Test Report Serial Number:	45461529 R2.0
Test Report Date:	1 November 2019
Project Number:	1460

EMC Test Report - New Filing

Applicant:

XETAWAVE | CUSTOM RF SOLUTIONS

Xetawave LLC **258 South Taylor Ave** **Louisville, Colorado, 80027** **United States**	**Xetawave, LLC** **258 South Taylor Ave** **Louisville, CO, 80027** **United States of America**
FCC ID:	IC Registration Number
PEJ-938240	**11169A-04003**
Product Model Number / HVIN	Product Name / PMN
XETA4-TMFA	**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:

Ben Hewson, President
Celltech Labs Inc.
21-364 Lougheed Rd.
Kelowna, BC, V1X 7R8
Canada

Test Lab Certificate: 2470.01 | **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		

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.

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 §90.279	RSS-Gen (6.12) RSS-119 (5.4)	6 Aug 2019	Complies
8.0	Occupied Bandwidth	ANSI C63.26 (5.4)	§2.1049 §90.210	RSS-Gen (6.7) RSS-119 (5.5)	6 Aug 2019	Complies
9.0	Emissions Mask and Band Edge	ANSI C63.26 (5.4)	§2.1049 §90.210	RSS-Gen (6.13) RSS-119 (5.8)	8 Aug 2019	Complies
10.0	Conducted TX Spurious Emissions	ANSI C63.26 (5.7)	§2.1051 §90.210	RSS-Gen (6.13) 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 §90.213	RSS-Gen (6.11) 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
OATS - Open Area Test Site
LISN - LISN Test Area
IMM - Immunity Test Area
SAC - Semi-Anechoic Chamber
TC - Temperature Chamber
ESD - ESD Test Bench
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

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. F. VOSS
31327

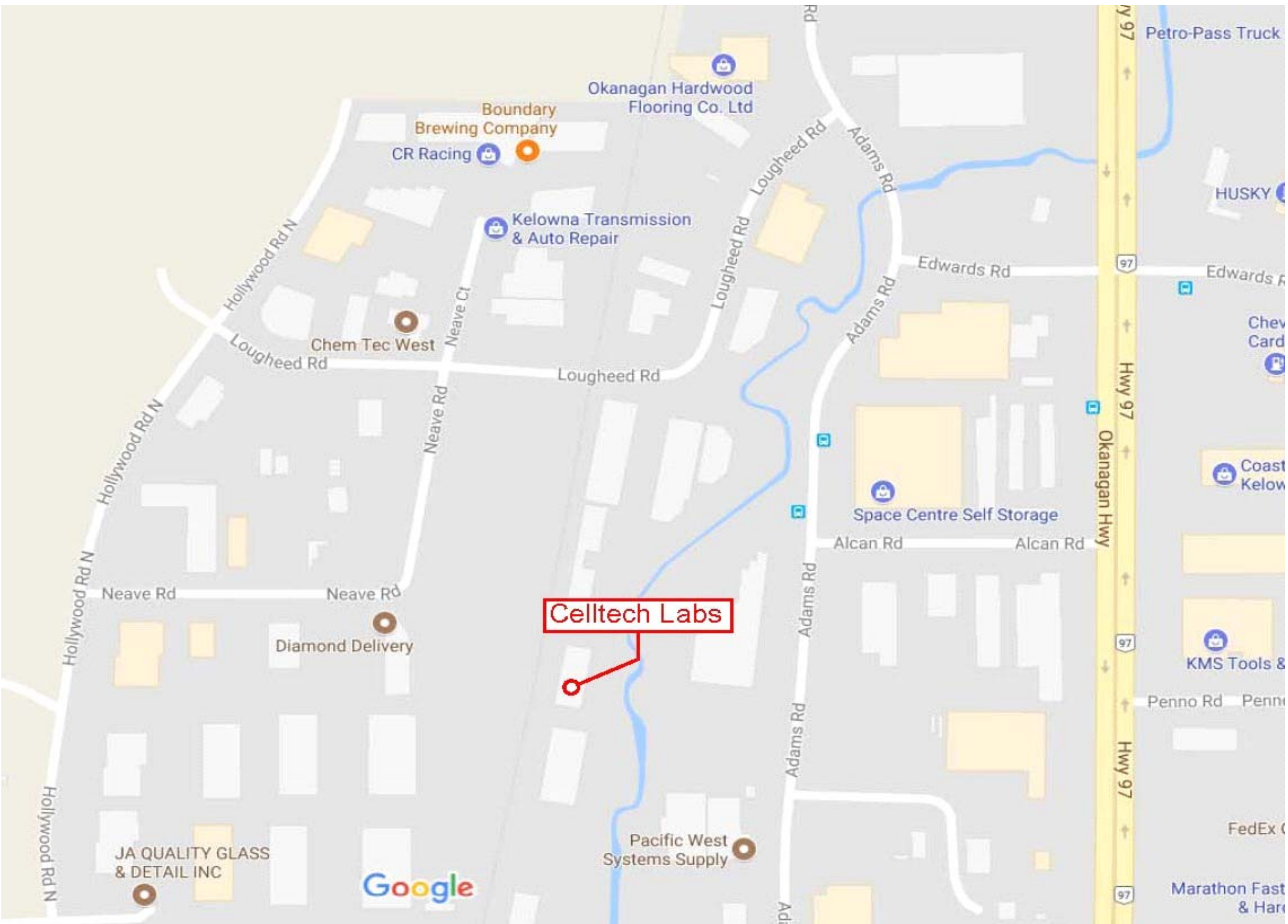
5.0 NORMATIVE REFERENCES

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 Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
CFR Title 47: Part 2:	Code of Federal Regulations Telecommunication Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
CFR Title 47: Part 90:	Code of Federal Regulations Telecommunication Private Land Mobile Radio Services
ISED RSS-Gen Issue 5: Amendment 1, March 2019	Innovation, Science and Economic Development Canada Spectrum Management and Telecommunications Radio Standards Specification General Requirements and Information for the Certification of Radiocommunication Equipment
ISED RSS-119 Issue 12: May 2015	Innovation, Science and Economic Development Canada Spectrum Management and Telecommunications Radio Standards Specification Land Mobile and Fixed Equipment Operating in the Frequency Range 27.41-960 MHz
ISED RSP-100 Issue 12: August 2019	Innovation, Science and Economic Development Canada Spectrum Management and Telecommunications Radio Standards Specification Certification of Radio Apparatus and Broadcasting Equipment
ISED SRSP-501 Issue 5: Revised December 2017	Innovation, Science and Economic Development Canada Spectrum Management and Telecommunications Radio Standards Specification Technical Requirements for Land Mobile and Fixed Radio Services Operating in the Bands 406.1-430 MHz and 450-470 MHz

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.



7.0 CONDUCTED POWER

Test Procedure	
Normative Reference	**FCC 47 CFR §2.1046, §90.279, RSS-Gen (6.12), RSS-119 (5.4)** **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.

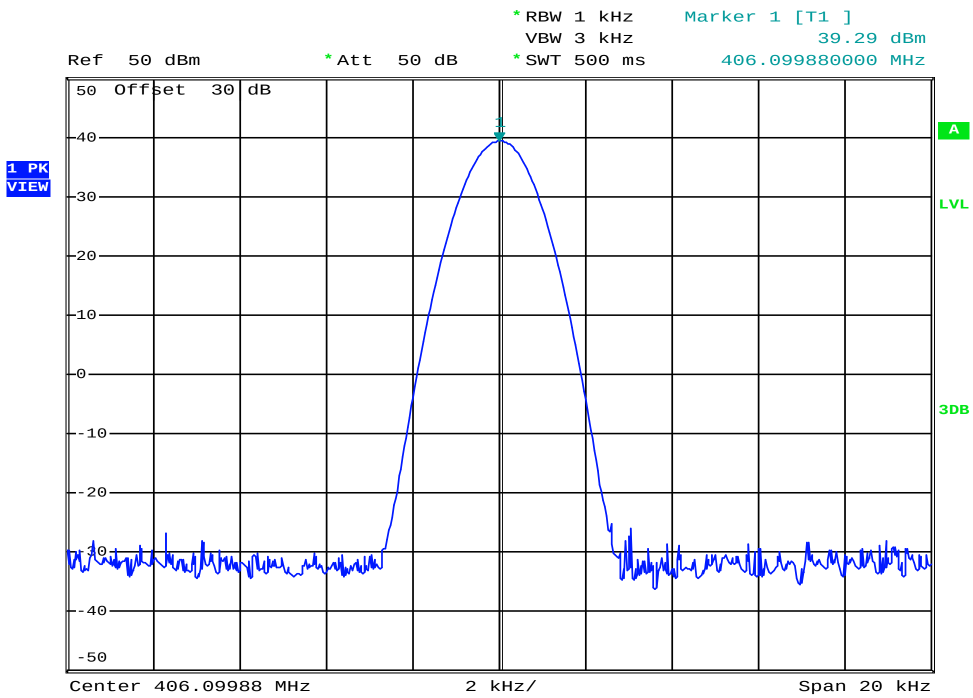
General Procedure	
ANSI C63.26	**5.2 General** Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges.

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.

Plot 7.1 – Conducted Power 406.1

Conducted Power (Peak)

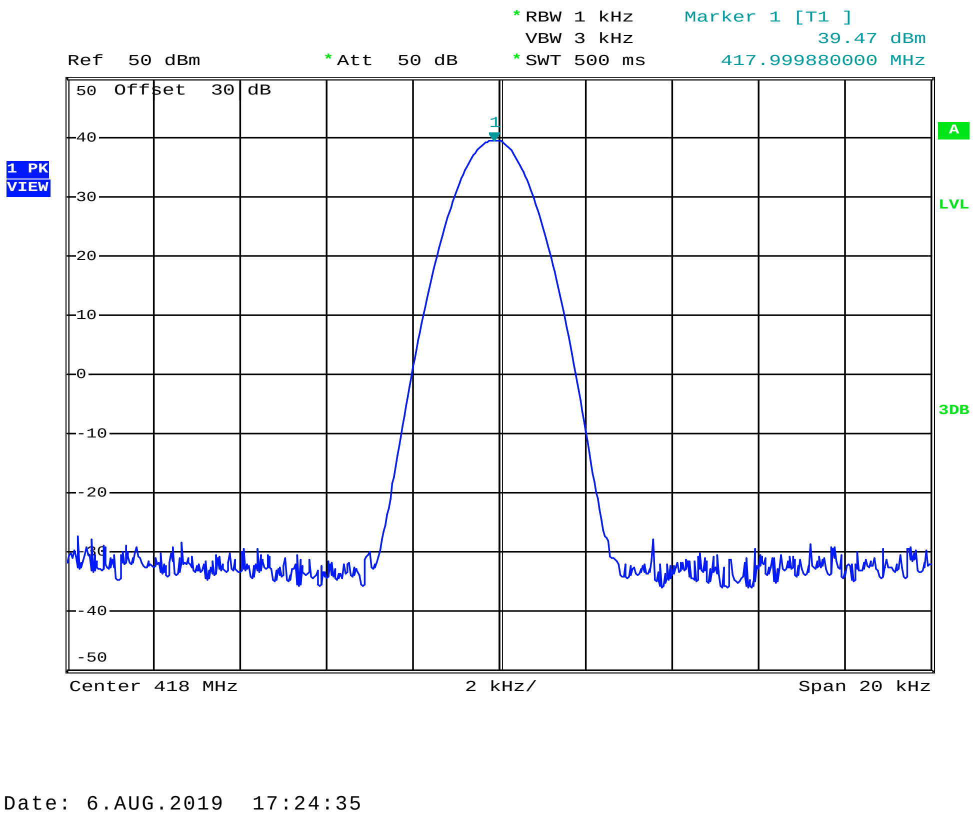


Date: 6.AUG.2019 17:22:10

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

Plot 7.2 – Conducted Power 418MHz

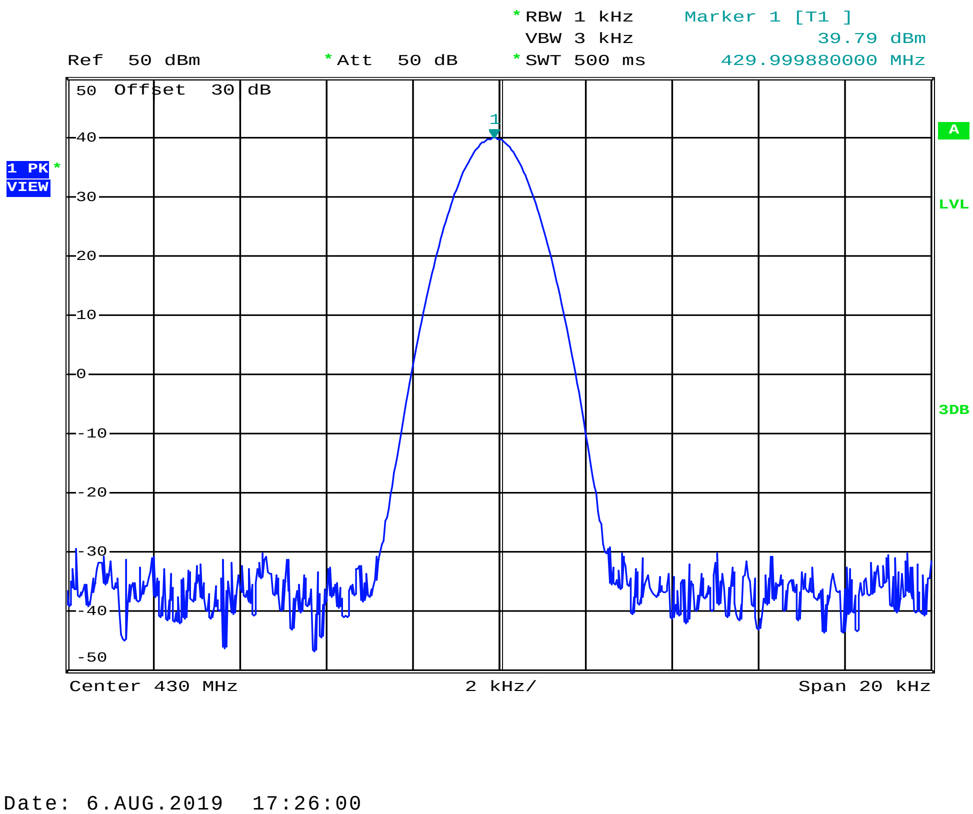
Conducted Power (Peak)



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

Plot 7.3 – Conducted Power 430MHz

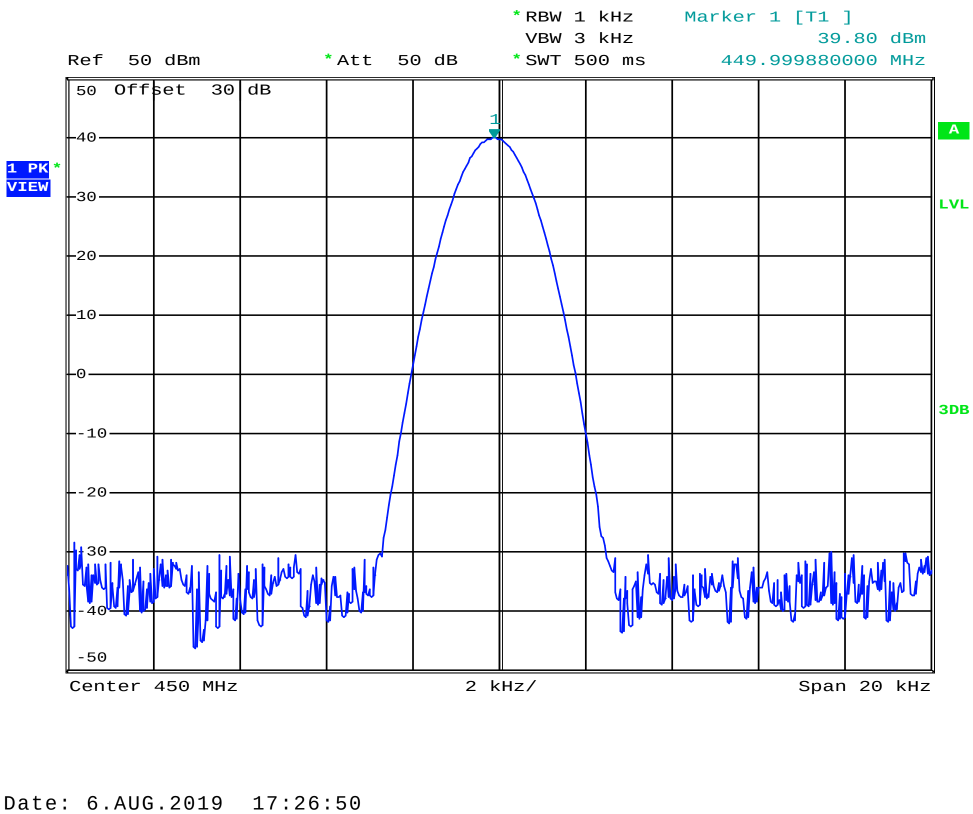
Conducted Power (Peak)



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

Plot 7.4 – Conducted Power 450MHz

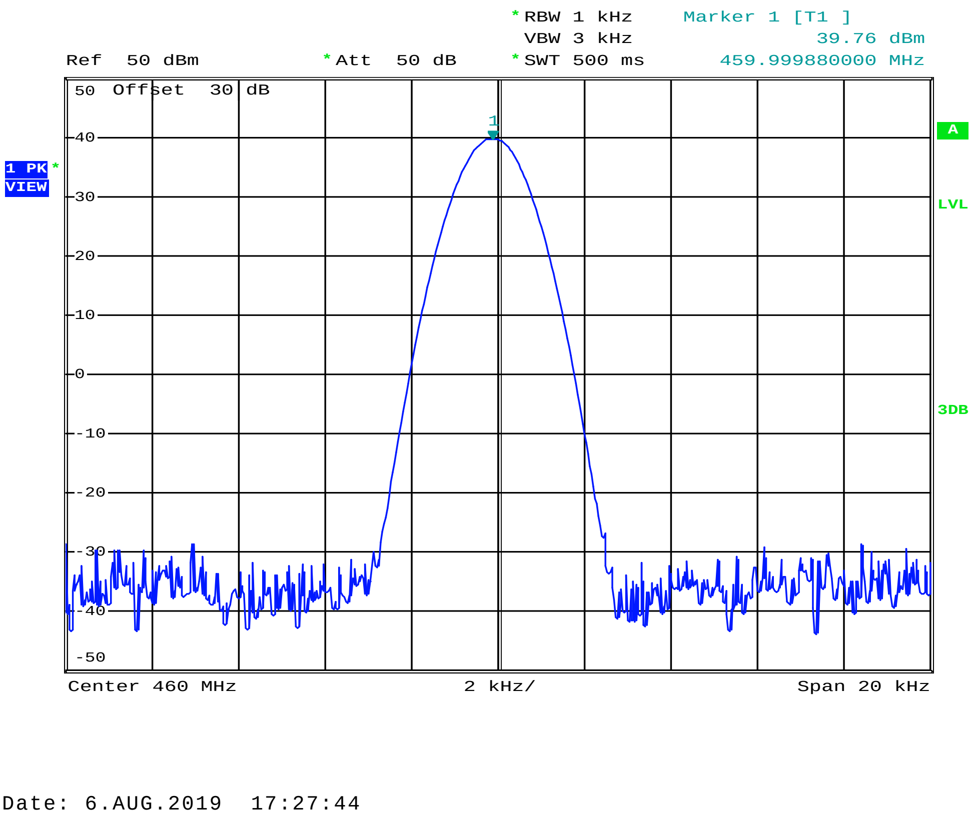
Conducted Power (Peak)



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

Plot 7.5 – Conducted Power 460MHz

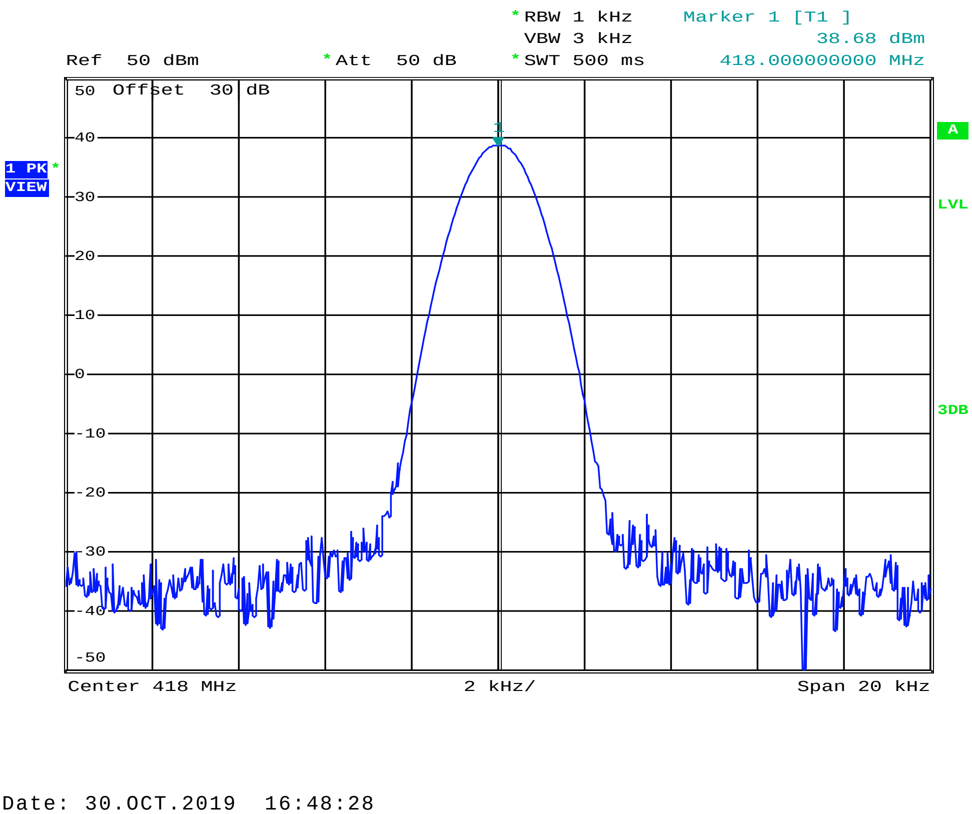
Conducted Power (Peak)



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

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

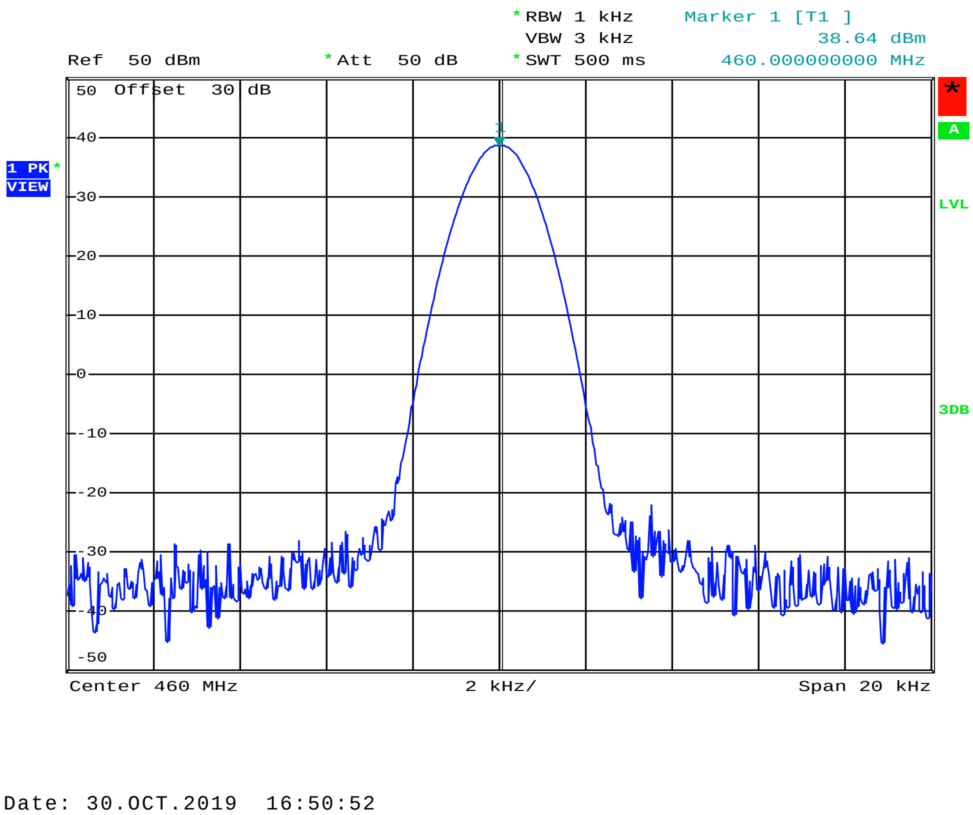
Conducted Power (Peak)



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

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

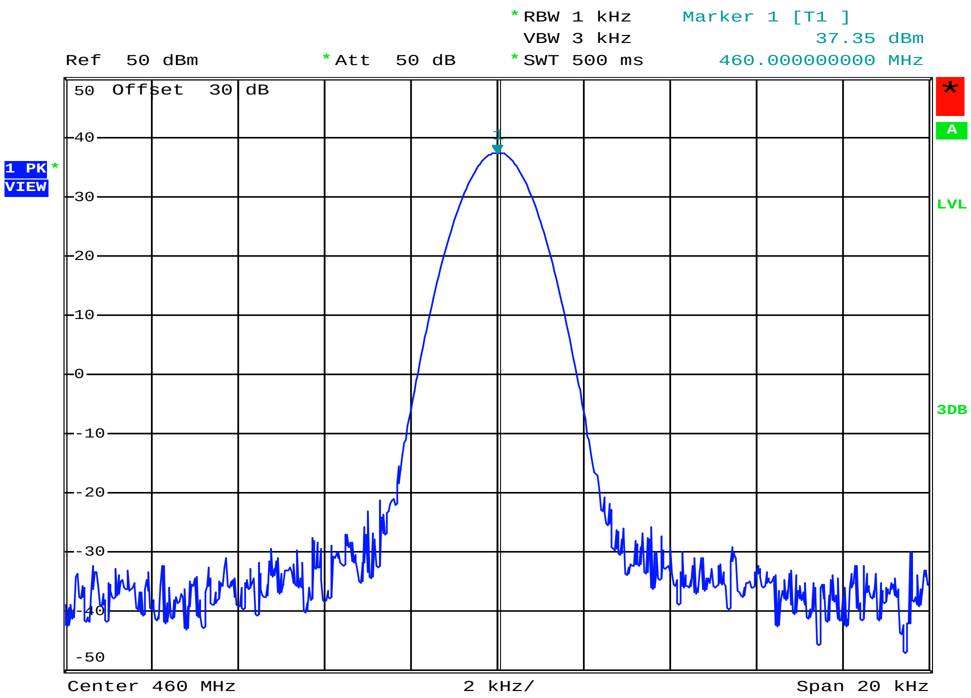
Conducted Power (Peak)



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

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

Conducted Power (Peak)



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

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

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

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** Note 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). 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

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

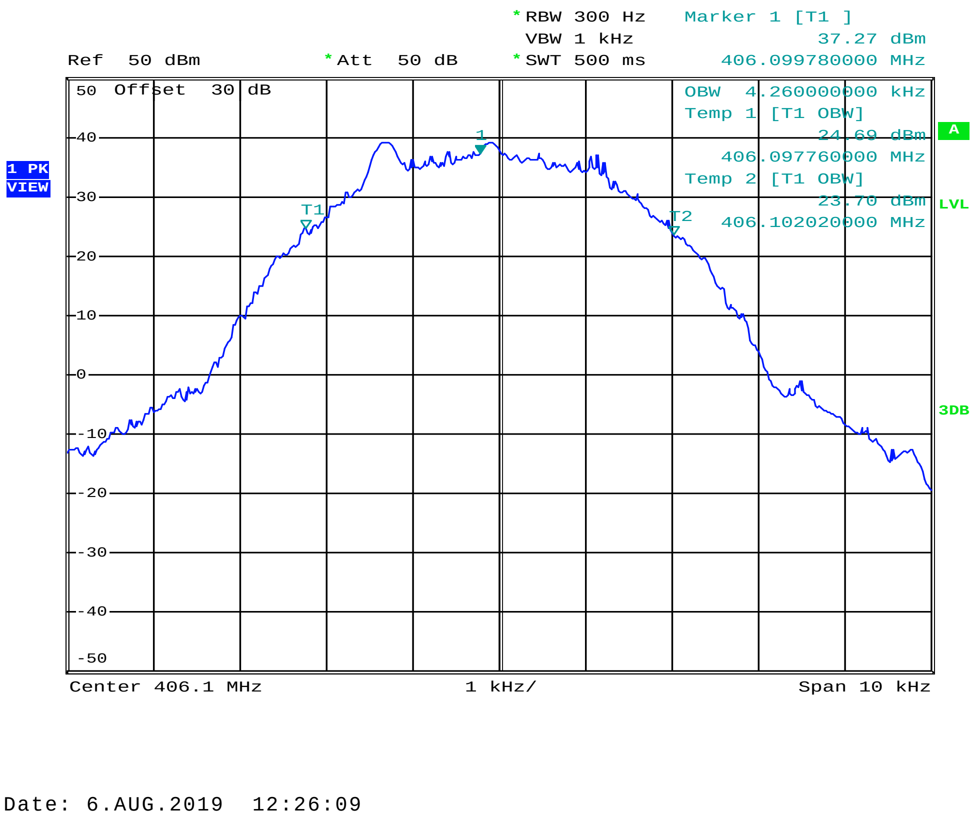
Measurement Procedure	
ANSI C63.26 5.4.4	**Occupied bandwidth—Power bandwidth (99%) measurement procedure30** The OBW is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following 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.

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

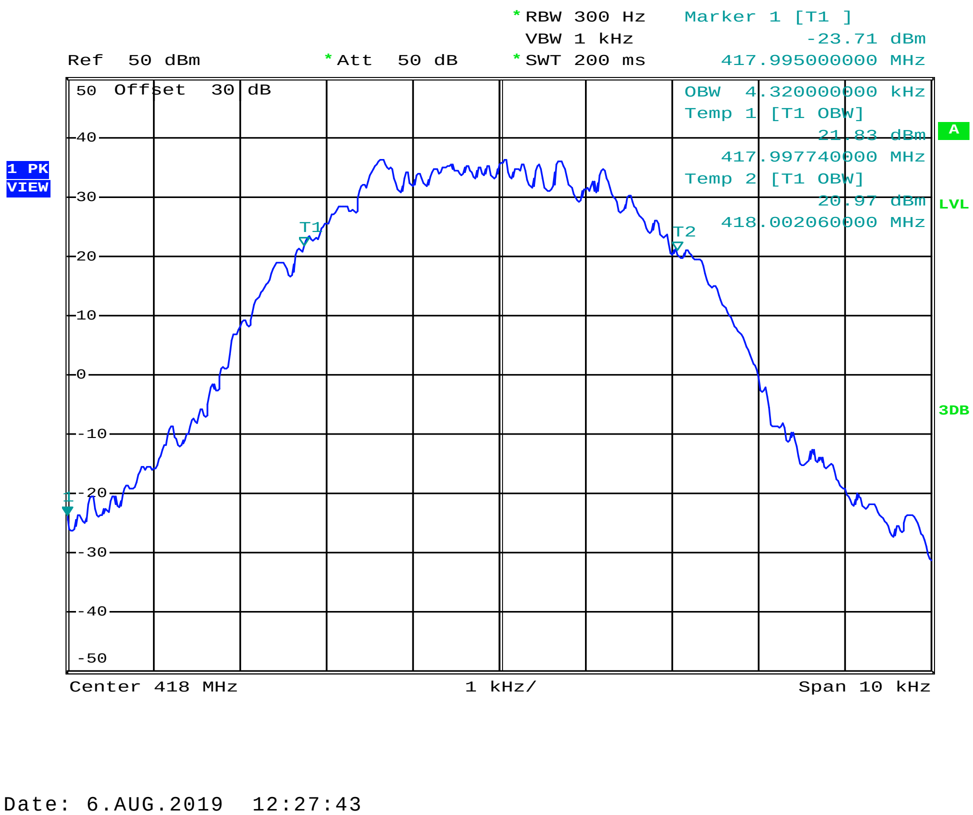
Occupied Bandwidth - Conducted



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

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

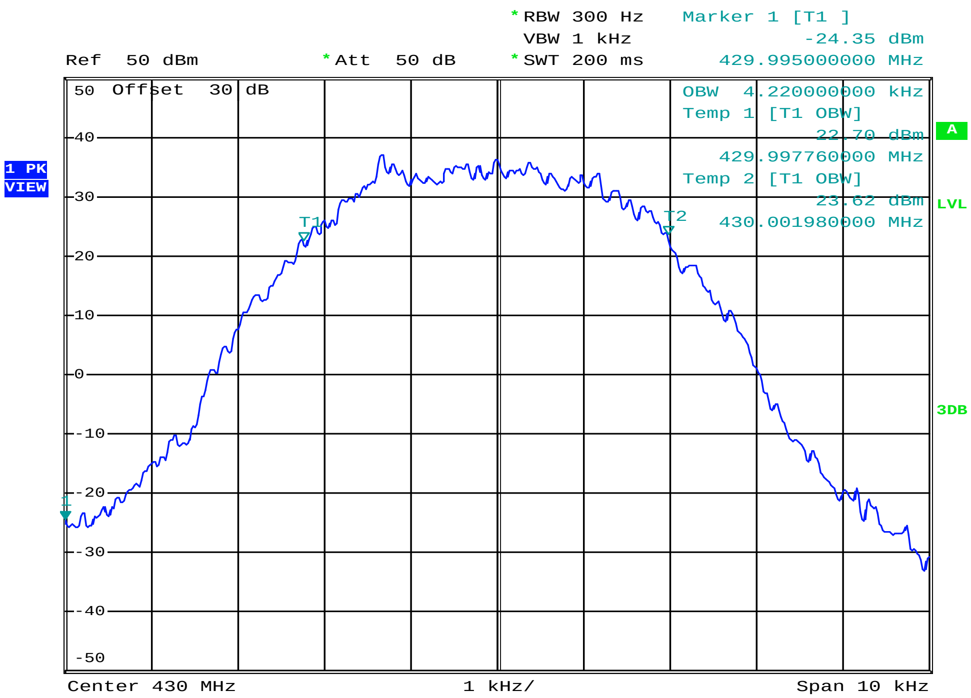
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

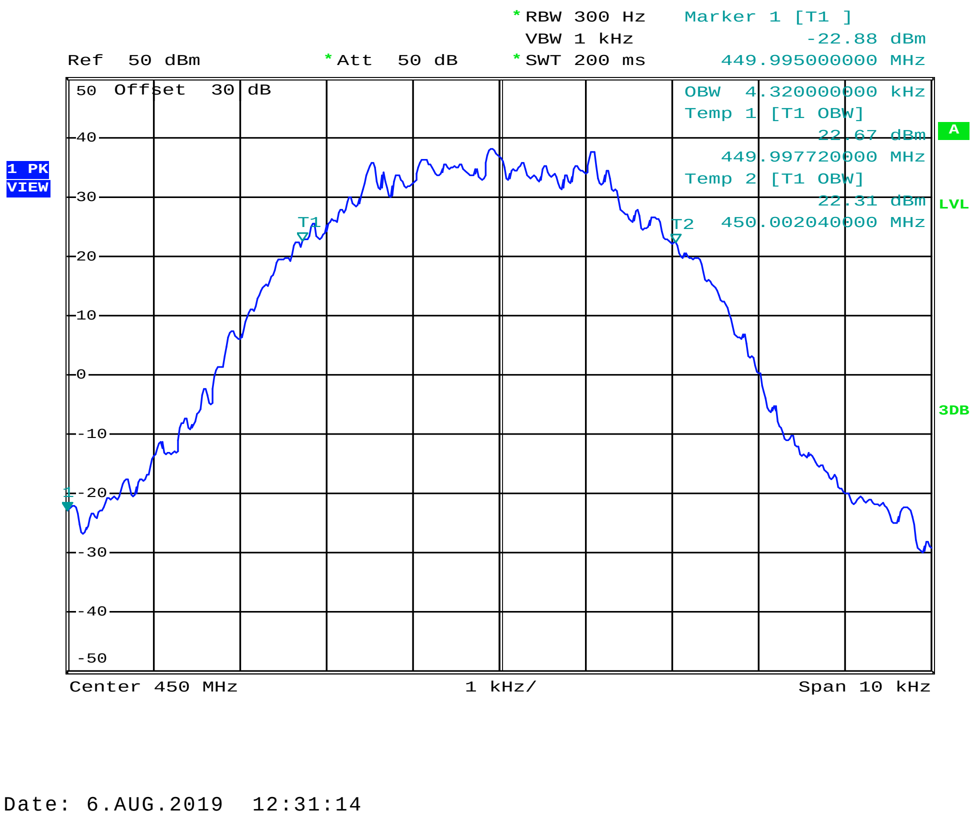


Date: 6.AUG.2019 12:29:26

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

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

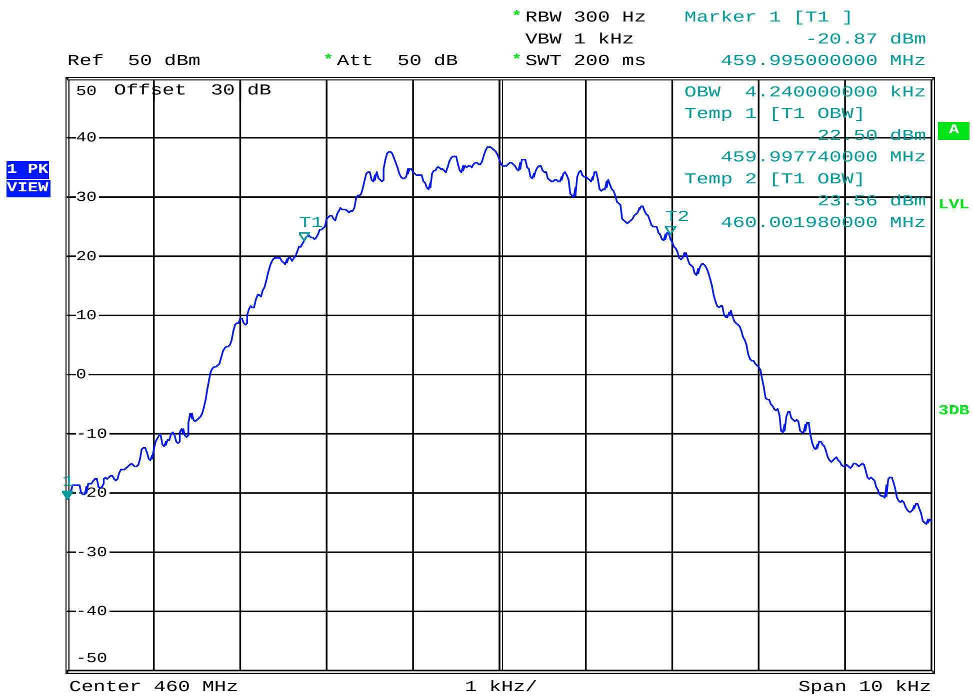
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

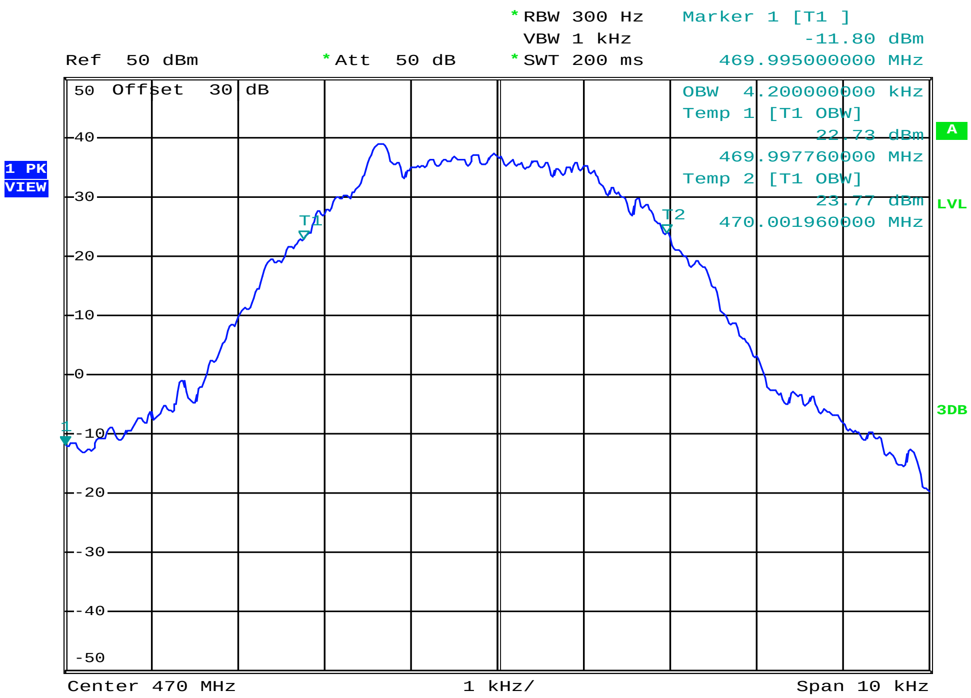


Date: 6.AUG.2019 12:33:34

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

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

Occupied Bandwidth - Conducted

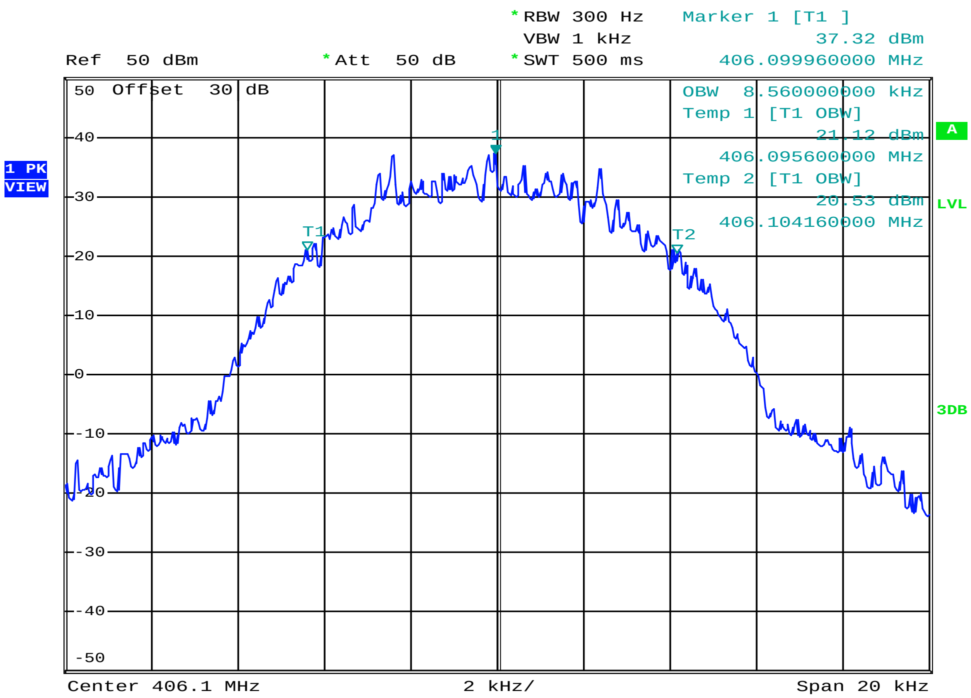


Date: 6.AUG.2019 12:35:32

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

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

Occupied Bandwidth - Conducted

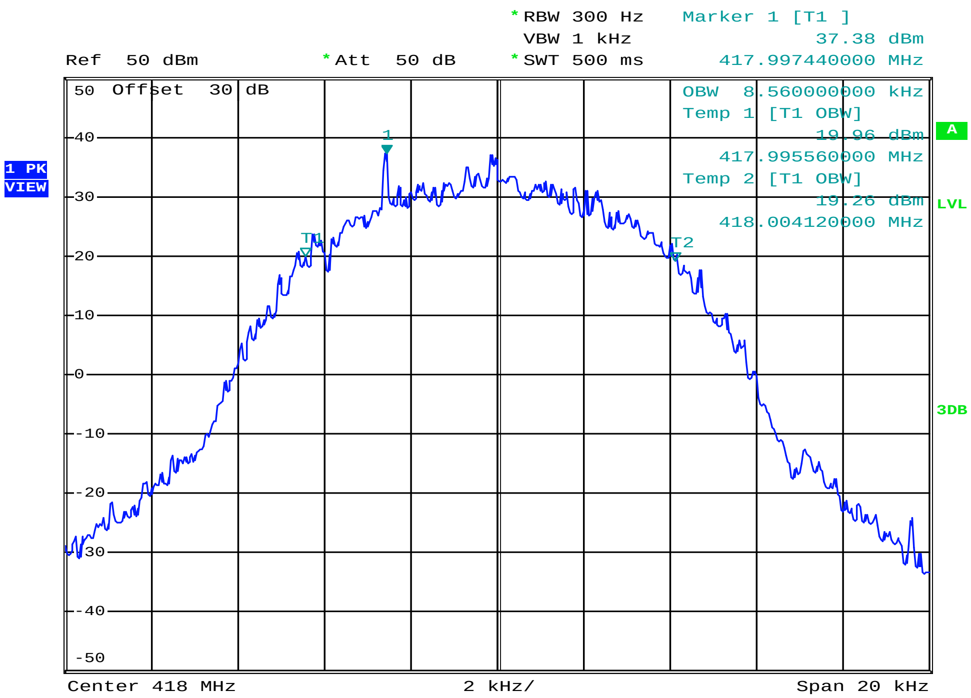


Date: 6.AUG.2019 12:44:03

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

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

Occupied Bandwidth - Conducted

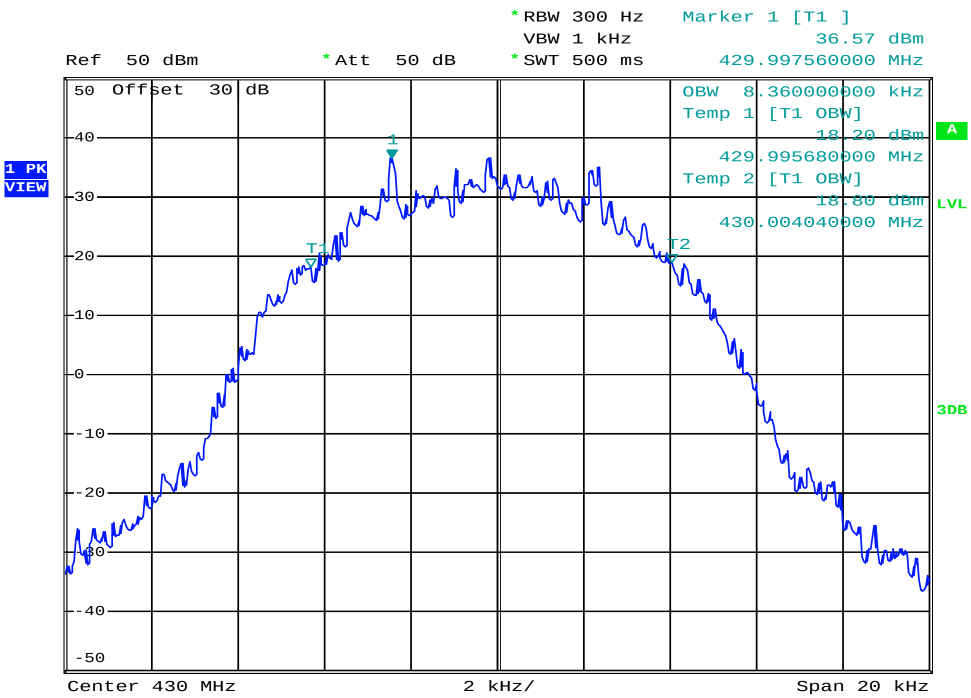


Date: 6.AUG.2019 12:45:05

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

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

Occupied Bandwidth - Conducted

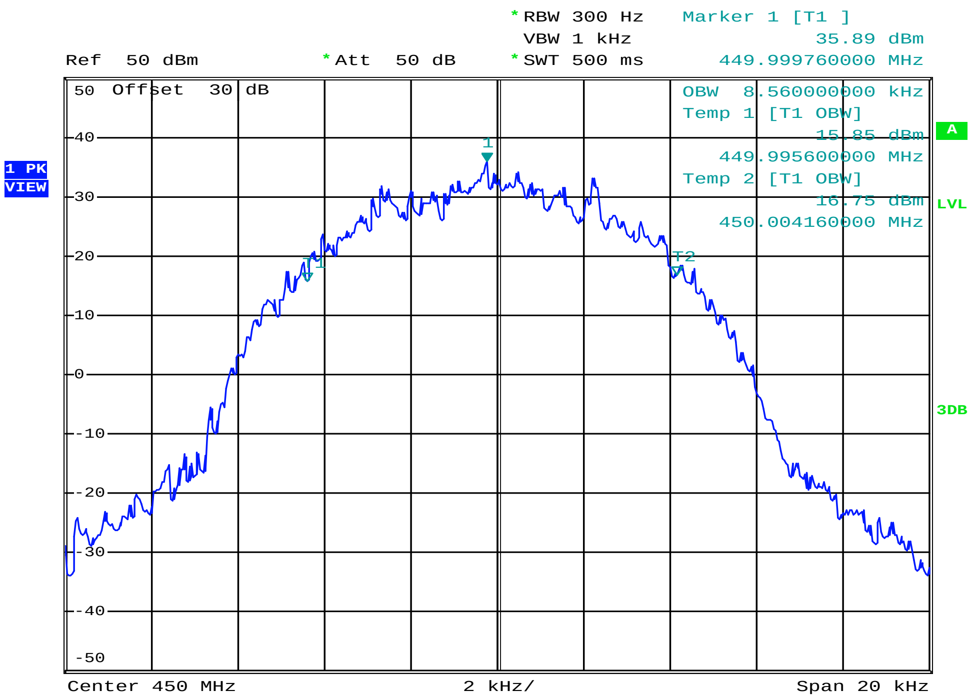


Date: 6.AUG.2019 12:46:05

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

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

Occupied Bandwidth - Conducted

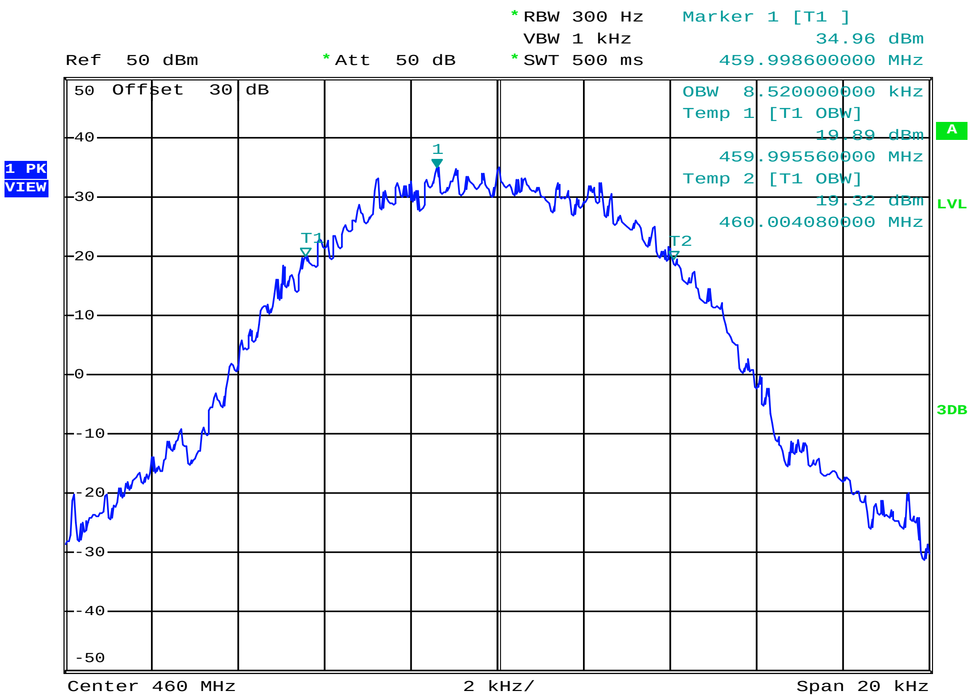


Date: 6.AUG.2019 12:47:08

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

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

Occupied Bandwidth - Conducted

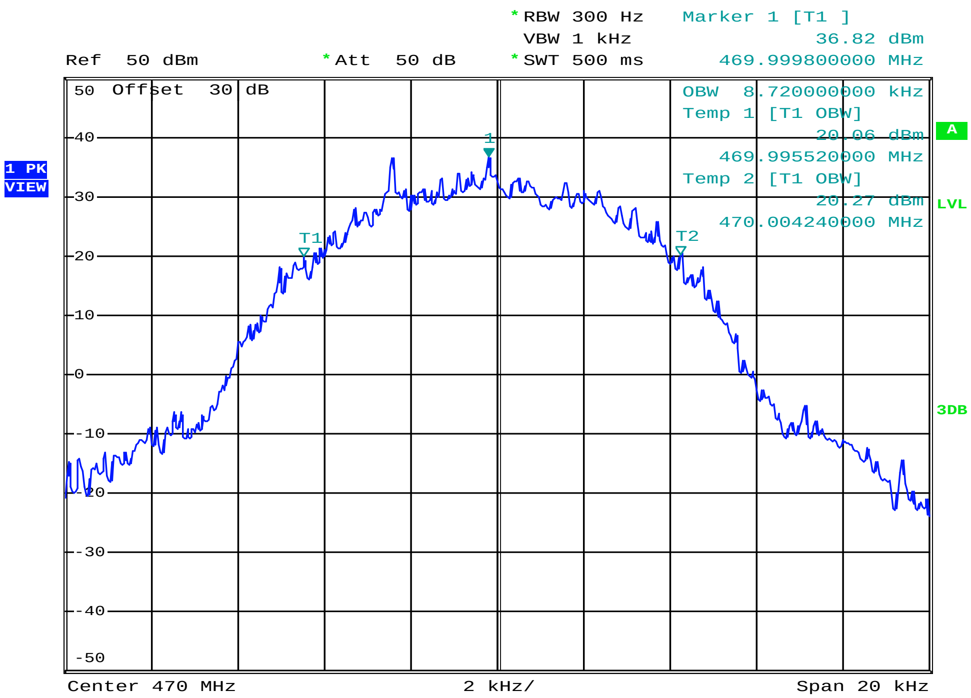


Date: 6.AUG.2019 12:48:07

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

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

Occupied Bandwidth - Conducted

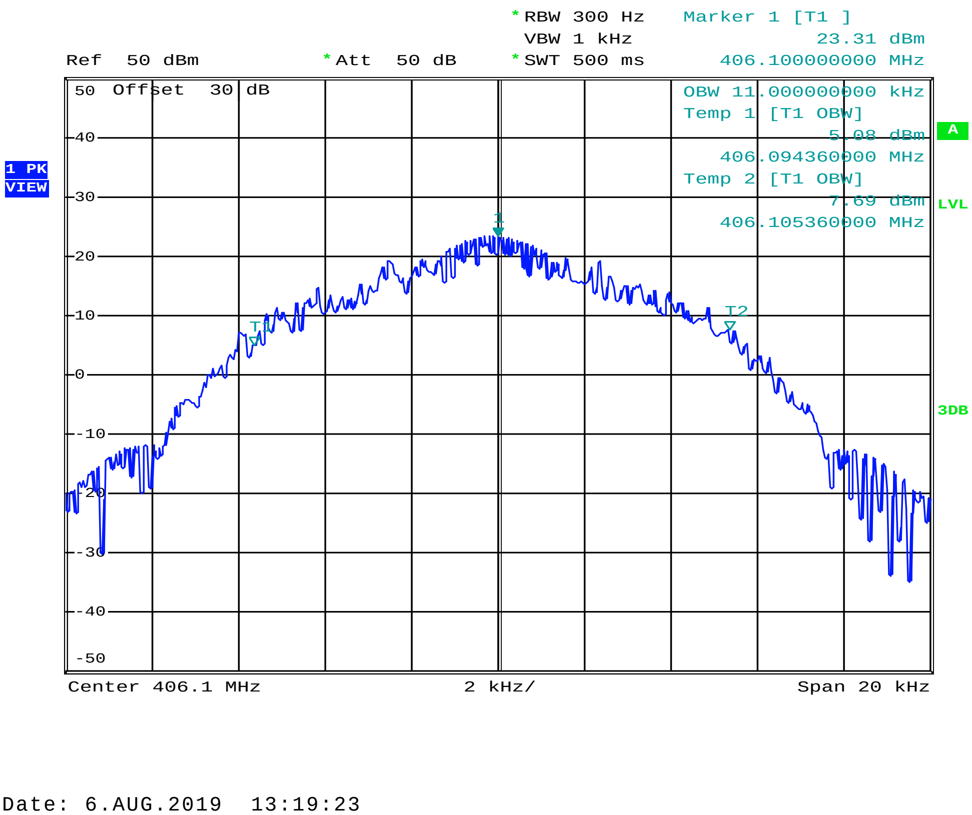


Date: 6.AUG.2019 12:49:10

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

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

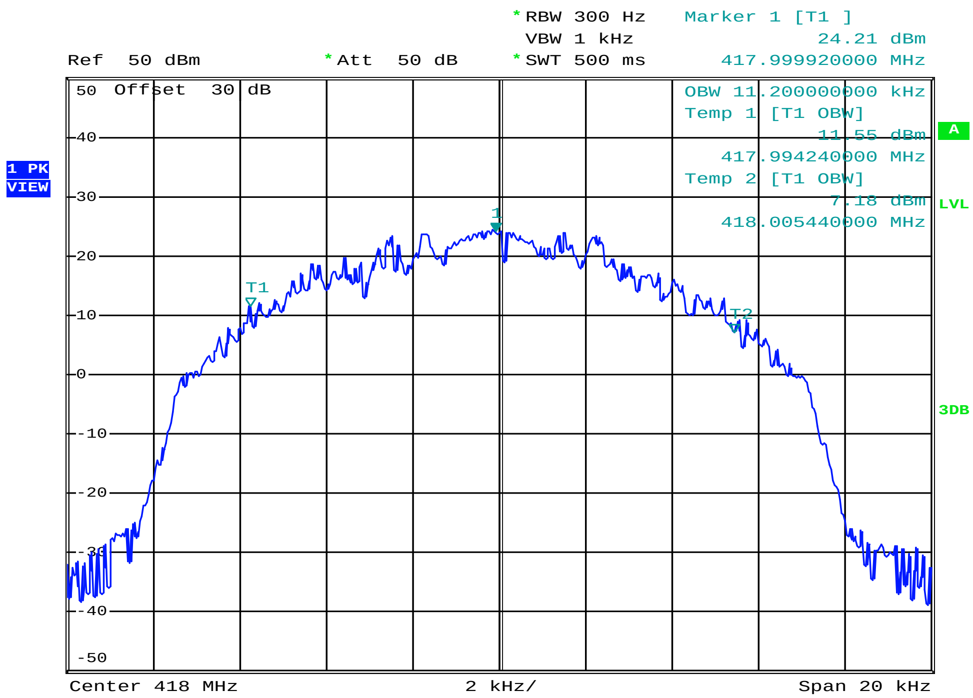
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

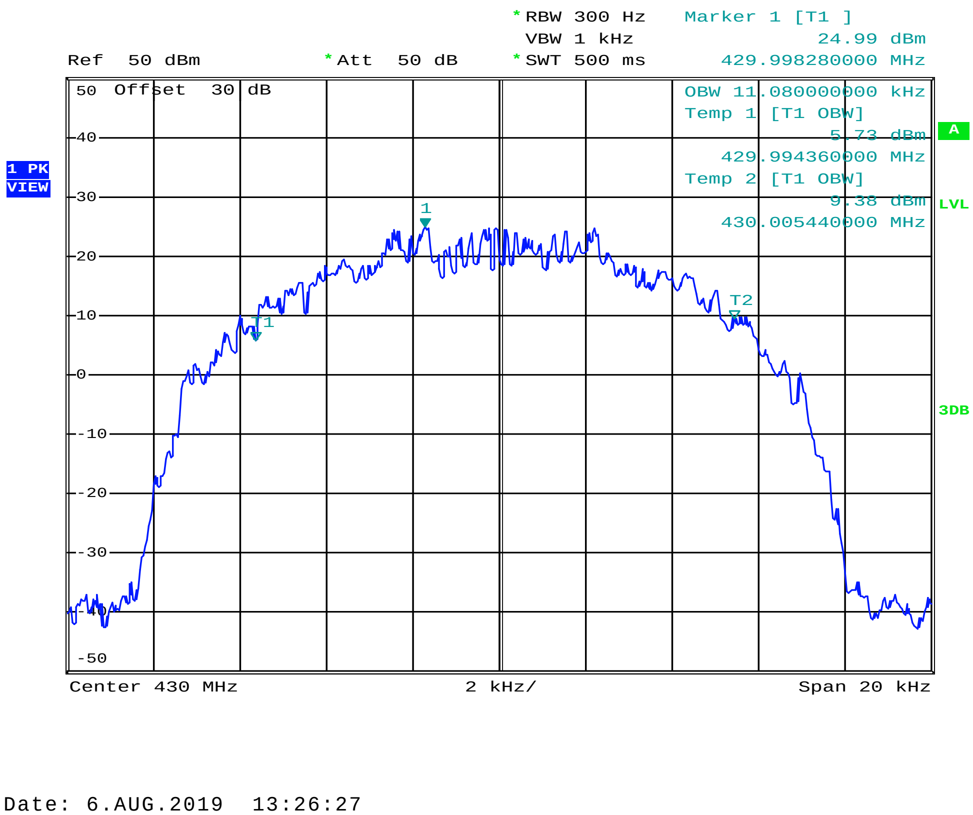


Date: 6.AUG.2019 13:22:57

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

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

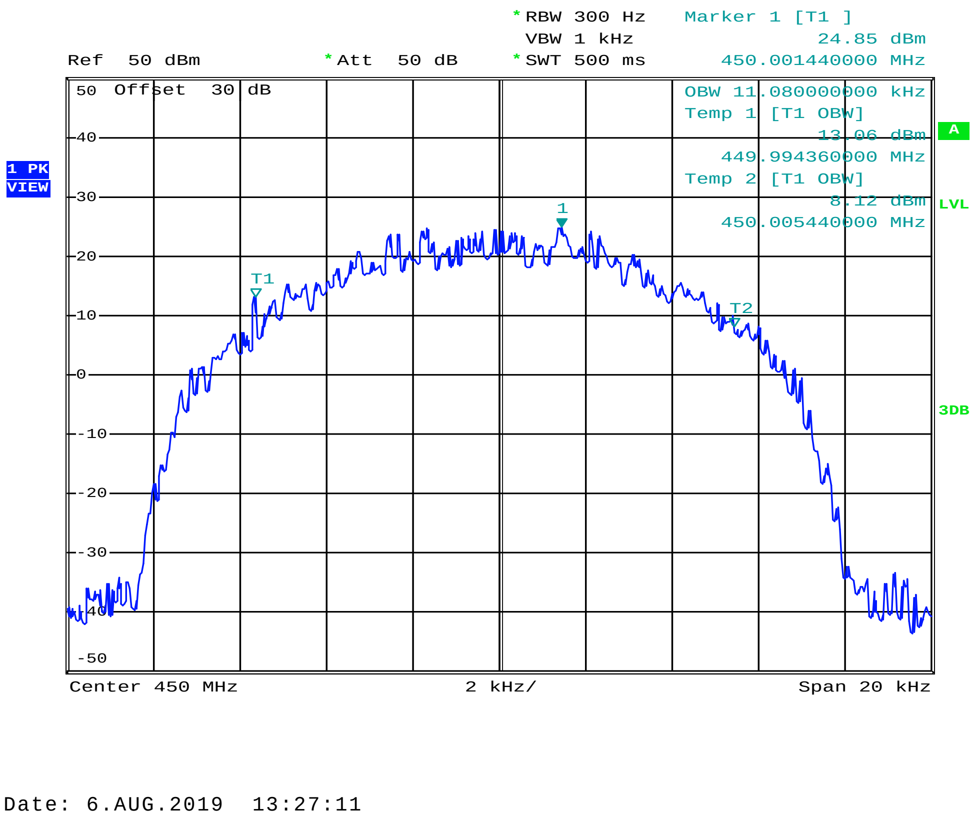
Occupied Bandwidth - Conducted



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

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

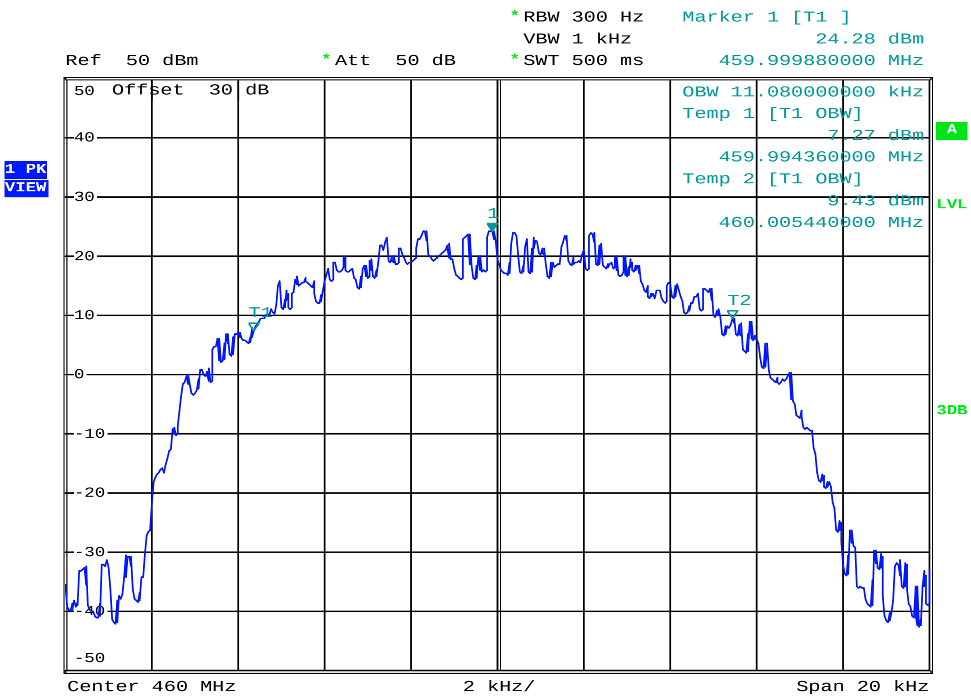
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

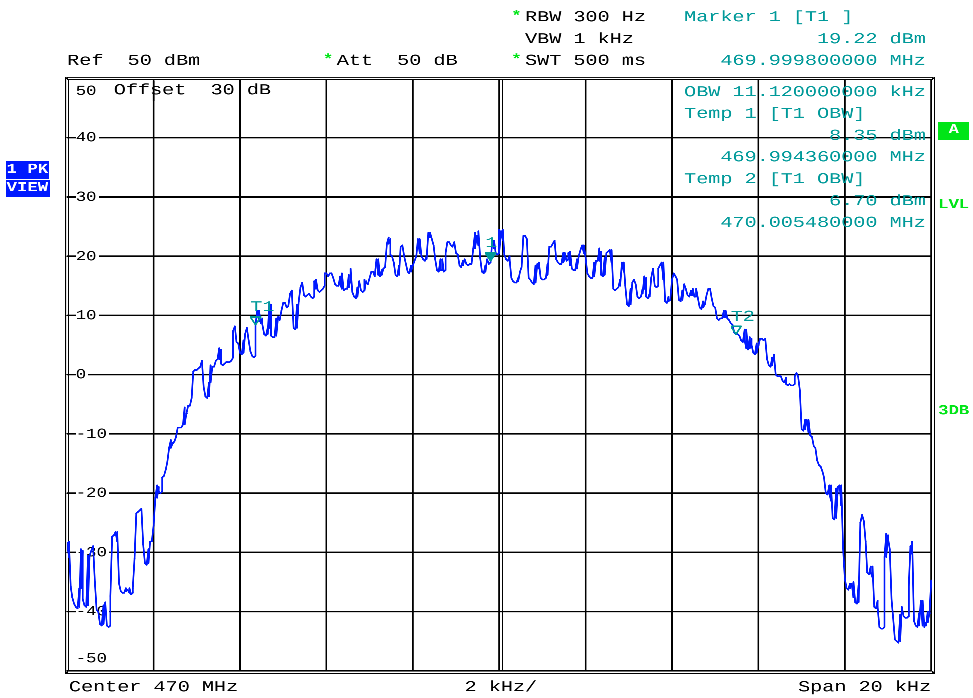


Date: 6.AUG.2019 13:28:05

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

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

Occupied Bandwidth - Conducted

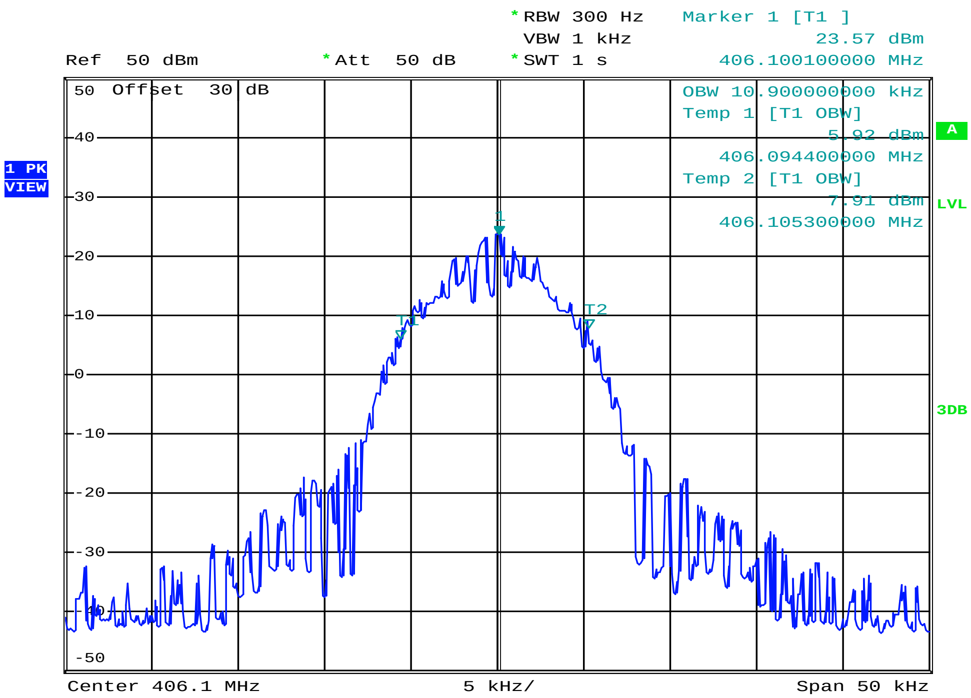


Date: 6.AUG.2019 13:29:34

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

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

Occupied Bandwidth - Conducted

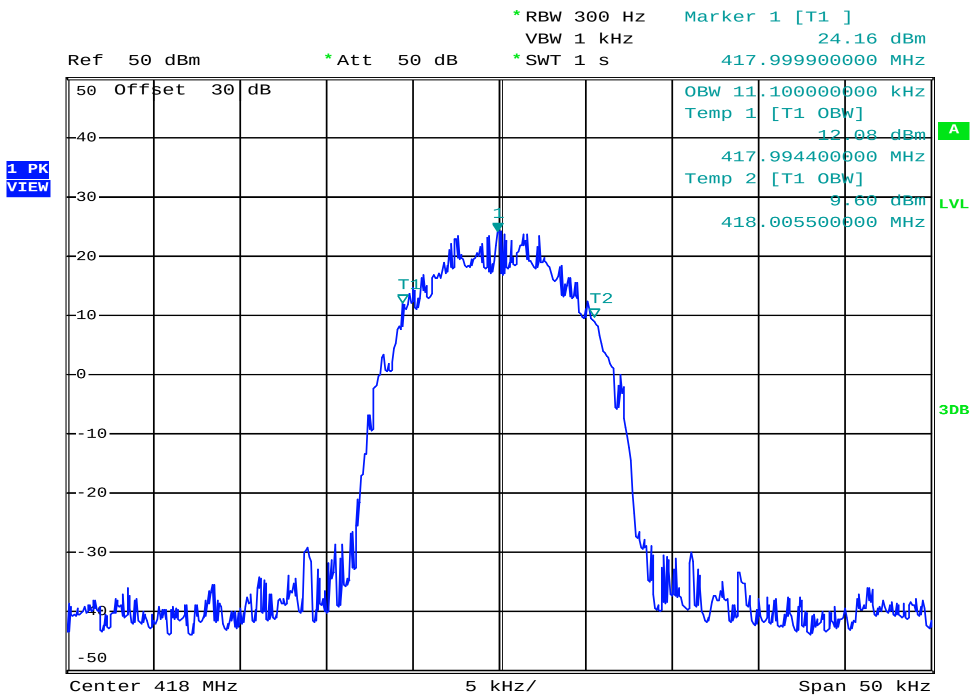


Date: 6.AUG.2019 12:58:48

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

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

Occupied Bandwidth - Conducted

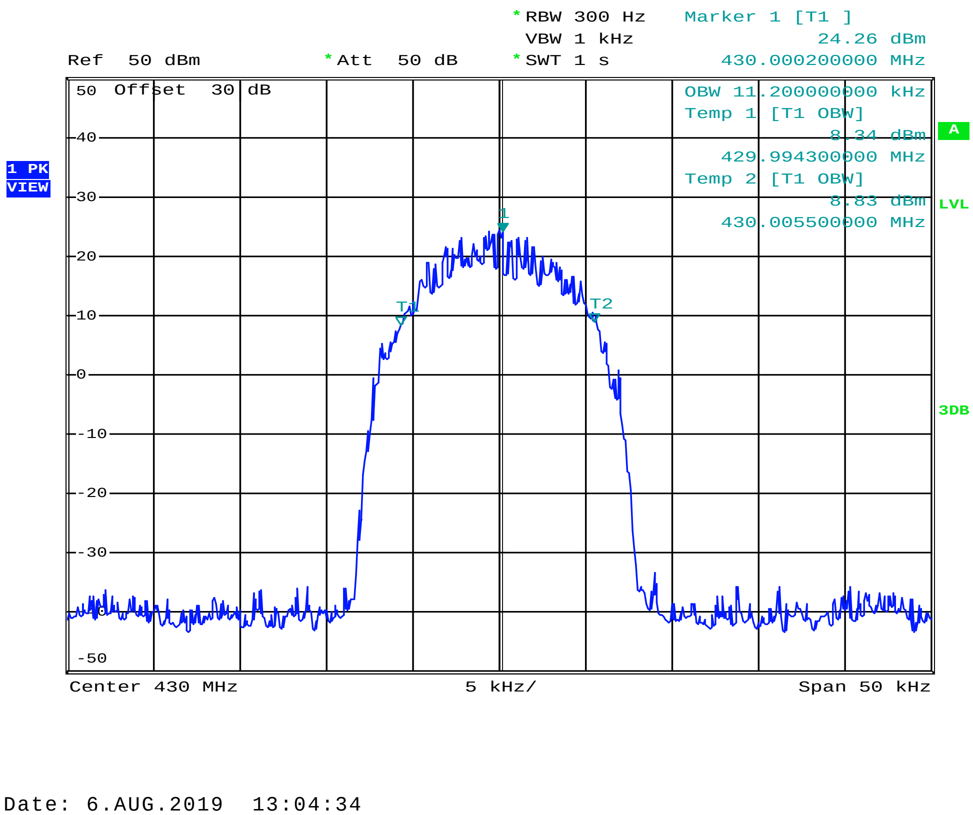


Date: 6.AUG.2019 13:00:41

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

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

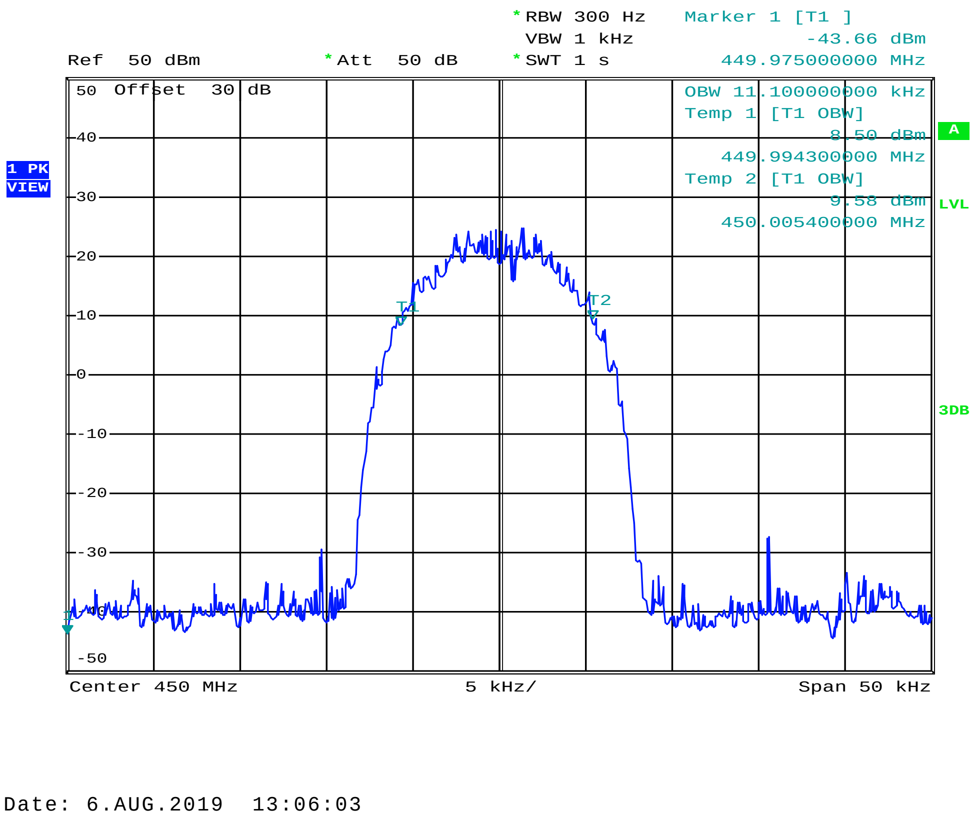
Occupied Bandwidth - Conducted



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

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

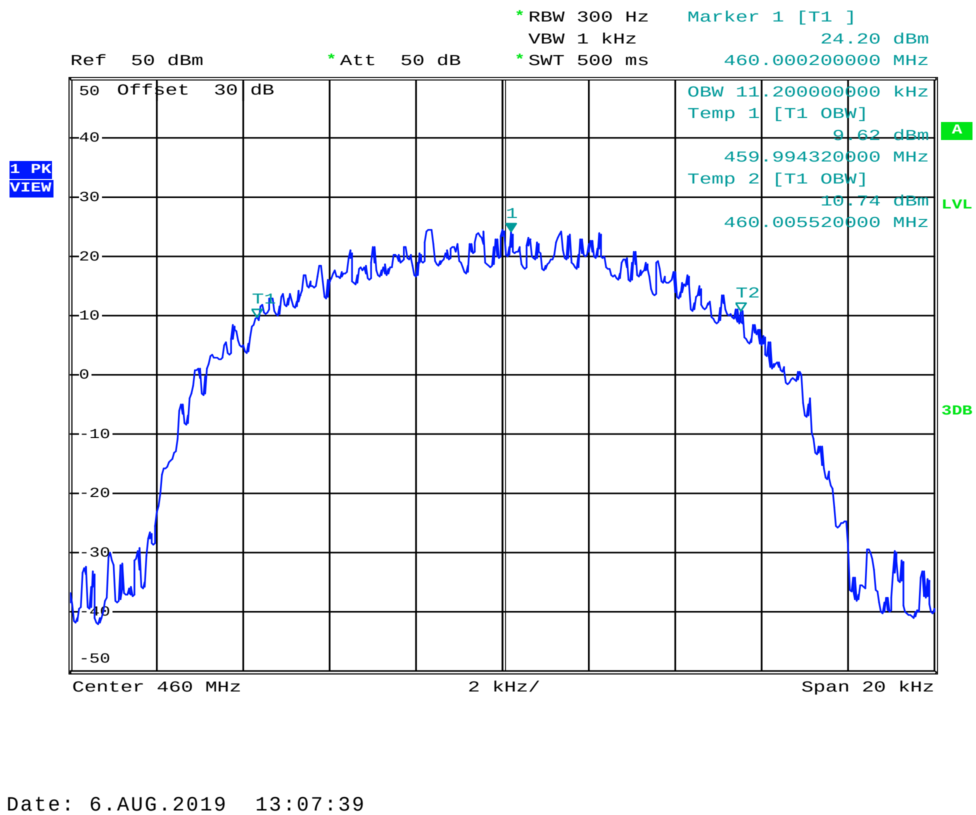
Occupied Bandwidth - Conducted



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

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

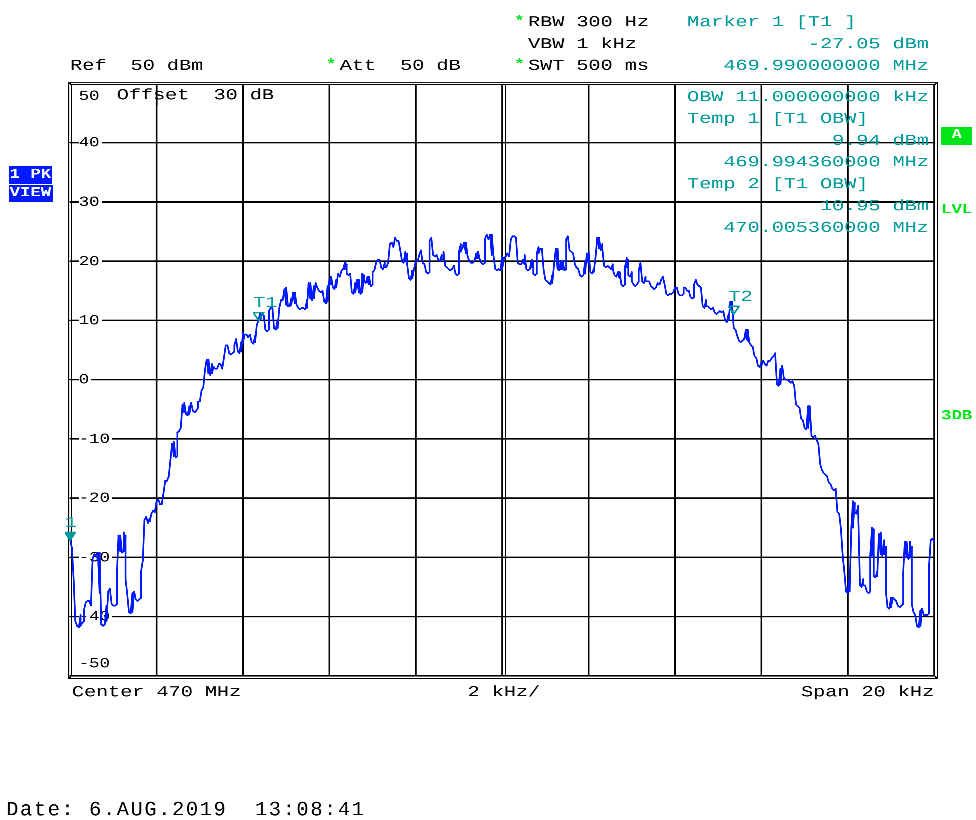
Occupied Bandwidth - Conducted



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

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

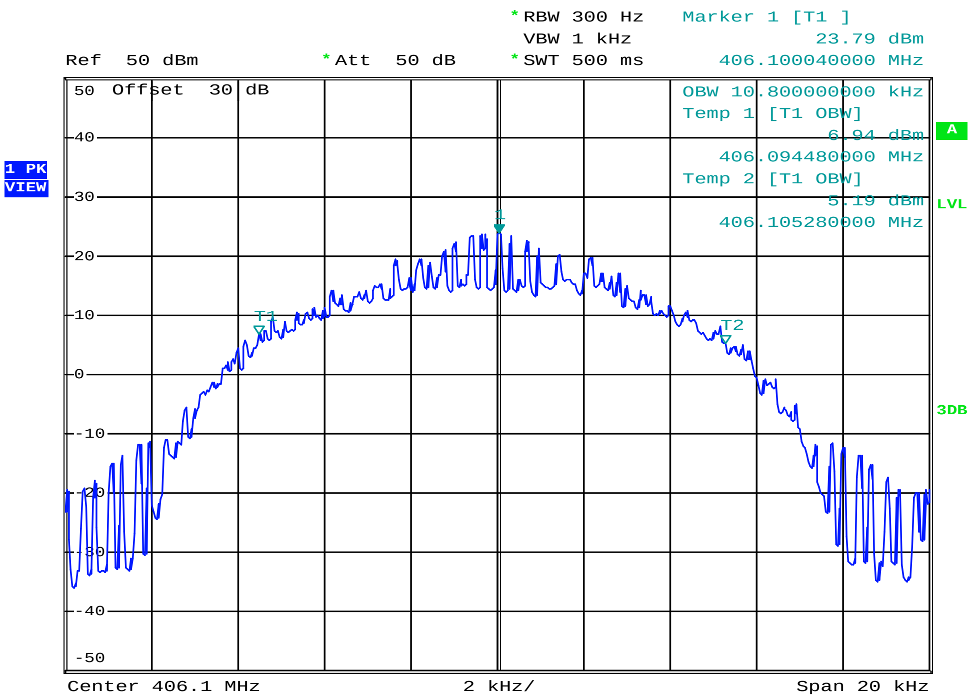
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

