask F, at a displacement frequency of less than 3.75 kHz, the resolution bandwidth shall be 30 Hz. |
| Note 1: RBW = 300Hz<br>Note 2: RBW = Specified in Section 4.2.1<br>Note 3: RBW = Specified in Section 4.2.2 | |

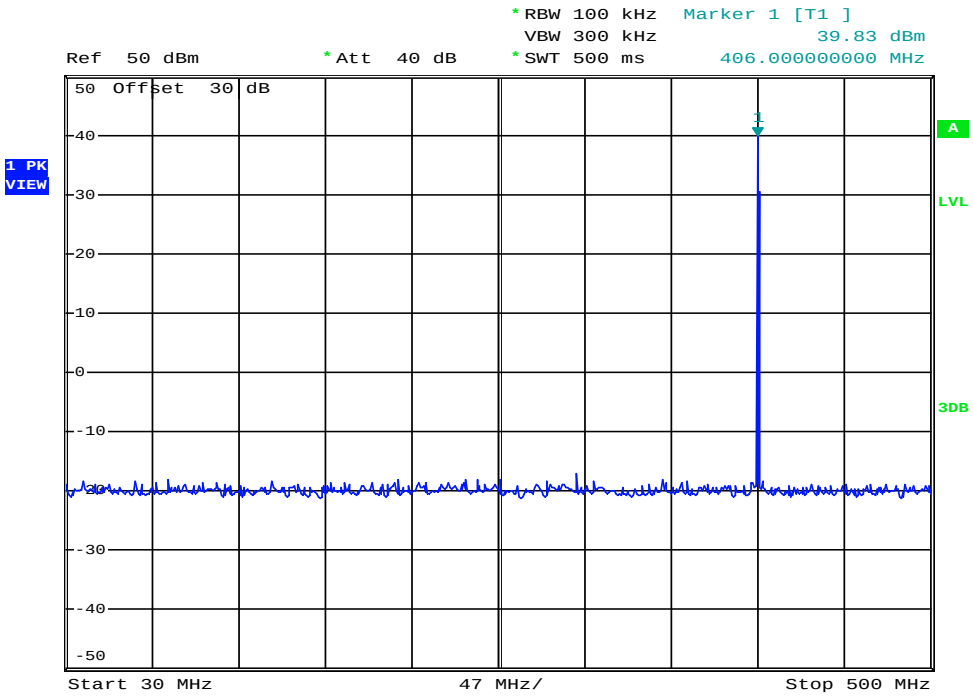
| Test Setup | Appendix A | Figure A.1 |
|---|---|---|

| Measurement Setup |
|---|
| The DUT was connected to a Spectrum Analyzer (SA) via a 30dB attenuator connected to the DUT's antenna port. The SA was configured as above using the appropriate mask and the SA Limit Check function. The output power of the DUT was set to the manufacturer's highest output power setting (except as noted) and set to MSK, QPSK, 8PSK, 16QAM, 32QAM and 64QAM modulation mode. The DUT was set to transmit at its maximum Duty Cycle. |

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**Plot 10.1 – Conducted Spurious Emission, 30MHz – 500MHz, Channel: 406.1MHz**

## Conducted Spurious Emissions




Date: 9.AUG.2019 13:54:51

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |

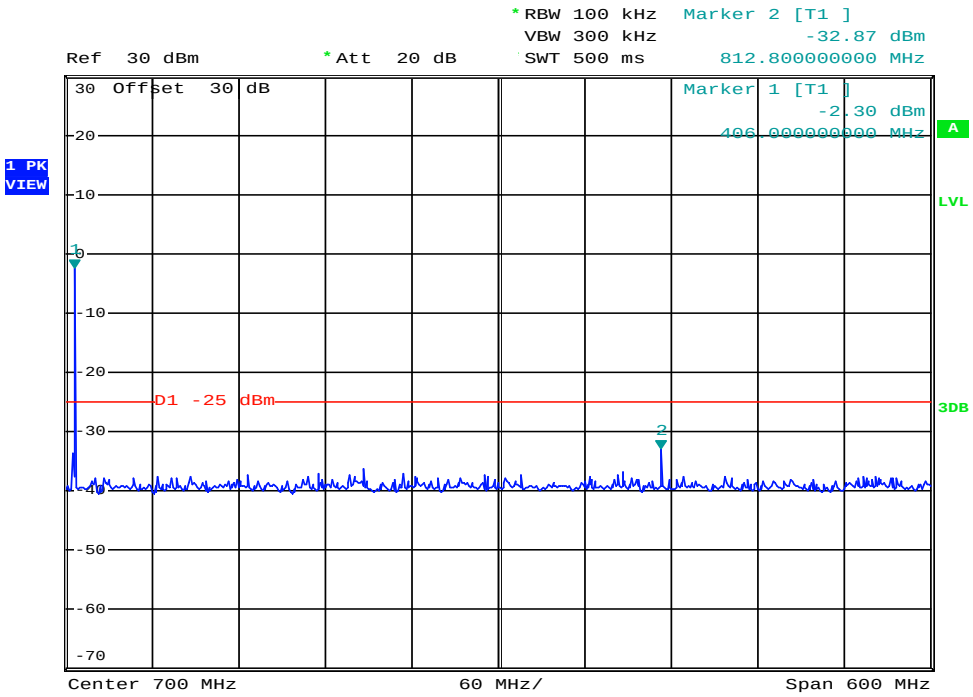
Marker 1: Fundamental

**Measured Emission Level:** **None Detected** dBm

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**Plot 10.2 – Conducted Spurious Emission, 400MHz – 1000MHz, Channel: 406.1MHz**

## Conducted Spurious Emissions




Date: 9.AUG.2019 13:57:11

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |

Marker 1: Fundamental

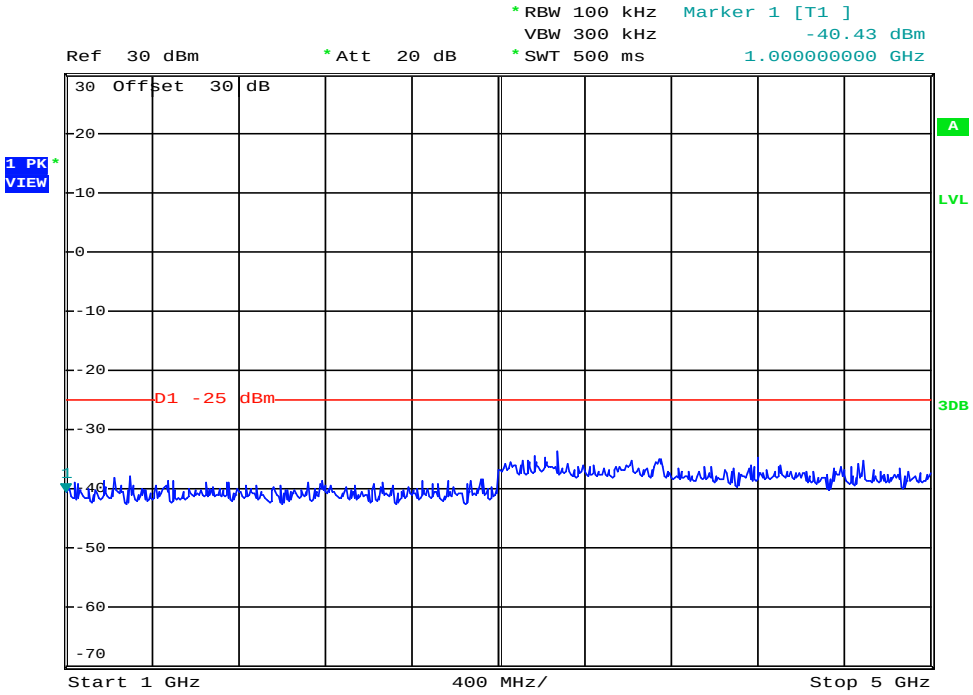
Marker 2: Spurious Emission

**Measured Emission Level:** **-32.87** dBm

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**Plot 10.3 – Conducted Spurious Emission, 1 – 5GHz, Channel: 406.1MHz**

## Conducted Spurious Emissions



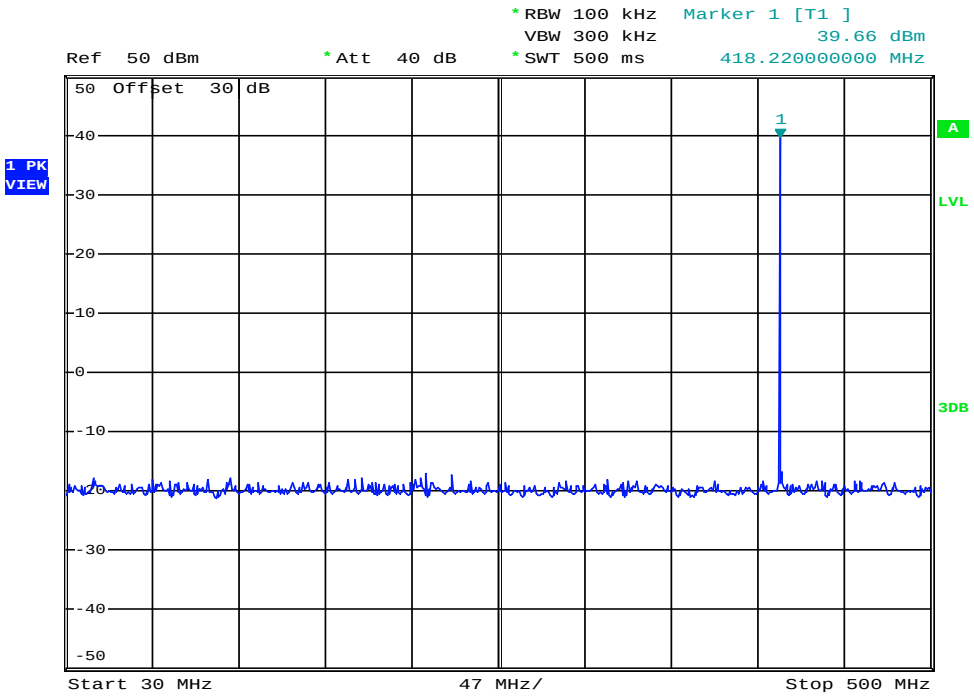

Date: 9.AUG.2019 14:05:18

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **406.10** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |
| | | **Measured Emission Level:** |
| | | **None Detected** dBm |

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**Plot 10.4 – Conducted Spurious Emission, 30MHz – 500MHz, Channel: 418MHz**