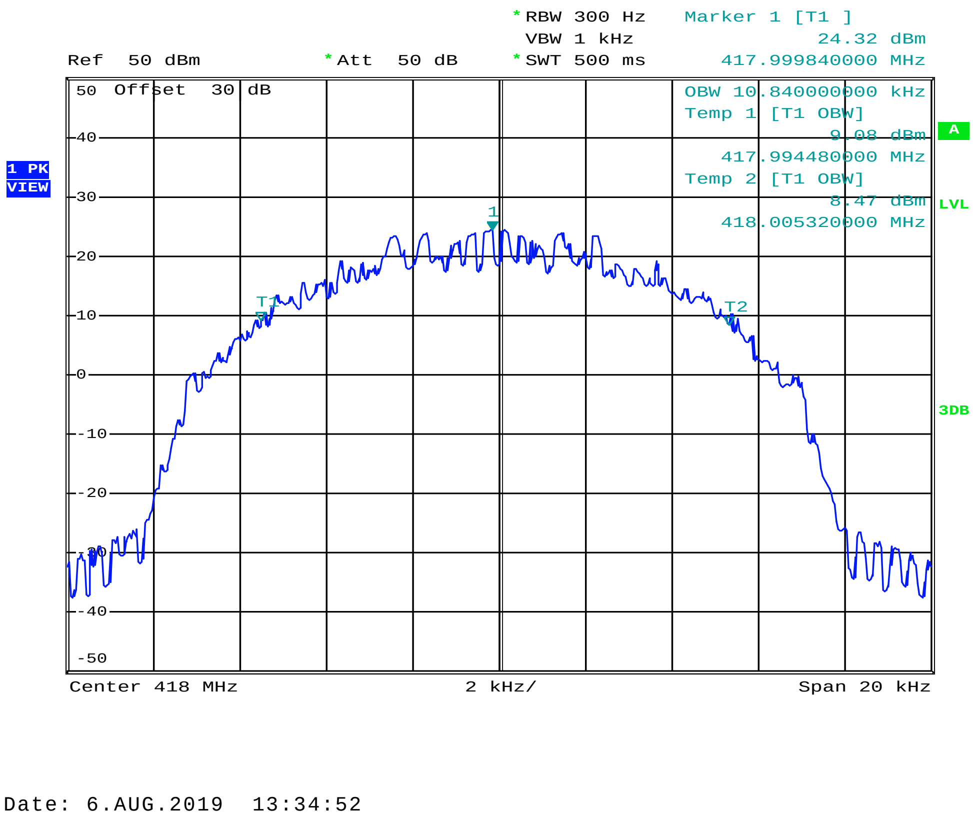


Date: 6.AUG.2019 13:33:15

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

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

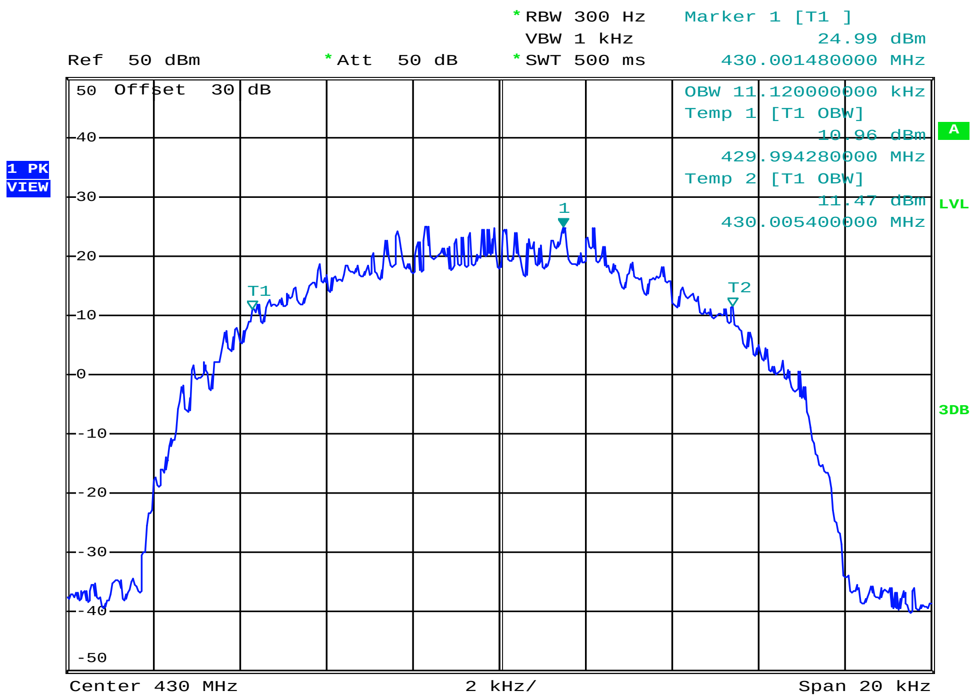
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

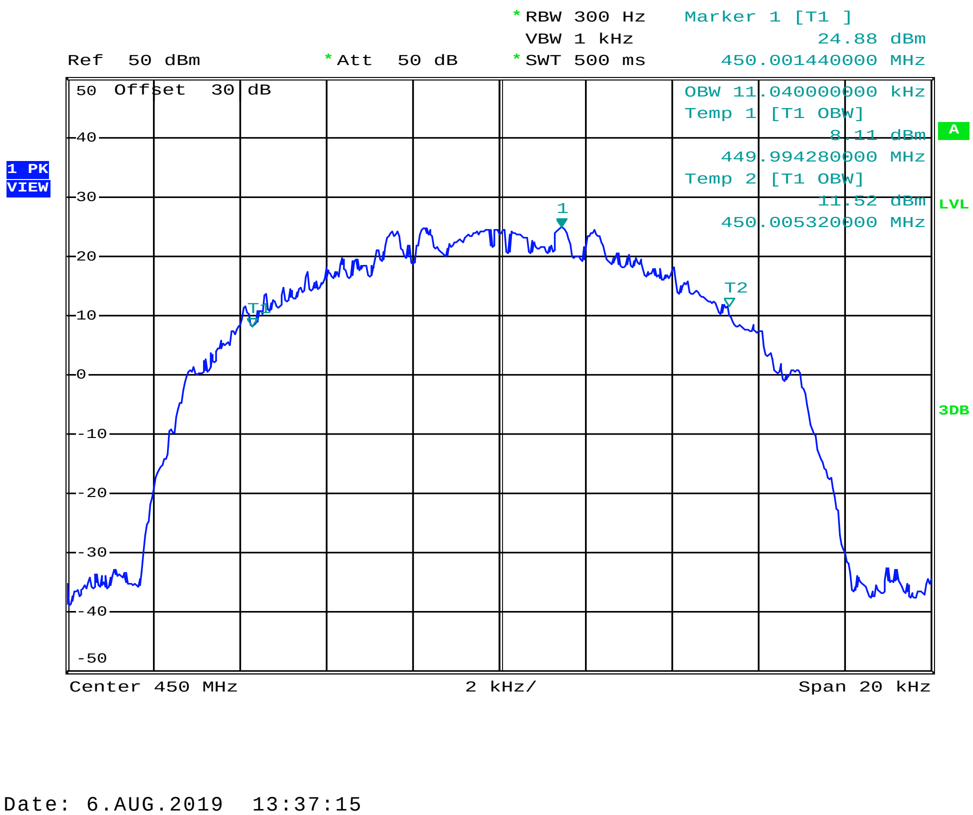


Date: 6.AUG.2019 13:35:42

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

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

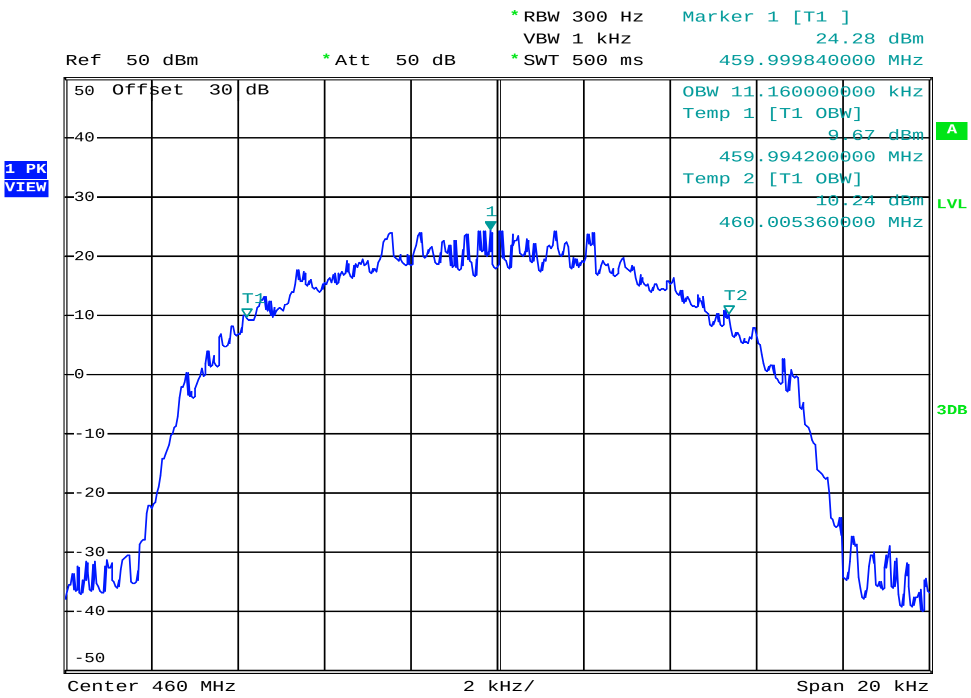
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

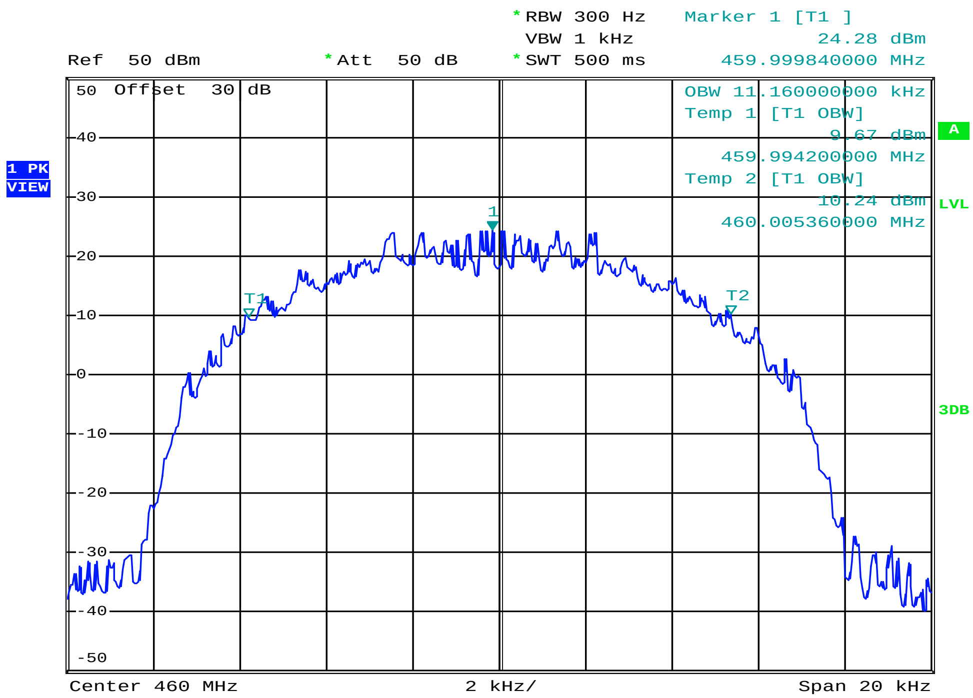


Date: 6.AUG.2019 13:38:14

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

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

Occupied Bandwidth - Conducted

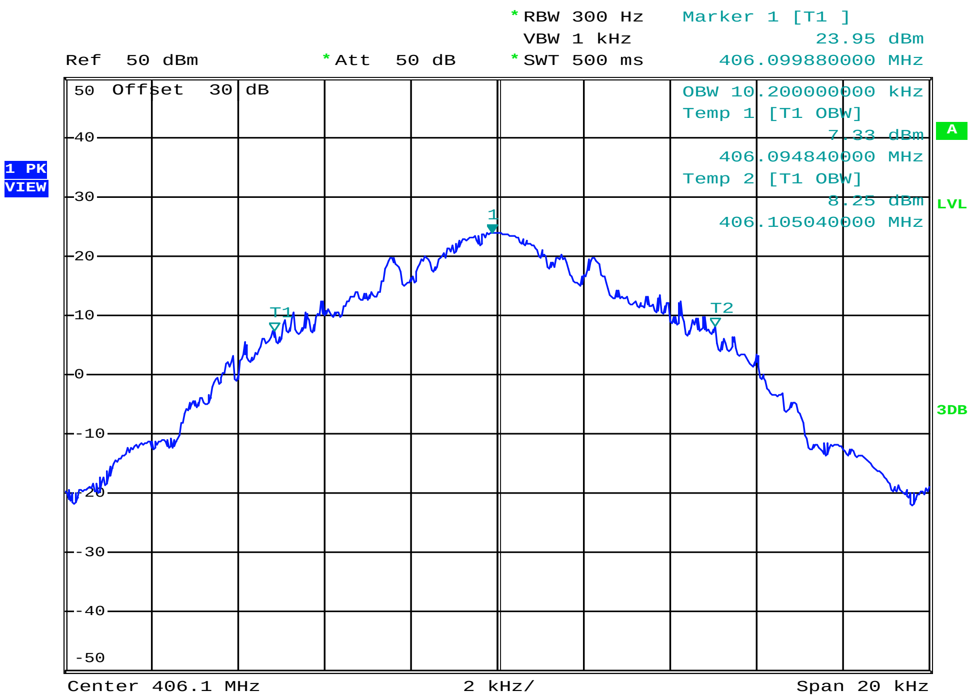


Date: 6.AUG.2019 13:38:14

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

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

Occupied Bandwidth - Conducted

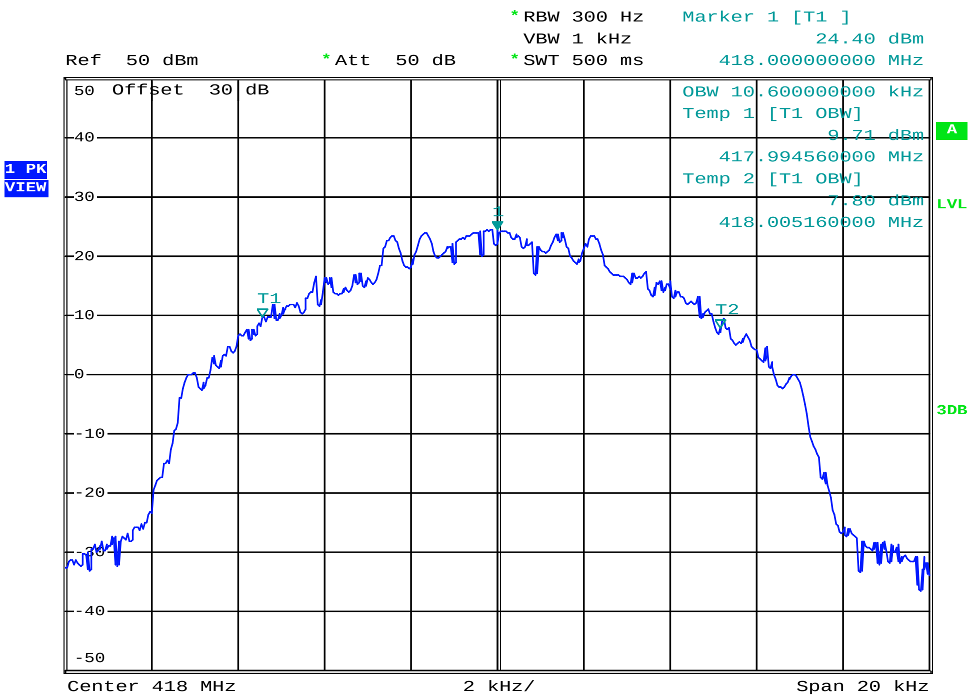


Date: 6.AUG.2019 13:42:47

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

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

Occupied Bandwidth - Conducted

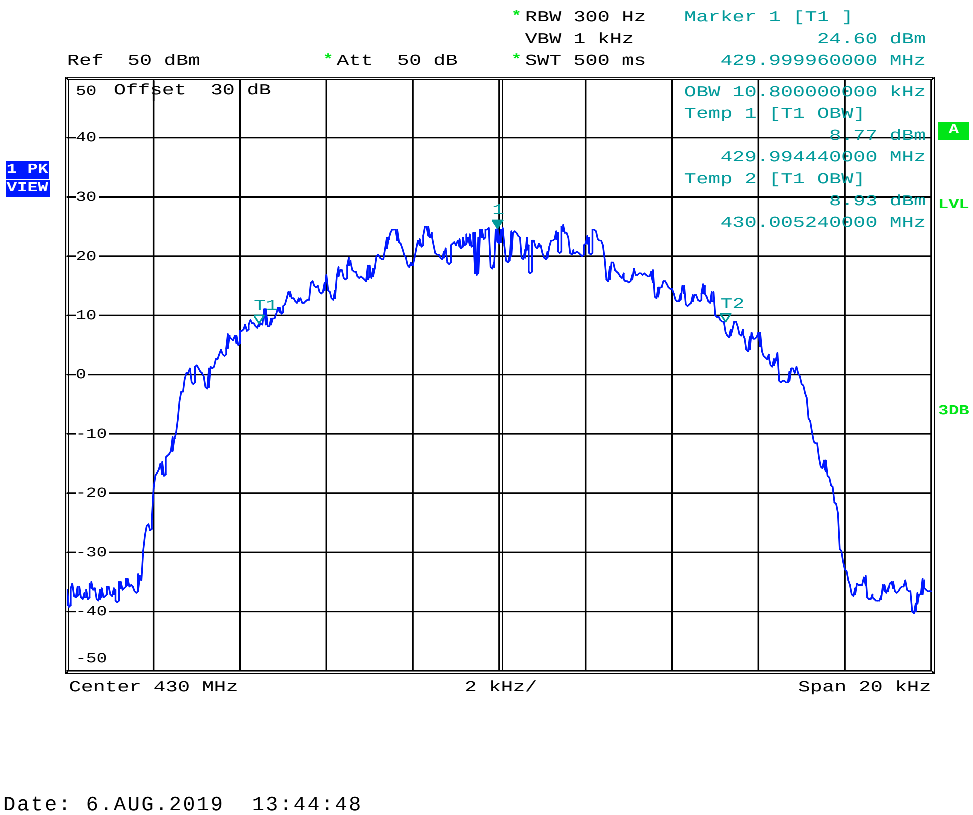


Date: 6.AUG.2019 13:43:51

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

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

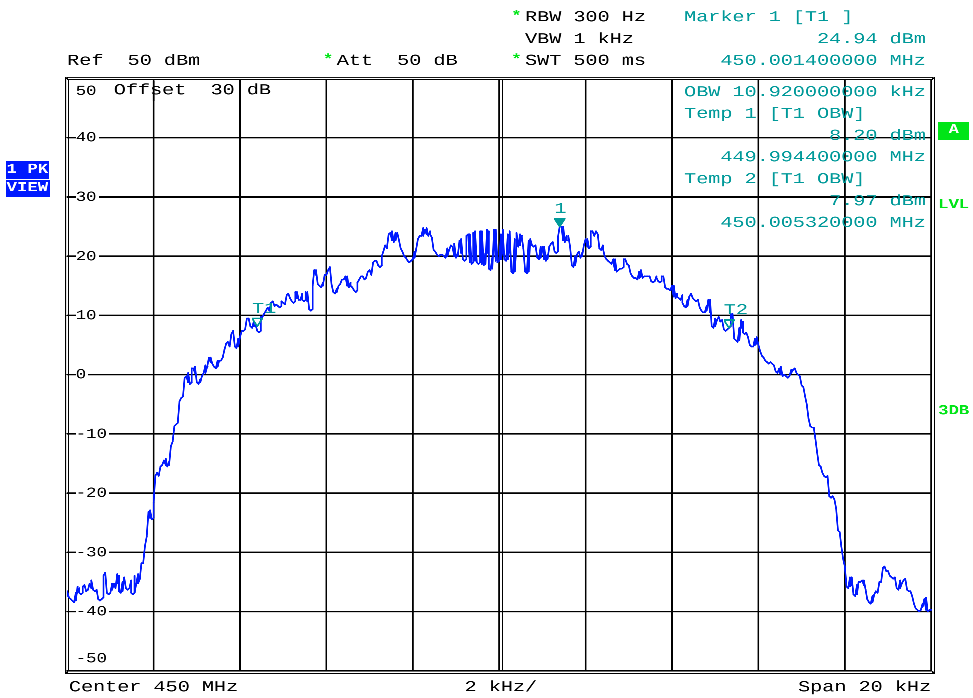
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

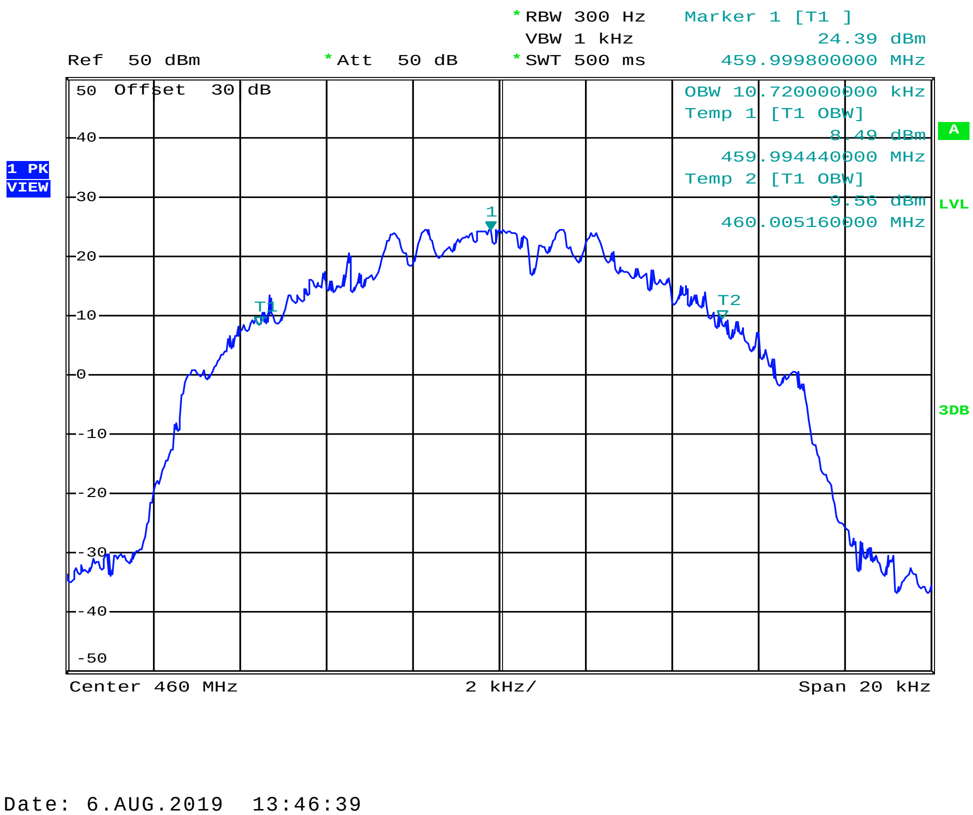


Date: 6.AUG.2019 13:45:33

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

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

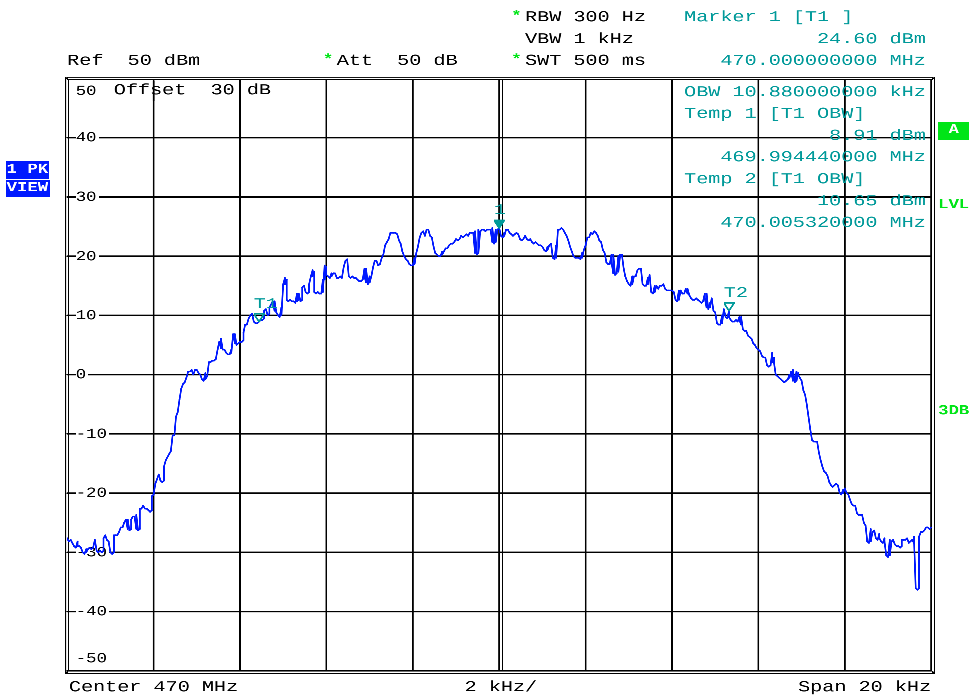
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

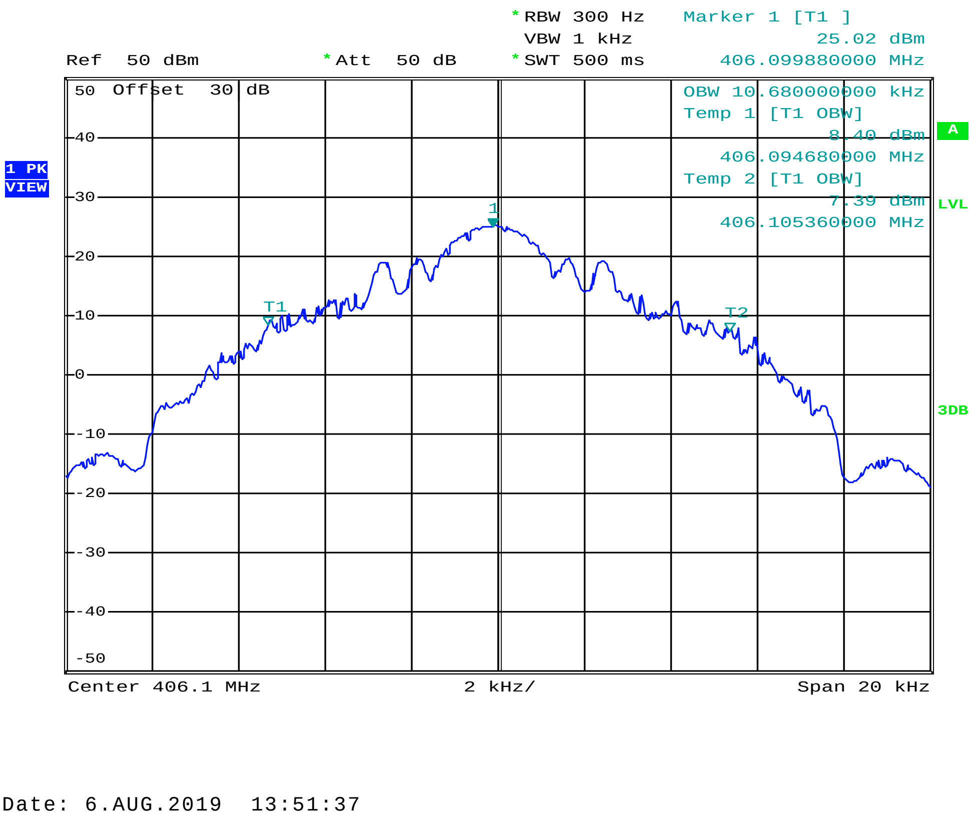


Date: 6.AUG.2019 13:47:47

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

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

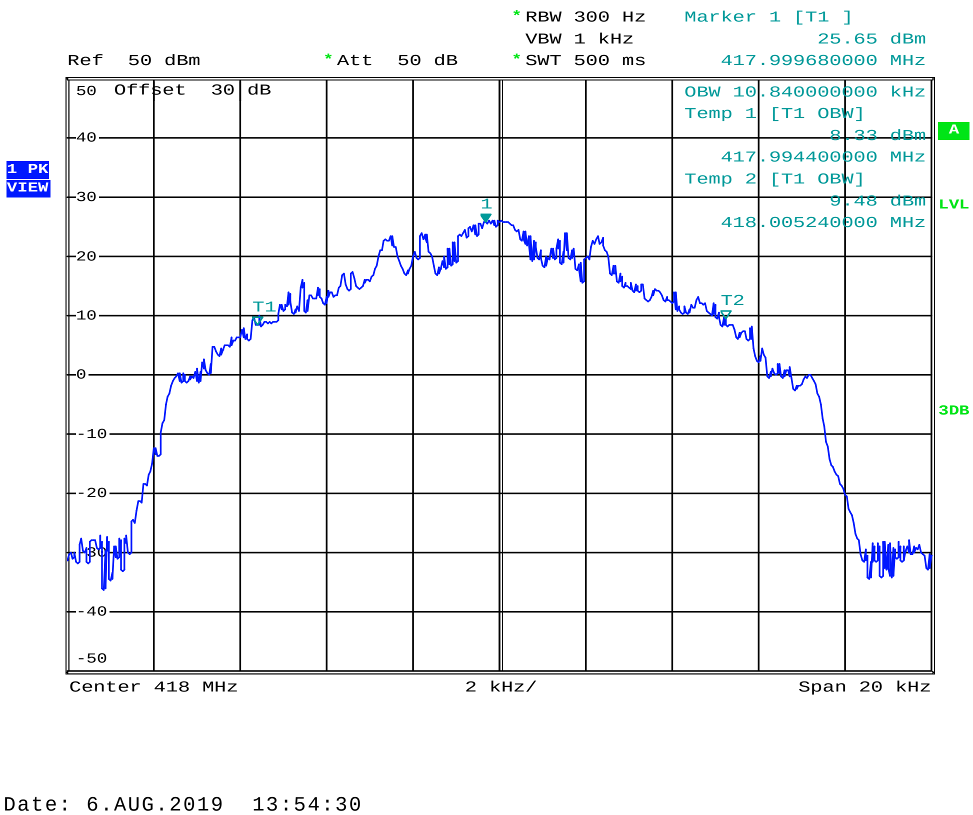
Occupied Bandwidth - Conducted



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

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

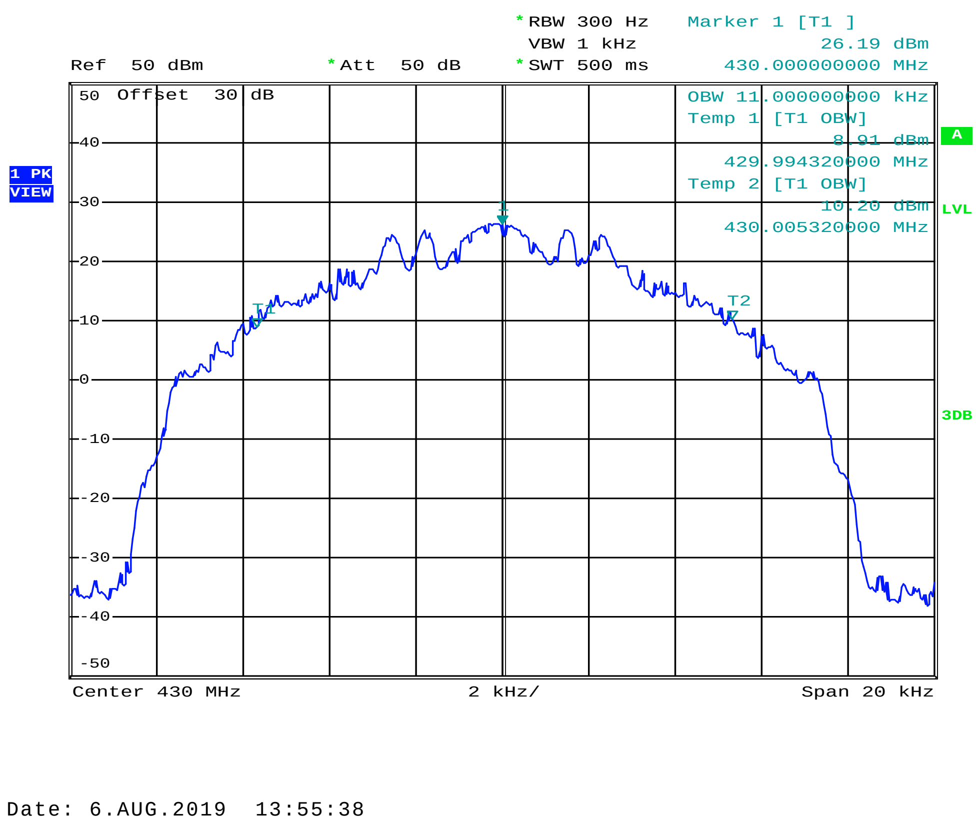
Occupied Bandwidth - Conducted



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

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

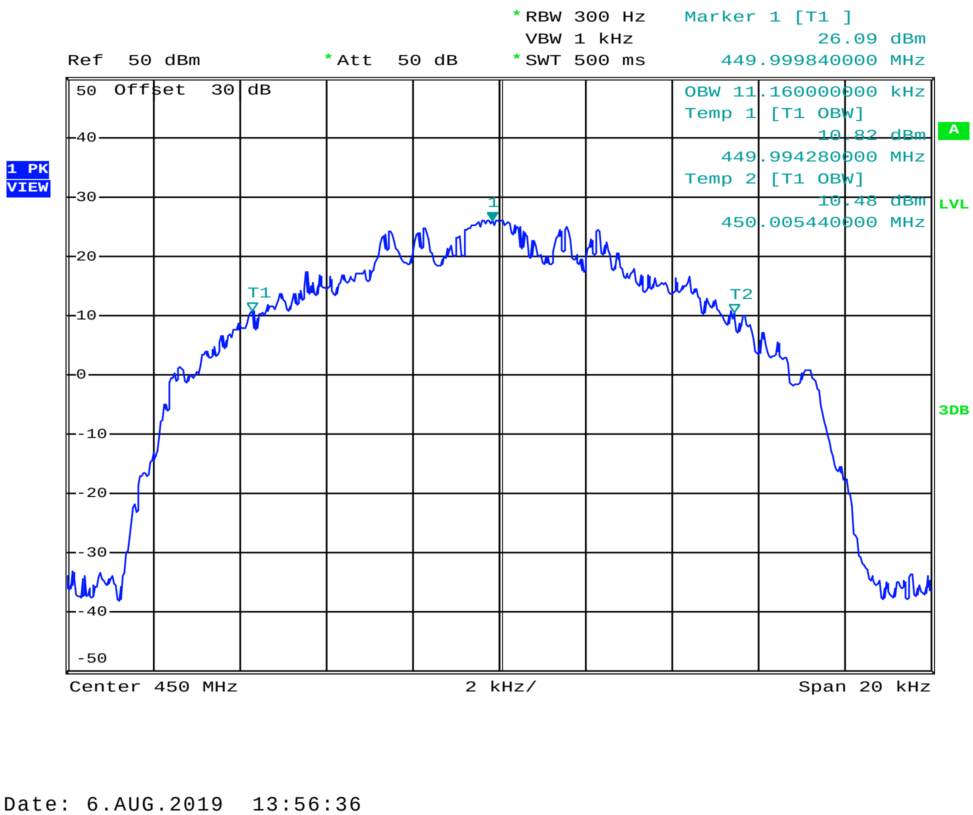
Occupied Bandwidth - Conducted



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

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

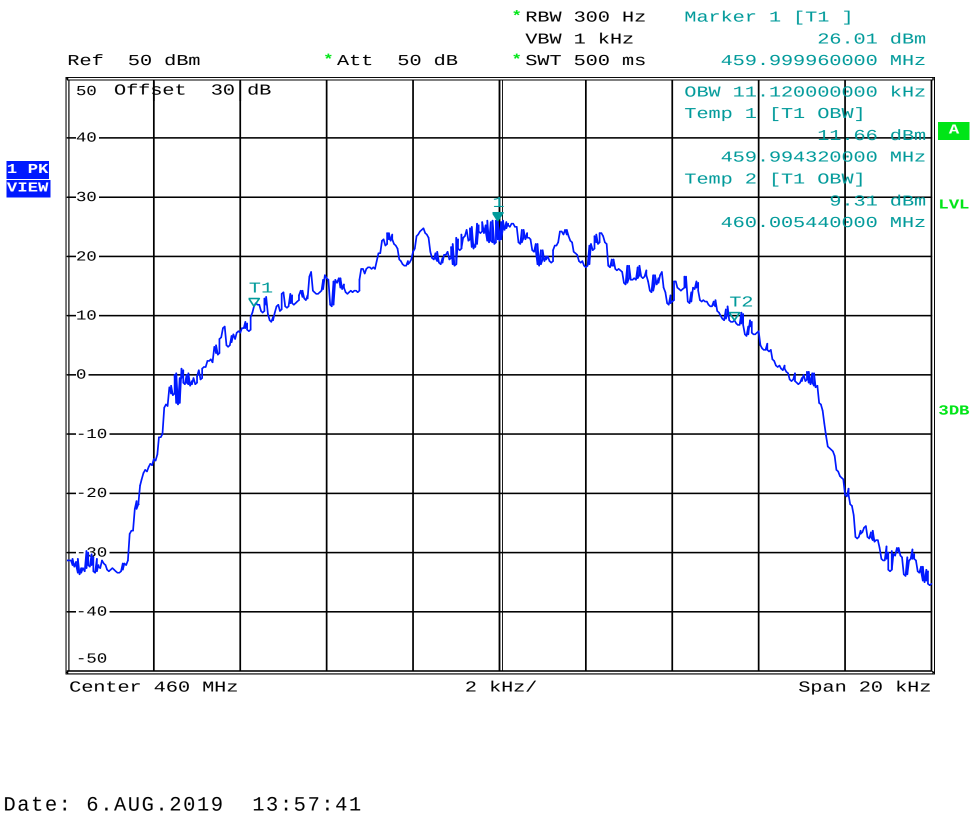
Occupied Bandwidth - Conducted



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

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

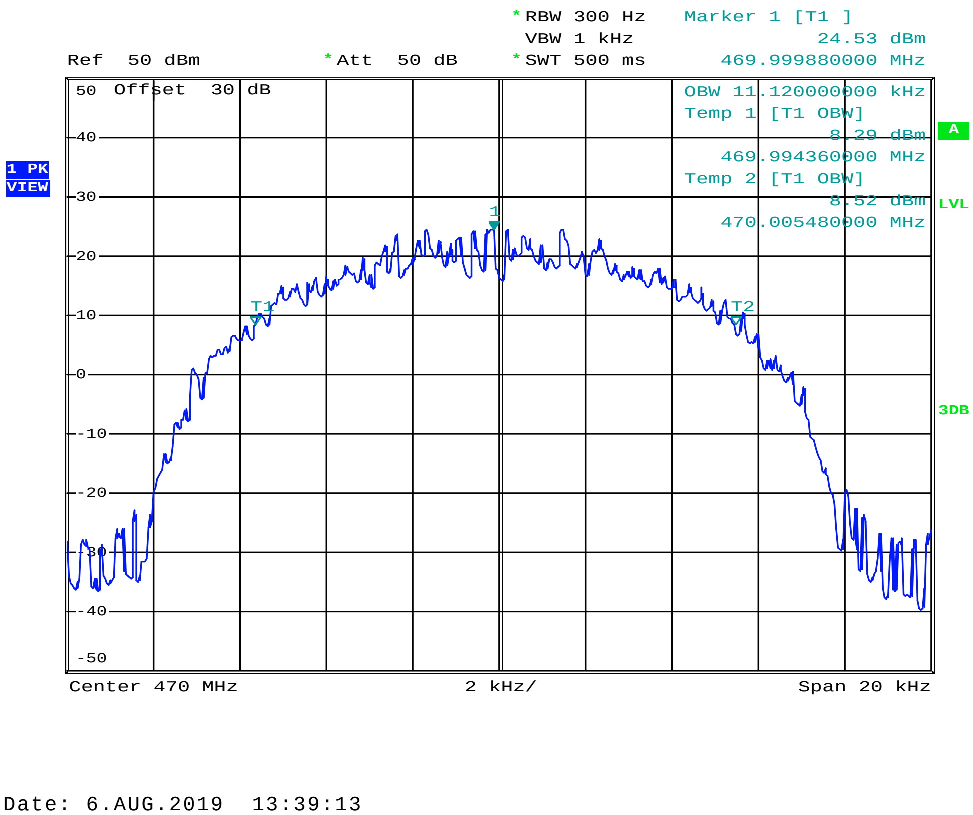
Occupied Bandwidth - Conducted



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

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

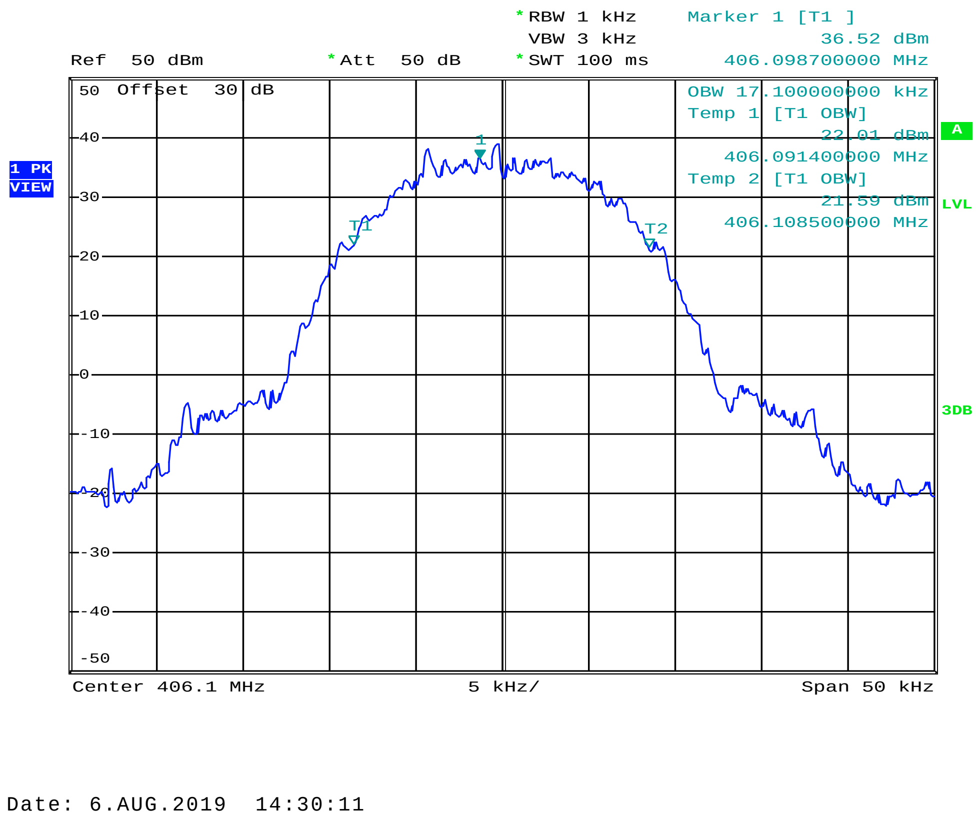
Occupied Bandwidth - Conducted



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

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

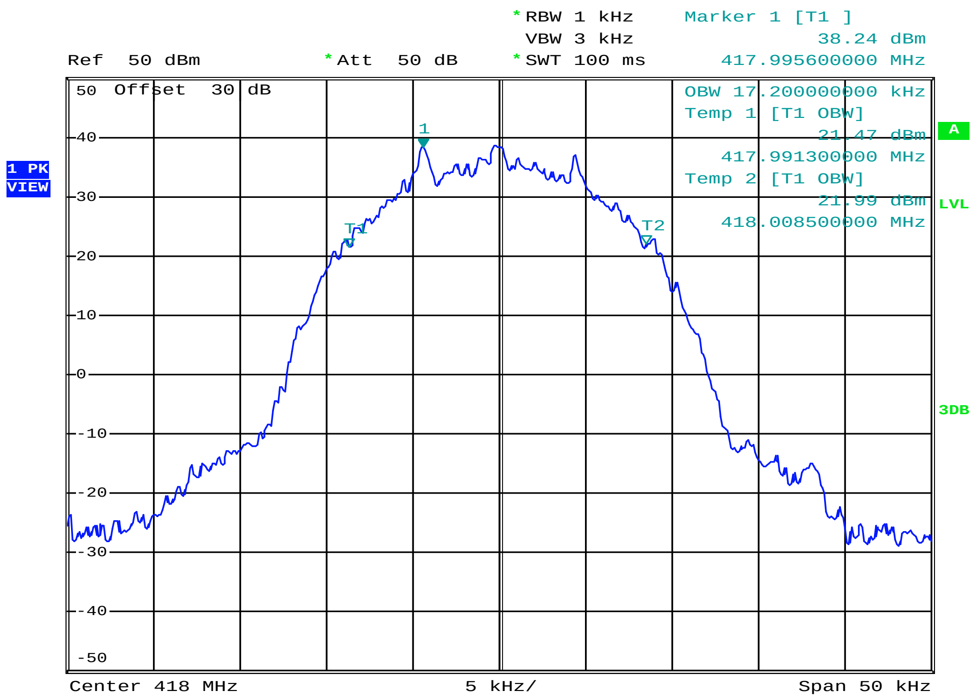
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

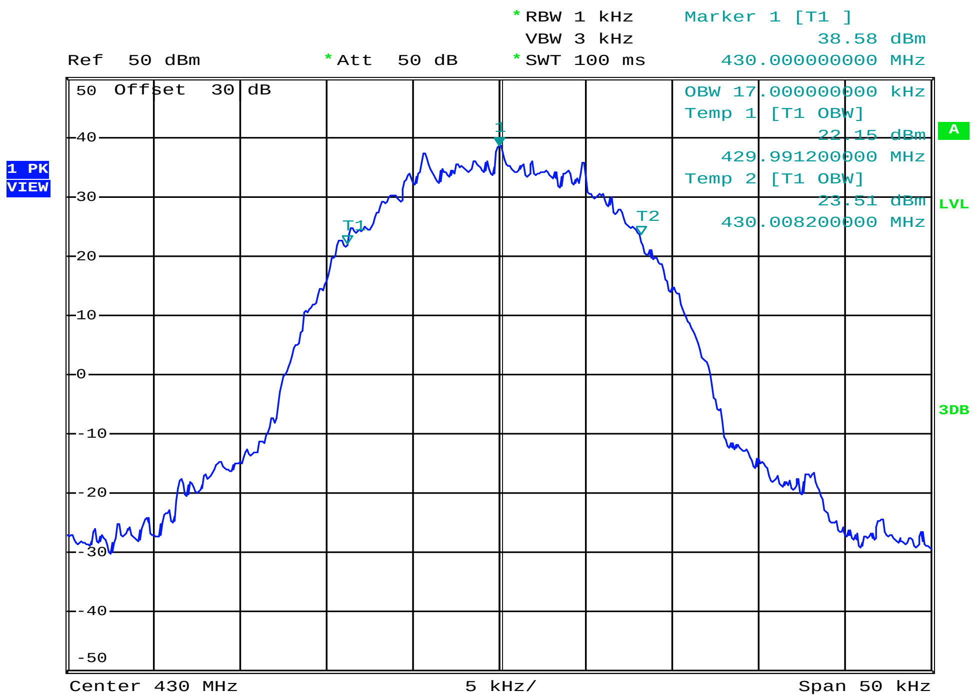


Date: 6.AUG.2019 15:16:33

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

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

Occupied Bandwidth - Conducted

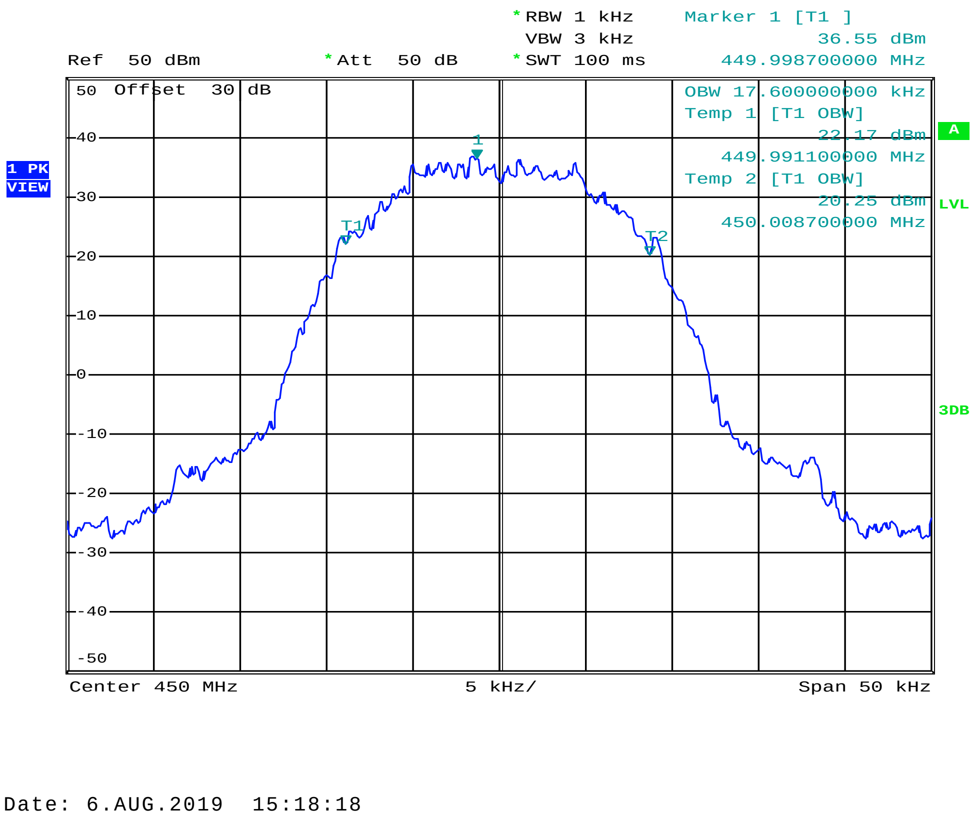


Date: 6.AUG.2019 15:17:34

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

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

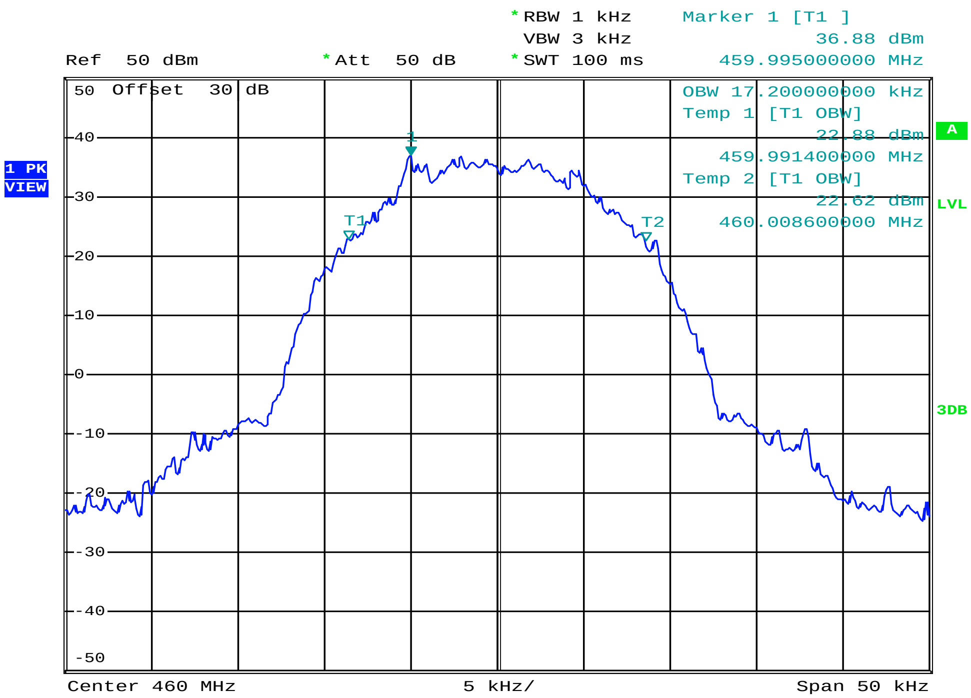
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

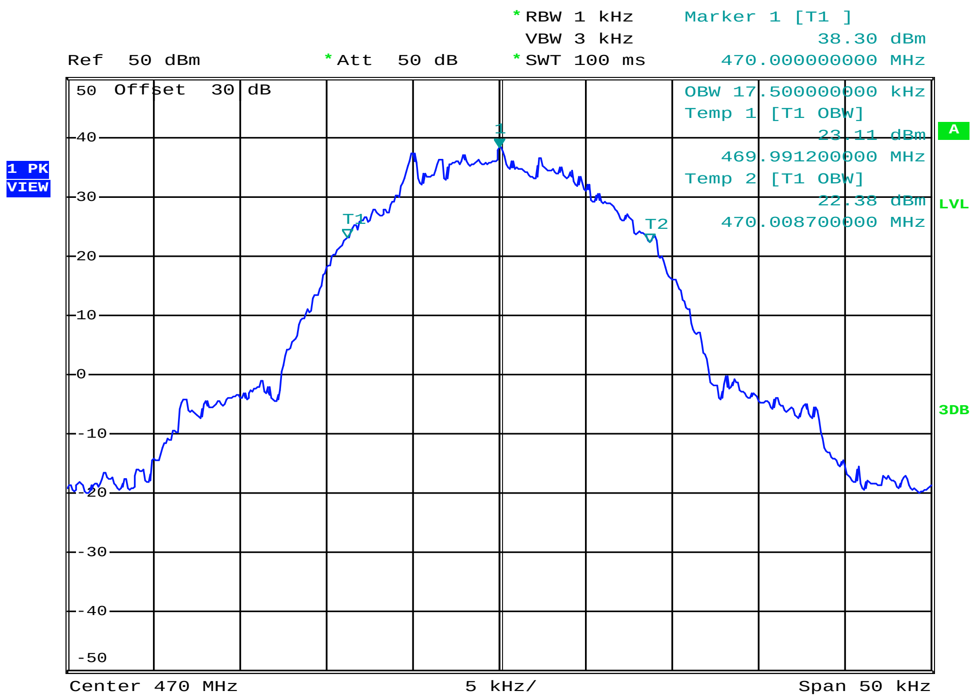


Date: 6.AUG.2019 15:19:01

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

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

Occupied Bandwidth - Conducted

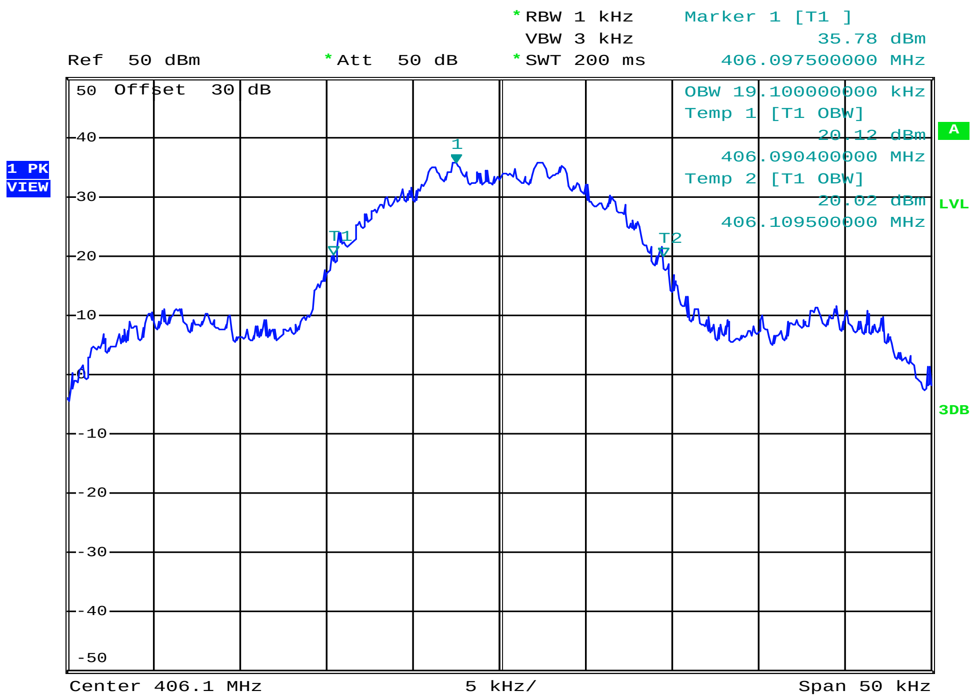


Date: 6.AUG.2019 15:19:45

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

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

Occupied Bandwidth - Conducted

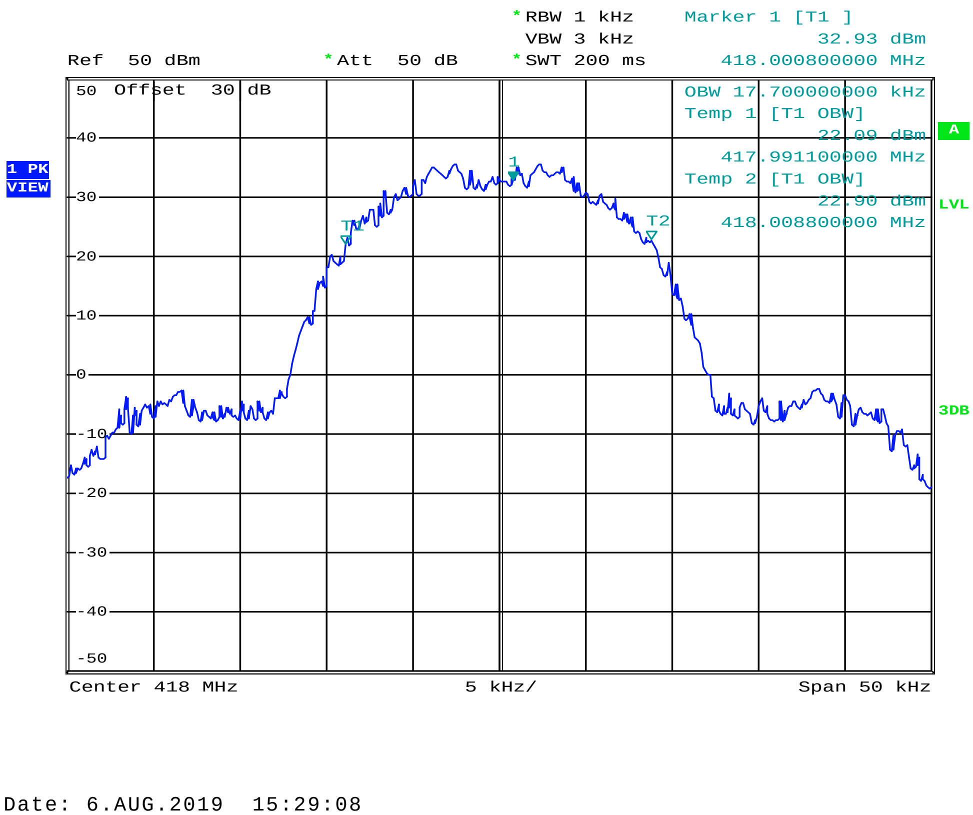


Date: 6.AUG.2019 15:30:10

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

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

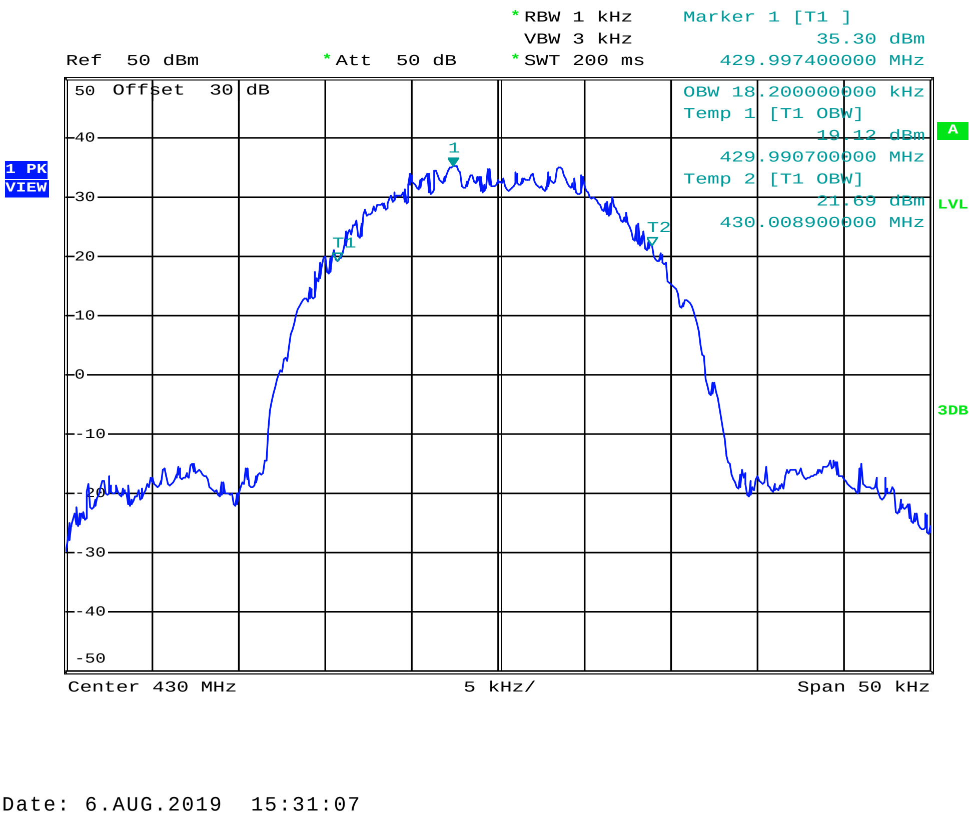
Occupied Bandwidth - Conducted



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

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

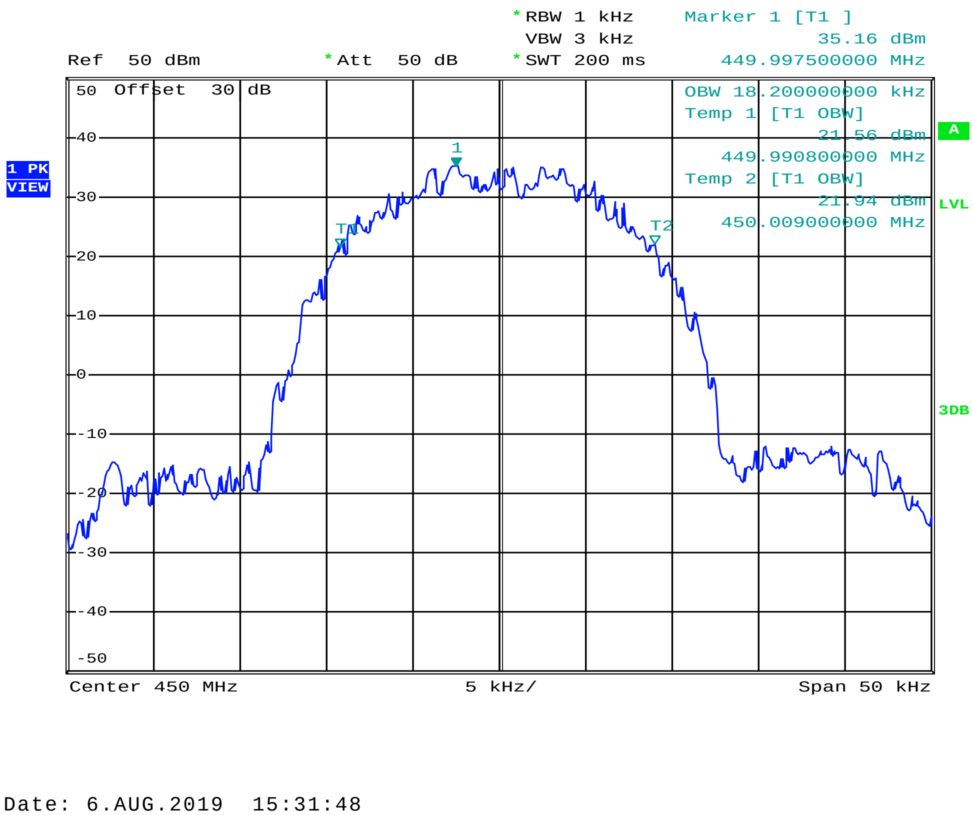
Occupied Bandwidth - Conducted



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

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

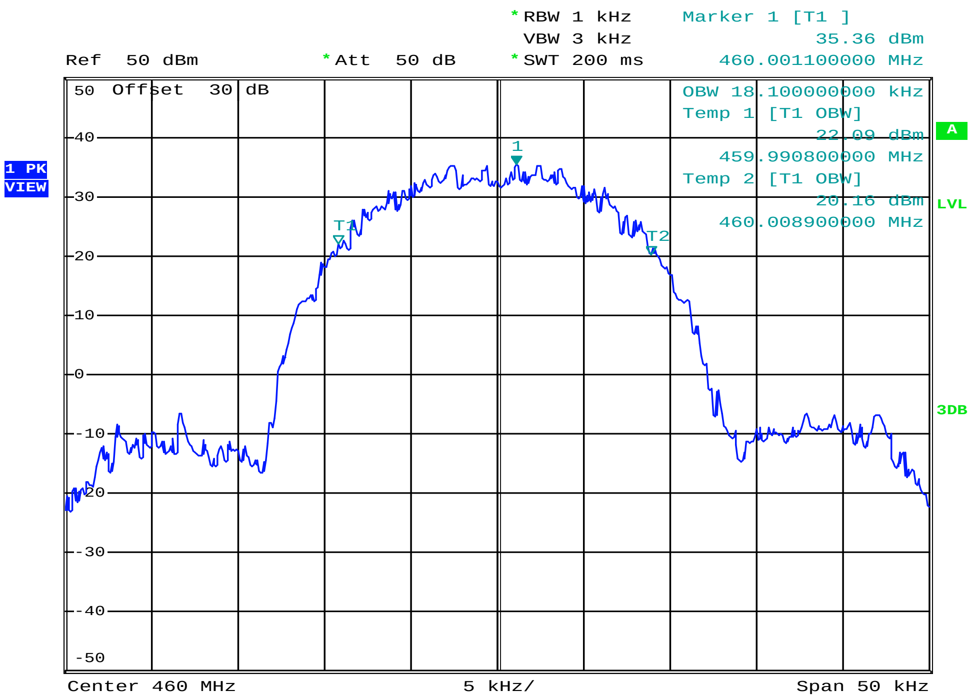
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

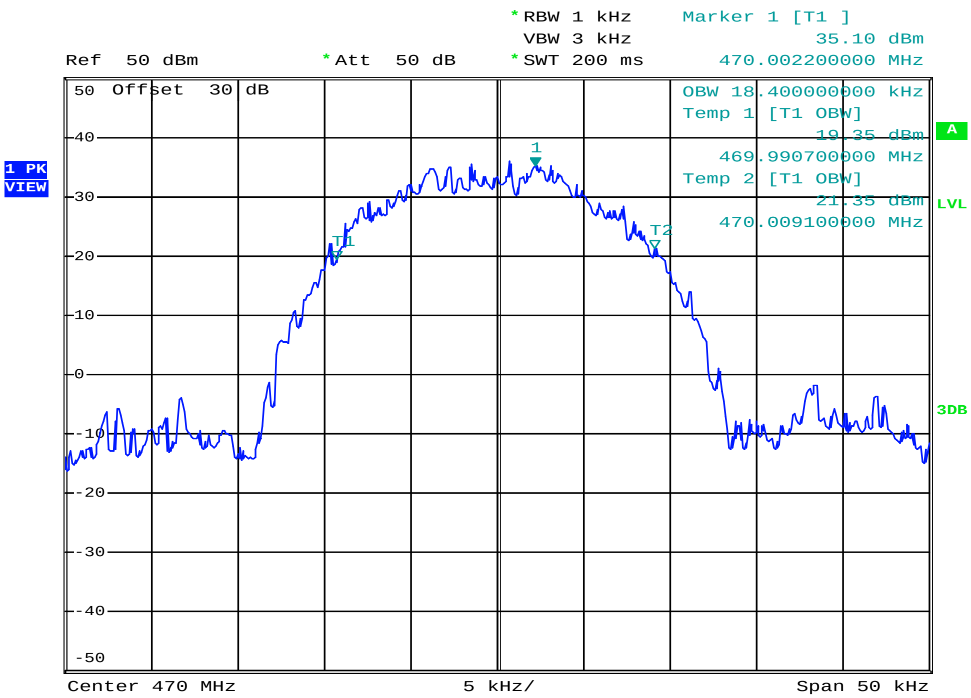


Date: 6.AUG.2019 15:32:31

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

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

Occupied Bandwidth - Conducted

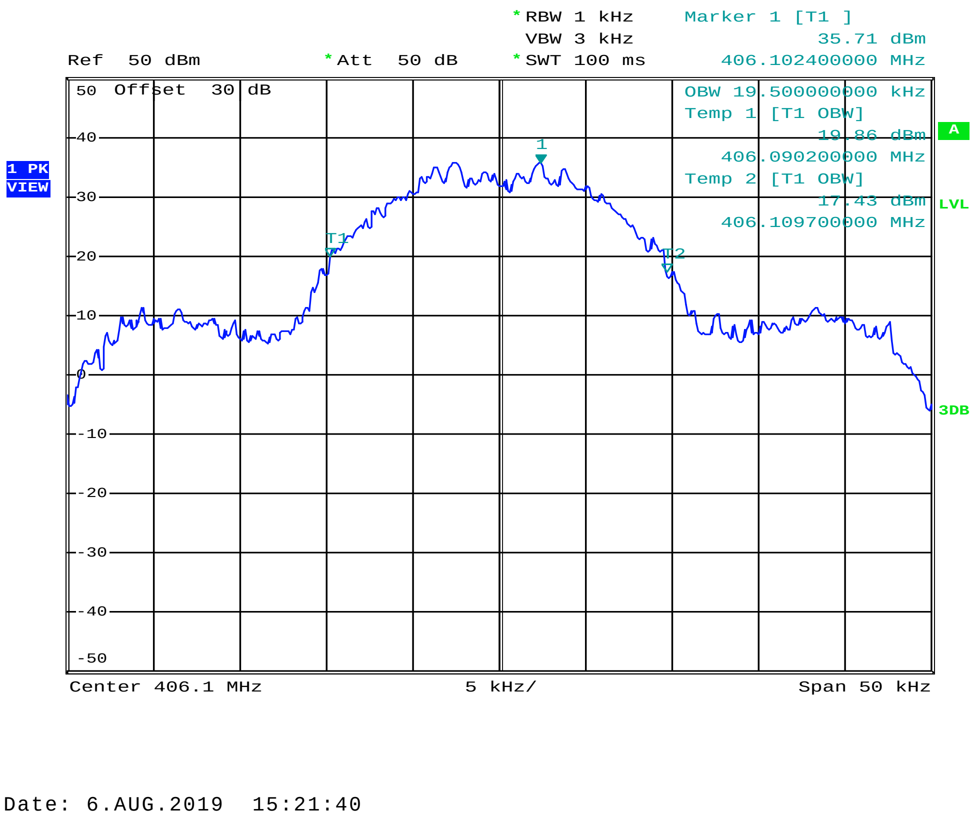


Date: 6.AUG.2019 15:33:38

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

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

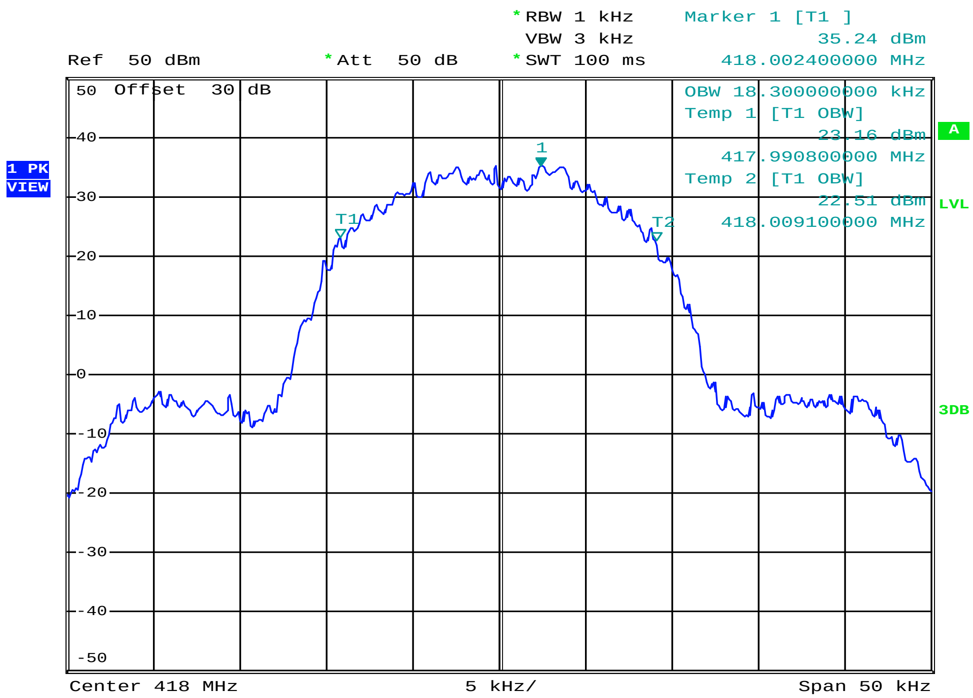
Occupied Bandwidth - Conducted



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

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

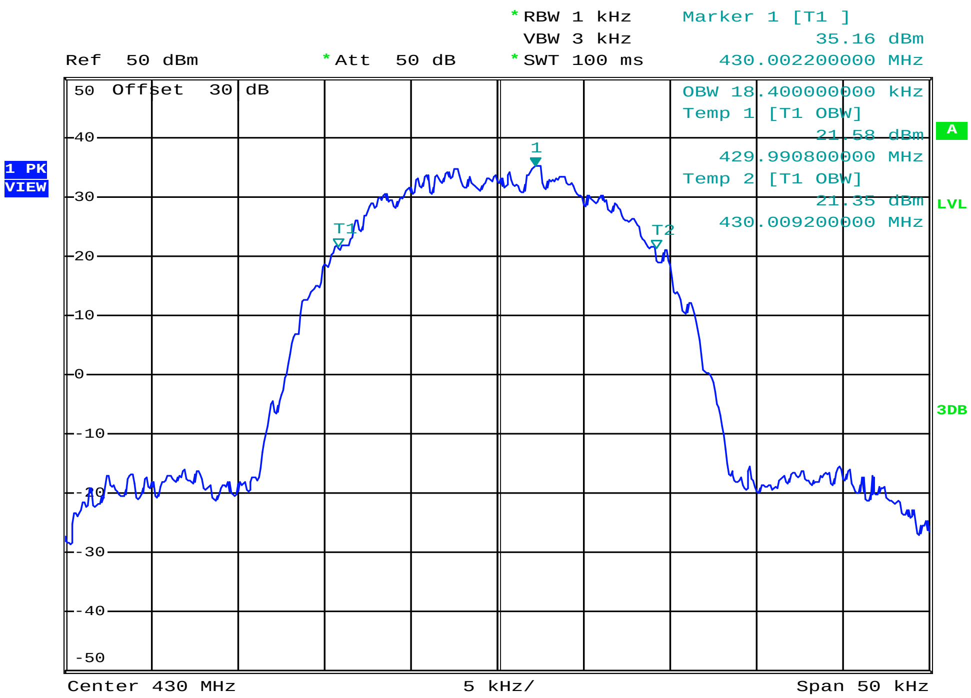
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

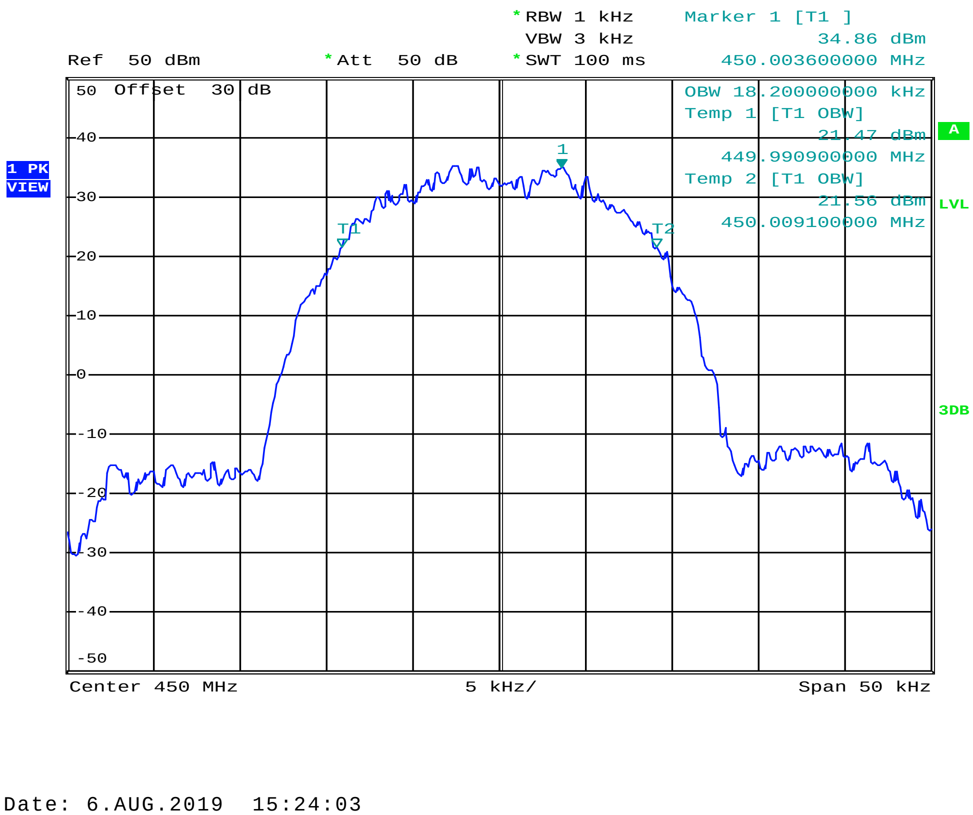


Date: 6.AUG.2019 15:23:16

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

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

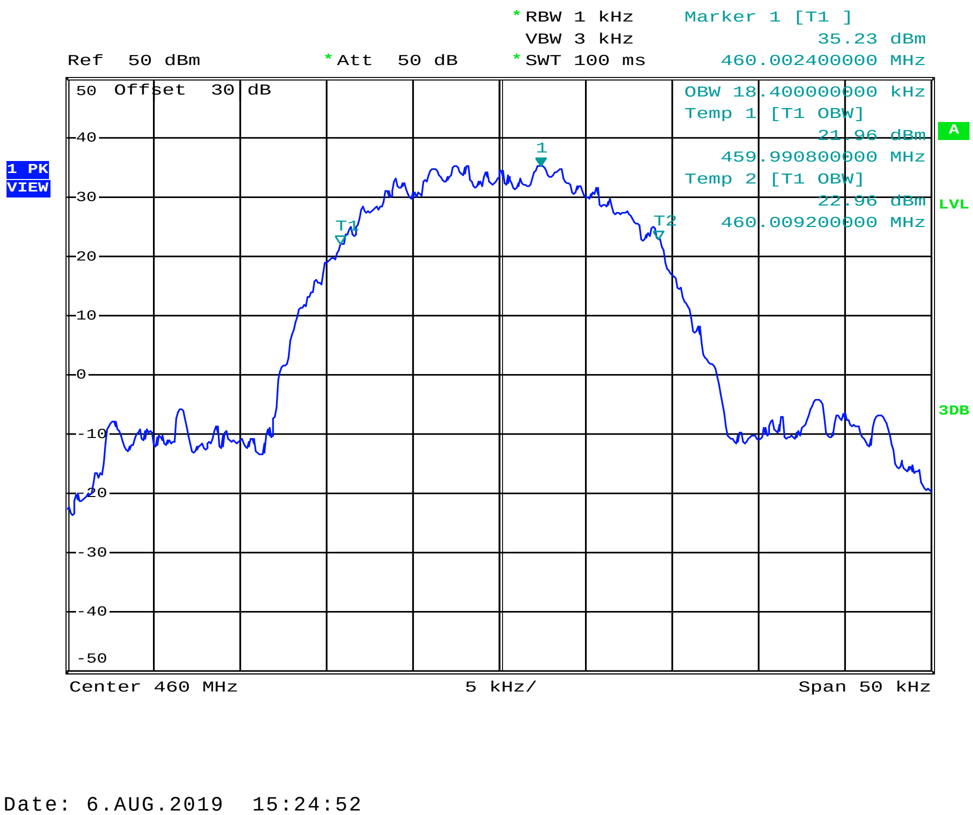
Occupied Bandwidth - Conducted



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

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

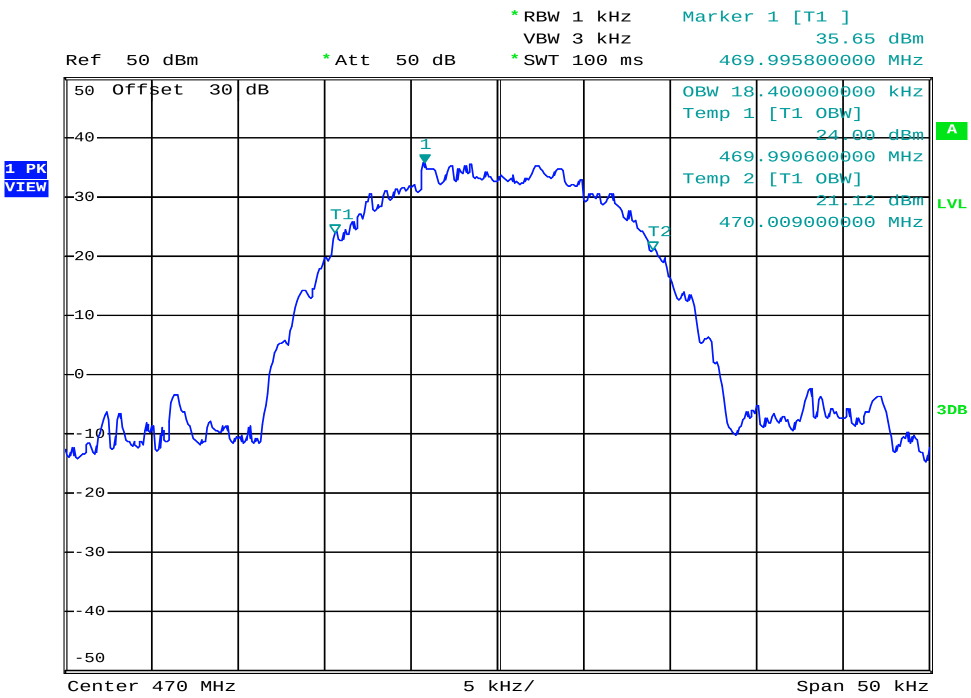
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

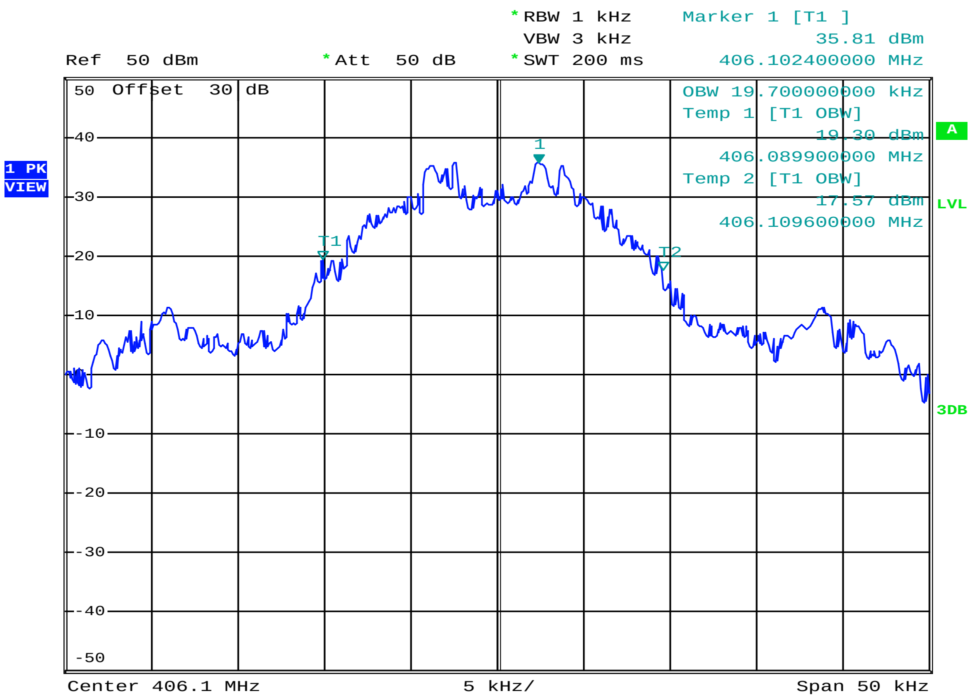


Date: 6.AUG.2019 15:25:34

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

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

Occupied Bandwidth - Conducted

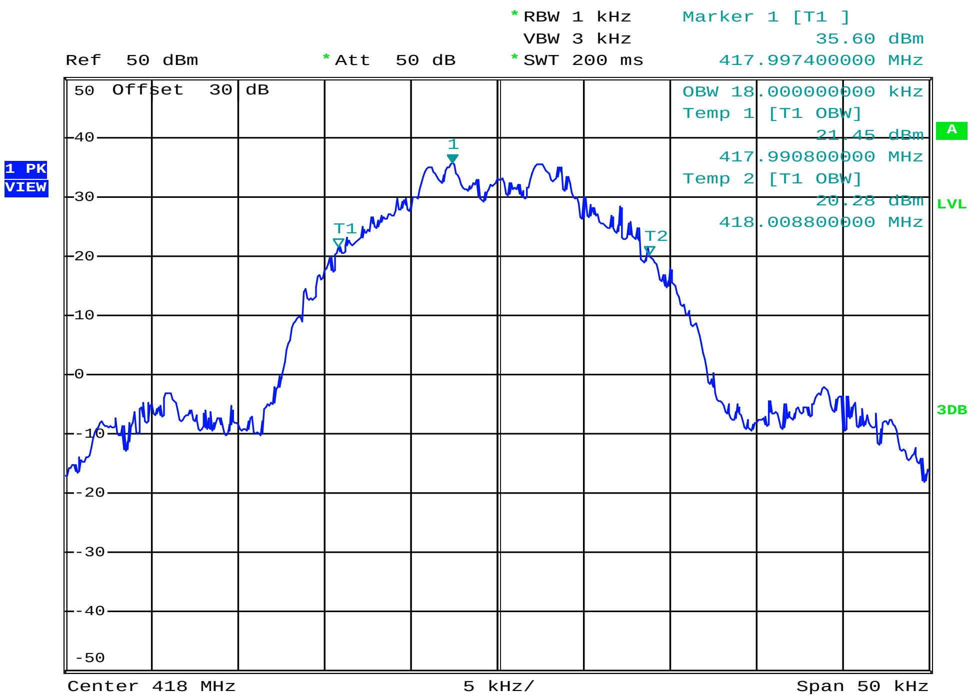


Date: 6.AUG.2019 15:35:20

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

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

Occupied Bandwidth - Conducted

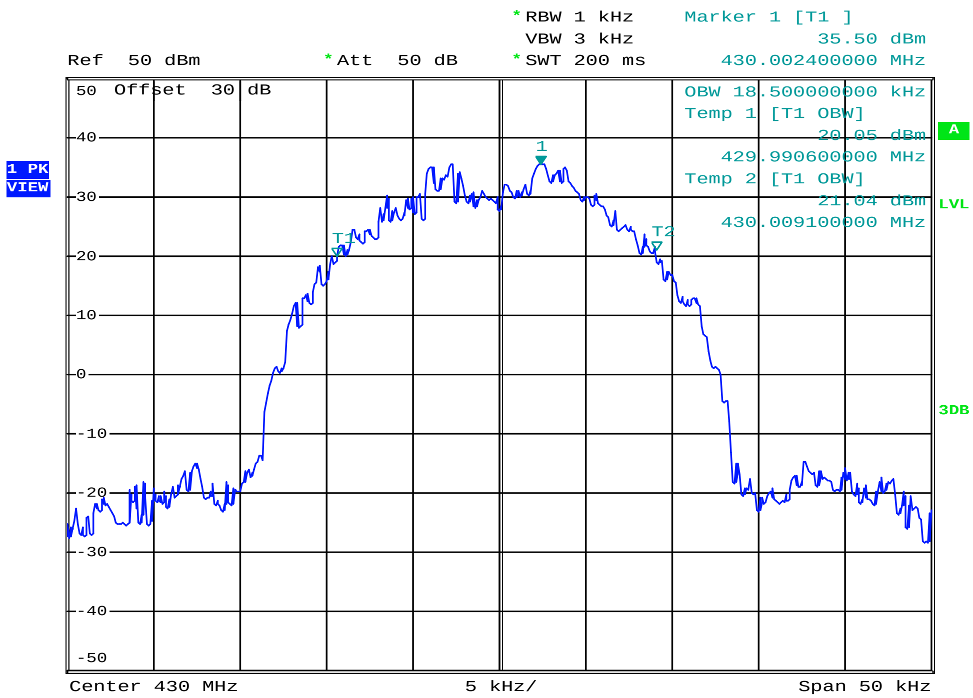


Date: 6.AUG.2019 15:36:10

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

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

Occupied Bandwidth - Conducted

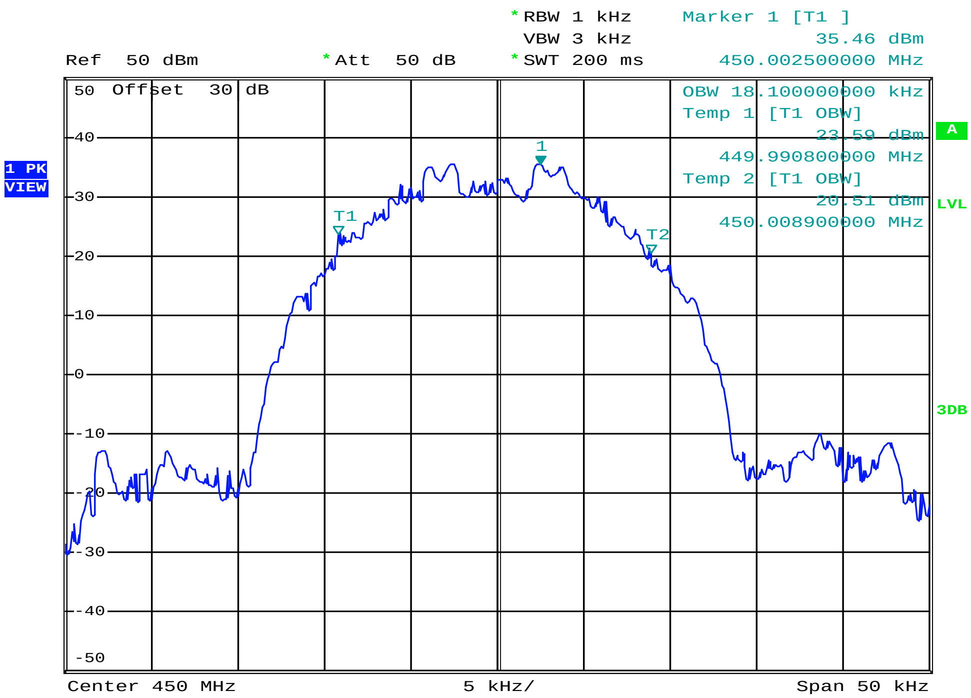


Date: 6.AUG.2019 15:36:50

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

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

Occupied Bandwidth - Conducted

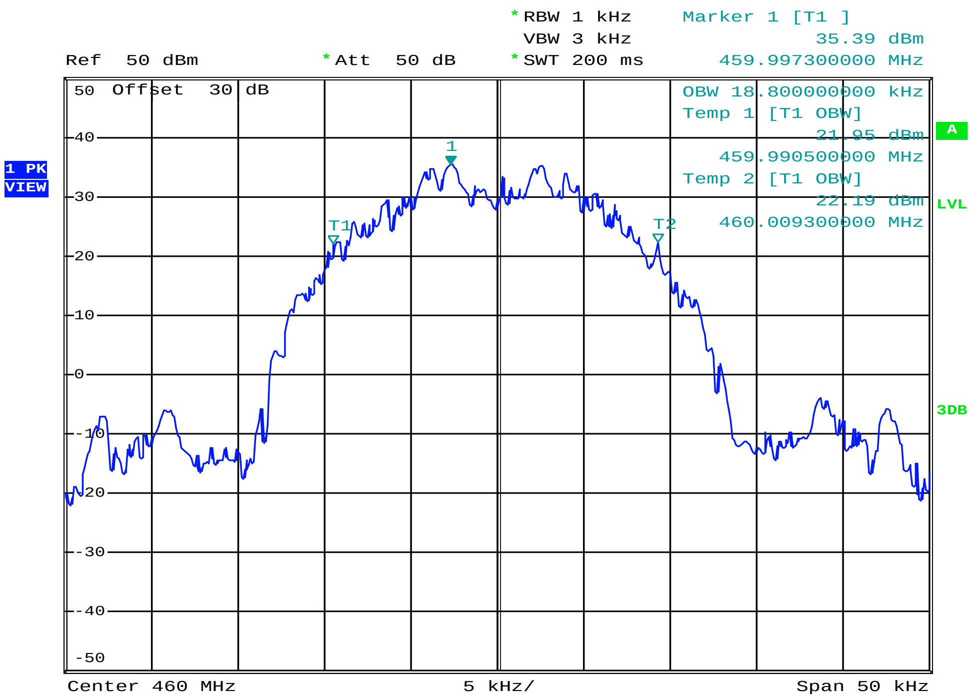


Date: 6.AUG.2019 15:37:37

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

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

Occupied Bandwidth - Conducted

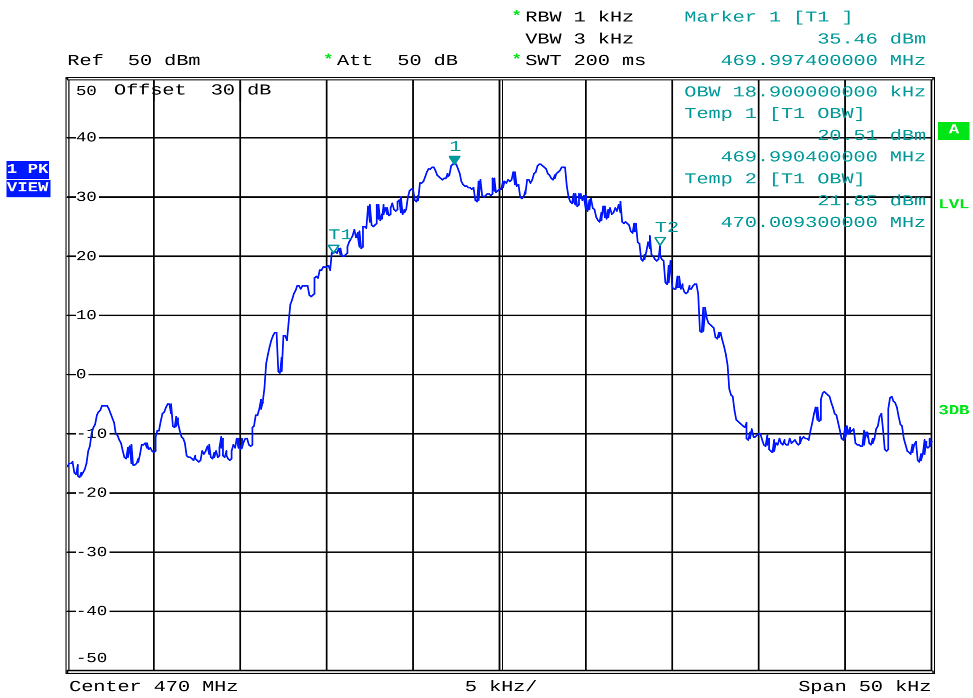


Date: 6.AUG.2019 15:38:24

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

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

Occupied Bandwidth - Conducted

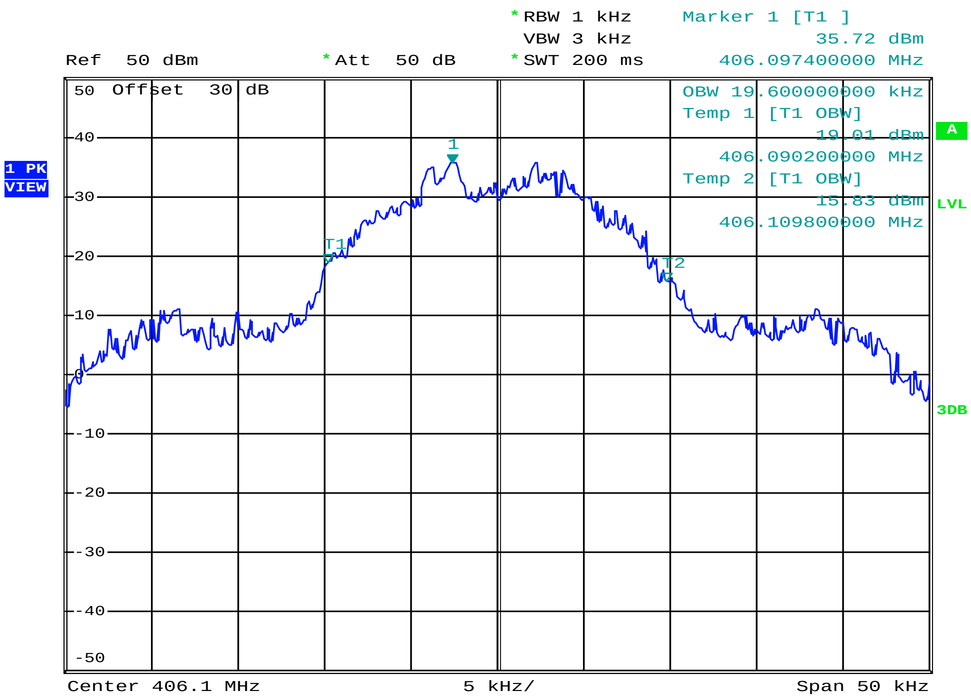


Date: 6.AUG.2019 15:40:12

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

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

Occupied Bandwidth - Conducted

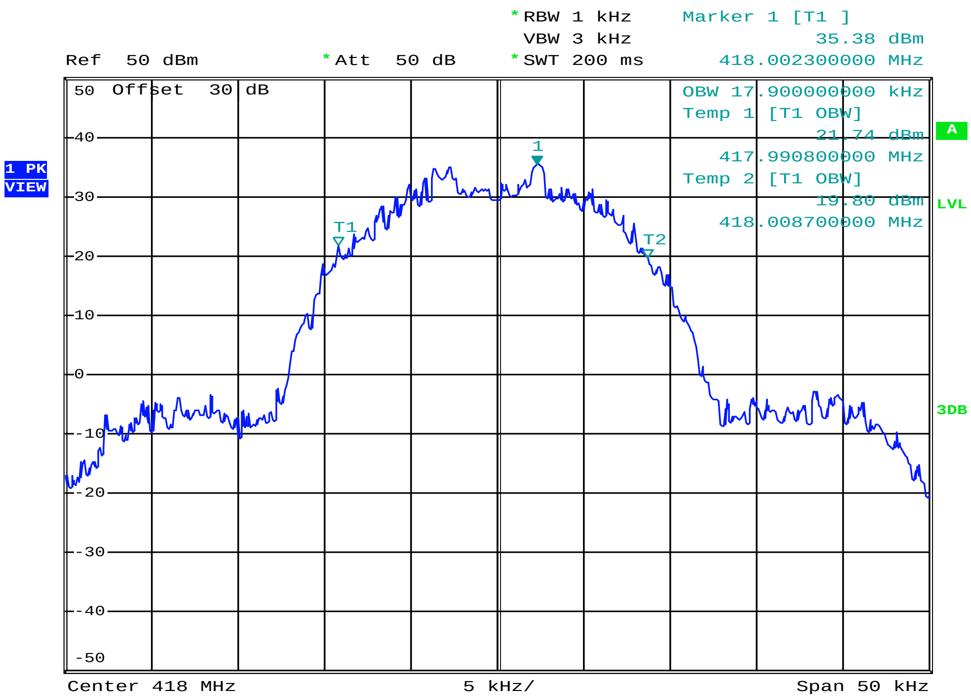


Date: 6.AUG.2019 15:41:16

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

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

Occupied Bandwidth - Conducted

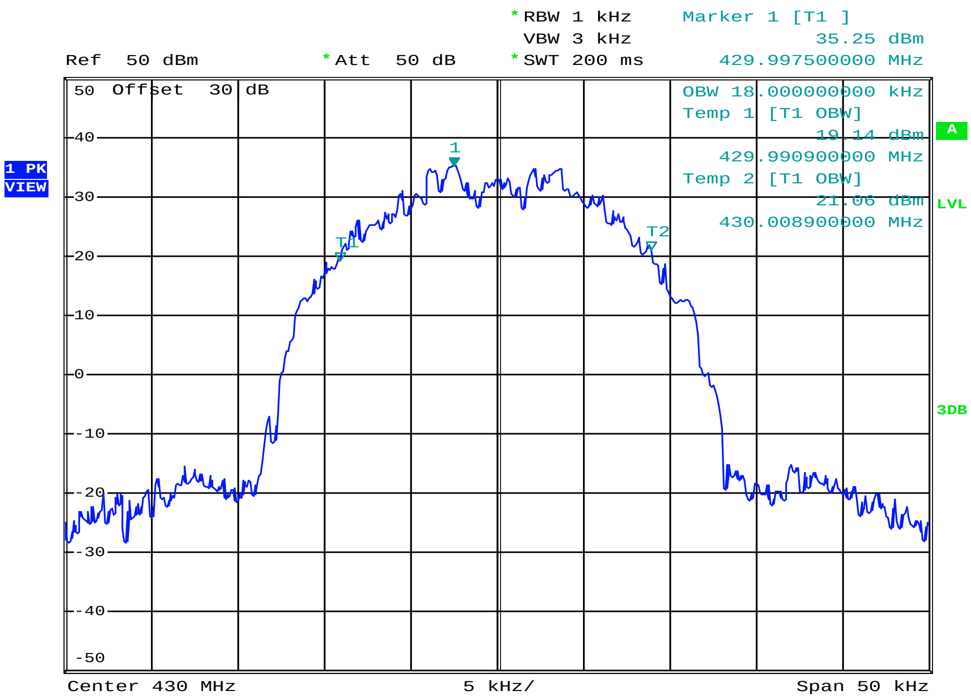


Date: 6.AUG.2019 15:41:59

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

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

Occupied Bandwidth - Conducted

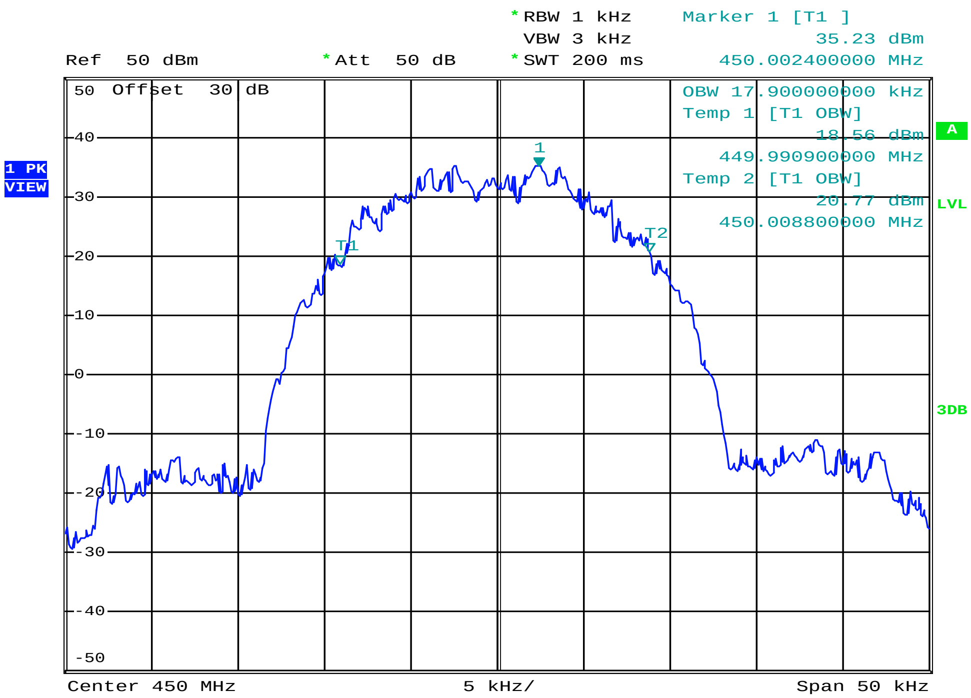


Date: 6.AUG.2019 15:42:39

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

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

Occupied Bandwidth - Conducted

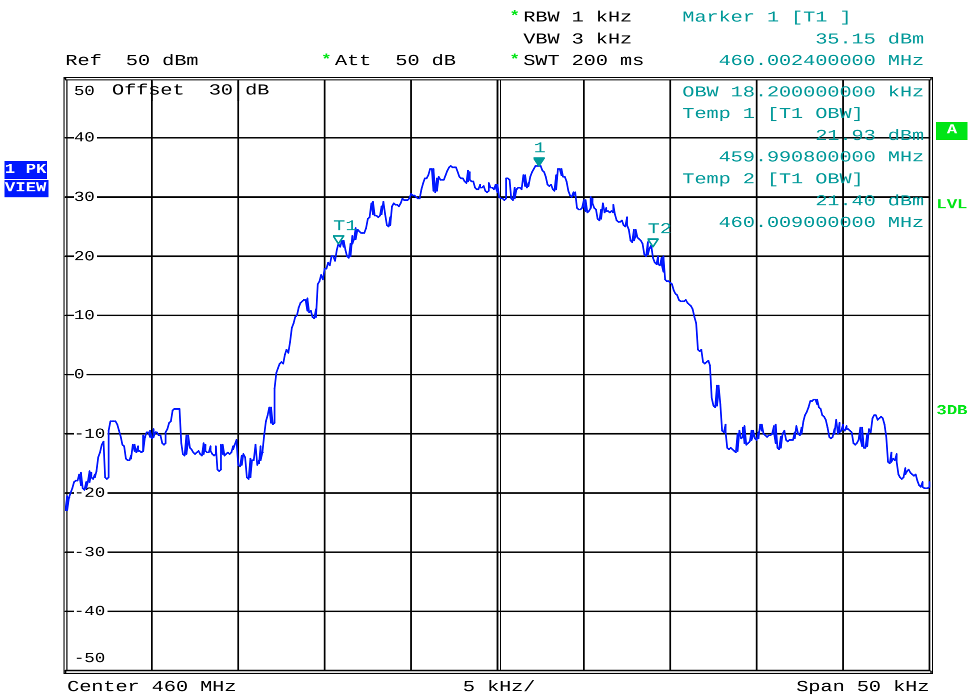


Date: 6.AUG.2019 15:43:25

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

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

Occupied Bandwidth - Conducted

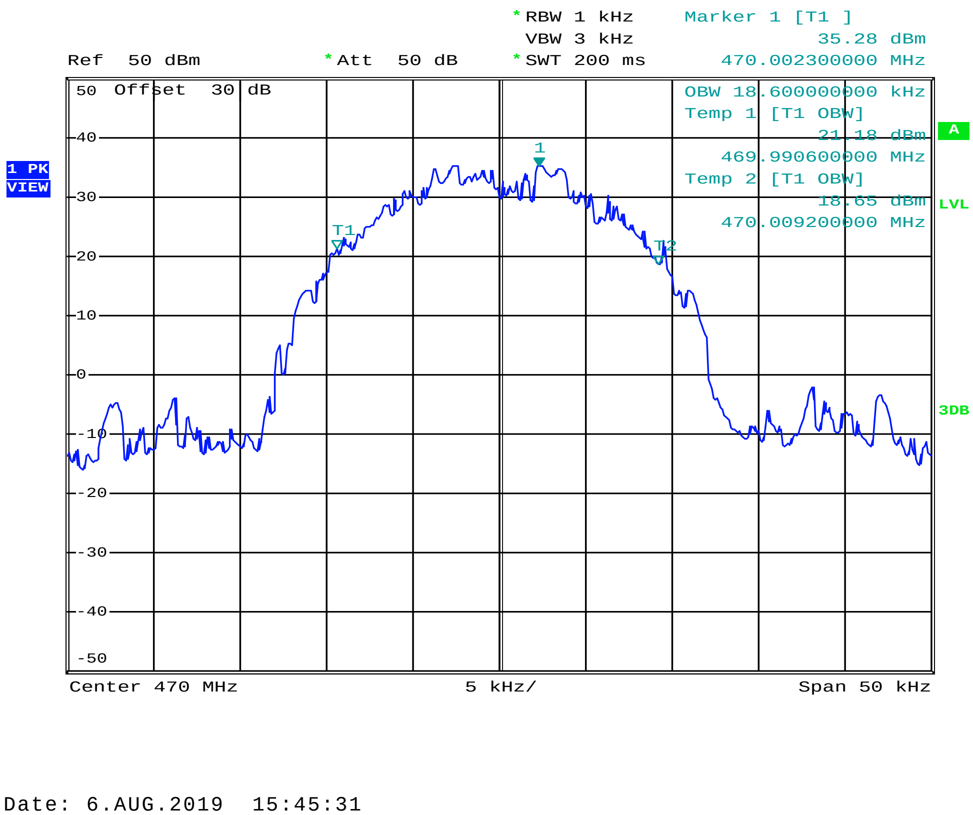


Date: 6.AUG.2019 15:44:04

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

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

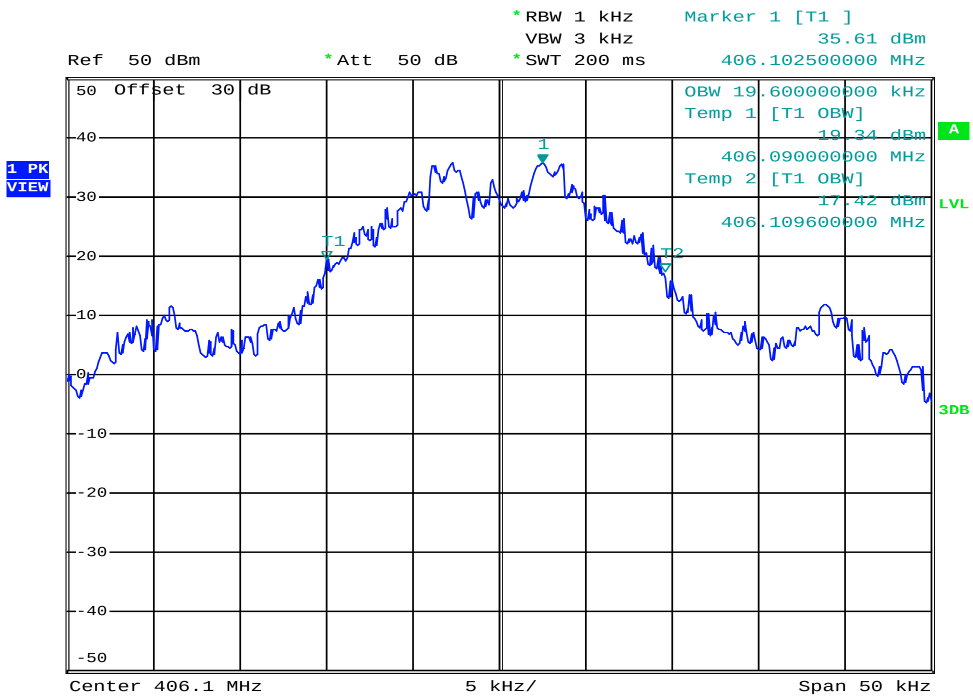
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

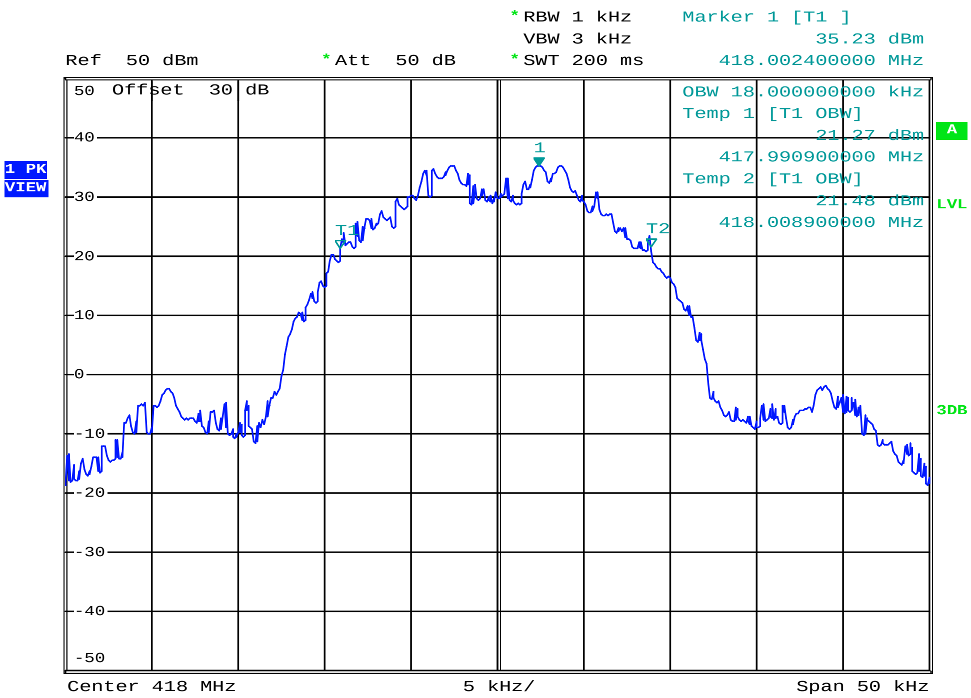


Date: 6.AUG.2019 15:46:54

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

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

Occupied Bandwidth - Conducted

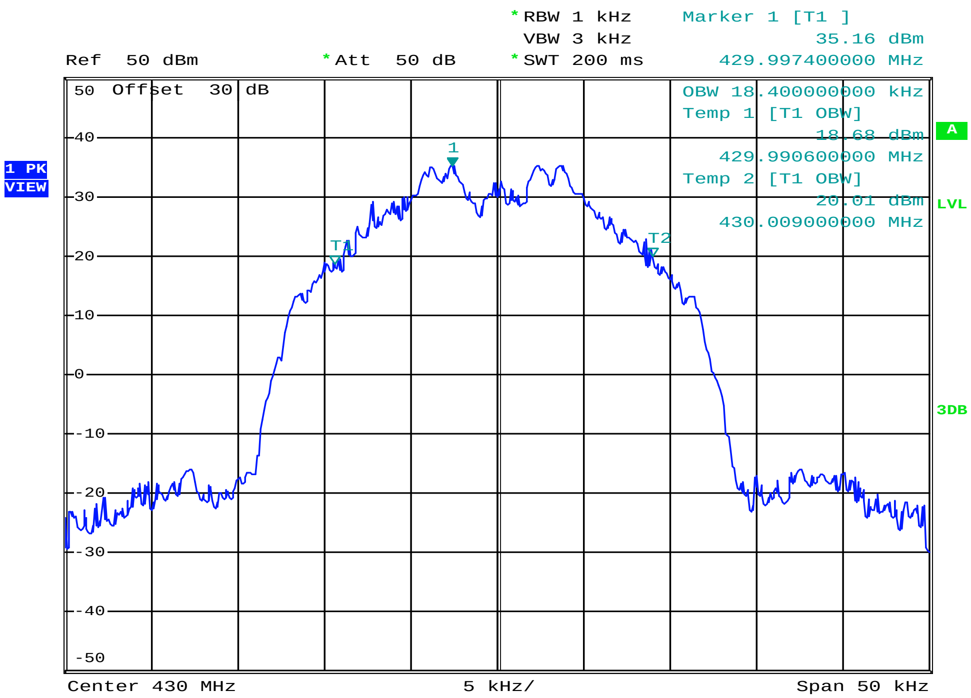


Date: 6.AUG.2019 15:47:41

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

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

Occupied Bandwidth - Conducted

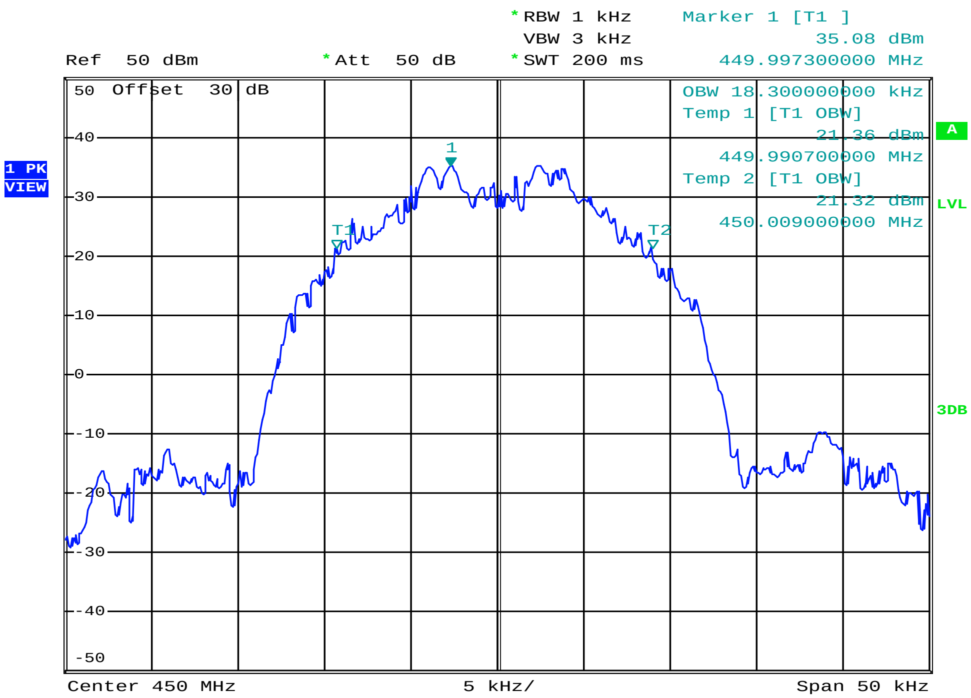


Date: 6.AUG.2019 15:48:21

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

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

Occupied Bandwidth - Conducted

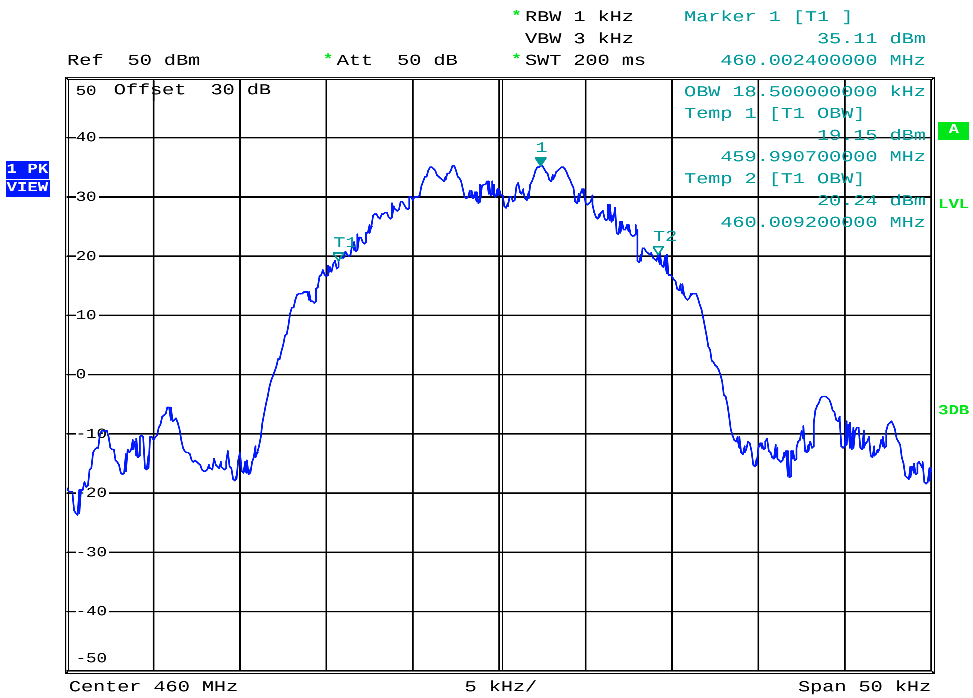


Date: 6.AUG.2019 15:49:10

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

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

Occupied Bandwidth - Conducted

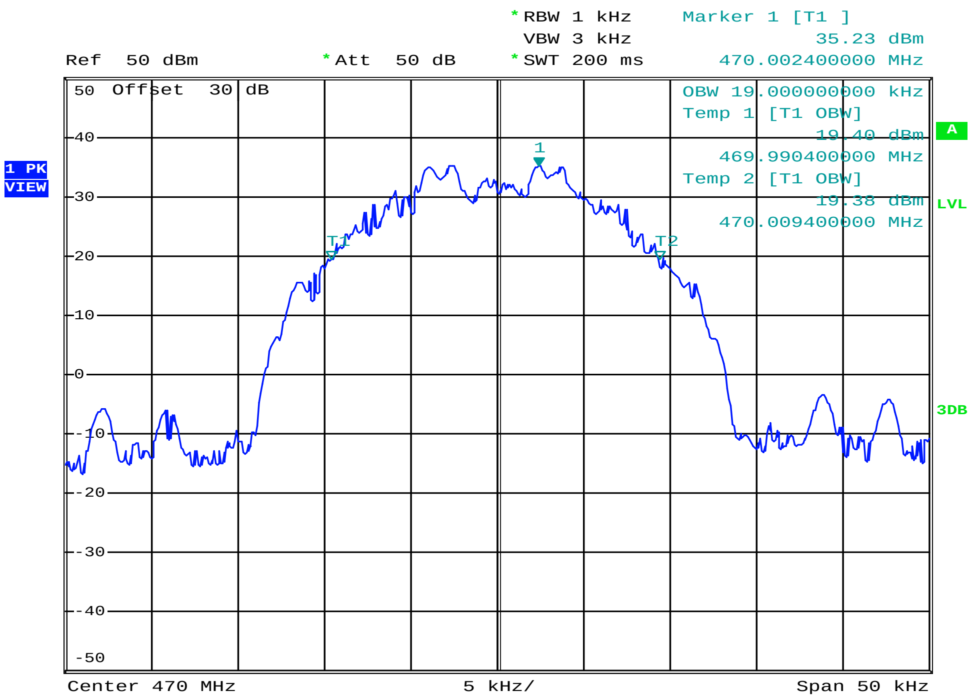


Date: 6.AUG.2019 15:49:56

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

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

Occupied Bandwidth - Conducted

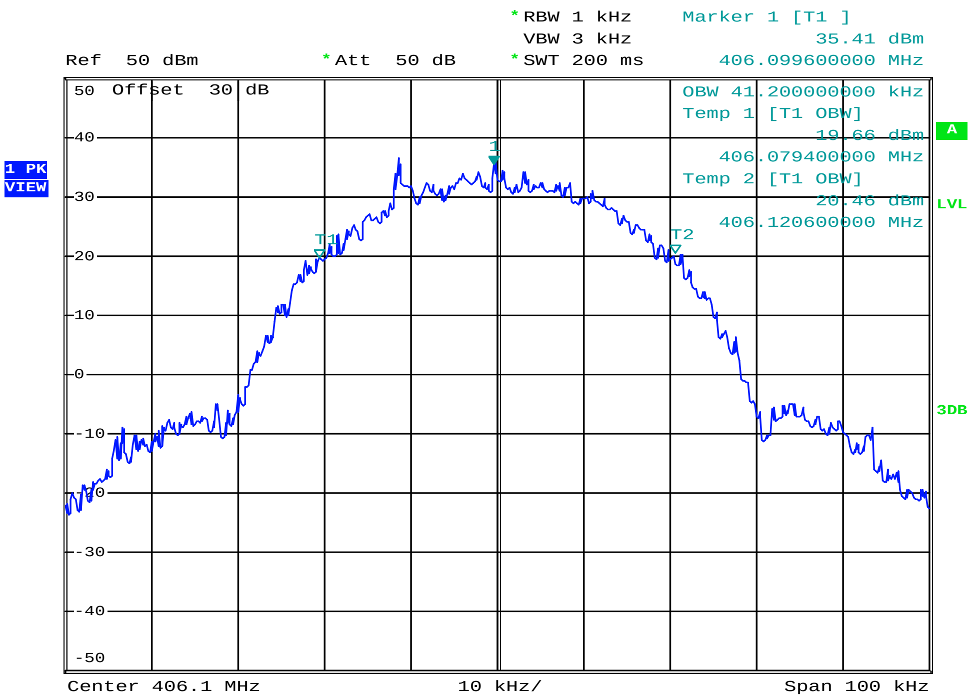


Date: 6.AUG.2019 15:50:47

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

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

Occupied Bandwidth - Conducted

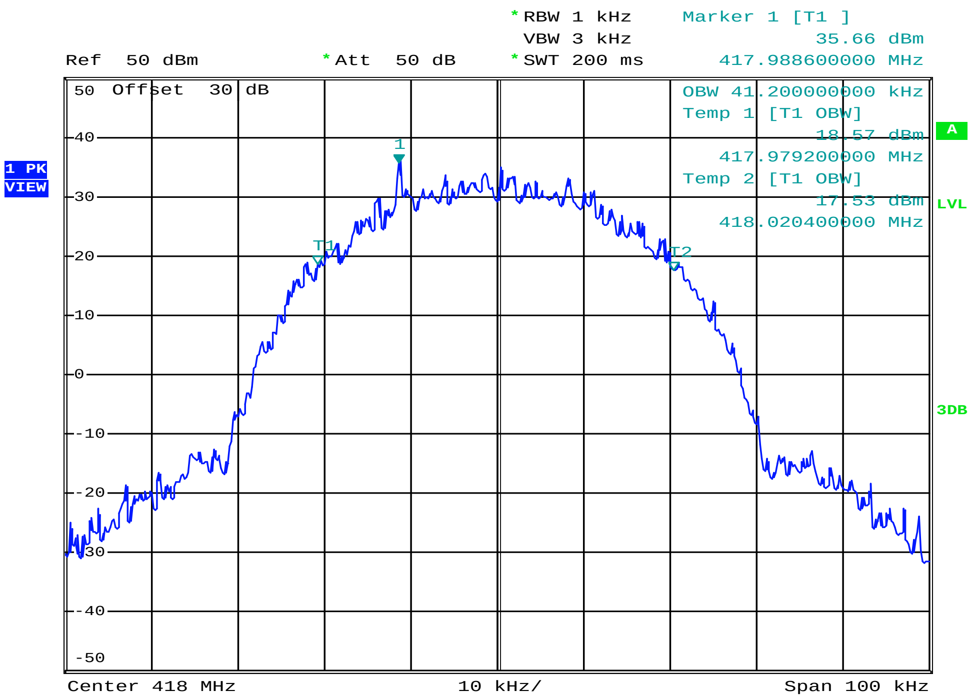


Date: 6.AUG.2019 16:08:08

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

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

Occupied Bandwidth - Conducted

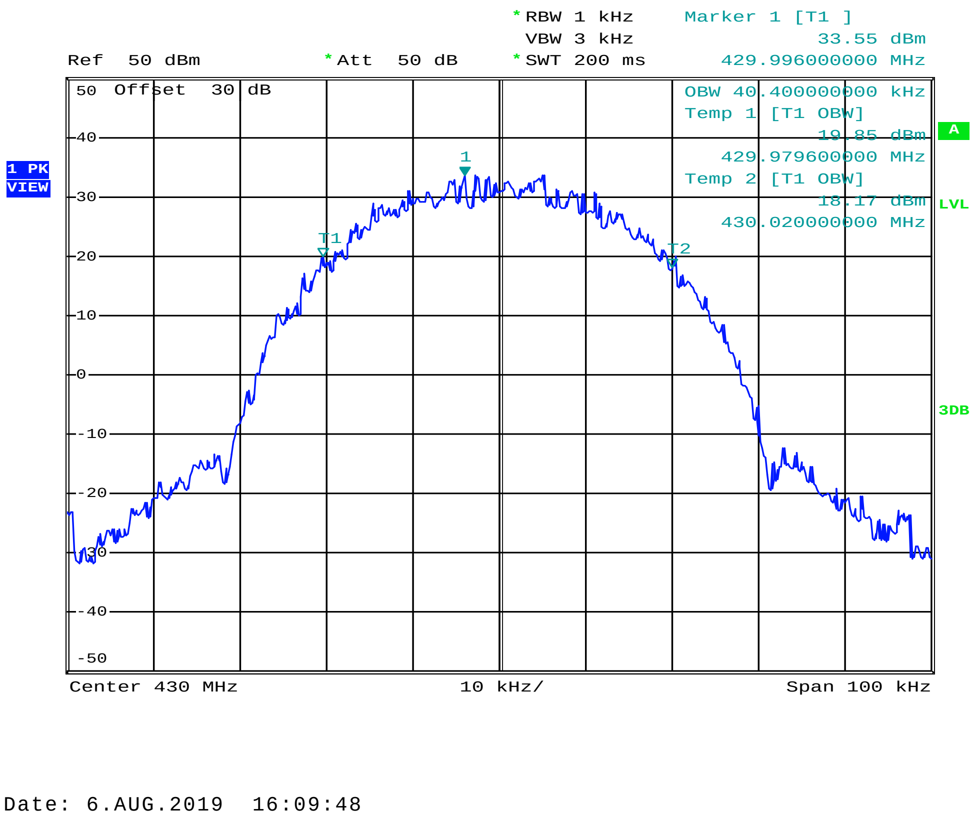


Date: 6.AUG.2019 16:09:04

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

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

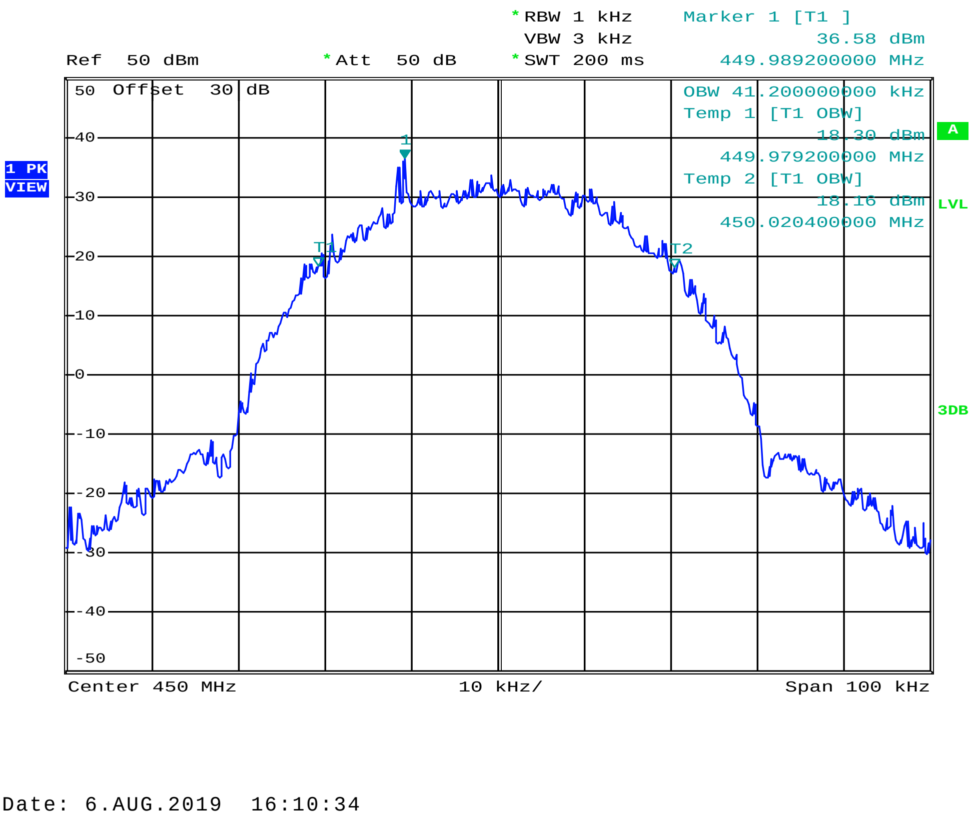
Occupied Bandwidth - Conducted



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

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

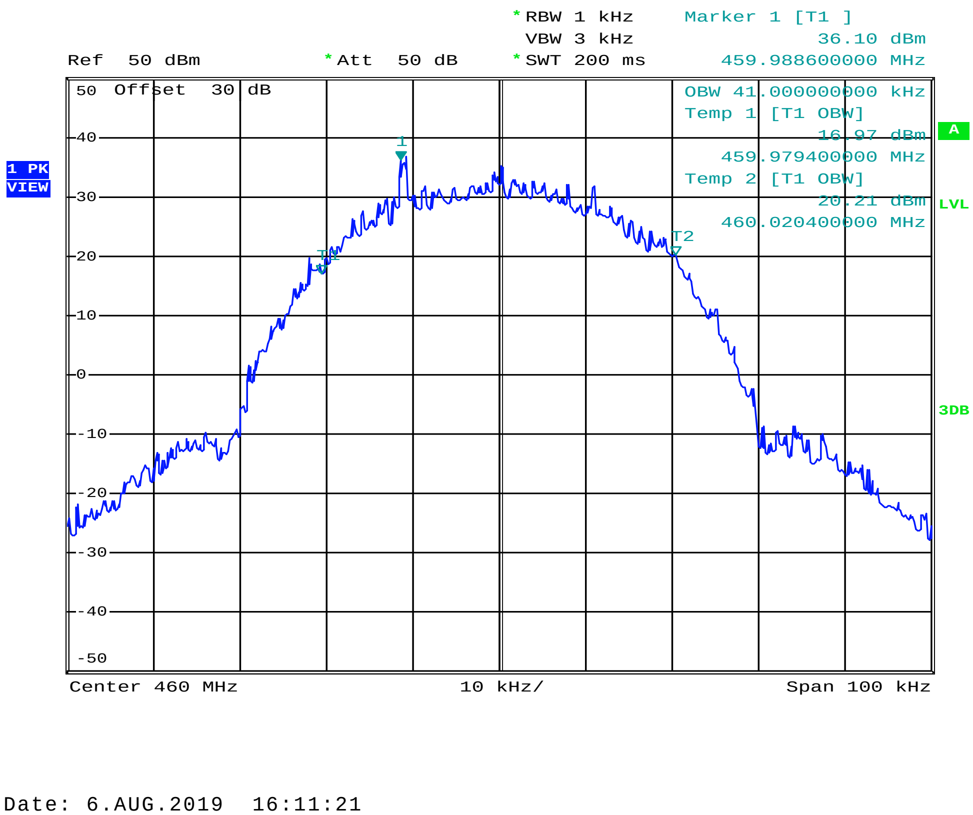
Occupied Bandwidth - Conducted



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

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

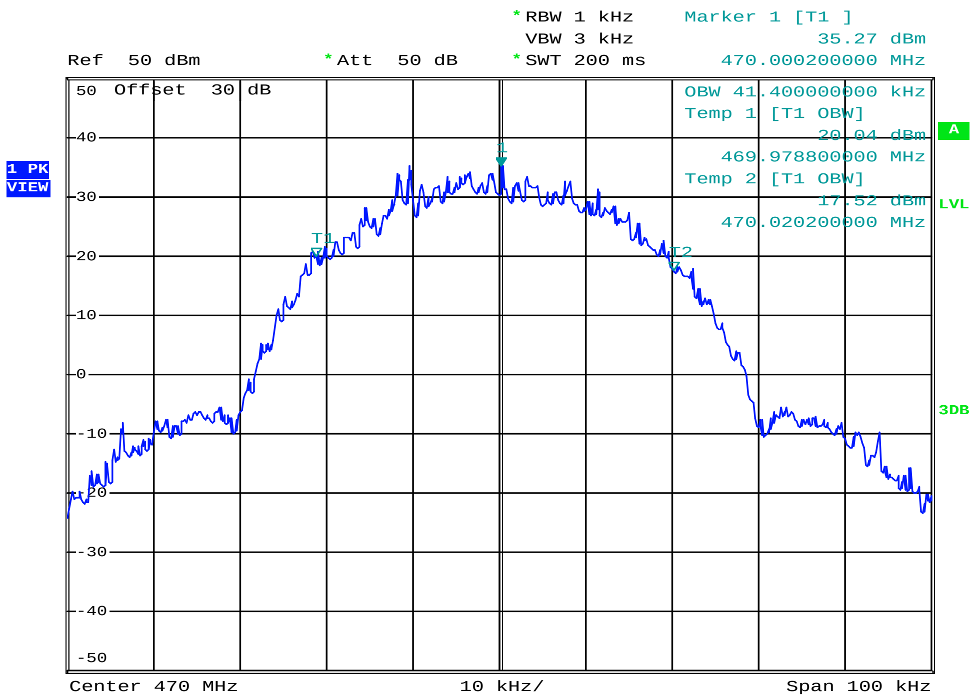
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

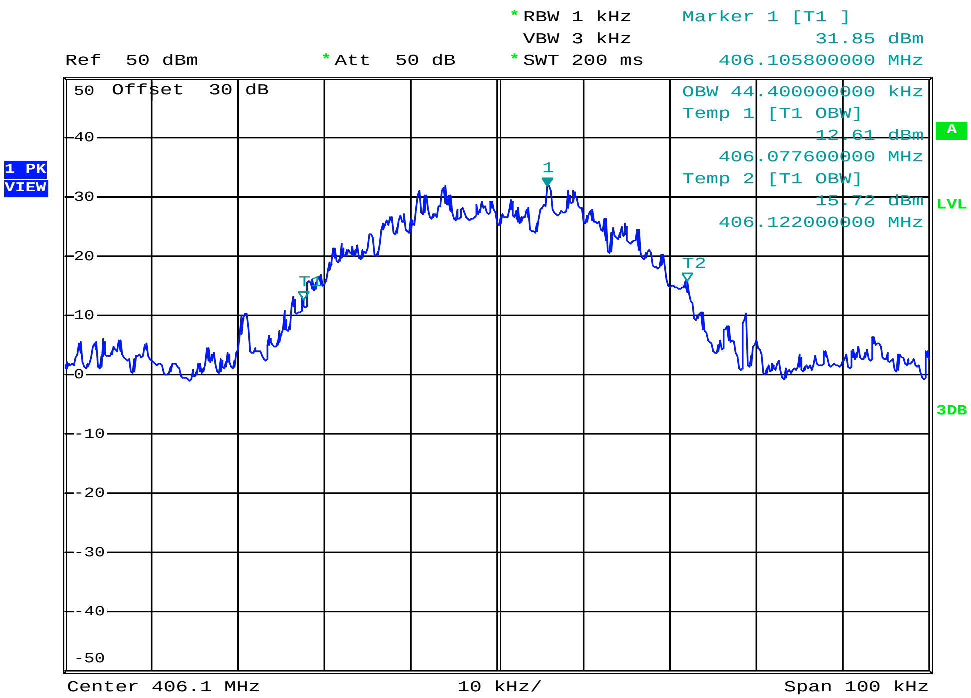


Date: 6.AUG.2019 16:12:28

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

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

Occupied Bandwidth - Conducted

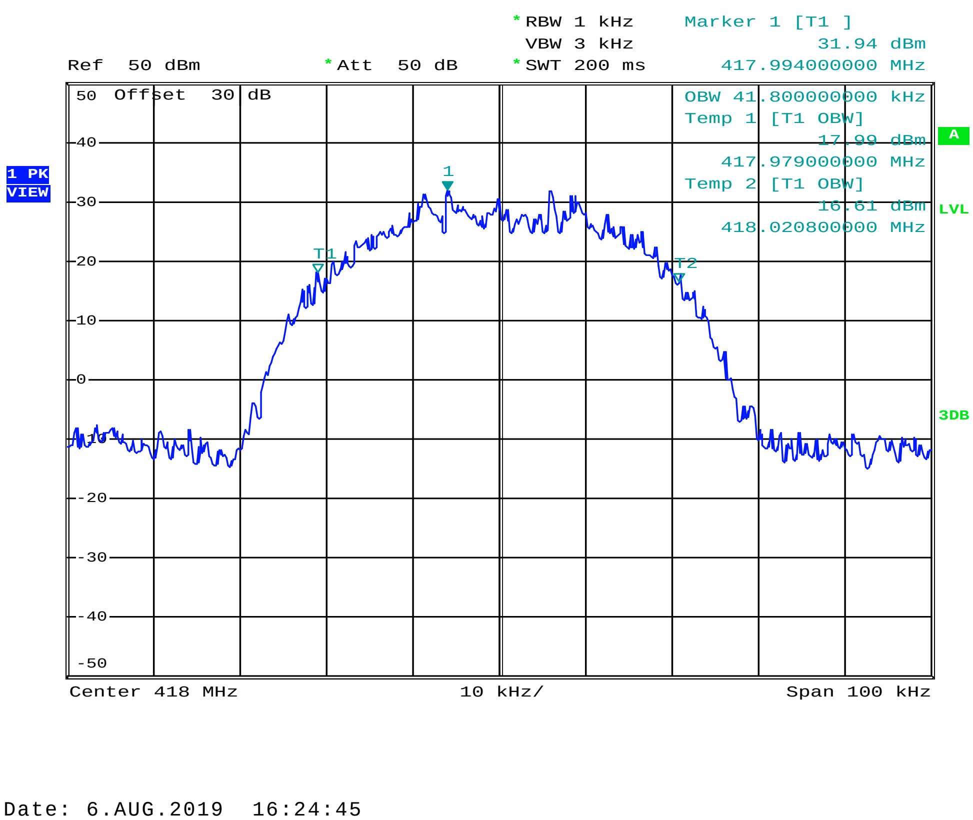


Date: 6.AUG.2019 16:23:56

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

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

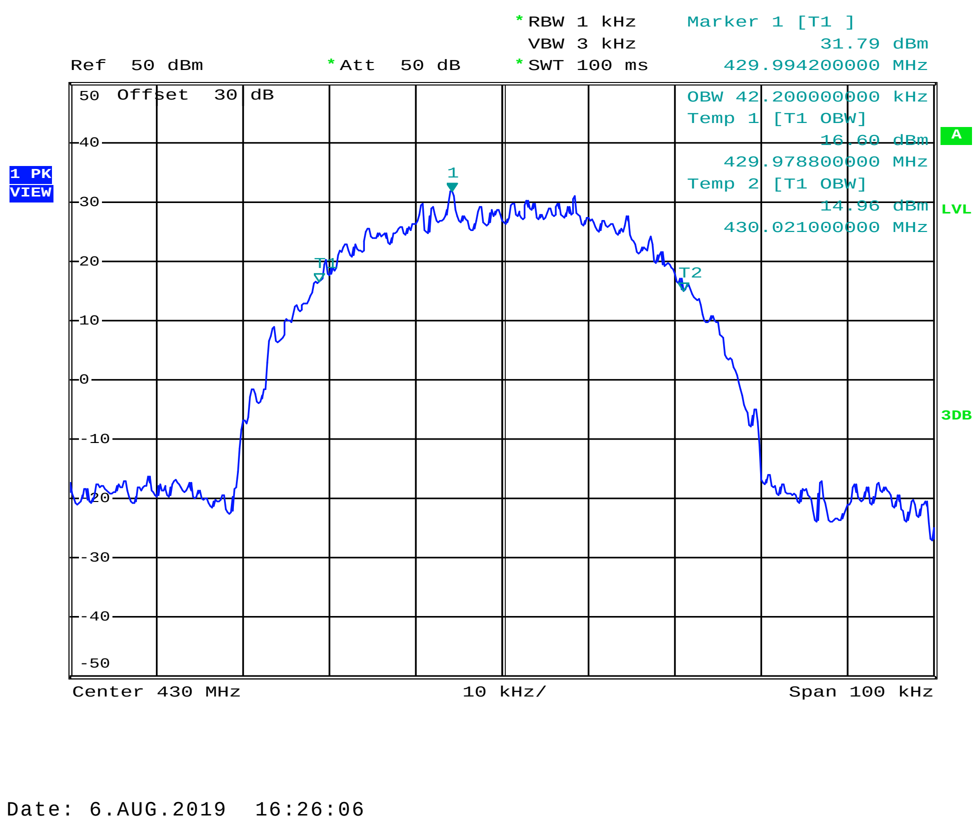
Occupied Bandwidth - Conducted



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

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

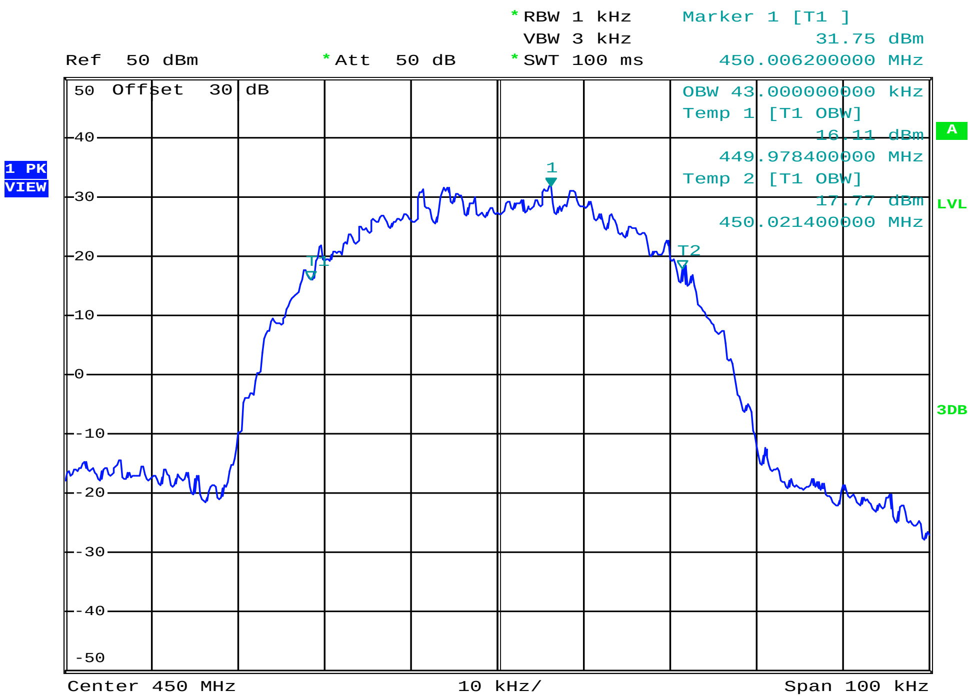
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

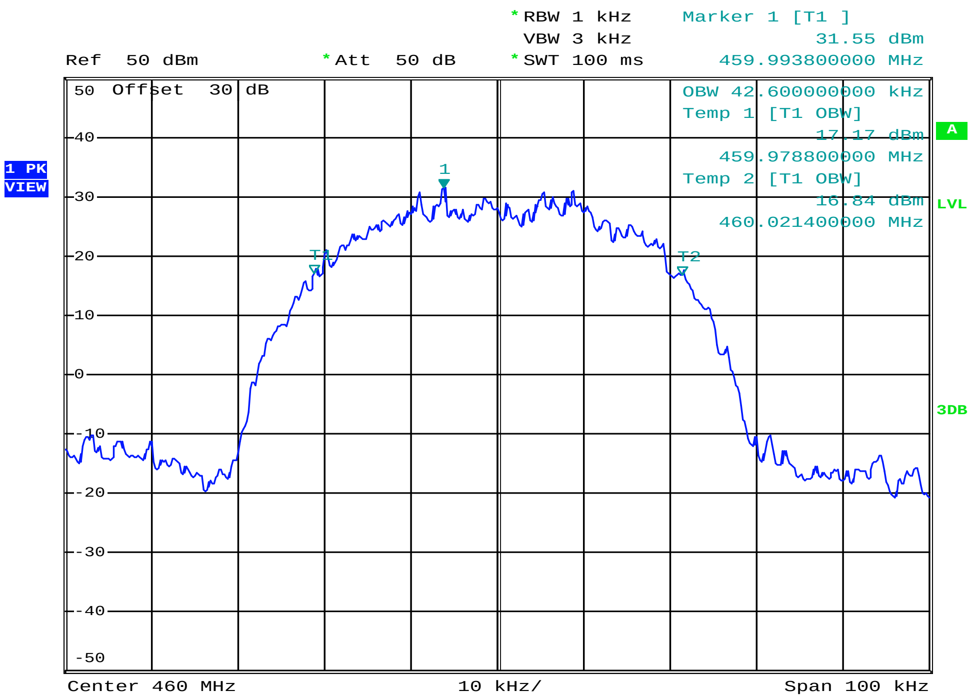


Date: 6.AUG.2019 16:26:55

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

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

Occupied Bandwidth - Conducted

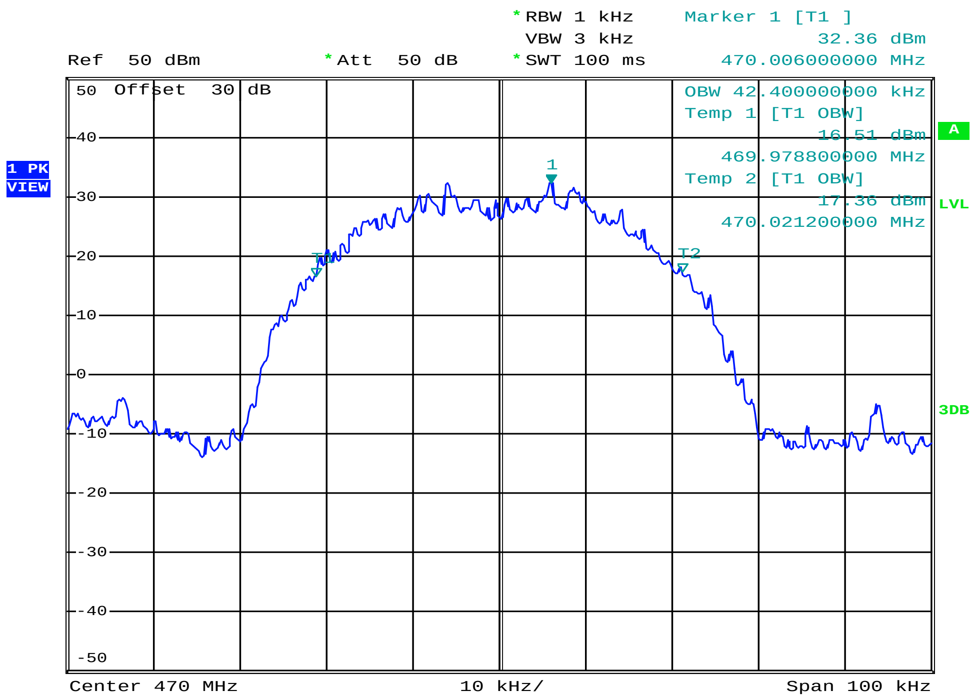


Date: 6.AUG.2019 16:27:38

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

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

Occupied Bandwidth - Conducted

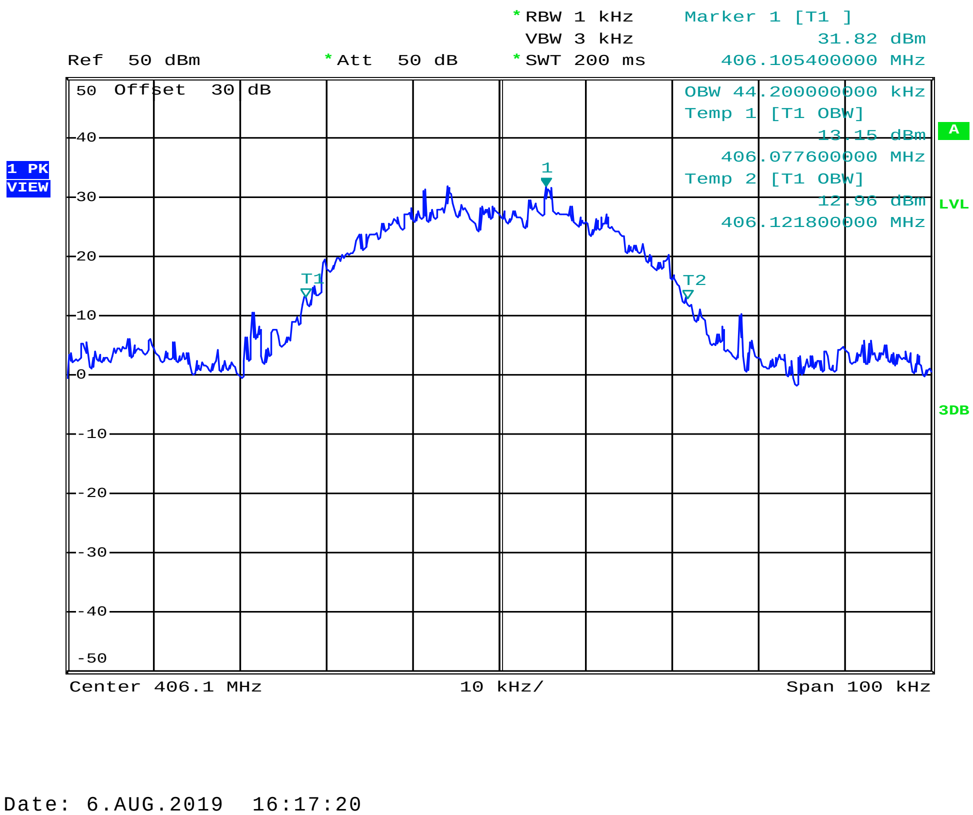


Date: 6.AUG.2019 16:28:25

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

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

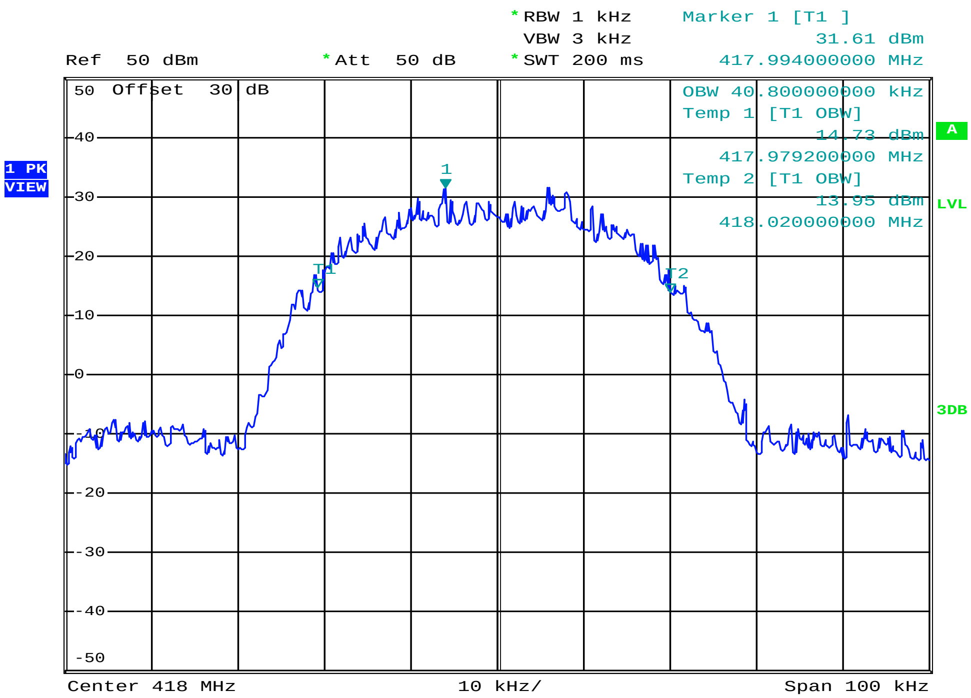
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

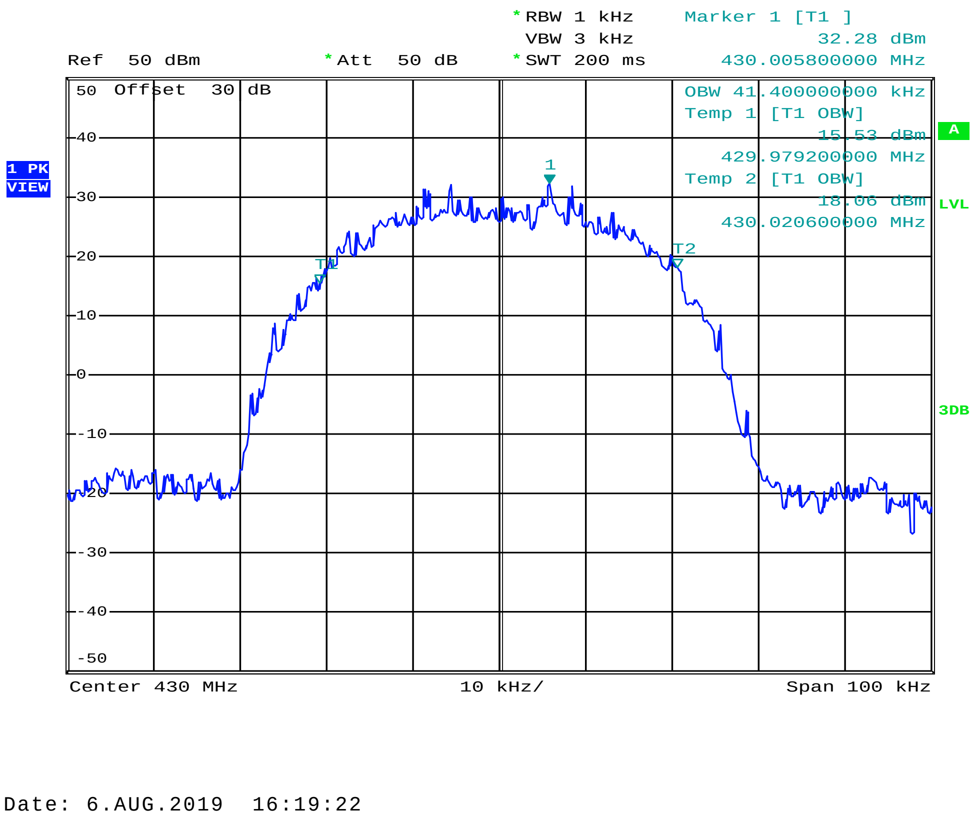


Date: 6.AUG.2019 16:18:38

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

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

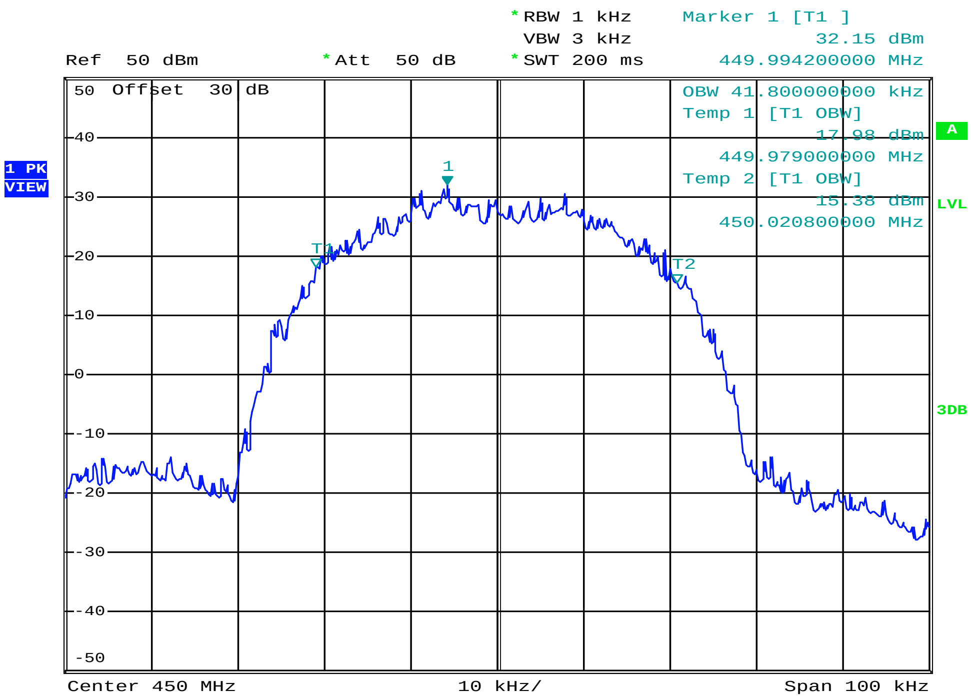
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