## Conducted Spurious Emissions




Date: 9.AUG.2019 13:54:16

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |

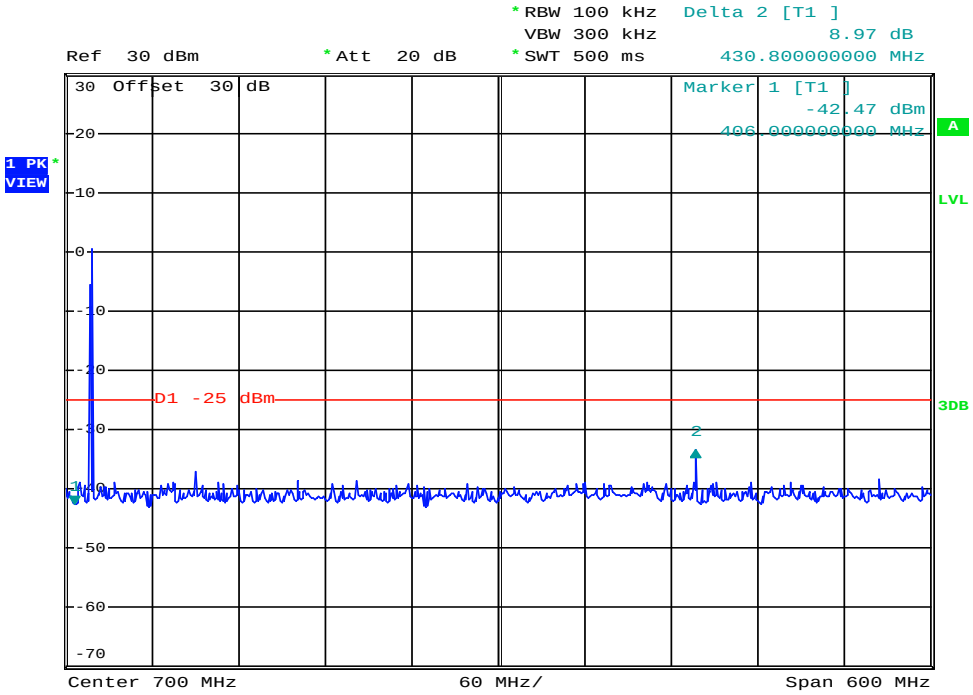
Marker 1: Fundamental

**Measured Emission Level:** **None Detected** dBm

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**Plot 10.5 – Conducted Spurious Emission, 400MHz – 1000MHz, Channel: 418MHz**

## Conducted Spurious Emissions




Date: 9.AUG.2019 13:58:37

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |

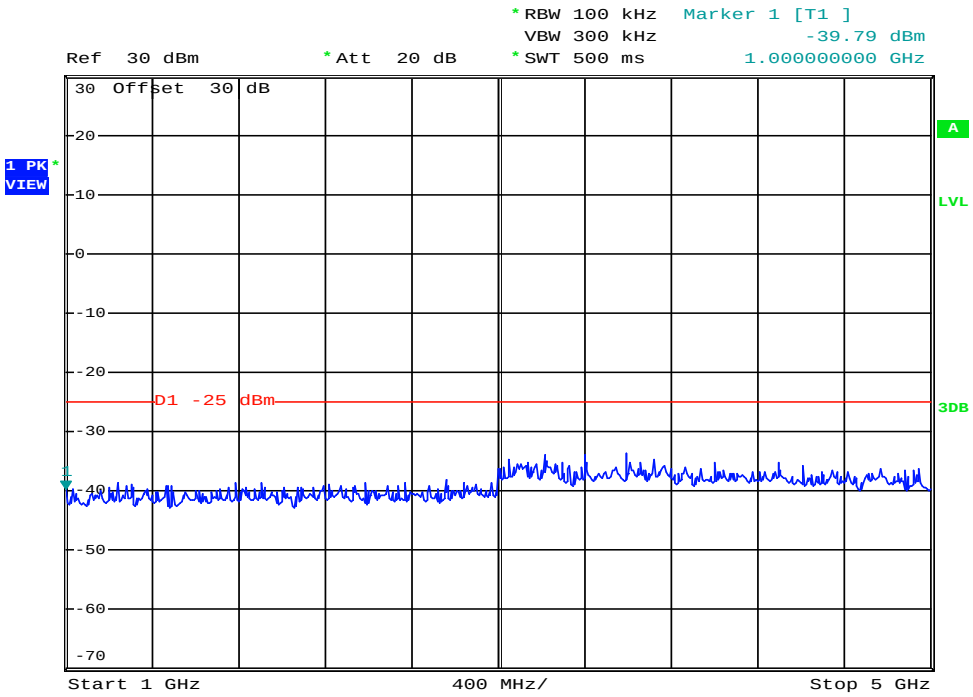
Marker 1: Fundamental  Marker 2: Spurious Emission

**Measured Emission Level:** **-33.50** dBm

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**Plot 10.6 – Conducted Spurious Emission, 1 – 5GHz, Channel: 418MHz**

## Conducted Spurious Emissions



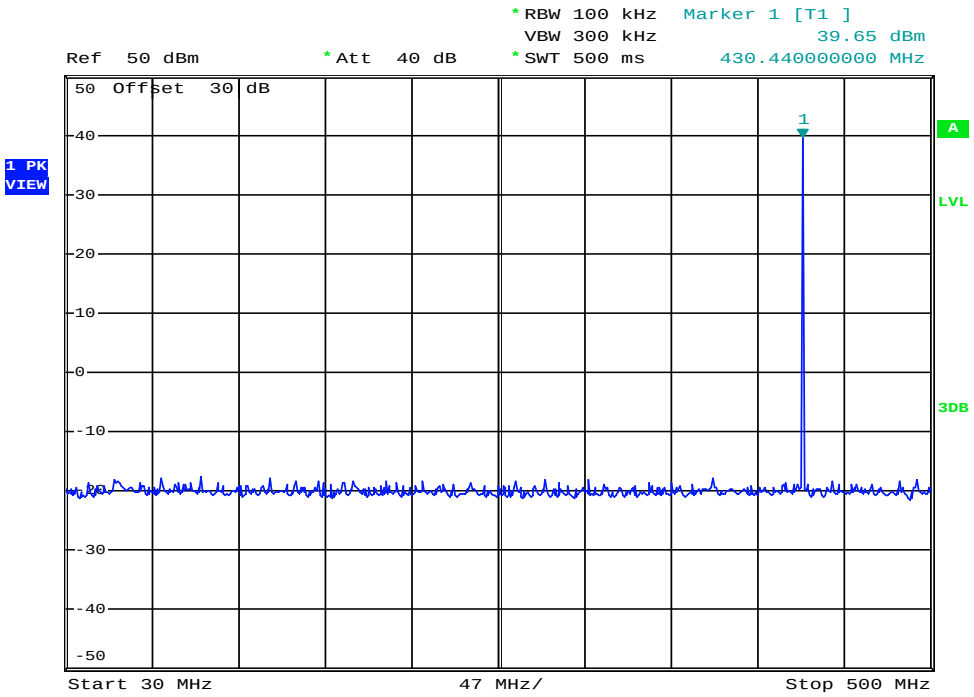

Date: 9.AUG.2019 14:04:53

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |
| | | **Measured Emission Level:** |
| | | **None Detected** dBm |

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**Plot 10.7 – Conducted Spurious Emission, 30MHz – 500MHz, Channel: 430MHz**

## Conducted Spurious Emissions




Date: 9.AUG.2019 13:53:51

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |

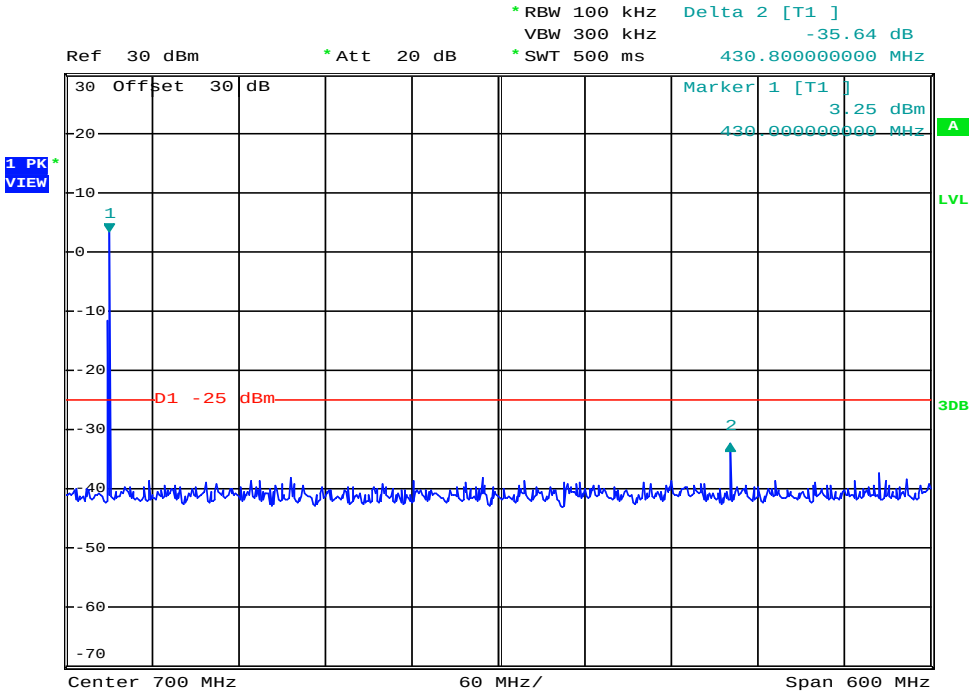
Marker 1: Fundamental

**Measured Emission Level:** **None Detected** dBm

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**Plot 10.8 – Conducted Spurious Emission, 400MHz – 1000MHz, Channel: 430MHz**

## Conducted Spurious Emissions




Date: 9.AUG.2019 13:59:13

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |

Marker 1: Fundamental

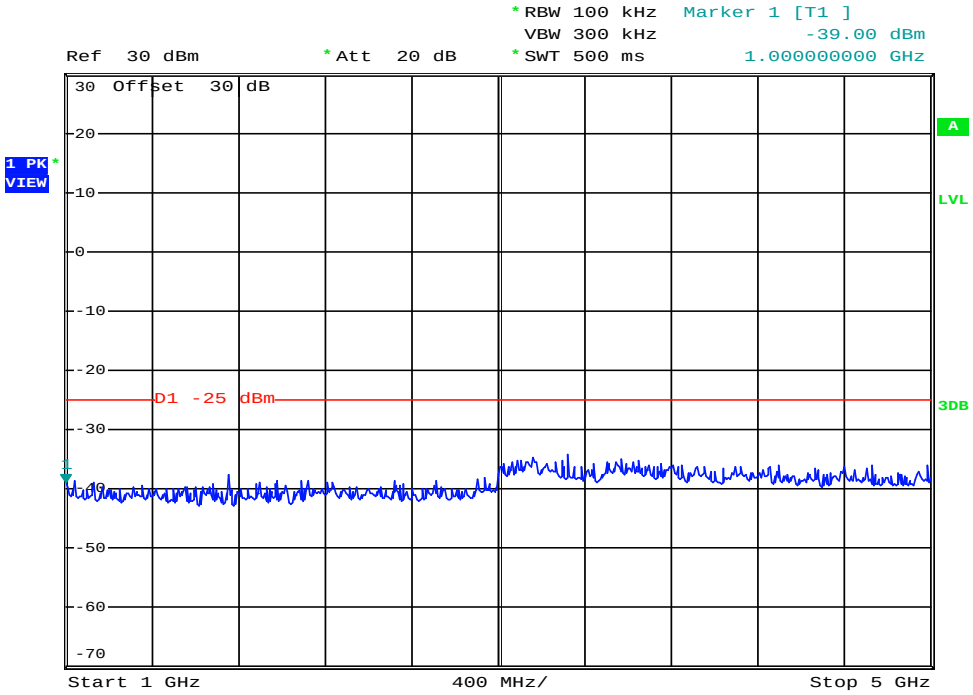
Marker 2: Spurious Emission

**Measured Emission Level:** **-32.39** dBm

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**Plot 10.9 – Conducted Spurious Emission, 1 – 5GHz, Channel: 430MHz**