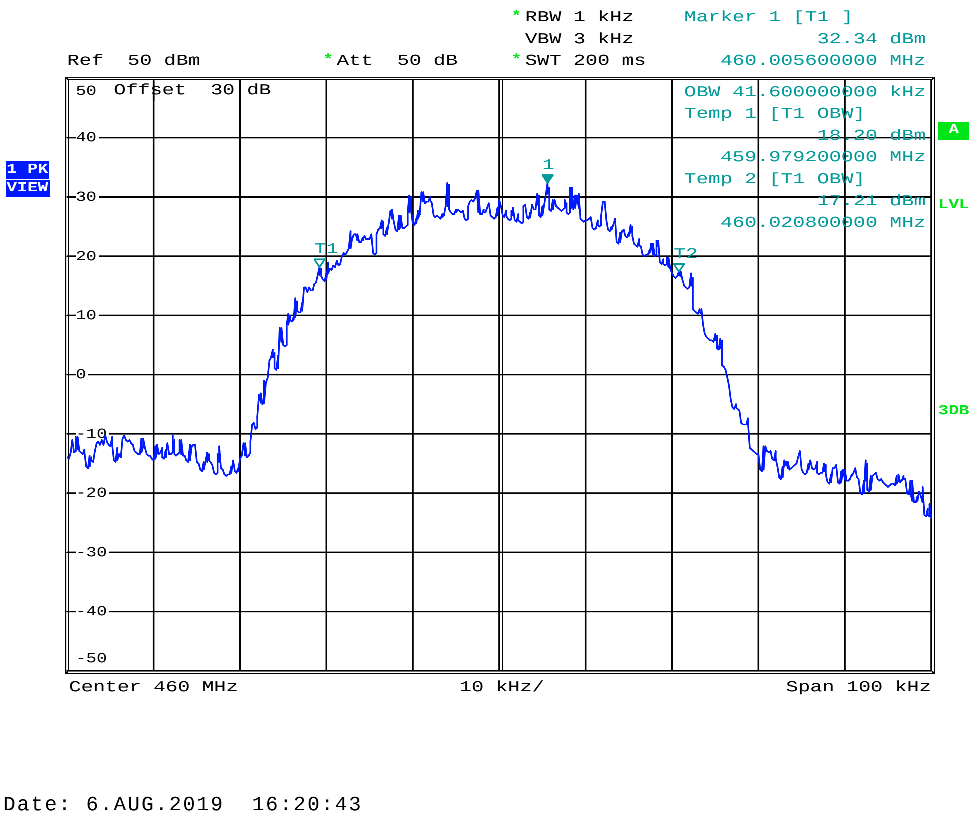


Date: 6.AUG.2019 16:20:04

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

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

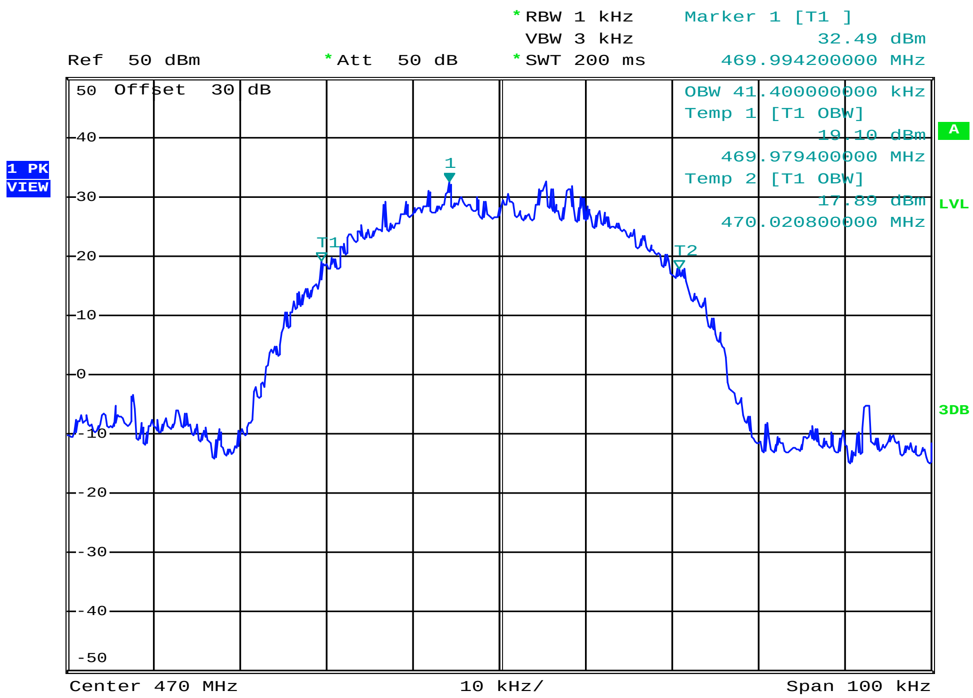
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

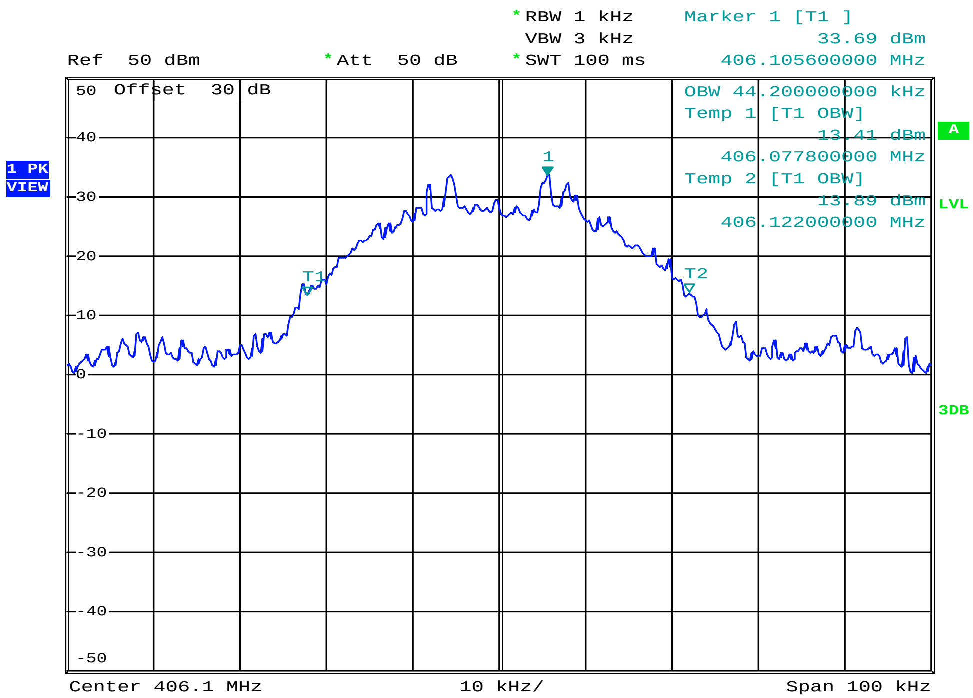


Date: 6.AUG.2019 16:21:25

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

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

Occupied Bandwidth - Conducted

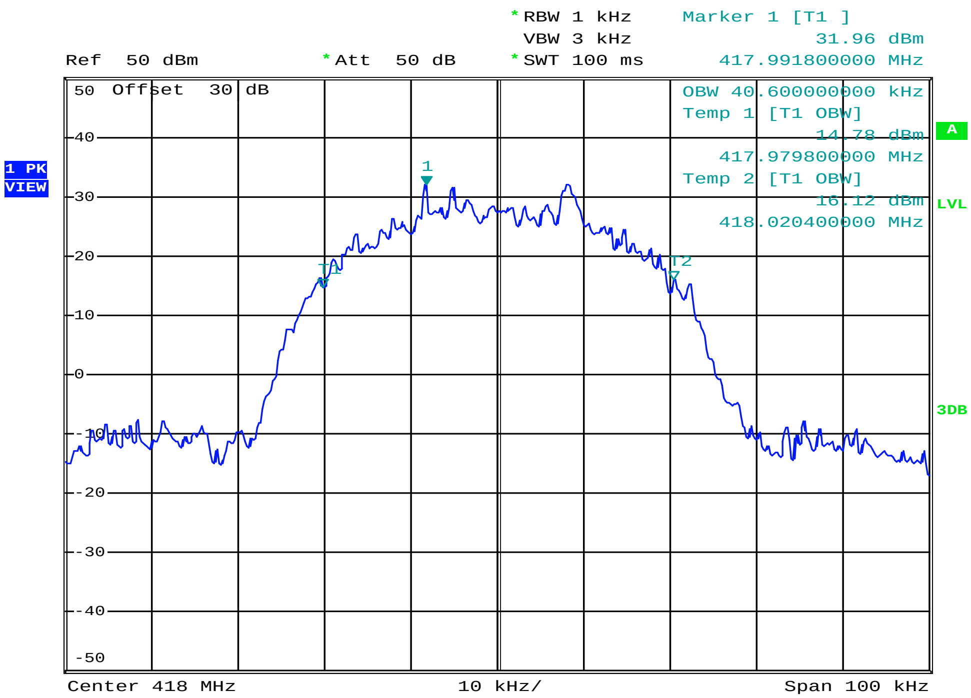


Date: 6.AUG.2019 16:34:22

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

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

Occupied Bandwidth - Conducted

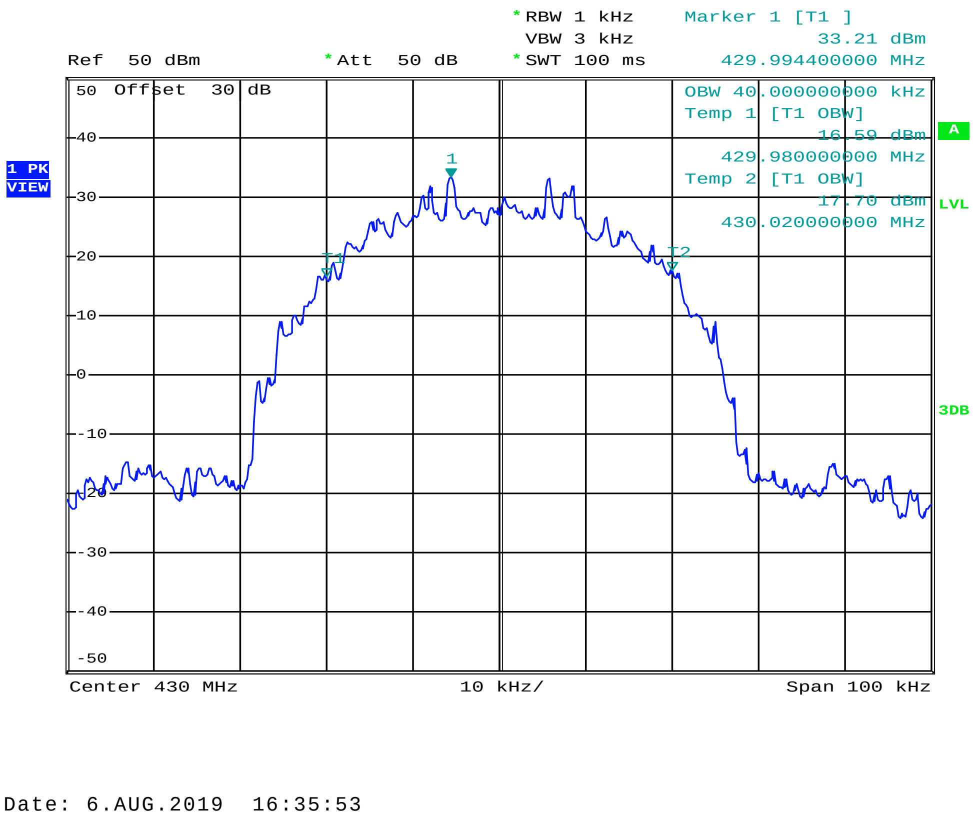


Date: 6.AUG.2019 16:35:02

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

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

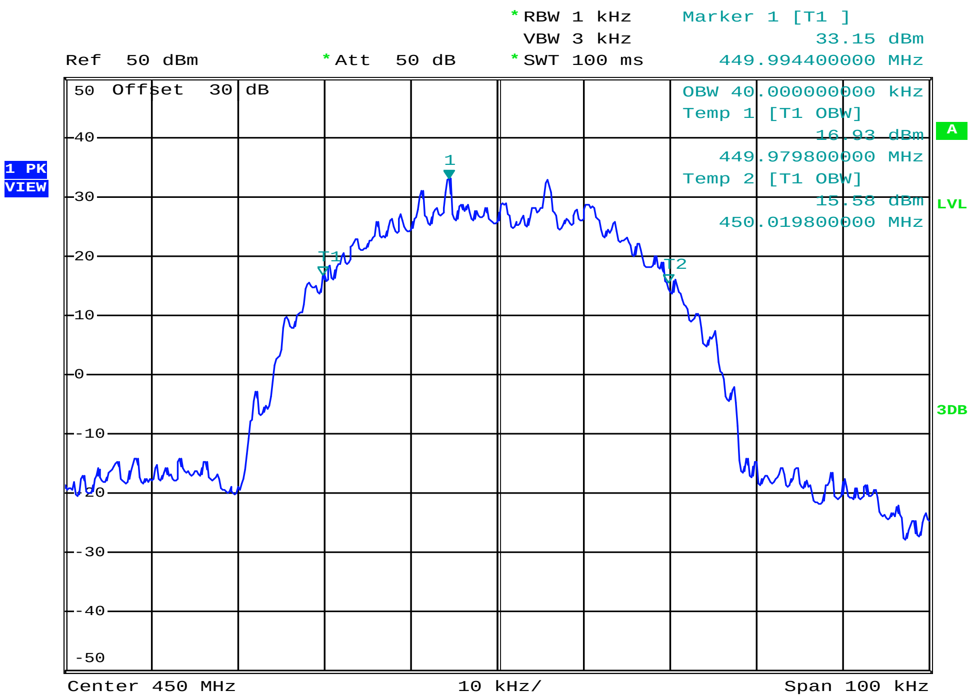
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

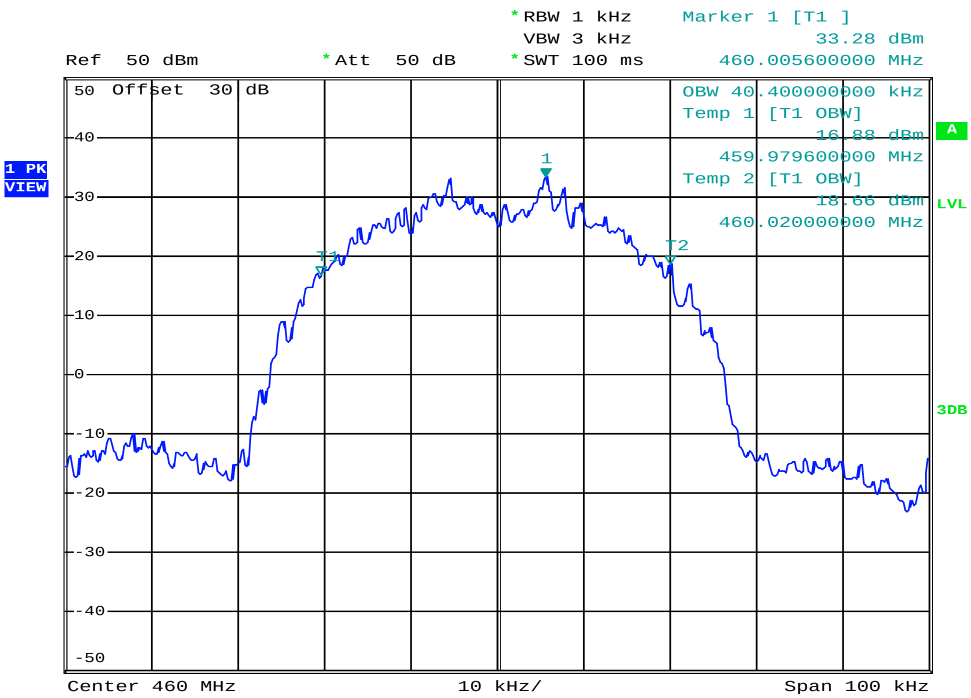


Date: 6.AUG.2019 16:36:45

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

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

Occupied Bandwidth - Conducted

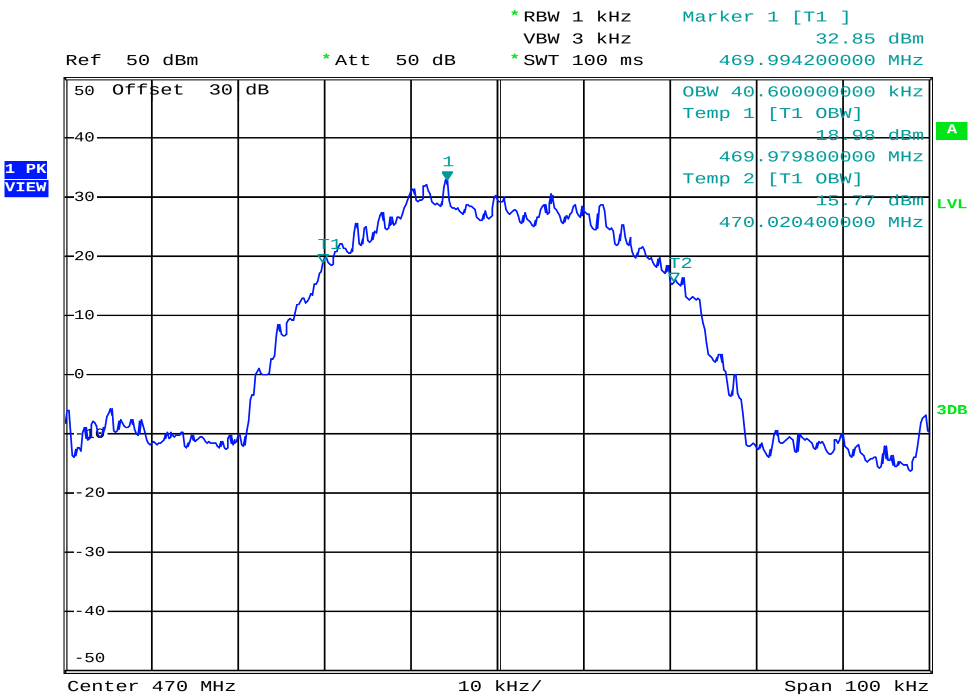


Date: 6.AUG.2019 16:37:26

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

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

Occupied Bandwidth - Conducted

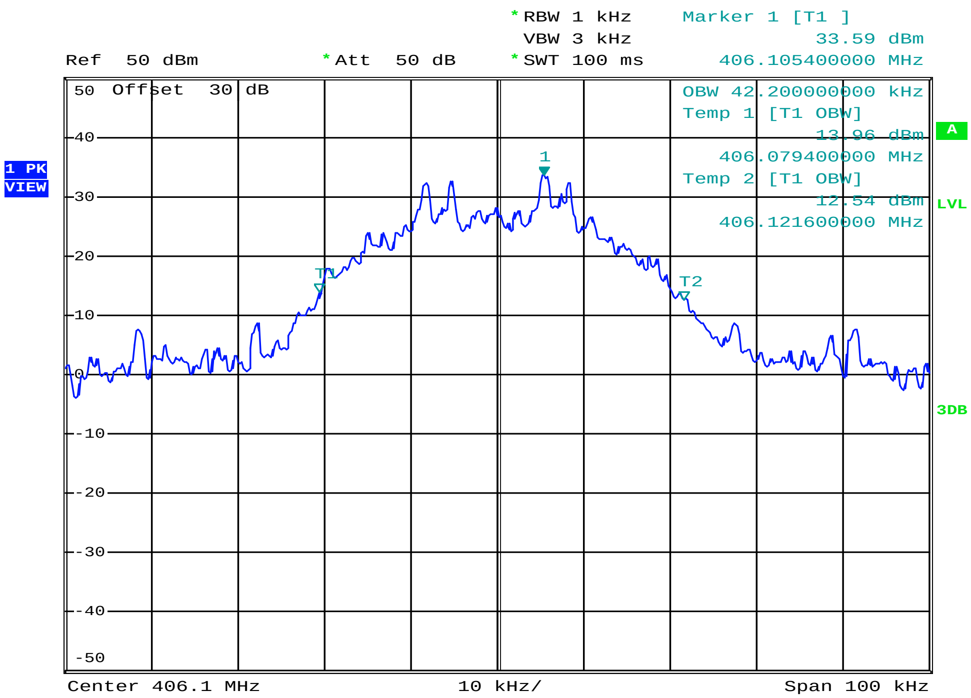


Date: 6.AUG.2019 16:38:11

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

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

Occupied Bandwidth - Conducted

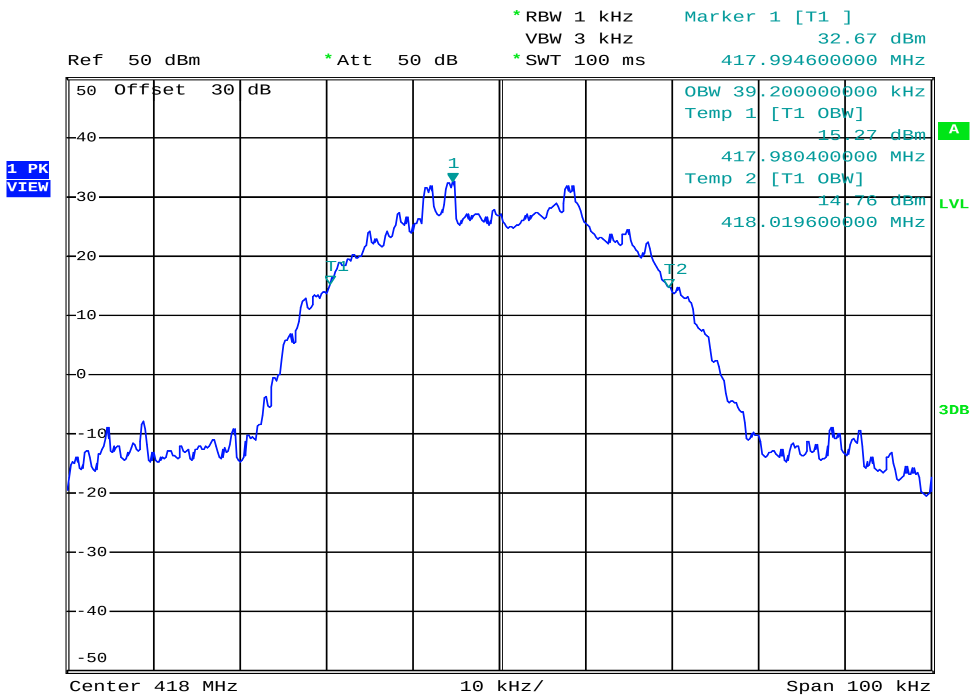


Date: 6.AUG.2019 16:40:56

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

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

Occupied Bandwidth - Conducted

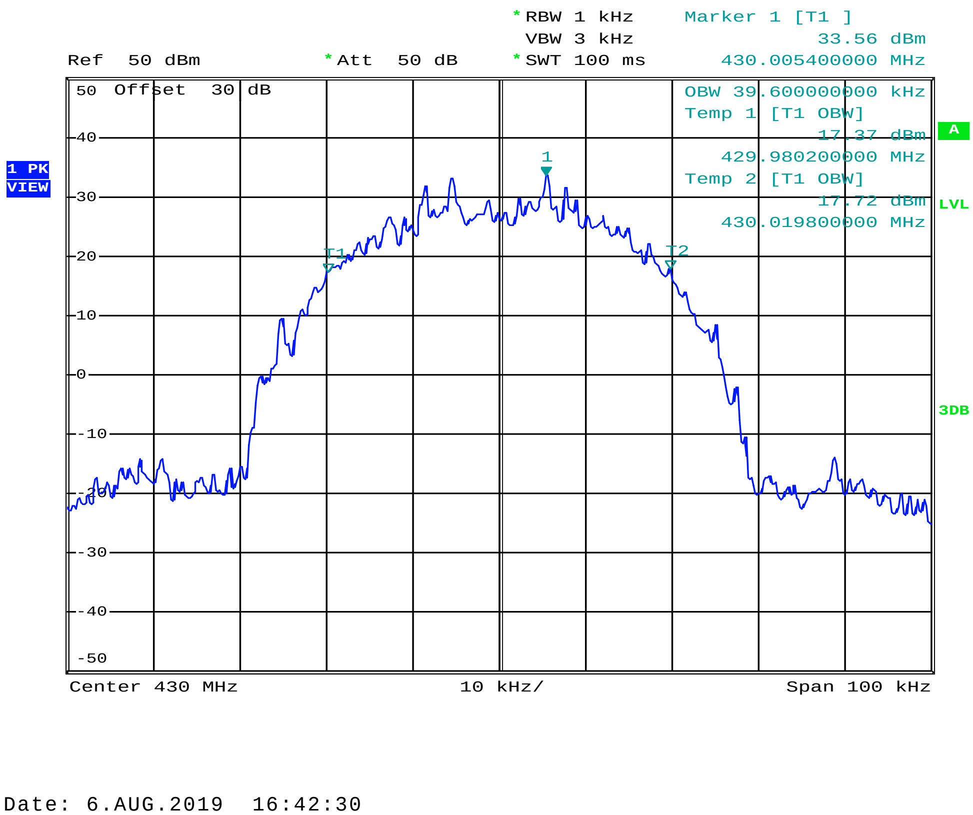


Date: 6.AUG.2019 16:41:42

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

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

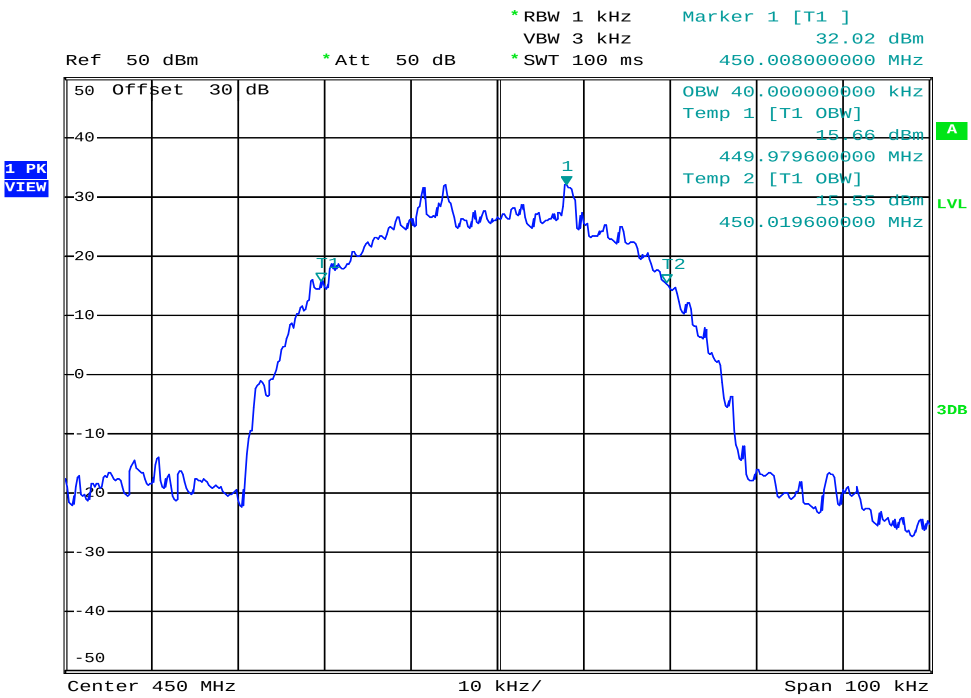
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

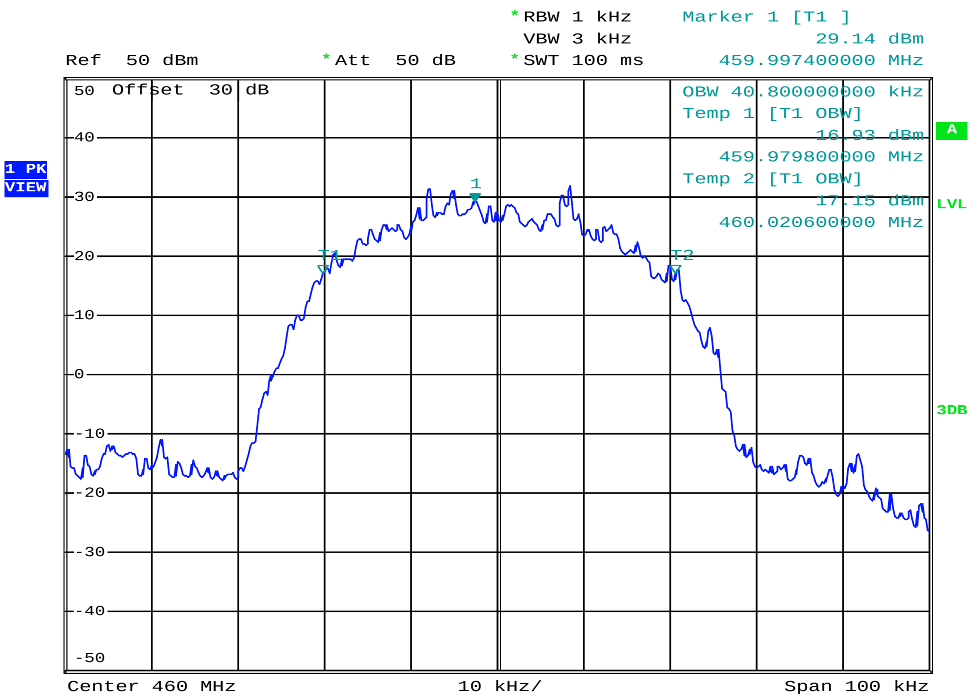


Date: 6.AUG.2019 16:43:10

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

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

Occupied Bandwidth - Conducted

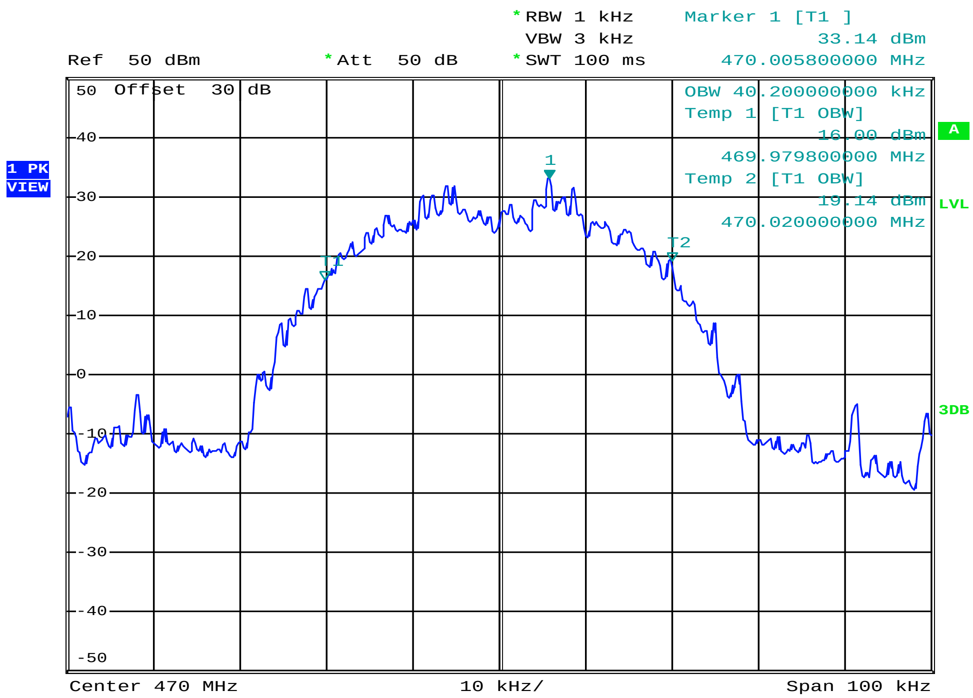


Date: 6.AUG.2019 16:44:02

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

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

Occupied Bandwidth - Conducted

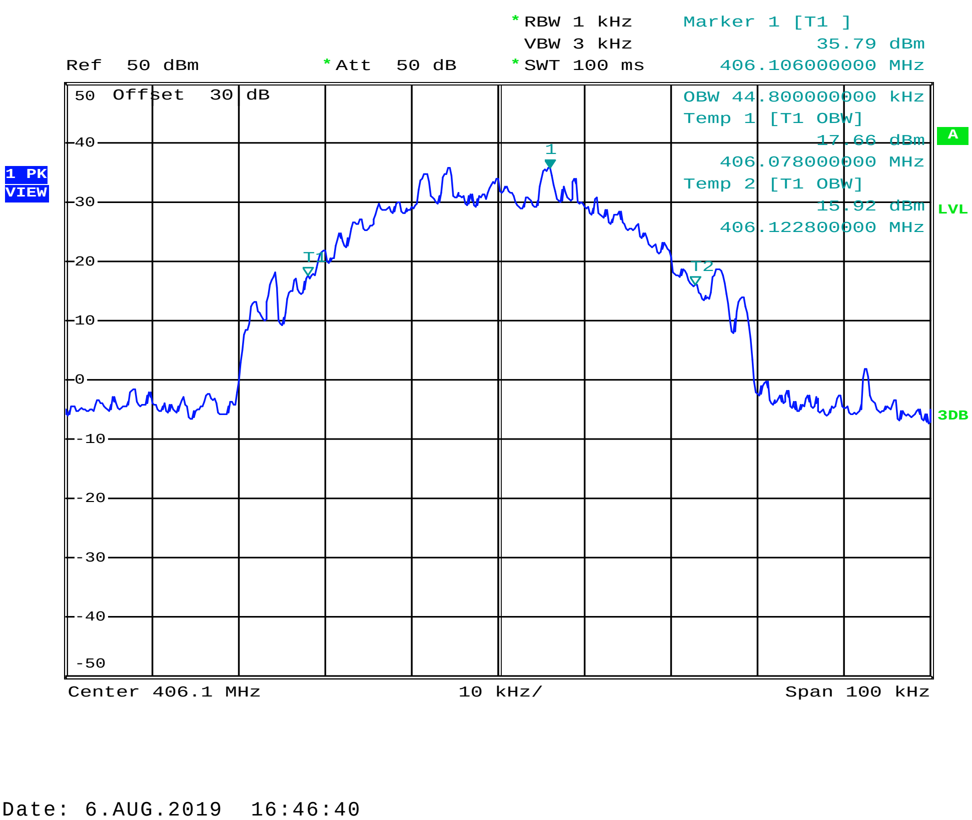


Date: 6.AUG.2019 16:44:47

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

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

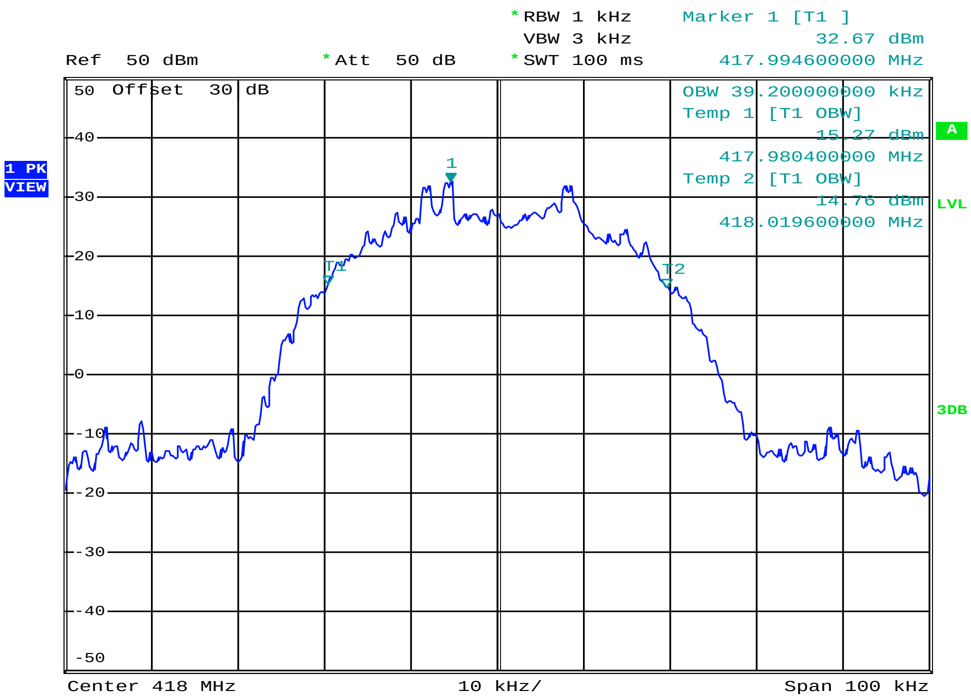
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

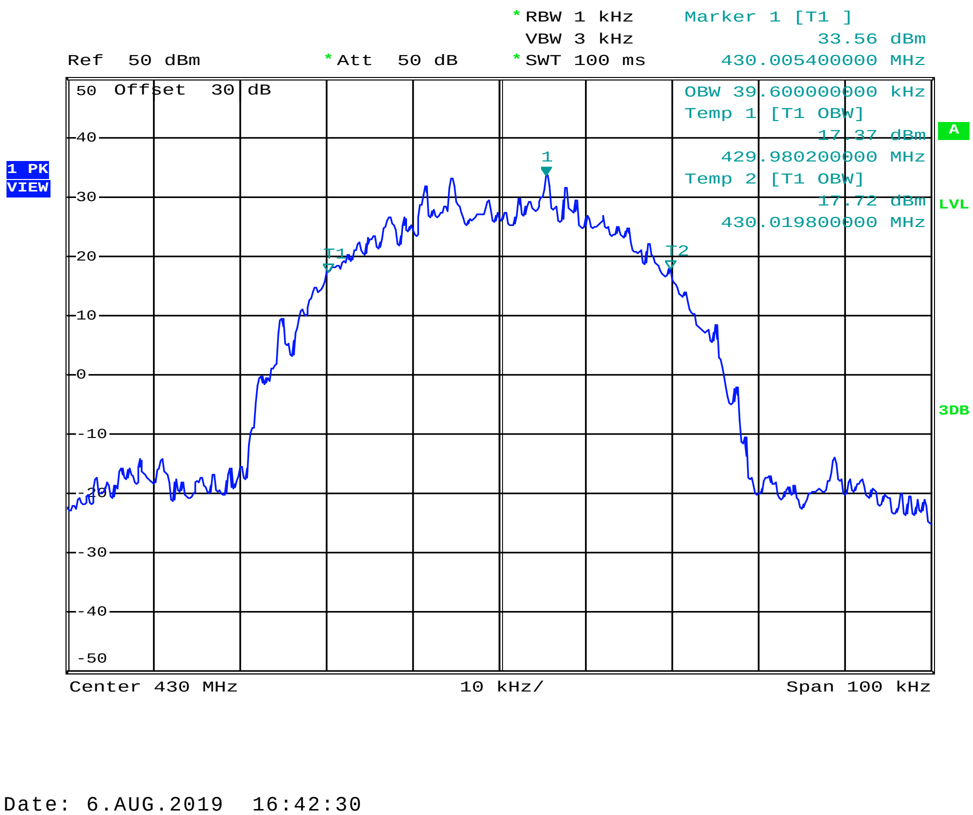


Date: 6.AUG.2019 16:41:42

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

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

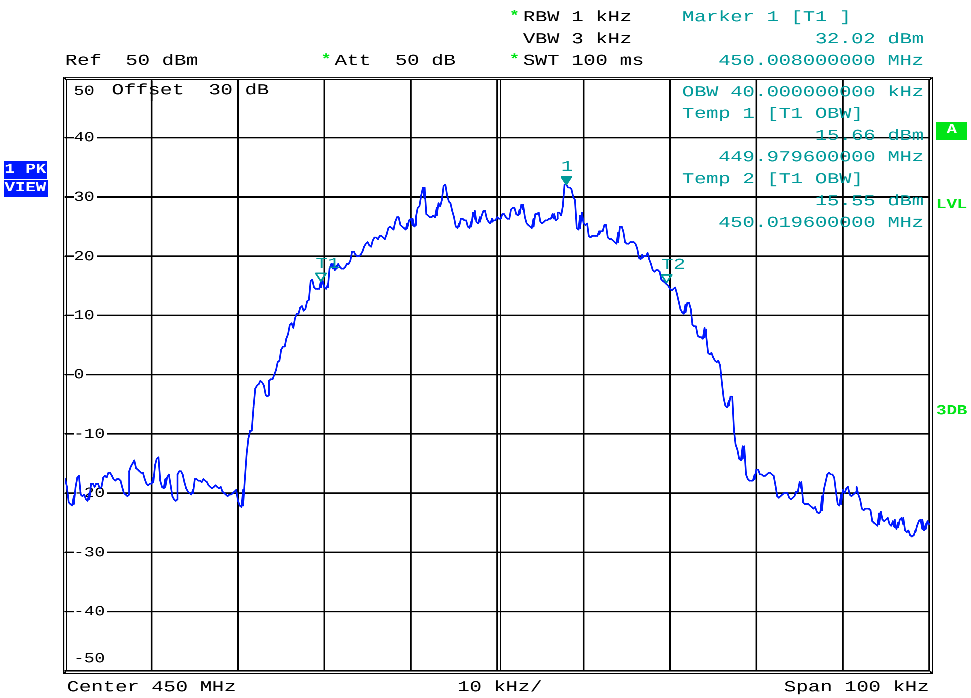
Occupied Bandwidth - Conducted



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

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

Occupied Bandwidth - Conducted

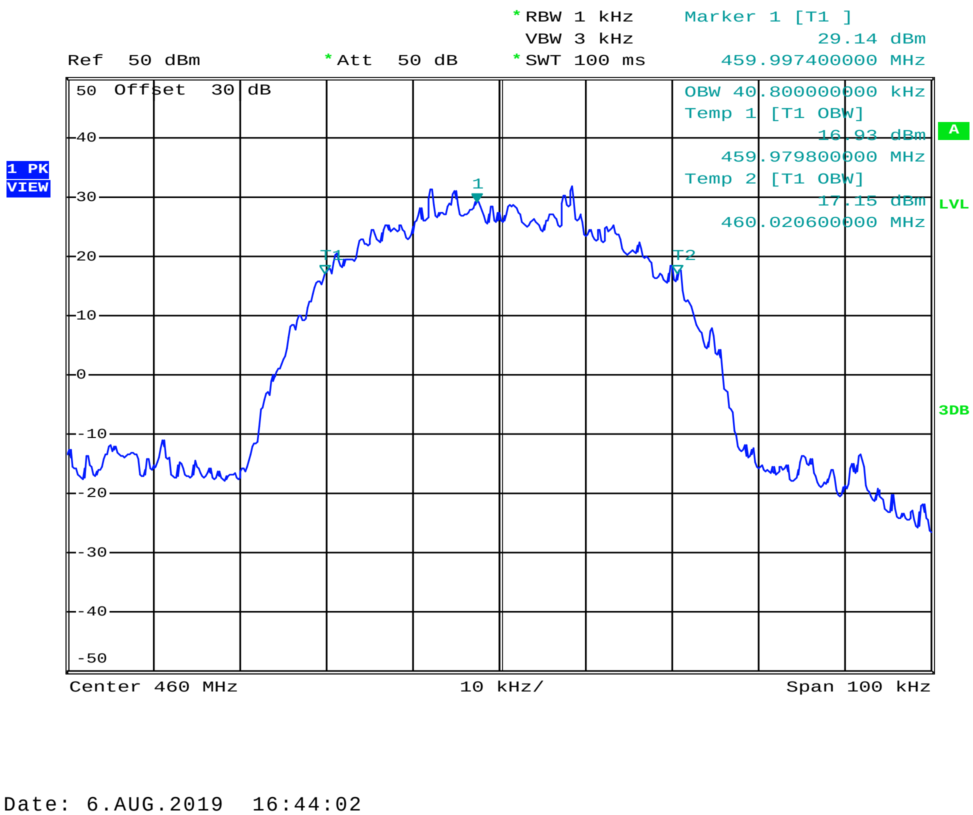


Date: 6.AUG.2019 16:43:10

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

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

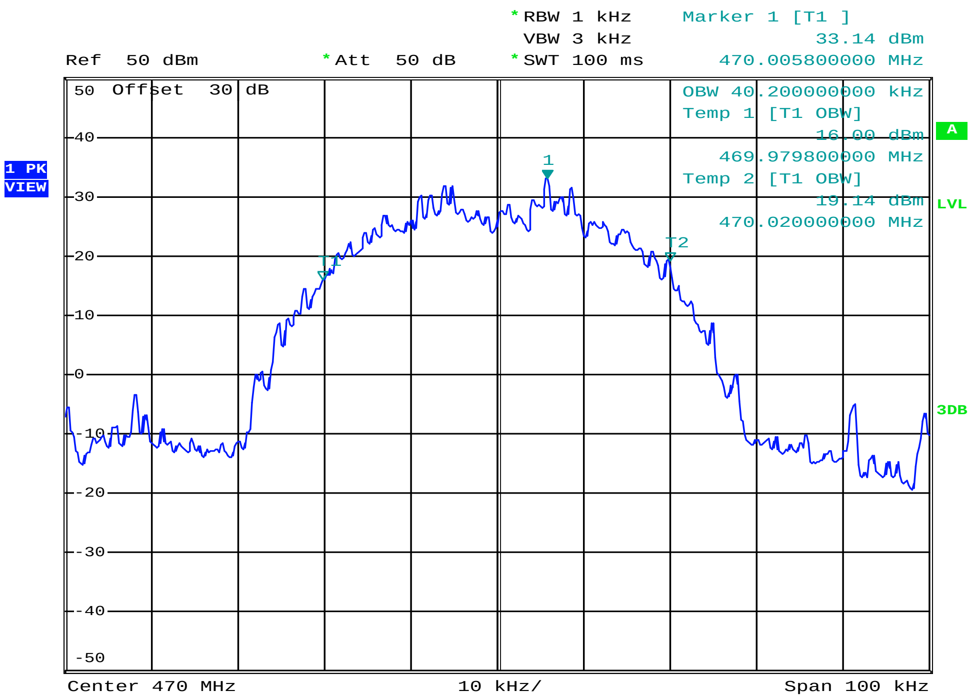
Occupied Bandwidth - Conducted



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

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

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	

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	

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	

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.

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	
$5 < f_d \leq 10$	$83Log_{10}(f_d/5)$
$10 < f_d \leq 50$	Lesser of: 50 or $29Log_{10}(f_d^2/11)$
$f_d > 50$	$43 + 10Log_{10}(P)$
50kHz Channel Bandwidth	
$17.5 < f_d \leq 22.5$	$83Log_{10}(f_d/5)$
$22.5 < f_d \leq 62.5$	Lesser of: 50 or $29Log_{10}(f_d^2/11)$
$f_d > 62.5$	$43 + 10Log_{10}(P)$

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: 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. 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: (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 $83Log_{10}$ (f_d/5) dB; (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 $29Log_{10}$ (f_d 2/11) dB or 50 dB, whichever is the lesser attenuation; (3) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least 43 + $10Log_{10}$ (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: (1) On any frequency from the center of the authorized bandwidth f0 to 5.625 kHz removed from f0: Zero dB. (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. (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 + $10Log_{10}$(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: (1) On any frequency from the center of the authorized bandwidth f_0 to 3.0 kHz removed from f_0: Zero dB. (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 + $10Log_{10}$(P) or 65 dB, whichever is the lesser attenuation. (3) On any frequency removed from the center of the authorized bandwidth by more than 4.6 kHz: At least 55 + $10Log_{10}$ (P) or 65 dB, whichever is the lesser attenuation.

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)	$83Log_{10}(f_d/5)$
	$10 < f_d \leq 50$ (see Note 1)	Whichever is the lesser: 50 or $29Log_{10}(f_d^2/11)$
	$f_d > 50$ (see Note 2)	$43Log_{10}(P)$
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: 70 or $50 + Log_{10}(P)$
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: $30 + 16.67(f_d - 3)$ or $55 + Log_{10}(P)$
	$f_d > 4.6$ (see Note 3)	Whichever is the lesser: 57 or $55 + Log_{10}(P)$

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) **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** 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. 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** 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 Note 2: RBW = Specified in Section 4.2.1 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.

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:

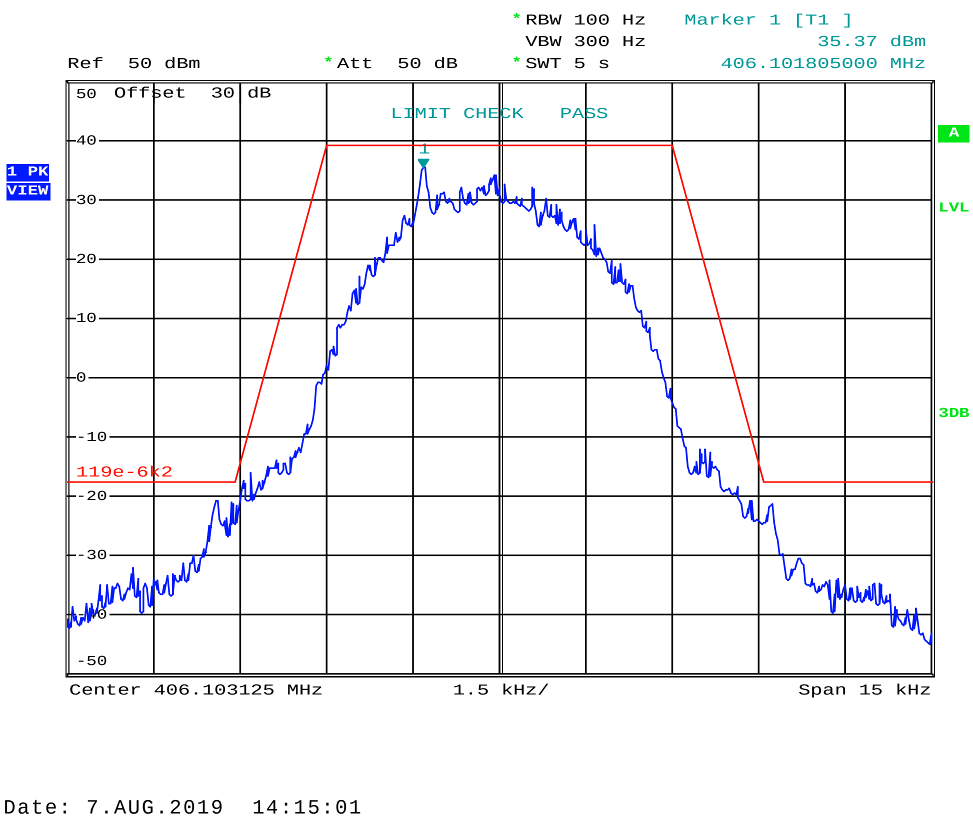
(1) The equipment is allowed to have aggregate channels as per the SRSP for its operating frequency bands.
(2) The ERP shall not be increased with increased occupied bandwidth.
(3) The equipment shall employ an emission mask that does not result in more adjacent channel interference than the standard 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 $29\text{Log}_{10}(f_d^2/11)$
$f_d > 62.5$	$43 + 10\text{Log}_{10}(P)$

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

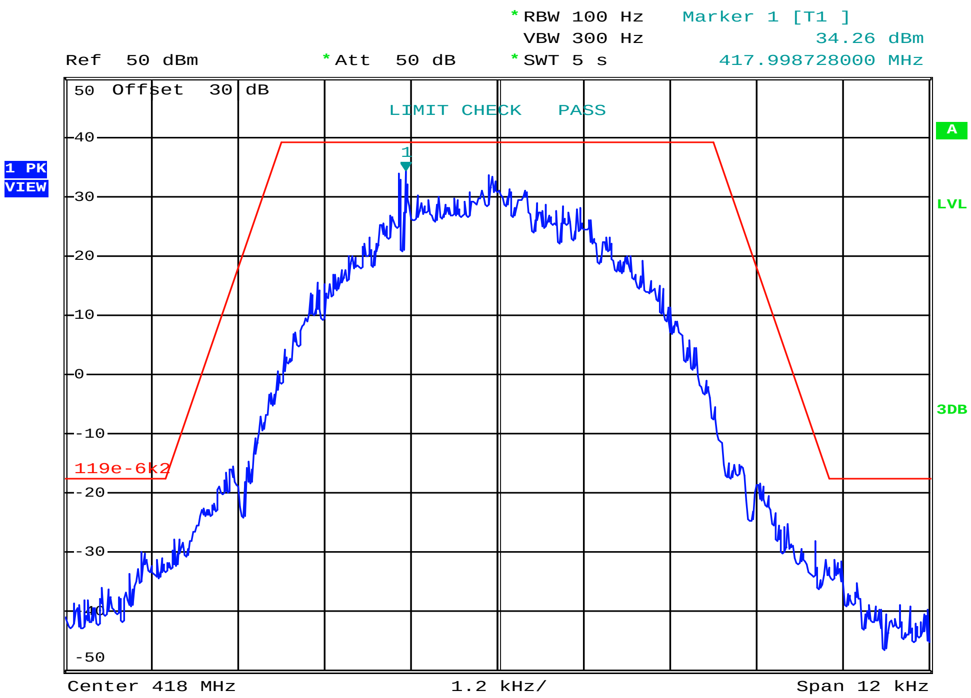
RSS-119 (5.8.4) Mask E



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**

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

RSS-119 (5.8.4) Mask E

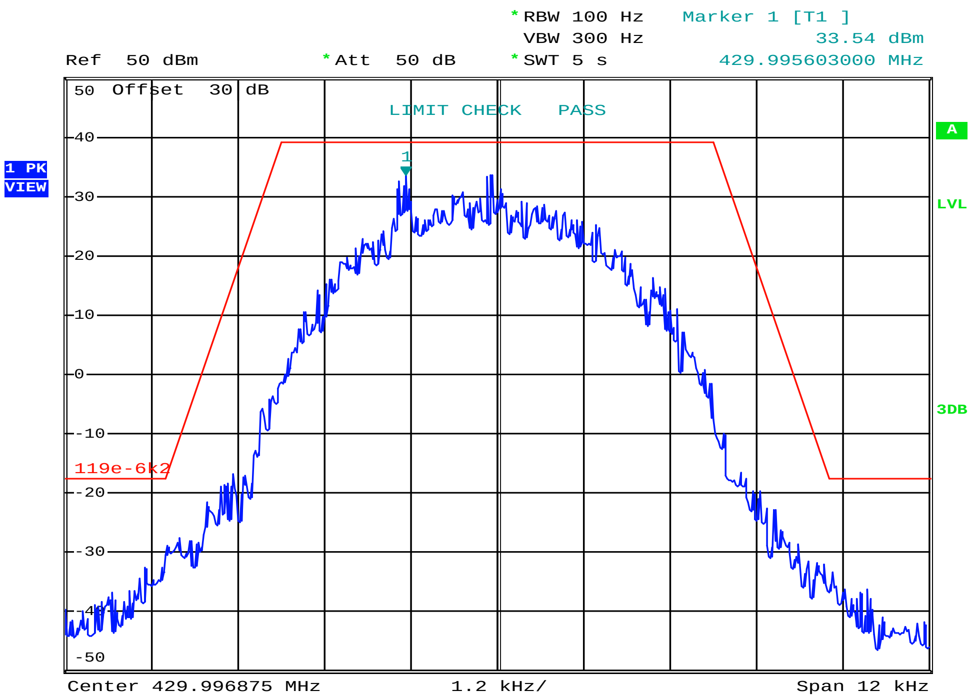


Date: 7.AUG.2019 15:42:08

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**

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

RSS-119 (5.8.4) Mask E

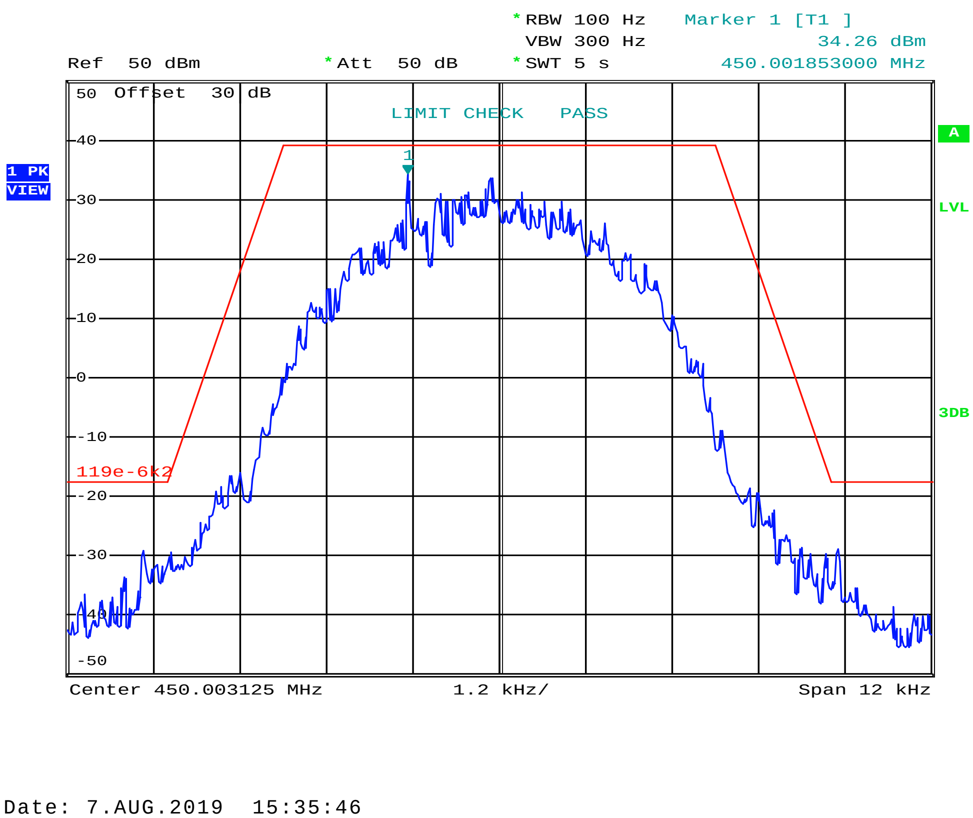


Date: 7.AUG.2019 15:37:37

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

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

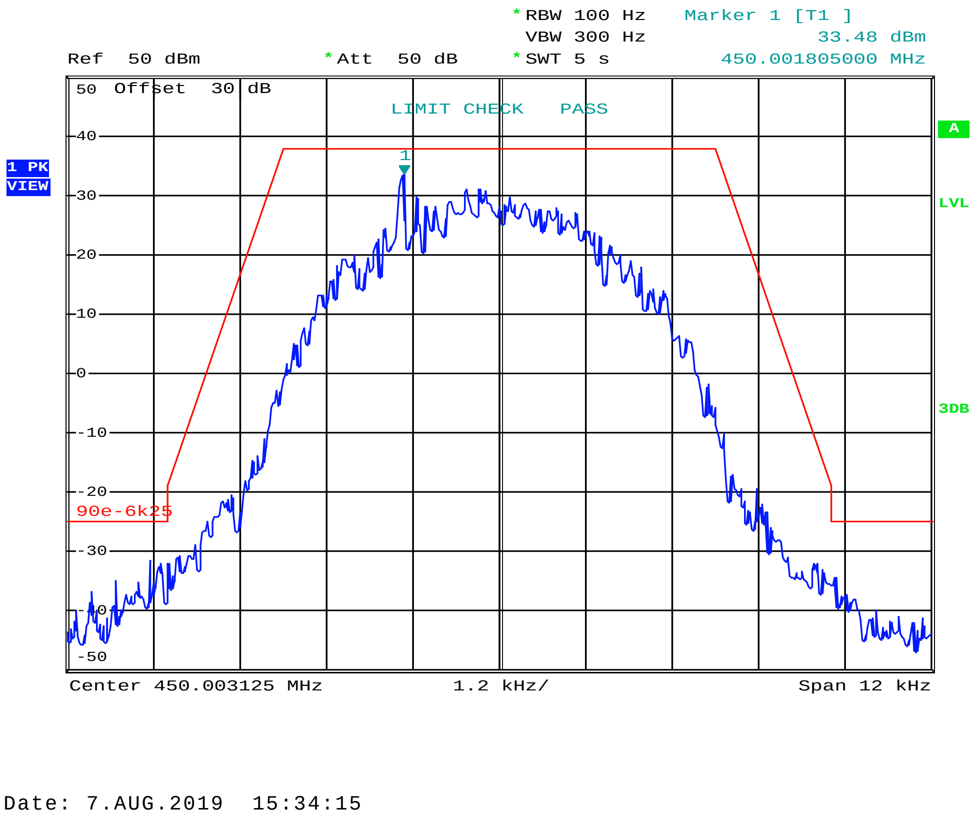
RSS-119 (5.8.4) Mask E



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

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

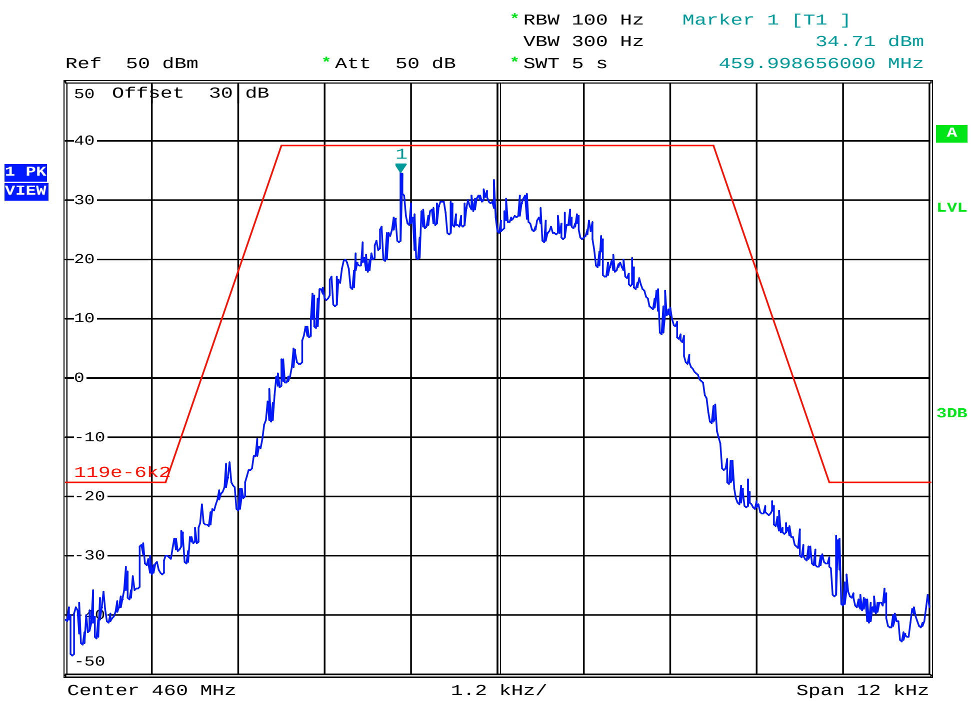
FCC §90.210(e) Mask E



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

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

RSS-119 (5.8.4) Mask E

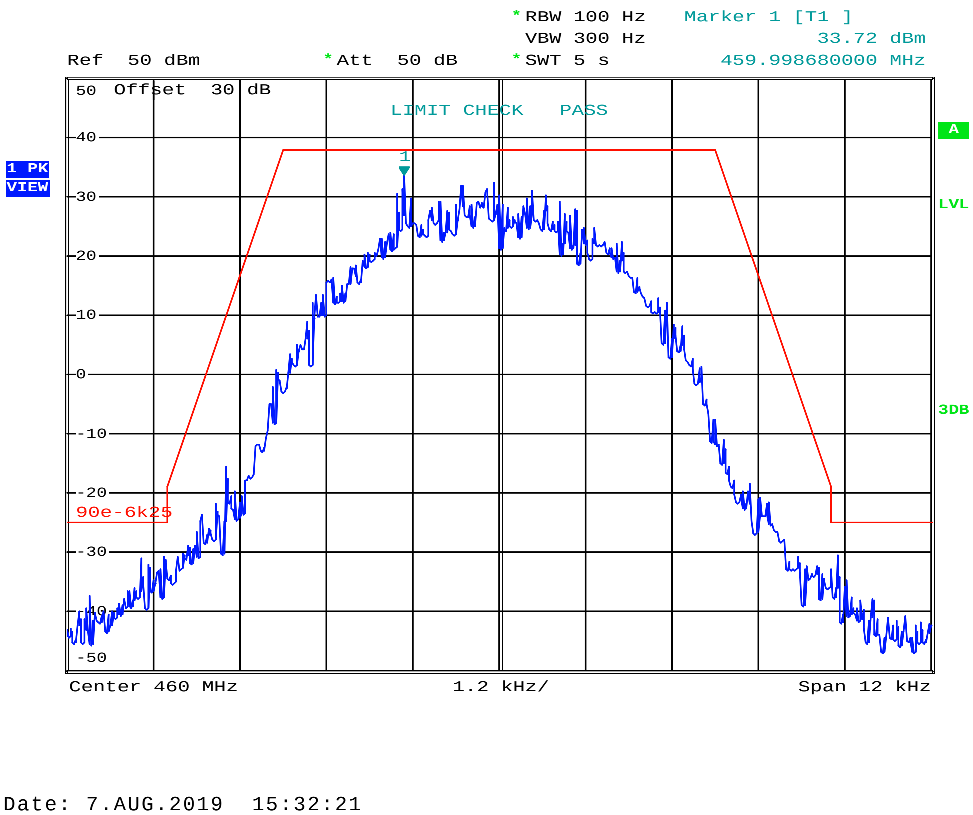


Date: 7.AUG.2019 15:30:57

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**

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

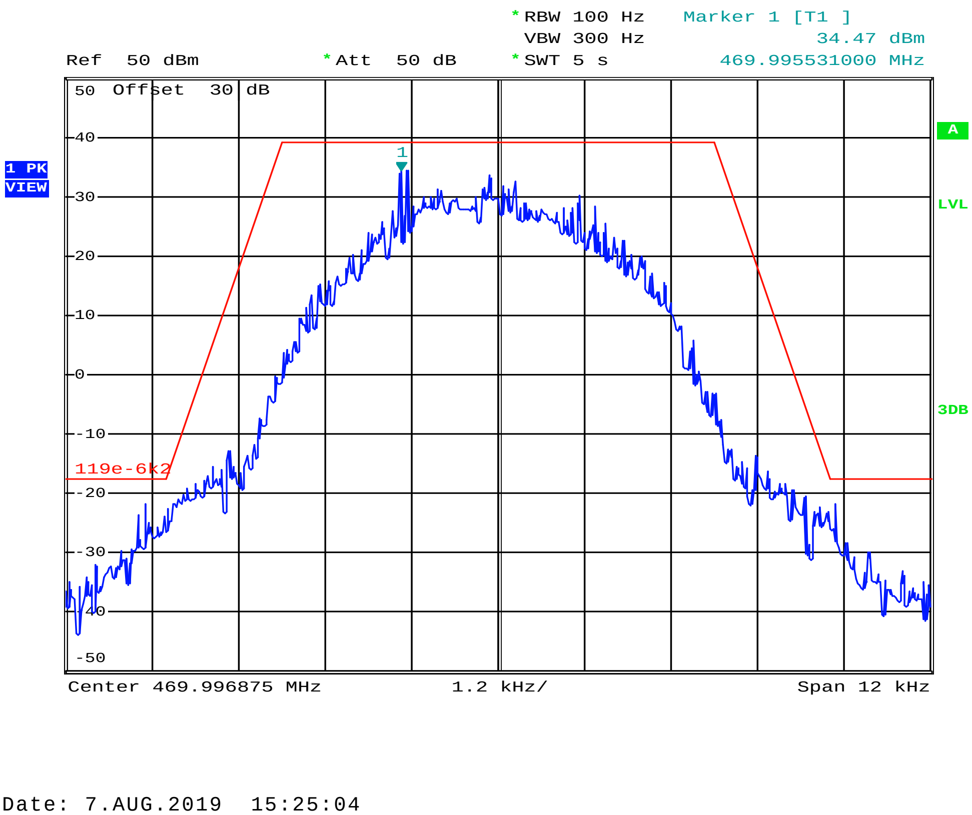
FCC §90.210(e) Mask E



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**

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

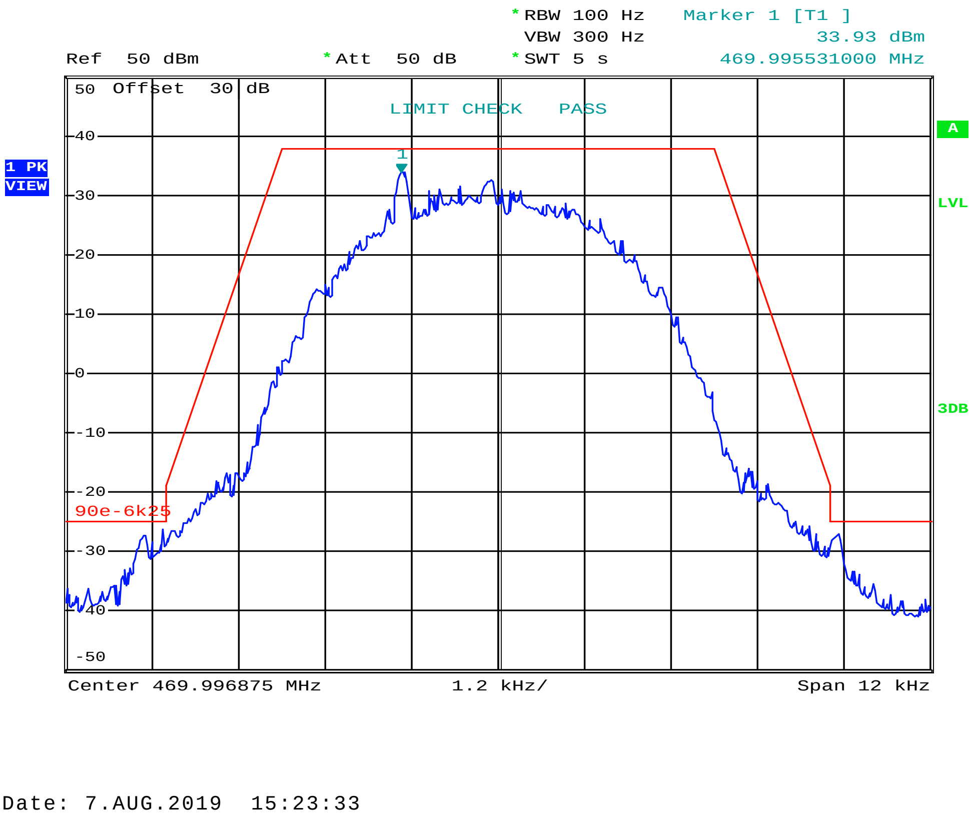
RSS-119 (5.8.4) Mask E



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

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

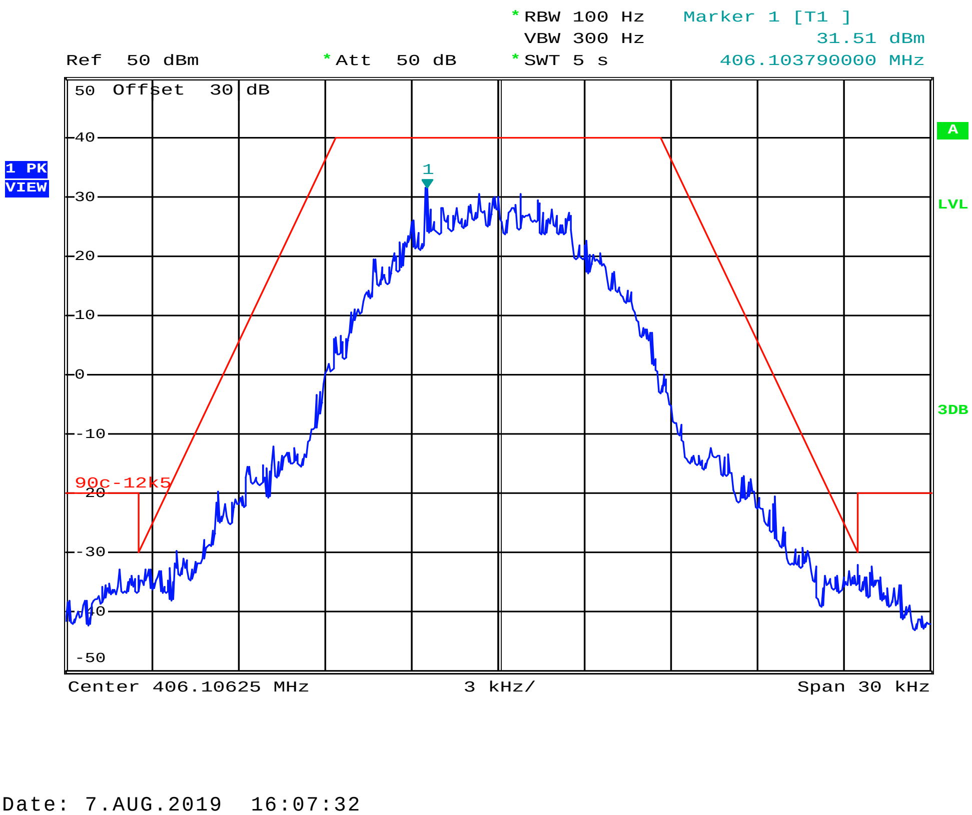
FCC §90.210(e) Mask E



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

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

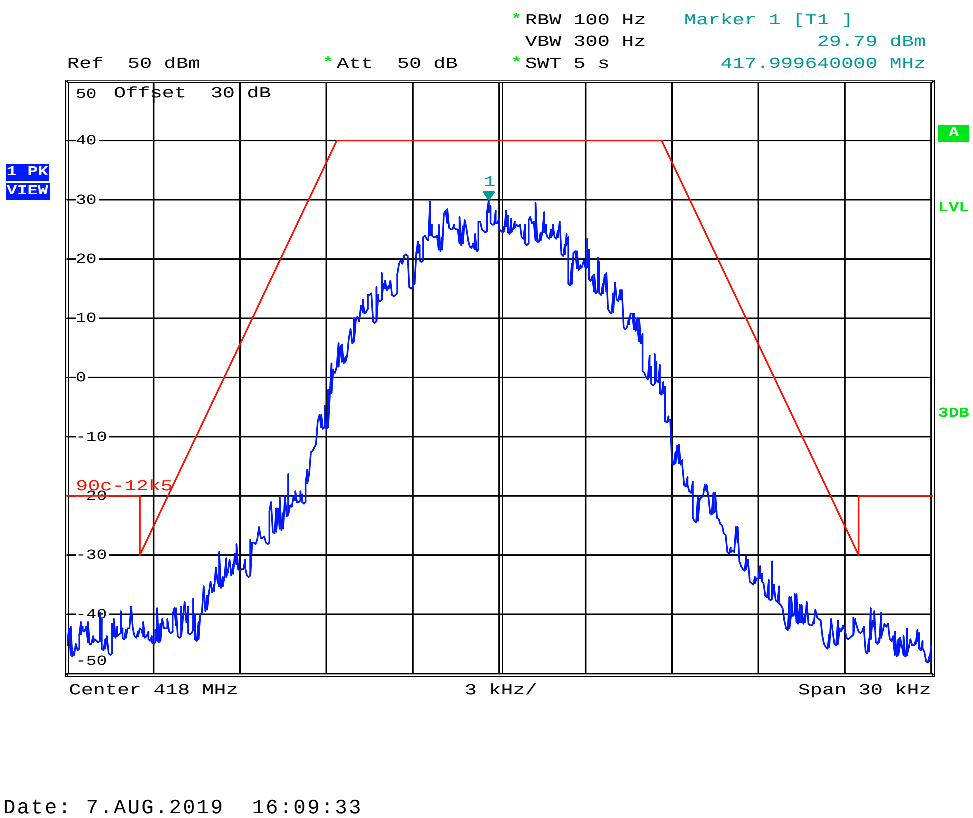
RSS-119 (5.8.3) Mask D



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**

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

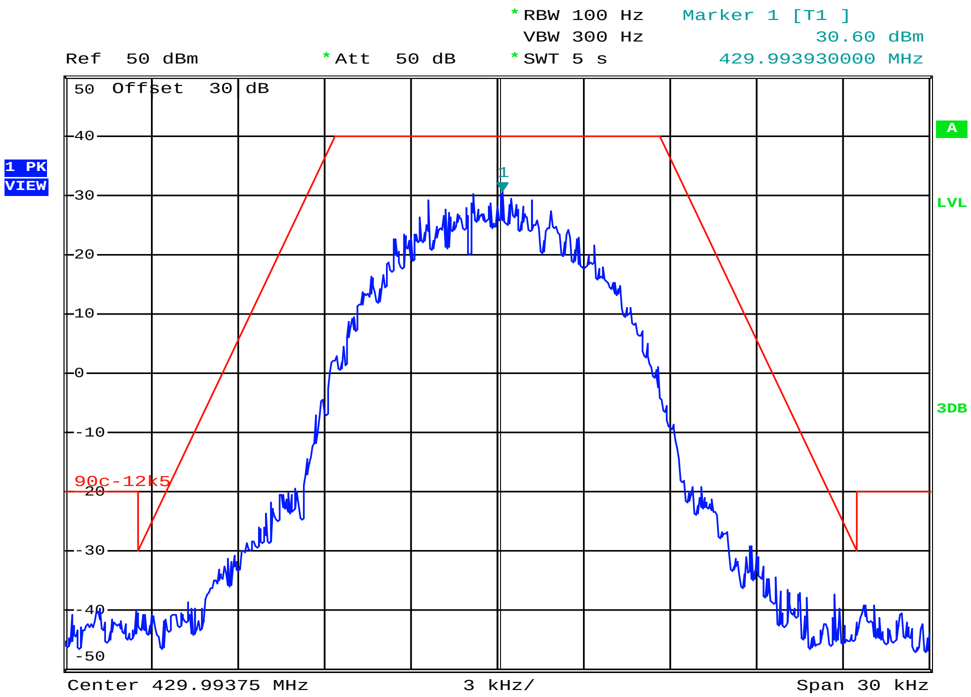
RSS-119 (5.8.3) Mask D



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**

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

RSS-119 (5.8.3) Mask D

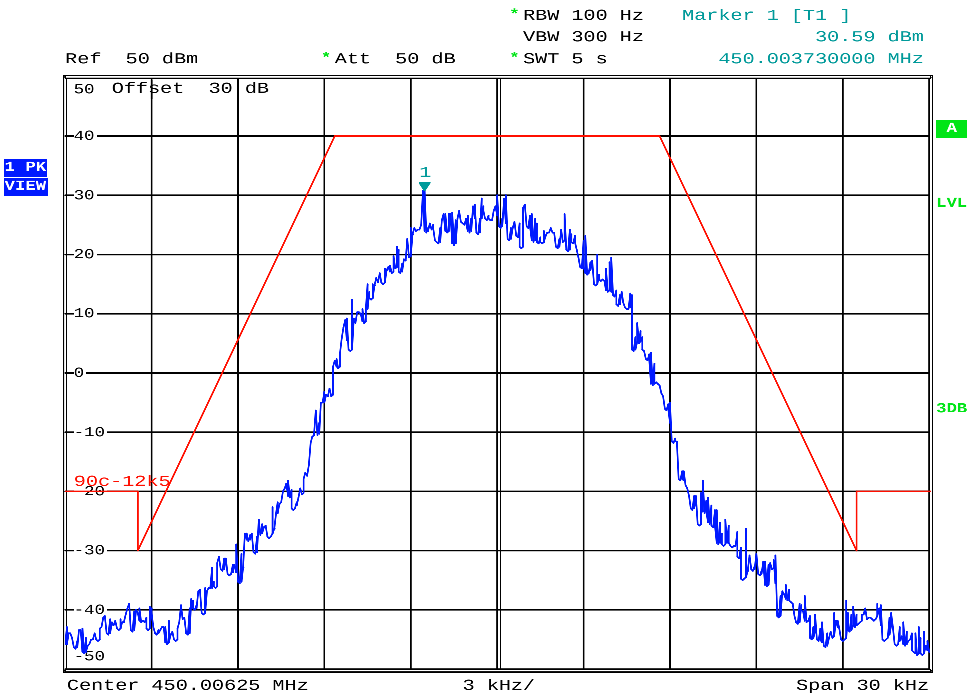


Date: 7.AUG.2019 16:15:57

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

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

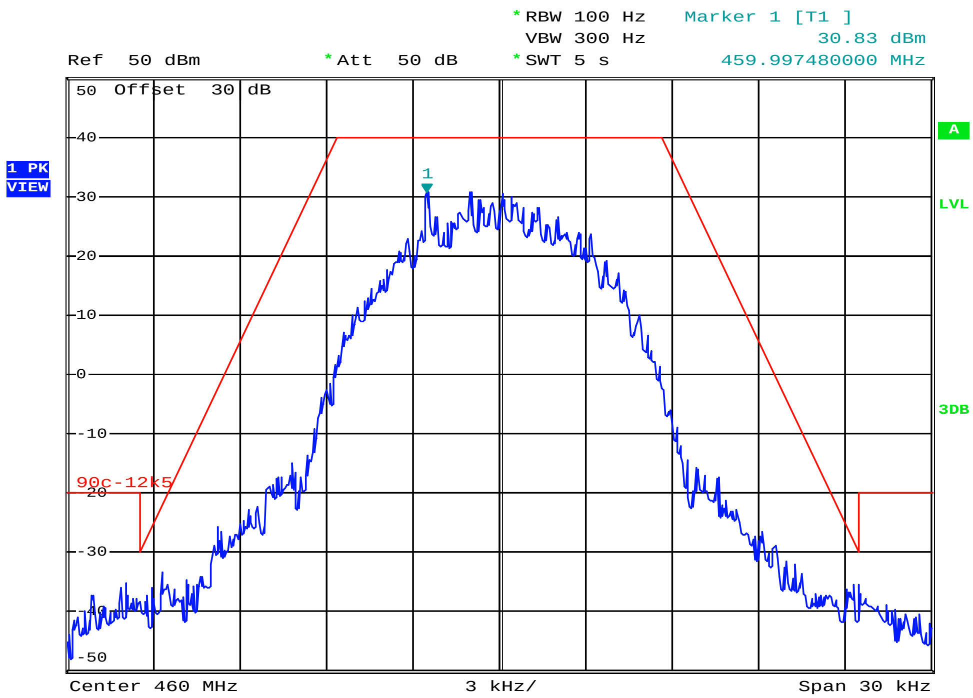


Date: 7.AUG.2019 16:17:28

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**

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

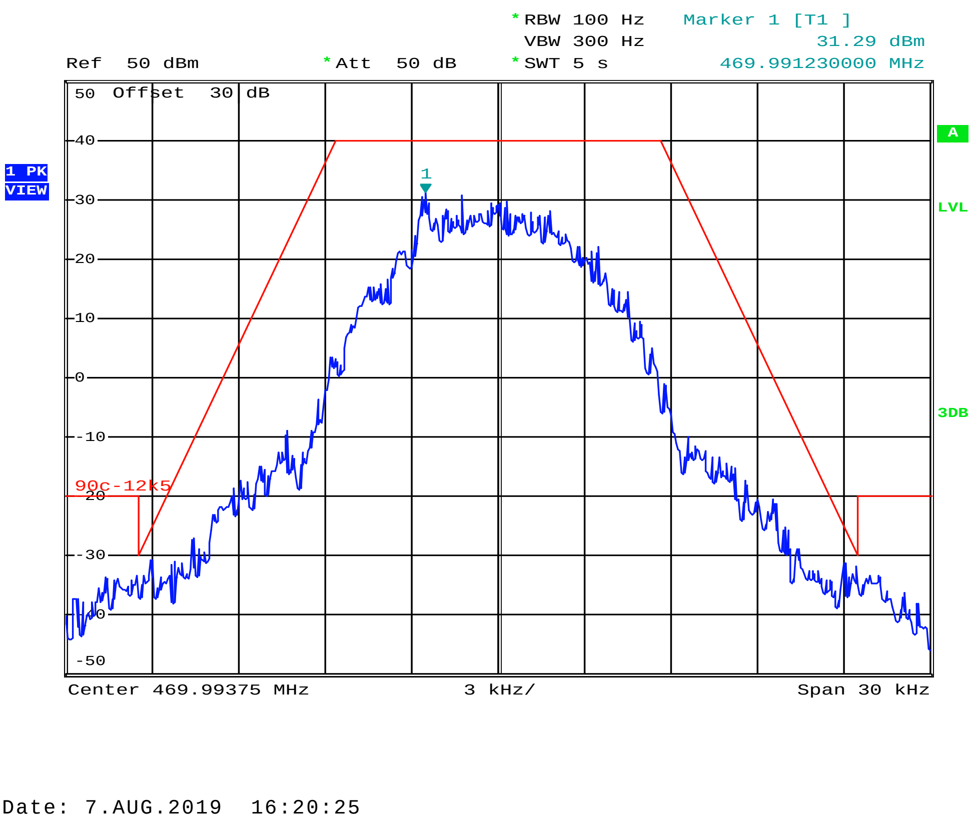


Date: 7.AUG.2019 16:18:45

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

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

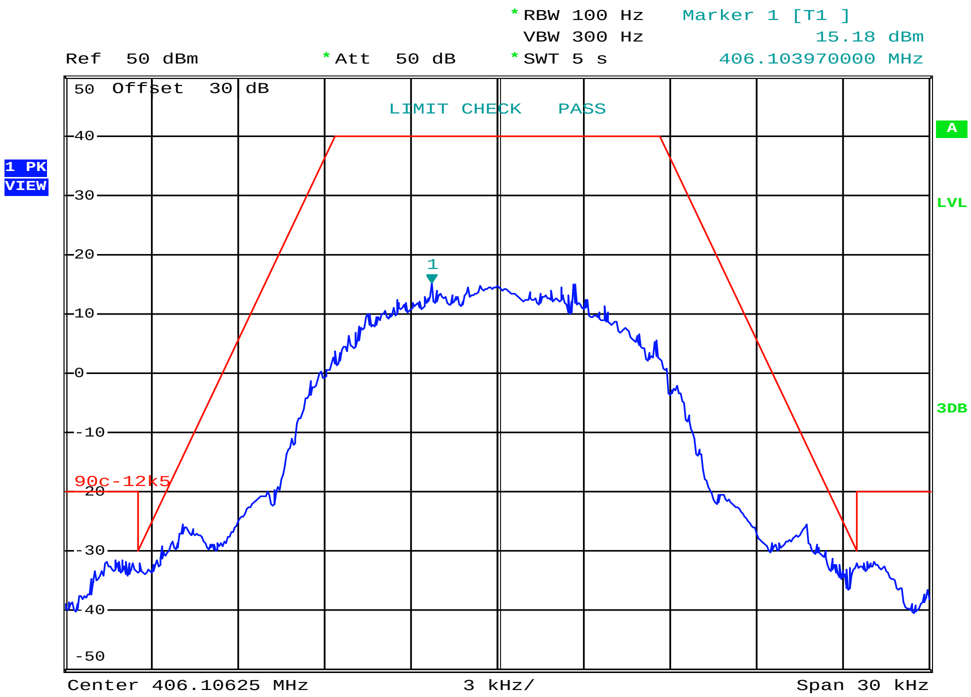
FCC §90.210(d) Mask D, RSS-119 (5.8.3) Mask D