## Conducted Spurious Emissions



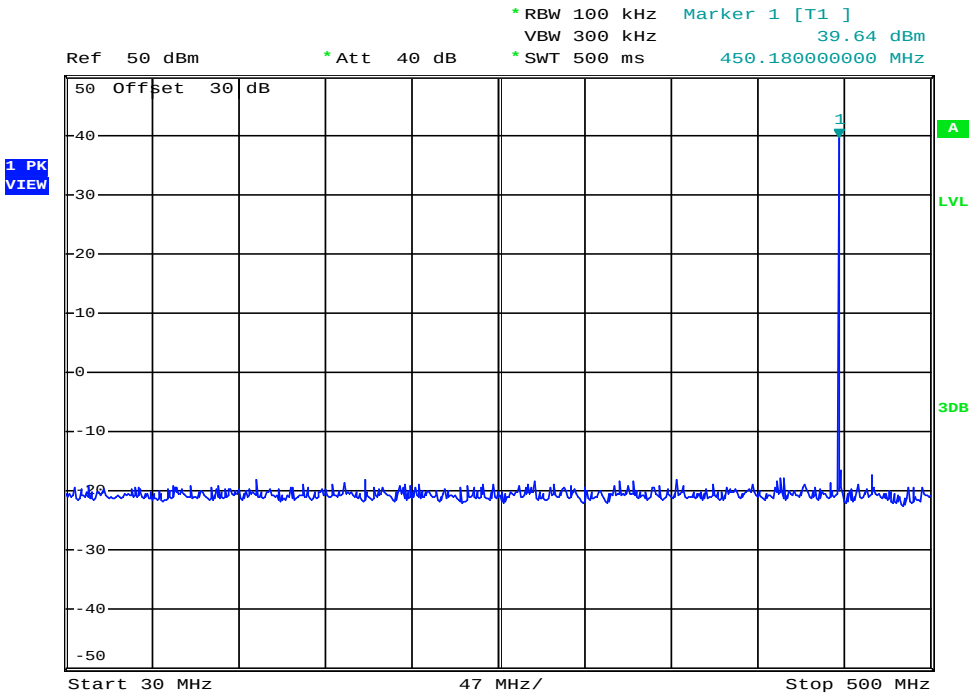

Date: 9.AUG.2019 14:04:27

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **430.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |
| | | **Measured Emission Level:** |
| | | **None Detected** dBm |

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**Plot 10.10 – Conducted Spurious Emission, 30MHz – 500MHz, Channel: 450MHz**

## Conducted Spurious Emissions




Date: 9.AUG.2019 13:53:07

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |

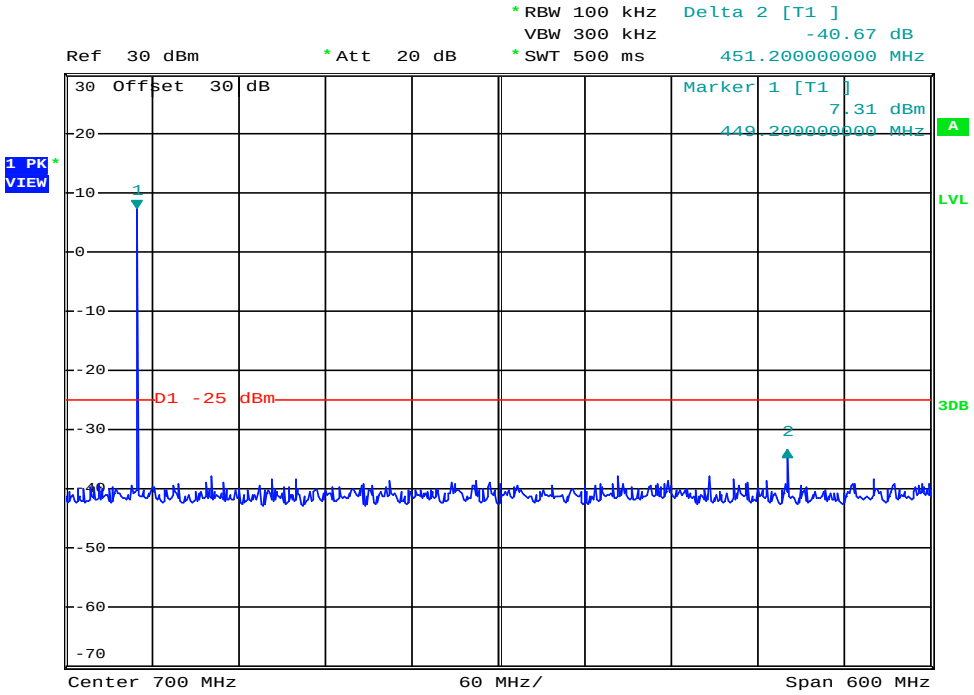
Marker 1: Fundamental

**Measured Emission Level:** **None Detected** dBm

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**Plot 10.11 – Conducted Spurious Emission, 400MHz – 1000MHz, Channel: 450MHz**

## Conducted Spurious Emissions




Date: 9.AUG.2019 13:59:47

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |

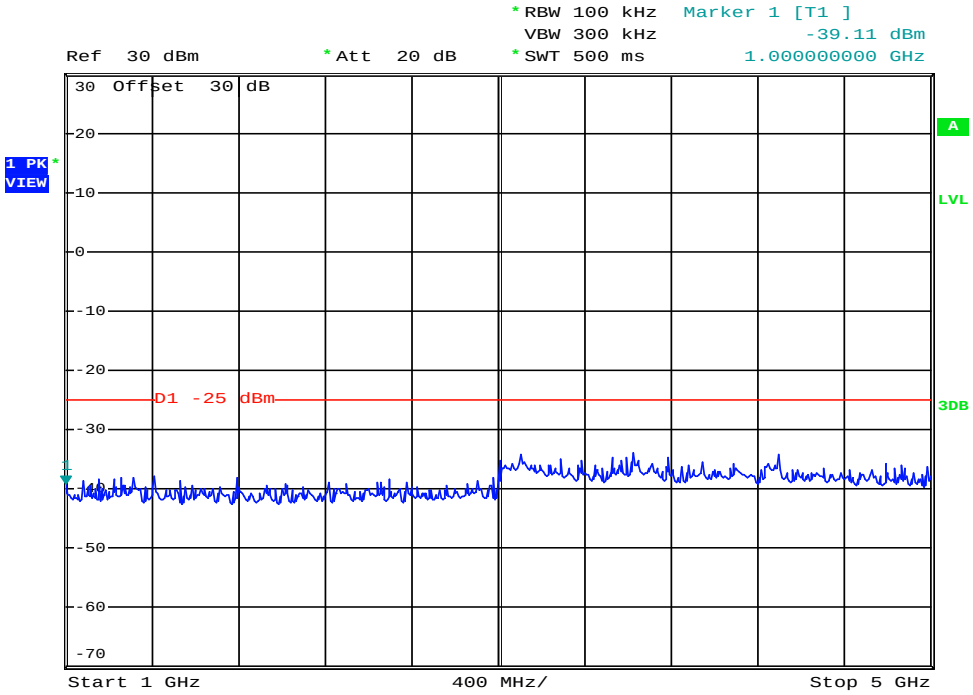
Marker 1: Fundamental  Marker 2: Spurious Emission

**Measured Emission Level:** **-33.36** dBm

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**Plot 10.12 – Conducted Spurious Emission, 1 – 5GHz, Channel: 450MHz**

## Conducted Spurious Emissions



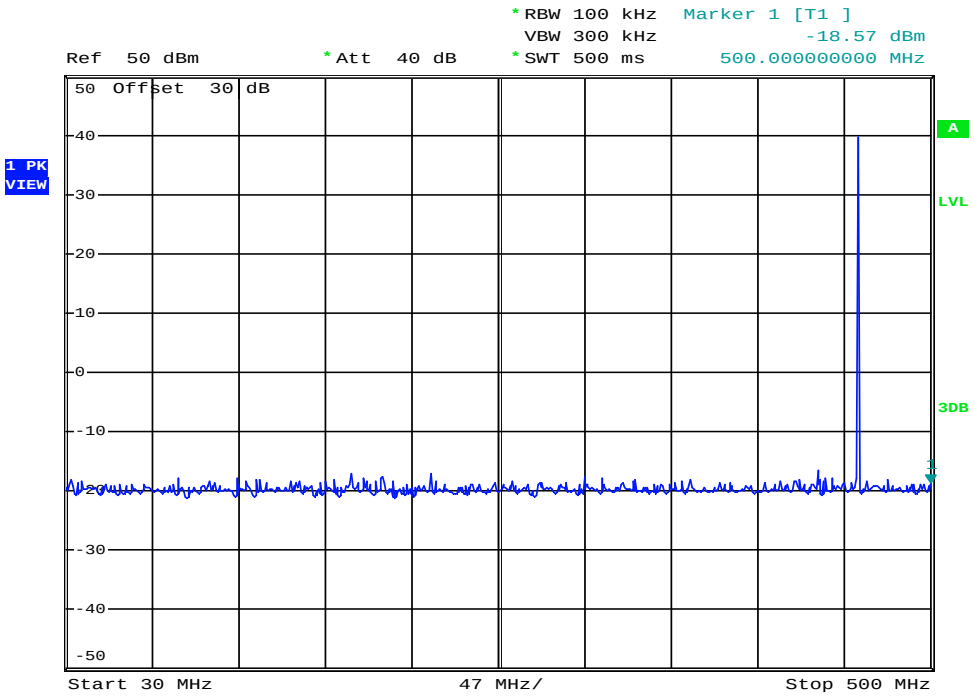

Date: 9.AUG.2019 14:03:56

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **450.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |
| | | **Measured Emission Level:** |
| | | **None Detected** dBm |

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**Plot 10.13 – Conducted Spurious Emission, 30MHz – 500MHz, Channel: 460MHz**