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**

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

RSS-119 (5.8.3) Mask D

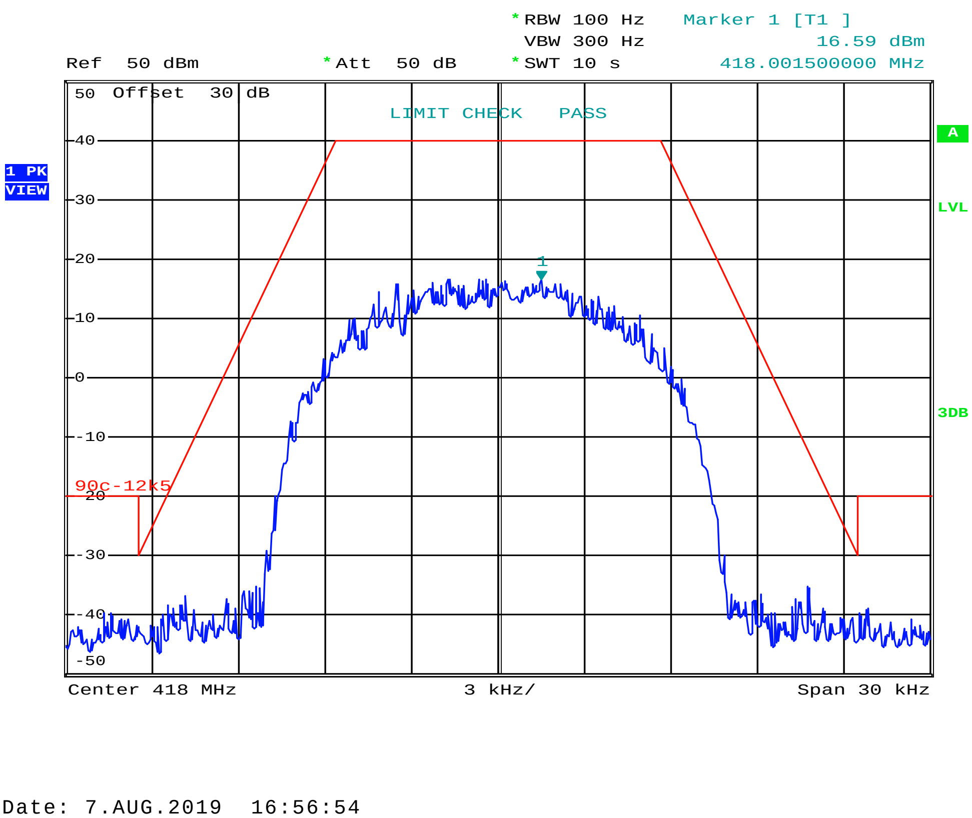


Date: 7.AUG.2019 16:54:03

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

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

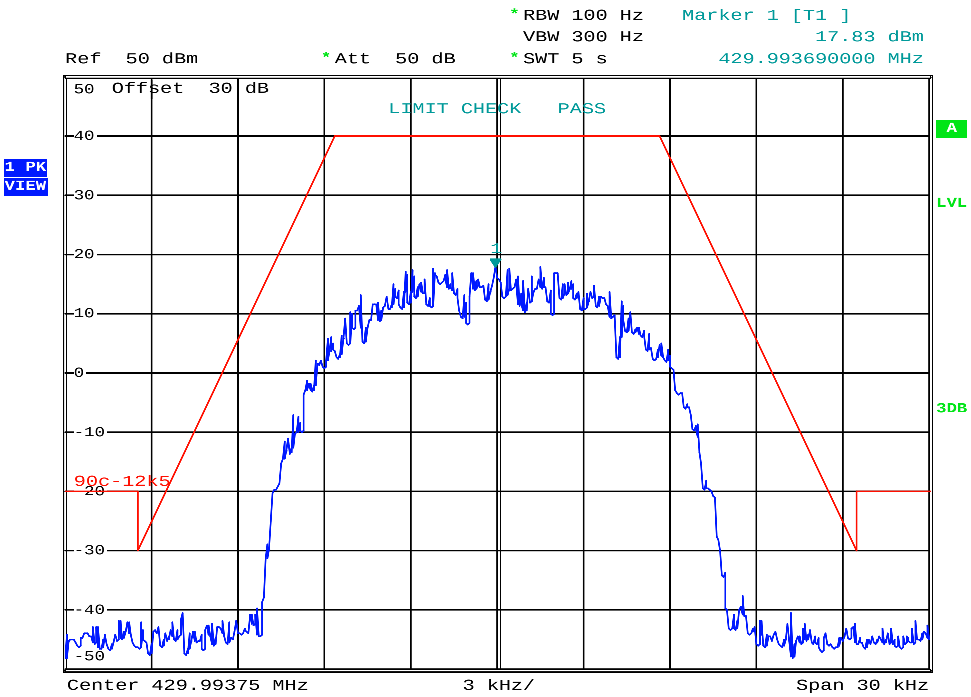
RSS-119 (5.8.3) Mask D



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

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

RSS-119 (5.8.3) Mask D

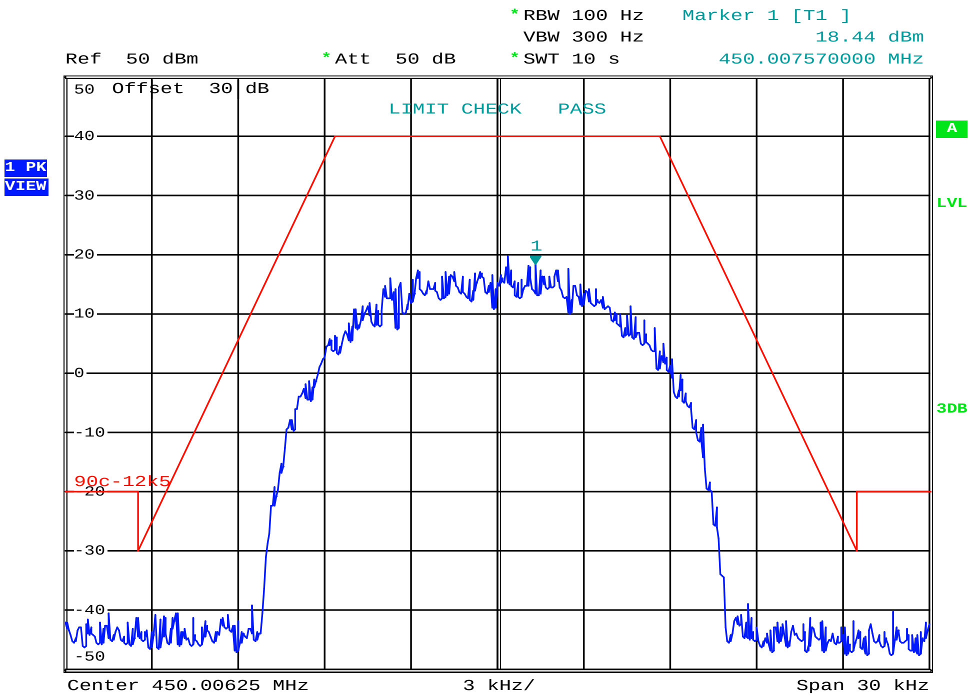


Date: 7.AUG.2019 17:04:06

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

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

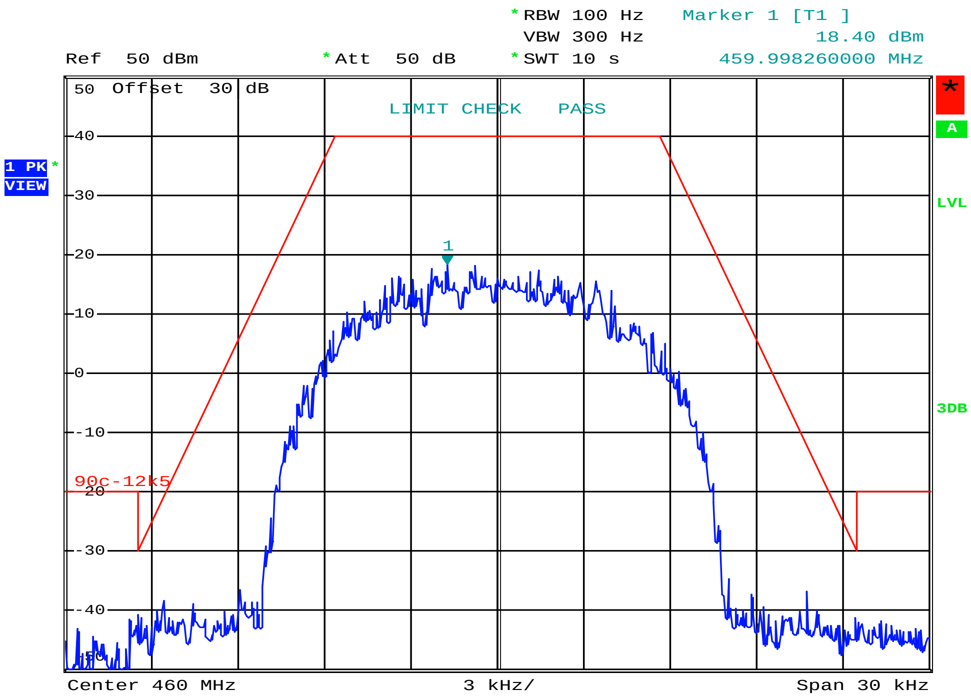


Date: 7.AUG.2019 17:06:30

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

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

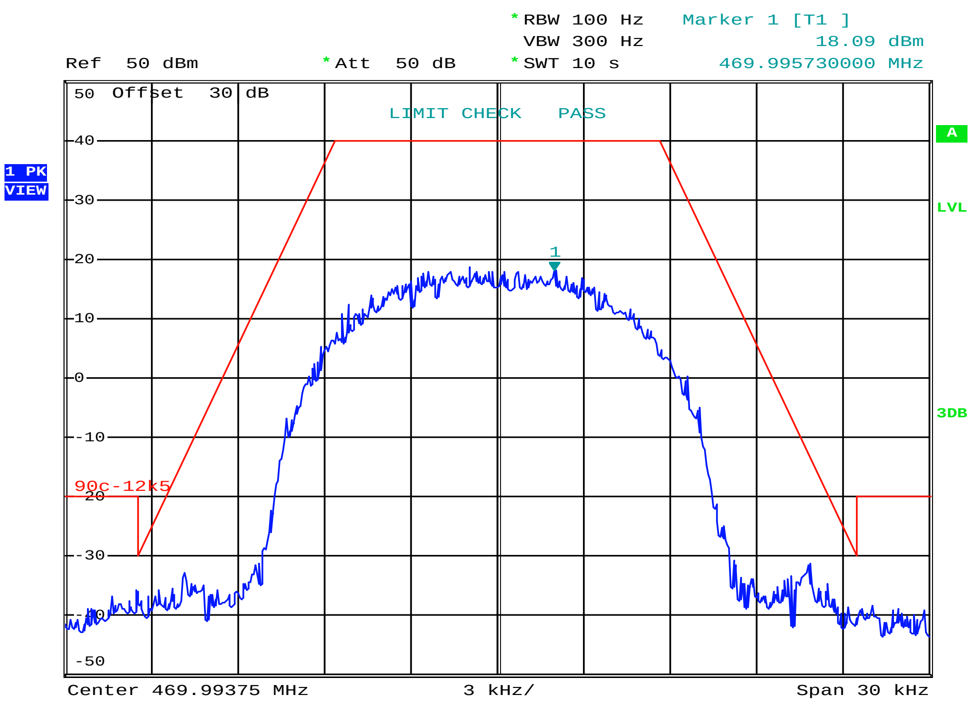


Date: 7.AUG.2019 17:08:32

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

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

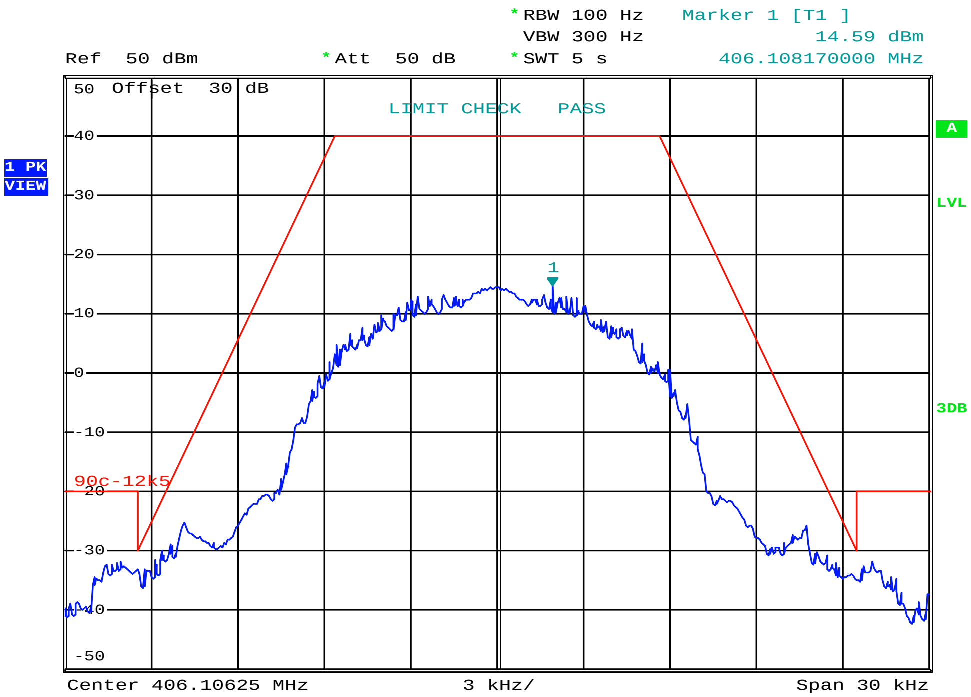


Date: 7.AUG.2019 17:15:37

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**

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

RSS-119 (5.8.3) Mask D

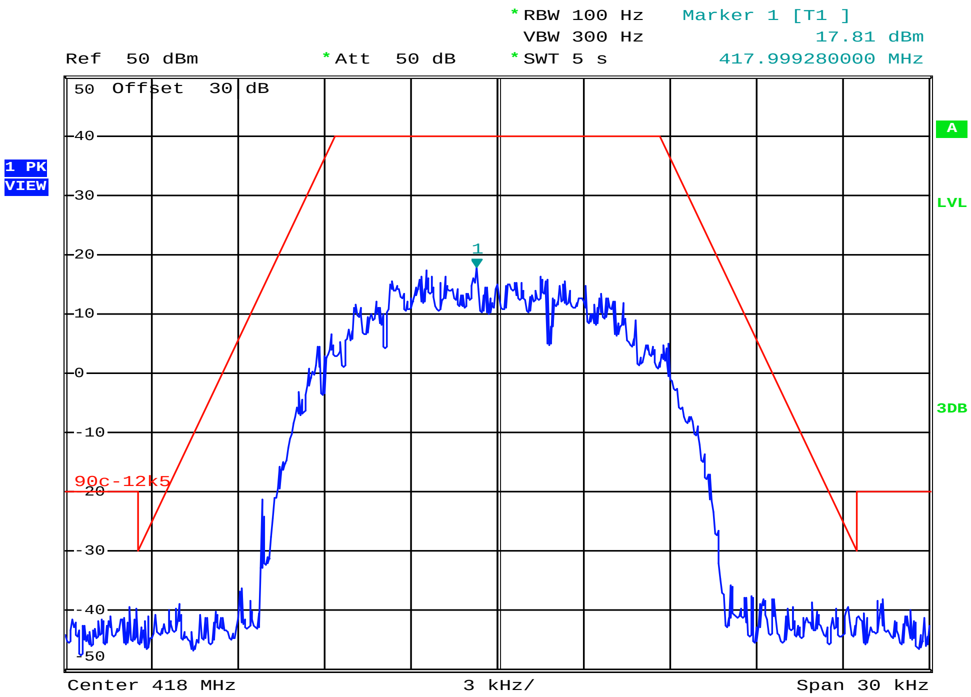


Date: 7.AUG.2019 16:35:43

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

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

RSS-119 (5.8.3) Mask D

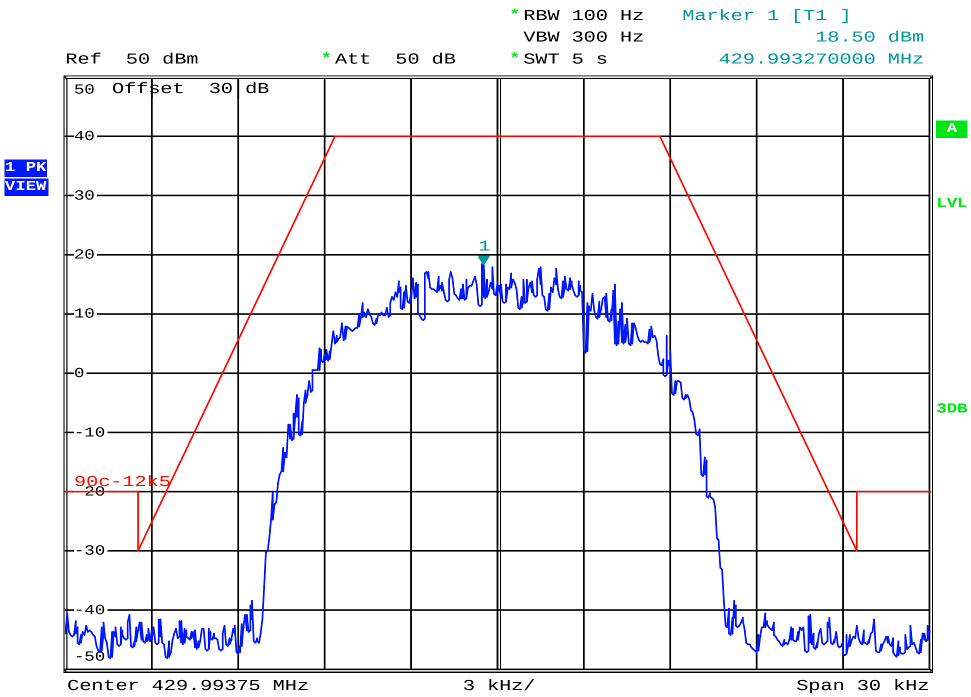


Date: 7.AUG.2019 16:32:11

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

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

RSS-119 (5.8.3) Mask D

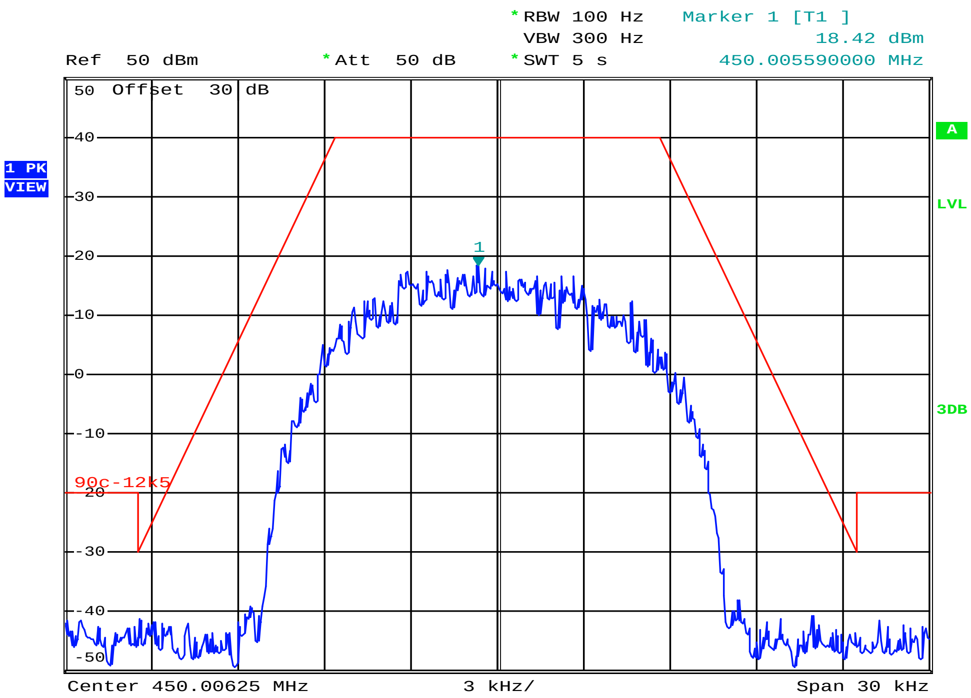


Date: 7.AUG.2019 16:27:37

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**

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

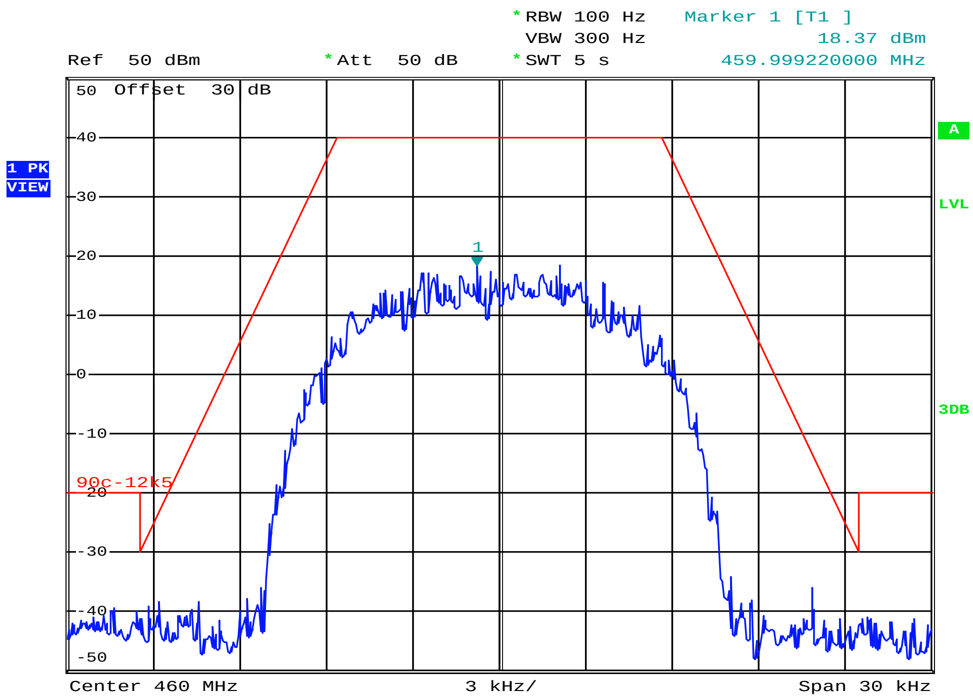


Date: 7.AUG.2019 16:26:06

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

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

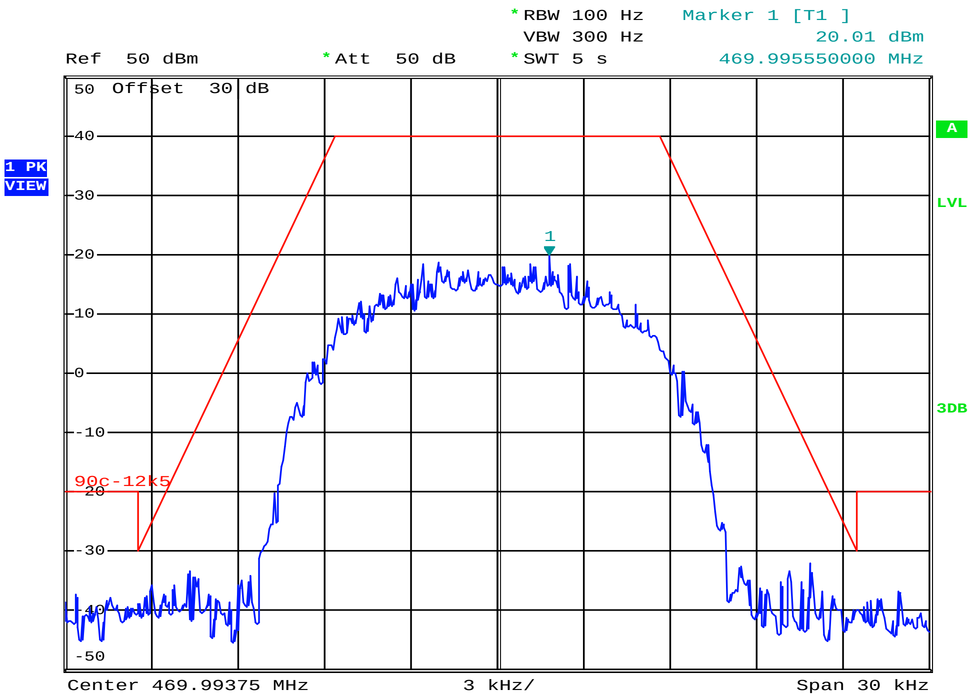


Date: 7.AUG.2019 16:24:42

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

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

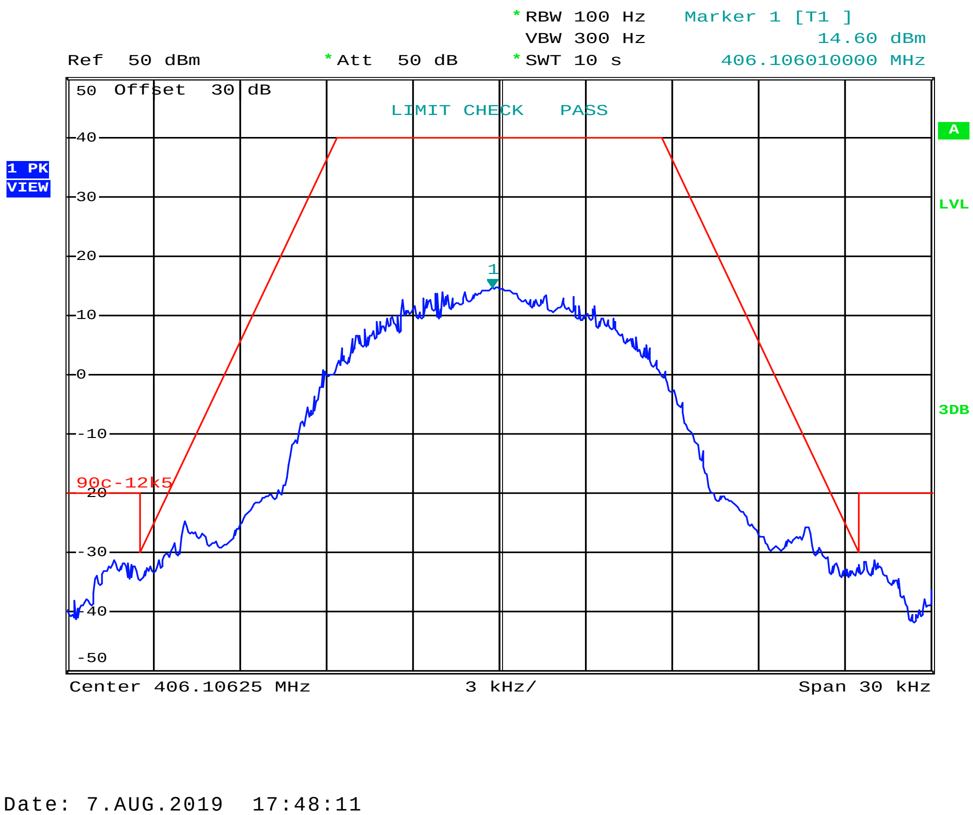


Date: 7.AUG.2019 16:23:20

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

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

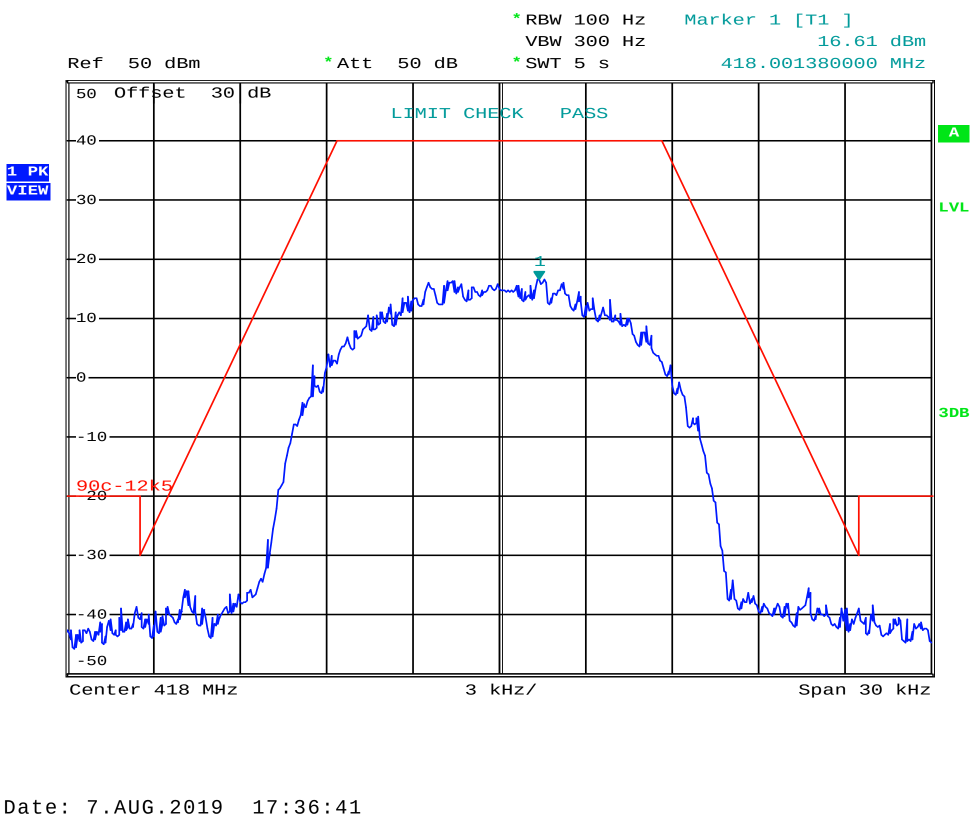
RSS-119 (5.8.3) Mask D



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

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

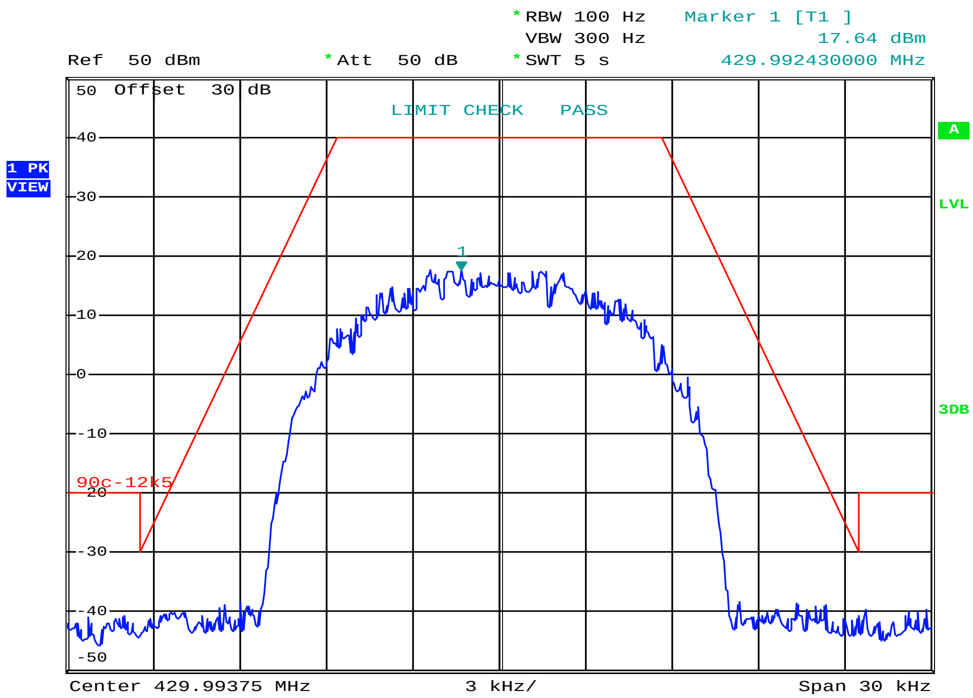
RSS-119 (5.8.3) Mask D



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**

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

RSS-119 (5.8.3) Mask D

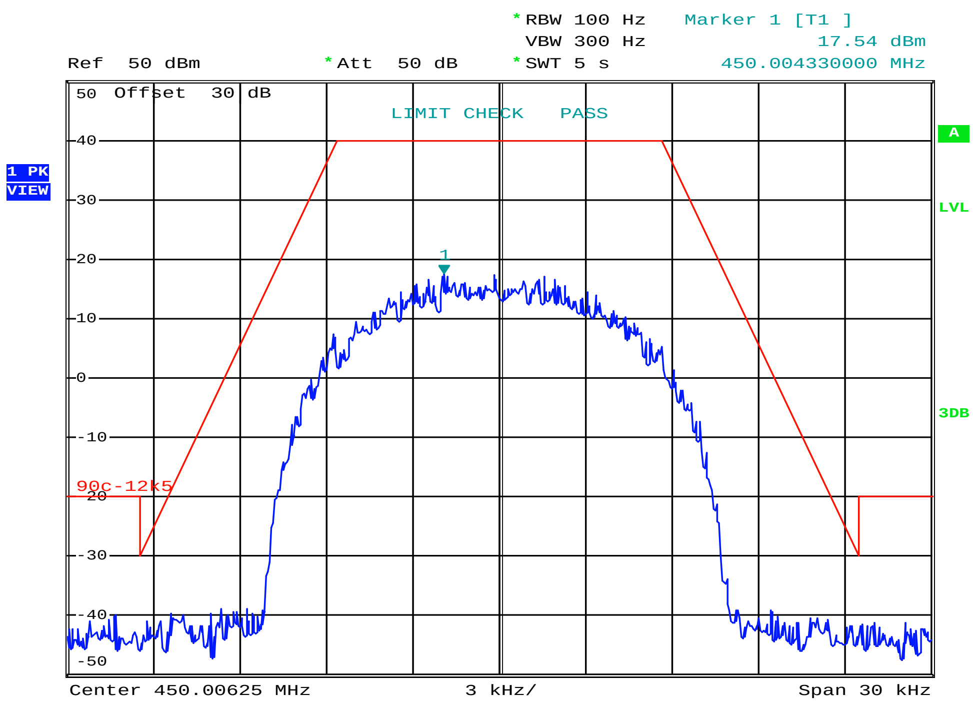


Date: 7.AUG.2019 17:27:51

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**

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

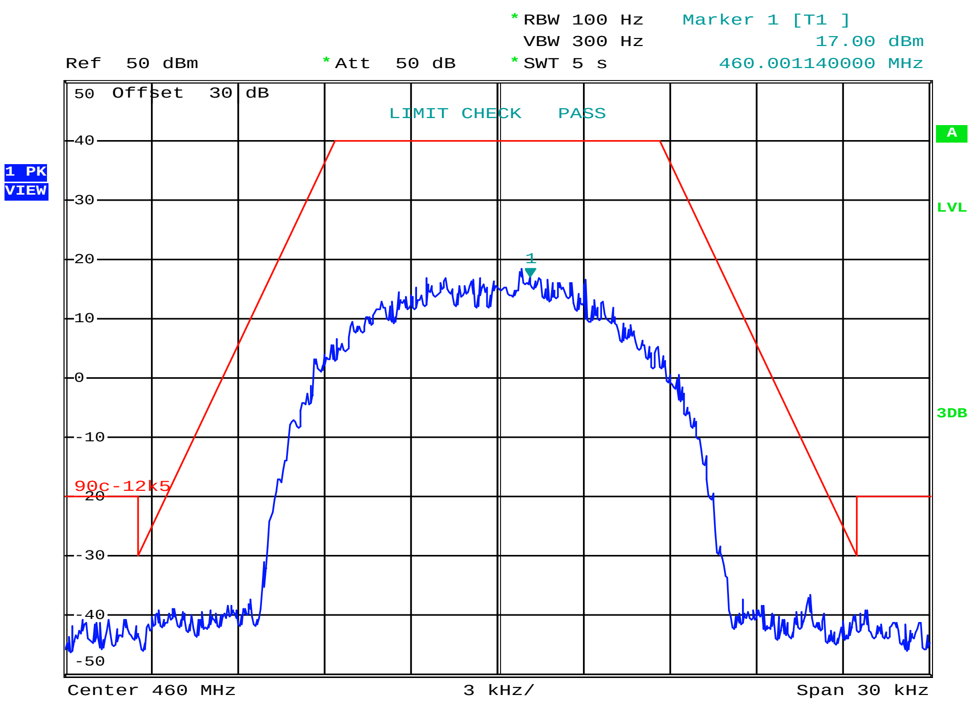


Date: 7.AUG.2019 17:23:42

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

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

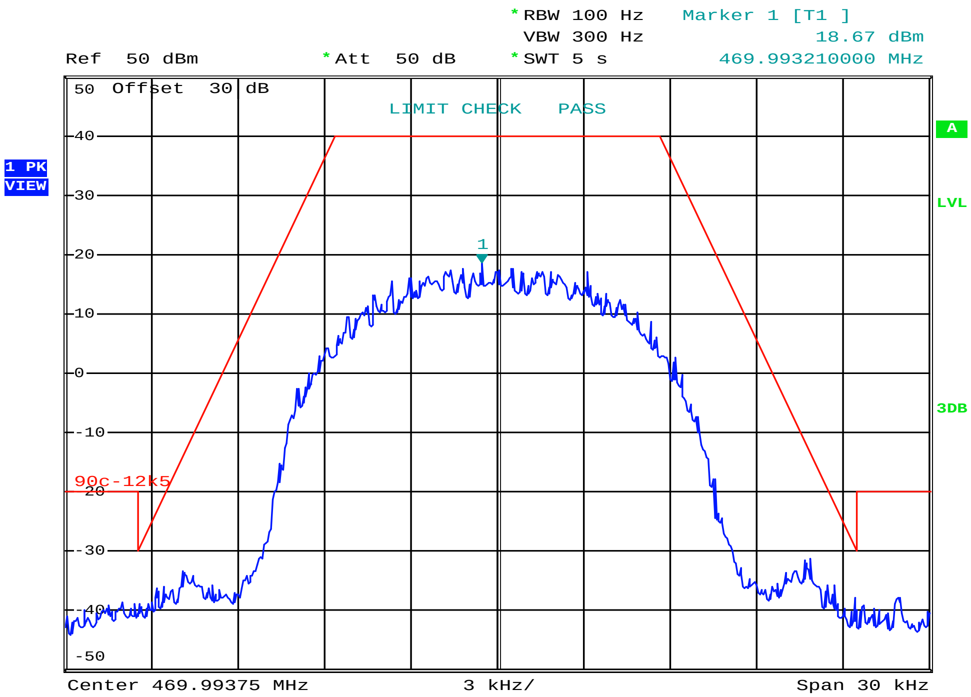


Date: 7.AUG.2019 17:21:42

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**

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

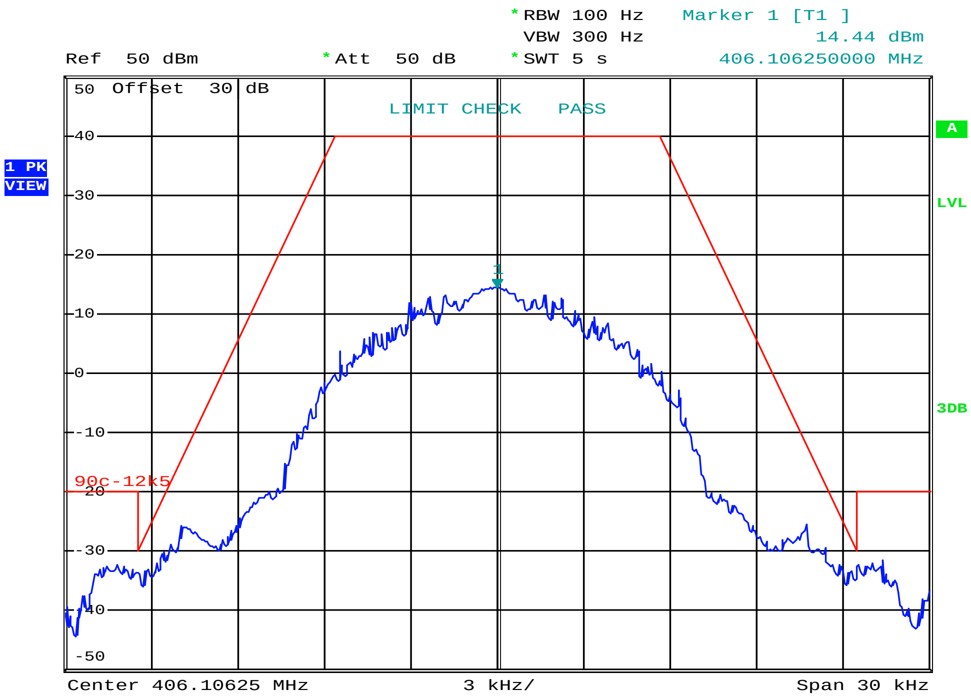


Date: 7.AUG.2019 17:19:24

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

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

RSS-119 (5.8.3) Mask D

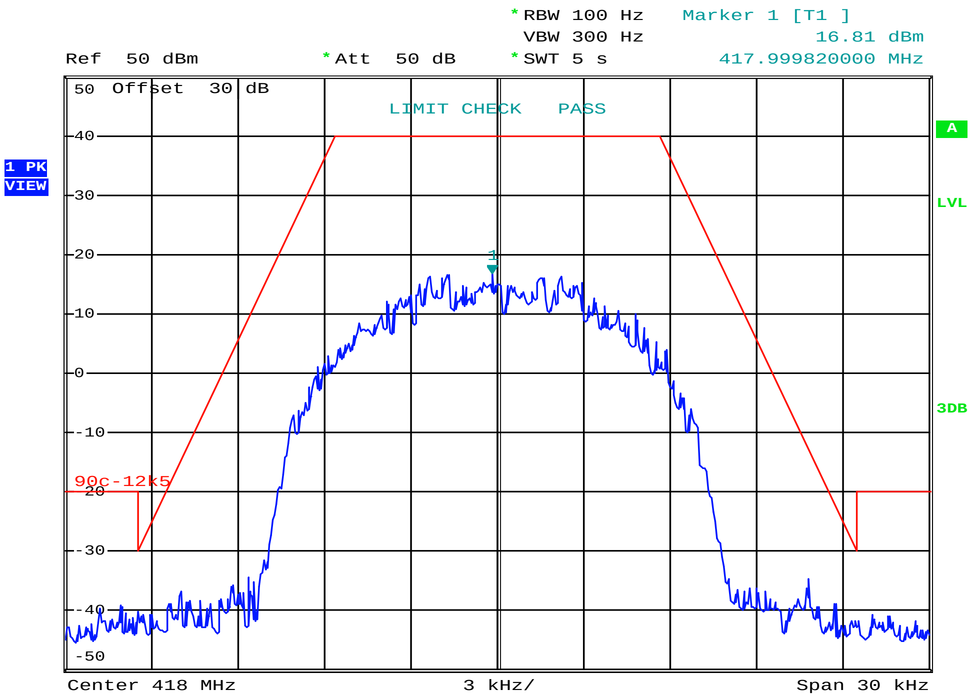


Date: 7.AUG.2019 17:52:38

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**

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

RSS-119 (5.8.3) Mask D

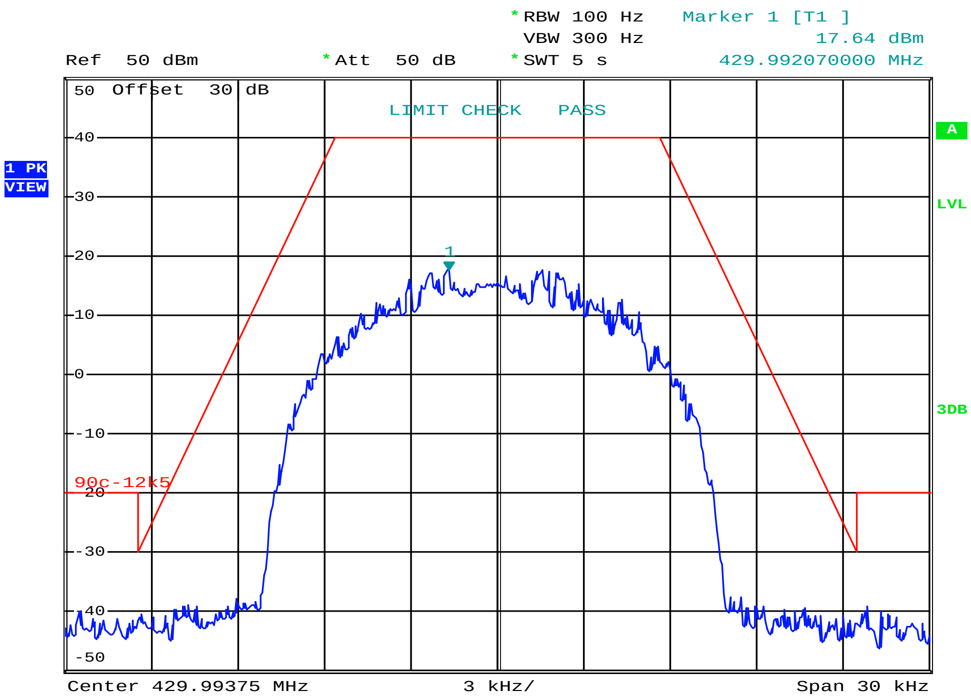


Date: 7.AUG.2019 17:55:07

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**

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

RSS-119 (5.8.3) Mask D

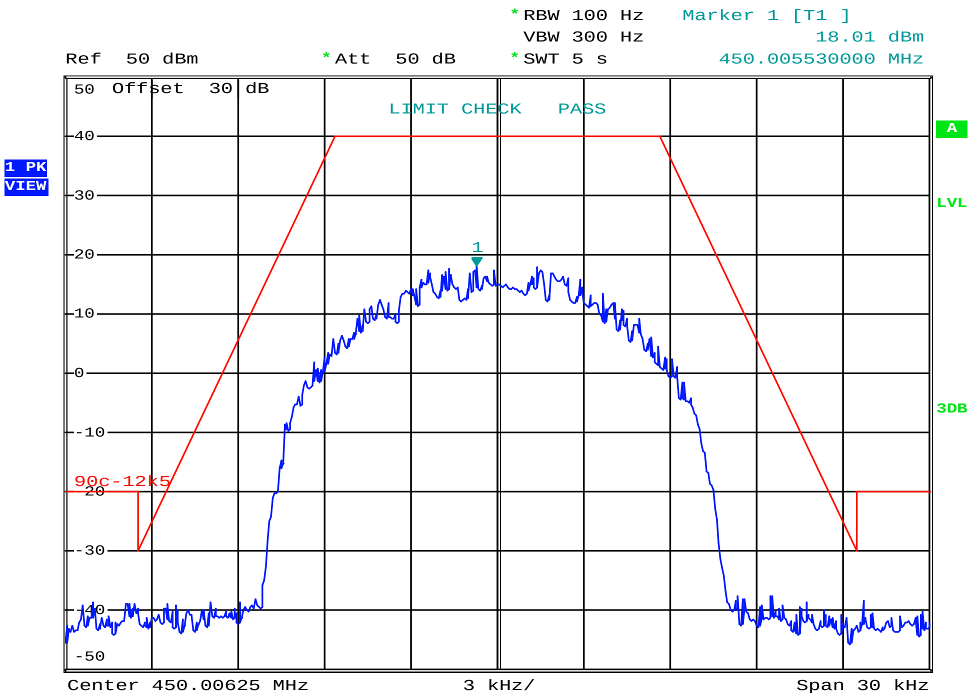


Date: 7.AUG.2019 18:02:03

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**

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

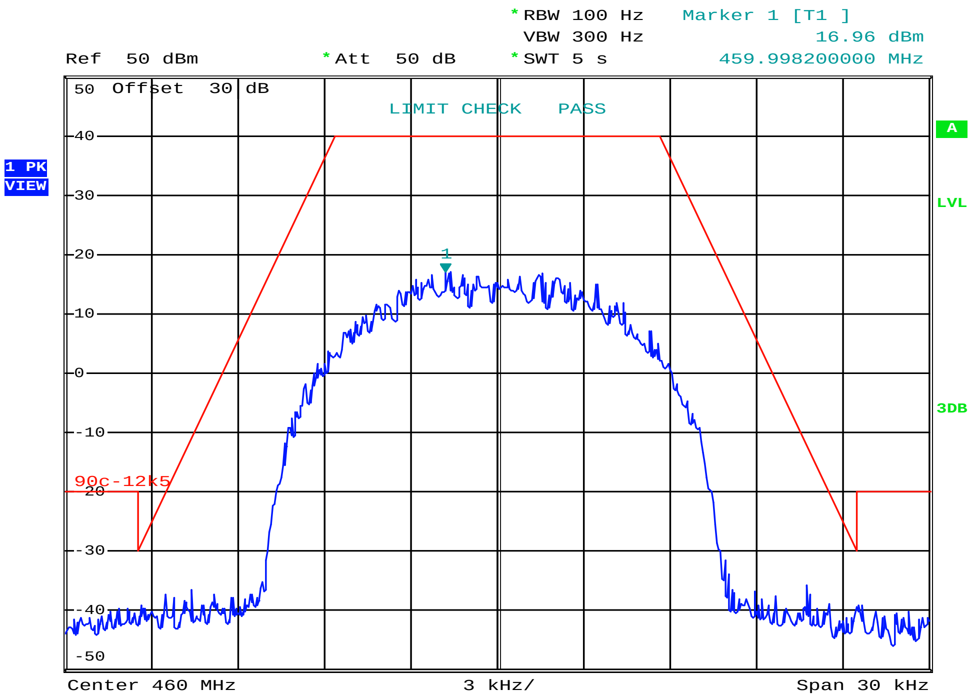


Date: 7.AUG.2019 18:04:52

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

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

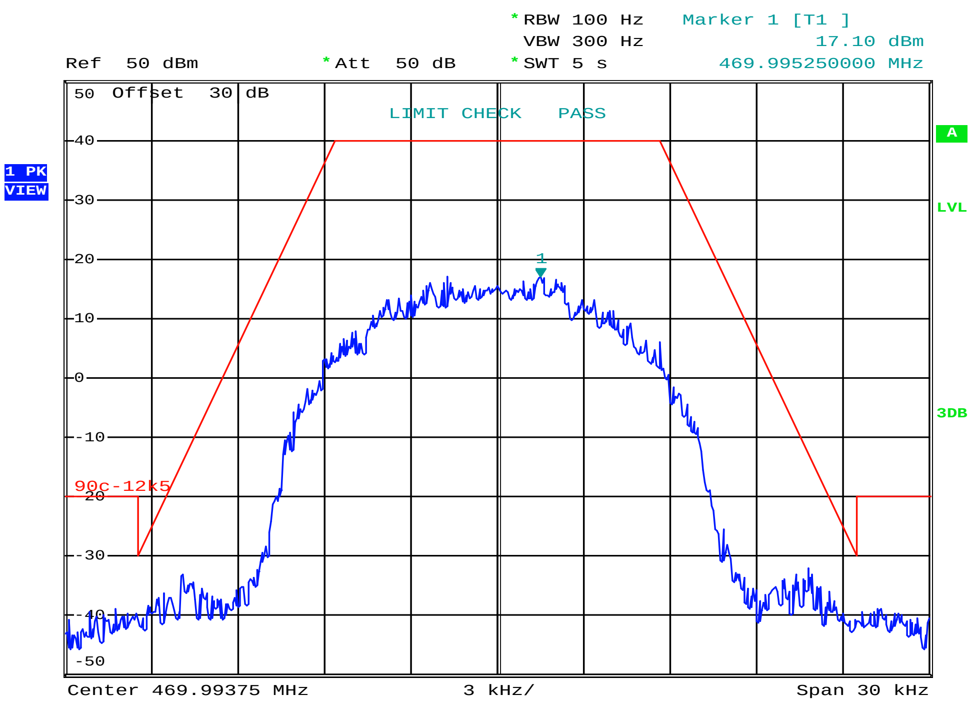


Date: 7.AUG.2019 18:07:13

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

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

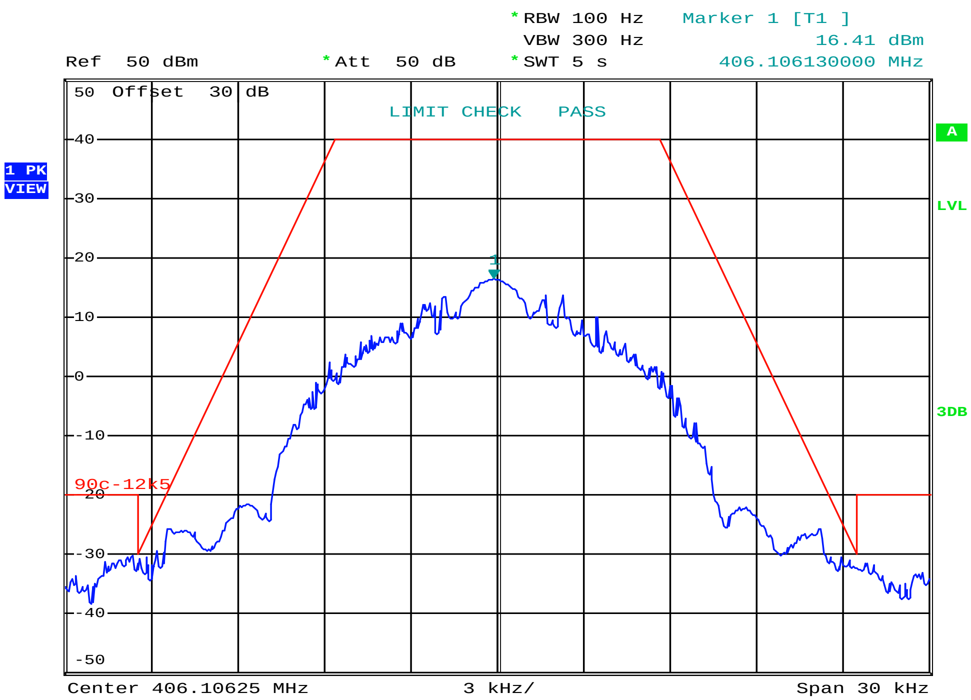


Date: 7.AUG.2019 18:09:13

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**

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

RSS-119 (5.8.3) Mask D

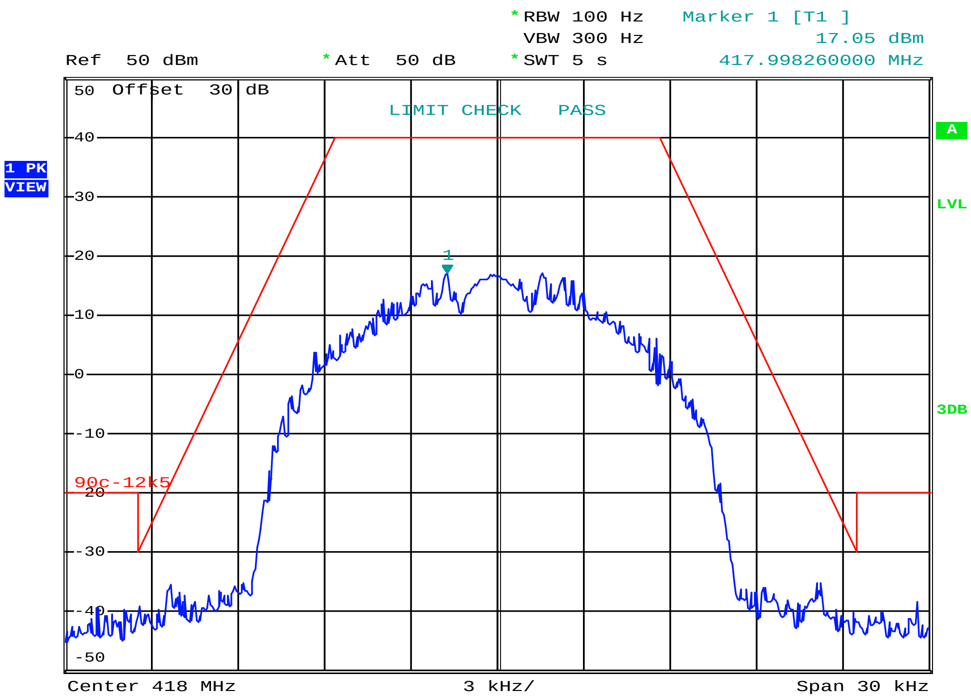


Date: 7.AUG.2019 18:28:20

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

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

RSS-119 (5.8.3) Mask D

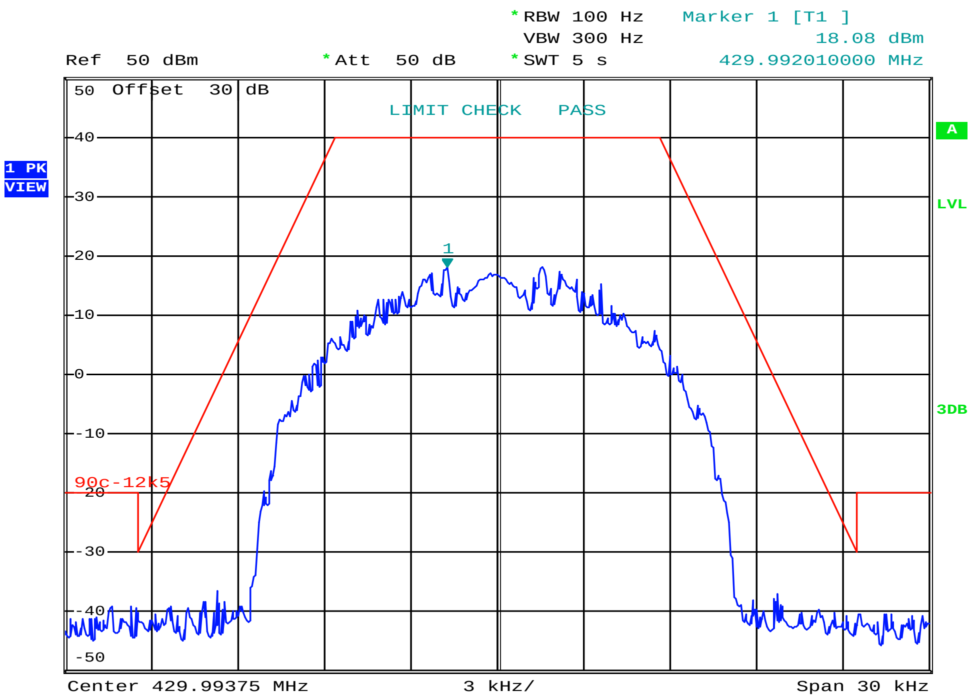


Date: 7.AUG.2019 18:25:31

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**

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

RSS-119 (5.8.3) Mask D

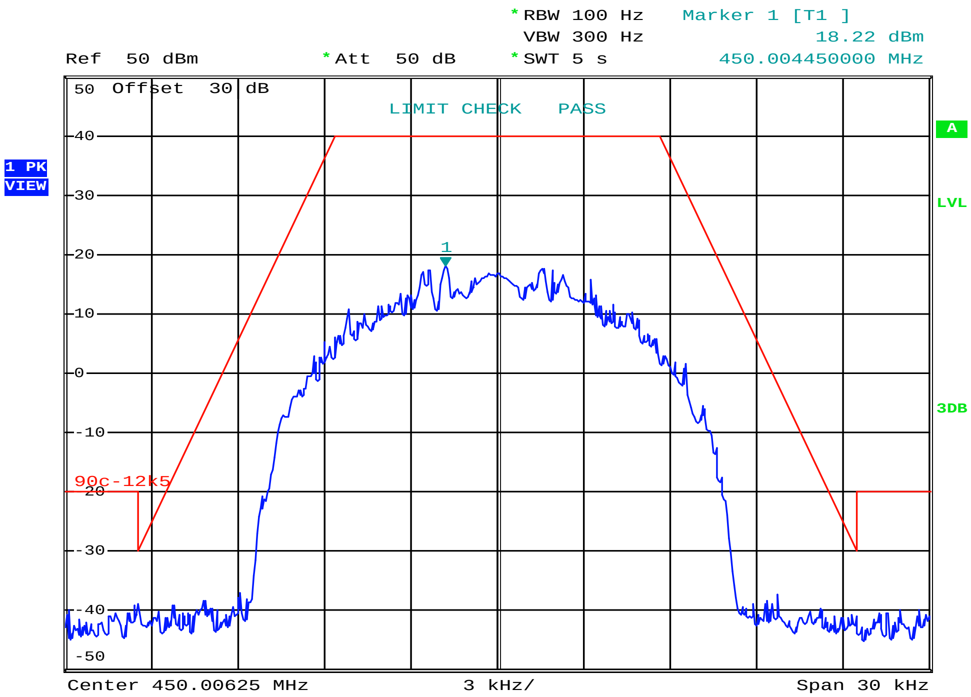


Date: 7.AUG.2019 18:19:17

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**

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

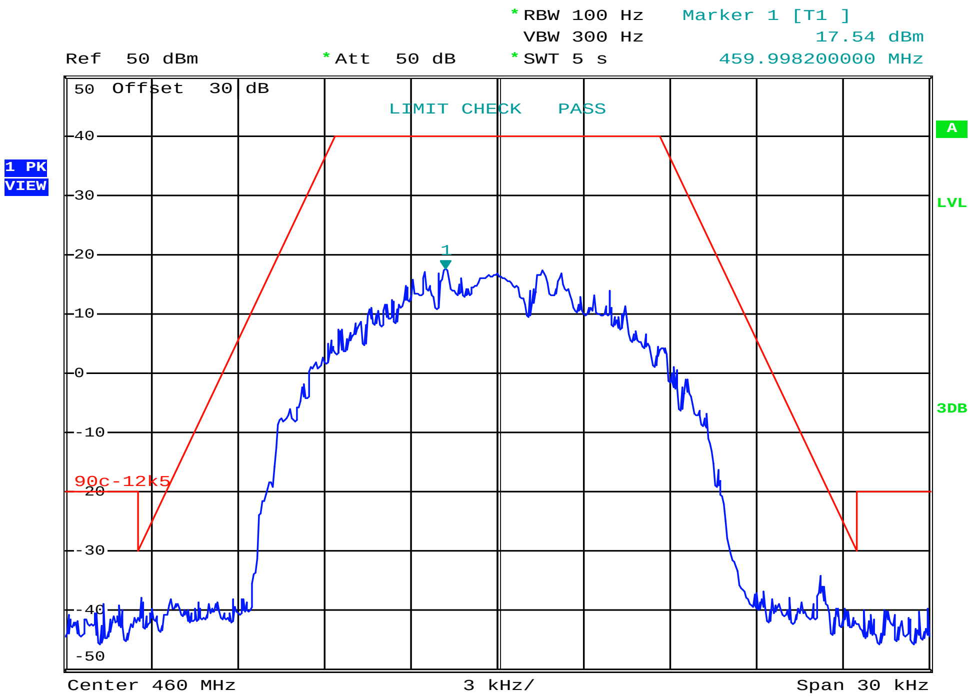


Date: 7.AUG.2019 18:16:43

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**

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

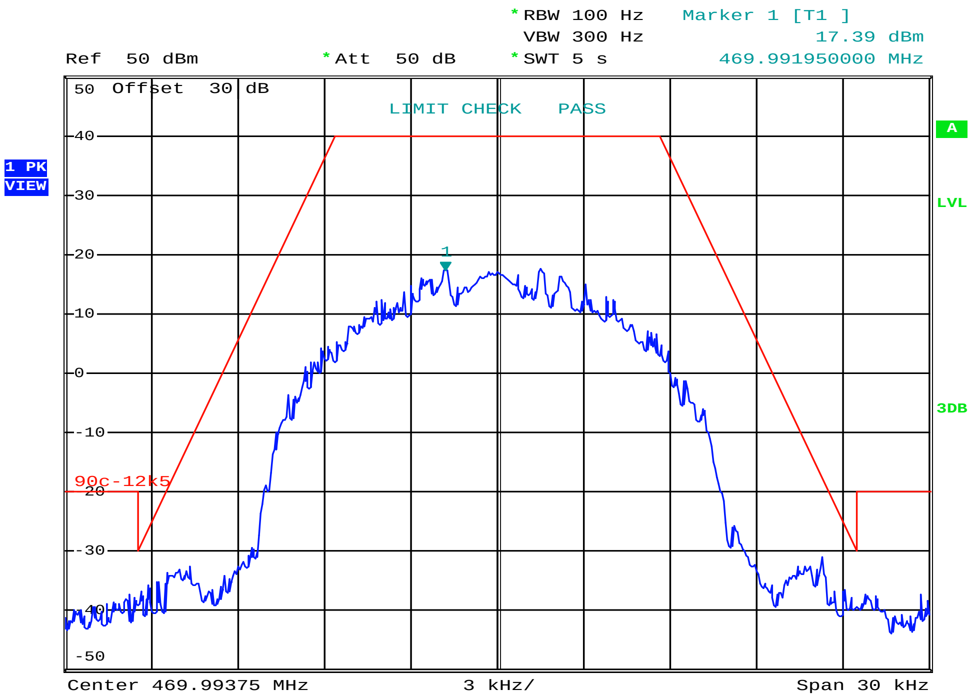


Date: 7.AUG.2019 18:13:53

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

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

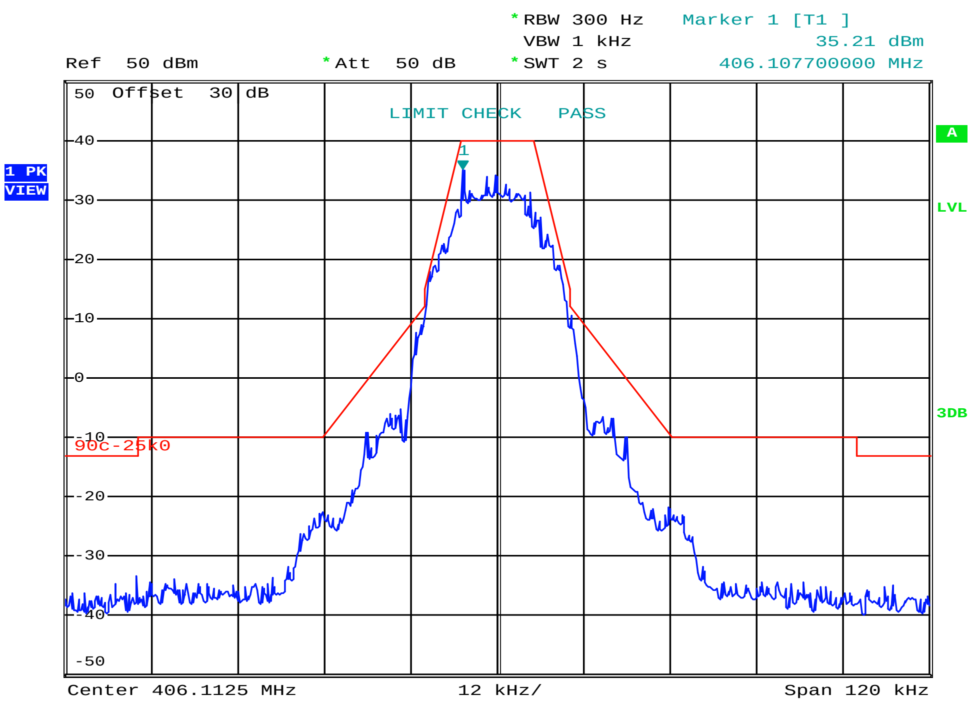


Date: 7.AUG.2019 18:11:55

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

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

RSS-119 (5.8.2) Mask C

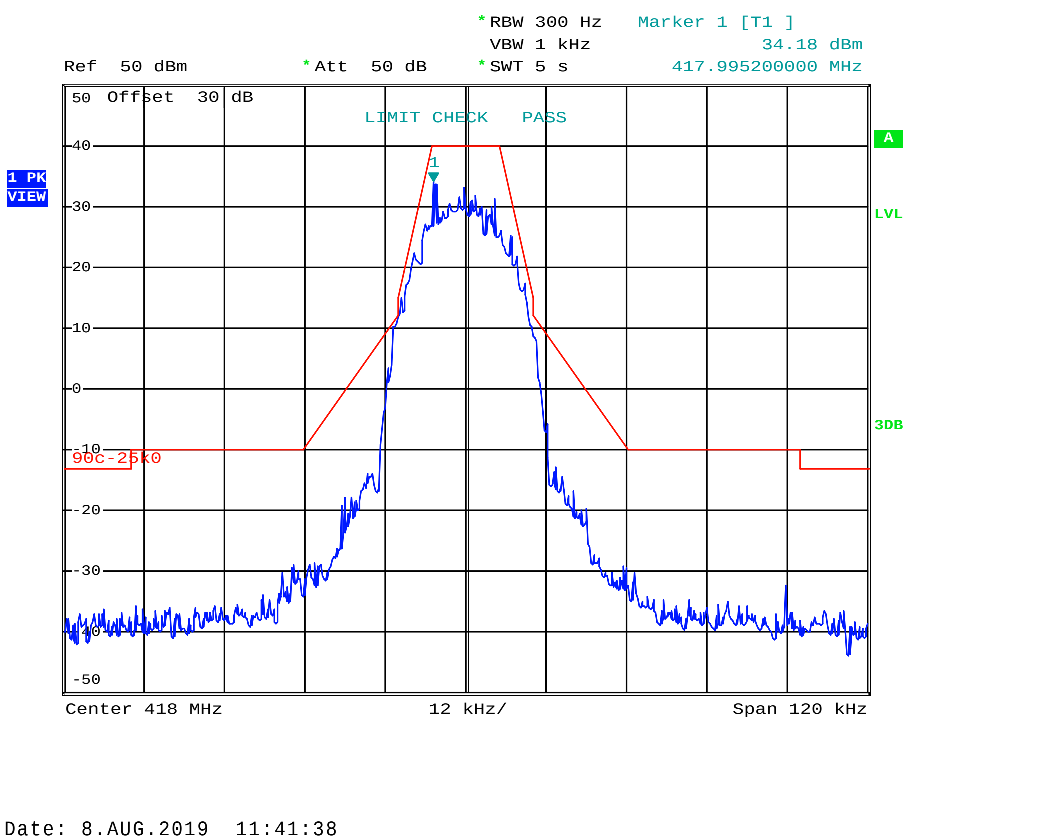


Date: 8.AUG.2019 11:40:09

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

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

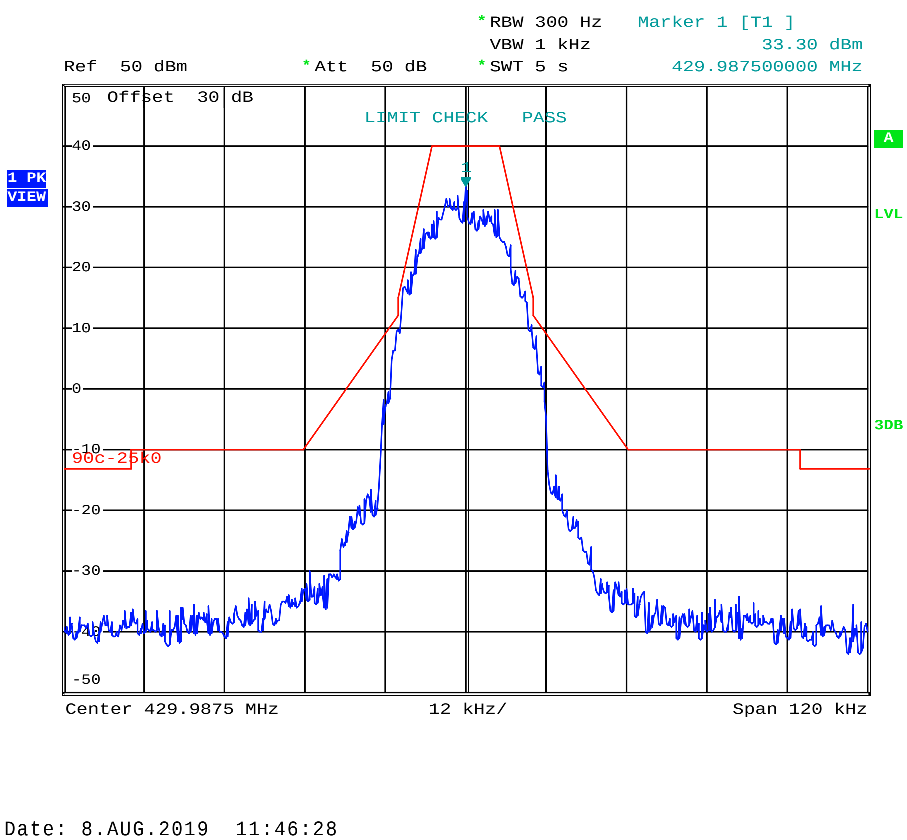
RSS-119 (5.8.2) Mask C



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**

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

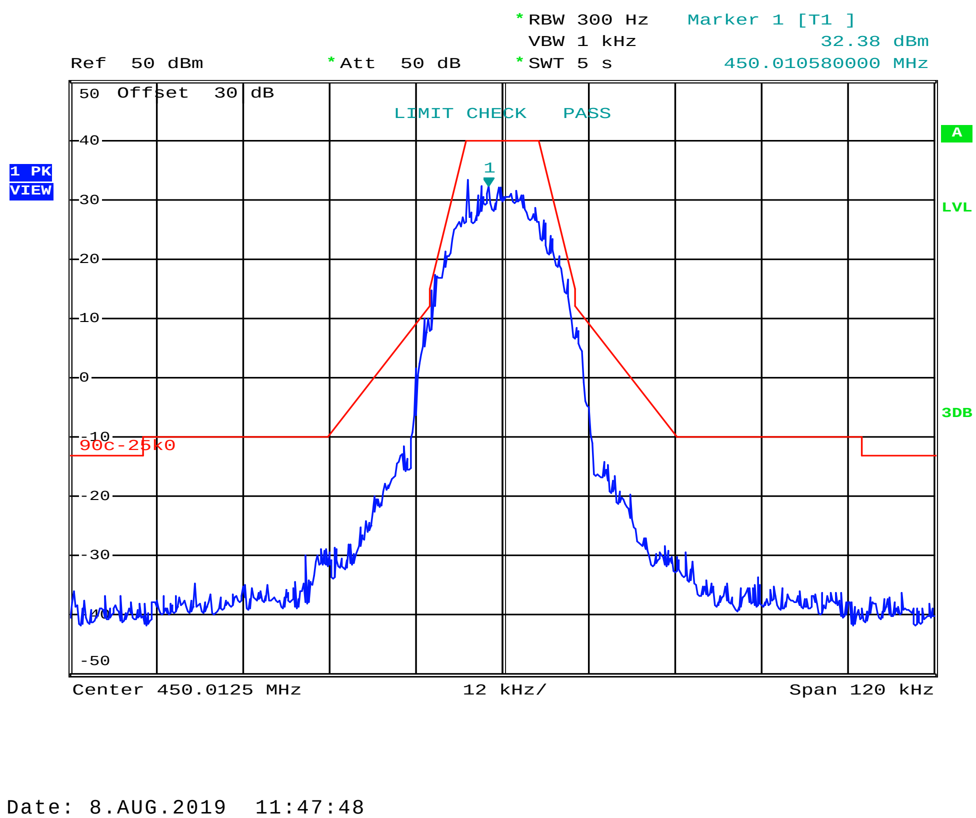
RSS-119 (5.8.2) Mask C



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**

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

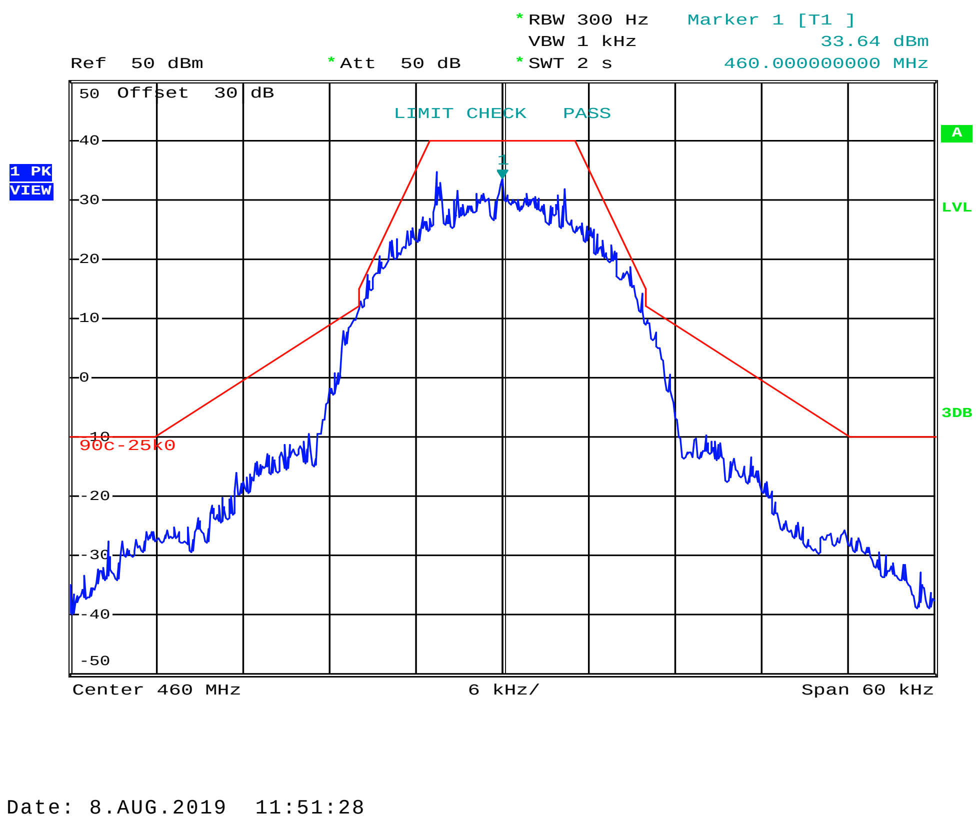
FCC §90.210(c) Mask C, RSS-119 (5.8.2) Mask C