## Conducted Spurious Emissions




Date: 9.AUG.2019 13:50:22

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |

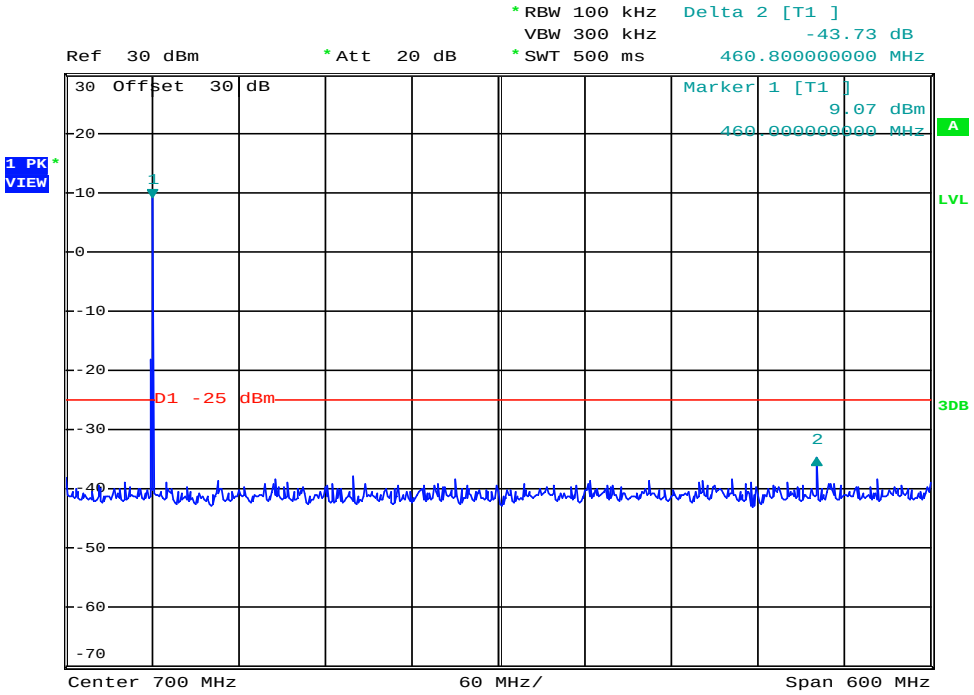
Marker 1: Fundamental

**Measured Emission Level:** **None Detected** dBm

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**Plot 10.14 – Conducted Spurious Emission, 400MHz – 1000MHz, Channel: 460MHz**

## Conducted Spurious Emissions




Date: 9.AUG.2019 14:00:39

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |

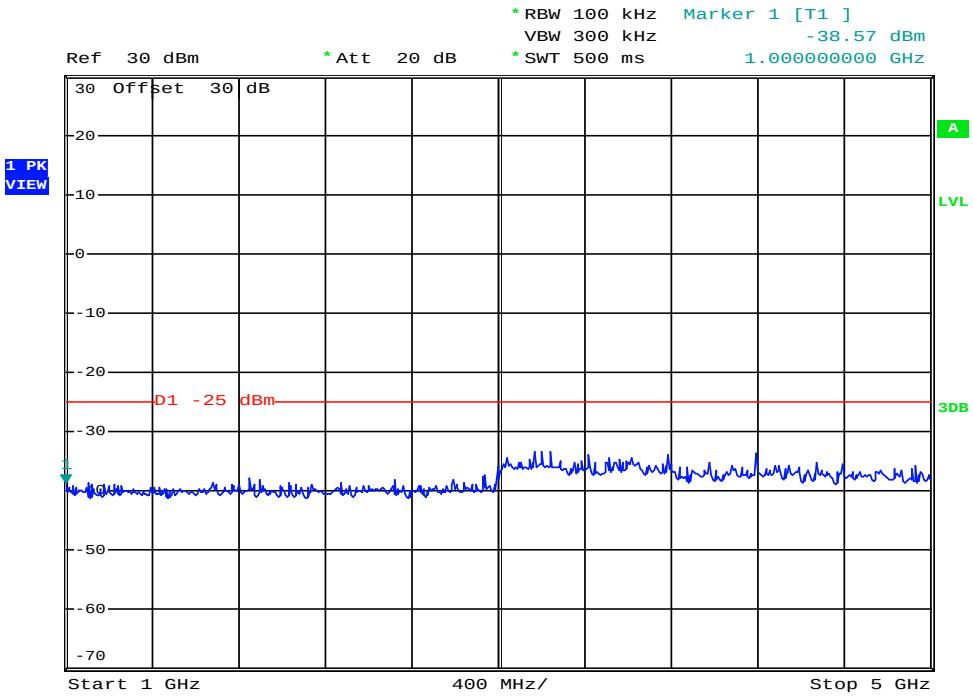
Marker 1: Fundamental  Marker 2: Spurious Emission

**Measured Emission Level:** **-34.66** dBm

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**Plot 10.15 – Conducted Spurious Emission, 1 – 5GHz, Channel: 460MHz**

## Conducted Spurious Emissions



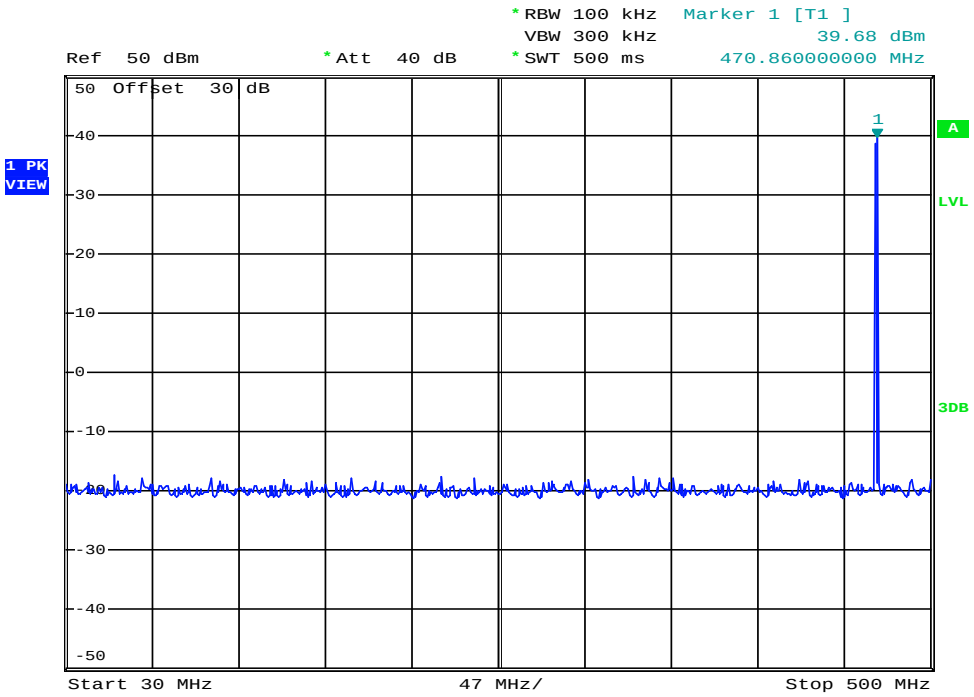

Date: 9.AUG.2019 14:03:26

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **460.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |
| | | **Measured Emission Level:** |
| | | **None Detected** dBm |

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**Plot 10.16 – Conducted Spurious Emission, 30MHz – 500MHz, Channel: 470MHz**

## Conducted Spurious Emissions




Date: 9.AUG.2019 13:52:05

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |

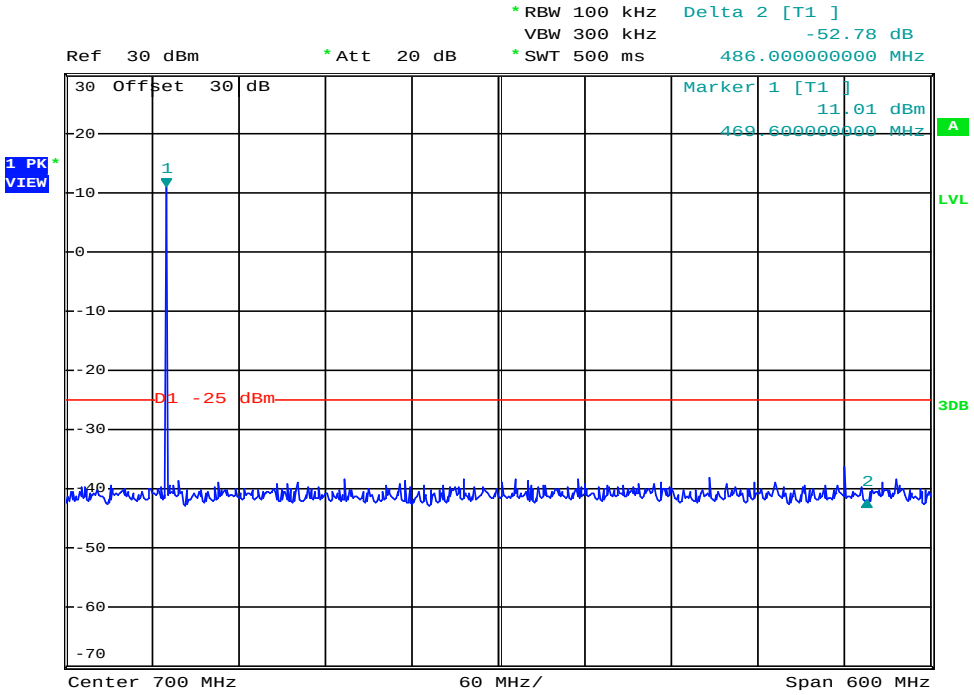
Marker 1: Fundamental

**Measured Emission Level:** **None Detected** dBm

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**Plot 10.17 – Conducted Spurious Emission, 400MHz – 1000MHz, Channel: 470MHz**

## Conducted Spurious Emissions




Date: 9.AUG.2019 14:01:20

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |

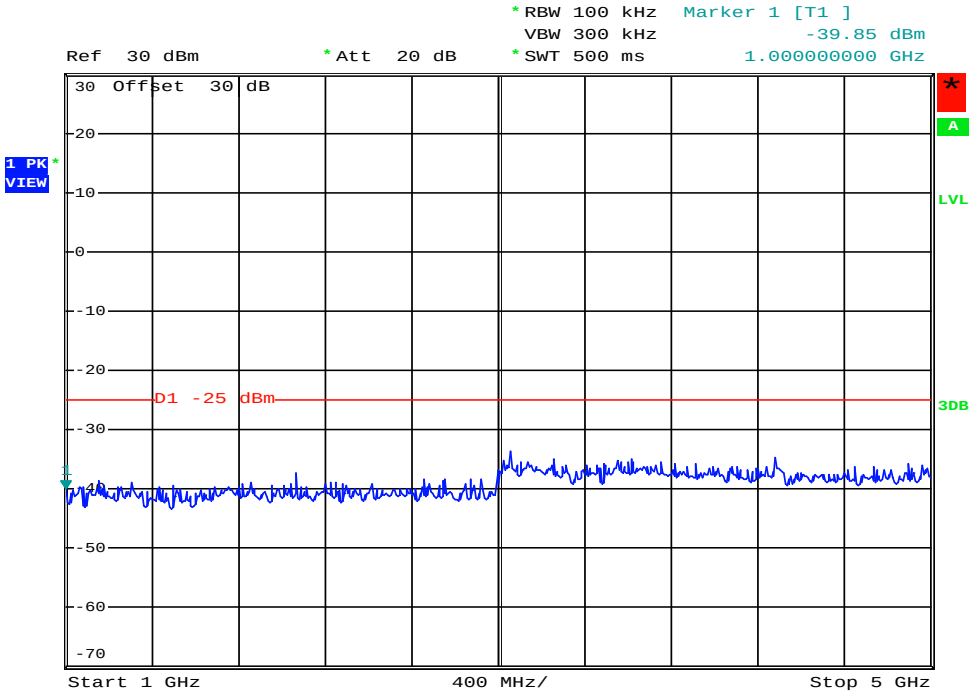
Marker 1: Fundamental  Marker 2: Spurious Emission

**Measured Emission Level:** **-41.77** dBm

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**Plot 10.18 – Conducted Spurious Emission, 1 – 5GHz, Channel: 470MHz**

## Conducted Spurious Emissions




Date: 9.AUG.2019 14:02:48

| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **470.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |
| | | **Measured Emission Level:** |
| | | **None Detected** dBm |

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**Table 10.1 – Summary of Conducted Spurious Emissions**

| Conducted Spurious Emissions | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Channel Frequency (MHz) | BW (MHz) | Modulation | Power Setting (dBm) | Transmit Duty Cycle (%) | Emission Frequency (MHz) | Measured Emission (dBm) | Attenuation (dBc) | Required Attenuation* [$A_A$] (dBc) | Margin (dB) |
| 406.1 | n/a | CW | Max | 100 | 812.8 | -32.87 | 72.87 | 65.00 | 7.87 |
| 418.0 | | | | | 836.0 | -33.50 | 73.50 | | 8.50 |
| 430.0 | | | | | 860.0 | -32.39 | 72.39 | | 7.39 |
| 450.0 | | | | | 900.0 | -33.36 | 73.36 | | 8.36 |
| 460.0 | | | | | 920.0 | -34.66 | 74.66 | | 9.66 |
| 460.0 | | | | | 919.8 | -37.32 | 77.32 | | 12.32 |
| | | | | | | | **Result:** | **Complies** | |

* Worst Case Limit for All Channel Bandwidths

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## 11.0 RADIATED SPURIOUS EMISSIONS

| Test Conditions | |
|---|---|
| Normative Reference | FCC 47 CFR §2.1053, RSS-Gen (6.13) |
| | ANSI C63.26 |

| Limits | |
|---|---|
| 47 CFR §2.1053 | **§2.1053 Measurements required: Field strength of spurious radiation.**<br>(a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. |
| RSS-Gen 6.13 | **6.13 Transmitter unwanted emissions**<br>When the unwanted emissions limits are defined in relative terms, the same parameter, peak power or average power, shall be used as the reference for both the transmitter's output power and the unwanted emissions measurements. |

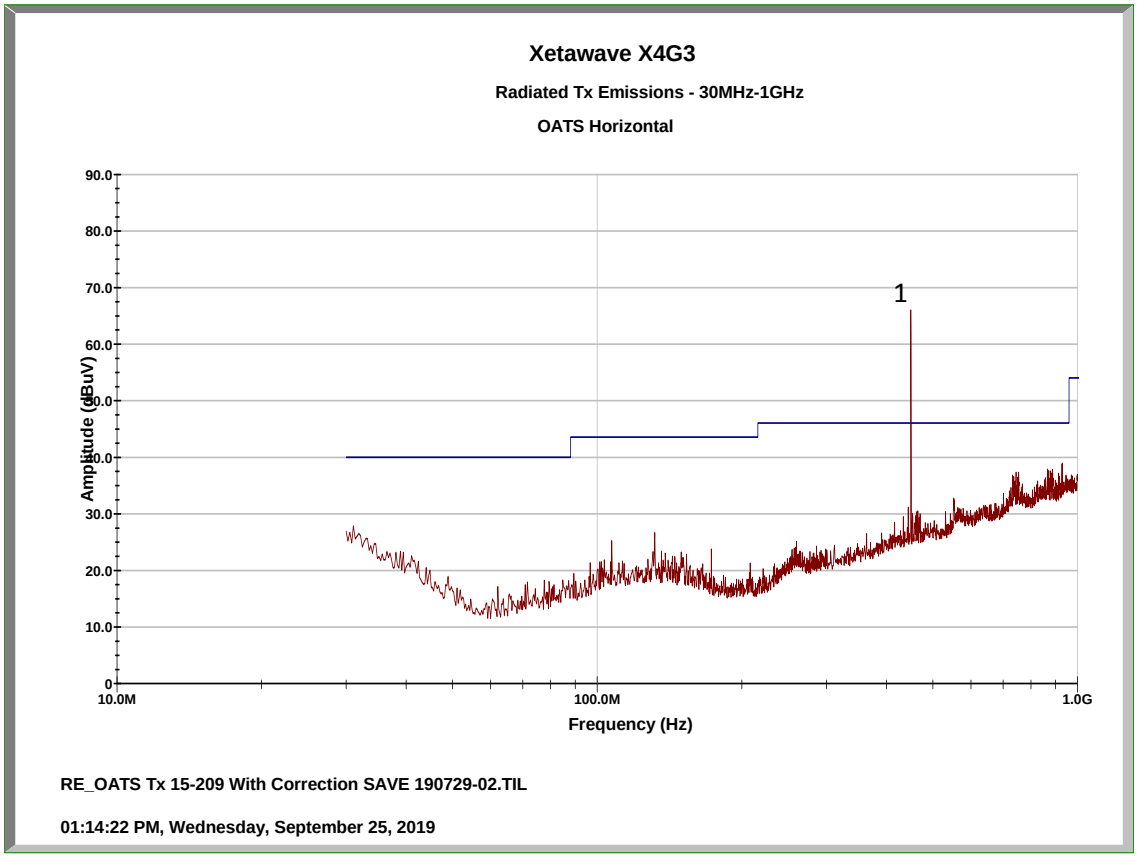
### Measurement Setup

The DUT was placed on a turntable on a 3m OATS. The output power of the DUT was set to the manufacturer's highest output power setting (except as noted) and set to MSK, QPSK, 8PSK, 16QAM, 32QAM and 64QAM modulation mode. The DUT was set to transmit at its maximum Duty Cycle. Emissions were evaluated at a vertical height from 1 - 4 m while the DUT was rotated from 0 to $360^{O}$.

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**Plot 11.1 – Radiates Tx Spurious Emissions – OATS - Horizontal**

## Radiated Tx Spurious Emissions




| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |

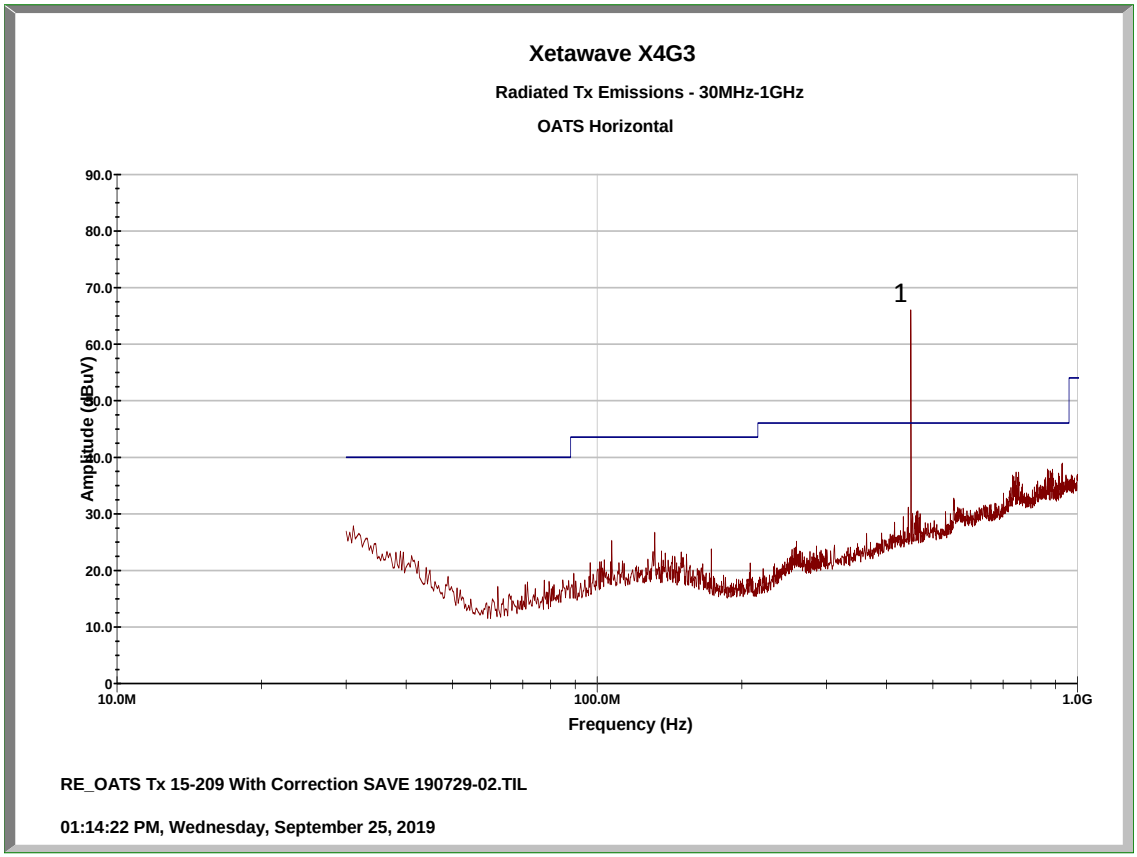
Marker 1: Fundamental

**Measured Emission Level:** **None Detected** dBm

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**Plot 11.2 – Radiates Tx Spurious Emissions – OATS - Vertical**

## Radiated Tx Spurious Emissions




| Channel Frequency: | Channel Bandwidth: | Transmit Duty Cycle: |
|---|---|---|
| **418.00** MHz | **n/a** kHz | **100** % |
| **Modulation Setting:** | **Channel Power Setting:** | **Nominal Input Voltage:** |
| **CW** | **Max** dBm | **12.0** VDC |

Marker 1: Fundamental

**Measured Emission Level:** **None Detected** dBm

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**Table 11.1 – Summary of Radiated Tx Emissions**

| Radiated Tx Spurious Emissions | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel Frequency (MHz) | BW (MHz) | Modulation | Power Setting (dBm) | Transmit Duty Cycle (%) | Antenna Polarization | Emission Frequency (MHz) | Measured Emission (dBuV @3m) |
| 418.0 | n/a | CW | Max | 100 | Vertical | 913.9 | 43.28 |