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**

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

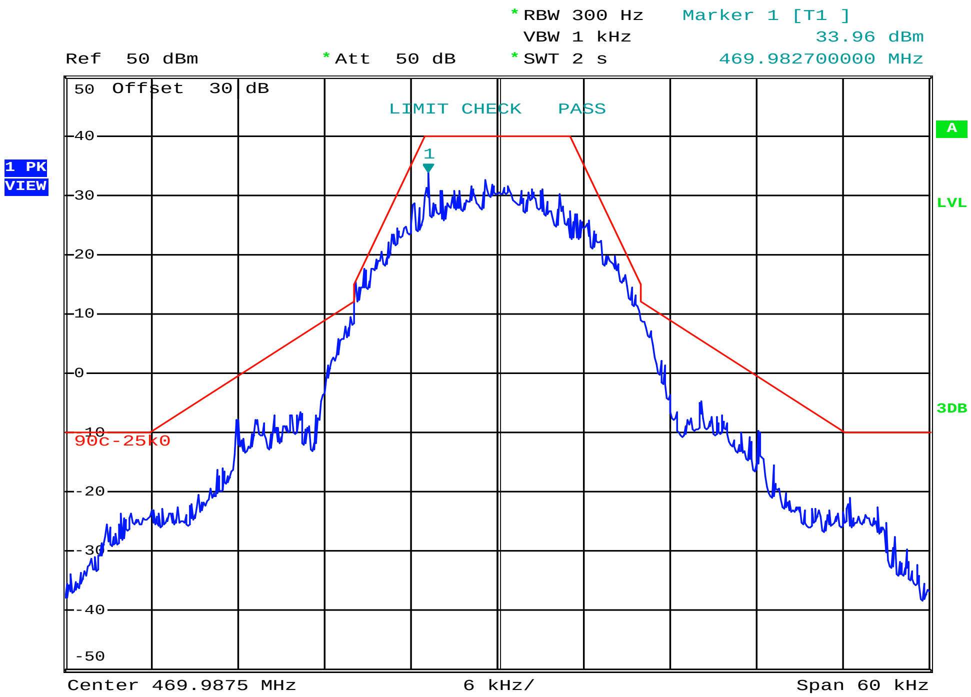
FCC §90.210(c) Mask C, RSS-119 (5.8.2) Mask C



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**

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

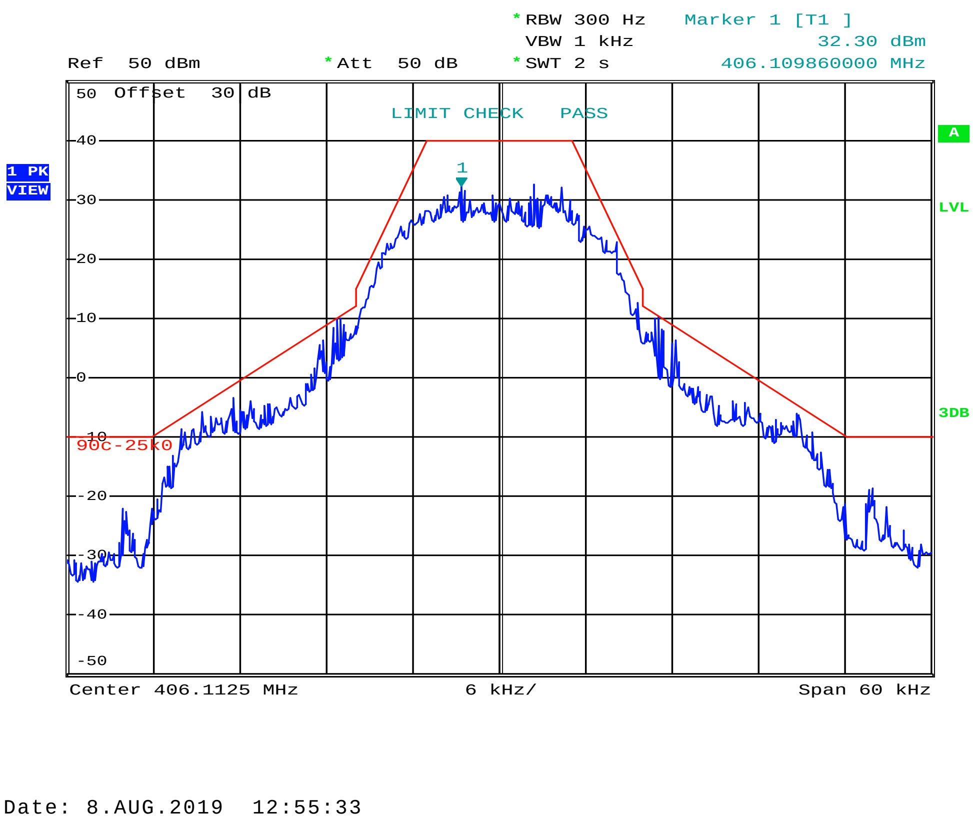


Date: 8.AUG.2019 11:54:59

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

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

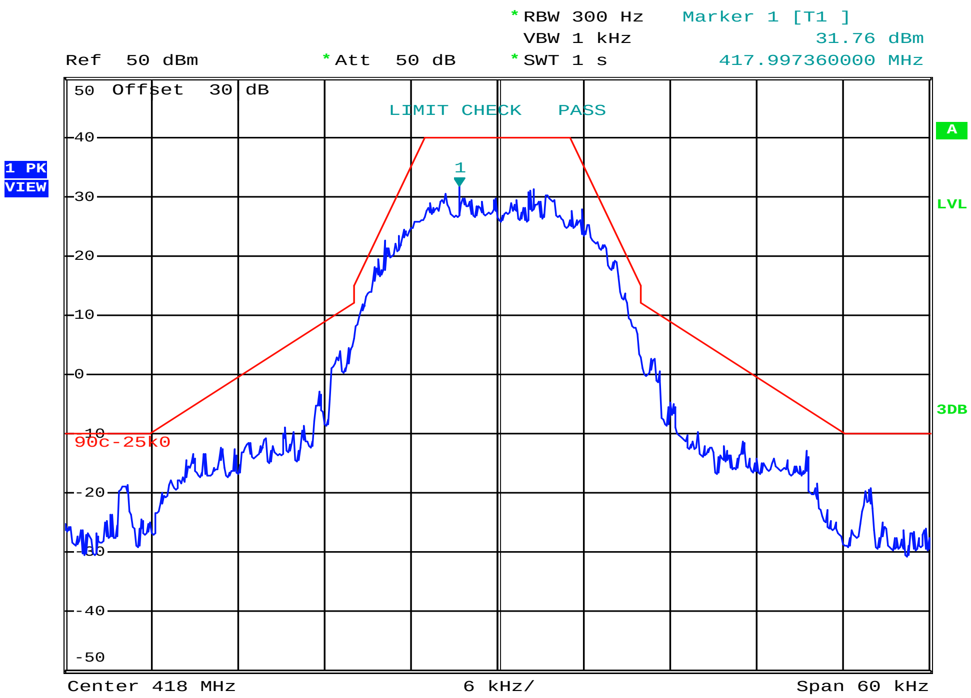
RSS-119 (5.8.2) Mask C



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

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

RSS-119 (5.8.2) Mask C

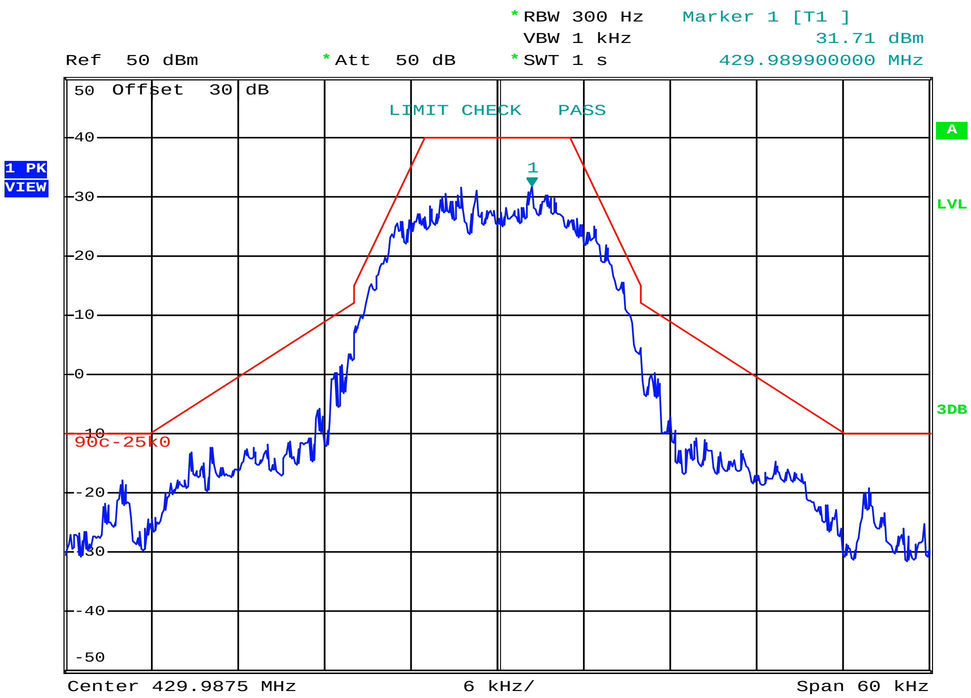


Date: 8.AUG.2019 12:58:52

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**

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

RSS-119 (5.8.2) Mask C

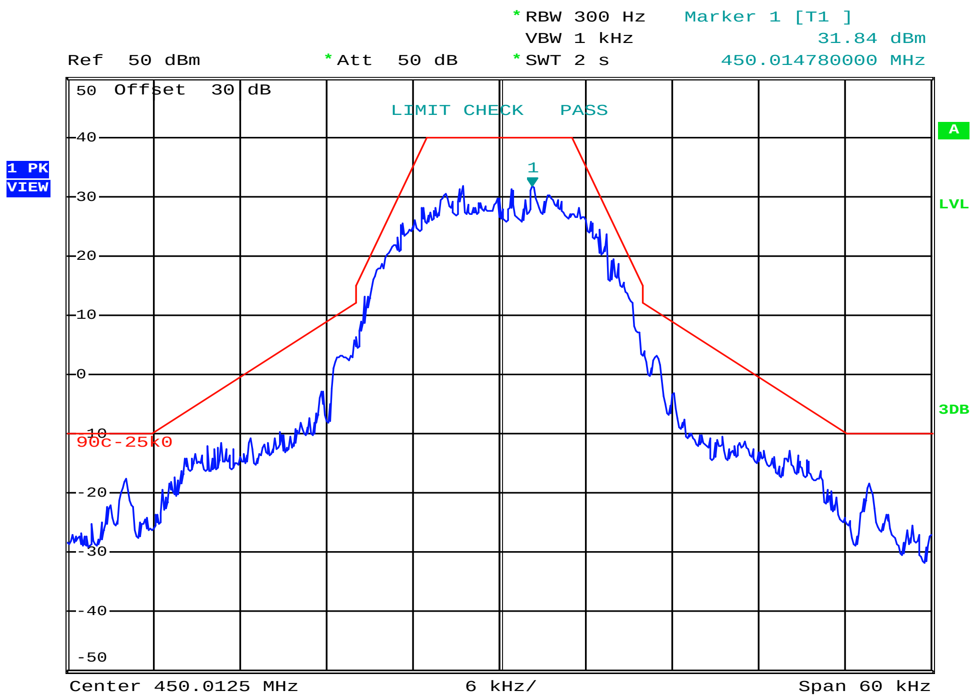


Date: 8.AUG.2019 13:03:18

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

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

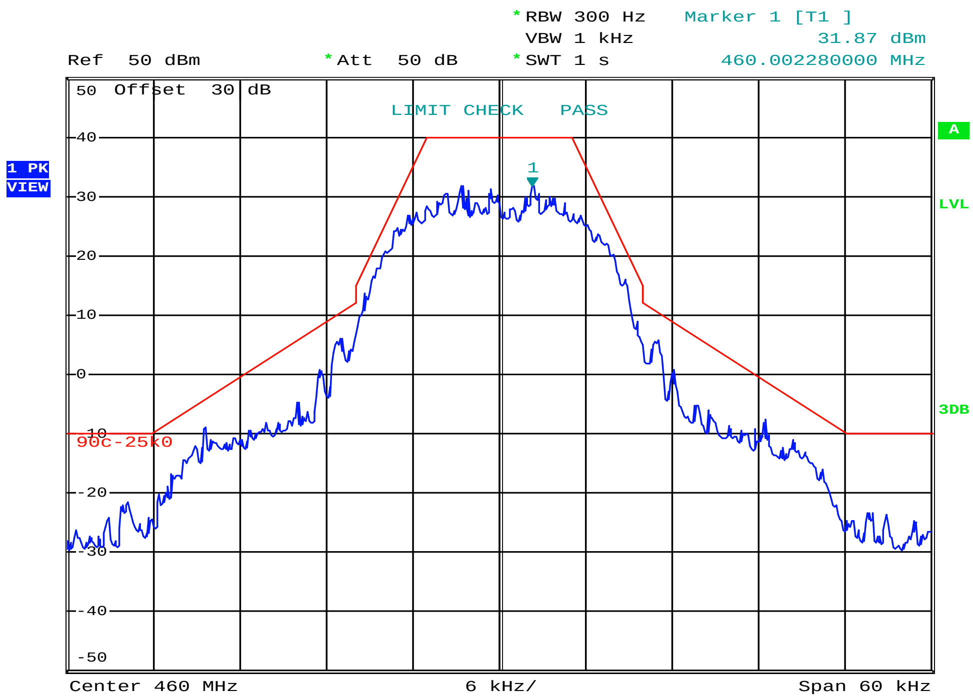


Date: 8.AUG.2019 13:05:28

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

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

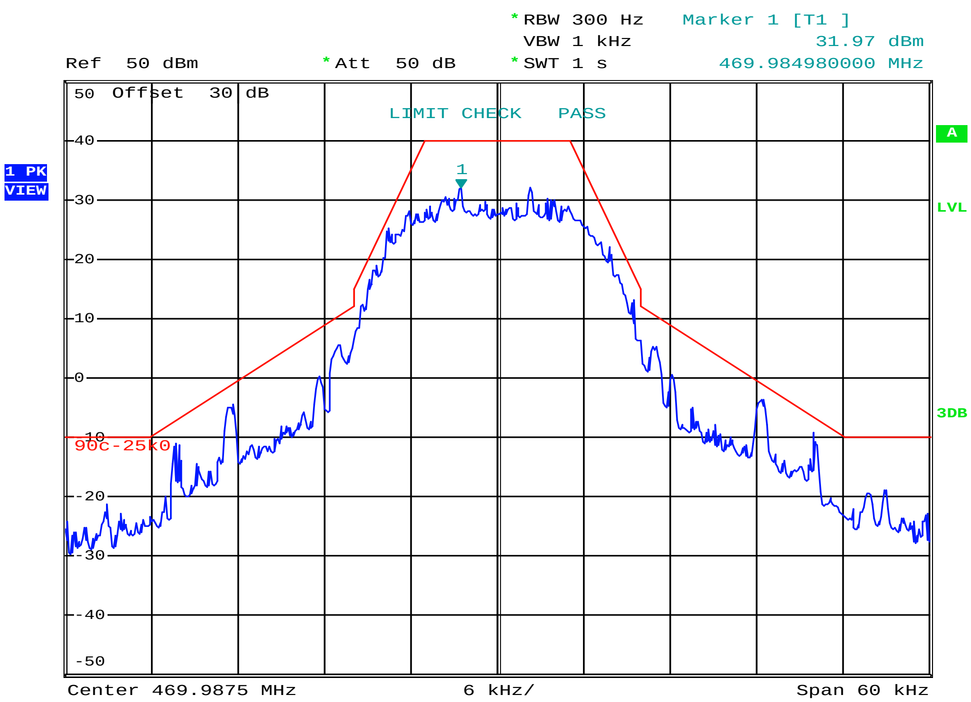


Date: 8.AUG.2019 13:07:00

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

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

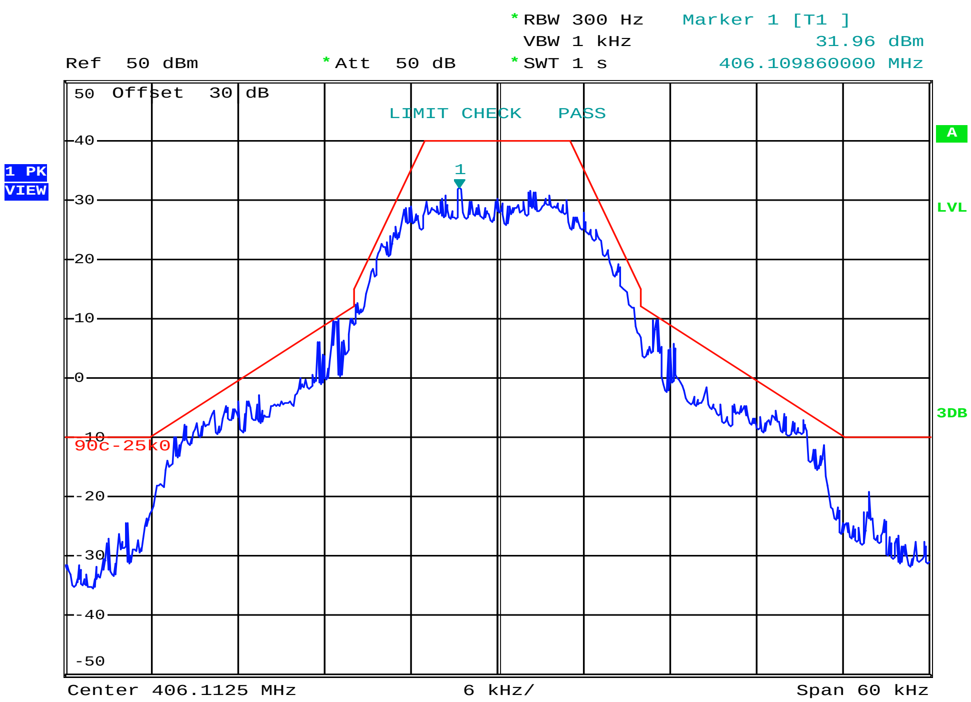


Date: 8.AUG.2019 13:15:23

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**

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

RSS-119 (5.8.2) Mask C

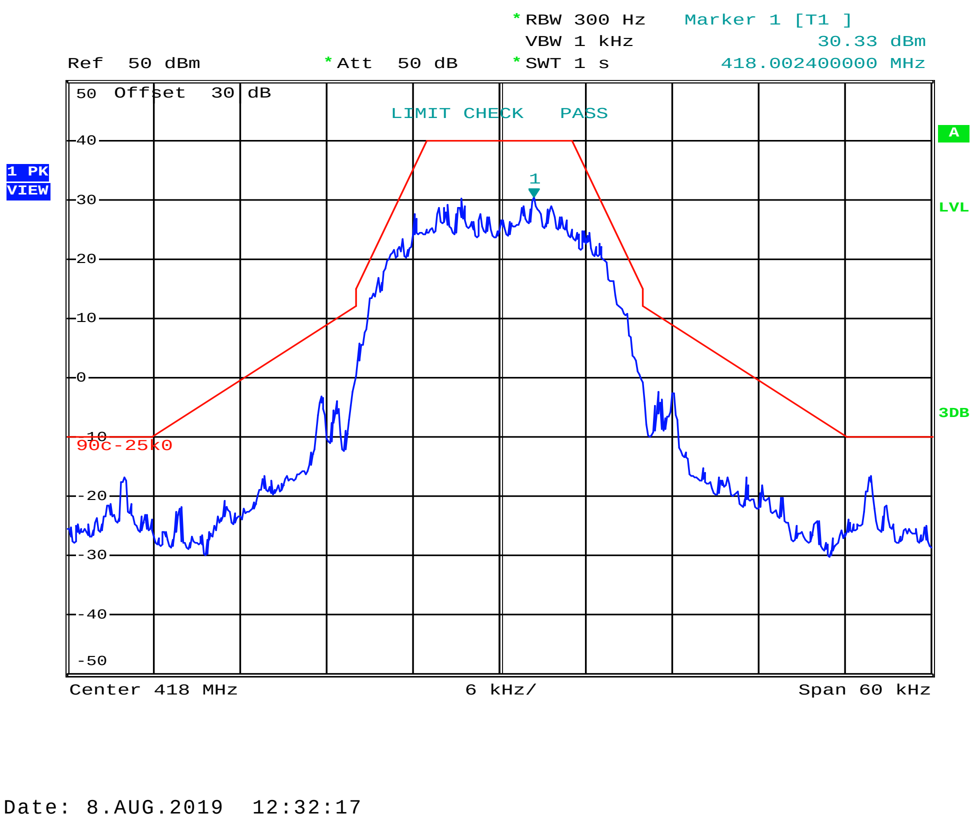


Date: 8.AUG.2019 12:53:11

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**

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

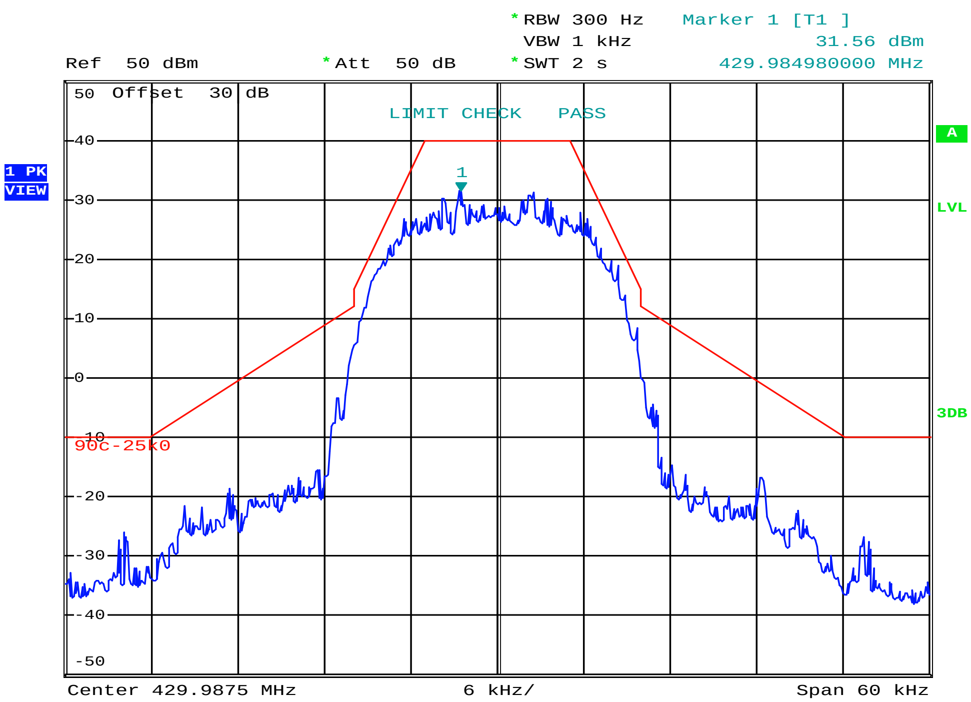
RSS-119 (5.8.2) Mask C



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

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

RSS-119 (5.8.2) Mask C

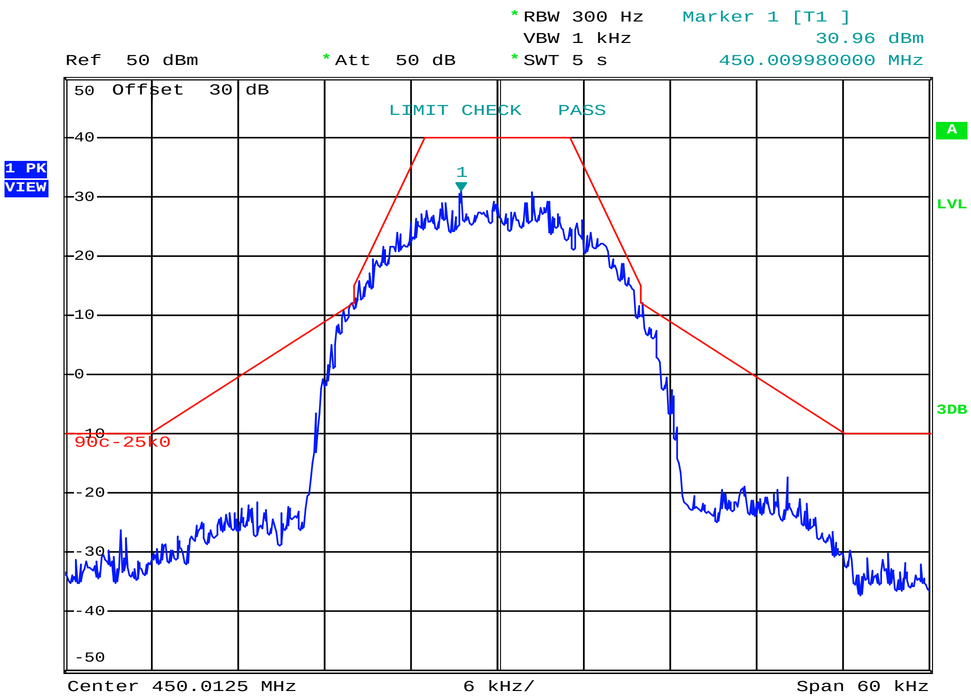


Date: 8.AUG.2019 12:27:11

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**

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

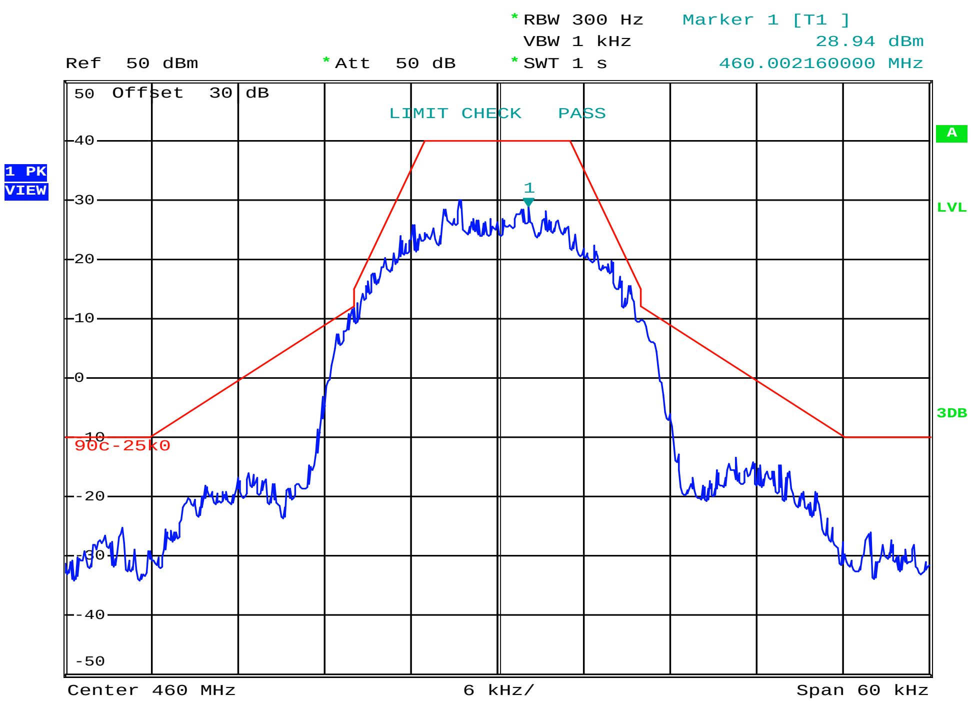


Date: 8.AUG.2019 12:18:48

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**

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

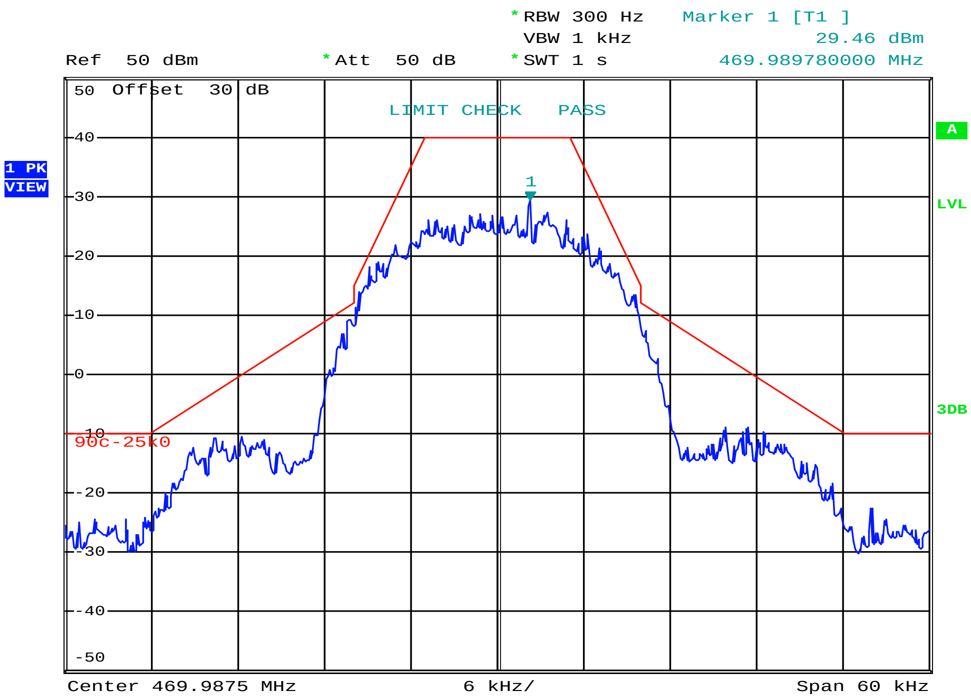


Date: 8.AUG.2019 12:16:33

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**

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

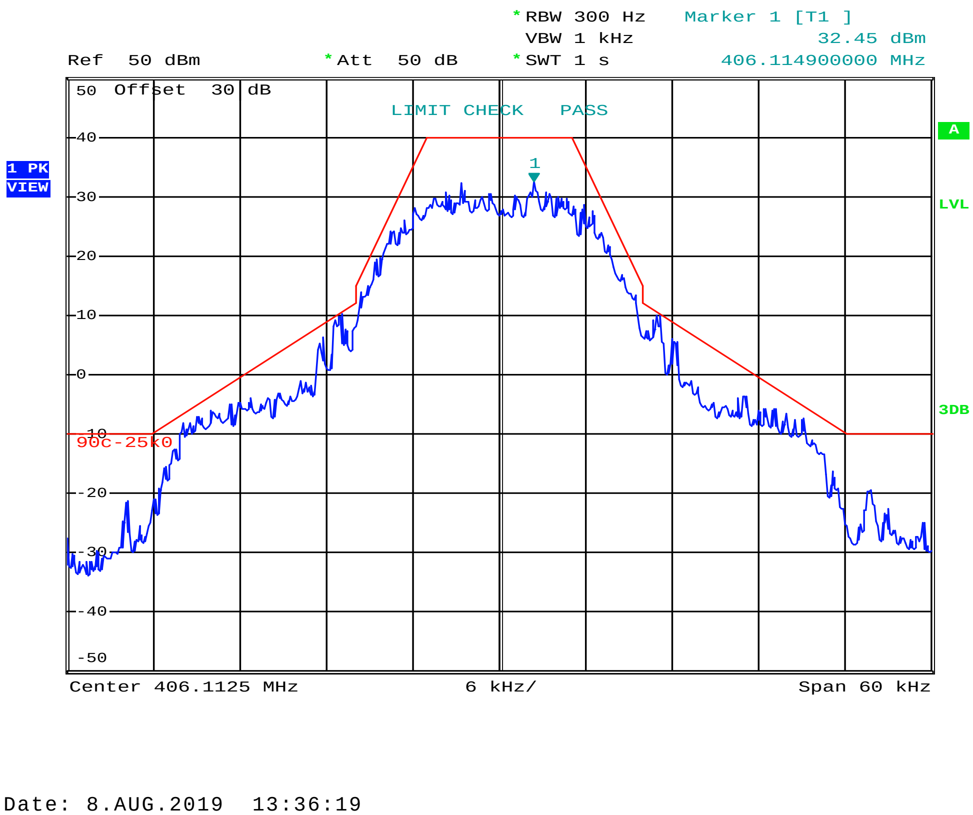


Date: 8.AUG.2019 12:15:08

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**

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

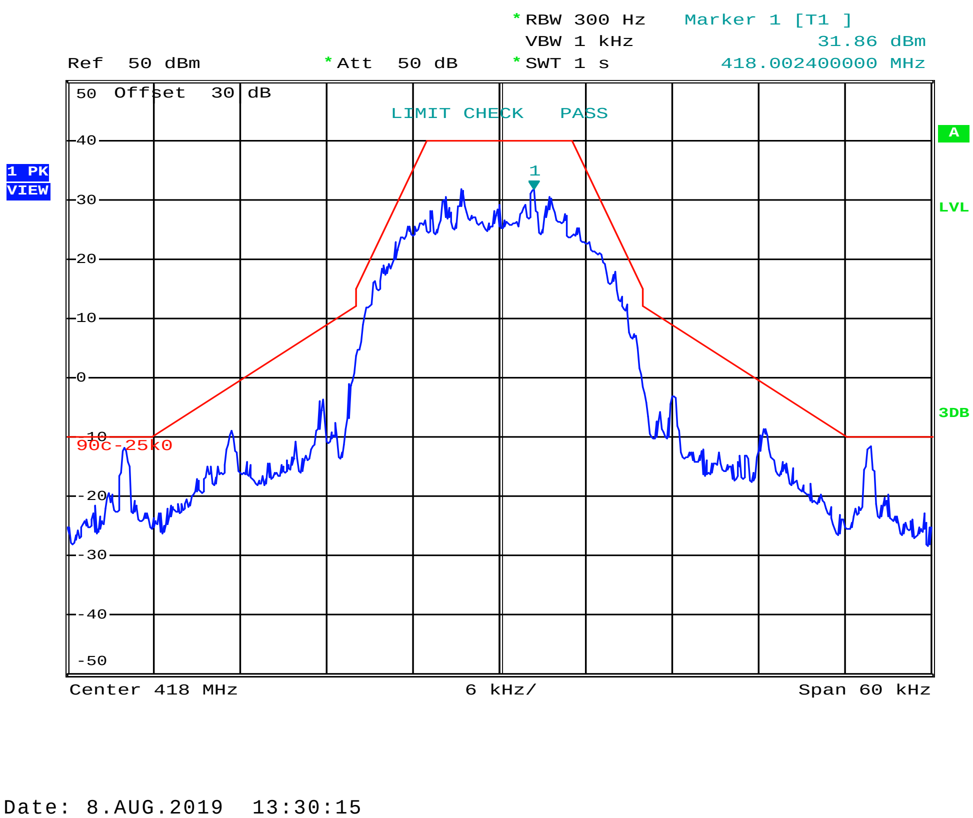
RSS-119 (5.8.2) Mask C



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**

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

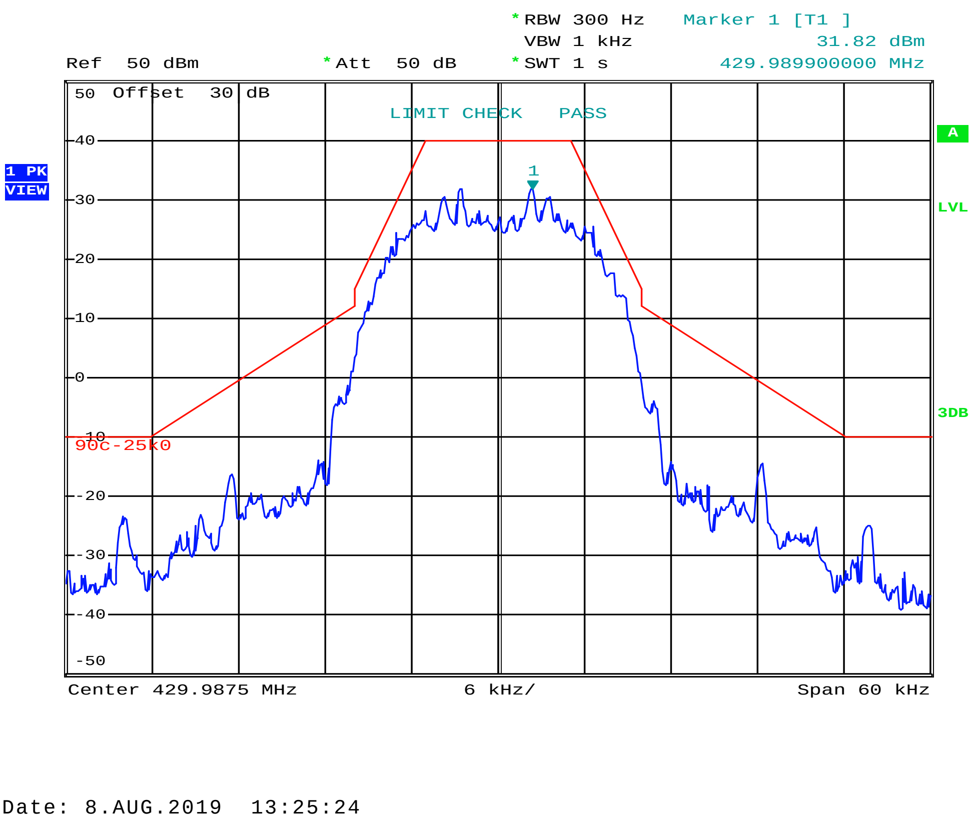
RSS-119 (5.8.2) Mask C



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

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

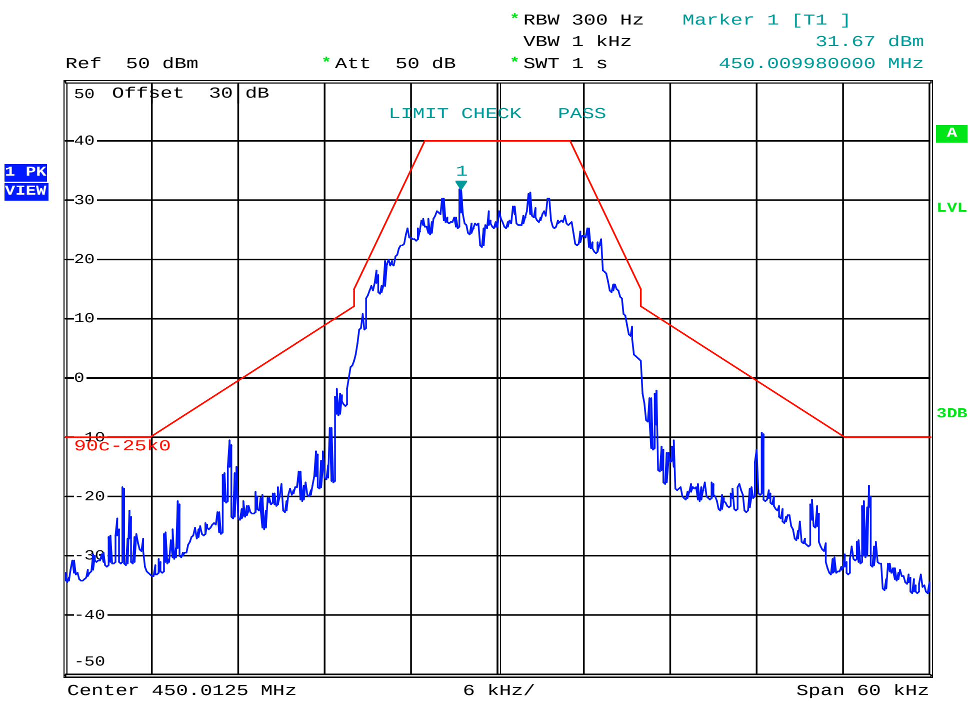
RSS-119 (5.8.2) Mask C



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

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

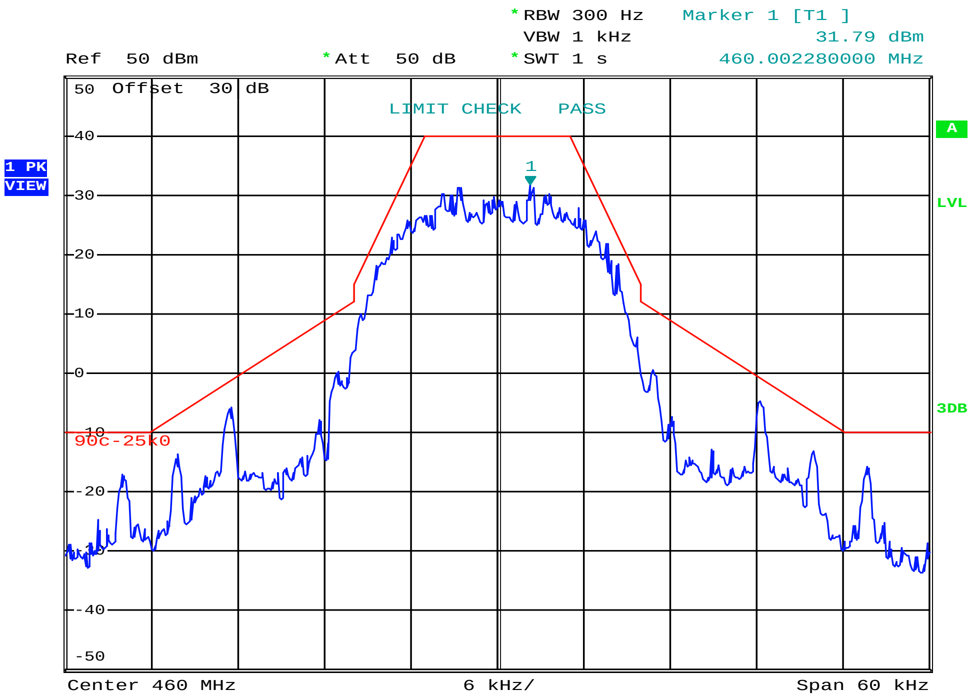


Date: 8.AUG.2019 13:23:41

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**

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

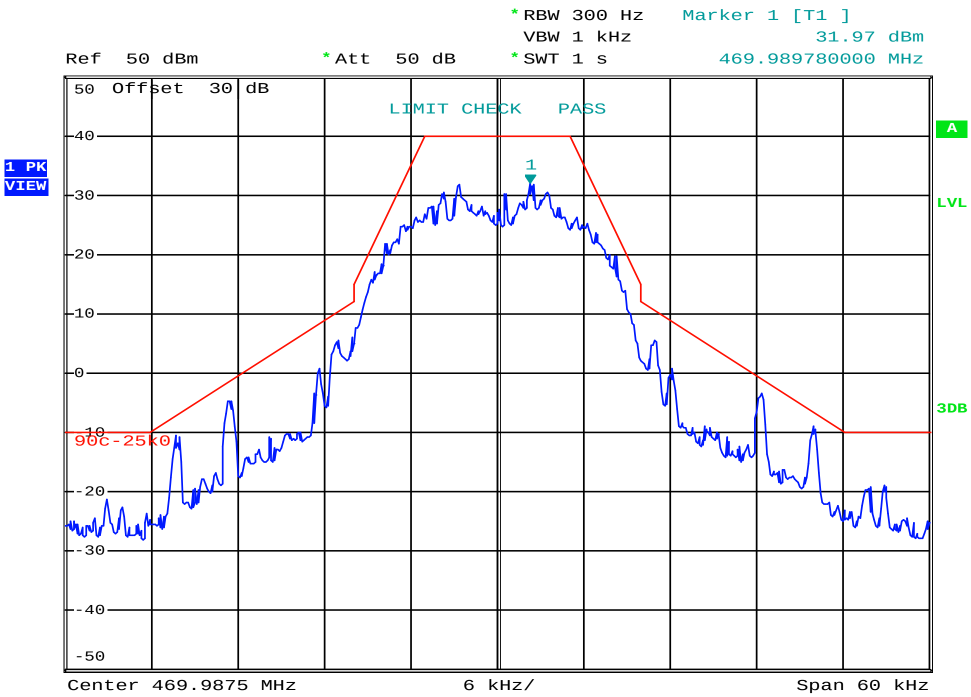


Date: 8.AUG.2019 13:20:28

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

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

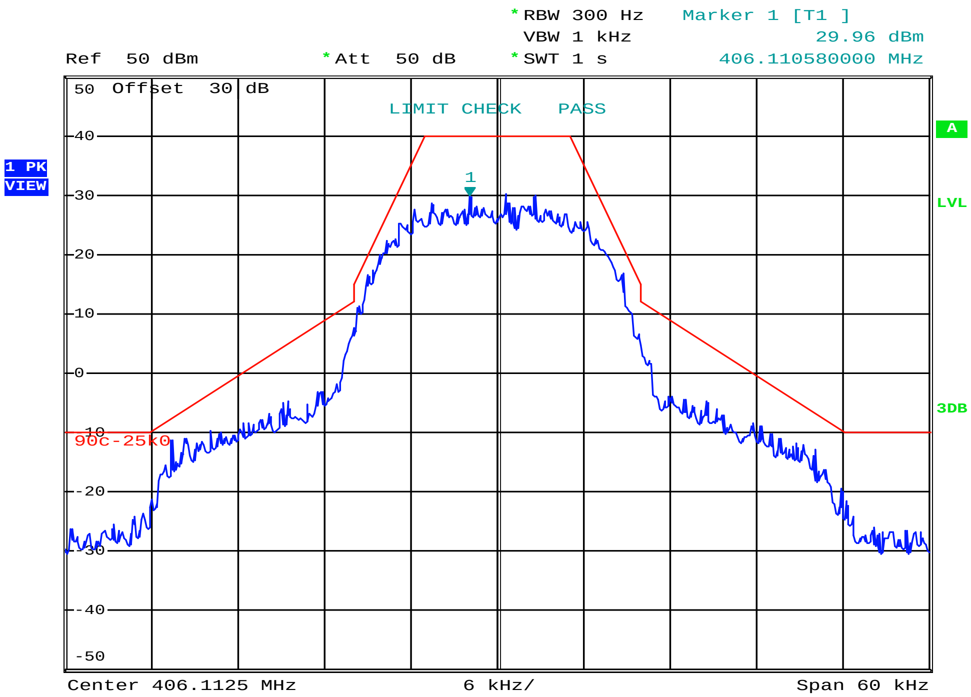


Date: 8.AUG.2019 13:22:11

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**

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

RSS-119 (5.8.2) Mask C

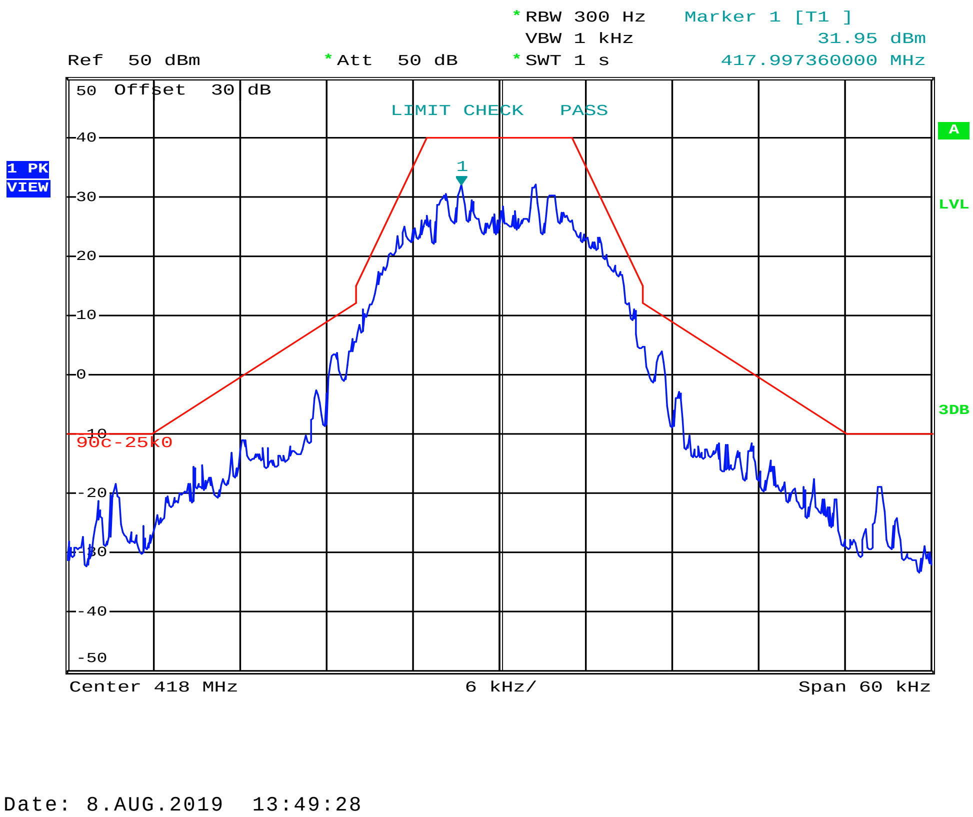


Date: 8.AUG.2019 13:46:55

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**

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

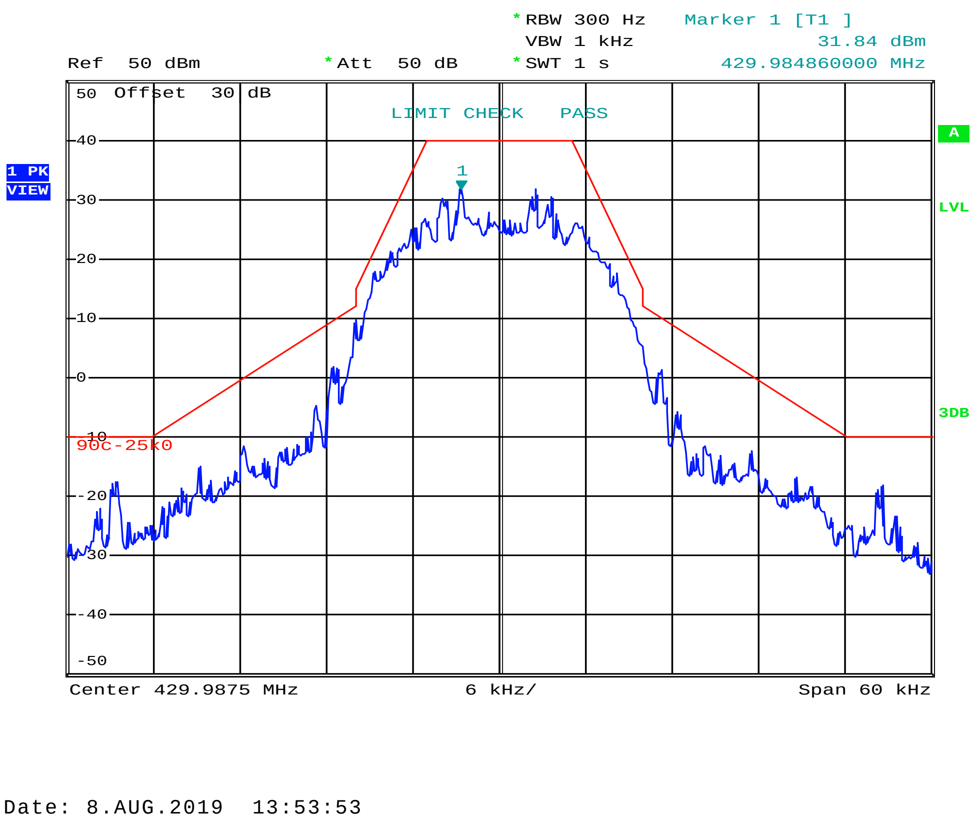
RSS-119 (5.8.2) Mask C



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

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

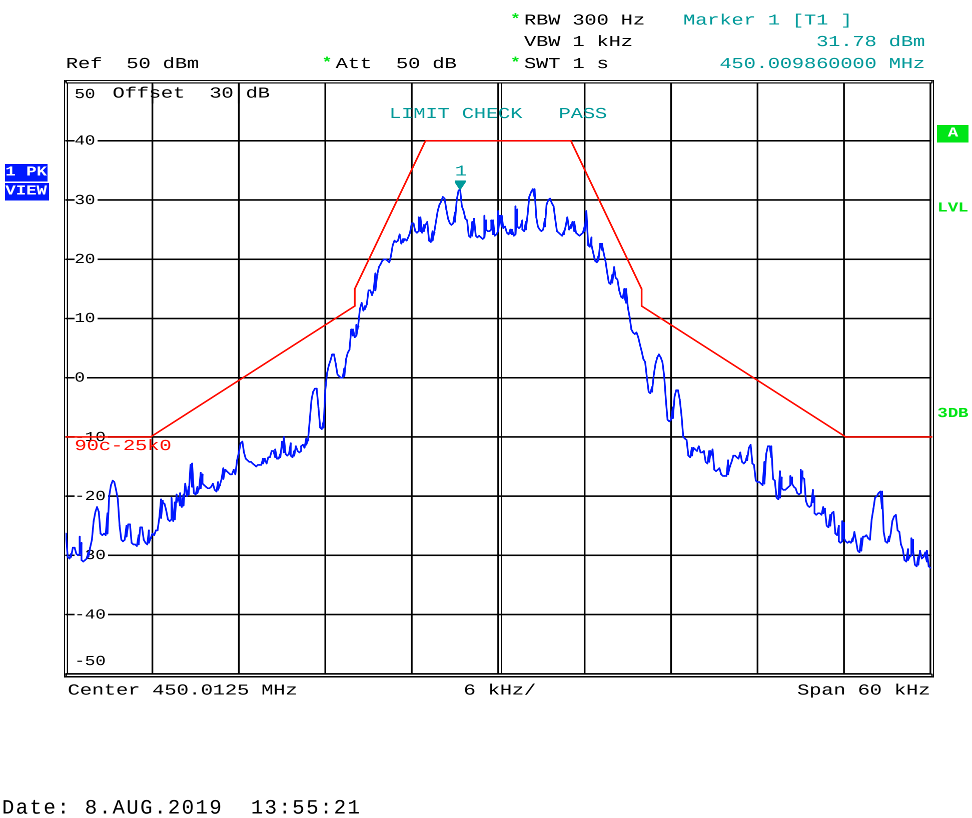
RSS-119 (5.8.2) Mask C



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**

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

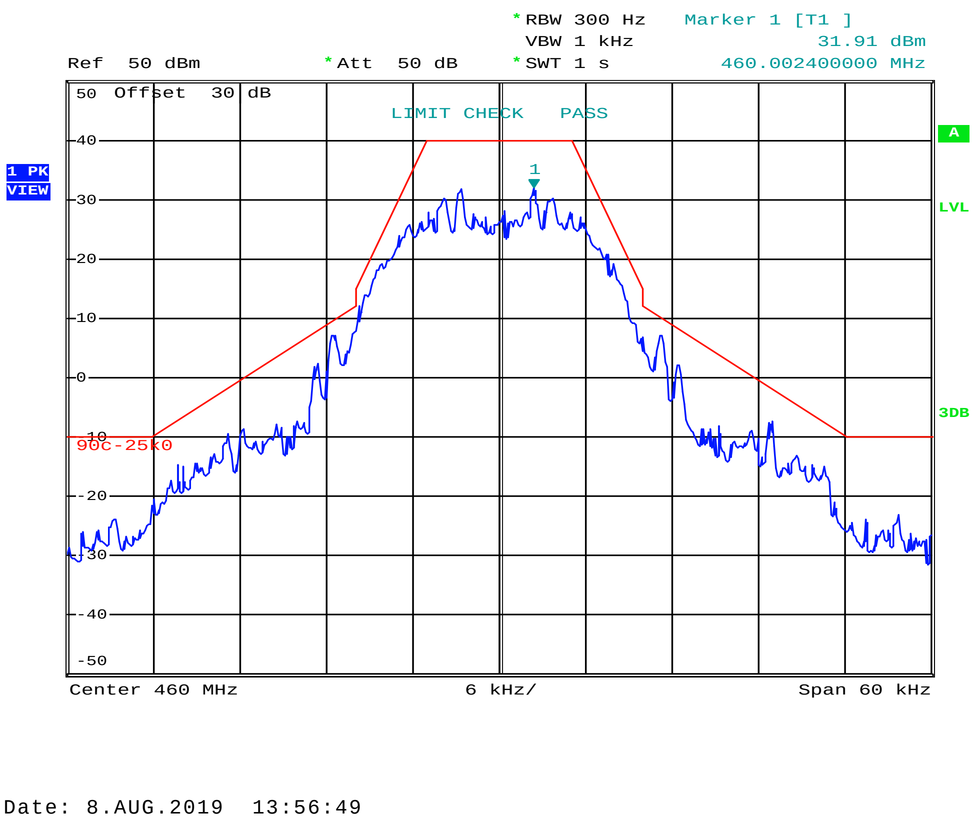
FCC §90.210(c) Mask C, RSS-119 (5.8.2) Mask C



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**

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

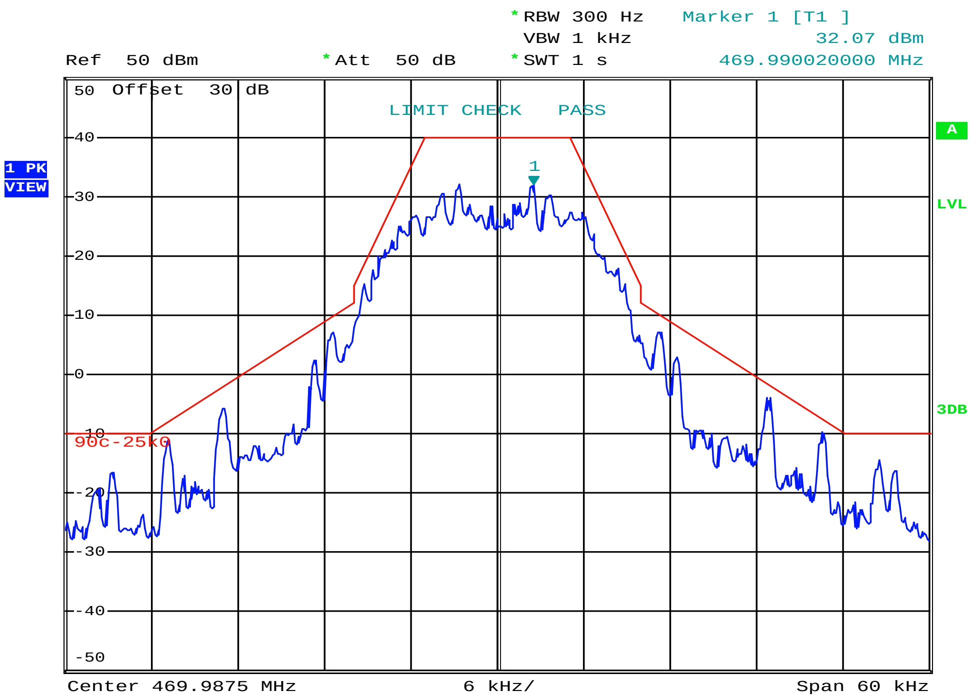
FCC §90.210(c) Mask C, RSS-119 (5.8.2) Mask C



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**

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

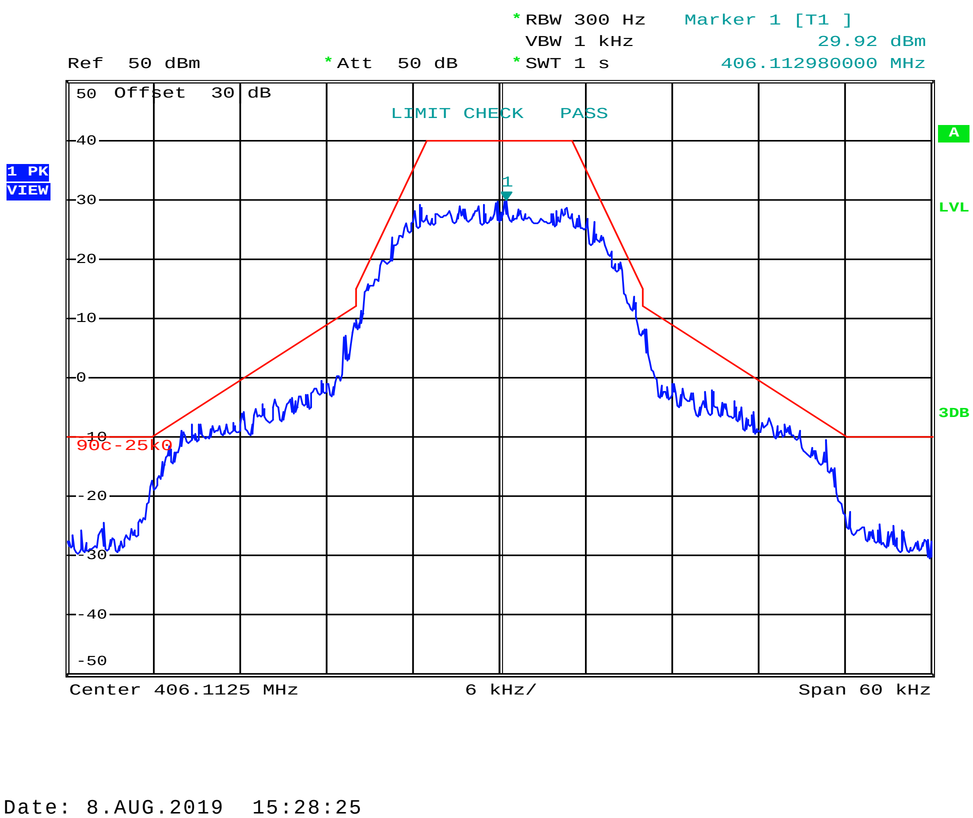


Date: 8.AUG.2019 13:59:43

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**

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

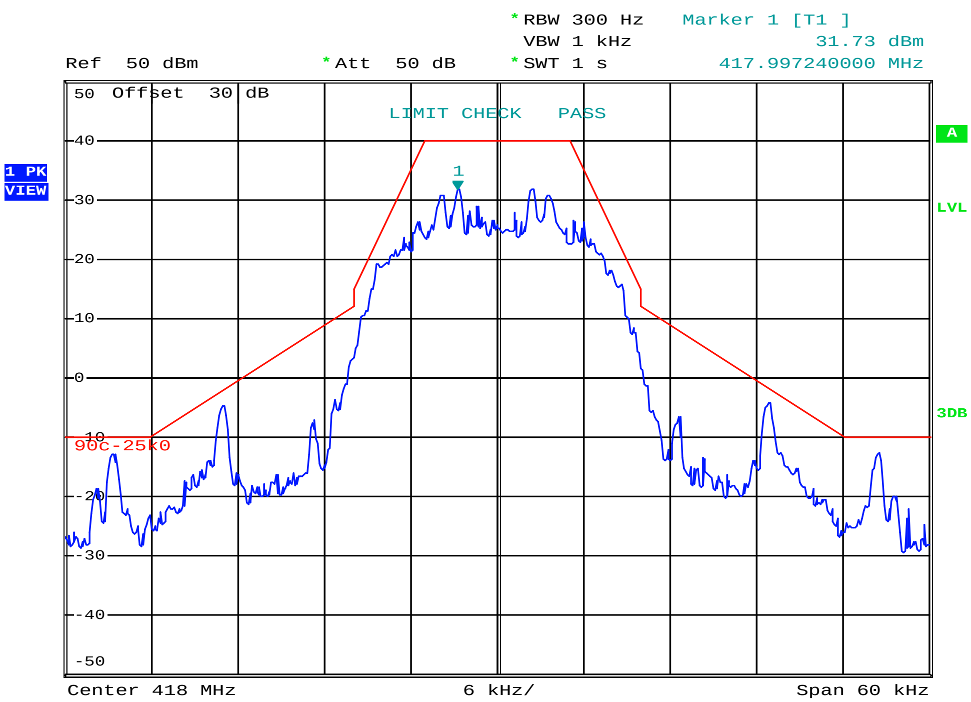
RSS-119 (5.8.2) Mask C



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

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

RSS-119 (5.8.2) Mask C

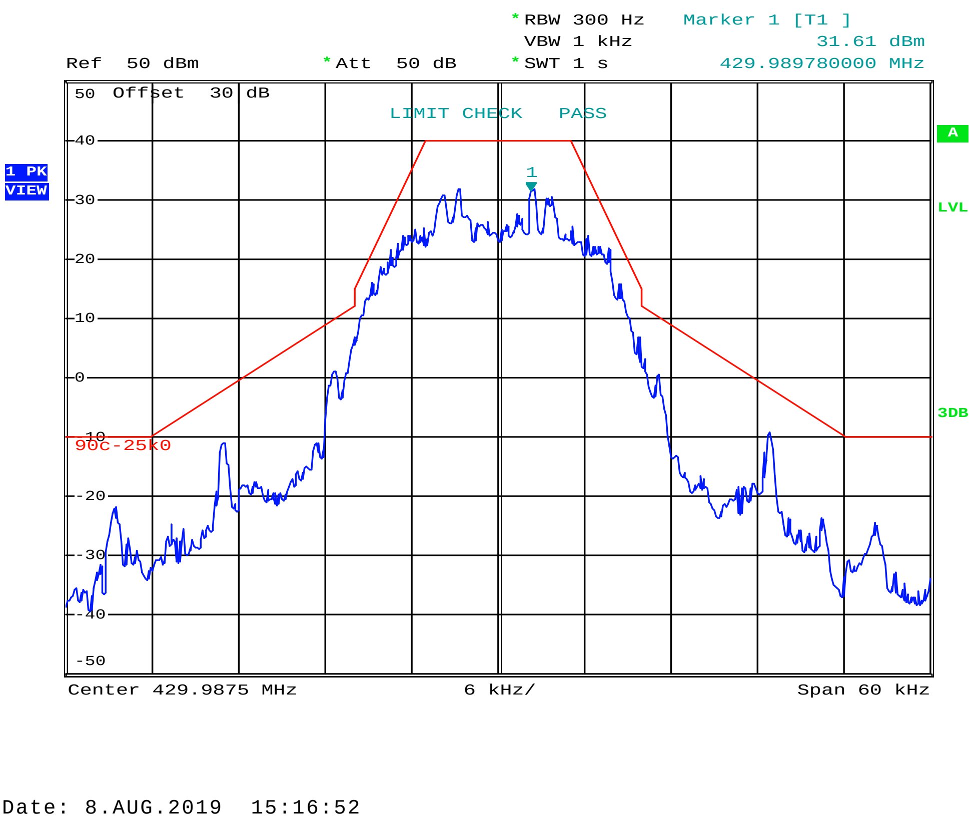


Date: 8.AUG.2019 15:22:20

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**

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

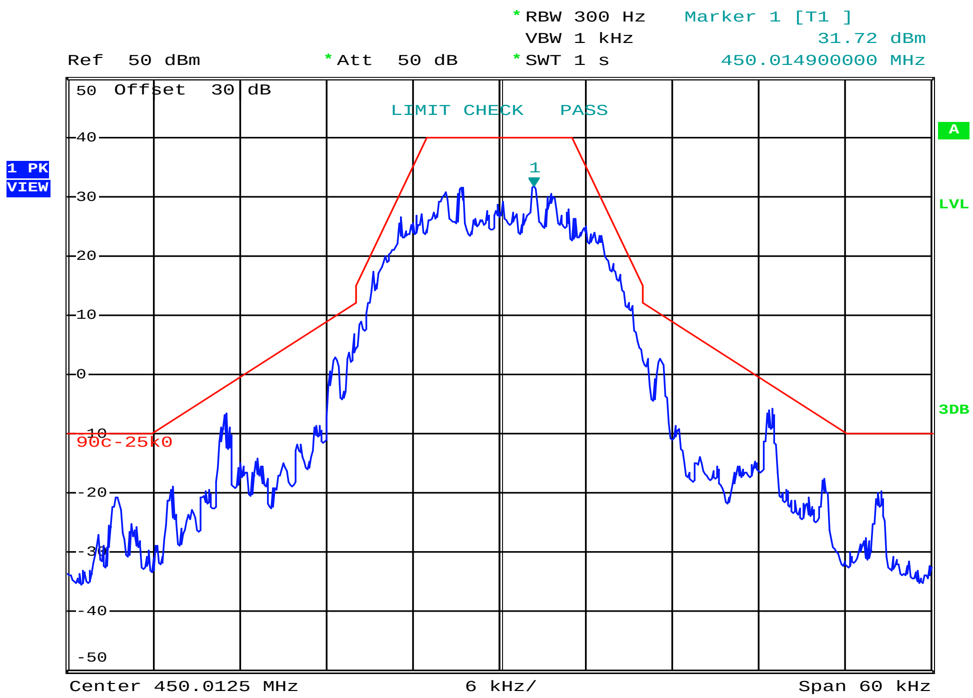
RSS-119 (5.8.2) Mask C



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**

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

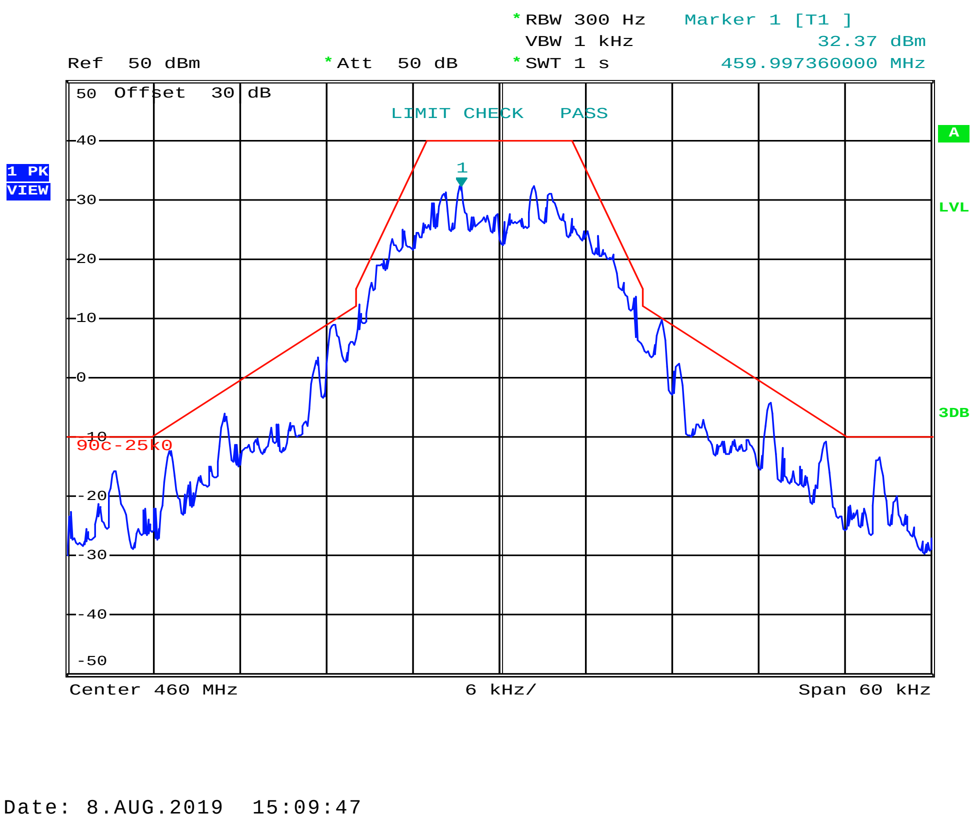


Date: 8.AUG.2019 15:15:40

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

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

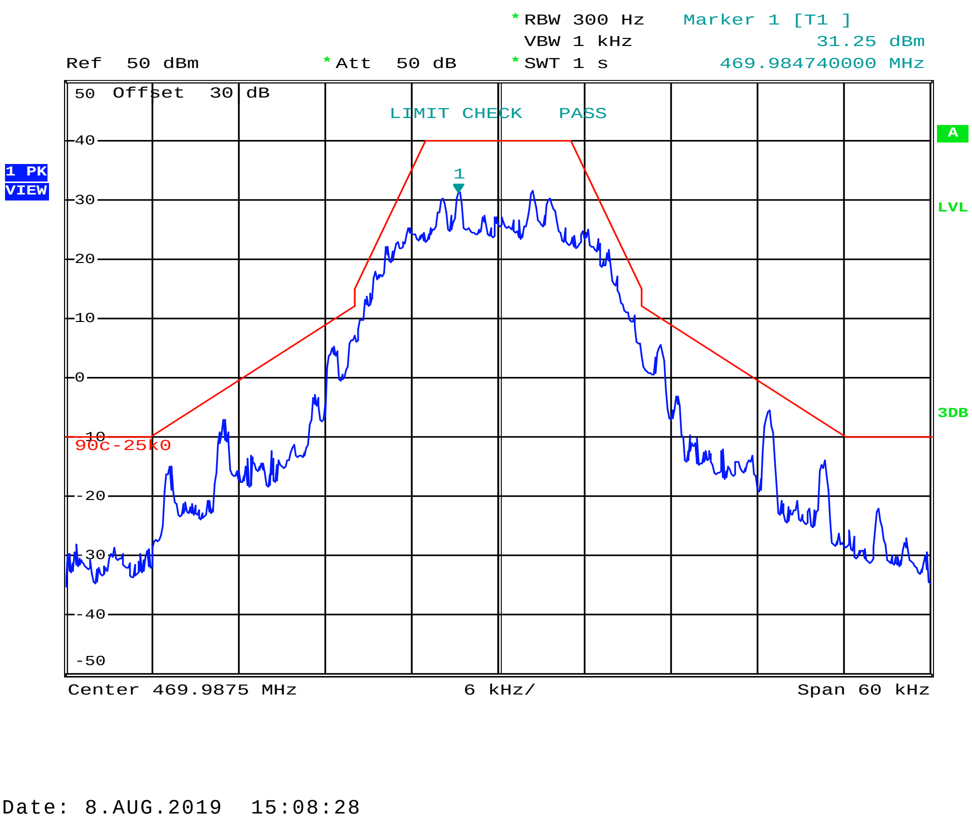
FCC §90.210(c) Mask C, RSS-119 (5.8.2) Mask C



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**

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

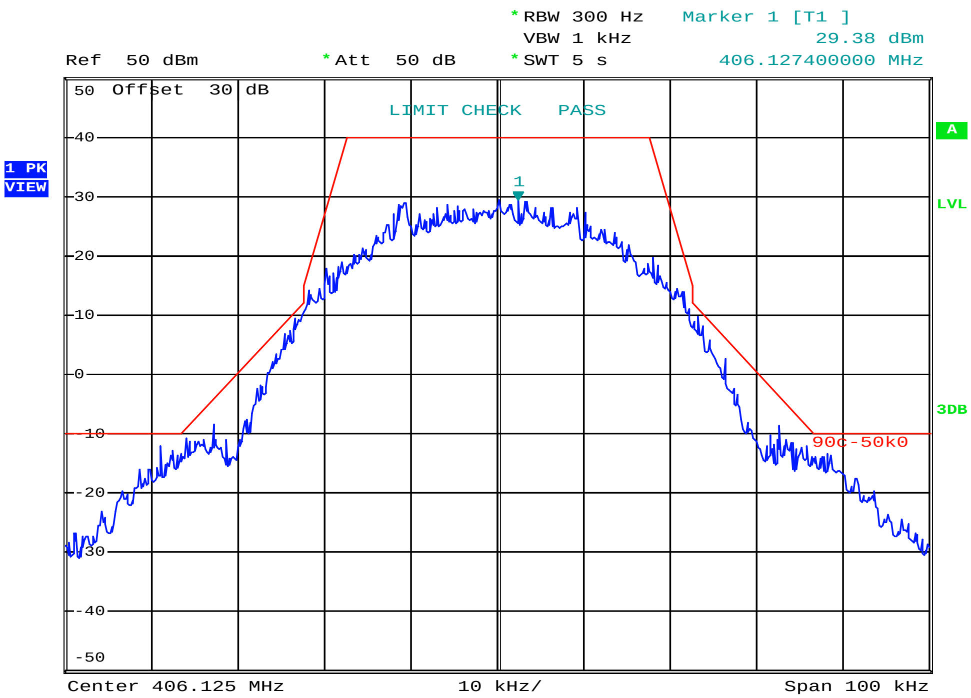
FCC §90.210(c) Mask C, RSS-119 (5.8.2) Mask C



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**

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

RSS-119 (5.8.2) Mask C (Modified)

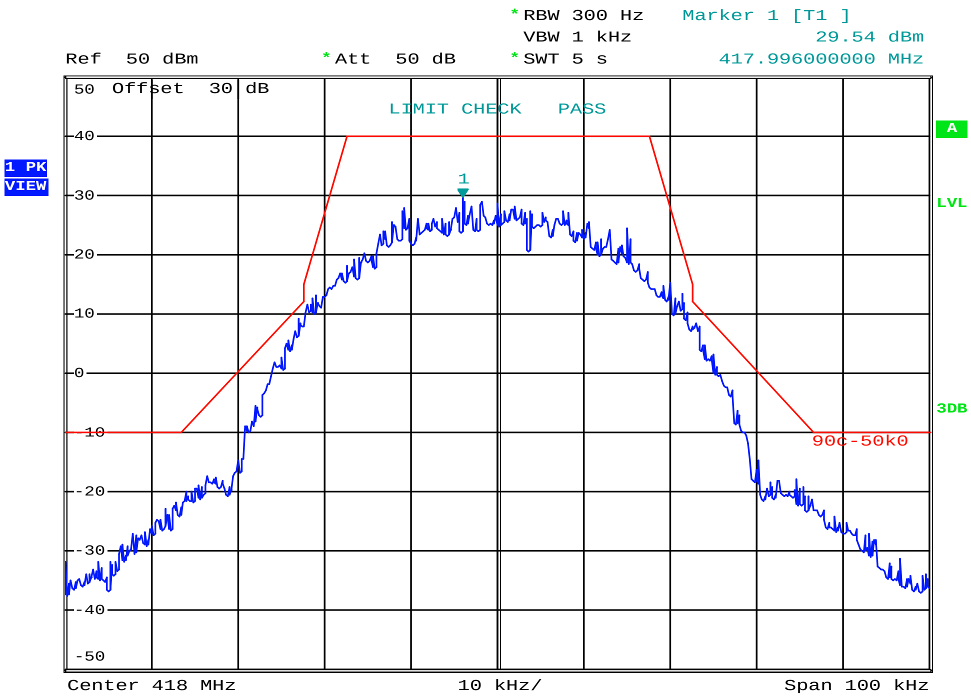


Date: 8.AUG.2019 16:10:40

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

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

RSS-119 (5.8.2) Mask C (Modified)

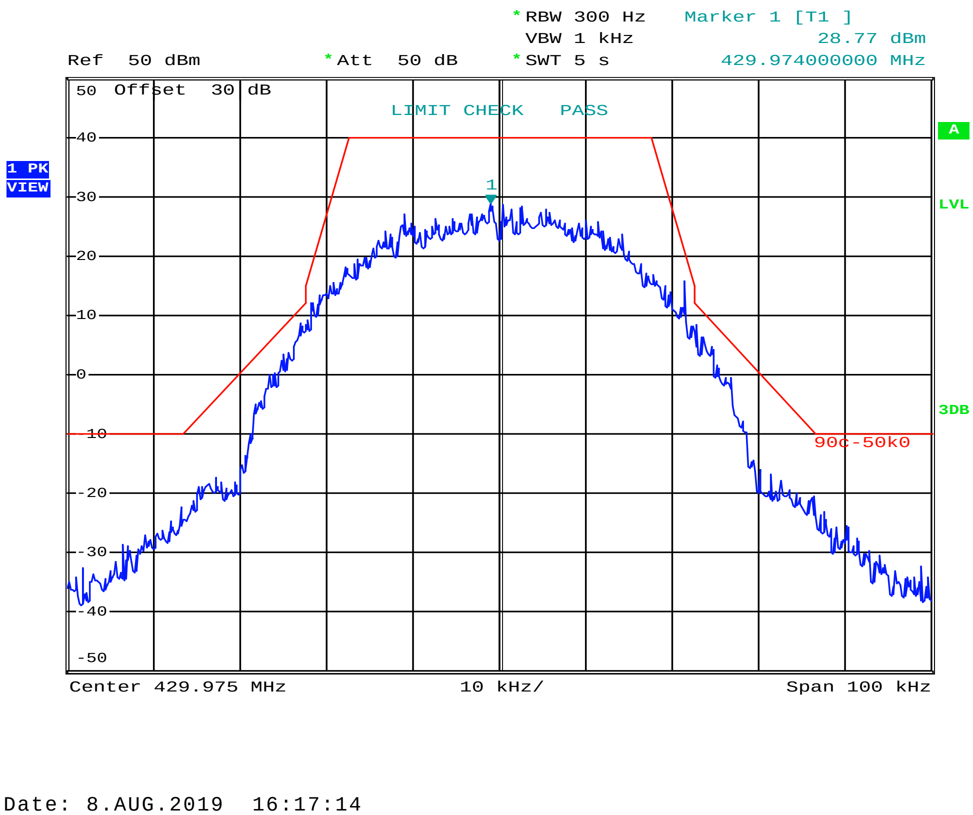


Date: 8.AUG.2019 16:15:53

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

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

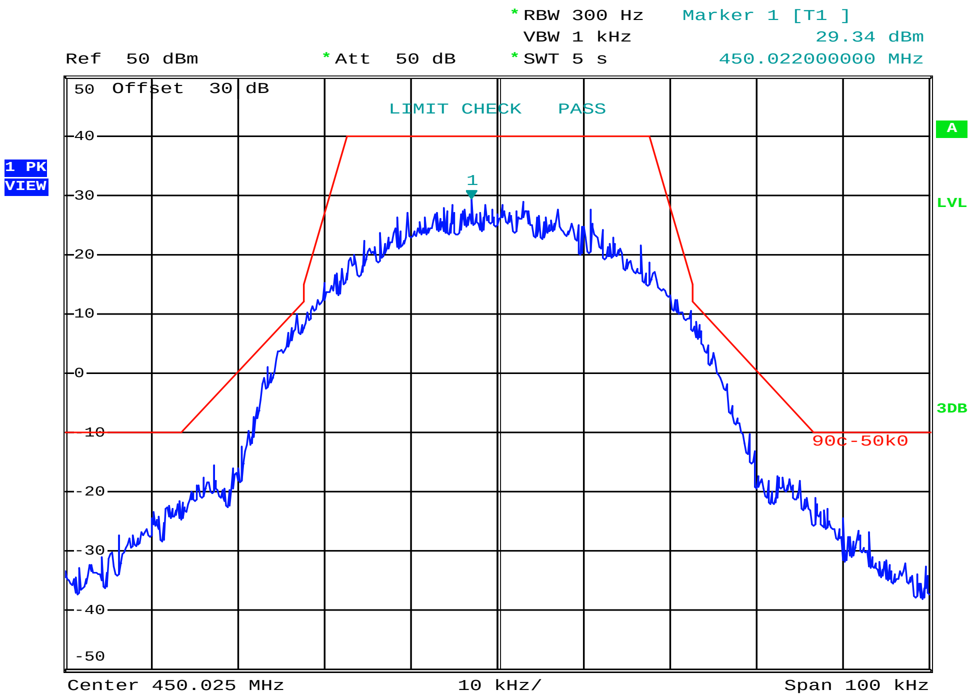
RSS-119 (5.8.2) Mask C (Modified)