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## 12.0 TRANSIENT FREQUENCY BEHAVIOR

| Test Conditions | |
|---|---|
| Normative Reference | FCC 47 CFR §90.214, RSS-Gen, RSS-119 (5.9) |
| | TIA-603-E (2.2.19.3) |

| Limits | | |
|---|---|---|
| 47 CFR §90.214 | Transmitters designed to operate in the 150-174 MHz and 421-512 MHz frequency bands must maintain transient frequencies within the maximum frequency difference limits during the time intervals indicated:<br>Transient Frequency Behavior for Equipment Designed to Operate on 6.25 kHz Channels | |
| | Maximum Frequency Difference | Time Interval (421 - 512MHz) |
| | **+ / - 6.25kHz** | **$T_1$ : 10msec** |
| | **+ / - 3.125kHz** | **$T_2$ : 10msec** |
| | **+ / - 6.25kHz** | **$T_3$ : 10msec** |
| RSS-119 | **5.9 Transient Frequency Behaviour**<br>When a transmitter is turned on, the radio frequency may take some time to stabilize. During this initial period, the frequency error or frequency difference (i.e., between the instantaneous and the steady state frequencies) shall not exceed the limits specified in Table 18. | |
| | Maximum Frequency Difference | Time Interval (421 - 512MHz) |
| | **+ / - 6.25kHz** | **$T_1$ : 10msec** |
| | **+ / - 3.125kHz** | **$T_2$ : 10msec** |
| | **+ / - 6.25kHz** | **$T_3$ : 10msec** |

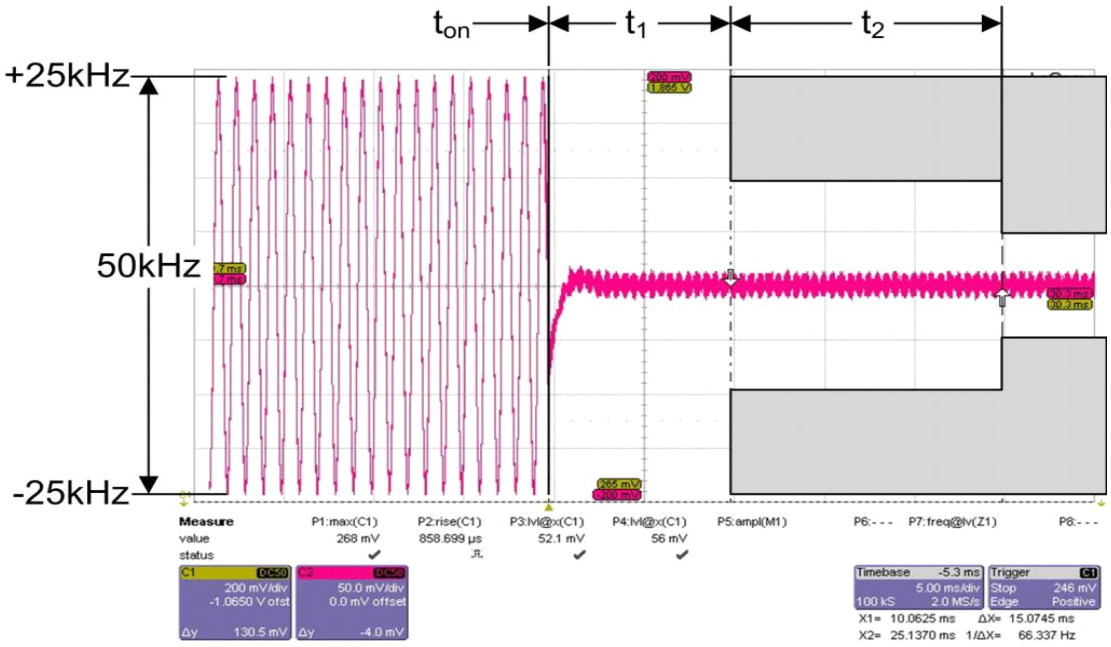
| Measurement Procedure |
|---|
| The DUT was connected as shown in Figure A.6. The DUT was set up to transmit a CW tone at 460MHz. The DUT output was combined with a Signal Generator set with a transmit frequency of 460MHz with 1kHz FM modulation and +/- 25kHz deviation. The output of the combination network was connected to a Modulation Analyzer. The Modulation output of the Modulation Analyzer was connected to an oscilloscope. The transient frequency behavior was observed while the DUT transmitter was turned on and off. |

| Test Setup | Appendix A | Figure A.6 |
|---|---|---|

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**Plot 12.1 – Transient Frequency Behavior, Tx ON**

**Transient Frequency Behavior: §90.214, RSS-119 (5.9), 6.25kHz BW**

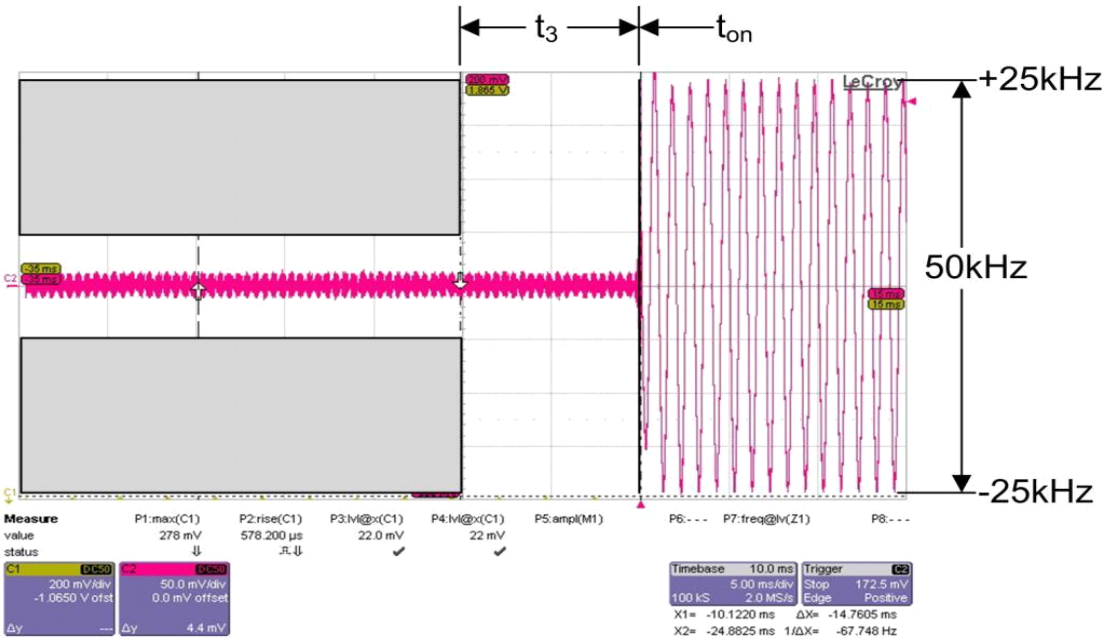



| | | |
|---|---|---|
| DUT Channel Frequency: **460.0** MHz | Test Frequency: **460.0 MHz** | Test Frequency Moduation Deviation: **50** kHz |
| DUT Modulation Setting: **CW** | Test Frequency Modulation: **FM** | Interval Time ($t_1$) **10** ms |
| **Transmitter On** | Transient Frequency Response: **PASS** | Interval Time ($t_2$) **25** ms |

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**Plot 12.1 – Transient Frequency Behavior, Tx OFF**

**Transient Frequency Behavior: §90.214, RSS-119 (5.9), 6.25kHz BW**




| | | |
|---|---|---|
| DUT Channel Frequency: **460.0** MHz | Test Frequency: **460.0 MHz** | Test Frequency Moduation Deviation: **50** kHz |
| DUT Modulation Setting: **CW** | Test Frequency Modulation: **FM** | Interval Time ($t_3$) **10** ms |
| **Transmitter Off** | Transient Frequency Response: **PASS** | |

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## 13.0 FREQUENCY STABILITY

| Test Conditions | |
|---|---|
| **Normative Reference** | **FCC 47 CFR §2.1055, §90.213, RSS-Gen, RSS-119 (5.3)** |

| Limits | |
|---|---|
| **47 CFR §25.202** | (a) Unless noted elsewhere, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following table.<br>Note 7: In the 421-512 MHz band, fixed and base stations with a 12.5 kHz channel bandwidth must have a frequency stability of 1.5 ppm. Fixed and base stations with a 6.25 kHz channel bandwidth must have a frequency stability of 0.5 ppm. |
| **RSS-170** | **5.2. Frequency Stability**<br>The carrier frequency shall not depart from the reference frequency in excess of the values given in Table 1. For transmitters that have an output power of less than 120 mW, the frequency stability shall comply with the limits listed in Table 1 or, alternatively, with the conditions in Section 5.10. (0.5ppm for 6.25kHz BW Channel) |

| Measurement Procedure | |
|---|---|
| **47 CFR §2.1055** | **Frequency Stability**<br>(a) The frequency stability shall be measured with variation of ambient temperature as follows:<br>(1) From -30° to +50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.<br>(b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement.<br>(d) The frequency stability shall be measured with variation of primary supply voltage as follows:<br>(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment. |

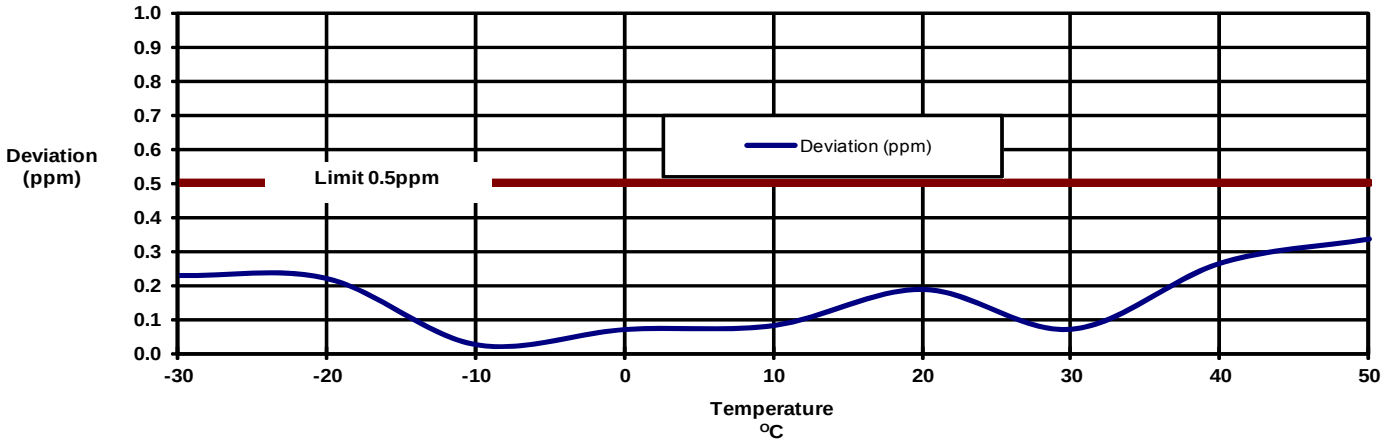
| Test Setup | Appendix A Figure A.5 |
|---|---|

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**Table 13.1 – Summary of Frequency Stability**

## Frequency Stability

| | |
|---|---|
| Nominal Frequency (MHz): | 450 |
| Nominal Channel BW (KHz): | CW |
| Nominal Voltage (VDC): | 12 |
| Nominal Temperature (°C): | 20 |




### Frequency Stability Measurements (Temperature)

| Temp (°C) | Assigned Frequency (MHz) | Measured Frequency (MHz) | Deviation (Hz) | Deviation [Absolute] (ppm) |
|---|---|---|---|---|
| -30 | 450.000917 | 450.00101940 | 102.06 | 0.227 |
| -20 | | 450.00101520 | 97.86 | 0.217 |
| -10 | | 450.00092800 | 10.66 | 0.024 |
| 0 | | 450.00088653 | -30.81 | 0.068 |
| 10 | | 450.00095332 | 35.98 | 0.080 |
| 20 | | 450.00100100 | 83.66 | 0.186 |
| 30 | | 450.00088634 | -31.00 | 0.069 |
| 40 | | 450.00079908 | -118.26 | 0.263 |
| 50 | | 450.00076721 | -150.13 | 0.334 |
| | | | Maximum Deviation: | 0.33 |
| | | | Maximum Limit: | 0.50 |
| | | | Result: | Complies |

### Frequency Stability Measurements (Voltage)

| Voltage (VDC) | Assigned Frequency (MHz) | Measured Frequency (MHz) | Deviation (Hz) | Deviation [Absolute] (ppm) |
|---|---|---|---|---|
| 13.8(115%) | 450.000917 | 450.001020 | 103 | 0.23 |
| 12.0 (100%) | | 450.001001 | 84 | 0.19 |
| 10.2 (85%) | | 450.001026 | 109 | 0.24 |
| | | | Maximum Deviation: | 0.24 |
| | | | Maximum Limit: | 0.50 |
| | | | Result: | Complies |

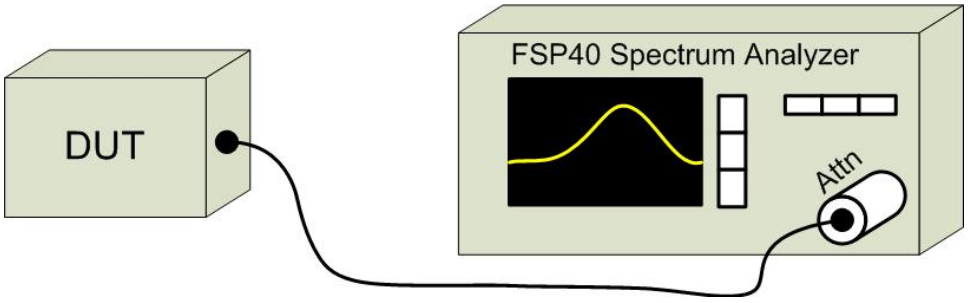
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## APPENDIX A – TEST SETUP DRAWINGS

**Table A.1 – Conducted Measurement Setup**

| Equipment List | | | |
|---|---|---|---|
| **Asset Number** | **Manufacturer** | **Model Number** | **Description** |
| 00241 | R&S | FSU40 | Spectrum Analyzer |

**Figure A.1 – Test Setup – Conducted Measurements**




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**Table A.2 – Radiated Emissions Measurement Equipment**

| Equipment List | | | |
|---|---|---|---|
| **Asset Number** | **Manufacturer** | **Model Number** | **Description** |
| 00051 | HP | 8566B | Spectrum Analyzer |
| 00049 | HP | 85650A | Quasi-peak Adapter |
| 00047 | HP | 85685A | RF Preselector |
| 00072 | EMCO | 2075 | Mini-mast |
| 00073 | EMCO | 2080 | Turn Table |
| 00071 | EMCO | 2090 | Multi-Device Controller |
| 00265 | Miteq | JS32-00104000-58-5P | Microwave L/N Amplifier |
| 00241 | R&S | FSU40 | Spectrum Analyzer |
| 00050 | Chase | CBL-6111A | Bilog Antenna |
| 00275 | Coaxis | LMR400 | 25m Cable |
| 00276 | Coaxis | LMR400 | 4m Cable |
| 00278 | TILE | 34G3 | TILE Test Software |
| 00034 | ETS | 3115 | Double Ridged Guide Horn |
| 00085 | EMCO | 6502 | Loop Antenna |

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**Figure A.2 – Test Setup Radiated Measurements 9kHzMHz – 30MHz**

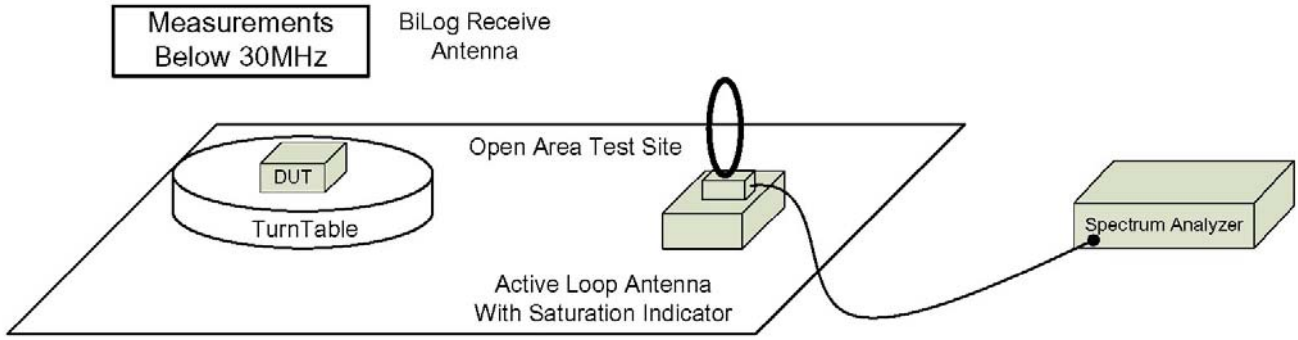



**Figure A.3 – Test Setup Radiated Measurements 30MHz – 1GHz**

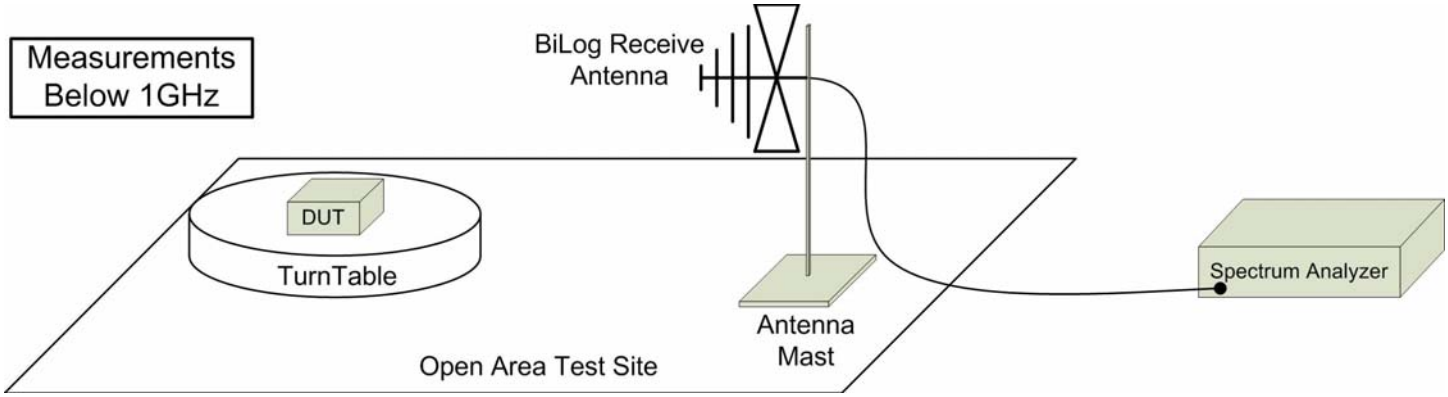
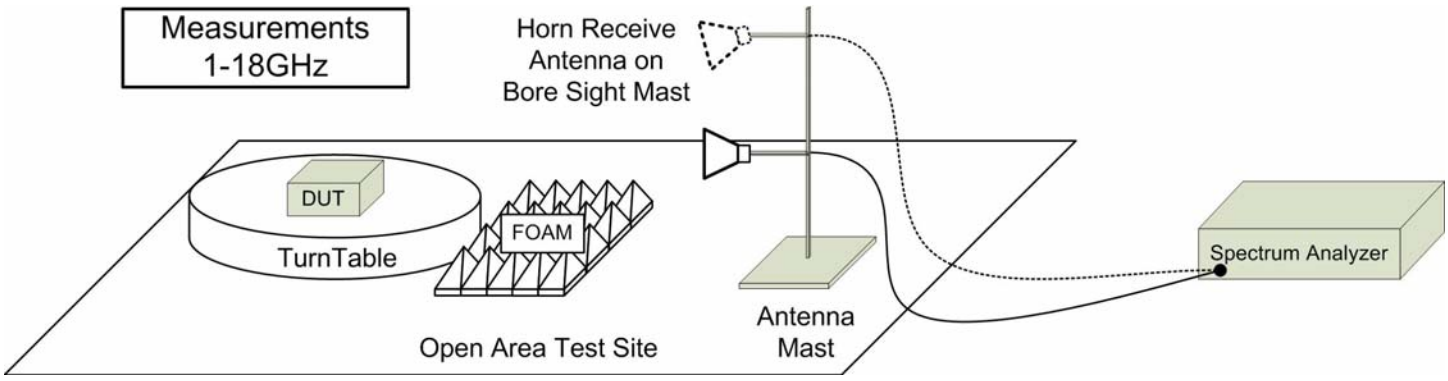



**Figure A.4 – Test Setup Radiated Measurements Above 1GHz**

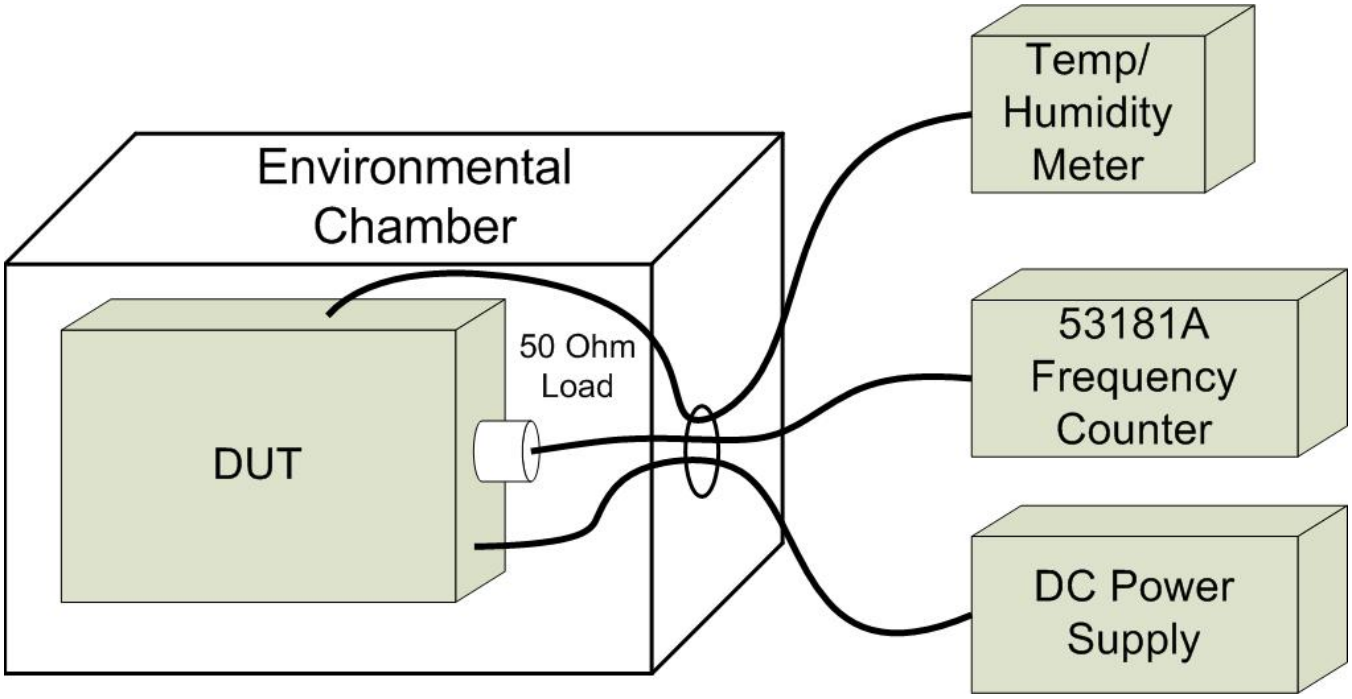



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**Table A.3 – Setup - Frequency Stability Measurement Equipment**