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

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

RSS-119 (5.8.2) Mask C (Modified)

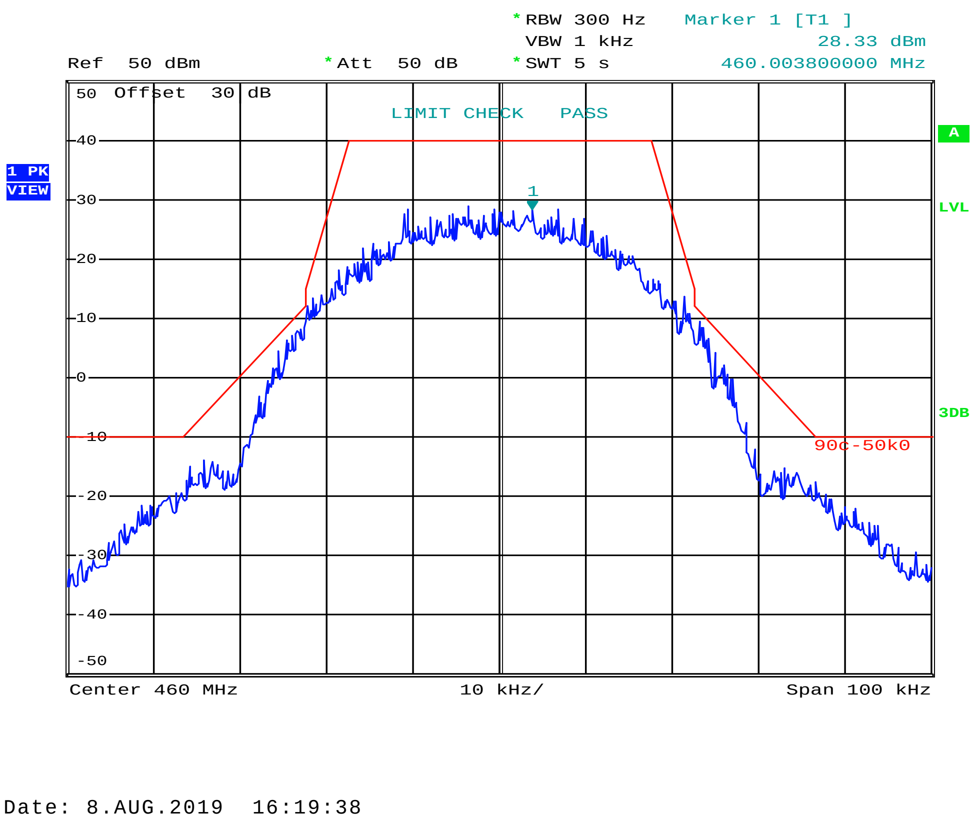


Date: 8.AUG.2019 16:18:27

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

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

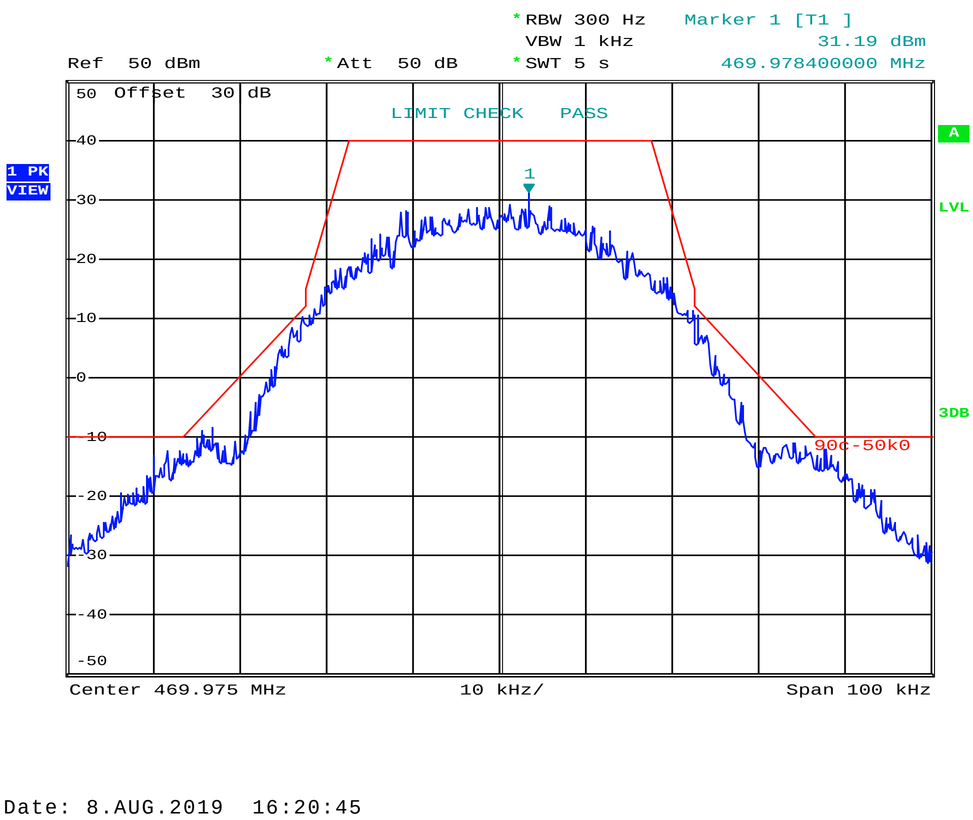
RSS-119 (5.8.2) Mask C (Modified)



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

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

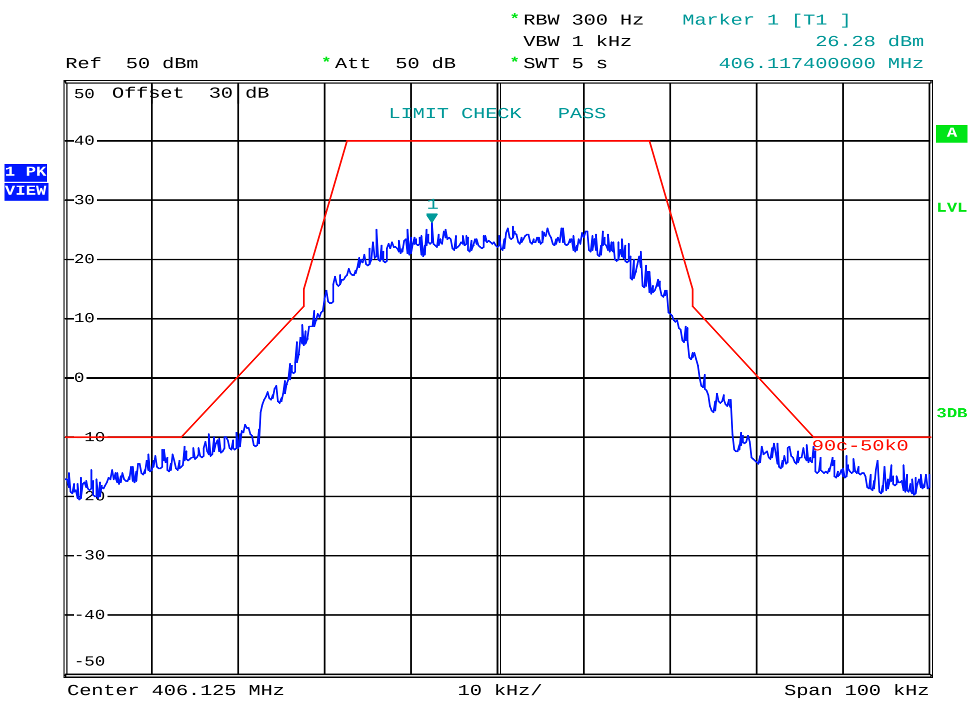
RSS-119 (5.8.2) Mask C (Modified)



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

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

RSS-119 (5.8.2) Mask C (Modified)

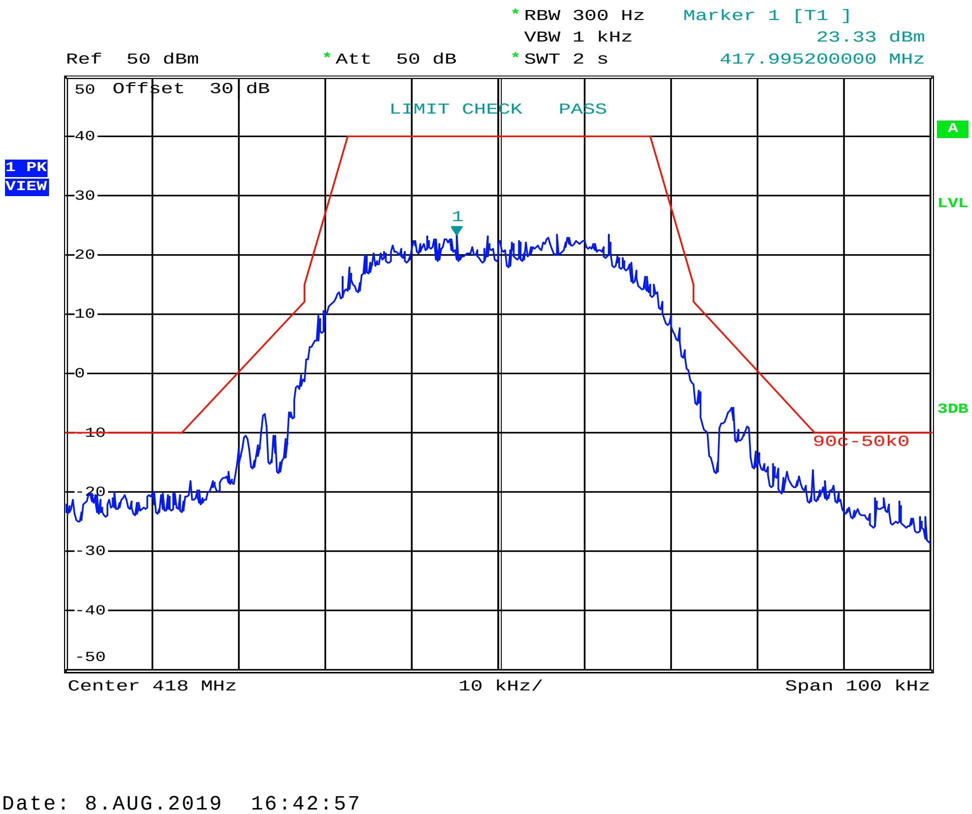


Date: 8.AUG.2019 16:40:24

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**

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

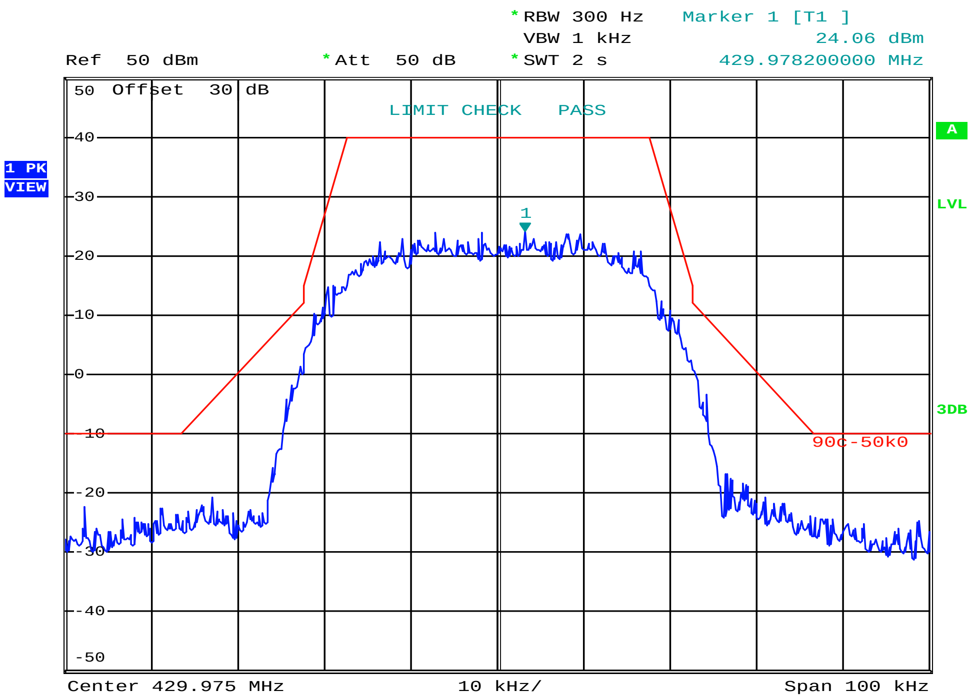
RSS-119 (5.8.2) Mask C (Modified)



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

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

RSS-119 (5.8.2) Mask C (Modified)

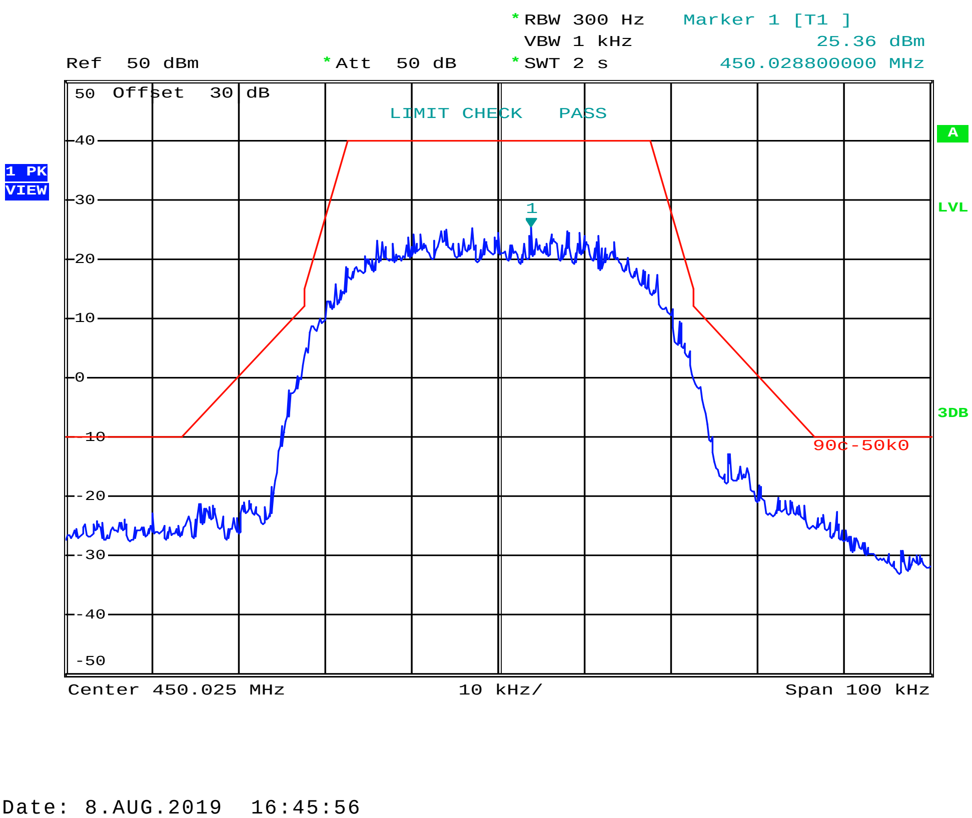


Date: 8.AUG.2019 16:44:12

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

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

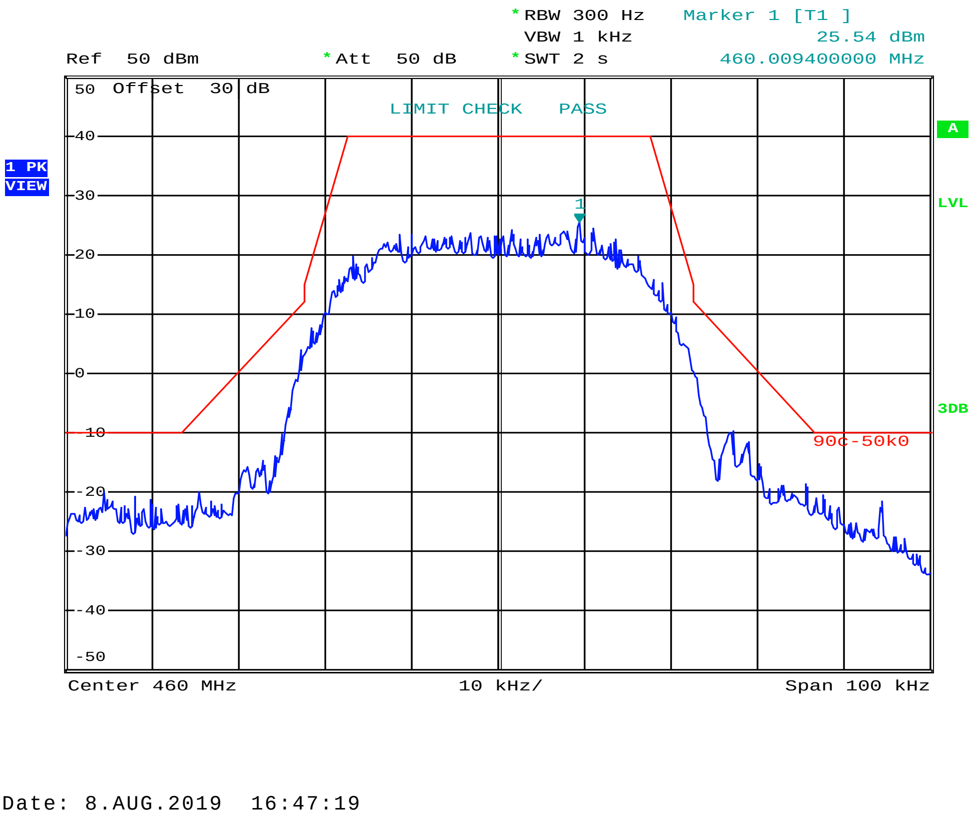
RSS-119 (5.8.2) Mask C (Modified)



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**

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

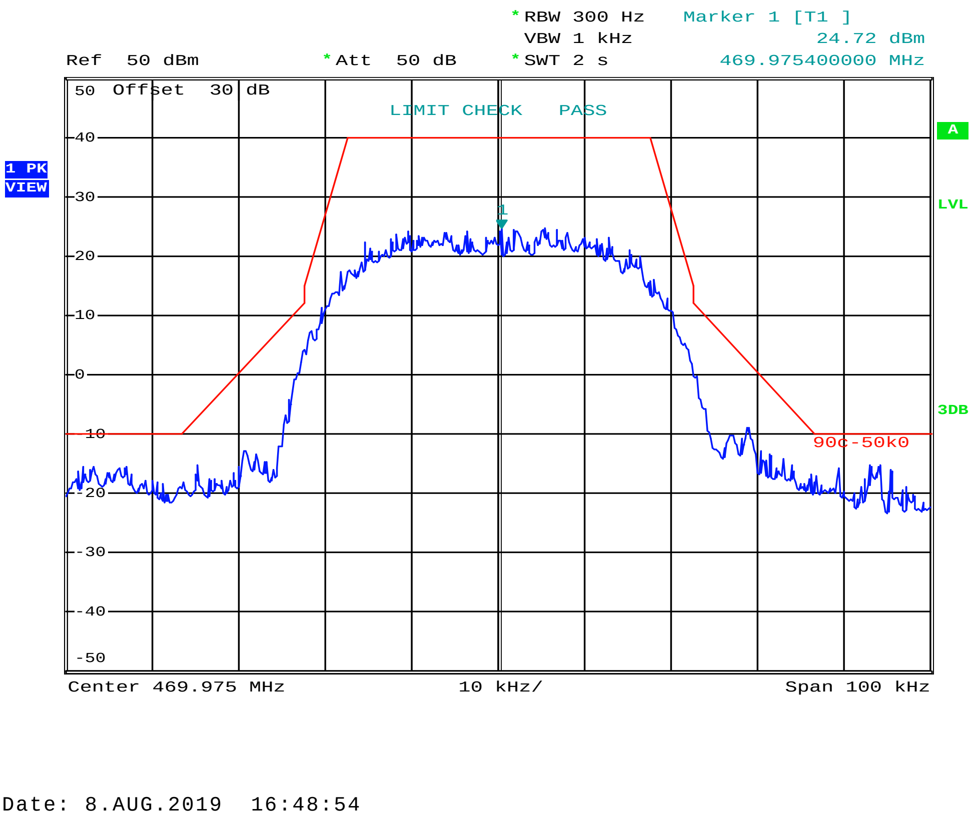
RSS-119 (5.8.2) Mask C (Modified)



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

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

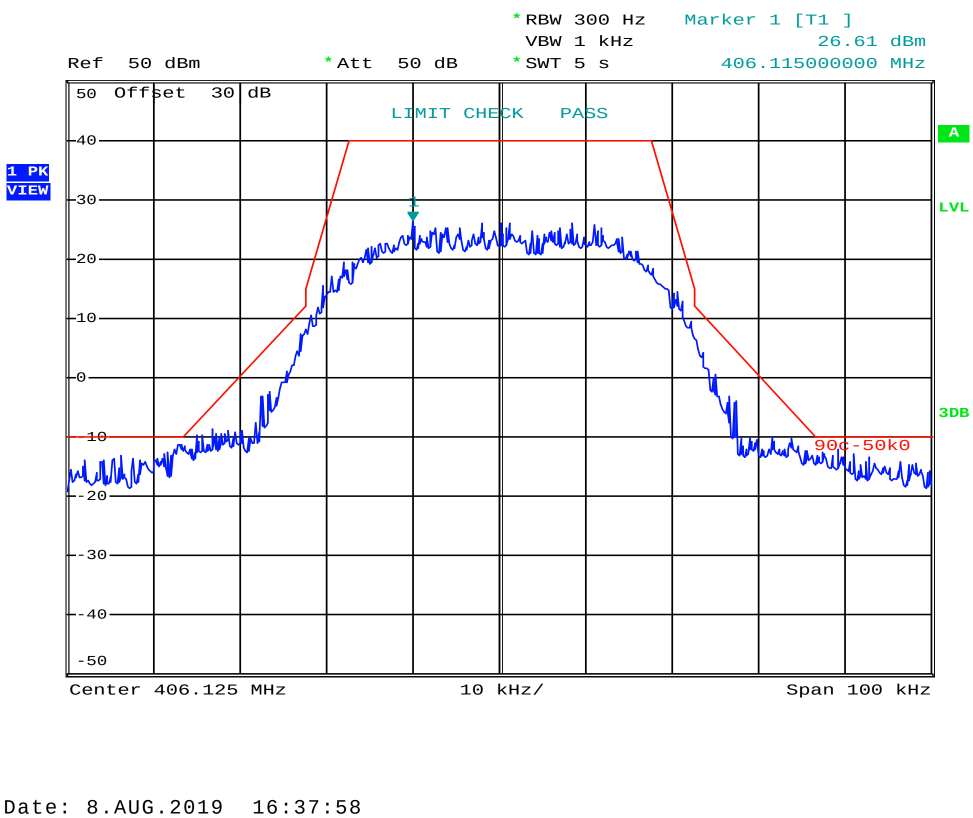
RSS-119 (5.8.2) Mask C (Modified)



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

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

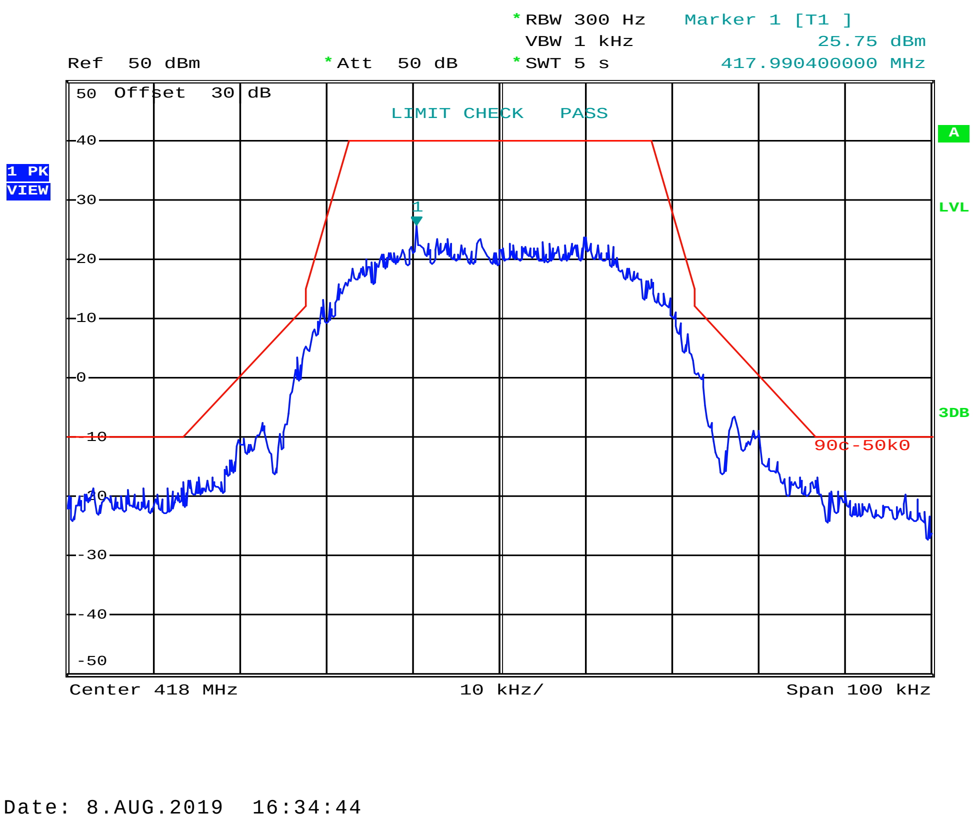
RSS-119 (5.8.2) Mask C (Modified)



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

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

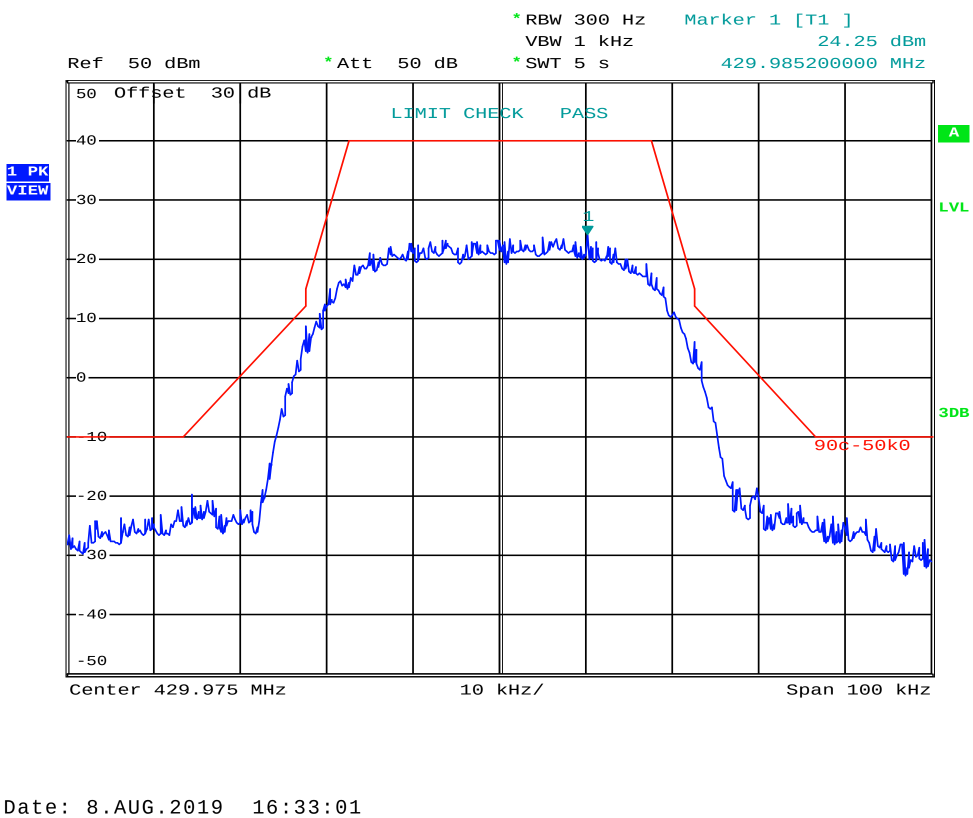
RSS-119 (5.8.2) Mask C (Modified)



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**

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

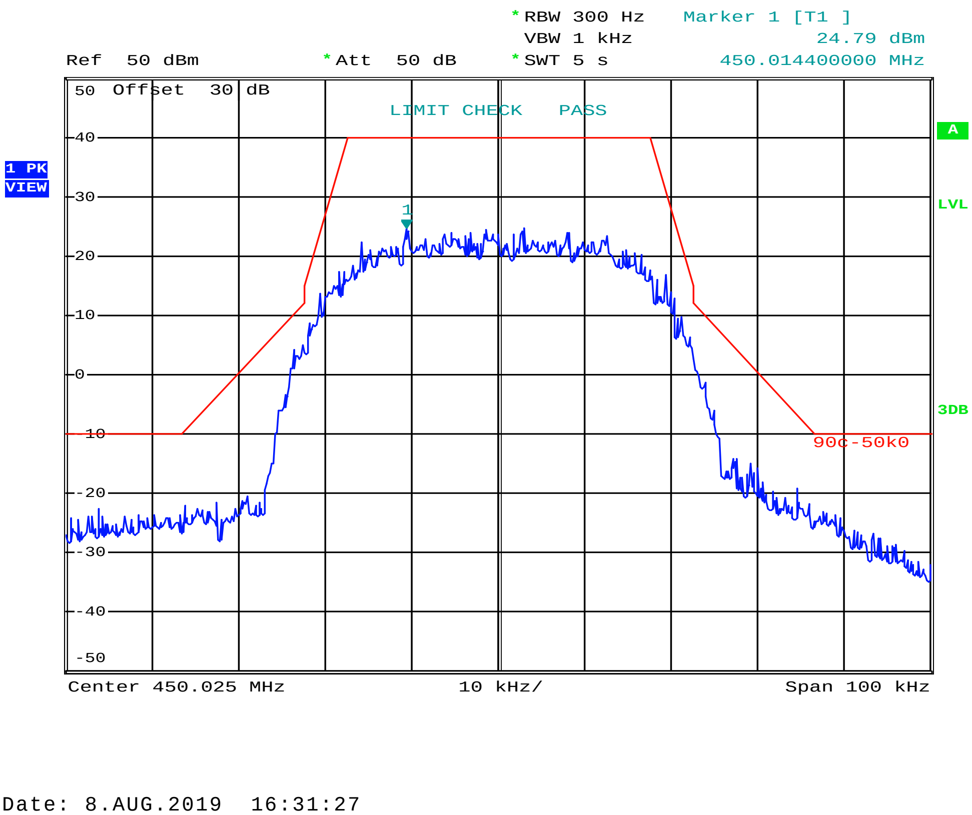
RSS-119 (5.8.2) Mask C (Modified)



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**

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

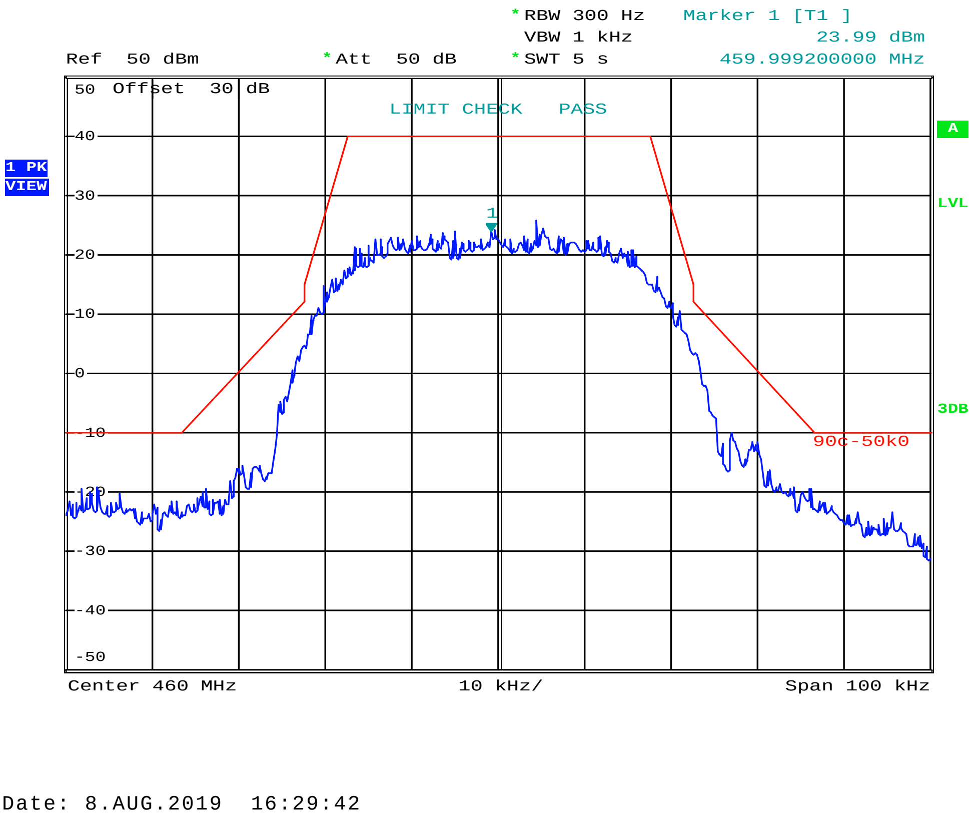
RSS-119 (5.8.2) Mask C (Modified)



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

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

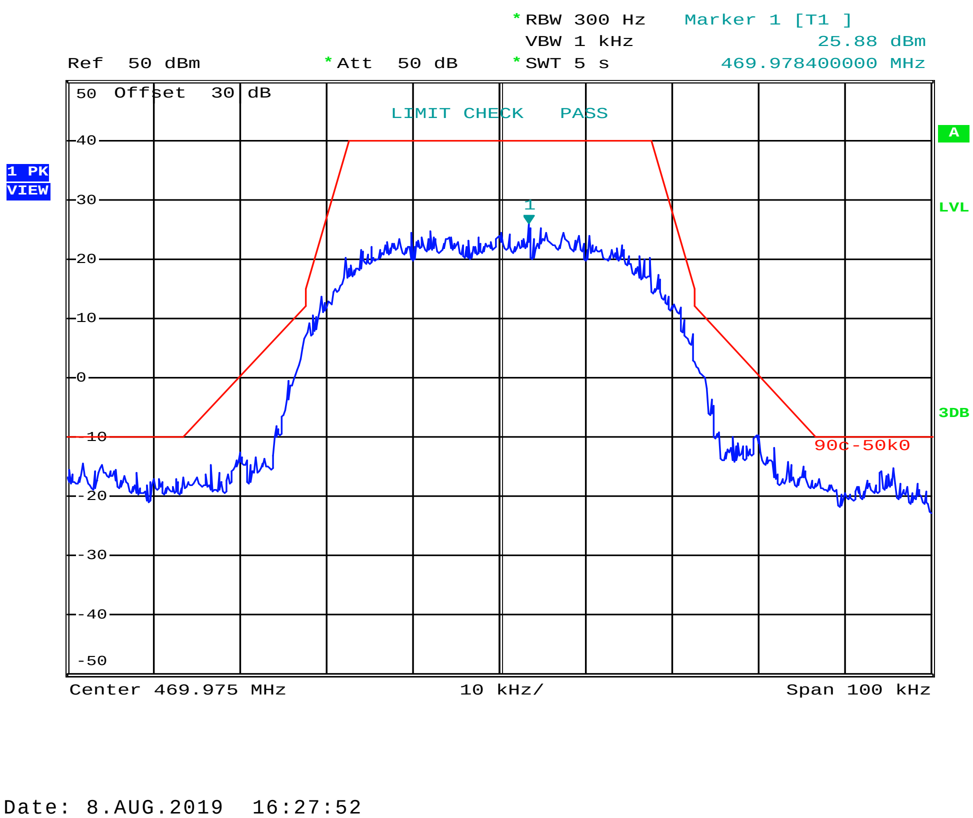
RSS-119 (5.8.2) Mask C (Modified)



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

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

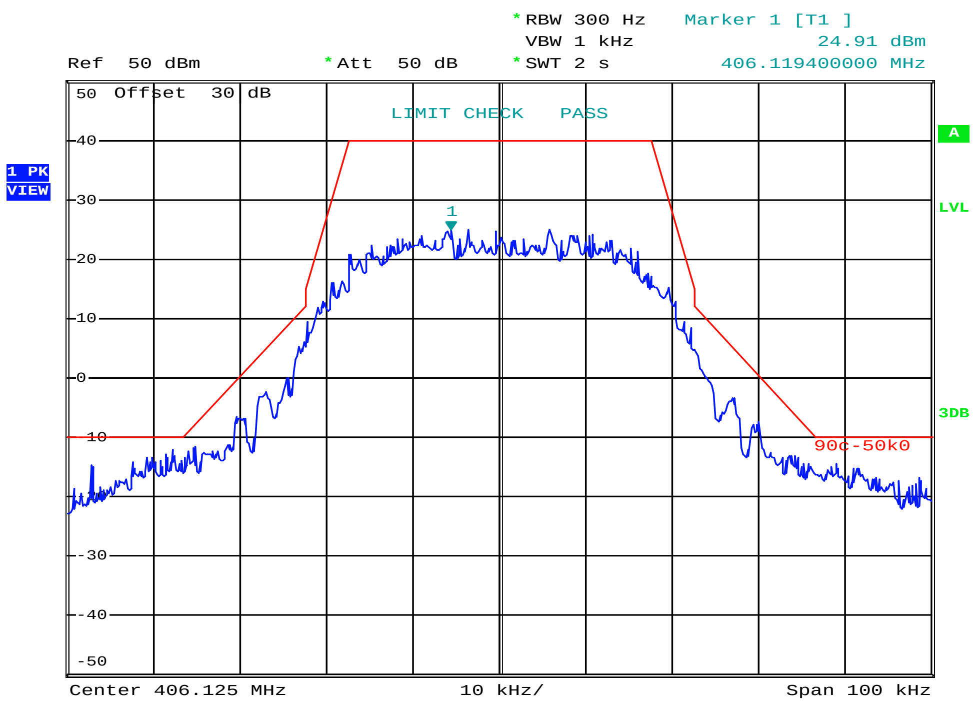
RSS-119 (5.8.2) Mask C (Modified)



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**

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

RSS-119 (5.8.2) Mask C (Modified)

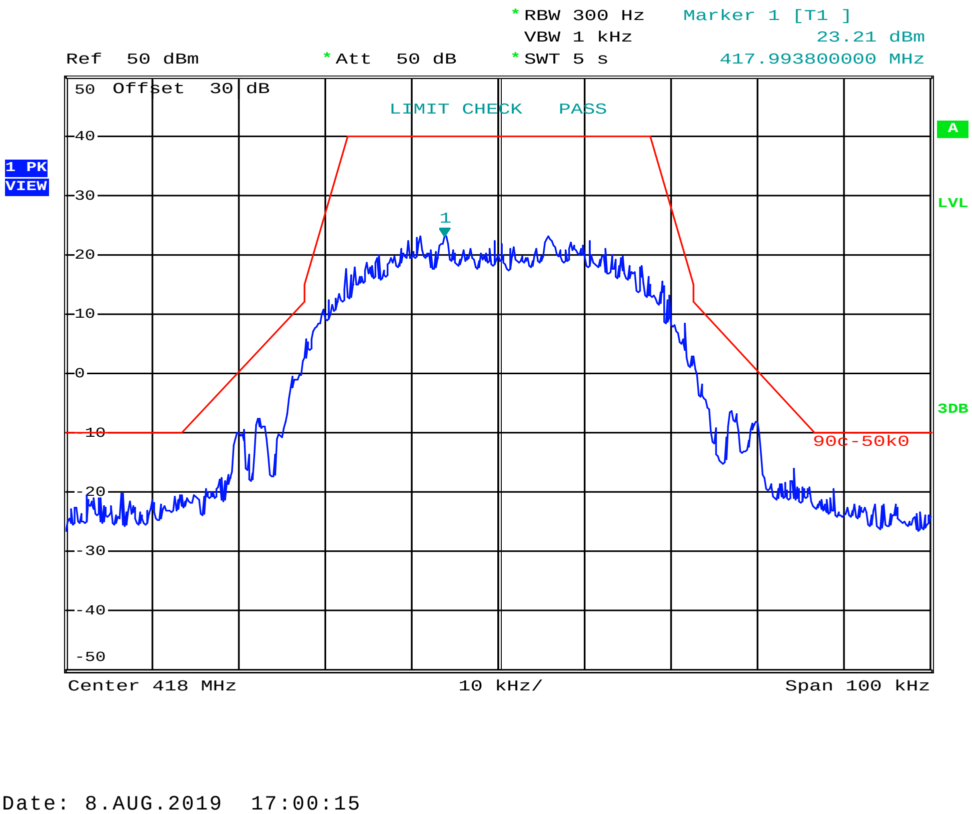


Date: 8.AUG.2019 17:02:31

Channel Frequency: **406.125000** MHz	Band Edge: **Lower Band Edge**	Channel Bandwidth Setting: **50.00** kHz
Modulation Setting: **16QAM**	Channel Power Setting: **40.00** dBm	Mask Limit Check: **PASS**

Plot 9.100 – Band Edge and Emissions Mask – 50kHz BW – 16QAM – 418MHz, ISED

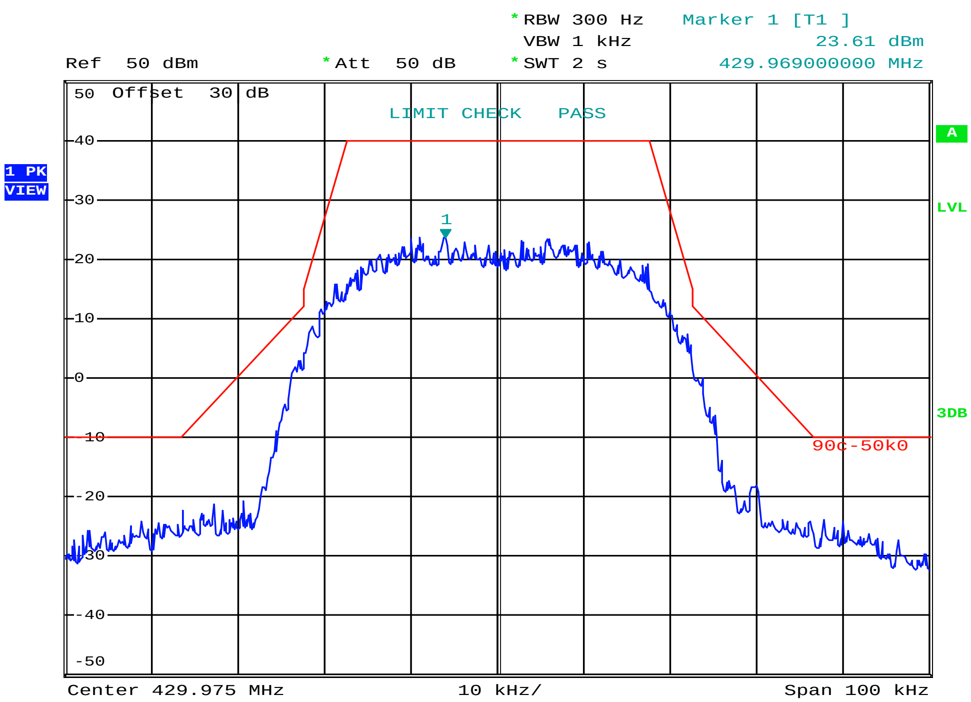
RSS-119 (5.8.2) Mask C (Modified)



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**

Plot 9.101 – Band Edge and Emissions Mask – 50kHz BW – 16QAM – 429.975MHz, ISED

RSS-119 (5.8.2) Mask C (Modified)

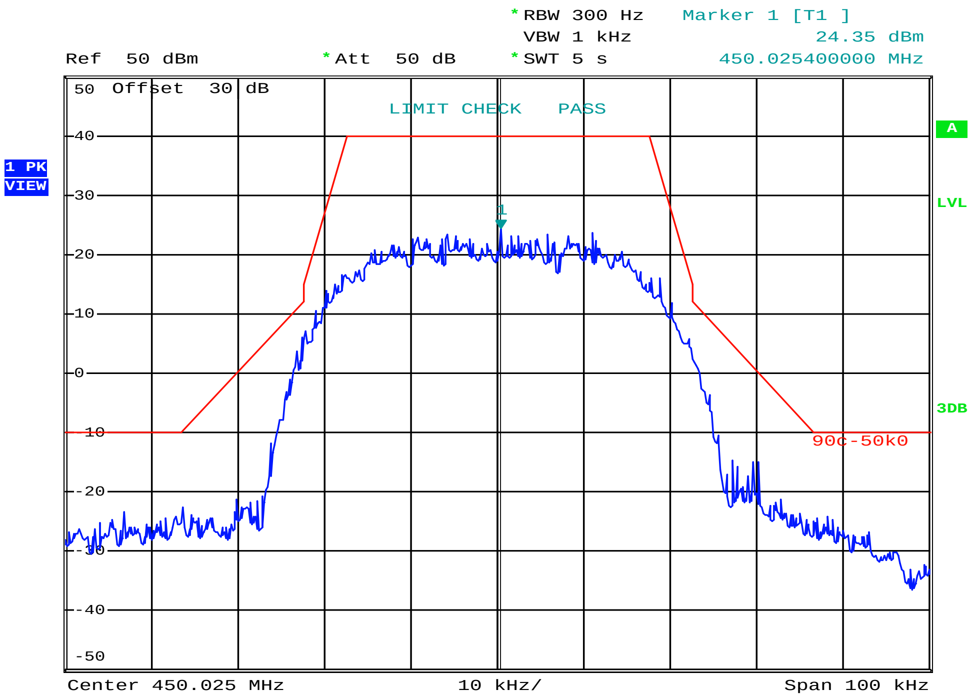


Date: 8.AUG.2019 16:57:11

Channel Frequency: **429.975000** MHz	Band Edge: **Upper Band Edge**	Channel Bandwidth Setting: **50.00** kHz
Modulation Setting: **16QAM**	Channel Power Setting: **40.00** dBm	Mask Limit Check: **PASS**

Plot 9.102 – Band Edge and Emissions Mask – 50kHz BW – 16QAM – 450.025MHz

RSS-119 (5.8.2) Mask C (Modified)

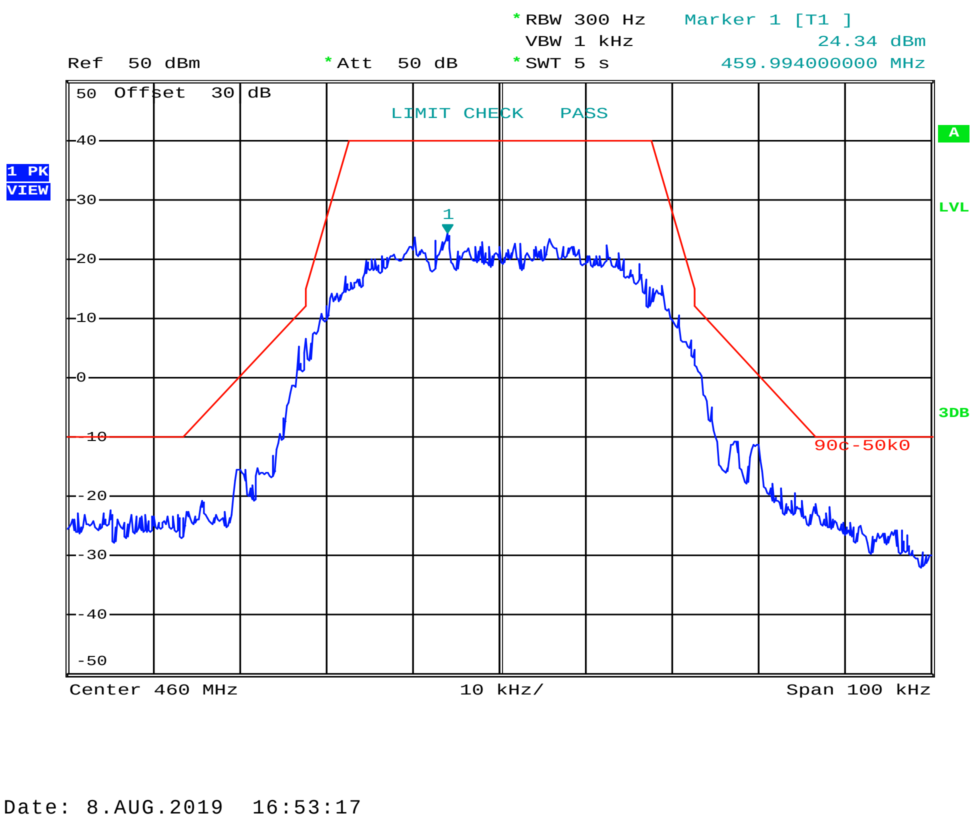


Date: 8.AUG.2019 16:55:10

Channel Frequency: **450.025000** MHz	Band Edge: **Lower Band Edge**	Channel Bandwidth Setting: **50.00** kHz
Modulation Setting: **16QAM**	Channel Power Setting: **40.00** dBm	Mask Limit Check: **PASS**

Plot 9.103 – Band Edge and Emissions Mask – 50kHz BW – 16QAM – 460MHz

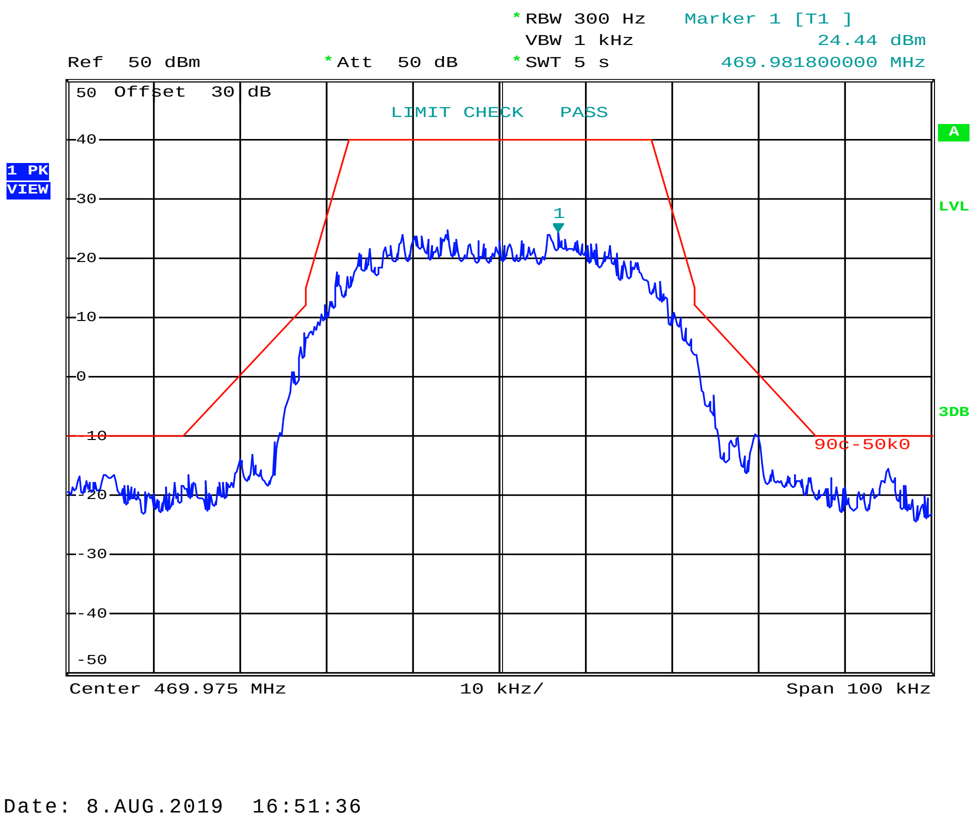
RSS-119 (5.8.2) Mask C (Modified)



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**

Plot 9.104 – Band Edge and Emissions Mask – 50kHz BW – 16QAM – 469.975MHz

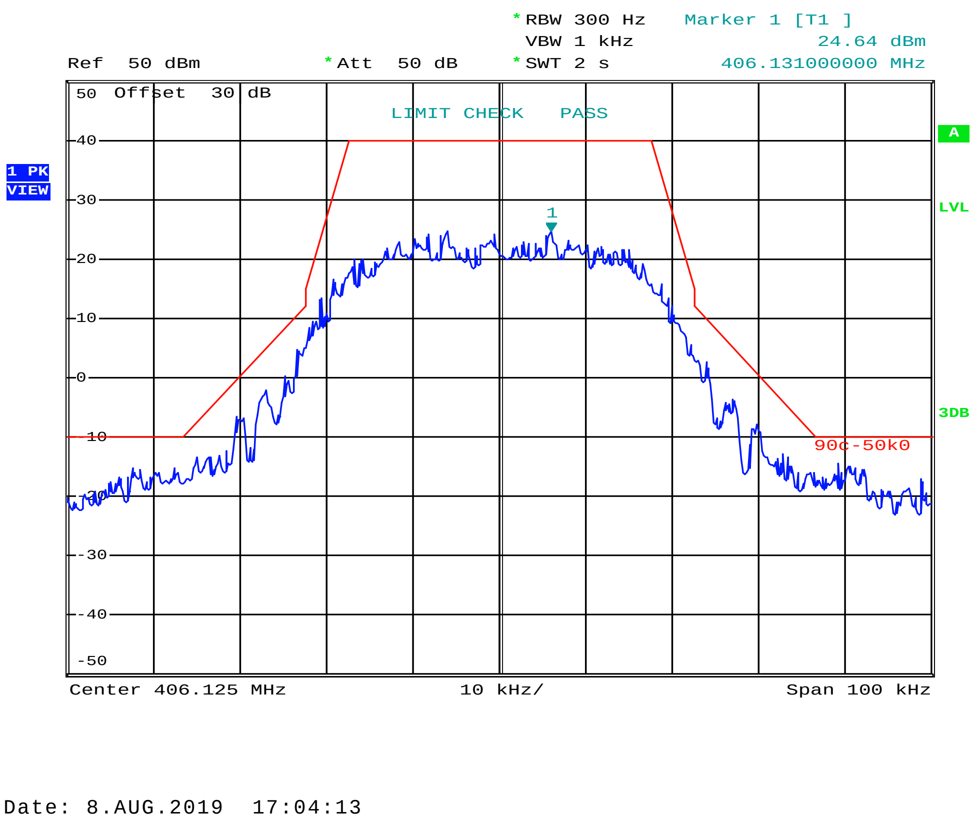
RSS-119 (5.8.2) Mask C (Modified)



Channel Frequency: **469.975000** MHz	Band Edge: **Upper Band Edge**	Channel Bandwidth Setting: **50.00** kHz
Modulation Setting: **16QAM**	Channel Power Setting: **40.00** dBm	Mask Limit Check: **PASS**

Plot 9.105 – Band Edge and Emissions Mask – 50kHz BW – 32QAM – 406.125MHz, ISED

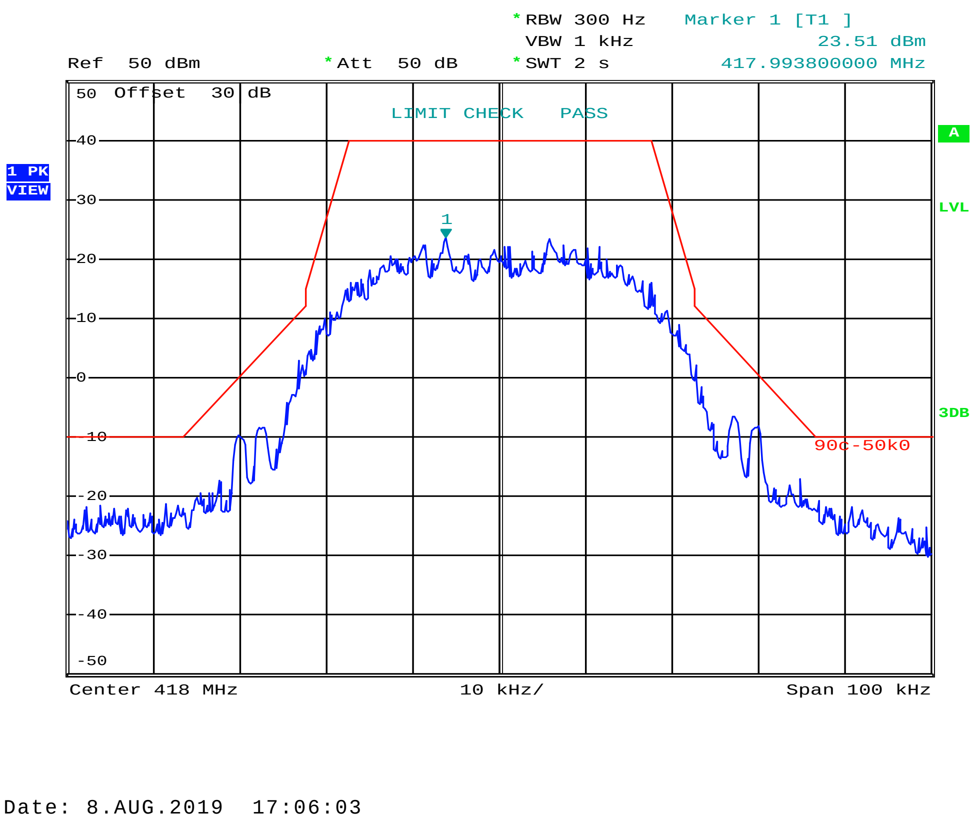
RSS-119 (5.8.2) Mask C (Modified)



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**

Plot 9.106 – Band Edge and Emissions Mask – 50kHz BW – 32QAM – 418MHz, ISED

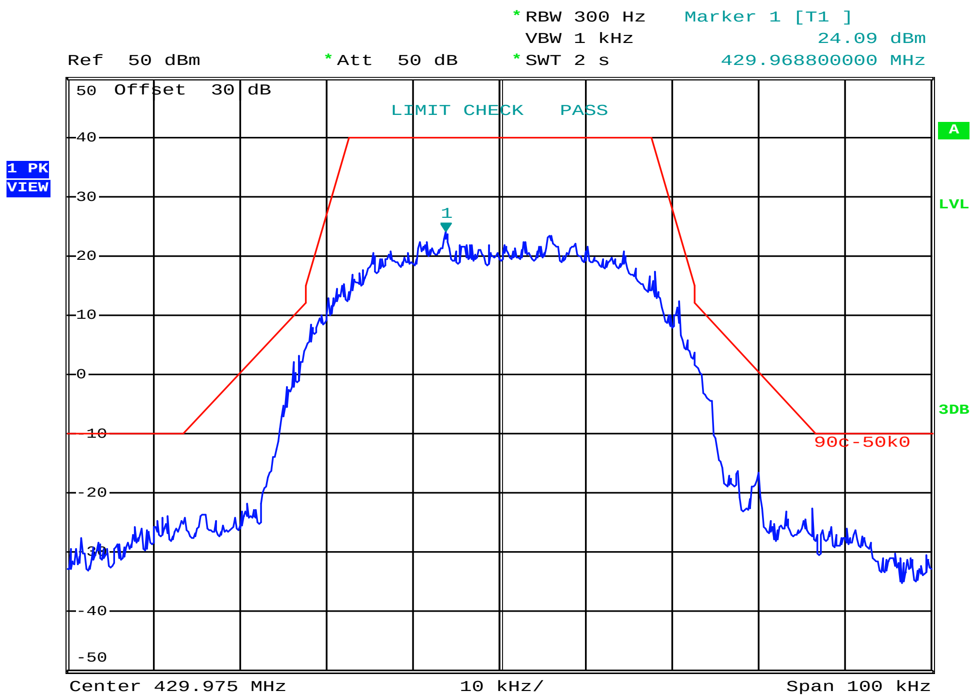
RSS-119 (5.8.2) Mask C (Modified)



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**

Plot 9.107 – Band Edge and Emissions Mask – 50kHz BW – 32QAM – 429.975MHz, ISED

RSS-119 (5.8.2) Mask C (Modified)

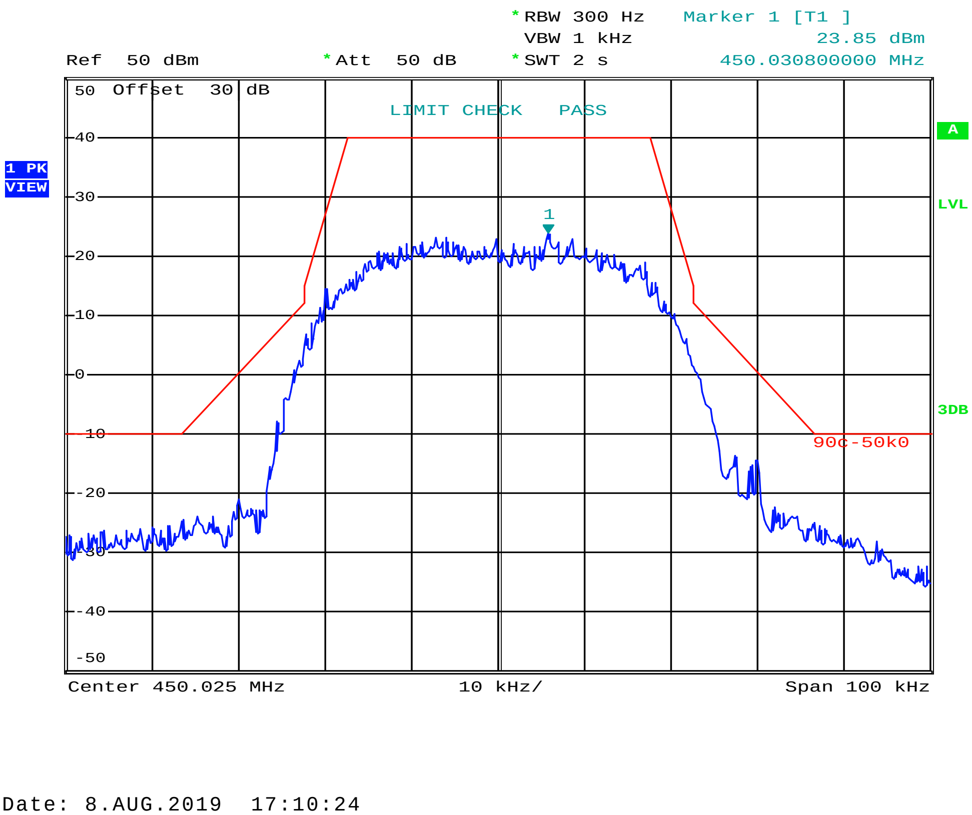


Date: 8.AUG.2019 17:08:11

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**

Plot 9.108 – Band Edge and Emissions Mask – 50kHz BW – 32QAM – 450.025MHz

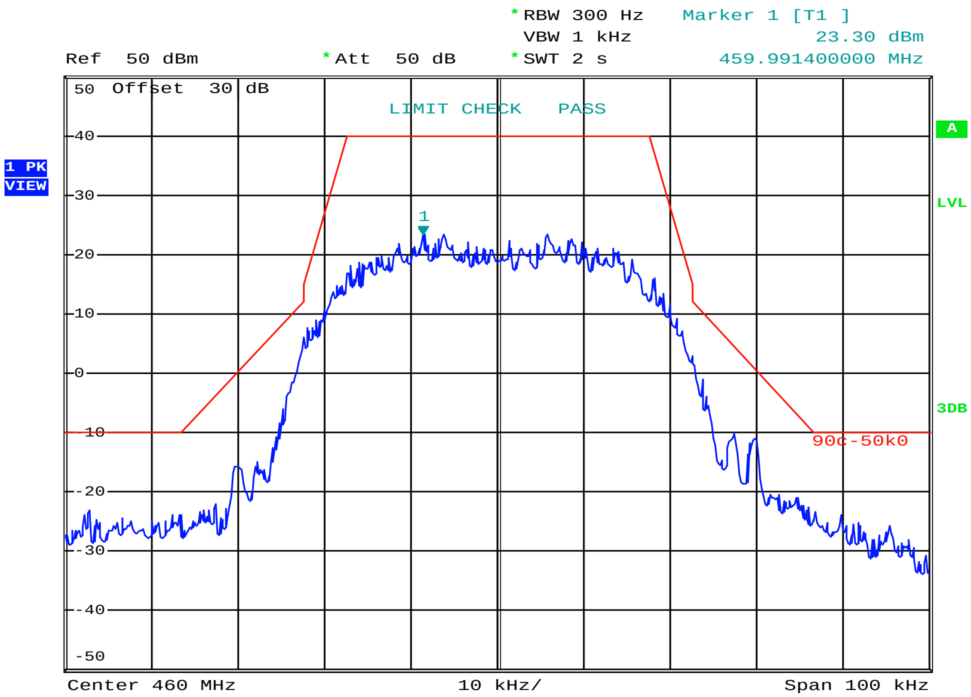
RSS-119 (5.8.2) Mask C (Modified)



Channel Frequency: **450.025000** MHz	Band Edge: **Lower Band Edge**	Channel Bandwidth Setting: **50.00** kHz
Modulation Setting: **32QAM**	Channel Power Setting: **40.00** dBm	Mask Limit Check: **PASS**

Plot 9.109 – Band Edge and Emissions Mask – 50kHz BW – 32QAM – 460MHz

RSS-119 (5.8.2) Mask C (Modified)

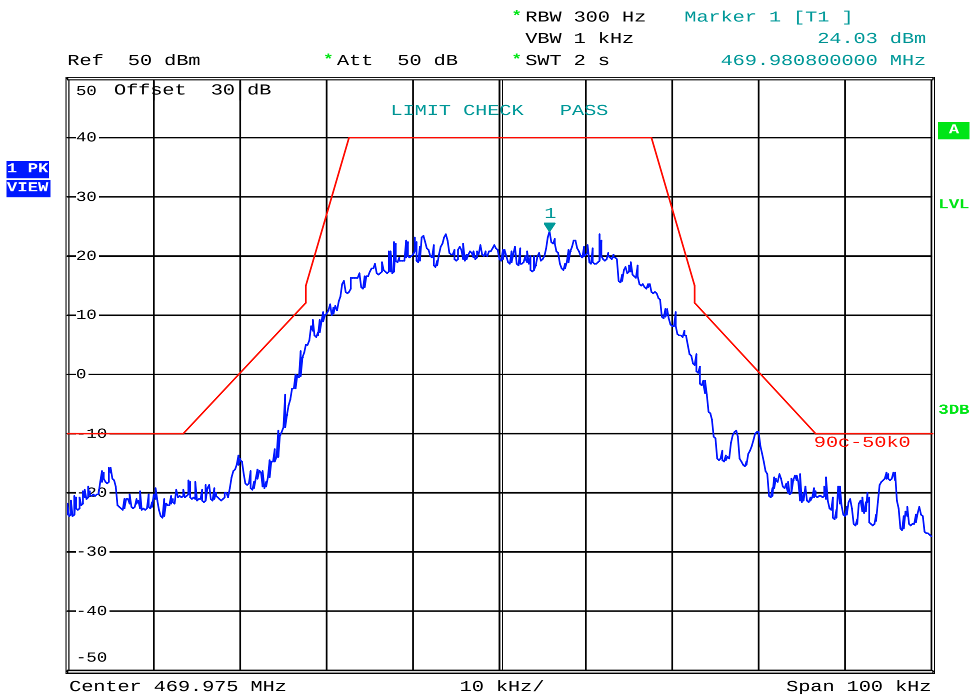


Date: 8.AUG.2019 17:12:07

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**

Plot 9.110 – Band Edge and Emissions Mask – 50kHz BW – 32QAM – 469.975MHz

RSS-119 (5.8.2) Mask C (Modified)

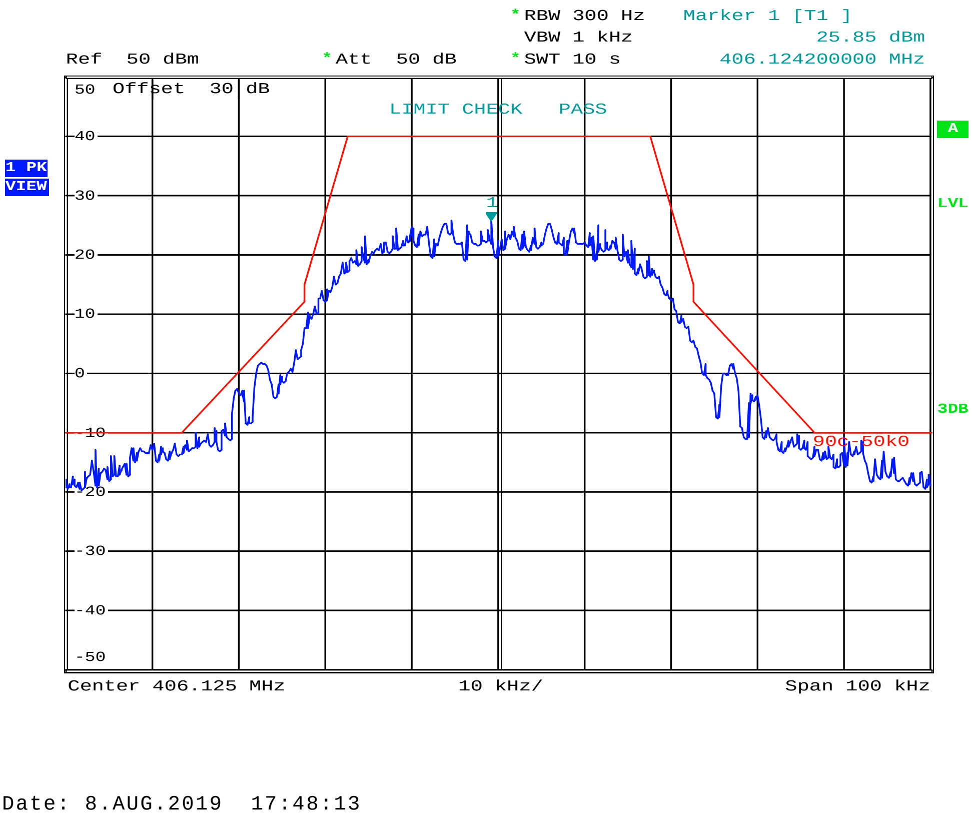


Date: 8.AUG.2019 17:13:43

Channel Frequency: **469.975000** MHz	Band Edge: **Upper Band Edge**	Channel Bandwidth Setting: **50.00** kHz
Modulation Setting: **32QAM**	Channel Power Setting: **40.00** dBm	Mask Limit Check: **PASS**

Plot 9.111 – Band Edge and Emissions Mask – 50kHz BW – 64QAM – 406.125MHz, ISED

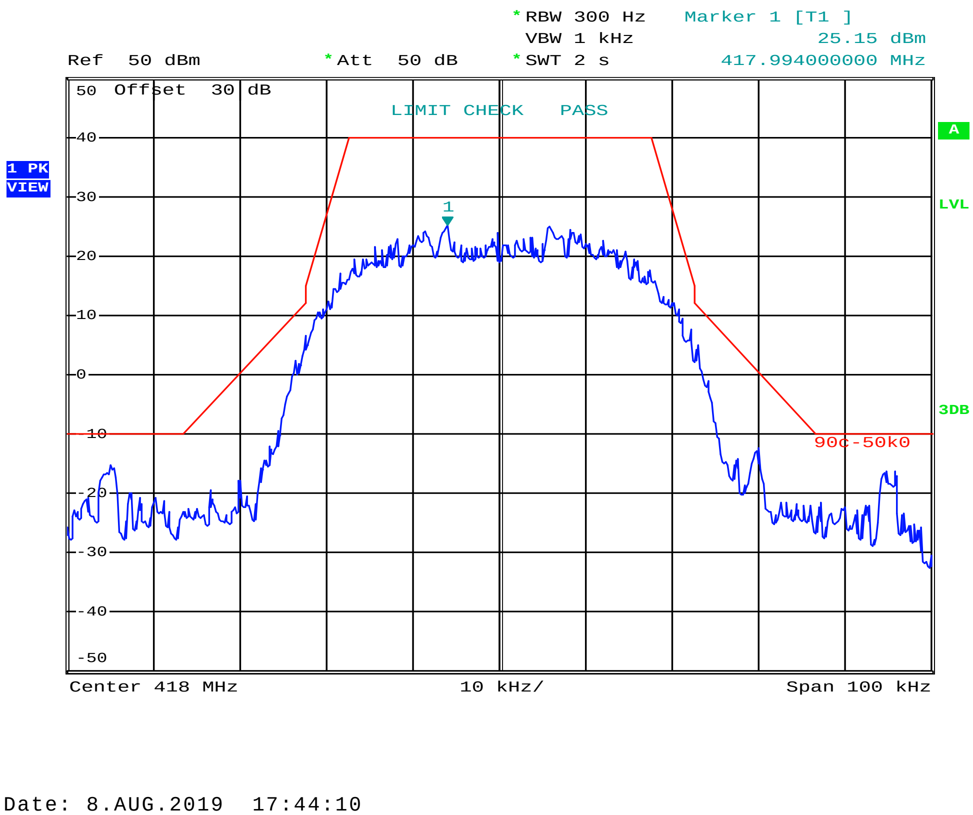
RSS-119 (5.8.2) Mask C (Modified)



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**

Plot 9.112 – Band Edge and Emissions Mask – 50kHz BW – 64QAM – 418MHz, ISED

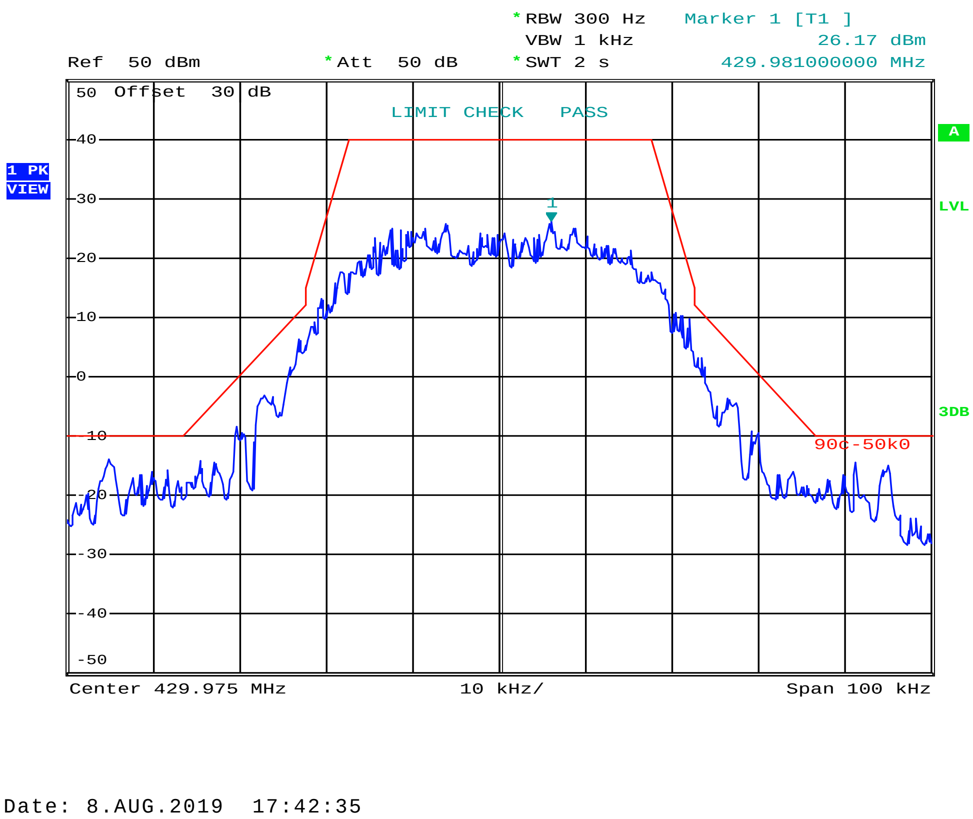
RSS-119 (5.8.2) Mask C (Modified)



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**

Plot 9.113 – Band Edge and Emissions Mask – 50kHz BW – 64QAM – 429.975MHz, ISED

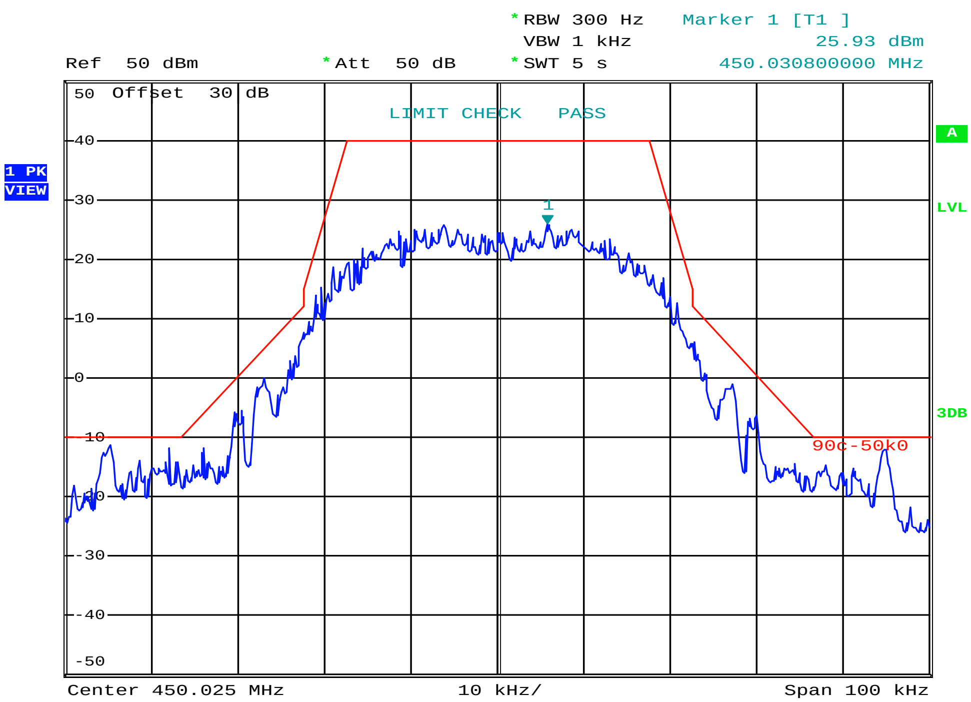
RSS-119 (5.8.2) Mask C (Modified)



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**

Plot 9.114 – Band Edge and Emissions Mask – 50kHz BW – 64QAM – 450.025MHz, ISED

RSS-119 (5.8.2) Mask C (Modified)

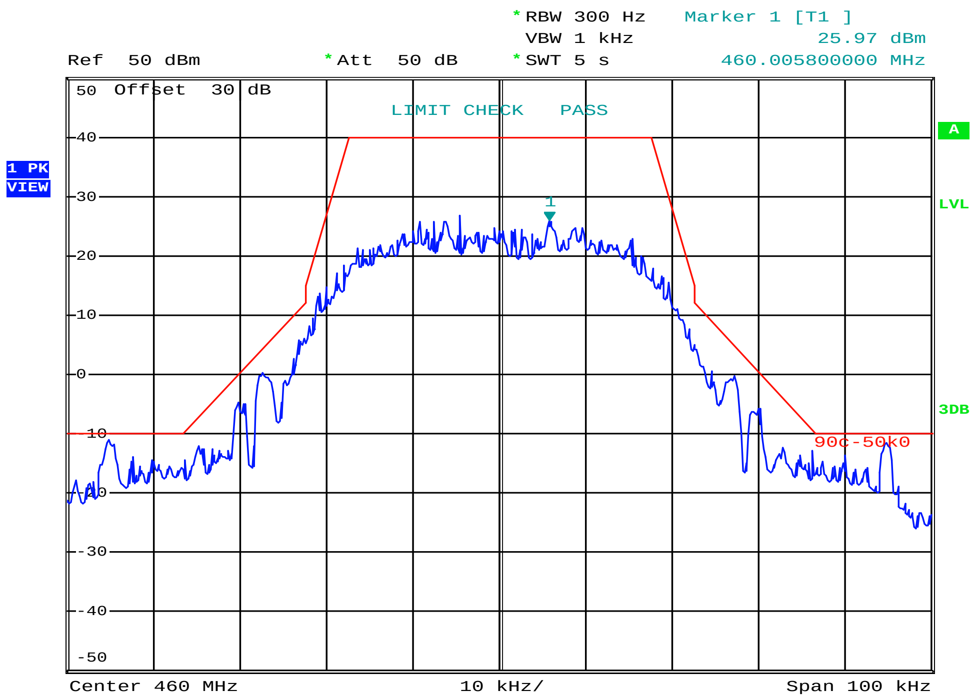


Date: 8.AUG.2019 17:40:59

Channel Frequency: **450.025000** MHz	Band Edge: **Lower Band Edge**	Channel Bandwidth Setting: **50.00** kHz
Modulation Setting: **64QAM**	Channel Power Setting: **40.00** dBm	Mask Limit Check: **PASS**

Plot 9.115 – Band Edge and Emissions Mask – 50kHz BW – 64QAM – 460MHz, ISED

RSS-119 (5.8.2) Mask C (Modified)

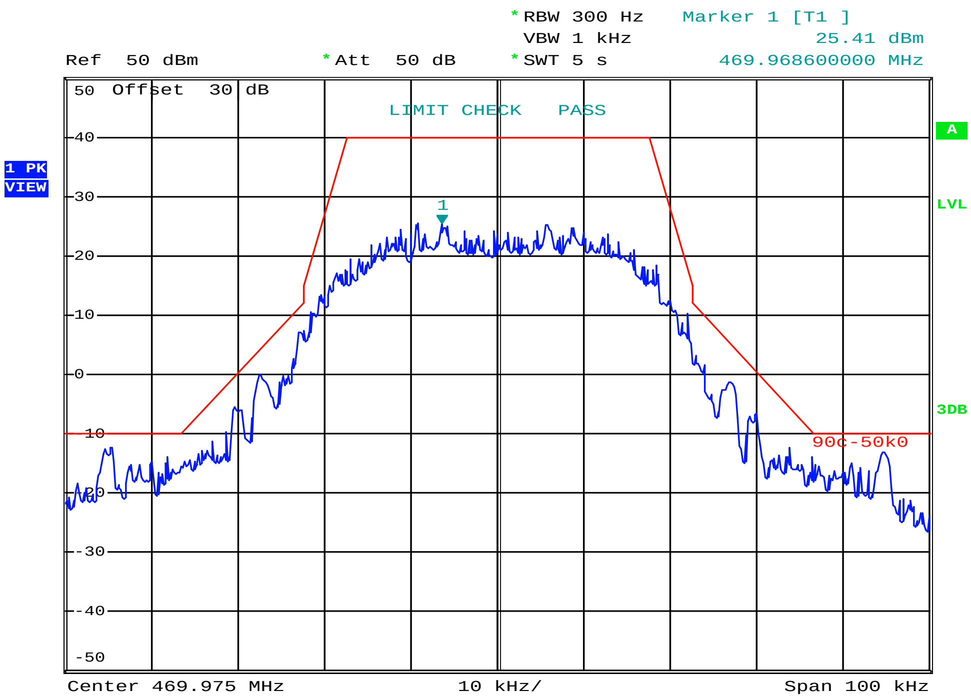


Date: 8.AUG.2019 17:29:17

Channel Frequency: **460.000000** MHz	Band Edge: **Mid Band**	Channel Bandwidth Setting: **50.00** kHz
Modulation Setting: **64QAM**	Channel Power Setting: **40.00** dBm	Mask Limit Check: **PASS**

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**

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 418.000000 429.996875 450.003125 460.000000 469.996875	MSK	6.25	39.00*	8.0*		RSS-119 5.8.4 Mask E	PASS	PASS	Complies
450.003125 460.000000 469.996875			37.78**	6.0**	§90.210(e) Mask E		PASS	PASS	Complies
406.106250 418.000000 429.993750 450.006250 460.000000 469.993750	MSK	12.5	40	10	§90.210(d) Mask D	RSS-119 5.8.3 Mask D	PASS	PASS	Complies
406.106250 418.000000 429.993750 450.006250 460.000000 469.993750	8PSK	12.5	40	10	§90.210(d) Mask D	RSS-119 5.8.3 Mask D	PASS	PASS	Complies
406.106250 418.000000 429.993750 450.006250 460.000000 469.993750	QPSK	12.5	40	10	§90.210(d) Mask D	RSS-119 5.8.3 Mask D	PASS	PASS	Complies
406.106250 418.000000 429.993750 450.006250 460.000000 469.993750	16QAM	12.5	40	10	§90.210(d) Mask D	RSS-119 5.8.3 Mask D	PASS	PASS	Complies
406.106250 418.000000 429.993750 450.006250 460.000000 469.993750	32QAM	12.5	40	10	§90.210(d) Mask D	RSS-119 5.8.3 Mask D	PASS	PASS	Complies
406.106250 418.000000 429.993750 450.006250 460.000000 469.993750	64QAM	12.5	40	10	§90.210(d) Mask D	RSS-119 5.8.3 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)

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 418.000000 429.987500 450.012500 460.000000 469.987500	MSK	25	40	10	§90.210(c) Mask C	RSS-119 5.8.2 Mask C	PASS	PASS	Complies
406.112500 418.000000 429.987500 450.012500 460.000000 469.987500	8PSK	25	40	10	§90.210(c) Mask C	RSS-119 5.8.2 Mask C	PASS	PASS	Complies
406.112500 418.000000 429.987500 450.012500 460.000000 469.987500	QPSK	25	40	10	§90.210(c) Mask C	RSS-119 5.8.2 Mask C	PASS	PASS	Complies
406.112500 418.000000 429.987500 450.012500 460.000000 469.987500	16QAM	25	40	10	§90.210(c) Mask C	RSS-119 5.8.2 Mask C	PASS	PASS	Complies
406.112500 418.000000 429.987500 450.012500 460.000000 469.987500	32QAM	25	40	10	§90.210(c) Mask C	RSS-119 5.8.2 Mask C	PASS	PASS	Complies
406.112500 418.000000 429.987500 450.012500 460.000000 469.987500	64QAM	25	40	10	§90.210(c) Mask C	RSS-119 5.8.2 Mask C	PASS	PASS	Complies

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 418.000000 429.975000 450.025000 460.000000 469.975000	MSK	50	40	10		RSS-119 5.8.2 Mask C*	PASS	PASS	Complies
406.125000 418.000000 429.975000 450.025000 460.000000 469.975000	8PSK	50	40	10		RSS-119 5.8.2 Mask C*	PASS	PASS	Complies
406.125000 418.000000 429.975000 450.025000 460.000000 469.975000	QPSK	50	40	10		RSS-119 5.8.2 Mask C*	PASS	PASS	Complies
406.125000 418.000000 429.975000 450.025000 460.000000 469.975000	16QAM	50	40	10		RSS-119 5.8.2 Mask C*	PASS	PASS	Complies
406.125000 418.000000 429.975000 450.025000 460.000000 469.975000	32QAM	50	40	10		RSS-119 5.8.2 Mask C*	PASS	PASS	Complies
406.125000 418.000000 429.975000 450.025000 460.000000 469.975000	64QAM	50	40	10		RSS-119 5.8.2 Mask C*	PASS	PASS	Complies

* See Notes at beginning of Section 9.0

10.0 CONDUCTED SPURIOUS EMISSIONS

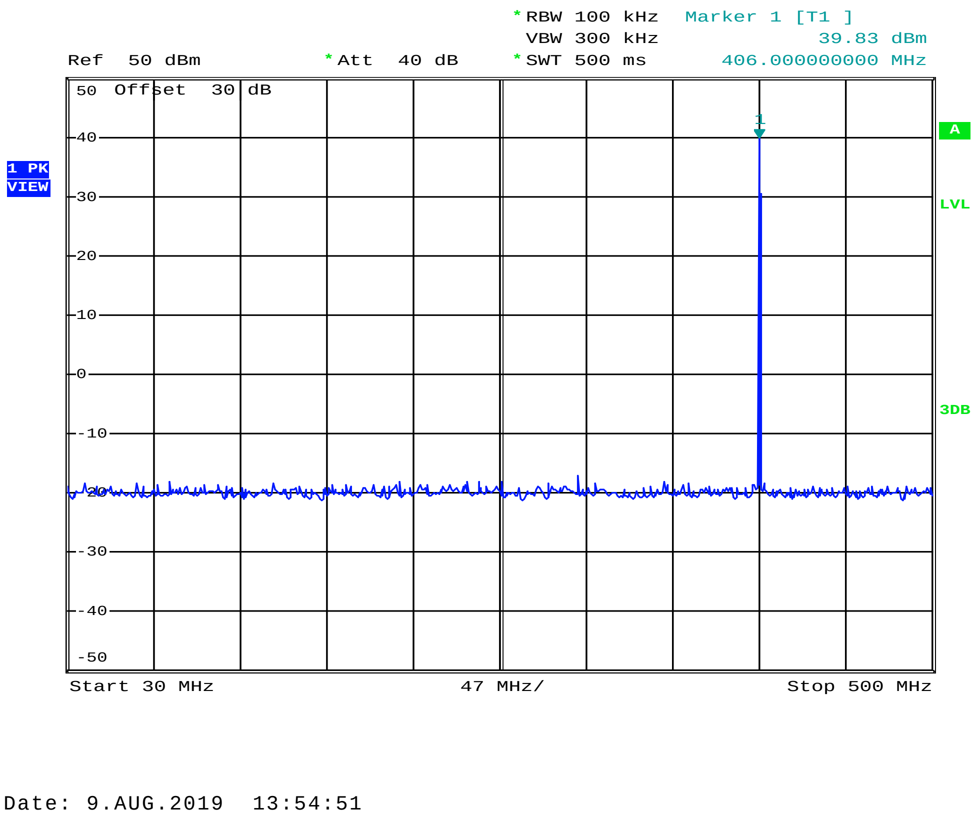
Test Conditions	
Normative Reference	**FCC 47 CFR §2.1049, §90.210, RSS-Gen (6.7), RSS-119 (5.5)**
	ANSI C63.26 7.2.3
Limits	
47 CFR §90.210 Notes 2, 5	421MHz - 512MHz: Note 2: Equipment designed to operate with a 25 kHz channel bandwidth must meet the requirements of Emission Mask B or C, as applicable. 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. 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: (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 $83Log_{10}$ (f_d/5) dB; (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 $29Log_{10}$ (f_d 2/11) dB or 50 dB, whichever is the lesser attenuation; (3) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least 43 + $10Log_{10}$ (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: (1) On any frequency from the center of the authorized bandwidth f0 to 5.625 kHz removed from f0: Zero dB. (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. (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 + $10Log_{10}$(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: (1) On any frequency from the center of the authorized bandwidth f_0 to 3.0 kHz removed from f_0: Zero dB. (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 + $10Log_{10}$(P) or 65 dB, whichever is the lesser attenuation. (3) On any frequency removed from the center of the authorized bandwidth by more than 4.6 kHz: At least 55 + $10Log_{10}$ (P) or 65 dB, whichever is the lesser attenuation.