| Equipment List | | | |
|---|---|---|---|
| **Asset Number** | **Manufacturer** | **Model Number** | **Description** |
| 00081 | ESPEC | ECT-2 | Environmental Chamber |
| 00003 | HP | 53181A | Frequency Counter |
| 00201 | HP | E3611A | Power Supply |
| 00234 | VWR | 61161-378 | Temp/Humidity Meter |

**Figure A.5 – Test Setup Frequency Stability Measurements**

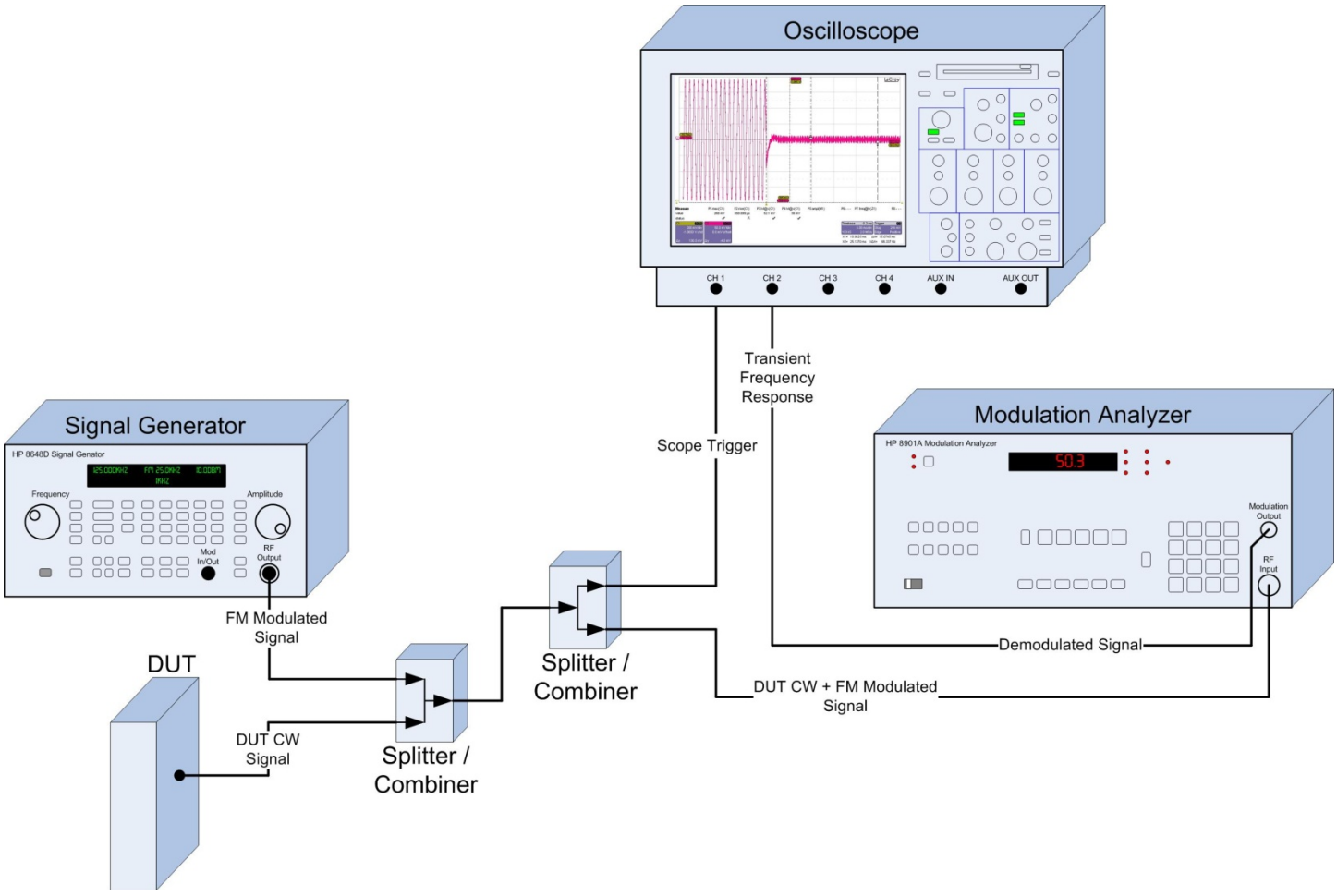



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**Table A.4 – Setup – Transient Frequency Behavior Measurement Equipment**

| Equipment List | | | |
|---|---|---|---|
| **Asset Number** | **Manufacturer** | **Model Number** | **Description** |
| 00241 | R&S | FSU40 | Spectrum Analyzer |
| 00028 | HP | 8901A | Modulation Analyzer |
| 00005 | Agilent | 8648D | Signal Generator |
| 00243 | Rigol | DS1102E | Oscilloscope |
| 00254 | LeCroy | WM8600A | Oscilloscope |

**Figure A.6 – Test Setup Transient Frequency Behavior Measurements**




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## APPENDIX B – EQUIPMENT LIST AND CALIBRATION

| Equipment List | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| (*) | Asset Number | Manufacturer | Model Number | Serial Number | Description | Last Calibrated | Calibration Interval | Calibration Due |
| * | 00050 | Chase | CBL-6111A | 1607 | Bilog Antenna | 3 Jan 2019 | Triennial | 3 Jan 2022 |
| * | 00034 | ETS | 3115 | 6267 | Double Ridged Guide Horn | 26 Nov 2018 | Triennial | 26 Nov 2021 |
| * | 00085 | EMCO | 6502 | 9203-2724 | Loop Antenna | 11 Jun 2019 | Triennial | 11 Jun 2022 |
| * | 00047 | HP | 85685A | 2837A00826 | RF Preselector | 23 Jun 2017 | Triennial | 23 Jun 2020 |
| * | 00049 | HP | 85650A | 2043A00162 | Quasi-peak Adapter | 23 Jun 2017 | Triennial | 23 Jun 2020 |
| * | 00051 | HP | 8566B | 2747A05510 | Spectrum Analyzer | 23 Jun 2017 | Triennial | 23 Jun 2020 |
| * | 00241 | R&S | FSU40 | 100500 | Spectrum Analyzer | 15 May 2018 | Triennial | 15 May 2021 |
| * | 00005 | HP | 8648D | 3847A00611 | Signal Generator | 21 Jun 2017 | Triennial | 21 Jun 2020 |
| * | 00243 | Rigol | DS1102E | DS1ET150502164 | Oscilloscope | 7 Nov 2017 | Triennial | 7 Nov 2020 |
| * | 00254 | LeCroy | WM8600A | 532 | Oscilloscope | NCR | n/a | NCR |
| * | 00265 | Miteq | JS32-00104000-58-5P | 1939850 | Microwave L/N Amplifier | COU | n/a | COU |
| * | 00072 | EMCO | 2075 | 0001-2277 | Mini-mast | n/a | n/a | n/a |
| * | 00073 | EMCO | 2080 | 0002-1002 | Turn Table | n/a | n/a | n/a |
| * | 00234 | VWR | 61161-378 | 140320430 | Temp/Humidity Meter | New | Triennial | New |
| * | 00201 | HP | E3611A | KR83015294 | DC Power Supply | COU | n/a | COU |
| * | 00263B | Koaxis | KP10-1.00M-TD | 263B | 1m Armoured Cable | COU | n/a | COU |
| * | 00264 | Koaxis | KP10-7.00M-TD | 264 | 7m Armoured Cable | COU | n/a | COU |
| * | 00275 | TMS | LMR400 | n/a | 25m Cable | COU | n/a | COU |
| * | 00276 | TMS | LMR400 | n/a | 4m Cable | COU | n/a | COU |
| * | 00277 | TMS | LMR400 | n/a | 4m Cable | COU | n/a | COU |
| * | 00278 | TILE | 34G3 | n/a | TILE Test Software | NCR | n/a | NCR |
| **Rented Equipment** | | | | | | | | |
| | | | | | | | | |

* Used during the course of this investigation
NCR: No Calibration Required
COU: Calibrate On Use

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## APPENDIX C – MEASUREMENT INSTRUMENT UNCERTAINTY

| CISPR 16-4 Measurement Uncertainty ( $U_{LAB}$ ) | |
|---|---|
| This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence interval using a coverage factor of k=2 | |
| **30MHz - 200MHz** | |
| **$U_{LAB}$ = 5.14dB  $U_{CISPR}$ = 6.3dB** | |
| **200MHz - 1000MHz** | |
| **$U_{LAB}$ = 5.90dB  $U_{CISPR}$ = 6.3dB** | |
| **1GHz - 6GHz** | |
| **$U_{LAB}$ = 4.80dB  $U_{CISPR}$ = 5.2dB** | |
| **6GHz - 18GHz** | |
| **$U_{LAB}$ = 5.1dB  $U_{CISPR}$ = 5.5dB** | |
| If the calculated uncertainty **$U_{lab}$** is **less** than **$U_{CISPR}$** then: | |
| 1 | Compliance is deemed to occur if **NO** measured disturbance exceeds the disturbance limit |
| 2 | Non-Compliance is deemed to occur if **ANY** measured disturbance **EXCEEDS** the disturbance limit |
| If the calculated uncertainty **$U_{lab}$** is **greater** than **$U_{CISPR}$** then: | |
| 3 | Compliance is deemed to occur if **NO** measured disturbance, increased by ( **$U_{lab}$ - $U_{CISPR}$** ), exceeds the disturbance limit |
| 4 | Non-Compliance is deemed to occur if **ANY** measured disturbance, increased by ( **$U_{lab}$ - $U_{CISPR}$** ), **EXCEEDS** the disturbance limit |

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