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: 50 or $29\text{Log}_{10}(f_d^2/11)$
	$f_d > 50$ (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: 70 or $50 + \text{Log}_{10}(P)$
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: $30 + 16.67(f_d - 3)$ or $55 + \text{Log}_{10}(P)$
	$f_d > 4.6$ (see Note 3)	Whichever is the lesser: 57 or $55 + \text{Log}_{10}(P)$

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) 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** 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. 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** 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 Note 2: RBW = Specified in Section 4.2.1 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.	

Plot 10.1 – Conducted Spurious Emission, 30MHz – 500MHz, Channel: 406.1MHz

Conducted Spurious Emissions



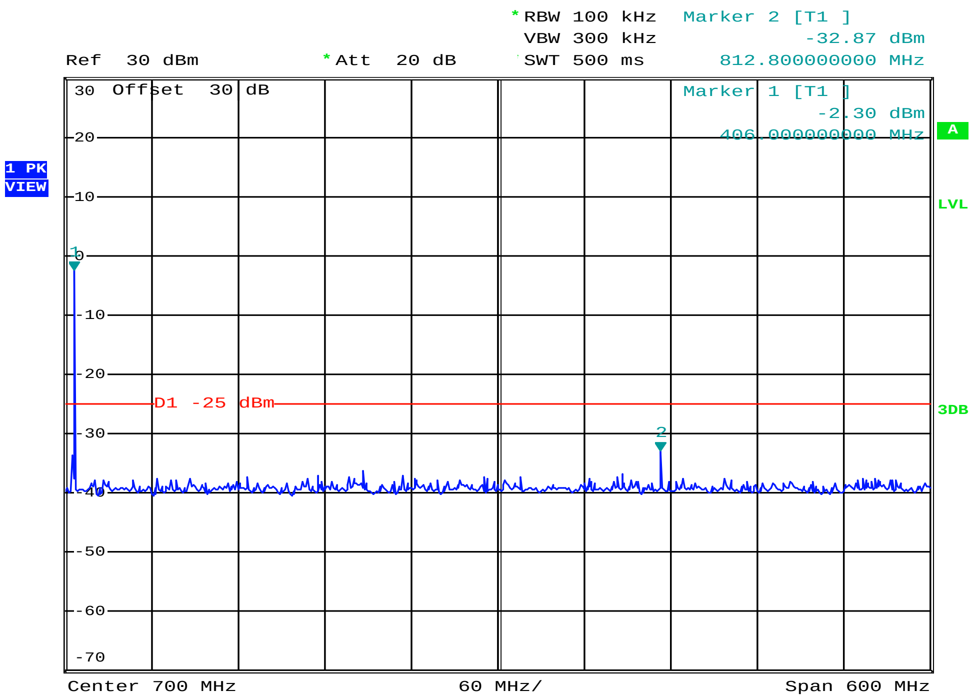
Channel Frequency:	Channel Bandwidth:	Transmit Duty Cycle:
406.10 MHz	**n/a** kHz	**100** %
Modulation Setting:	Channel Power Setting:	Nominal Input Voltage:
CW	**Max** dBm	**12.0** VDC

Marker 1: Fundamental

Measured Emission Level:
None Detected dBm

Plot 10.2 – Conducted Spurious Emission, 400MHz – 1000MHz, Channel: 406.1MHz

Conducted Spurious Emissions

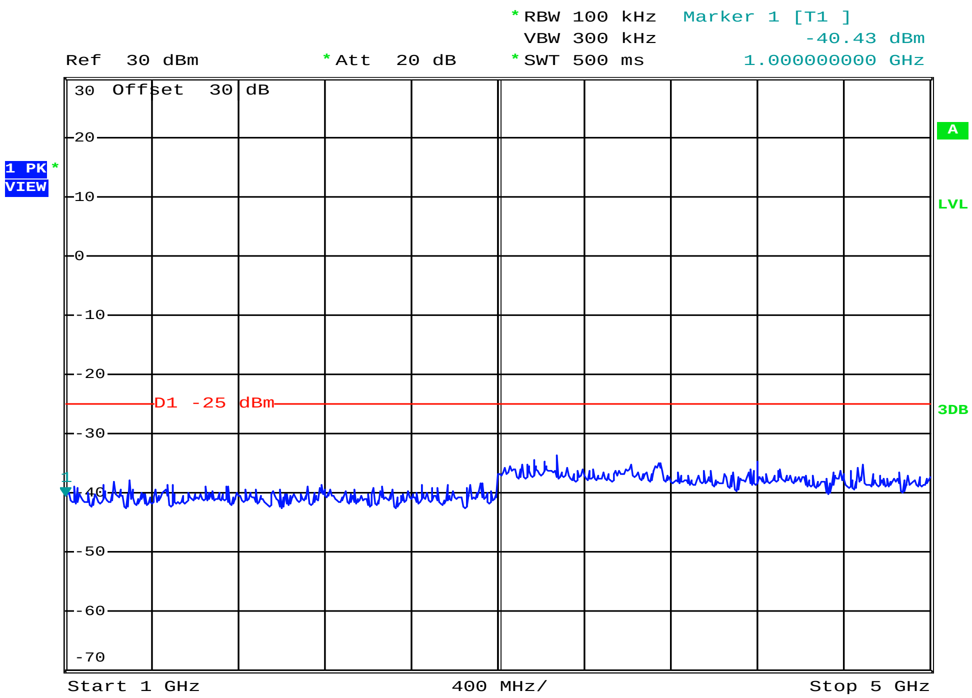


Date: 9.AUG.2019 13:57:11

Channel Frequency: **406.10** MHz	Channel Bandwidth: **n/a** kHz	Transmit Duty Cycle: **100** %
Modulation Setting: **CW**	Channel Power Setting: **Max** dBm	Nominal Input Voltage: **12.0** VDC
Marker 1: Fundamental	Marker 2: Spurious Emission	Measured Emission Level: **-32.87** dBm

Plot 10.3 – Conducted Spurious Emission, 1 – 5GHz, Channel: 406.1MHz

Conducted Spurious Emissions

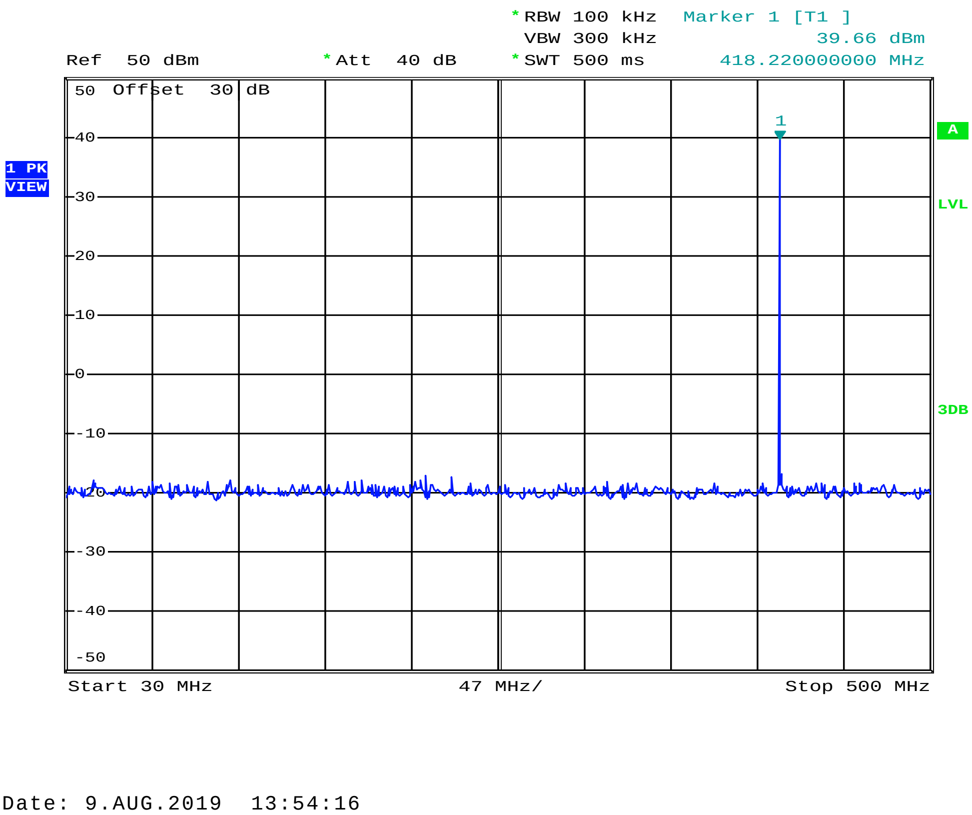


Date: 9.AUG.2019 14:05:18

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

Plot 10.4 – Conducted Spurious Emission, 30MHz – 500MHz, Channel: 418MHz

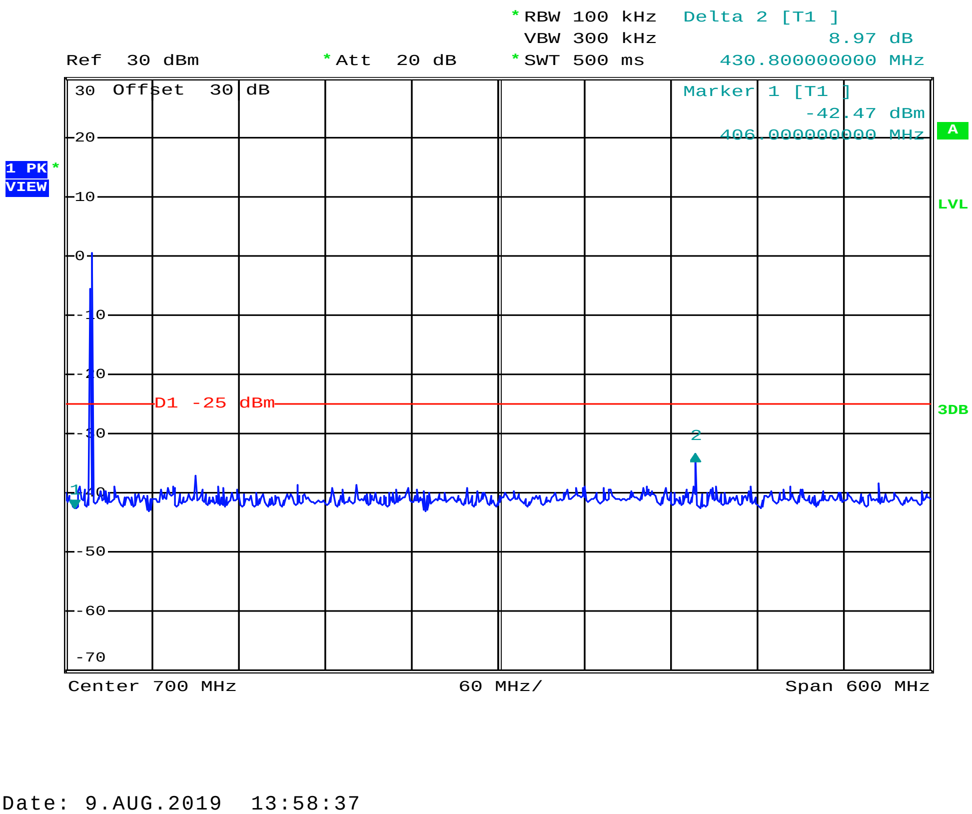
Conducted Spurious Emissions



Channel Frequency: **418.00** MHz	Channel Bandwidth: **n/a** kHz	Transmit Duty Cycle: **100** %
Modulation Setting: **CW**	Channel Power Setting: **Max** dBm	Nominal Input Voltage: **12.0** VDC
Marker 1: Fundamental		Measured Emission Level: **None Detected** dBm

Plot 10.5 – Conducted Spurious Emission, 400MHz – 1000MHz, Channel: 418MHz

Conducted 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

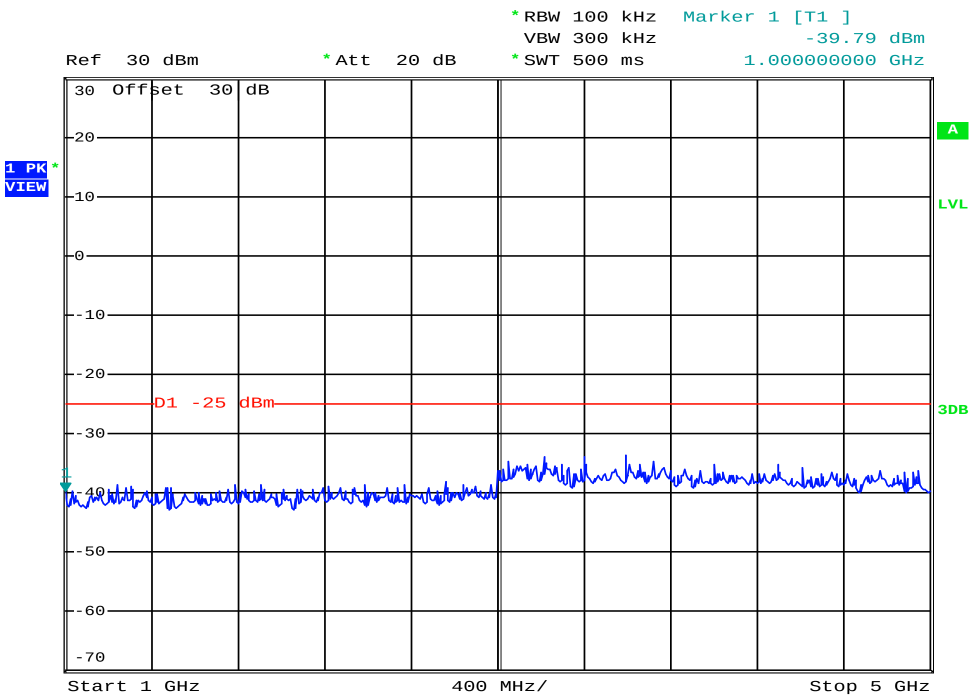
Marker 1: Fundamental

Marker 2: Spurious Emission

Measured Emission Level: **-33.50** dBm

Plot 10.6 – Conducted Spurious Emission, 1 – 5GHz, Channel: 418MHz

Conducted Spurious Emissions

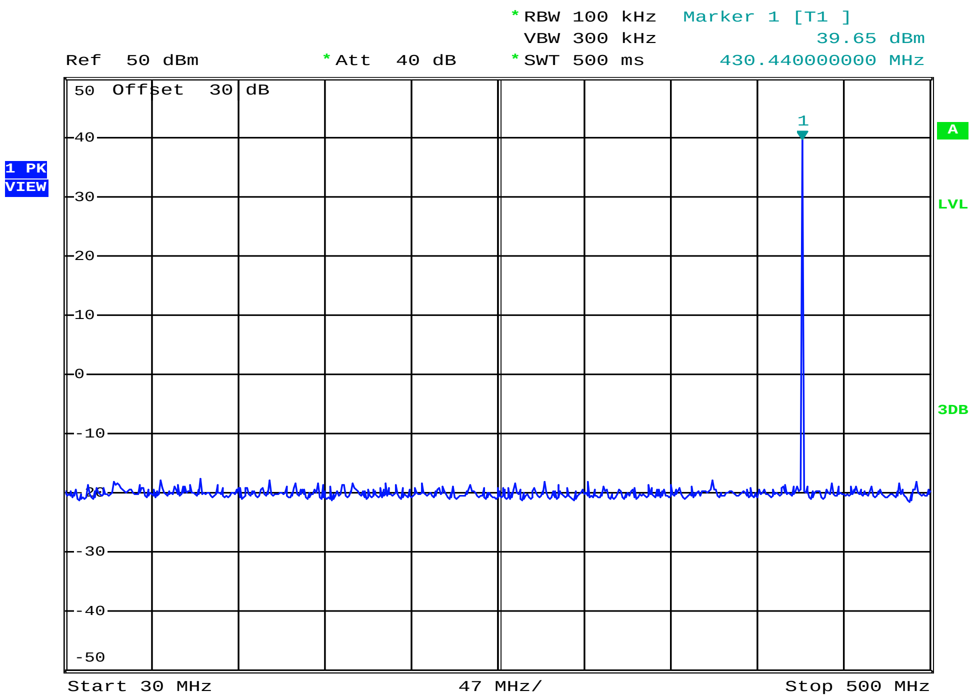


Date: 9.AUG.2019 14:04:53

Channel Frequency: **418.00** MHz	Channel Bandwidth: **n/a** kHz	Transmit Duty Cycle: **100** %
Modulation Setting: **CW**	Channel Power Setting: **Max** dBm	Nominal Input Voltage: **12.0** VDC
		Measured Emission Level: **None Detected** dBm

Plot 10.7 – Conducted Spurious Emission, 30MHz – 500MHz, Channel: 430MHz

Conducted Spurious Emissions



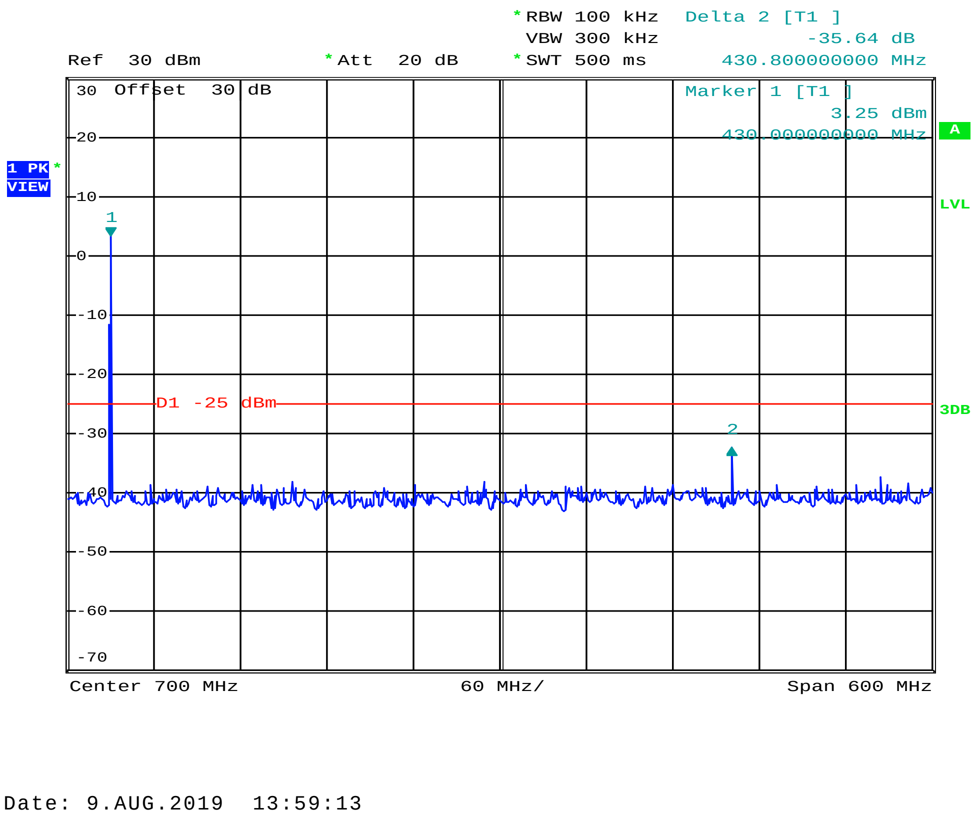
Date: 9.AUG.2019 13:53:51

Channel Frequency: **430.00** MHz	Channel Bandwidth: **n/a** kHz	Transmit Duty Cycle: **100** %
Modulation Setting: **CW**	Channel Power Setting: **Max** dBm	Nominal Input Voltage: **12.0** VDC
		Measured Emission Level: **None Detected** dBm

Marker 1: Fundamental

Plot 10.8 – Conducted Spurious Emission, 400MHz – 1000MHz, Channel: 430MHz

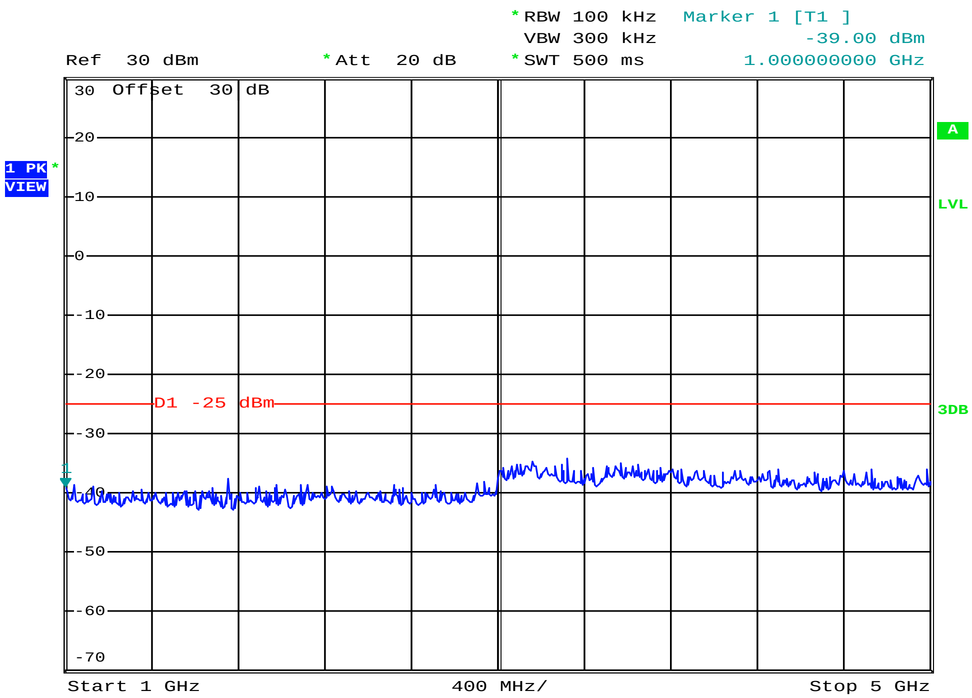
Conducted Spurious Emissions



Channel Frequency: **430.00** MHz	Channel Bandwidth: **n/a** kHz	Transmit Duty Cycle: **100** %
Modulation Setting: **CW**	Channel Power Setting: **Max** dBm	Nominal Input Voltage: **12.0** VDC
Marker 1: Fundamental	Marker 2: Spurious Emission	Measured Emission Level: **-32.39** dBm

Plot 10.9 – Conducted Spurious Emission, 1 – 5GHz, Channel: 430MHz

Conducted Spurious Emissions

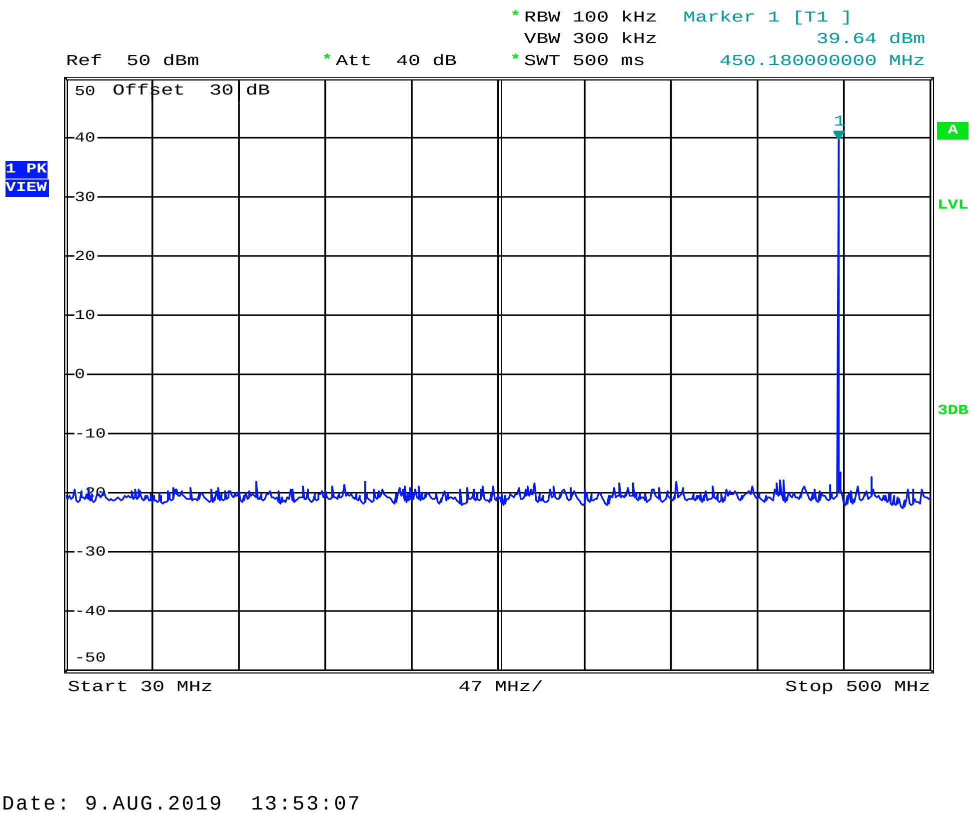


Date: 9.AUG.2019 14:04:27

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

Plot 10.10 – Conducted Spurious Emission, 30MHz – 500MHz, Channel: 450MHz

Conducted Spurious Emissions

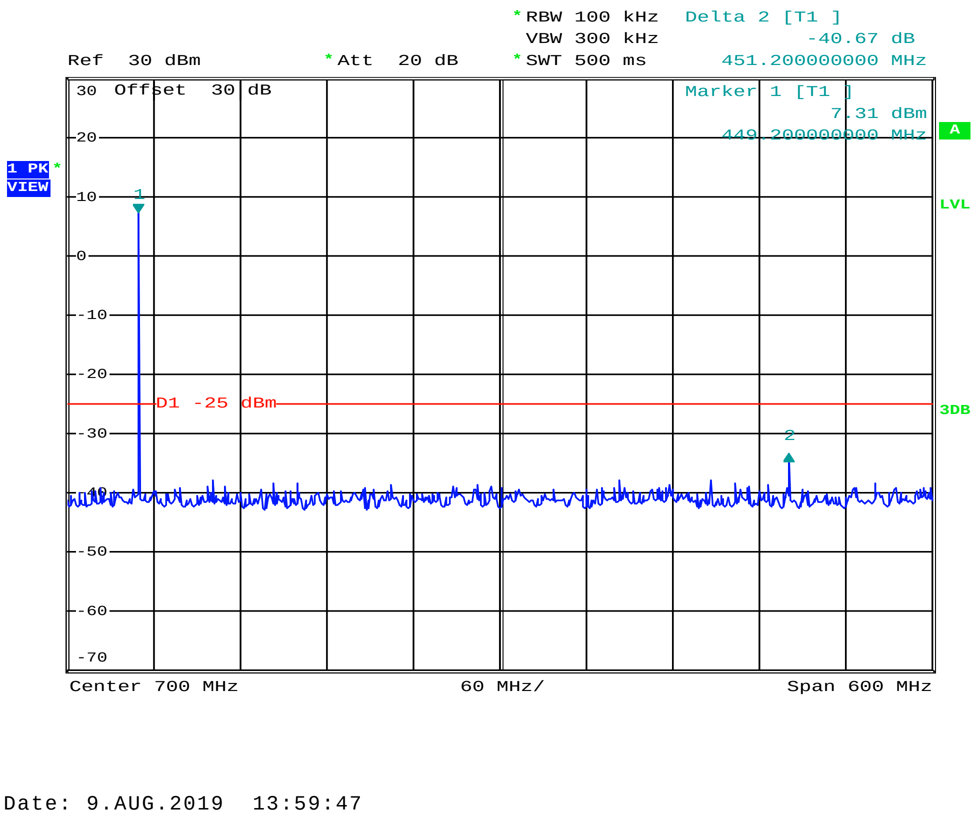


Channel Frequency:	Channel Bandwidth:	Transmit Duty Cycle:
450.00 MHz	**n/a** kHz	**100** %
Modulation Setting:	Channel Power Setting:	Nominal Input Voltage:
CW	**Max** dBm	**12.0** VDC
		Measured Emission Level:
		None Detected dBm

Marker 1: Fundamental

Plot 10.11 – Conducted Spurious Emission, 400MHz – 1000MHz, Channel: 450MHz

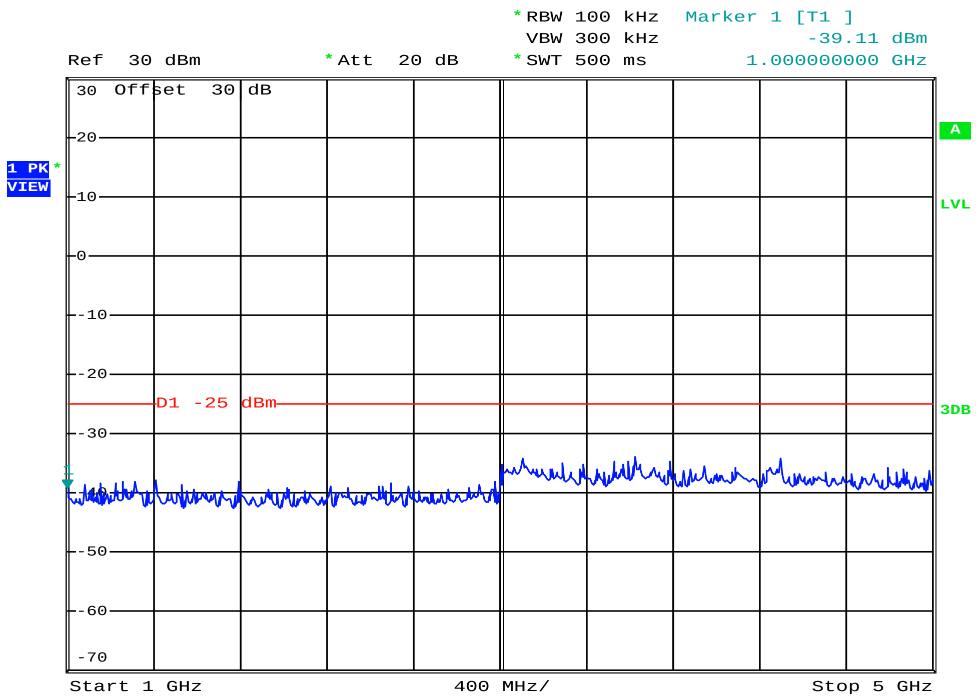
Conducted Spurious Emissions



Channel Frequency: **450.00** MHz	Channel Bandwidth: **n/a** kHz	Transmit Duty Cycle: **100** %
Modulation Setting: **CW**	Channel Power Setting: **Max** dBm	Nominal Input Voltage: **12.0** VDC
Marker 1: Fundamental	Marker 2: Spurious Emission	Measured Emission Level: **-33.36** dBm

Plot 10.12 – Conducted Spurious Emission, 1 – 5GHz, Channel: 450MHz

Conducted Spurious Emissions

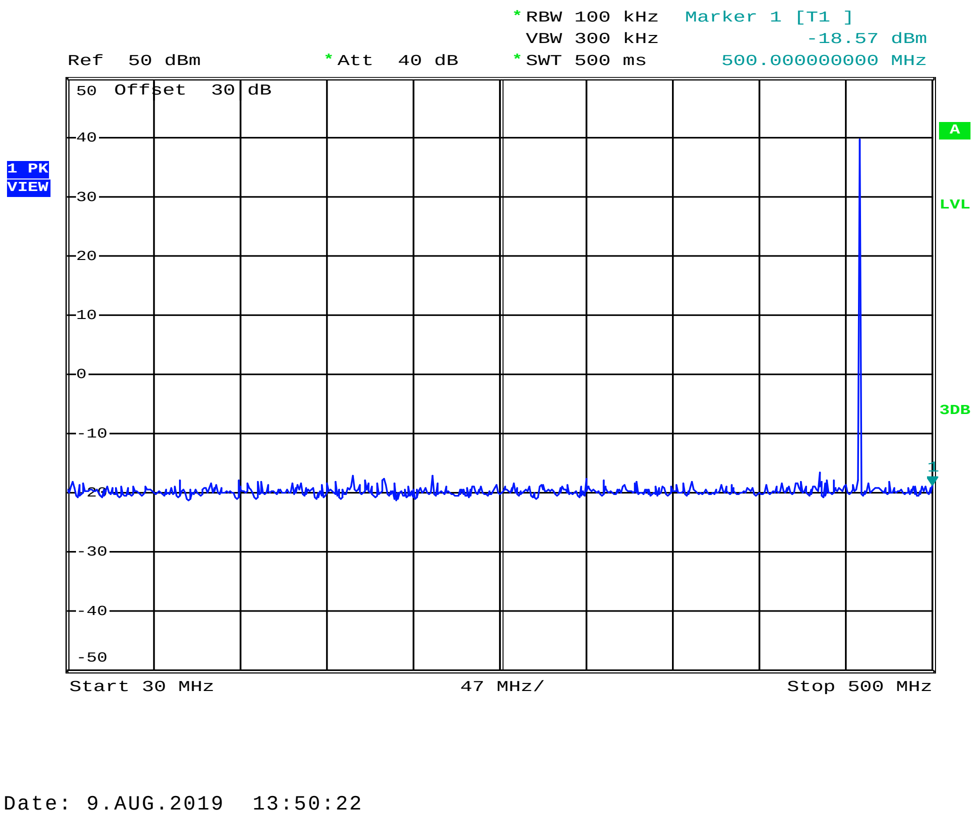


Date: 9.AUG.2019 14:03:56

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

Plot 10.13 – Conducted Spurious Emission, 30MHz – 500MHz, Channel: 460MHz

Conducted Spurious Emissions



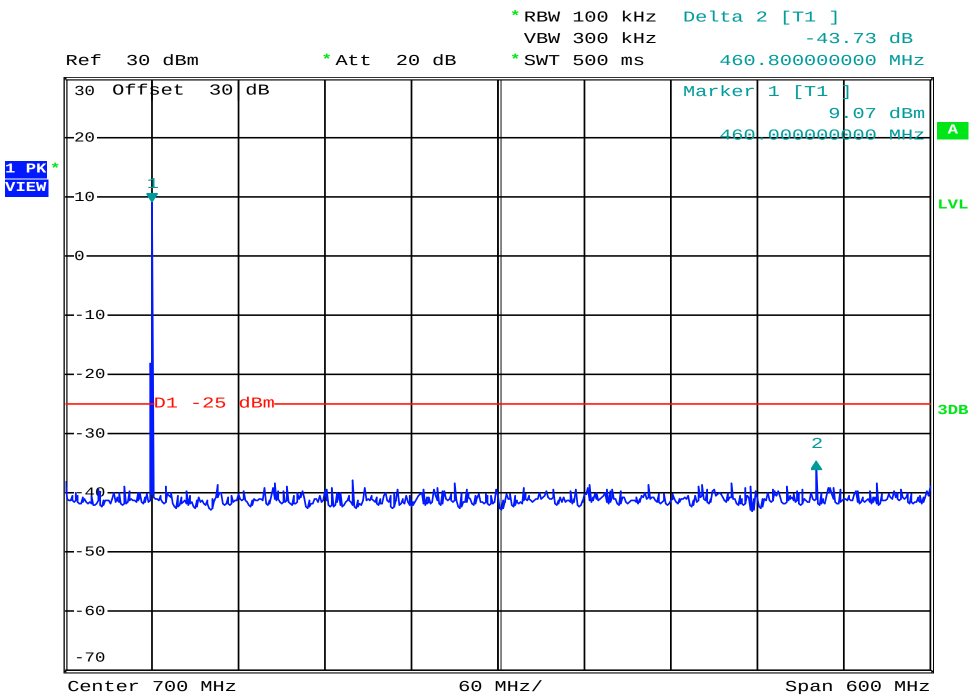
Channel Frequency: **460.00** MHz	Channel Bandwidth: **n/a** kHz	Transmit Duty Cycle: **100** %
Modulation Setting: **CW**	Channel Power Setting: **Max** dBm	Nominal Input Voltage: **12.0** VDC

Marker 1: Fundamental

Measured Emission Level: **None Detected** dBm

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

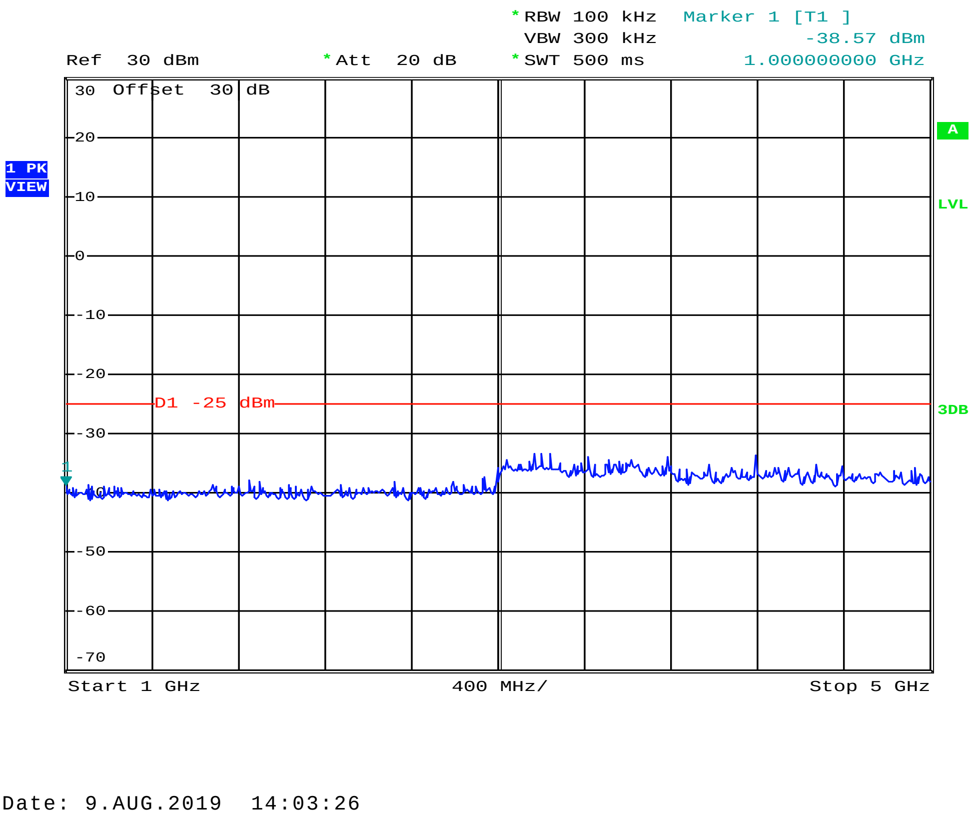
Marker 1: Fundamental

Marker 2: Spurious Emission

Measured Emission Level:
-34.66 dBm

Plot 10.15 – Conducted Spurious Emission, 1 – 5GHz, Channel: 460MHz

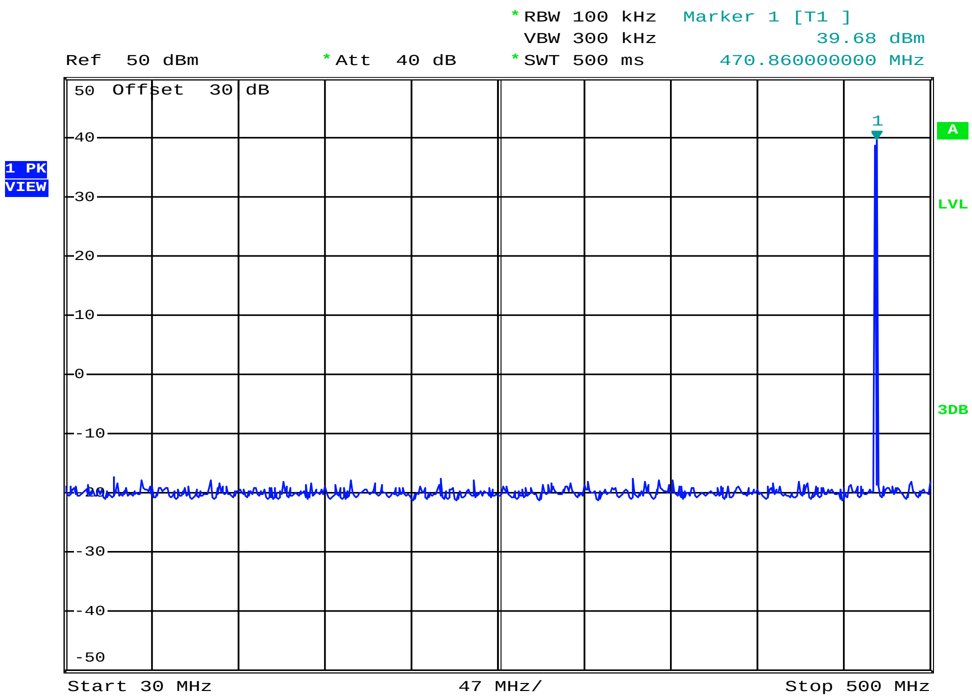
Conducted Spurious Emissions



Channel Frequency: **460.00** MHz	Channel Bandwidth: **n/a** kHz	Transmit Duty Cycle: **100** %
Modulation Setting: **CW**	Channel Power Setting: **Max** dBm	Nominal Input Voltage: **12.0** VDC
		Measured Emission Level: **None Detected** dBm

Plot 10.16 – Conducted Spurious Emission, 30MHz – 500MHz, Channel: 470MHz

Conducted Spurious Emissions

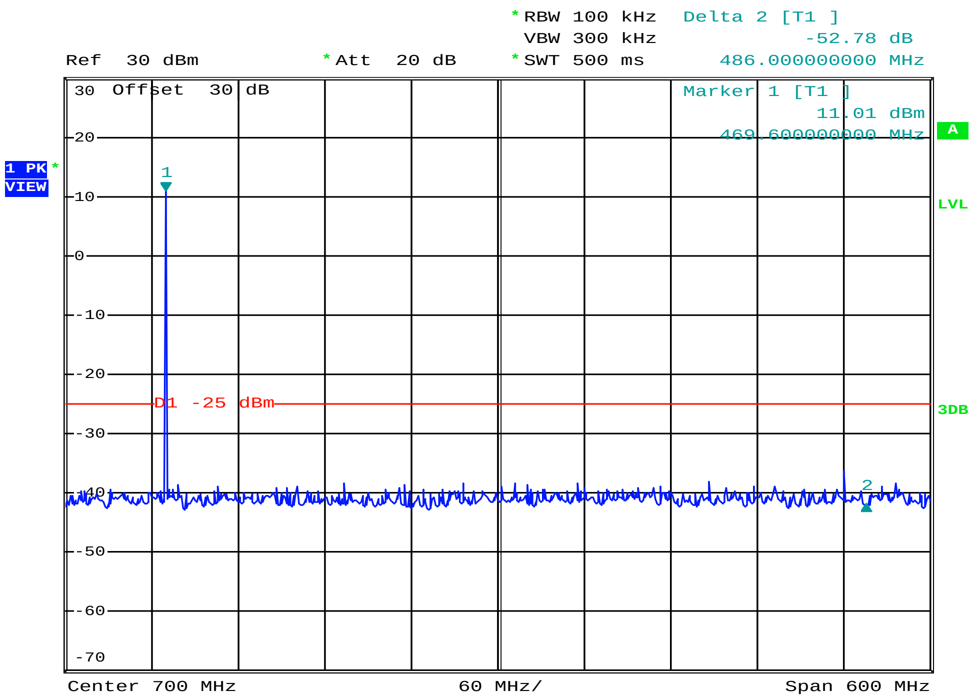


Date: 9.AUG.2019 13:52:05

Channel Frequency: **470.00** MHz	Channel Bandwidth: **n/a** kHz	Transmit Duty Cycle: **100** %
Modulation Setting: **CW**	Channel Power Setting: **Max** dBm	Nominal Input Voltage: **12.0** VDC
Marker 1: Fundamental		Measured Emission Level: **None Detected** dBm

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

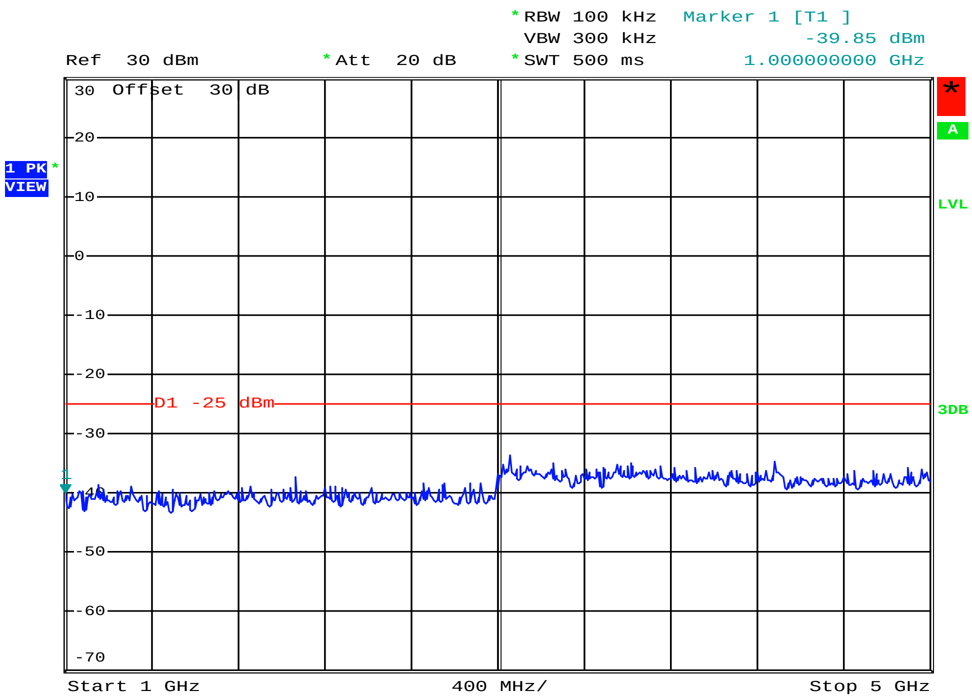
Marker 1: Fundamental

Marker 2: Spurious Emission

Measured Emission Level:
-41.77 dBm

Plot 10.18 – Conducted Spurious Emission, 1 – 5GHz, Channel: 470MHz

Conducted Spurious Emissions



Date: 9.AUG.2019 14:02:48

Channel Frequency: **470.00** MHz	Channel Bandwidth: **n/a** kHz	Transmit Duty Cycle: **100** %
Modulation Setting: **CW**	Channel Power Setting: **Max** dBm	Nominal Input Voltage: **12.0** VDC
		Measured Emission Level: **None Detected** dBm

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

11.0 RADIATED SPURIOUS EMISSIONS

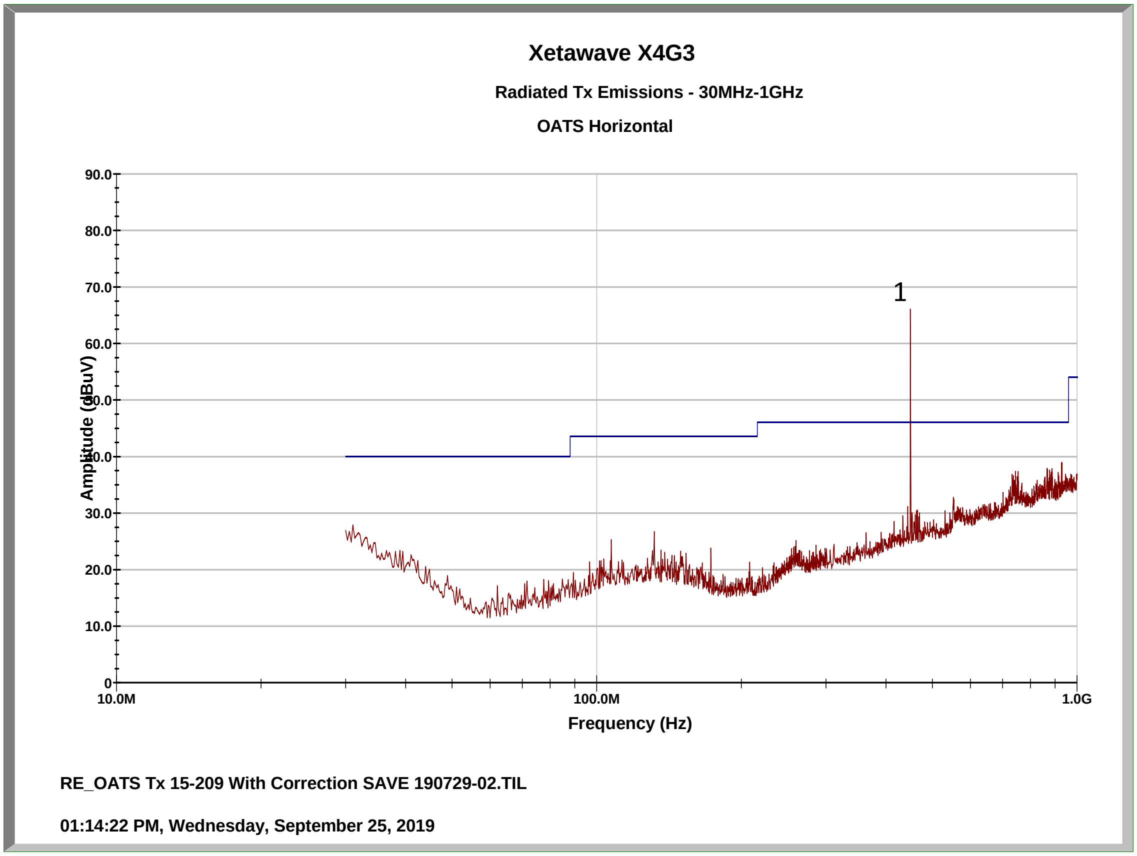
Test Conditions		
Normative Reference	FCC 47 CFR §2.1053, RSS-Gen (6.13)	
	ANSI C63.26	

Limits	
47 CFR §2.1053	**§2.1053 Measurements required: Field strength of spurious radiation.** (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** 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}.

Plot 11.1 – Radiates Tx Spurious Emissions – OATS - Horizontal

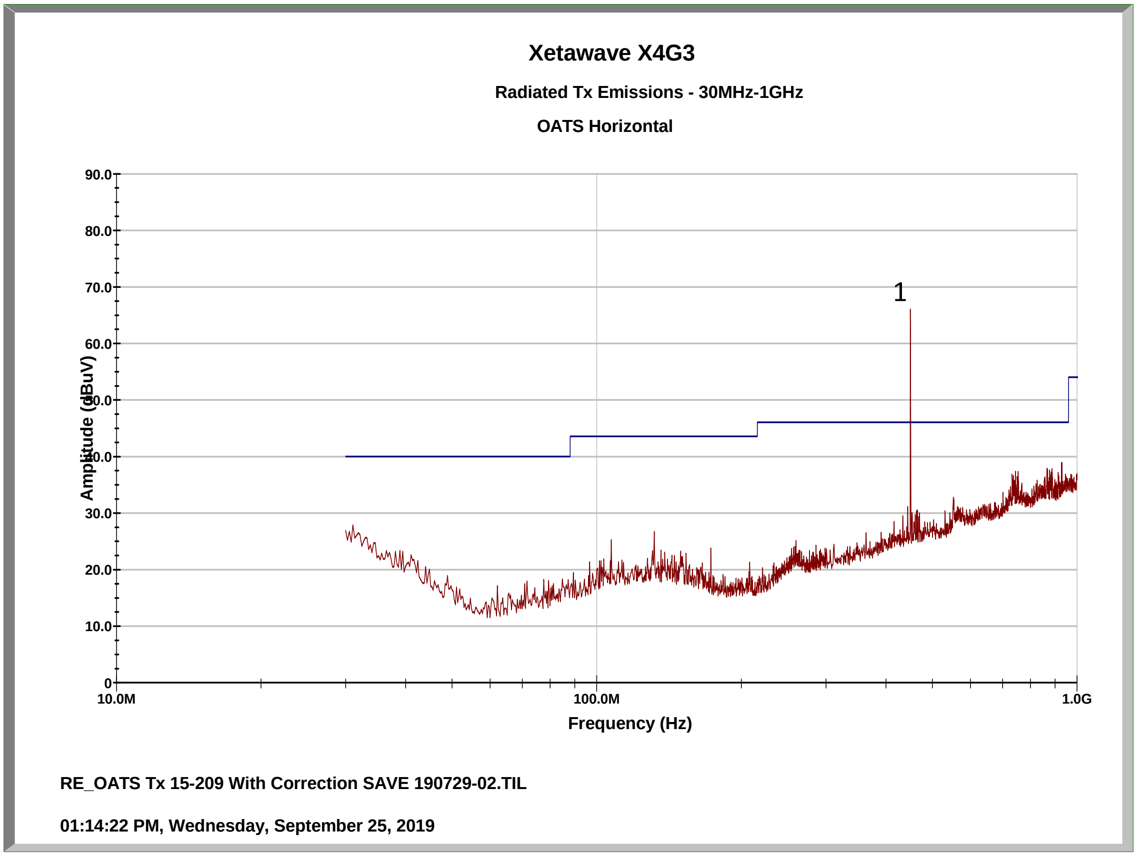
Radiated Tx Spurious Emissions



Channel Frequency: **418.00** MHz	Channel Bandwidth: **n/a** kHz	Transmit Duty Cycle: **100** %
Modulation Setting: **CW**	Channel Power Setting: **Max** dBm	Nominal Input Voltage: **12.0** VDC
Marker 1: Fundamental		Measured Emission Level: **None Detected** dBm

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

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

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: 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** 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**

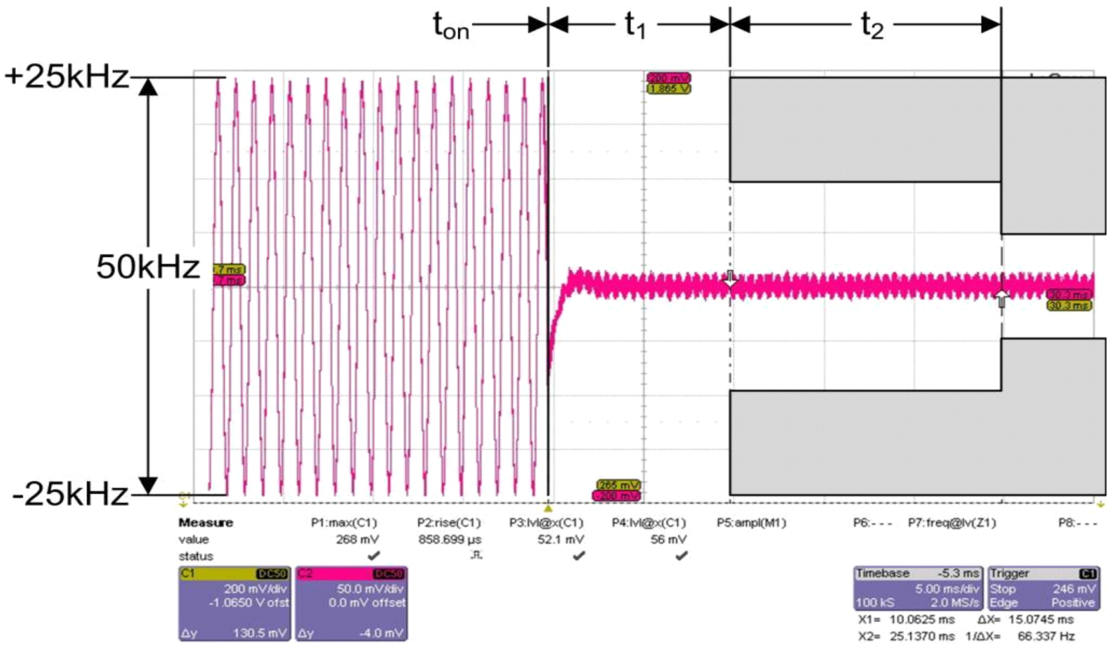
Measurement Procedure

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

Plot 12.1 – Transient Frequency Behavior, Tx ON

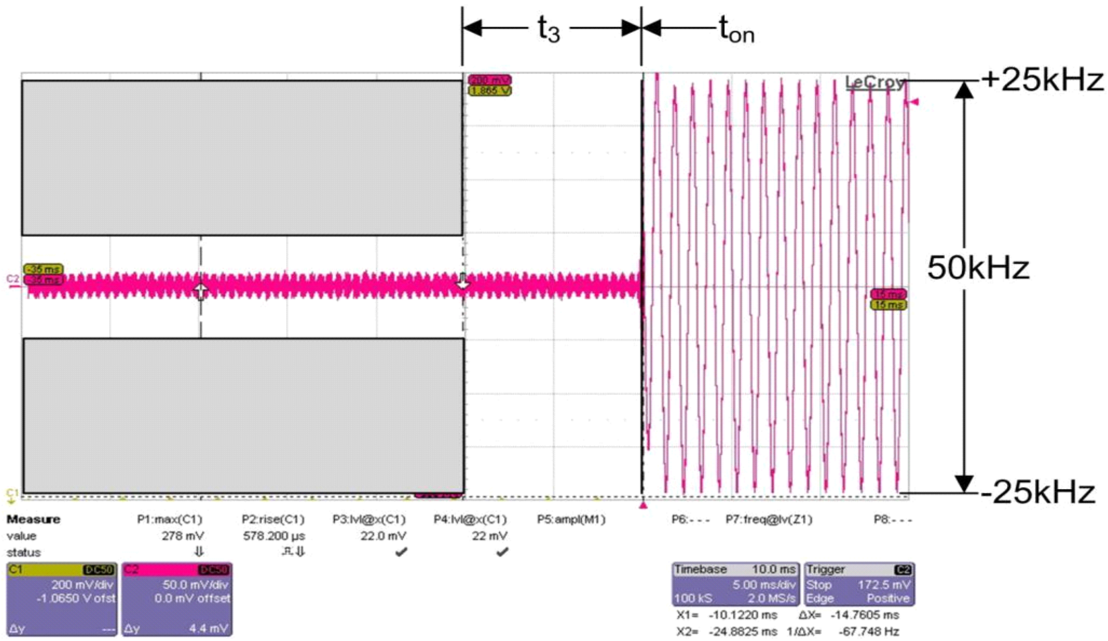
Transient Frequency Behavior: §90.214, RSS-119 (5.9), 6.25kHz BW



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

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**	

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. 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** 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)

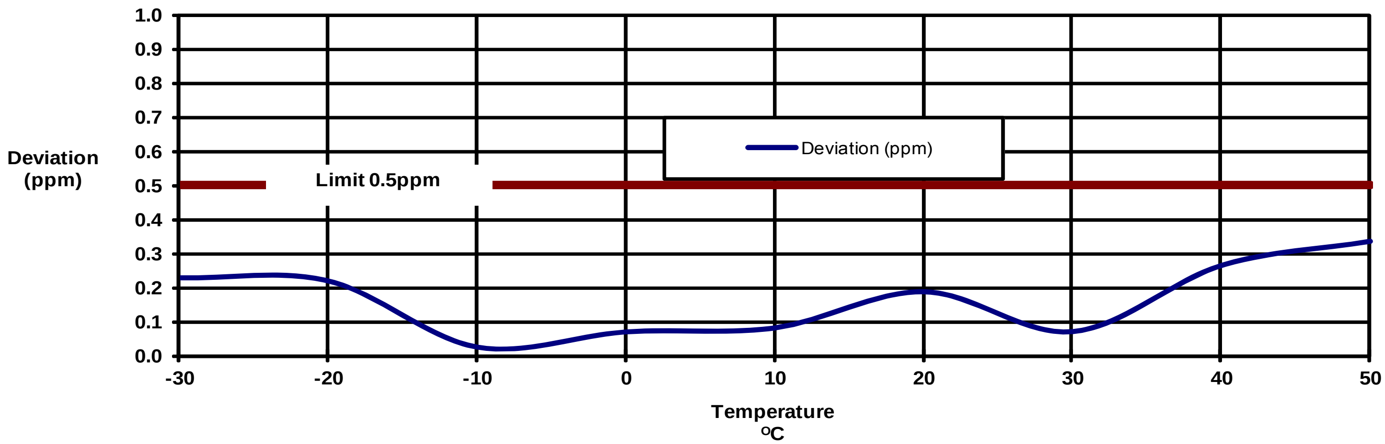
Measurement Procedure	
47 CFR §2.1055	**Frequency Stability** (a) The frequency stability shall be measured with variation of ambient temperature as follows: (1) From -30° to +50° centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section. (b) Frequency measurements 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. (d) The frequency stability shall be measured with variation of primary supply voltage as follows: (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**

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

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

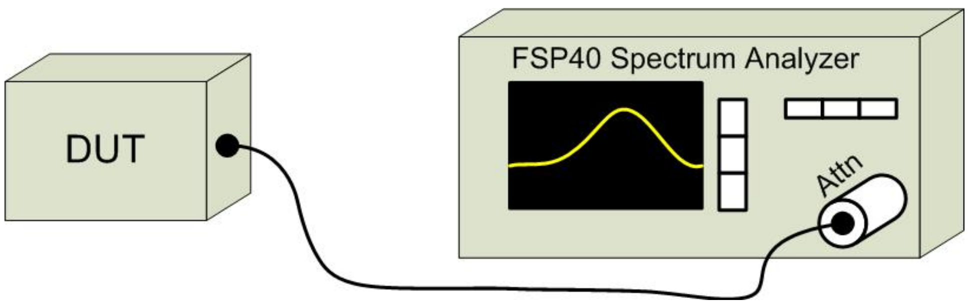


Table A.2 – Radiated Emissions Measurement Equipment

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

Figure A.2 – Test Setup Radiated Measurements 9kHzMHz – 30MHz

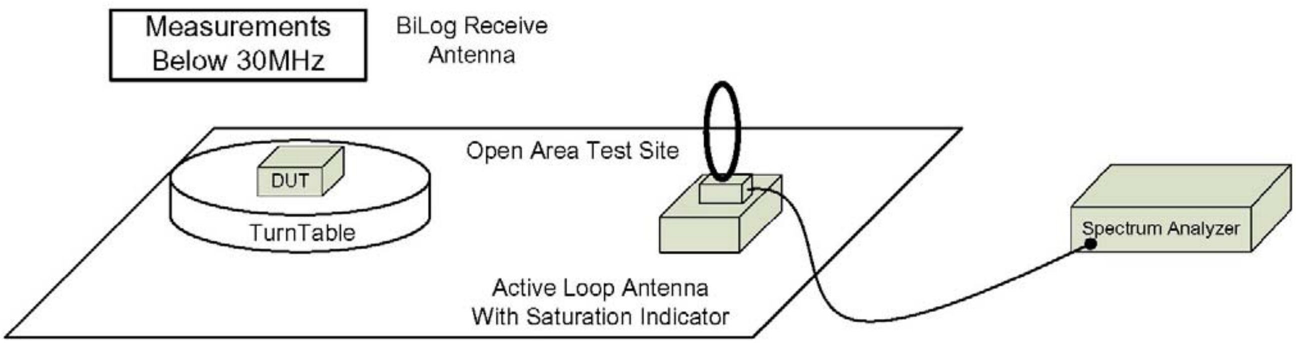


Figure A.3 – Test Setup Radiated Measurements 30MHz – 1GHz

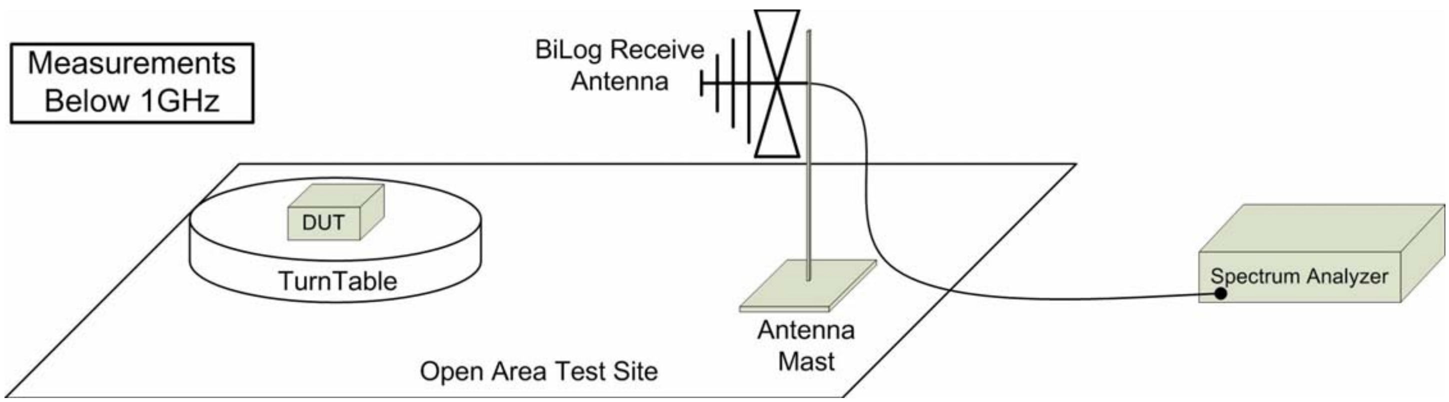


Figure A.4 – Test Setup Radiated Measurements Above 1GHz

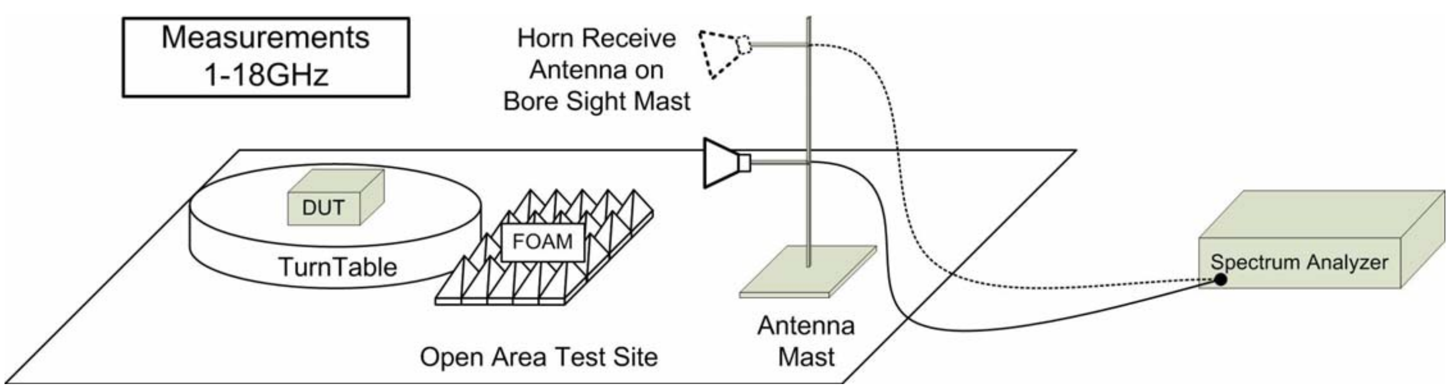


Table A.3 – Setup - Frequency Stability Measurement Equipment

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

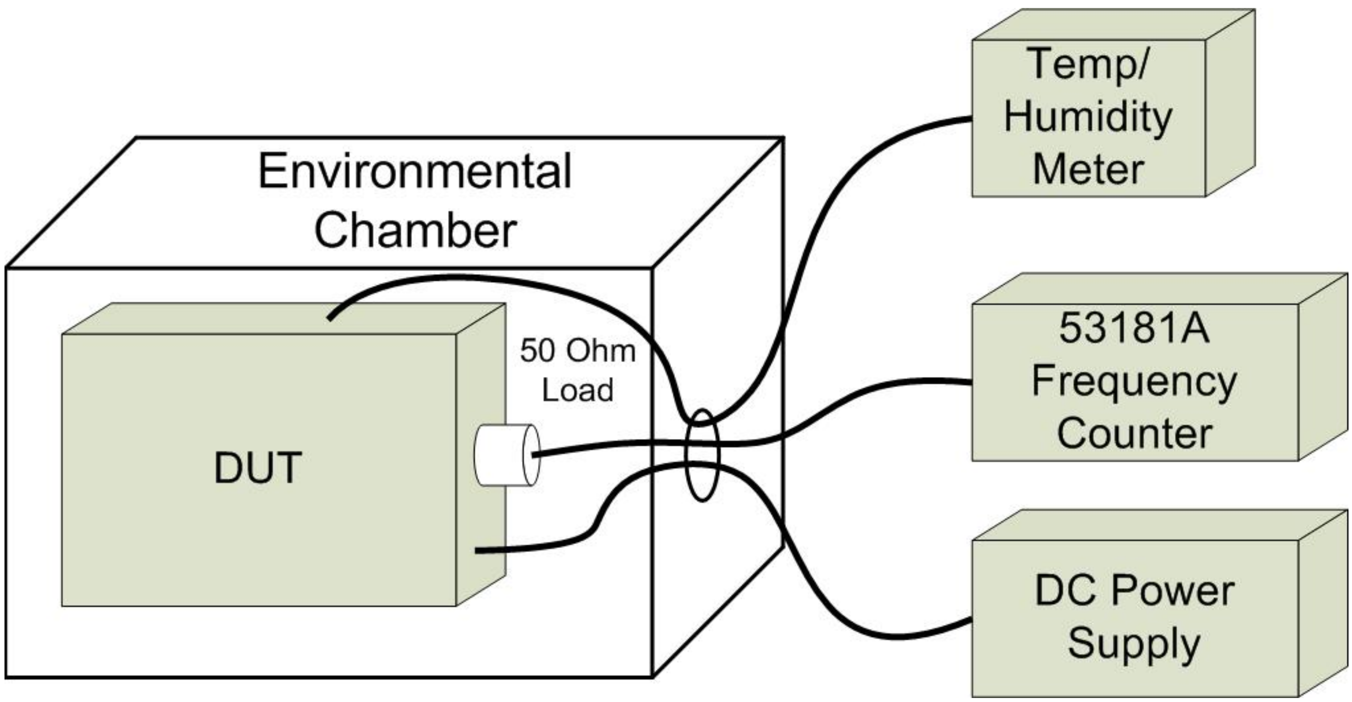
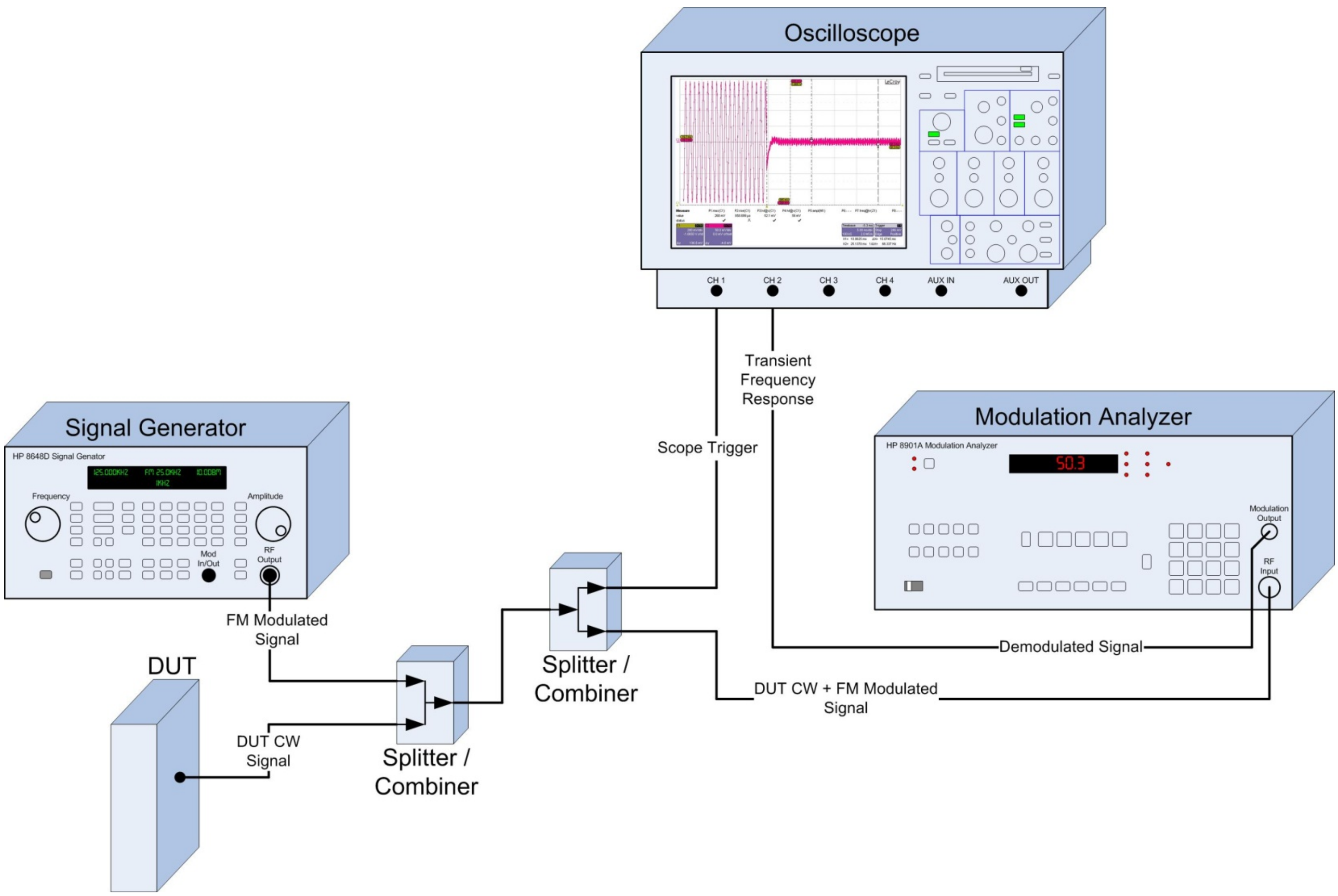


Table A.4 – Setup – Transient Frequency Behavior Measurement Equipment

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



APPENDIX B – EQUIPMENT LIST AND CALIBRATION

(*)	Asset Number	Manufacturer	Model Number	Serial Number	Description	Last Calibrated	Calibration Interval	Calibration Due
Equipment List								
*	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

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

